

Overhaul of EU air quality policy announced

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Potential for cuts in the non road sector

Often neglected in comparison to regulations concerning road vehicles, the so-called “non-road” sector, offers potential for future mitigation of air pollution.

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EU voting on new climate target for 2020

On 23 June 2011 the European Parliament will vote on proposals to strengthen the target for emission reductions of greenhouse gases in the EU by 2020.

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IPCC: Huge potential for renewable energy

There are sufficient resources to provide the world with renewable energy. The main constraint on development is public policy.

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Ship pollution causes 50,000 deaths per year

The number of deaths in Europe caused by air pollutant emissions from international shipping is estimated to amount to approximately 50,000.

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Call for new approach to nitrogen management

Europe should take an integrated approach to nitrogen management. This is the main message of the European Nitrogen Assessment.

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Negotiating new air pollutant ceilings

Significant environmental improvements can be achieved while additional costs still stay well below 0.1 per cent of GDP. Moreover, health benefits alone outweigh the costs by ten times or more.

Negotiations are ongoing for a revised Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution (CLRTAP). At a meeting of the convention's negotiating body, the Working Group on Strategies and Review (WGSR), in Geneva on 11-16 March, discussions focussed on the level of environmental ambition, the new emission ceilings for 2020, and updating of the technical annexes that among other things specify emission limit values for different emission sources.

The current protocol covers four pollutants (see box on p. 3), and there is general agreement to extend it to add fine particles (PM_{2.5}), and that black carbon should also be included in the revision of the Gothenburg Protocol as a component of PM_{2.5}.

To assess various levels of environmental ambition and the resulting national emission ceilings for 2020 that would be

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:

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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

Even when the Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution was signed in 1999 it was clear that the agreed emission reductions were totally inadequate to achieve the long-term objective of not exceeding critical loads. A process of review and revision in which emission ceilings are progressively lowered was therefore foreseen – a process that is expected to end this year with the signing of a new updated agreement (see article on front page).

The protocol is cleverly constructed with nationally differentiated undertakings that are designed to achieve commonly agreed interim environmental targets at least cost for Europe as a whole. It includes requirements for reducing emissions of four air pollutants (sulphur dioxide, nitrogen oxides, ammonia, and volatile organic compounds). The new protocol will be expanded to include one more pollutant, namely fine particulate matter (PM_{2.5}).

By establishing that international agreements could be made to rest on an effects-based scientific foundation in accordance with the critical-loads approach, the Gothenburg Protocol certainly marked a significant step forward. But it was a great disappointment that the emission reductions that the signatories undertook to make by 2010 were clearly insufficient.

The reason for this anomaly was that the ceilings of the protocol were in effect set by the signatories themselves, there having been no proper negotiation. In a great majority of cases the figures were an expression of what the countries believed their emissions would be in 2010 as a result of existing legislation. In other words, that was the end of their commitments.

Unfortunately history may repeat itself. In the ongoing negotiations for a new protocol, many countries still claim they are unable to commit to emission

reductions by 2020 that go beyond what is generally expected to be achieved by just implementing current legislation.

It is paradoxical and shameful that EU member states that have accepted that the EU must reduce its emissions of greenhouse gases by 20 or even 30 per cent by 2020, do not accept that such policy targets are fully reflected in the scenario analysis!

This is essential because the forecast fossil fuel use largely determines the levels of emissions of the air pollutants SO₂, NO_x and PM. So if fossil fuel use is overesti-

mated, the estimated cost of cutting air pollutants will be exaggerated, and inflated cost estimates are likely to lower political acceptance of the more ambitious initiatives.

An overestimation of future fossil fuel use will moreover result in an underestimation of the potential to reduce emissions of air pollutants, thus further weakening the case for ambitious new emission ceilings.

Consequently, if the EU takes the necessary additional action to reduce emissions of carbon dioxide, the costs of reducing emissions of the traditional air pollutants will be significantly lowered – cost savings that could be used to further improve the protection of human health and the environment from the damaging impacts of air pollution. This would mean aiming for a much higher level of environmental ambition, compared to the current focus of negotiations.

The gravity of the current air pollution situation calls for a new Gothenburg Protocol that establishes a very high level of ambition.

It is not acceptable that even after 2020, air pollution will still cause several hundreds of thousands of premature deaths among European citizens each year, and that millions of hectares of sensitive ecosystems will still be exposed to pollutant depositions in excess of their critical loads.

Christer Ågren

**‘many
countries
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Negotiating new air pollutant ceilings

Continued from front page

required to meet the environmental targets, the GAINS computer model for integrated assessment is being used to inform and assist negotiators. The optimisation feature of the GAINS model identifies cost-effective emission abatement options and the least-cost combinations of measures for Europe as a whole that achieve specified environmental targets.

Negotiators analyse the outcome from GAINS, such as the costs and benefits to individual countries and how these are distributed in the various least-cost scenarios. From these scenarios, a main negotiating scenario will eventually be selected. The resulting allocation of emission reductions to different countries is used as a quantitative starting point for the negotiations.

The scenarios are constructed for what is known as a gap closure approach, aiming at step-wise health and environmental improvements (see AN 3/10, pp. 14-15). So far, negotiators have been looking at five gap-closure scenarios, investigating varying levels of ambition, from 25 to 75 per cent gap closure for four different health and environmental targets: Health damage from PM_{2.5}; Health damage from

Table: Annual impact on health and ecosystems in Europe in the year 2020 of various ambition levels (scenarios), and estimated additional costs.

Scenario	Million years of life lost due to PM _{2.5}	Cases of premature deaths due to O ₃	Ecosystem area with excess nitrogen deposition (1000 km ²)	Forest area with excess acid deposition (1000 km ²)	Catchment area with excess acid deposition (1000 km ²)	Costs (billion euro/year in 2020)
Baseline	189.88	24.417	1408.1	112.7	34.1	-
LOW	168.03	23.533	1274.6	94.1	31.7	0.6
Low*	168.13	23.534	1152.1	86.4	31.3	0.9
Mid	146.66	23.026	1093.2	72.5	27.6	2.3
High*	125.31	22.670	991.6	52.1	24.8	5.4
HIGH	125.28	21.834	986.0	55.9	25.2	10.6
MTFR	104.10	20.996	847.5	38.3	22.7	63.7

ground-level ozone (O₃); Eutrophication from excess nitrogen deposition; and, Acidification from excess sulphur and nitrogen deposition (see table).

Named from "low" to "high", the outcome of these five scenarios can be compared to the situation in a baseline case, which assumes full implementation of current legislation in all countries by 2020, and also with a scenario that assumes all countries will apply so-called maximum technically feasible reduction measures (MTFR).

As shown in the table, the costs for the additional emission abatement measures range from €0.6 billion per year in 2020 for the Low scenario case, and up to €10.6 billion/yr for the HIGH case. If expressed as a percentage of GDP in 2020, for the Mid case this is equivalent to 0.01 per cent, for the High* case 0.03 per cent, and for the HIGH case 0.07 per cent as an average for the whole region.

Preliminary estimates of the health benefits indicate that these may amount to some €35-40 billion/year for the two low scenarios, about €70 billion/year for the mid scenario, and more than €100 billion/year for the two high scenarios.

Interestingly, calculations were presented showing that the additional working time required to pay for the

additional costs, would be more than compensated in five of the six scenarios by the working time gained from less absence from work resulting from reduced health impacts.

At this March meeting, there was virtually no discussion on the preferred level of ambition, which means that if a revised protocol is to be signed before the end of this year – as was agreed by all parties as late as December 2010 – this issue will have to be settled at the next (and final?) negotiating meeting in Geneva on 12-16 September.

Clearly, the final choice of ambition level will strongly influence the final outcome regarding the national emission ceilings. It should however be noted that the ceilings are complemented by a general requirement to implement best available techniques and apply binding emission limit values (ELVs) for a number of specific emission source categories, including large combustion plants and road vehicles. Therefore the level of ambition of the ELVs, the emission sources covered by these, and the deadlines set for their implementation are also of great importance for the overall outcome.

Christer Ågren

The report and other documents from the 48th session of the Working Group on Strategies and Review are available at: <http://www.unece.org/env/lrtap/WorkingGroups/wgs/docs48th%20session.htm>

Scenario analysis report: **Cost-effective emission reductions to improve air quality in Europe in 2020**. 31 March 2011. By M. Amann et al, CIAM/IIASA, Austria.

The Gothenburg Protocol

The Convention on Long-Range Transboundary Air Pollution (CLRTAP) dates back to 1979 and covers 51 parties in Europe and North America. The convention is extended by eight protocols that specify emission reduction commitments and identify specific abatement measures to be taken. Cooperation under the convention includes development of policies and strategies to cut emissions of air pollutants through exchanges of information, consultation, research and monitoring.

The Gothenburg Protocol to Abate

Acidification, Eutrophication and Ground-level Ozone was signed in 1999 and entered into force in 2005. It sets binding national emission ceilings for 2010 for four pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia), contains emission limit values for a number of specific emission source categories such as large combustion plants and road vehicles, and requires the use of best available techniques.

For more information, see: <http://www.unece.org/env/lrtap/>



Overhaul of EU air quality policy announced

Prompt action is required to further reduce particulate matter, ground-level ozone, and nitrogen dioxide – an EU clean air strategy should be adopted in 2013.

As a follow-up to the European Commission top-level debate on EU air quality policy on 18 January, in mid-March the Commission released a paper¹ that briefly presents its planned activities over the next few years.

Initially it is concluded that “current policy efforts, at EU and national level, have not fully delivered the expected results” and that the current levels of exposure to particulate matter (PM) and ground-level ozone cause significant loss of life-expectancy, acute and chronic respiratory and cardiovascular effects, impaired lung development in children and reduced birth weight.

Air pollution is also causing serious threats to ecosystem biodiversity by excess nitrogen nutrient deposition (eutrophication). There are widespread problems with vegetation damage from high levels

of ground-level ozone, and ecosystem damage from acidification still remains.

The Commission therefore concludes that “prompt action is required to further reduce air emissions linked to the most problematic pollutants such as particulate matter, ground-level ozone, and nitrogen dioxide” and it intends to “resume without delay” work to update the 2005 Thematic Strategy on Air Pollution, to review the 2008 air quality directive, and to revise the 2001 national emissions ceilings (NEC) directive. An up-to-date clean air strategy package is to be adopted in 2013, at the latest.

The work towards the clean air strategy is to be supported by an open and broad stakeholder consultation process, to be launched this summer, and will include a public online consultation; the establishment of a stakeholder group, dedicated

workshops and events, and a dialogue with international organisations, such as the World Health Organisation (WHO) and the Convention on Long-range Transboundary Air Pollution (CLRTAP).

In order to achieve short-term emission reductions – as a complement to the longer term reductions expected from the clean air strategy after 2013 – the Commission outlines a series of initiatives, including:

- Revision of the 1999 sulphur-in-fuels directive, in order to incorporate the stricter shipping sulphur emission standards of the revised International Maritime Organisation’s MARPOL Annex VI from 2008;
- A number of actions linked to road vehicle emissions aimed at addressing urban air pollution “hot spots”, such as promoting the upgrading of vehicles

by applying retrofit technologies, and promoting cleaner and more energy-efficient vehicles;

- Revision of the CLRTAP's 1999 Gothenburg Protocol, with broadened participation by eastern European countries, as well as extending it to include NECs for particulate matter (PM_{2.5}).

The Commission recognises that there are several important links and potentially beneficial synergies between policies on air pollution and climate change. For example, measures to improve energy efficiency, promote renewable energy sources and reduce the burning of fossil fuels will create co-benefits by also reducing air pollutant emissions. And measures to cut PM emissions and ground-level ozone can create short-term climate benefits, since both ground-level ozone and black carbon (which is a PM constituent) are short-lived climate forcers.

The 2005 Thematic Strategy on Air Pollution was developed following the Commission's four-year Clean Air For Europe (CAFE) programme, and it established interim environmental targets to be achieved by 2020. The original intention was that a revised NEC directive setting binding national emission ceilings for 2020 should secure the achievement of these targets. But this intention may now fail, due to the fact that the Commission has – for various reasons – repeatedly over the last five years postponed the publication of a proposal to revise the NEC directive.

Delaying the NEC proposal another two years, up to 2013, as is currently implied in the Commission document, will in practice mean that adoption by the Parliament and the Council of a new NEC directive is likely to take place in 2015. This in turn means that the new, stricter national emission ceilings will rather be set for 2025 (or perhaps even for as long ahead as 2030), than for 2020, as originally intended.

Christer Ågren

¹ **Commission Staff working paper on the implementation of EU Air Quality Policy and preparing for its comprehensive review** (14 March 2011). SEC(2011) 342 final. Available at: http://ec.europa.eu/environment/air/review_air_policy.htm

Ten countries to exceed their NOx emission ceilings

EU member states must meet legally binding limits for four air pollutants set by the 2001 National Emission Ceilings Directive (NECD), but according to the annual NECD status report released 1 June by the European Environment Agency (EEA), ten member states expect to miss their respective emission ceilings for nitrogen oxides.

The report documents the most recent emissions (2009) and projection information (2010) for the four pollutants sulphur dioxide (SO₂), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs) and ammonia (NH₃). The pollutants covered by the report harm both human health and the environment by contributing to the formation of ground-level ozone and particulate matter and leading to acidification and eutrophication.

By contributing to more than 40 per cent of total EU27 NO_x emissions in 2009, the road transport sector bears most of the blame for the anticipated exceedances. Although emissions from this sector have

decreased since 1990, recent reductions have not been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because vehicle emission standards have not always delivered the anticipated level of NO_x reductions.

Some member states, such as the Netherlands and Slovenia, expect to exceed their respective NO_x ceilings by only small margins (less than 5 per cent). In contrast, Germany and France expect to exceed their ceilings by 328 kilotonnes and 275 kilotonnes respectively – equivalent to exceedances of 31 and 34 per cent. Austria, while expecting a lower surplus in absolute terms, anticipates exceeding its ceiling by 40 per cent.

While all countries are likely to achieve their ceilings for SO₂, four (Denmark, Germany, Portugal and Spain) are expected to exceed their ceilings for NMVOCs, and two (Germany and the Netherlands) those for NH₃.

Source: EEA, 1 June 2011. Information: www.eea.europa.eu

EU green light for lorry pollution charges

On 23 May an agreement was reached between the European Commission, Council and Parliament on revised road charging rules for lorries (the Eurovignette directive) that would open the door for member states to charge for air and noise pollution in road tolls but introduces a loophole for lorries under twelve tonnes.

Nina Renshaw at green group Transport & Environment (T&E), said: "This agreement will enable countries to directly target the noisiest and most polluting lorries, which is a significant step forward. But it still forbids charges to cover

the €60 billion costs of climate change, congestion and accidents caused by lorries – that's a wasted opportunity and is unnecessarily restrictive."

In a step backwards, a requirement in the existing directive for charges to apply to all lorries from 3.5 tonnes upwards from 2012 has been scrapped. Following pressure from Germany, member states will now be able to give lorries under 12 tonnes a free ride, under certain conditions.

The agreement between the three EU institutions now needs to be formally approved by transport ministers and the full parliament before becoming law.

Source: Transport & Environment, 24 May 2011



ZENTILIA / FOTOLIA

Sustainable transport is more than emissions

“Curbing mobility is not an option,” says the European Commission in a new roadmap for the transport sector, expressing a view that immediately sparked criticism.

On 28 March the European Commission presented a strategy that will create “a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment”. At the same time dependence on oil will be considerably reduced, and carbon emissions from transport will be cut by 60 percent by 2050, compared to the 1990 level.

The commission’s proposal is called Transport 2050 and takes the form of a white paper recommending around forty different measures at EU level. The last time a white paper on transport was presented was in 2001. At that time the commission recommended around sixty measures, most of which are still waiting to be implemented.

In contrast to most other scenarios for transport sector development, the commission states in its new roadmap that the targets can even be achieved if traffic continues to grow. “The widely held belief that you need to cut mobility to fight climate change is simply not true,” said commissioner Siim Kallas when the white paper was presented. A staff working document reinforces the message that “Curbing mobility is not an option”.

There are four reasons for current problems, according to the commission: ineffective pricing (external costs are still not internalised), inadequate research policy, inefficient transport services and a lack of integrated planning.

To achieve the 60 per cent target by 2050 the commission considers that ten



The white paper on traffic leaves much for later.

targets must be achieved, including the following:

- No more conventionally fuelled cars in cities.
- 40 per cent use of sustainable low carbon fuels in aviation; at least 40 per cent cut in shipping emissions.
- A 50 per cent shift of intercity passenger and freight journeys from road to rail and waterborne transport for distances over 300 km.

Some 40 policy measures are listed to help implement these goals. They include road pricing, charging lorries for infrastructure costs, fuel taxation and research and innovation. The commission once again proposes to support or possibly force larger cities to develop urban mobility plans.

The white paper leaves much of the detail on cleaner modes of transport to a strategic transport technology plan due later this year and a clean transport systems strategy planned for 2012.

Transport & Environment (T&E), a network of environmental organisations concerned with EU transport issues,

welcomes the 60 per cent transport target, but says the plan for reaching it is insufficient because it postpones short-term action to the point where emissions reductions will “magically” have to intensify after 2030.

“The only concrete action the commission proposes within its current mandate (2010–14) is to expand airport capacity, which will make the headline targets even harder to reach. Plans to tackle harmful subsidies and to develop greener

transport pricing are up to five years away. In short, this is a manifesto for inaction,” commented Jos Dings, Director of T&E.

T&E believes that the commission’s statement that “curbing mobility is not an option” is both incompetent and unacceptable. “How are we to tackle congestion in cities without tackling demand for mobility in those areas?”

The EU spends 13 billion euro every year on transport infrastructure projects, but the strategy paper says nothing concrete about how to make sure only sustainable projects get funded. “The EU should link the proportion of funding projects receive to the amount of carbon emissions they save,” comments T&E.

T&E also sees a risk in the commission urging reliance on electricity and biofuels, while saying nothing about measuring or reducing their carbon footprints.

Per Elvingson

The full white paper and supporting documents are available at: http://ec.europa.eu/transport/strategies/2011_white_paper_en.htm

Compliance with emission ceilings “not required to build new plants”

Compliance with national air emission caps under the NEC directive is not a condition for authorising the construction of new industrial installations, the European Court of Justice (ECJ) concluded in three joint rulings. EU judges were asked to interpret the 2001 directive and a related law on industrial pollution in a case brought by several environmental groups against decisions to approve the construction of three coal-fired power plants in the Netherlands. The groups complained the construction of these plants should never have been authorised, given that, according to estimates at the time, the member state was likely to exceed its

emission caps for SO₂ and NO_x in 2010 without additional measures.

According to figures cited in the ECJ rulings, one of the plants expected to start operating in 2012 in Eemshaven will emit about 2.9 per cent of the country's emission cap for SO₂ annually. In the end, the ECJ ruled member states have some flexibility as to how they decide to meet their national emission caps. A single measure such as the construction of a plant is unlikely to jeopardise their efforts. However, they must make sure that all the measures in place form a coherent policy aimed at complying with the law.

Source: ENDS Europe Daily, 26 May 2011

Belgium to court

Belgium has so far failed to effectively tackle excess emissions of health-damaging particles (PM₁₀) in eight zones across the country, and is therefore being taken to the EU Court of Justice. Belgium has applied for time extensions for meeting the targets, but the conditions required have not been met.

Source: European Commission, 6 April 2011

Sweden condemned

The European Court of Justice (ECJ) has condemned Sweden for having exceeded EU air quality limits on PM₁₀ in three areas including Stockholm and Gothenburg. Sweden has said it will take additional measures to comply. According to Sweden, the pollution is restricted to large roads with heavy traffic in a number of urban areas and is mainly due to the use of studded winter tyres. Issued on 10 May, the court ruling follows infringement proceedings launched by the EU executive in February 2009.

Source: ENDS Europe Daily, 10 May 2011

France to court

The European Commission is taking France to court for failing to comply with EU air quality limit values for airborne particles (PM₁₀). Since 2005, the PM₁₀ limit values have not been respected in 16 air quality zones across the country. France has applied for time extensions for meeting the targets, but only one zone (Strasbourg) has met the conditions for an exemption. Despite an earlier reasoned opinion asking France to act, air quality standards are still exceeded in the 15 remaining air quality zones.

Source: European Commission, 19 May 2011

Romania warned

In Romania, 17 areas have been found to exceed PM₁₀ limits. Romania applied for an exemption in 2010 for 11 of these 17 areas, but the Commission turned down the application. Consequently, the Commission has sent a reasoned opinion, and Romania has two months to comply. In the absence of a satisfactory response, the Commission may refer the case to the court.

Source: European Commission, 6 April 2011

Busy times at the European Court of Justice, dealing with air pollution offences.

Potential for cuts in the non road sector

As no revision of the European Air Quality legislation is planned until at least 2013, the EU has said it will focus on source-oriented legislation in the meantime. Often neglected in comparison to regulations concerning road vehicles, the so-called “non-road” sector, which includes locomotive engines and construction site diggers, offers significant potential for future mitigation of air pollution, but important work still needs to be done to achieve results.

In January 2011, the environmental community was disappointed by the European Commission’s decision to postpone the review of the NEC Directive and other air quality legislation until 2013, which the EU intends to make the “Year of Air” (see AN 1/2011, p. 7). As a result, no new limit values or national ceilings will be set by EU regulation before this date and the only instrument left for improving air quality in the EU is source-oriented legislation.

Following the debate on air quality at the European Commission last January, the Environment Commissioner Janez Potočnik released a statement reporting that: “The Commission will without further delay take measures which will help member states comply with established EU air quality standards. These include, for example, measures on the sulphur content of bunker fuels and on reducing emissions from vehicles and machinery.”

This statement signals the growing importance of the non-road sector when it comes to mitigating air pollution. While measures on reducing air pollution from road vehicles were translated into regulatory proposals from the late 80s, the regulation on Non-Road Mobile Machinery (NRMM) was only agreed almost a decade later. It covers a large variety of applications: from diesel locomotives and inland waterway vessels to construction machines and generators.

EU NRMM standards were first adopted in 1997 and then revised in 2004. However, due to the lack of stringency of

the limit values so far adopted, the sector has progressively fallen behind on air quality improvements.

According to the seventh NEC Scenario Analysis Report by IIASA, non-road vehicles accounted for about 16 per cent of NO_x emissions in the EU and nine per cent of PM_{2.5} pollution in the year 2000. By 2020, the sector’s share of NO_x emissions is expected to grow further and its importance for particulate pollution will slightly decrease – but at a much slower rate compared to the road sector. In addition, the sector is estimated to be one of the most important emitters of ultra-fine particles and black carbon, whose effects harm both the environment and the climate. These effects are magnified by the fact that most of these vehicles run continuously for most of the day, close to workers and quite often within cities. As a result, reducing the exposure to NRMM exhaust emissions should be given priority when addressing local air pollution and this should be supported by a corresponding technical regulation at the EU level.

As mentioned, one of the explanations for the growing importance of the non-road sector in terms of air pollution is its relatively poor exhaust emission standards compared to the limit values that have been set for road vehicles (see figure). As an example, the NO_x emission limit (in g/kWh) for a diesel locomotive is 10 times higher than for a truck. Similarly, the standards introduced for so-called constant speed engines (generators, pumps, etc.) and inland vessels compare really poorly to the Euro VI truck standards.

Although some NRMM standards will be revised, the future emission limits currently discussed by the European experts for the next revision of the directive will not reduce the enormous gap in NO_x emissions between on-road and non-road standards (especially for the highest power range, i.e. >560 kW, which is not regulated yet, e.g. locomotives and inland shipping engines). The same applies to some extent to particulate matter control as the new Euro VI regulation for heavy-duty vehicles introduces a more stringent and comprehensive approach on particulate

pollution with a limit value for particulate matter mass (PM) and particulate number (PN). Although the current approach, based on mass concentration, has been quite successful in reducing emissions of fine particles (PM₁₀ and to some extent PM_{2.5}), it still fails to address the smallest fraction of particulate matter. Mass has traditionally been the metric for particulate control but it has shown its limits in addressing ultra-fine particles (<0.1µm),

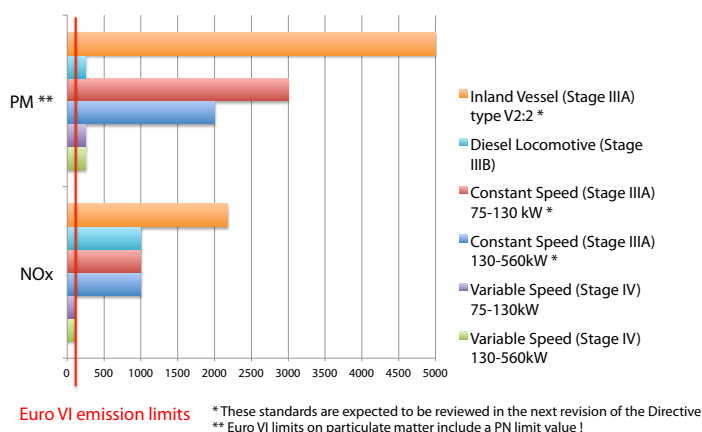


Figure: Emissions standards from Non-Road engines in 2015 compared to Euro VI (in %)



Emission standards for lawnmowers, locomotives and inland shipping engines, the so called “non-road” sector, are way behind those for other sectors.

such as black carbon, which are nearly weightless. However the actual health and climate impacts of these nano-sized particles belie their size. Their mitigation is a crucial challenge that the NRMM sector has to meet.

A lot of hopes are being placed on the long-awaited review of the NRMM Directive that was originally due to be proposed by the Commission in 2007. The introduction of new emissions stages for constant speed engines, inland shipping and rail engines and the improvement of the existing standards for variable speed engines should be key priorities of the next revision. One of the most important objectives should be the alignment with Euro VI standards, which would mean, in practice, that the sector will have to comply with more stringent NO_x limit values and further reduce its emissions of particulate matter. In practical terms, the introduction of PN limit values will lead to the prompt introduction of the best available technology (currently a wall-flow type diesel particle filter) to address both fine and ultra-fine particulate pollution, such as black carbon. For this reason, the alignment of non-road standards with Euro VI has also been acknowledged as

a priority by the Ad-Hoc Expert Group on Black Carbon of the UN ECE Convention on Long-range Transboundary Air Pollution.

This more progressive approach on particulate matter regulation has already been adopted by Switzerland in its Ordinance on Air Pollution Control. Since 2009, Swiss construction equipment has had to meet a PM standard similar to the one in the current NRMM Directive, but also comply with a PN limit value set at 1×10^{12} solid particles per kWh. When a new engine system cannot be certified to the PN limit value, the standard is considered to be met if the machine is retrofitted with a particle filter meeting specific requirements defined by the Swiss regulations. This approach ensures a smooth introduction of the new standard and also allows the Swiss authorities to adopt a standard that can ultimately be met by all construction equipment.

In comparison to the Swiss regulation, the lack of retrofitting requirements of NRMM equipment represents one additional important loophole in the current EU regulation. The in-use compliance is also a critical aspect that needs to be ad-

dressed. In practice, the EU limit values only apply to new engines, and instruments to control the real-world performance of NRMM equipment in terms of air quality are limited. The EU should correct this and include in any revised directive the necessary provisions to ensure that the standards are met in real life. In addition, provisions for retrofitting should be included in future legislation to ensure the constant improvement of the air quality performance of the sector, especially for equipment with long lifetimes such as locomotives, railcars and inland vessels.

In its report on the so-called flexibility provisions of the directive, the European Parliament's Environment Committee urged the Commission to adopt stricter limit values for further controlling exhaust emissions from the NRMM sector. The ball is now in the Commission's court and the upcoming revision of the NRMM Directive, planned to be published in the beginning of 2012, will be a good indicator as to how serious the EU executive really is in wanting to tackle air pollution in Europe.

Antoine Kedzierski
Transport & Environment



Energy efficiency makes people smile.

Standards for new boilers underway

The European Commission circulated in early April a draft of ecodesign and energy labelling standards for new boilers. It hopes to agree the ecodesign standard with member states this summer. Labelling standards can be adopted by the commission. Ecodesign rules would introduce increasingly stringent energy efficiency standards that vary according to different boiler types.

There is an additional set of efficiency standards for boilers that also heat water. These will be matched to separate requirements for standalone water heaters once they have been agreed. Further standards cover noise from heat pumps, nitrogen oxide emissions and product information requirements.

Source: ENDS Europe Daily, 5 April 2011

Pressure on London to act on PM pollution

Under a decision to grant a “temporary, conditional time extension” for meeting limits for the concentration of dangerous airborne particles (PM₁₀), the UK government and the Mayor of London have been told by the European Commission to urgently implement a plan for dealing with air pollution “hotspots” in London.

James Grugeon of Environmental Protection UK said, “Air pollution in our cities is one of the biggest public health crises we face in the UK. It contributes to more premature deaths than passive smoking and traffic accidents combined. The government and the Mayor of London need to be implementing solutions, not delaying action, to improve air quality.”

Source: ENDS Europe Daily, 11 March 2011

Cut mercury from coal combustion

Mercury emissions from coal-fired plants can be cut by well over 90 per cent, but this fact has so far been neglected in ongoing talks for a revised Heavy Metals Protocol.

Coal-fired power plants are the largest man-made source of atmospheric mercury emissions in Europe and North America. They contribute about half of the anthropogenic mercury emissions in the EU. For some years, the Convention on Long-range Transboundary Air Pollution (CLRTAP) has been in the process of revising the 1998 Protocol on Heavy Metals. In these discussions, the introduction of an emission limit value (ELV) for mercury from coal-fired power plants of 30 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) has been proposed. Even without modern air pollution control devices many coal-fired power plants can fulfil this limit value.

For many coal-fired power plants, mercury abatement will come as a co-benefit of reducing other main air pollutants, namely NO_x, SO₂ and dust. Some of the mercury is bound to particles and removed by the dust control devices, such as electrostatic

precipitators (ESP), which are common practice, or fabric filters that are being used more and more. The water-soluble fraction of mercury can be captured by the wet flue gas desulphurisation systems (FGD) that are already widely used in the EU. In many of these cases mercury emissions will already be below 10 $\mu\text{g}/\text{m}^3$. Elemental mercury in gaseous form is generally not captured by existing dust or sulphur removal systems. However, when a selective catalytic reduction (SCR) is applied this will promote oxidation of the elemental form and thus enhance mercury capture in a downstream FGD. Many large power plants already use SCR to reduce emissions of NO_x. These installations can reduce mercury emissions to levels below 3 $\mu\text{g}/\text{m}^3$ at no additional cost.

Even coal-fired power plants that are not fully equipped with conventional abatement techniques can meet an ELV of 3 $\mu\text{g}/\text{m}^3$, as several techniques specifically aimed at cutting mercury emissions exist (see Box). While the additional costs for such techniques could amount to several million euros for a large plant, they would lead only to a very small increase in the price of electric power of about 0.0001 euro/kWh, which adds up to less than one euro per year for a family.

In the USA, about one-third of power generating capacity was equipped with FGD in 2005, and the US Environment Protection Agency expects that by 2015 this figure will increase to two-thirds of the installations.

In the Netherlands, all six coal-fired power plants currently in operation use ESP, FGD and SCR. Three new plants are being constructed and these will be equipped with FGD, SCR and a fabric filter, but no specific mercury abatement

Mercury removal

There are several techniques commercially available for the reduction specifically of mercury emissions, with removal efficiencies of around 90 per cent. Activated Coal Injection upstream of the electrostatic precipitation or fabric filter increases the mercury fraction that can be removed from the flue gas. Injection of brominated active coal also improves mercury removal by flue gas desulphurisation. Using activated coal as adsorbent can reduce mercury emissions to levels of between 0.5 and 3 $\mu\text{g}/\text{m}^3$. Besides activated coal other adsorbents and methods with similar effects are commercially available.



A revised Heavy Metals Protocol might make eating fish a less risky business in the future.

techniques. Their environmental permits state that their annual average emissions of mercury must stay below $3 \mu\text{g}/\text{m}^3$.

These emission control methods (ESP, FGD, SCR) are regarded as Best Available Techniques (BAT) in the EU, and for EU member states application of BAT is mandatory. This is reflected in the new Industrial Emissions Directive (IED) that will replace the current 2001 Large Combustion Plant Directive (LCPD) after 2012. This sets stricter NO_x emission limit values, which means that all new installations and many existing ones will have to be equipped with SCR.

The 1999 Gothenburg Protocol also requires the use of BAT, which implies that new coal-fired power plants in European countries that have ratified the protocol also have to use ESP, FGD and SCR. The ELVs in the new protocol, to be signed before the end of this year, are expected to be stricter than the current ones. Mercury emissions from large coal-fired power plants in those countries that sign the

new protocol will be at levels of $3 \mu\text{g}/\text{m}^3$ without additional costs.

It can therefore be assumed that within the next 15 years or so, virtually all coal-fired power plants in Europe will be equipped with abatement techniques for NO_x, SO₂ and dust removal, and they will thus achieve emission levels far below $30 \mu\text{g}/\text{m}^3$. In many cases emissions will be below $3 \mu\text{g}/\text{m}^3$. Consequently, the ELV for mercury in the revised Heavy Metals Protocol could be set at $3 \mu\text{g}/\text{m}^3$ for new installations and some of the existing installations without entailing extra costs for the operators.

André Peeters Weem

Information: Reduction of mercury emissions from coal-fired power plants, by André Peeters Weem, (InfoMil, NL Environment). Informal document No. 3, presented to the 48th session of the Working Group on Strategies and Review of the Convention on Long-range Transboundary Air Pollution, 11-15 April 2011. Available at: <http://www.unep.org/env/lrtap/WorkingGroups/wgs/docs48th%20session.htm>

Proposal for new minimum tax on fuels

The European Commission proposes a minimum tax rate for CO₂ on transport and heating fuels from 2013 and minimum rates for energy based on the energy content of a fuel rather than on its volume as is the case for most motor fuels now. This means fuels would also be taxed according to the amount energy they produce, driving higher efficiencies. One of the proposal's main objectives is to make energy taxation fairer by introducing a carbon element reflecting the true environmental impact of various types of fuels. For example, diesel is less taxed than petrol even though it has a higher energy and CO₂ content. The commission is likely to face hefty opposition when it puts the proposal to ministers later this year.

Source: European Commission, 13 April 2011

Spanish motorway speed limits cut fuel use

A cut in motorway speed limits introduced by Spain appears to have reduced seasonally-adjusted fuel consumption by 8.4 per cent in its first month in operation, Spain's industry ministry claimed last week. "The (10 km/hr) cut in speed limits to 110 km/hr is behind this reduction," the ministry stated. Monthly road fuel consumption in March was the lowest recorded since December 2002.

The statistics provide impressive evidence of the potential of lower speed limits to conserve road fuels and cut carbon dioxide emissions. A European Environment Agency simulation concluded that a reduction in motorway speed limits identical to the Spanish case would most likely achieve savings of 2-3 per cent, though with a theoretical potential of 12-18 per cent.

Source: ENDS Europe Daily, 2 May 2011



MARCOS CASTELLANO

The next obvious step to cut CO₂ emissions?



ANNE BOWERMAN

Noise is no laughing matter, is the still up-to-date title of this brochure from the 1950s.

WHO: Traffic noise major threat to health

Traffic noise is the second biggest environmental problem affecting health after air pollution, says a report published by the World Health Organization (WHO). The report says that each year Europeans lose at least one million healthy life-years due to disability or disease caused by traffic noise. This new health evidence highlights the urgency of adopting more stringent EU vehicle noise standards.

“The Commission has an opportunity in the coming weeks to cut road traffic noise by half, and protect millions of Europeans from this health risk,” says Nina Renshaw at Transport & Environment (T&E). The European Commission is expected to release a proposal to update EU legislation on vehicle noise in June.

Source: World Health Organization, 30 March 2011

Multiple benefits from stricter global vehicle emission controls

Non-CO₂ air pollutants from motor vehicles have traditionally been controlled to protect air quality and health, but they also affect climate. In a new study, a global composition-climate model was used to examine the integrated impacts of adopting stringent EU air pollutant emission standards for road vehicles in 2015 in many developing countries.

Relative to a baseline scenario which assumed no extra controls on top of currently proposed or adopted standards, implementation of the tighter EU emissions and fuel standards as from 2015 would lead to annual benefits in 2030 and beyond of:

- 120,000–280,000 avoided premature air pollution-related deaths;
- 6.1–19.7 million metric tons of avoided ozone-related yield losses of major food crops;
- \$US 0.6–2.4 trillion avoided health damage; and,
- \$US 1.1–4.3 billion avoided agricultural damage.

Moreover, the tighter standards resulted in mitigation of approximately 0.2°C of northern hemisphere extratropical warming during 2040–2070. Note that there is significant uncertainty regarding the estimated cooling effect, primarily relating to black carbon and due to the poorly quantified indirect effects on clouds and albedo of this pollutant. Including the uncertainty range would show a cooling of between 0.03 and 0.34°C.

Tighter vehicle emission and fuel standards are thus extremely likely to mitigate short-term climate change in most cases, in addition to providing large improvements in human health and food security. These standards will not reduce CO₂ emissions, however, which are required to mitigate long-term climate change.

Source: Climate, health, agricultural and economic impacts of tighter vehicle-emission standards. By D. Shindell, M. Walsh, et al. Published in *Nature Climate Change*, Vol 1, April 2011.

Half of all Americans breathe polluted air

The United States has made progress in cleaning up air pollution, but 154.5 million people, about half the population, live where the air is so polluted with smog and particles that it is often dangerous to breathe, according to the State of the Air 2011 report. Nearly half the people in the United States, 48.2 percent, live in counties that received an “F” for air quality due to unhealthy ozone levels. Los Angeles-Long Beach-Riverside, California remains the metropolitan area with the worst ozone problem, although great improvements

have been made since the report was first issued 12 years ago. In fact, eight of the 10 most ozone-polluted cities are in California, the report shows. Honolulu, Hawaii and Santa Fe-Espanola, New Mexico are identified as the cleanest cities – the only two cities in the nation that were among the cleanest for year-round particle pollution and also had no days when ozone and daily particle pollution levels reached unhealthy ranges.

Source: American Lung Association, 27 April 2011

The dirtiest plants in Europe

Germany's lignite power plants still dominate the CO₂ list. Serbia is registering emissions for the first time and enters both the NO_x list and the SO₂ list.

The European Pollutant Release and Transfer Register (E-PRTR) has been updated with information on releases and transfers from industrial installations in 2009. For the first time voluntarily reported data from Serbia are included in the register. Five Serbian facilities are found among the register's top twelve emitters of SO₂ and one of them also makes it on to the NO_x list.

The effects of the 2001 Large Combustion Plants Directive, which extended limit values for NO_x and SO₂ to existing plants, are starting to show, especially for SO₂. Maritsa 2 in Bulgaria is still the largest polluter, but decreased emissions of SO₂ in 2009 by more than 100,000 tonnes compared to 2008.

When looking at major CO₂ emitters you notice hardly any changes in 2009 compared with the previous year. There are no significant decreases and Germany's lignite power plants still dominate among the top polluters.



Belchatow power plant in Poland is a European top polluter.

The E-PRTR is a service managed by the European Commission and the European Environment Agency (EEA). The online register contains information on emissions of pollutants released to air, water and land by industrial facilities throughout Europe (32 countries: EU27, Iceland,

Liechtenstein, Norway, Switzerland and Serbia). The first data set is from 2007 and has now been updated for the third time.

Kajsa Lindqvist

Source: <http://prtr.ec.europa.eu/>

CO ₂		
	Plant	Tonnes
1	Belchatow (PL)	29,500,000
2	Niederaussem (DE)	26,300,000
3	Jäncshwalde (DE)	23,600,000
4	Drax (UK)	20,500,000
5	Eschweiler (DE)	19,200,000
6	Neurath (DE)	17,900,000
7	Frimmersdorf (DE)	16,800,000
8	Boxberg (DE)	15,300,000
9	Toulon incinerator (FR)	13,400,000
10	Brindisi (IT)	13,000,000
11	Agios Dimitrios (EL)	12,900,000
12	Lippendorf (DE)	12,800,000

NO _x		
	Plant	Tonnes
1	Belchatow (PL)	42,900
2	Drax (UK)	38,400
3	Cottam (UK)	28,300
4	Agios Dimitrios (EL)	24,800
5	Obrenovac A (RS)	23,700
6	Kozeinice (PL)	21,200
7	Aberthaw (UK)	20,000
8	West Burton (UK)	18,700
9	Jäncshwalde (DE)	18,200
10	Sines (PT)	17,600
11	Kardia (EL)	17,400
12	Prunerov (CZ)	17,100

SO ₂		
	Plant	Tonnes
1	Maritsa 2 (BG)	290,000
2	Megapolis (EL)	184,000
3	Turceni (RO)	106,000
4	Kostolac B (RS)	92,200
5	Obrenovac A (RS)	80,800
6	Obrenovac B (RS)	71,000
7	Galabavo (BG)	70,700
8	Topionica (RS)	66,800
9	Rovinari (RO)	63,500
10	Agios Dimitrios (EL)	58,000
11	Kostolac A (RS)	53,500
12	Bobov Dol (BG)	53,100



Smoke coming from a traditional kiln in the Atlas mountains, Morocco.

Air quality measures with climate benefits

A handful of measures targeting black carbon and tropospheric ozone can reduce future global warming by 0.5°C, according to a UNEP and WMO report.

Black carbon and tropospheric ozone are so called short-lived climate forcers: substances that do not stay in the atmosphere for a long time but have a great impact while there. Since both of them also have a negative effect on human health, and ozone is the air pollutant that causes greatest damage to crops globally, UNEP and WMO have looked in to how they can be tackled on a global scale and what combined benefits could come out of this. The recently published report “Integrated Assessment of Black Carbon and Tropospheric Ozone, Summary for Decision Makers” outlines the main results of a full report that is soon to be published.

More than 2,000 different measures to reduce black carbon (BC) or ozone precursors have been assessed using IIASA’s GAINS model. The selection criterion was that the measure should be likely to reduce global climate change and also provide air quality benefits. Sixteen measures were selected by the assessment team to have the highest potential to mitigate global warming (see table). These measures provide about 90 per cent of the climate benefit compared with the effect if all

2,000 measures were to be implemented. Measures that are selected to target ozone precursors are mainly those reducing methane (CH₄) emissions. If the sixteen measures are carried out globally by 2030, the expected global temperature increase in 2050 is estimated to be 0.5°C (0.2 to 0.7°C) lower than otherwise, i.e. be around 1.5°C instead of rising to 2°C. This “limiting effect” is expected to persist at least until 2070.

For the Arctic, the effect is expected to be, 0.7°C (0.2 to 1.3°C) lower than otherwise in 2040. Another regional benefit is that expected disruption of the Asian monsoon is likely to be mitigated. Implementing the package of measures would also have positive effects on human health with an estimated decrease in annual premature deaths of 2.5 million and an avoided loss of crop yield of 50 million tonnes.

Black carbon

Black Carbon (BC) particles are a major component of particulate matter (PM). Since they strongly absorb sunlight, the BC particles warm the atmosphere. Sources include emissions from diesel engines, cooking stoves, wood burning and forest fires. Reducing BC emissions has an especially high effect in polar and high altitude regions, since the pollutant makes the ice and snow darker, thus increasing absorption of sunlight and further accelerating melting.

Tropospheric ozone

Ozone (O₃) is a highly reactive gas that exists both in the stratosphere (the upper layer of the atmosphere) and in the troposphere (ground level to ~ 10-15 km). O₃ in the stratosphere stops harmful UV radiation from the sun. In contrast, O₃ at ground level is harmful to human health and to vegetation. Tropospheric ozone is formed from precursor pollutants, including CH₄, nitrogen oxides (NO_x), volatile organic compounds (VOC) and carbon monoxide (CO) under the influence of sunlight.

Table: Measures that improve climate change mitigation and air quality and have a large emission reduction potential

Measure ¹	Sector
CH ₄ measures	
Extended pre-mine degasification and recovery and oxidation of CH ₄ from ventilation air from coal mines	Extraction and transport of fossil fuel
Extended recovery and utilisation, rather than venting, of associated gas and improved control of unintended fugitive emissions from the production of oil and natural gas	
Reduced gas leakage from long-distance transmission pipelines	
Separation and treatment of biodegradable municipal waste through recycling, composting and anaerobic digestion as well as landfill gas collection with combustion/utilisation	Waste management
Upgrading primary wastewater treatment to secondary/tertiary treatment with gas recovery and overflow control	
Control of CH ₄ emissions from livestock, mainly through farm-scale anaerobic digestion of manure from cattle and pigs	Agriculture
Intermittent aeration of continuously flooded rice paddies	
BC measures (affecting BC and other co-emitted compounds)	
Diesel particle filters for road and off-road vehicles	Transport
Elimination of high-emission vehicles in road and off-road transport	
Replacing coal by coal briquettes in cooking and heating stoves	Residential
Pellet stoves and boilers, using fuel made from recycled wood waste or sawdust, to replace current wood-burning technologies in the residential sector in industrialised countries	
Introduction of clean-burning biomass stoves for cooking and heating in developing countries ^{2,3}	
Substitution of clean-burning cooking stoves using modern fuels for traditional biomass cooking stoves in developing countries ^{2,3}	
Replacing traditional brick kilns with vertical shaft kilns and Hoff-man kilns	Industry
Replacing traditional coke ovens with modern recovery ovens, including the improvement of end-of-pipe abatement measures in developing countries	
Ban on open field burning of agricultural waste ²	Agriculture

¹ There are measures other than those identified in the table that could be implemented. For example, electric cars would have a similar impact to diesel particulate filters but these have not yet been widely introduced; forest fire controls could also be important but are not included due to the difficulty in establishing the proportion of fires that are anthropogenic.

² Motivated in part by its effect on health and regional climate, including areas of ice and snow.

³ For cooking stoves, given their importance for BC emissions, two alternative measures are included.

The report states that measures to reduce short-term climate forcers are not to be seen as a replacement for measures aimed at deep and immediate reductions of carbon dioxide emissions, only as a complement. The sixteen measures identified in the report have no effects on CO₂ emissions and to some extent address different sectors than measures that effectively target CO₂. One major difference between typical CO₂ measures and the measures suggested for BC and CH₄ is that several of the latter are supposed to be implemented in developing countries.

Many of the measures entail cost savings in the long run, but require some sub-

stantial investments before they pay off. Another challenge is that several of the BC measures deal with diffuse emission sources and implementation will require cooperation between several stakeholders. Relevance, benefits and costs of measures vary from region to region. The assessment does not analyse the cost-effectiveness of the different measures or policy options at national level.

Kajsa Lindqvist

Source: Integrated Assessment of Black Carbon and Tropospheric Ozone, Summary for Decision Makers, UNEP and WMO

Removal of sulphate aerosols increases temperature

In the 2011 German Yearbook of Ecology, Nobel Prize laureate Paul Crutzen states that model calculations in studies for IPCC's Fourth Assessment Report conclude that complete removal of anthropogenic sulphate aerosols could lead to a global average surface air temperature rising by 0.8°C on most continents and 4°C in the Arctic.

Calculations performed by the German Max Planck Institute for Meteorology suggest that climate change resulting from increasing greenhouse gas emissions would become considerably more pronounced if anthropogenic sulphate aerosols were to be completely removed from the atmosphere. Specifically, the globally averaged surface air temperature and amount of precipitation could increase in less than a decade by 0.8°C and 3 per cent, respectively. The geographic patterns of the calculated changes bear resemblance with those found in greenhouse gas and aerosol scenario experiments (annual mean temperature increase of approximately 1°C on most continents, 4°C in the Arctic). The scientists suggest that possible future changes as well as the general issue of the stability of atmospheric aerosol loads should be considered in strategies that aim to maintain global warming below a prescribed threshold. The goal of these simulations was not to present realistic scenarios in terms of future emissions, but to illustrate response time scales associated with the physics of the climate system. The study ignored the additional effects of black carbon and organic aerosol particles.

Reinhold Pape

Source: 2011, Jahrbuch fuer Ökologie <http://www.jahrbuch-oekologie.de/jahrbuecher.htm> and **Impact of improved air quality on the future evolution of climate**, G. P. Brasseur and E. Roeckner, Max Planck Institute for Meteorology, Hamburg, Germany, Geophysical Research Letters, Vol. 32, L23704, doi:10.1029/2005GL023902, 2005

Final 2010 ETS show rise in emissions

Updated figures for the EU emissions trading scheme (ETS) show that emissions from sites covered by the scheme were 3.2% higher last year than in 2009, together amounting to 1.9 billion tonnes of CO₂ equivalents. Emissions from traded sectors increased by almost 40% in Estonia and by about 30% in Sweden and Latvia. The next largest increase was in Finland (20%). Emissions fell in Denmark, Malta, Spain, Portugal and Romania.

Credits from international projects accounted for about 7% of the allowances and credits surrendered this year, and their use was 68% higher than last year. Seventeen plants appear to have covered more than 90% of their 2010 emissions with international credits. These include Romanian energy firm SC RAFO SA, a site in France owned by paper company Stora Enso and a Spanish gas compression facility.

Source: ENDS Europe Daily, 17 May 2011

Britain unveils plan to halve emissions by 2027

The UK government has adopted a 50 per cent greenhouse gas reduction target relative to 1990 levels for its carbon budget for the period 2023–27. But it added this budget should be reviewed in 2014, a provision seen by some as a weakening.

Minister Chris Huhne took advice from the UK's Committee on Climate Change on targets for the mid-2020s but rejected its recommendation that emissions from Britain's non-traded sectors be tightened between 2013 and 2022. The ministry has also rejected advice that the carbon budget be met without use of international offsets. The budget will be met by domestic reductions "as far as practicable and affordable". But "we also intend to keep our carbon trading options open to maintain maximum flexibility, and minimise costs", it added.

Source: ENDS Europe Daily, 18 May 2011

EU voting on new climate target for 2020

On 23 June 2011 the European Parliament will vote on proposals to strengthen the EU target for emission reductions of greenhouse gases in the European Union until 2020. Later during the year the European Council will also decide on the new target. The decision could be an important step towards the possibility of reaching agreement on a second commitment period for the Kyoto Protocol during the UN climate conference in South Africa in December 2011. The present EU target of a 20 per cent reduction is not enough to assure that global temperatures will stay at 2 degrees, a climate policy goal set up by the EU in 1996 and in the UN in 2010. IPCC scenarios from 2007 which analyse how to avoid a global temperature increase of 2–2.4 degrees suggest that industrialised countries must reduce emissions by at least 25–40 per cent by 2020. In the meantime more than 100 countries in the UN are demanding a target of 1.5 degrees due to new scientific research on the dangers of climate change, and much larger reduction targets are now needed to reach this goal.

Environmental NGOs such as the European Environmental Bureau, Friends of the Earth Europe and AirClim are demanding that the European Union should as a first step decide this year to decrease greenhouse gas emissions by at least 40 per cent through domestic measures by 2020. Several EU parliamentarians have also argued for a new 40 per cent target by 2020 for the EU.

EU committees have discussed the new targets over spring. Before the end of 2011, the EU should pledge to cut its greenhouse gas emissions by 30 per cent by 2020 (from 1990 levels), according to a resolution agreed by the Environment Committee on 24 May 2011. This would create millions of additional jobs in the

EU and yield other economic benefits, the committee said. Bas Eickhout (Greens/EFA, NL), who drafted the resolution, said: "The European Parliament's position has been shifting over the last year. There is now broad support for a 30 per cent reduction target and a growing realization that ambitious climate policies are in Europe's own economic interest."

A 30 per cent cut in greenhouse gas emissions is possible by 2020 if Europe meets its efficiency targets, according to the calculations used by Climate Commissioner Connie Hedegaard and reported by EurActiv. All that was needed was for a strong energy efficiency directive in June 2011 to recommend that the EU's efficiency targets be made binding.

The most recent data shows the EU has reduced its emissions by 17.3 per cent compared to 1990 levels, and has therefore almost reached its objective for 2020. This is not all due to the financial crisis, argues WWF Europe. "European emissions have dropped each year since 2005. Further, the European Environment Agency projects business-as-usual emissions to stabilize below 2008 levels – so a massive emissions rebound is not anticipated. If existing and planned EU policies are effectively implemented, the European Commission estimates an emission reduction potential of 1.4 to 1.8 Gt CO₂-eq in 2020. This alone would cover most of the gap even to a 40 per cent target, provided member states also take ambitious measures."

Achieving only 20 per cent by 2020 would mean much deeper emission reductions in later years. The EU has already committed to reducing emissions by 80–95 per cent by 2050, implying a 40 per cent reduction by 2020 under a linear trajectory.

Greenpeace Europe argues that "de-

Proposals by the Stockholm Environment Institute in "The 40% Study" for achieving a 40 per cent domestic reduction in greenhouse gases in the EU by 2020 (published by FOE Europe):

Transport

- ✱ An ambitious binding sub-target for energy savings and GHG emissions in transport in line with the 40 per cent target
- ✱ a fossil fuel and kerosene tax and redirection of direct and indirect subsidies to expand and improve public transport and invest in electrification
- ✱ phasing out of EU public financing for the construction of new road and aviation infrastructure and significant increases in financial support for rail and mobility management systems
- ✱ reduced energy intensity of car fleets by 30 per cent by 2020 compared to current levels and progressive phasing out of internal combustion vehicles through aggressive vehicle performance and technology standards
- ✱ progressive electrification of vehicles by 2050 and rail by 2030
- ✱ an infrastructure plan ensuring that rail network is more than doubled by 2050
- ✱ regulations ensuring that all electric vehicles and rail run on renewable electricity.

Agriculture

- ✱ an ambitious binding sub target for energy savings and GHG emission reductions from agriculture in line with the 40 per cent target, in particular to set ever-tightening standards on emissions from fertilisers and livestock, and to reduce emissions caused by the production of animal feeds outside Europe
- ✱ reform of the EU's Common Agriculture Policy to develop a new food and farming policy for Europe that shifts political and financial support away from climate unfriendly intensive agriculture towards sustainable farming, based on agro ecology and the support of biodiversity.

Buildings

- ✱ an ambitious binding sub-target for energy savings and GHG emissions in buildings in line with the 40 per cent target
- ✱ EU funds to be made available immediately for energy saving measures in every household or at least secure upfront capital
- ✱ an overarching framework to streamline different sets of legislation on energy performance in buildings and energy efficiency of appliances
- ✱ improvement of the Energy Performance in Buildings Directive to ensure 'passive house' standards for all new buildings by 2015 and retrofits for nearly all buildings at a rate of 5 per cent per year.

Industry

- ✱ an ambitious binding sub-target for energy savings in industry in line with the 40 per cent target
- ✱ EU ETS cap in line with the 40 per cent target with 100 per cent auctioning of allowances and the auctioning revenues used 100 per cent for climate finance
- ✱ EU ETS to exclude offsetting (CDM projects) and free allowances
- ✱ no expansion of the EU ETS to other Annex I carbon markets or Southern countries
- ✱ incentives to shift towards less fossil-intensive techniques and research and development in alternative processes for energy intensive sectors such as cement, steel and chemicals.

See further details under: http://www.sei-international.org/mediamanager/documents/Publications/Climate-mitigation-adaptation/europes_share_heaps_09.pdf

laying emission cuts makes them more costly. The International Energy Agency estimates that each year of delay adds an extra €336 billion (US\$500 billion) to the clean investment needed globally in the energy sector between 2010 and 2030".

One of the key EU countries blocking the increase in the EU target is Germany. A recent study by Ökoinstitut shows that

Germany is still running 76 very old and very inefficient fossil-fuel power stations with a production capacity of 21 Gigawatt built in the 1960s, which should be closed immediately.

Reinhold Pape



Sorry, no content in this one.

TWINSPARC/CREATIVE COMMONS

The Energy Efficiency Plan is "an empty shell"

On 8 March 2011 the European Commission published its Energy Efficiency Plan. Environmental NGOs hoped that this plan would become an important instrument for a legally binding 20 per cent energy efficiency target for the EU until 2020. According to Climate Action Network Europe (CAN Europe) the main firm measures proposed are:

- a binding target to double the refurbishment rate of public buildings
- new energy efficiency criteria for public procurement
- a requirement for member states to reduce the legal obstacles that result in split incentives e.g. for building renovation
- enhanced requirements for combined heat and power to be used
- a requirement for member states to establish energy-saving obligation schemes for energy companies
- mandatory energy audits for large companies
- an extended Ecodesign workplan

Some of these are good ideas says CAN Europe, but very little detail is given, and a lot looks likely to be left to the discretion of member states. CAN Europe therefore calls it "an empty shell of an energy efficiency plan" that lists many measures that are already part of business as usual, and contains very little in the way of hard or concrete measures.

Reinhold Pape

Source: Energy Efficiency and Savings: Clearing the fog. Everything you always wanted to know but were afraid to ask about Europe's First Energy Source March 2011, http://www.climnet.org/index.php?option=com_content&view=article&id=298:an-empty-shell-of-an-energy-efficiency-plan&catid=275:energy-saving&Itemid=287



IPCC: Huge potential for renewable energy

There are sufficient resources to provide the world with renewable energy. The main constraint on development is public policy, that is the main message in a new IPCC report.

The technical potential for renewable energy is huge. Almost 80 per cent of global energy demand could be met with renewables by 2050, but not without dedicated national energy policies, that is the conclusion of the IPCC's Special Report on Renewable Energy Sources¹.

Ramon Pichs, Co-Chair of the Working Group III and one of the lead authors, said: "The report shows that it is not the availability of the resource, but the public policies that will either expand or constrain renewable energy development over the coming decades".

The report covers six fields of renewable energy technologies: bioenergy, direct solar energy, geothermal energy, hydropower, ocean energy and wind energy. Some are still in an early stage of development, but a growing number of them are becoming technically mature.

The technical potential for these fields together exceeds global energy demand by a considerable amount (Figure 1). Solar power has the highest technical potential

and can alone cover global energy demand. Identified as limiting factors are instead sustainability, public acceptance, system integration, infrastructure constraints and economic factors.

Although there has been rapid development in several renewable technologies in the last decade, renewable energy still only accounted for 12.9 per cent (63.5 EJ) of global primary energy supply in 2008 (Figure 2). Biomass accounted for 10.2 per cent of this total and hydropower for 2.3 per cent. All the others were included in the last 0.4 per cent. Traditional biomass, for cooking and heating in developing countries, accounted for roughly 60 per cent of the biomass supply. Specifically for electricity supply, the share of renewables was higher, at 19 per cent (of which hydropower makes up 16 per cent).

The authors behind the report have compiled 164 future energy scenarios, developed by more than 120 scientists. They range from baseline scenarios to

scenarios that stabilise GHG concentrations in the atmosphere beneath 400 ppm. Among the scenarios that stabilize GHG concentrations at 440 ppm, median deployment of renewable energy in 2050 is 248 Exajoules (EJ) (139 EJ in 2030), which is almost four times higher than present production. In the scenarios with the highest deployment of renewables, annual production in 2050 is six times higher than at present.

The most ambitious scenario predicts that solar power will reach up to 130 EJ per year. The wind power share could grow to more than 20 per cent of the global electricity supply, while hydropower's contribution may decrease to 10–14 per cent. Despite absolute growth in hydropower supply, the expected energy demand growth and continuing electrification could result in a decreasing share. Bioenergy could supply 100–300 EJ by 2050. Geothermal could account for more than three per cent of electricity demand, and about five per cent for heat.

One of the main findings of the scenario review is that renewable energy can contribute to cumulative greenhouse gas (GHG) savings of 220 to 560 Gigatonnes of CO₂-equivalents between 2010 and 2050. Even the most ambitious scenario will not use more than 2.5 per cent of the global technical potential.

To manage such an increase in renewable energy approximately €9 trillion will have to be invested up to 2030. That is about one per cent of the global GDP annually. The cost of many renewable energy solutions is declining, e.g. wind power in good wind locations is already cost competitive with new coal power plants. Monetising

external costs of existing energy supply would increase competitiveness for renewables even more.

Besides pure investment, the report suggests some areas that decision makers need to address in order to significantly upscale the contribution of the different kinds of renewables:

- Bio energy: proper design and monitoring of sustainability to minimise negative impacts
- Solar energy: regulatory and institutional barriers, integration and transmission issues
- Geothermal energy: prove that enhanced geothermal systems can be deployed

- Hydropower: sustainable assessments tools, regional and multi-party collaboration
- Ocean energy: testing centres, policies that encourage early deployment
- Wind energy: develop solutions to transmission constraints, increase public acceptance

Massive efforts to increase renewable energy will not only lead to mitigating climate change. If implemented properly, they can contribute to social and economic development, energy access, and a more secure energy supply for the global poor. Already 53 per cent of global renewable electricity capacity is located in developing countries.

In a press release, Sven Teske, renewable energy director at Greenpeace International, and a lead author of the report, said:

“The IPCC report shows overwhelming scientific evidence that renewable energy can also meet the growing demand of developing countries, where over two billion people lack access to basic energy services and can do so at a more cost-competitive and faster rate than conventional energy sources.”

Kajsa Lindqvist

¹ **Special Report on Renewable Energy Sources, Summary for Policymakers** can be downloaded at http://cms.srren.ipcc-wg3.de/report/srren-spm-fd4/at_download/file

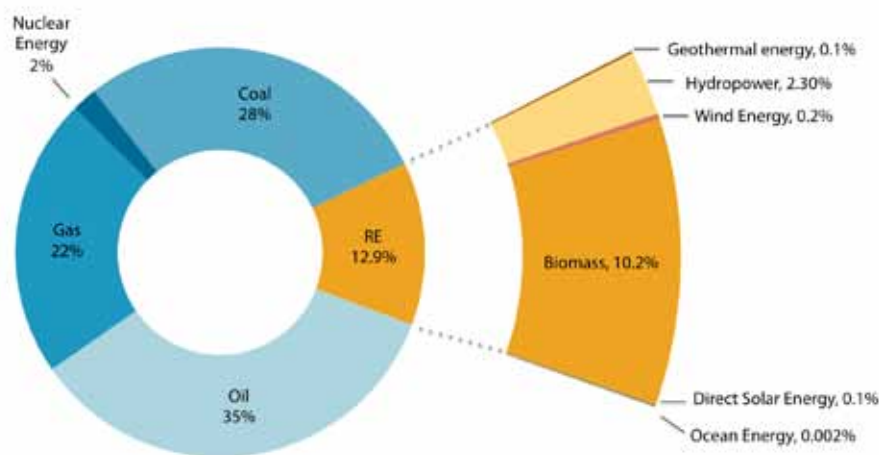


Figure 2: Shares of energy sources in total global primary energy supply in 2008 (492 EJ). Modern biomass contributes 38% of the total biomass share. Underlying data for the figure has been converted to the 'direct equivalent' method of accounting for primary energy supply

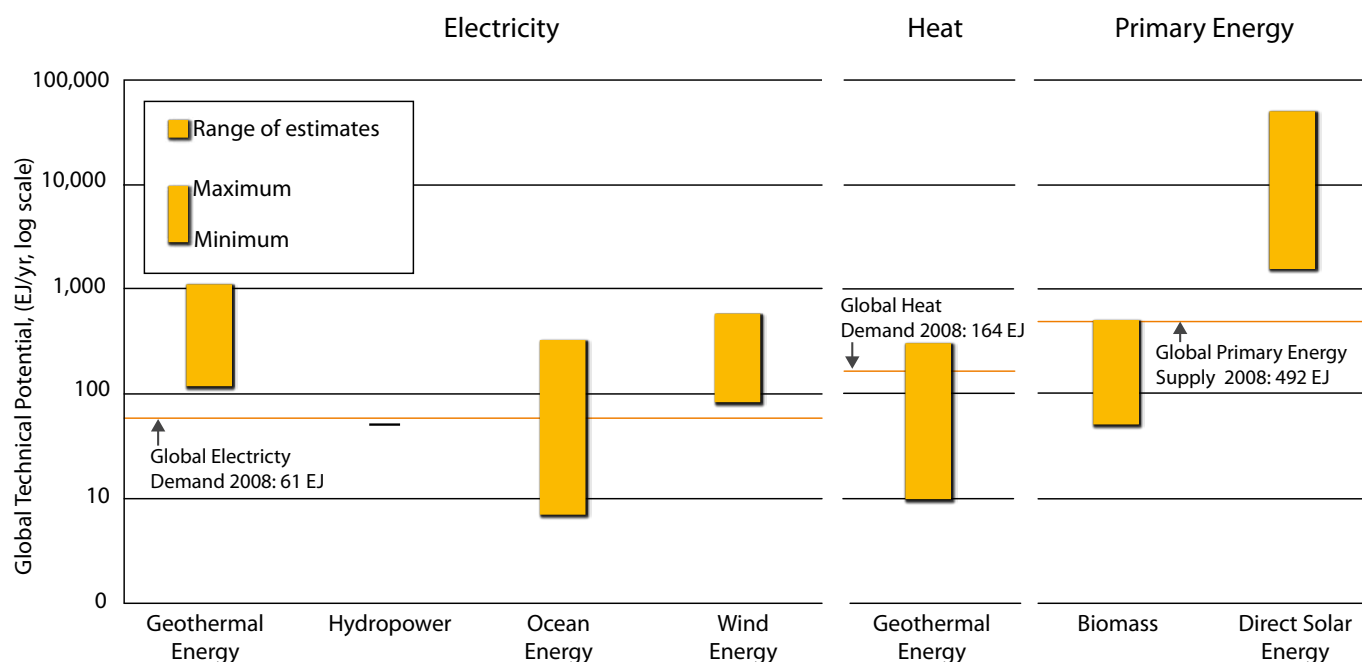


Figure 1: Ranges of global technical potentials of renewable energy sources. Biomass and solar are shown as primary energy due to their multiple uses; note that the figure is presented in logarithmic scale due to the wide range of assessed data

EU study to assess additional ECAs

A new study is planned that may identify candidates for new emission control areas (ECAs) in waters around the European Union. The new study for the European Commission would be more detailed than an earlier 2010 analysis on the benefits and costs of ECA designation, for example by looking into a “distance-to-shore” ECA for the Mediterranean.

Results from the 2010 analysis of the costs and benefits of a 0.10% sulphur limit showed clear net benefits from introducing the stricter sulphur standards, especially for the existing SOx ECAs (the Baltic Sea and the North Sea, including the English Channel) but also for potential new SOx ECAs in the Mediterranean and the Black Sea.

“If candidates for new ECAs are identified by this study, the Commission would support member states bordering such areas to make a corresponding proposal at the International Maritime Organization (IMO),” Commission official Christian Wimmer said.

The Commission is due to review its Thematic Strategy on Air Pollution and the Air Quality Directive in 2013. Additional ECAs could be considered in connection with this policy review. EU member states are free to go ahead with an ECA application to the IMO without awaiting an initiative from the Commission.

Source: Sustainable Shipping News, 23 May 2011

Slow steaming cuts pollution

The port of Long Beach on the US West Coast has honoured thirteen shipping companies for practising slow steaming when travelling close to the port. The port’s Green Flag programme provides financial incentives to ship operators for reducing the speed limit of their vessels to 12 knots when travelling within 20 and 40 nautical miles, respectively, around the port. According to the port, the programme has helped reduce pollution from ships by nearly 50 % since it began six years ago.

Source: Sustainable Shipping News, 8 April 2011

Ship pollution causes 50,000 deaths per year

The number of premature deaths in Europe caused by air pollutant emissions from international shipping is estimated to amount to approximately 49,500 in the year 2000, and rise to 53,200 in 2020.

Air pollutant emissions from ships operating in the North Sea and the Baltic Sea were responsible for annual health damage in Europe valued at €22 billion at the emission levels of year 2000. By 2020, this figure is expected to come down to €14.1 billion, as a result of implementation of the stricter ship fuel sulphur standards agreed by the International Maritime Organization (IMO) in 2008 (see Box).

However, since these stricter fuel standards apply only in designated Sulphur Emission Control Areas (SECAs), and the Baltic Sea and the North Sea so far are the only such areas in Europe, and ship traffic overall is expected to continue to increase, the total health-related costs in Europe of international ship traffic are expected to increase from €58.4 billion in the year 2000 to €61.4 billion in 2020.

These figures come from a recent study¹ by the Danish Centre of Energy, Environment and Health (CEEH), using the EVA (Economic Value of Air pollution) computer model. The research project aims at mapping the true costs of damage caused by air pollutant emissions from various sectors. Different scenarios assessing the human health impacts and associated external costs from different emission sectors in Denmark and from international ship traffic, respectively, have been investigated for the years 2000, 2007, 2011 and 2020.

It is noted by the authors that economic valuations of air pollution damage currently focus primarily on health damage, while impacts on the general environment,

including ecosystems, usually are not valued in monetary terms.

The total health-related costs of air pollution in Europe are calculated to be more than €800 billion at the pollution levels of year 2000. This figure is estimated to decrease to €537 billion in 2020, provided that EU countries reduce their emissions from land-based sources in line with what is needed to achieve the environmental targets of the EU’s Thematic Strategy on Air Pollution, and provided that the SECA standards for shipping in the Baltic Sea and the North Sea are complied with.

Comparing the air pollution impacts from shipping with those from land-based sources shows that in the year 2000 emissions from international shipping were responsible for an estimated seven per cent of the total health damage from air pollution in Europe, and that its share will increase to 12 per cent by 2020.

Specifically for Denmark, it is estimated that the total national emissions of air pollution from inside the country cause health damage in Europe valued at €4.9 billion each year, of which €800 million occurs within Denmark.

Regarding emissions from Danish sources, it was found that the agricultural sector is the largest contributor to human health impacts and related external costs within the country, with a share of approximately 40 per cent. Road traffic contributes about 19 per cent, domestic heating sources 16 per cent, non-road mobile sources seven per cent, and large power plants six per cent.



For some the sun sets early due to shipping.

Air pollutant emissions from international shipping in the Baltic Sea and the North Sea are responsible for health damage in Denmark valued at more than €620 million per year (year 2000), decreasing to €360 million in 2020. The authors conclude that the SECA regulation that limits the sulphur content in ship fuel to a maximum of 0.1 per cent as from 2015, is expected to significantly reduce the external costs, and that “a similar regulation of international ship traffic in the whole world would have a tremendous positive effect on human health.”

It is however noted that the health impacts from ship emissions in the SECAs will remain significant after 2015. The reason being that the emissions of

nitrogen oxides (NO_x) from ship traffic are not regulated by the SECA standard, and NO_x emissions from international shipping are therefore expected to continue to increase more or less in line with the projected increase in shipping activities.

The number of premature deaths in Europe caused by air pollutant emissions from international shipping is estimated to amount to approximately 49,500 in the year 2000, and rise to 53,200 in 2020.

These figures could be compared to the total number of premature deaths in the whole of Europe in the year 2000 due to air pollution, which is estimated at about 680,000, and is expected to decrease to some 450,000 in the year 2020.

The study has also looked at the cost

per kilogramme of sulphur emitted from international ship traffic in the Baltic Sea and the North Sea, and found that it is comparable to other sectors, such as major power plants.

According to the authors, there are two important aspects of ship emissions compared to other emission sectors. Firstly, the height of the ship emissions is much lower than the height of the stacks from the power plants, which means that the emissions of pollutants such as sulphur dioxide (SO₂) are mixed in a lower volume of air, which results in higher concentrations near the surface. So when the emitted air pollution from ships is transported over land, where people are located, the contribution from ships will result in a more direct exposure.

Secondly, most of the external costs related to the emission of sulphur are associated with the secondary sulphate particles. It takes hours to days for SO₂ to be chemically transformed into secondary sulphate particles, and therefore sources located far away from the highly populated areas (e.g. international ship traffic) can have a larger impact than sources near or inside the populated areas.

Christer Ågren

International ship emission regulations

The International Maritime Organization (IMO), under ANNEX VI of MARPOL 73/78 (the International Convention for the Prevention of Pollution from Ships), has adopted controls on sulphur in marine fuels.

The global fuel sulphur limit is currently 4.5%, and will be reduced to 3.50% in 2012 and then further lowered to 0.50%, but not until 2020 (or 2025, subject to a review in 2018). In specially designated sulphur emission control areas (SECAs), the current limit is set at 1.00% sulphur. It will be tightened to 0.10% by 2015.

There are currently only two existing SECAs in Europe, the Baltic Sea and the North Sea, including the English Channel. In addition most of the coastal waters – within 200 nautical miles of the coast – of USA and Canada have been designated as “combined” ECAs for both SO₂ and NO_x. It should be noted that exhaust gas cleaning systems (e.g. scrubbers) that achieve equivalent sulphur emission reductions may be used as an alternative to low-sulphur fuels to fulfil the IMO’s sulphur requirements.

¹ **Assessment of health-cost externalities of air pollution at the national level using the EVA model system** (March 2011). By J. Brandt et al. CEEH Scientific Report No 3. Centre for Energy, Environment and Health. Available at: www.ceeh.dk

Sweden to boost on-shore power

Sweden is planning to give energy tax breaks to ships that use on-shore power while berthed in ports. On-shore electricity is quieter and less polluting than electricity produced on board. The tax cuts will target vessels with significant on-board electricity generation, and will therefore be restricted to vessels of at least 400 tonnes. The European Commission backs the measure and has adopted a proposal for a Council Decision authorising Sweden to apply a reduced electricity tax rate. The proposal will be discussed and authorised by EU member states and would apply for a three-year period.

Source: European Commission, 8 April 2011



TWIXX/FOTOLIA

Soon you can plug in on-shore and get a tax break, at least if you are in Sweden and the owner of a vessel weighing 400 tonnes or more.

Ship scrubber system selection guide

The Ship Operations Cooperative Program (SOCP), which is a US industry-government partnership, has announced the release of a study on exhaust gas cleaning systems (EGCS), also known as scrubbers. The study was conducted in light of new regulations for ships operating in emission control areas (ECAs) from 2015. Ships operating in ECAs will be required to use fuel with a sulphur content of no more than 0.10 per cent or install abatement technology that can achieve equivalent emission reductions.

The report is available at: www.socp.us

Ship fuel sulphur rules widely ignored

Stricter rules on the sulphur content of marine fuels are not being widely observed, according to reports from the shipping insurers' publication Lloyds List.

Up to 1 July 2010, ships plying the designated Sulphur Emissions Control Areas (SECAs) had to use fuels with a sulphur content lower than 1.5%. After that date, the limit was lowered to 1.0%, but this appears to have caused a massive increase in the number of ships failing to respect the limits.

Ship inspections conducted by the Dutch water management inspectorate have revealed that 29 of the 63 ships (46%) inspected since July 2010 were over the 1.0% limit, compared with five out of 72 (7%) inspected in the first half of 2010, which were over the then 1.5% limit. Separate research carried out in the first three months of this year found 21% of inspections revealed breaches of the standards, most of them linked to the 1.0% sulphur limit.

Possible action taken by Dutch authori-



LOUIS VEST/CREATIVE COMMONS

No smoking and no pollution, signs that might help shippers to remember the rules.

ties against ships that violate the sulphur limits include detention, nonconformity notices against the vessel under the ISM Code and financial penalties of up to 700,000 euro.

Source: Transport & Environment, 23 May 2011

New brochure

For Clean Air Everywhere: what can be done in our cities to decrease air pollution? is a new eight-page 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.

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



Call for new approach to nitrogen management

Europe should take an integrated approach to nitrogen management. This is the main message of the European Nitrogen Assessment, a new report launched during the “Nitrogen and Global Change” conference, in Edinburgh (UK) from 11–14 April, 2011.

The scientists conclude that policy makers have so far tackled the nitrogen issue in a piecemeal fashion, which means that policies are usually separated by media – for example air, land and water – by issues, such as climate, biodiversity waste – or by various forms of reactive nitrogen (nitrogen oxides, nitrous oxide or ammonia). The assessment recommends seven key actions for reducing pollution from nitrogen, including improving nitrogen use efficiency in crop and animal production, improved emission abatement technologies for both stationary combustion sources and vehicles, increasing energy efficiency and use of alternative energy sources, recycling nitrogen from waste water systems and lowering meat consumption, particularly beef.

Over the past century humans have caused unprecedented changes to the global nitrogen cycle, converting atmospheric nitrogen (N_2) into many reactive nitrogen (Nr) forms, doubling the total fixation of nitrogen globally and more than tripling it in Europe. Five key societal threats from Nr can be identified: to water quality, air quality, greenhouse balance, ecosystems and biodiversity, and soil quality.

Cost-benefit analysis highlights how the overall environmental costs of all Nr losses in Europe (estimated at €70–320 billion per year at current rates) outweigh the direct economic benefits of Nr in agriculture. The highest societal costs are associated with loss of air quality and water quality, linked to impacts on ecosystems and especially on human health.

The European Nitrogen Assessment (ENA) was established to help synthesise the science and understanding of nitrogen into a form that is useful to governments and society. The Assessment provides a European contribution to the International Nitrogen Initiative (INI).



DAVE WILDCREATIVE COMMONS

A threat to water quality.

Reactive nitrogen is a threat to air quality because air pollution by nitrogen oxides (NO_x) and ammonia (NH_3) causes formation of secondary particulate matter (PM), while emissions of NO_x also increase levels of nitrogen dioxide (NO_2) and tropospheric ozone (O_3). All of these are causes for respiratory problems and cancers for humans, while ozone causes damage to crops and other vegetation,

as well as to buildings and other cultural heritage.

It is estimated that PM contributes to several hundred thousand premature deaths annually in the EU, leading to a reduction in life expectancy due to PM of 6–12 months across most of central Europe. Reactive nitrogen contributes up to 30–70 per cent of the PM by mass.

Although NO_x emission reductions over the last few decades in the EU have reduced peak ozone concentrations, background tropospheric ozone concentrations continue to increase. By comparison to the limited progress in reducing NO_x emissions, there has been even less success in controlling agricultural ammonia emissions, which therefore contribute to an increasing share of the European air pollution burden.

Source: ENA website, 11 April 2011

More information, and to download the “Summary for policy makers” or the full report: **Nitrogen in Europe** at <http://www.nine-esf.org/ENA-Book>

Seven key actions for better management of the nitrogen cascade

Agriculture

1. Improving nitrogen use efficiency in crop production
2. Improving nitrogen use efficiency in animal production
3. Increasing the fertiliser nitrogen equivalence value of animal manure

Transport and Industry

4. Low-emission combustion and energy-efficient systems

Wastewater treatment

5. Recycling nitrogen (and phosphorus) from wastewater systems

Societal consumption patterns

6. Energy and transport saving
7. Lowering the human consumption of animal protein

Key Action 4 involves technical measures that are already being combined with public incentives for energy saving and less polluting transport (Key Action 6), linking Nr, air pollution and climate policies. Similarly, each of the Key Actions in the food chain (1–3, 7) offers co-benefits with climate mitigation and the management of other nutrients, including phosphorus. Given the limited success so far in reducing agricultural Nr emissions, more effort is needed to link the Key Actions, both to learn from the successes and to ensure equitability between sectors.

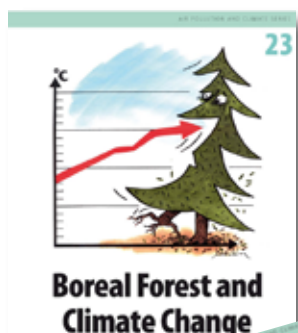
Recent publications from the Secretariat



Market-based instruments for NOx abatement in the Baltic Sea

By Per Kågeson, November 2009. This report assesses potential market-based instruments for reducing emissions from existing vessels and an early introduction of efficient NOx abatement technologies for newly built ships.

A rough calculation of the emission reduction potential indicates that application of an emissions charge, as outlined in the report, could cut NOx emissions from ships in the Baltic Sea by around 60 per cent.



Boreal Forest and Climate Change

By Roger Olsson, November 2009. Reviews recent scientific findings on the fate of the world's boreal forests under climate change. The effects of climate change are already evident in all parts of the boreal forest, and change will be far more dramatic as temperature continues to increase.

Two degrees of warming may trigger the creation of new, hitherto unseen ecosystems. Three to five degrees warming may be the critical limit for massive forest die-back in the boreal region.

Additional, regional perspectives on this topic are given in *"Boreal Forest and Climate Change - regional perspectives"* (by the same author, 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.



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Coming events

UNFCCC meeting of the subsidiary bodies. Bonn, Germany, 6-17 June 2011. Information: <http://unfccc.int>

Acid Rain Conference 2011. Beijing, China, 6-9 June 2011. Information: www.acidrain-2010.org

European Biomass Conference and Exhibition. Berlin, Germany, 6-10 June 2011. Information: www.conference-biomass.com

EU Environment Council. Luxembourg, 10 June 2011.

FAIRMODE – Forum for air quality modelling in Europe, Norrköping, Sweden, 14-16 June, 2011. Information: [http://fairmode.europa.eu/](http://fairmode.europa.eu)

CITEAIR II Conference, Rome, Italy, 24 June 2011. Information: www.citeair.eu

EU Environment Council (informal), 11-12 July 2011. Information: <http://europa.eu/eu/calendar/>

IMO Marine Environment Protection Committee. London, UK, 11-15 July 2011. Information: www.imo.org

European Photovoltaic Solar Energy Conference and Exhibition. Hamburg, Germany, 5-8 September 2011. Information: www.photovoltaic-conference.com

CLRTAP Working Group on Strategies and Review. Geneva, Switzerland, 12-16 September 2011. Information: www.unece.org/env/lrtap/

Air Pollution 2011: 19th International Conference on Modelling, Monitoring and Management of Air Pollution. Malta, 19-21 September 2011. Information: www.wessex.ac.uk

IUAPPA's 2011 Annual Meeting Paris. 28 - 30 September. Information: http://www.iuappa.com/newsletters/iuappa_newsletter_apr11.pdf

European Transport Conference 2011. Glasgow, Scotland, 10-12 October 2011. Information: www.aetransport.org

Local Renewables Freiburg 2011. Freiburg, Germany, 27-28 October 2011. Information: www.local-renewables-conference.org/

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>

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/eu/calendar/>