NO. 3, SEPTEMBER 2010

Acid News

High costs of delaying NEC directive revision

The EU Commission must stop delaying and start acting, as the benefits of further reducing air pollution far outweigh the costs.

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Renewables industry – we can power the EU!

A report by EREC provides hope of a more coordinated industry low-carbon lobby – and shows how to do 100 per cent renewables by 2050.

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CCS: setbacks in Norway and Germany

CCS is proving far more difficult and controversial in Norway and Germany than proponents had hoped.

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1.5° tough, but doable

A new UK study demonstrates that limiting warming to less than 1.5°C is achievable, especially if we accept a temporary 'overshoot' of that target.

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New emission ceilings for 2020 underway

As negotiators explore updating LRTAP's Gothenburg Protocol, a new study shows significant scope for cost-effective air pollution reductions in Europe.

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Agreement on Industrial Emissions Directive

After many years of work, agreement has been reached on the new Industrial Emissions Directive, replacing seven existing directives and tightening standards - but not by enough.

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High benefits of ship fuel action

Implementing internationally agreed stricter ship fuel sulphur standards may save 26,000 lives per year and provide economic benefits to health worth up to 26 times the costs.

A recent study for the European Commission[1] has examined the costs and benefits of implementing in European sea areas the new marine fuel and engine standards that were adopted by the International Maritime Organisation (IMO) in October 2008.

Emissions of air pollutants from shipping activities around Europe are high – in the year 2000 they were estimated to amount to around 2.1 million tonnes of sulphur dioxide (SO_2), 3.4 million tonnes of nitrogen oxides (NOx), and 211,000 tonnes of fine particles (PM).

While pollutant emissions from land-based sources are gradually coming down, those from shipping show a continuous increase, and – in the absence of control action – by 2020 ship emissions of SO_2 and NOx in European sea areas are expected to equal or even surpass the total from all

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Acid News

A newsletter from the Air Pollution & Climate Secretariat, the primary aim of which is to provide information on air pollution and its effects on health and the environment.

Anyone interested in these matters is invited to contact the Secretariat. All requests for information or material will be dealt with to the best of our ability. Acid News is available free of charge.

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

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

Editor: Christer Ågren
Assistant editors: Reinhold Pape and Paul Ferris
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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

AirClim

The high costs of inaction

Publication of a long-awaited EU proposal to tighten national emission ceilings (NEC) for air pollutants may yet again be delayed by the Commission.

The former Commission managed – without providing any valid motive whatsoever – to successfully manoeuvre to keep the revision of the NEC directive in limbo for five years. Judging from the statements this summer by Environment Commissioner Janez Potocnik, it now appears very likely that the new Commission intends to continue stalling the urgently-needed revision of this essential legislation for another three years (see article on page 20).

Air pollution by fine particles is estimated to cause 455,000 premature deaths every year in the 27 EU member states, corresponding to almost 4.5 million years of life lost (see *Acid News* 2/2010, p. 1). Another air pollutant, ground-level ozone, is responsible for some 20,000 premature deaths each year.

In the year 2000, deposition of airborne nitrogen compounds in the EU exceeded the critical loads for eutrophication (over-fertilisation) of vulnerable ecosystems over a total area of close to 1.2 million square kilometres, or an area nearly 40 times the size of Belgium. The critical loads for acidification were also exceeded in 280,000 square kilometres of forest ecosystems.

Continued excess pollutant inputs to various types of sensitive ecosystems will sooner or later result in harmful impacts to biodiversity, and some of this damage will be irreversible.

It has been speculated that one possible motive for the Commission's non-action on the NEC directive is that the costs of implementing new 2020 emission ceilings would be high and that they would particularly affect the newer member states.

However, the most recent updated analysis[1] of the costs for achieving the environmental objectives of the Thematic Strategy on Air Pollution (TSAP) shows that the incremental annual air pollution control costs for the EU as a whole would amount to approximately €1.4 billion in 2020, which would equal just 0.01 per cent of the EU's GDP in that year.

In everyday terms, this would cost each EU citizen just €2.70 each year, or less than one eurocent per day.

At the time of writing, no updated estimate of the monetised health benefits of implementing the TSAP objectives has presented. When this was last investigated about two years ago, these benefits were valued at between €22 and €70 billion per year. If this estimate still holds, and there is no reason why it shouldn't, the benefits of action exceed the costs by up to 50 times.

Most member states are struggling to meet mandatory air quality standards for fine particles and nitrogen dioxide, and as it looks now, the Commission will most likely have to bring several countries to the Court of Justice for failing to comply with the legislation.

A revised NEC directive would spur necessary emission abatement action across the EU, thereby facilitating compliance with the air quality standards. It would also bring significant health, environmental, and socio-economic benefits.

Any further delay in the NEC directive revision would clearly be both irresponsible and costly – protection of human health and the environment cannot be put on hold.

Christer Ågren

[1] **NEC Scenario Analysis Report Nr 7.** Consultancy report prepared by IIASA for the European Commission, dated 27 August 2010.

Europe's worst polluters: still a lot of work to do

Despite some required improvements, Europe's dirtiest power plants still emit vast amounts of air pollutants. The "Dirty Dozen" are still big, and still dirty.

The European Pollutant Release and Transfer Register (E-PRTR) has released its latest annual dataset, detailing the emissions of 91 pollutants by large industrial facilities across the EU27, Switzerland, Norway, Iceland and Liechtenstein in 2008. The figures show that many plants have substantially reduced their sulphur dioxide (SO_2) and nitrogen oxides (NOx) emissions from 2007, although a number of big polluters continue to dominate EU emissions. Emissions of carbon dioxide (CO_2) remain high.

The dataset is only the second to be released, following the entry into force of the Pollutant Release and Transfer Registers Protocol to the Aarhus Convention in 2007.

The observed reductions in SO_2 and NOx emissions are required by the EU under the Large Combustion Plants (LCP) Directive. While EU legislation has addressed SO_2 and NOx emissions from large plants since 1988, it was only under the 2001 LCP Directive that emission limits values were applied to existing plants. These stricter limits for SO_2 from

PETR ŠTEFEK

The Belchatow plant in Poland.

large existing plants entered into force on 1 January 2008, resulting in the improved performance of many plants. In the case of NOx the stricter emission limits for existing plants do not apply until 2016.

Overall, SO_2 emissions from E-PRTR sources declined from approximately 6.15 million tonnes in 2007 to approximately 4.13 million tonnes in 2008. Emissions from the biggest twelve polluters showed a similar trend, dropping from approximately 1.86 to 1.34 million tonnes.

However, the "dirty dozen" remain big and dirty. Maritsa 2 in Bulgaria remained the highest SO_2 emitter in 2008, achieving a six per cent reduction but still emitting 402,000 tonnes of SO_2. This amounted to almost ten per cent of the 31 reporting countries' total annual emissions – all from a single source. Together, the SO_2 "dirty dozen" emit almost one third of total annual emissions from E-PRTR sources.

NOx emissions recorded in the E-PRTR database have also decreased, with total emissions dropping from 3.72 to 2.81 million tonnes. The UK's Drax power station dropped to second place on the list after reducing NOx emissions by almost 30 per cent. In first place for 2008 was Poland's Belchatow plant, emitting 40,900 tonnes of NOx, an increase of almost four per cent on 2007.

Germany's coal-dominated electricity sector continues to dominate the list of the largest CO_2 emitters, with seven of the twelve biggest emitters found there. Poland is the only other country to feature more than once on the list. It is home to the Belchatow plant, which has the dubious honour of emitting both the largest amount of NOx, and the largest amount of CO_2.

Paul Ferris

The E-PRTR register is accessible at: *prtr.ec.europa.eu/*

Table: The "dirty dozen" facilities of the EU27 + 4 in 2008 for emissions of sulphur dioxide (SO_2), nitrogen oxides (NOx) and carbon dioxide (CO_2).

	SO_2		NOx		CO_2	
	Plant	Tonnes	Plant	Tonnes	Plant	Tonnes
1	Maritsa 2 (BG)	402,000	Belchatow (PL)	40,900	Belchatow (PL)	30,900,000
2	Megalopolis (EL)	210,000	Drax (UK)	38,600	Niederaussem (DE)	24,900,000
3	Turceni (RO)	134,000	Drewsen Paper (DE)	30,800	Jänschwalde (DE)	23,500,000
4	Galabavo (BG)	109,000	Aberthaw (UK)	26,100	Drax (UK)	23,000,000
5	Patnow (PL)	86,600	Agios Dimitrios (EL)	22,600	Eschweiler (DE)	21,600,000
6	Rovinari (RO)	83,400	Compostilla (ES)	22,100	Frimmersdorf (DE)	18,600,000
7	Bobov Dol (BG)	69,500	Kozeinice (PL)	21,800	Neurath (DE)	18,000,000
8	Belchatow (PL)	61,300	Cottam (UK)	21,400	Boxberg (DE)	15,400,000
9	Romag Termo (RO)	48,900	Andorra (ES)	20,200	Turow (PL)	12,900,000
10	Agios Dimitrios (EL)	48,000	Turceni (RO)	19,700	Toulon incinerator (FR)	12,700,000
11	Narva (EE)	47,000	Jänschwalde (DE)	18,700	Schwarze Pumpe (DE)	12,500,000
12	Maritsa 1 (BG)	42,000	Varna (BG)	18,100	Agios Dimitrios (EL)	11,800,000

High benefits of ship fuel action

Continued from front page

land-based sources in the 27 EU member states combined.

In the study, a series of different scenarios for 2015 and 2020 are investigated and compared to a baseline scenario. The latter is a reference scenario which assumes a sulphur content of marine heavy fuel oil (HFO) of 2.70 per cent (the current world average for international shipping) in sea areas which are not designated sulphur emission control areas (SECAs). Inside SECAs, a fuel sulphur content of 1.45 per cent is assumed. Currently only two European sea areas – the Baltic Sea and the North Sea – are designated as SECAs. The baseline scenario does not include any policies or measures to reduce NOx emissions.

Compared to this baseline scenario, the following policy scenarios are investigated:

- Scenario 1: No additional SECAs beyond the existing Baltic Sea and North Sea (including the English Channel) designations.
- Scenario 2: Additional inclusion of the Mediterranean as a SECA.

CARABY/FOTOLIA

- Scenario 3: Additional inclusion of the Black Sea as a SECA.

For all the policy scenarios investigated, a lowering of the fuel sulphur content to 0.10 per cent in SECAs by switching to low sulphur distillate oil is assumed.

As a consequence of this stricter SECA-standard, the sulphur content in marine HFO used outside of SECAs without policy intervention is expected to increase from 2.70 to 2.94 per cent. This is reflected in the first three scenarios. For the 2020 scenarios only, two additional scenarios were modelled where the IMO's global sulphur limit of 0.50 per cent is implemented outside of SECAs.

All scenarios (except the baseline) include implementation of the global NOx-emissions standards (Tier I and Tier II) to all new ships, in accordance with IMO's MARPOL Annex VI. Moreover, the study makes the rather brave assumption that the Baltic Sea, the North Sea and the Mediterranean will be designated as emission control areas for NOx (NECAs). This means that from 2016 all new ships in these three areas are assumed to comply with the IMO's Tier III standards, implying an 80 per cent reduction in NOx emissions as compared to the Tier II standards.

It should be noted that none of the scenarios assume the Northeast Atlantic (i.e. the sea area from Gibraltar up to western France and southern England)

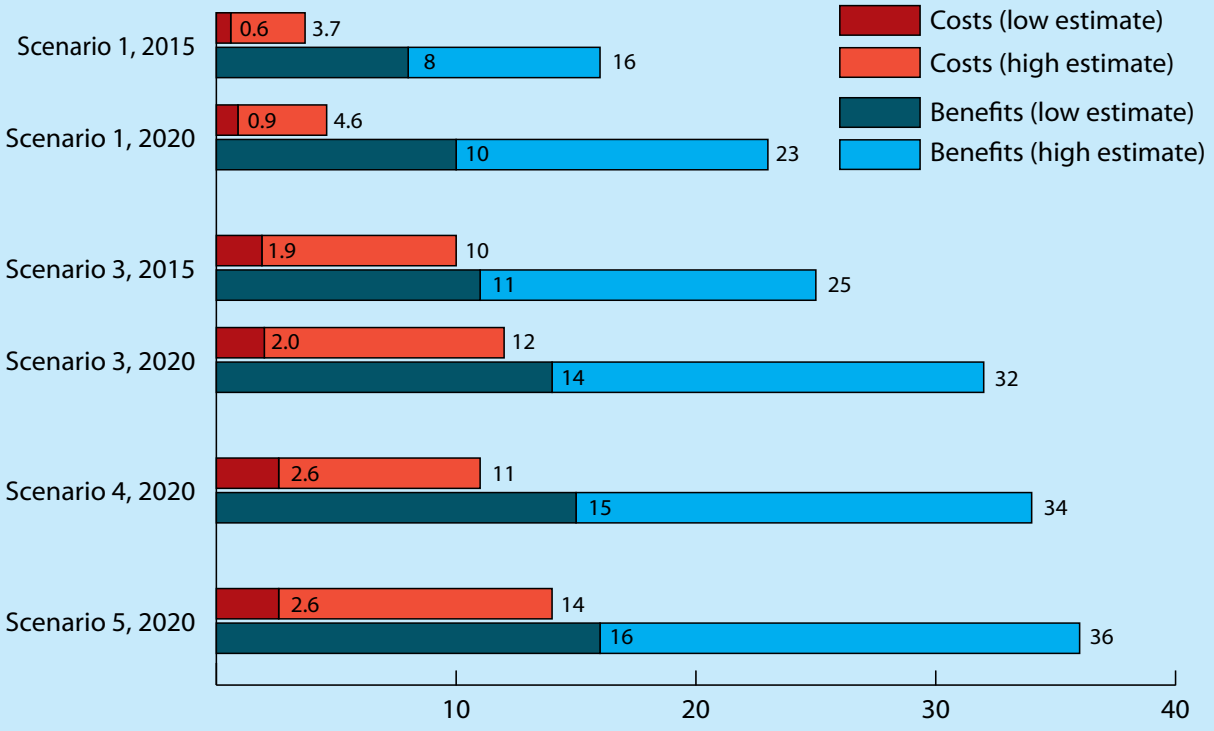

Figure 1: Comparison of costs and benefits of applying the various scenarios to European sea areas, in billion euro. *Scenario 1:* Baltic and North Seas as SECAs. *Scenario 3:* Scenario 1 plus Mediterranean and Black Seas as SECAs. *Scenario 4:* Scenario 1 plus 0.5% S outside SECAs. *Scenario 5:* Scenario 3 plus 0.5% S outside SECAs.

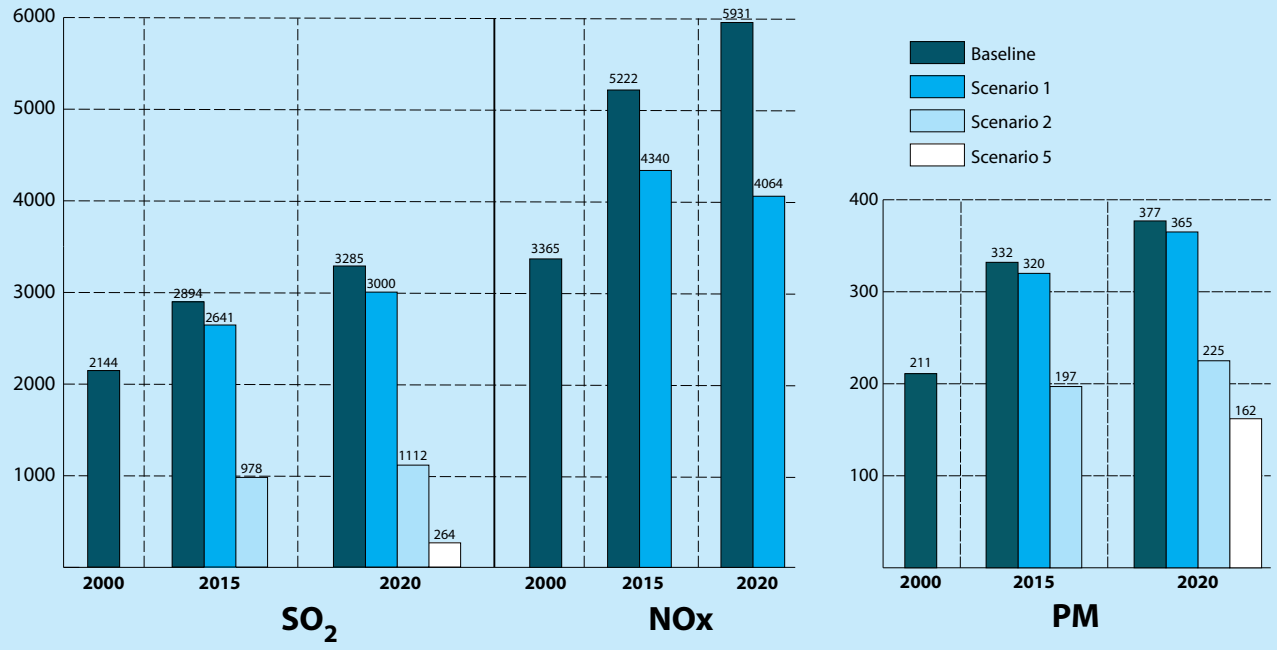

Figure 2: Emissions of SO_2, NOx and PM in 2000, 2015 and 2020 from international shipping around Europe in selected scenarios, in kilotonnes. *Scenario 1:* Baltic and North Seas as SECAs. *Scenario 2:* Scenario 1 plus Mediterranean as a SECA. *Scenario 5:* Baltic, North and Mediterranean Seas as SECAs plus 0.5% S outside SECAs.

will be designated as a SECA or a NECA.

Figure 2 shows estimated changes in emissions of SO_2, NOx and $PM_{2.5}$ for some of the scenarios, as compared to the baseline level of emissions.

Computer modelling was used to estimate environmental outcomes in terms of depositions and concentrations of air pollutants. Most scenarios show significant reductions in exceedance of the critical loads for acidification, especially in the coastal areas of the Baltic Sea and the North Sea. As a result of the NOx abatement measures, exceedance of the critical loads for eutrophication is also lowered, by up to 20 per cent in coastal areas of the Mediterranean.

Cutting ship emissions will improve air quality, and the resulting reduced concentrations of fine particles ($PM_{2.5}$) is estimated to avoid between 16,000 and 26,000 annual premature deaths in 2020. Better air quality will also result in less respiratory and cardiac hospital admissions, amongst other benefits.

The economic benefits of the various scenarios are calculated from the quantified health benefits only – environmental improvements are not monetised. As shown in Figure 1, low and high benefit estimates are given, reflecting different methods of valuing human life.

When estimating the emission abatement costs, low and high estimates are also used. The lower bound of costs is based on ships fitting exhaust cleaning techniques (scrubbers) to reduce SO_2 emissions, while the upper bound assumes a fuel shift from high-sulphur HFO to lower-sulphur distillates.

In all scenarios investigated the benefits exceeded the costs, even when comparing the lower bound for benefits with the higher bound for costs (see Figure 1). When additional analysis was done to assess further uncertainties, it was found that the probability of benefits exceeding costs is either "very likely" or "virtually certain". According to the authors, it is therefore a robust conclusion that the benefits of the measures investigated will exceed the costs.

Christer Ågren

[1] **Cost benefit analysis to support the impact assessment accompanying the revision of Directive 1999/32/EC on the sulphur content of certain liquid fuels.** Final report to the European Commission, 23 December 2009. By AEA Technology, UK. Available at: *http://ec.europa.eu/environment/air/transport/ships_directive.htm*

Marine fuel demand up

Global marine fuel demand has recovered to pre-2008 levels and annual consumption will likely grow to 450 million tonnes (Mt) by 2020, according to recent estimates.

Martin Tallet from EnSys Energy has estimated global marine fuel demand in 2010 at about 370 Mt, of which heavy fuel oil (HFO) would account for 290 Mt and marine distillates 80 Mt.

Taking into account anticipated growth in world trade and the shipping fleet versus measures to improve energy efficiency in the years ahead, Tallet said a realistic growth rate of two per cent annually would push global demand up to 450 Mt by 2020.

A previous study for the International Maritime Organization (IMO) in 2009 arrived at a global marine fuel consumption consensus estimate of 333 Mt for 2007, but also gave a low and a high range of 279 and 400 Mt, respectively.

Tallet predicted that the price of distillate fuels relative to crude in the future would increase, and that the premium of low sulphur marine gas oil (MGO) to HFO would also likely increase from current levels.

Source: Sustainable Shipping News, 16 September 2010

Renewables industry says – we can power the EU!

A new report by the European Renewable Energy Council provides hope of a more coordinated industry low-carbon lobby – and shows how to do 100 per cent renewables by 2050.

By 2050, almost all of the European Union's energy demands could be met by renewables, a new study looking at the electricity, heating/cooling and transport sectors has concluded. *RE-Thinking 2050* is authored by the European Renewable Energy Council (EREC), an industry umbrella group whose member organisations include various renewables associations such as EWEA (wind), EPIA (solar cells) and ESTIF (solar hot water).

Apart from its findings, the report is significant in demonstrating that the renewables industries can get their act together, agreeing not only to common scenarios but also shared policy recommendations.

The old industries, such as fossil and nuclear, can always flex lobbying muscle. But the future has no lobby, or so they say... With this report under their belt, EREC may be able to increase their own effectiveness and show that the future does indeed have a voice.

While *RE-Thinking* enhances the hope that the renewables industries can lobby for a common vision, the big unknown is still efficiency. Thousands of studies have shown that efficiency has enormous potential and that it is very often the cheapest and fastest option for reducing emissions, but progress remains slow. The efficiency industries are yet to form a strong, common EU lobby organisation. Potentially they are a formidable force, including many very large companies such as the biggest producers of glass, lighting, pumps, insulation and so on. However, many of the businesses selling energy efficiency in one form or the other do not yet see themselves as such.

A coherent low carbon future lobby must include the efficiency industries. Euro-Ace, the European Alliance of Companies for Energy Efficiency in Buildings, is a good starting point (www.euroace.org).

As detailed in Figure 1, *RE-Thinking* envisages a massive scale-up of renewable energy sources in the electricity sector between now and 2050, with the largest single contributions in that year coming from solar photovoltaic and wind power. Electricity is, however, the simple part, even though the scenario assumes a growth of electricity consumption from 3362 TWh in 2007 to between 3491 and 4987 TWh in 2050, depending on efficiency targets.

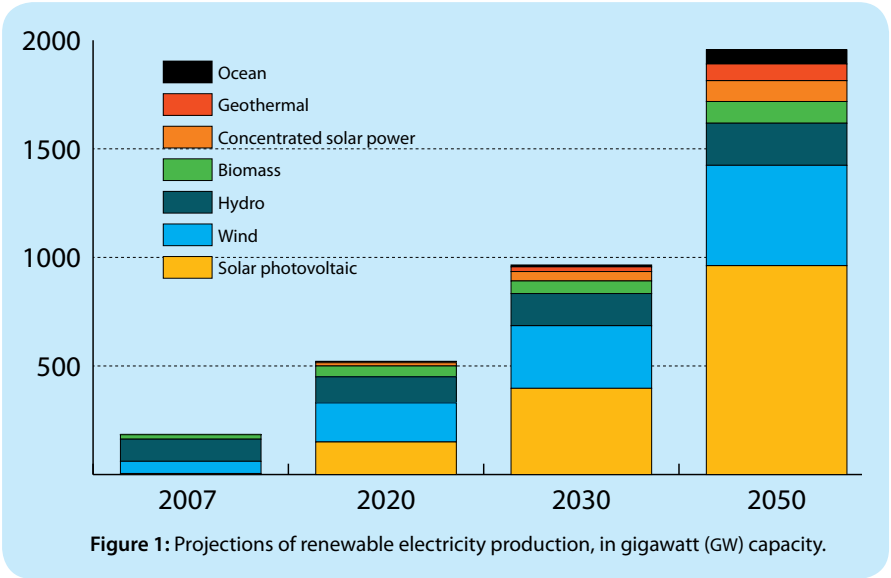

Figure 1: Projections of renewable electricity production, in gigawatt (GW) capacity.

It is noteworthy that CCS is not mentioned once. When the coal lobby speaks for CCS, they often mention the "carbon negative" option of biomass CCS. Evidently, this vision is not shared by the biomass lobby, who participated in the study through the European Biomass Industry Association. *RE-Thinking* makes no room for nuclear power.

The second sector considered in the report is heating and cooling, where a scenario for 100 per cent renewables is again outlined. In this scenario, energy use in heating and cooling is predicted to drop from 554 megatonnes of oil equivalent (Mtoe) in 2007 to between 330.8 and 472.6 Mtoe in 2050. Table 1 sets out the breakdown of energy sources for the high use scenario.

This vision is somewhat more problematic, due in part to the substantial biomass contribution (see further below), but is doable.

In fact it has largely already happened in Sweden, one of the coldest countries in the EU, where most heating either comes from biomass in district heating or from electric heat pumps.

The hard part is of course the transport sector. The study projects that by 2020, transport fuel use will have dropped back to 2007 levels of 450 Mtoe. Biofuels will rise from two per cent to nine per cent of the total due to the Renewable Energy Directive, which demands that 10 per cent of fuel is sourced from biofuels by 2020 but which only covers gasoline and diesel. The total transport fuel use falls to 325 Mtoe in 2050, of which 100 Mtoe is biofuels, a large increase from less than 8 Mtoe in 2007. Another 150 Mtoe comes from electric cars and a shift from road

DAVID BLAIKIEK, CREATIVE COMMONS

to rail. However, a 50 Mtoe use of fossil fuels remains.

It is these remaining transport emissions that scuttle the hope of a completely renewable energy supply in the EU by 2050. However, the report argues that 100 per cent is still within reach, effectively in the form of direct offsets generated by exporting renewable energy and/or biomass outside of the EU. This excess exists because the 100 per cent targets can be overshot in the electricity and heating and cooling sectors, where renewables can supply between 100 and 143 per cent of demand in each sector, depending on which assumptions of efficiency improvements are used.

The sum of it all amounts to a renewables contribution of between 96 and 137 per cent of the final energy consumption in 2050.

There are several probable objections from environmental and nature conservation NGOs. One is the very high use of biomass, a total increase across all sectors from 78 Mtoe in 2007 to 359 Mtoe by 2050, more than a quadrupling. It remains to be demonstrated if, with sufficiently strong incentives, biomass exploitation can be scaled up without putting food production, biodiversity and landscape values at risk. However, large increases of useful energy can be expected, both due to more efficient conversion and an increased raw materials base, through use of what are currently seen as waste products such as straw, sewage and residues from the food and paper industry. To a limited extent, nor would an increase of land used for energy grass, energy wood and even algae pose too many problems. But an assumption made by the study, that 10 per cent of the biomass can be imported in the case of high energy consumption, is problematic. The solution is simple: this importation can be avoided with an aggressive efficiency target.

The risk of over-exploitation of biomass, however, is neither imminent nor unavoidable. *RE-Thinking* does not rely heavily on ocean energy, calling for just 14 Mtoe by 2050. Wave power may have a far greater potential than this, about which much more will be known within the next few years.

Forms of ocean energy other than wave power are either controversial (such as tide barrages) or difficult to evaluate (salinity gradient power) or both. "Ocean energy" may not be a very practical concept, but in an imperfect world lobbying organisations are not formed on theoretical considerations. The EU-OEA (European Ocean Energy Association), one of the participants of the study, may yet become a good approximation of a wave energy lobby.

One point in the 2050 vision which is bound to cause reservations from the NGO world is "small hydro". Hydro is projected to increase from 102 GW in 2007 to 194 GW in 2050, a consequence of the participation of ESHA (European Small Hydropower Association) in the study.

However, this technology-by-technology part of the vision is very unlikely to be realised, and many of the policies suggested by *RE-Thinking* are more general. These include:

- Making the 2009 Renewable Energy Directive binding in every one of the 27 Member States, a seemingly modest, but practically radical demand.
- Setting renewables targets for 2030, pointing the way to 100 per cent renewables by 2050.
- Fully liberalising the energy market, including harmonisation of technical standards to pave the way for a pan-European smart grid.
- Providing incentives for flexible suppliers. (Biomass CHP, geothermal power, and hydro are flexible, and wind power producers have the option of curtailing production when demand is exceeded. More flexibility so as to match supply and demand can be added through storage, electric heating in district heating and on the demand side.)
- Phasing out all subsidies for fossil fuel and nuclear energy.
- An EU-wide Carbon Tax. **Page 12** ▶

Table 1: Projections of energy use in heating and cooling, in megatonnes of oil equivalent (Mtoe).

	2007	2020	2050
Biomass	61.2	120	314.5
Solar thermal	0.88	12	122
Geothermal	0.9	7	136.1
Non-renewable	491.02	360	0
Total	554	499	472.6

CCS in Norway: postponed

CCS has been delayed for another four years, in an admission it is far from "off-the-shelf".

MORTEN ODDVIK/PAUL FERRIS/CREATIVE COMMONS

Finding an economically viable method to remove CO_2 from fossil fuel and store it underground – carbon capture and storage or CCS for short – has been a cornerstone of Norwegian climate policy for a number of years. Per capita, the Norwegian Government has been among the top spenders on CCS research and development in the world. As one of the leading oil and gas exporting countries, their interest in CCS is not difficult to understand.

Most parties in the Norwegian Parliament support the development of two or more full scale CCS plants in Norway, and are also committed to the government taking responsibility for storage of CO_2. So far, however, the government has not paid a single Norwegian krone for such storage. The simple reason is this – there are not yet any CCS facilities in Norway operating at an industrial scale. As the years go by, the goal of industrial CCS plants seems to recede gradually into the future. The supporters of CCS have a long list of what they see as broken promises regarding the building of full-scale CCS plants. This list goes back to the time the idea first was launched back in the late 1990s.

The supporters had a new disappointment this spring. On 1 May 2010 it became clear that a full-scale CCS plant in Norway would be postponed for another four years. According to the parliamentary opposition, the governing red-green coalition had enough information as early as April 2009 to suggest the project would have to be postponed, but suppressed it due to potential damage to their re-election prospects. In response, the opposition directed a collective no-confidence motion towards the oil and energy minister in the red-green government, Mr. Terje Riis-Johansen, for withholding information.

The no-confidence vote did not have any practical consequences for the minister, as the red-green government led by Mr. Jens Stoltenberg has a majority in the parliament. But the vote illustrates the heat that the issue sometimes attracts in Norwegian politics.

Following the postponement of the CCS project, a parliamentary hearing was held in June this year. Gassnova is the Norwegian government organisation with responsibility for CCS. At the hearing, the director of Gassnova underlined that the technology involved is far from being "off-the-shelf". This is in stark contrast to the opinion of the companies seeking a part of the contract for building the plants, supported by some Norwegian NGOs, principally Bellona. According to them, the construction of a full-scale CCS plant at Mongstad, west of Bergen on the Norwegian coast, could start almost immediately.

The Norwegian minister for oil and energy, Mr. Riis-Johansen, argued that there was a need for more testing at small-scale facilities before they could start building a full-scale CO_2 removal plant. Originally, the government had said that testing at a small-scale facility and building of a full-scale plant should be completed in parallel. In that case, a full-scale CCS plant would have been scheduled to be operational in 2014. The postponement means that an investment decision will not be made until 2014, and a full-scale CCS plant will not be operational until 2018, at the earliest.

Tore Braend

Tore Braend is an energy and climate policy specialist and consultant who lives in Norway. He is the author of **Carbon Capture and Storage in Norway**. October 2008, Air Pollution & Climate Secretariat series No.22. Available at: *http://www.airclim.org/reports/*

CCS in Europe: doomed

Reuters reports that a new study warns that Carbon Capture and Storage (CCS) technology might barely get past the testing phase in Europe as the economic crisis and a shift to green power destroys incentives. Massive European investment in renewable energy will reduce demand for carbon emissions permits in 2020, dragging down their price and undermining investment in CCS says the report, "EU Energy Trends to 2030", by the National Technical University of Athens. The complex computer modelling exercise, commissioned by EU Energy Commissioner Guenther Oettinger, factors in all of the EU's latest climate and energy legislation, most importantly the 2008 renewable energy directive.

"The lower carbon price does not allow a competitive marketing of CCS," says the report. The study sees carbon prices rising just 7 per cent to the equivalent of €16.50 a tonne in 2020 and €18.70 a tonne in 2030. The power industry hopes CCS will allow it to continue burning cheap and abundant coal supplies, trapping and burying waste emissions underground to prevent them from exacerbating climate change. But additional costs of around €1 billion per power plant have prevented CCS from taking off.

Reuters, 17 September 2010, Pete Harrison.

CCS in Germany: emotional

A new draft CCS law in Germany has done little to resolve the ongoing conflict over the issue.

Protest, resistance, acceptance, necessity – these are just a few words that can be used to describe the discussion of CCS in Germany. The technology – capture of CO_2, transport and storage in deep geological formations – either must be tested, should not be tested, or shall never be tested. Positions on CCS couldn't be more controversial in Germany these days. After postponement of the CCS law in summer 2009, a new draft law is now out for consultation, but has done little to resolve the conflict.

The draft law is created to allow the demonstration and testing of CCS. It limits the amount of CO_2 a project will be allowed to inject, as well as the total amount of CO_2 that can be stored in Germany annually. It also restricts the period in which an application for a storage permit can be made, to prevent any run for projects and storage sites.

However, the law does little to satisfy critics of CCS or those concerned about site exploration. They fear that this new law paves the way for commercial use, hiding the risks of CO_2 storage, such as leakage of CO_2 or displacement of brine into drinking water. Farmers' associations, water unions and local authorities all treat the information and explanations given by potential operators with suspicion. In areas chosen for exploration of potential storage sites, local action groups have formed with the clear goal of preventing CO_2 storage in their respective region. Scandals involving irresponsible, frivolous handling of nuclear waste in Germany have also contributed to public doubts.

Thus far, CCS has primarily been discussed as a technology for coal. In this regard, CCS would become the escape route for coal in a carbon constrained world, resulting in the continued destruction of the natural environment through coal mining, and with new storage sites to take care of as well. A number of new coal-fired power plants are in the planning or construction phase in Germany. While environmental organisations are united in their opposition to these new plants, consensus is over when it comes to CCS. While some regard storage of CO_2 as a risky end-of-pipe technology, objecting in principle, others view it as a necessity to test and subsequently use CCS if it can be done without jeopardising health, safety and the environment.

Were climate protection and safety issues to have highest priority, construction of new coal-fired power plants would be adjourned until CCS is commercially viable and demonstrated. However, it is questionable whether this will ever be achieved. Renewable energy is growing and becoming more and more competitive.

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A demonstration in front of the Vattenfall coal power station in Jänschwalde, Germany. Vattenfall is currently expanding their coal operations in Germany, with a new plant in the Hamburg area to emit 8.5 million tonnes of CO_2 annually.

Nukutoa Island, Papua New Guinea. Such islands are likely to disappear without a 1.5° target.

1.5° is tough, but doable

A new report underscores that while a climate target of 1.5°C is difficult and filled with uncertainties, it remains feasible and achievable with the right level of ambition.

A group of climate science experts and research institutions from the UK have published a study[1] exploring a variety of potential paths for annual global emissions of greenhouse gases which would offer a reasonable chance of limiting a rise in the global average temperature to no more than 1.5°C above its pre-industrial level. Groups participating in the study included the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science, and the Met Office Hadley Centre. The report concludes that while keeping temperature rises below 1.5°C degrees in the short term would be very challenging, there are a number of emissions path that can limit warming to 1.5°C in the longer term.

In order to assess the theoretical possibility of staying under the 1.5°C target, the report considers two aggressive mitigation scenarios. The first of these posits that emissions drop from 47 billion tonnes of CO_2 equivalent in 2010 to 40 billion tonnes in 2020, and then permanently drop to zero in 2021. The second sees emissions stay level this decade, remaining at 48 billion tonnes in 2020, and then again dropping to zero in 2021. In both scenarios, anthropogenic aerosols are modelled on a path directly related to that of CO_2 emissions. Even under these aggressive scenarios, conceived of as 'first tests' rather than realistic emissions pathways, the study estimates that there would be less than a 50 per cent of avoiding global warming of more than 1.5°C.

A 90 per cent chance

However, in both these scenarios, there was a 90 per cent chance of temperatures dropping back to below 1.5°C within 50 years after the initial overshoot.

An alternative first test scenario was modelled on the basis that aerosols remained fixed at their 2020 level from that year onwards, staying put when CO_2 emissions dropped to zero. In this scenario, the chance of remaining below 1.5°C with no overshoot increased from below 50 per cent to above 90 per cent, with a probable peak warming of just 1.2°C. As the study noted, however, a fixed aerosol scenario is unrealistic given the negative health and environmental effects of aerosols and current trends in air pollution legislation. It would likely only be possible with risky and as yet unproven geoengineering methods.

After establishing the theoretical potential of limiting warming to less than 1.5°C, the study moved on to explore emissions paths corresponding to more realistic rates of decline in annual emissions after 2020. Two sets of scenarios were explored, with differing assumptions on emissions baselines up to 2020, the shape of the paths from 2020, and the level of anthropogenic emissions of sulphate aerosols.

In all the 'realistic' scenarios tested, the chance of avoiding an overshoot of a 1.5°C target was well under 50 per cent.

A 50 per cent chance

However, the report also concluded that a number of realistic pathways existed that offered more than a 50 per cent chance of temperatures dropping back below

1.5°C after an overshoot period of up to 100 years.

Four characteristics of emissions paths capable of achieving this 1.5°C target in the long term are identified.

The first characteristic is that global emissions have to start falling no later than 2015, and can be no more than 48 billion tonnes of CO_2 equivalent in 2020. Existing studies demonstrate that such cuts are both possible and economically attractive – if the right policy measures are put in place.

The second characteristic is rapid cuts from 2020 onwards, from between three and six percent annually depending on the level of emissions in 2020 and the chosen level of risk of missing the target. Limiting overshoot to 50 years or less will require reduction rates of at least five per cent a year. While noting that the upper feasible rate of emissions reductions was essentially a political policy question open for debate, the report argued that rates of up to six per cent a year may be possible but will certainly be challenging, and will entail a higher cost than less aggressive rates of reductions.

The third characteristic of the paths is that annual global emissions must be close to zero in 2100, and certainly well below 5 billion tonnes per year. The report argued that such a target might require the use of as-yet untested 'negative emissions' technology, such as biomass burning with carbon capture and storage.

The final characteristic of the emissions paths, as stated earlier, is that they accept a temporary overshoot of the 1.5°C target, returning to below 1.5°C within less than 100 years.

It is in this final characteristic, as the report noted, that the greatest uncertainties and risks lie. The risk is that a temporary overshoot of 1.5°C could cause irreversible damage or initiate feedback loops, such as release of greenhouse gasses from thawing permafrost, which could prevent temperatures from dropping back to below 1.5°C even in the long term.

As such, the report concludes that limiting temperature increases to 1.5°C on pre-industrial levels in the long term may be feasible, if a temporary overshoot is allowable. However, this remains filled with uncertainties. Given this, the report recommends that policymakers take actions today that are compatible with a later decision to switch to a 1.5°C goal. Specifically, limiting global emissions to between 40 and 48 billion tonnes of CO_2 equivalent in 2020 may be compatible with both a 1.5°C and a 2°C goal. It would be advisable, however, to aim for the lower end of this 2020 window, in order to minimise the risk of losing the 1.5°C option for good.

Reinhold Pape

[1] **Mitigating climate change through reductions in greenhouse gas emissions: is it possible to limit global warming to no more than 1.5°C?** Policy brief August 2010. Available at: *http://www2.lse.ac.uk/GranthamInstitute/publications/Policy/docs/PB-Mitigating-climate-change.pdf*

Chance of returning to 1.5° with <50 year overshoot

Emissions in 2020	Annual rate of reduction from 2021 -3%	-4%	-5%	-6%
48 Bt	-	45%	55%	65%
44 Bt	-	50%	60%	70%
40 Bt	40%	60%	65%	75%

Table: Chance of global average temperature returning to less than 1.5°C above pre-industrial levels with less than 50 years of 'overshoot', for given annual rates of reductions from 2021, and given emissions in 2020 in billion tonnes of CO_2 equivalent.

CCS in Germany: emotional

Continued from page 9

At the end of the day, CCS is not solely about the burning of coal. If the world is to win the fight against climate change, and if Germany is to achieve a greenhouse gas reduction target of at least 80 per cent by 2050, CCS must be looked at in a broader context. Renewable energy provides an existing alternative to coal in the electricity sector. However, this is not the case in the industrial sector with its process-related emissions coming from activities such as steel or cement production. Here, CO_2 emissions remain a problem and CCS could offer a solution. Biomass with CCS might also be an interesting option, allowing negative emissions to be achieved.

Risks with CCS seem to be manageable, if all involved take due responsibility and diligence. However, it is exactly this "if" that creates discomfort and doubt. Public trust had been lost in the past through misinformation, sloppiness and cover-ups, especially in the nuclear industry. Absence of transparency and openness have resulted in a low public acceptance of CCS, potentially the greatest barrier for CCS in Germany. Whether one sees this as good or bad has to be figured out by oneself.

Gabriela von Goerne

Gabriela von Goerne (PhD) is a geologist, climate policy expert and consultant living in Germany. She is co-author of **Last Gasp of the Coal Industry**. October 2008, Air Pollution & Climate Secretariat series No.21. Available at: *http://www.airclim.org/reports/*

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Renewables industry can power EU

Continued from page 7

Less specifically, but nevertheless present in the study, is the awareness that technical fixes alone are not enough. Lifestyle changes will also be necessary. For example, the study suggests that transport energy growth can be substantially reduced by a shift towards public transportation, as other scenarios have also suggested.

RE-Thinking does not give all the answers on how to achieve the needed investments in new power, power lines and storage, but it gives one good hint: very large savings can be made by avoiding the use of imported fossil fuels. Assuming an oil price of $100/barrel by 2020 increasing to $200 by 2050, the study finds that use of renewables will save fuel costs of approximately €158 billion in 2020, €325 billion in 2030 and €1,090 billion in 2050.

The oil price assumptions are, as they should be, on the conservative side. But the one thing we know about future oil prices is that they will not follow a straight line. In a situation of actual scarcity, which is the likely consequence of Peak Oil, prices may shoot up much higher, and much faster. And that is only a small part of the environmental cost of staying with fossil fuels. On the other hand, rethinking – if done fast enough – may yet save us from such a disaster.

In all likelihood an even more radical "RE-Thinking" is needed, with more focus on 2020 and less on 2050.

Fredrik Lundberg

The full report: ReThinking 2050. Available at: *http://www.rethinkinging2050.eu*

CAN supports 1.5°

The Climate Action Network (CAN), a worldwide network of over 450 non-governmental organisations (NGOs), decided in August to adopt a new climate policy target. CAN is now committed to the position that global average surface temperature should be limited to less than 1.5°C above pre-industrial levels. This replaces their previous target of 2°C, a position held by CAN for more than 15 years.

In favour of the new 1.5°C target is the scientific reality that more than this amount of warming would lead to sea level rises threatening the existence of several small island states, and endangering communities and agricultural production in Africa. Additional, recent climate science suggests that dangerous anthropogenic interference with the climate system cannot be ruled out at 1.5°C, and that various tipping points initiating severe damage to several global ecosystems could lie between 0.5°C and 2°C of warming.

The 1.5°C target has been promoted within the United Nations by the coalition of 39 small island states (AOSIS) and the 49 poorest countries in the world (LDCs), including in the lead-up to the Copenhagen UN Climate Summit in 2009. The Copenhagen Accord, an agreement taken during the Copenhagen conference by more than 110 UN members including the US, EU, China, India, Brazil and South Africa, also includes a decision that a 1.5°C target shall be analysed by 2015. In the meantime, Bolivia and some other Latin American states have started to promote a 1°C target.

At the UN Climate negotiations in Bonn this June, parties discussed the creation of a mandate for preparing an initial scientific report on the 1.5°C and 2°C target, but this proposal was unfortunately turned down by four Arab States (Saudi Arabia, Kuwait, Oman and Qatar). Most other country groups in the UN, including the US, expressed strong disappointment at the blocking of this very important mandate proposal.

Today more than 100 countries support the 1.5°C target. CAN and various scientific institutions are working to develop new strategies on how to reach this goal. CAN is demanding that the decision to create a UN mandate to prepare a paper on the scientific, technical and socio-economic issues relating to keeping global average temperature increases to no more than 1.5°C must be taken at the UN climate conference COP 16 in Cancun, with the report to be presented to the UN in spring 2011. CAN expects that this will inform deliberations on, amongst other things, emissions reductions and equitable effort-sharing.

CAN is also discussing the possibility of strengthening its 2020 target of 40 per cent greenhouse gas reductions in industrialised countries. AOSIS has for some time called for a 45 per cent reduction and Bolivia for a 50 per cent reduction in greenhouse gases by 2020, based on 1990 levels.

Reinhold Pape

Ship emissions deal in force

The revised Annex VI, which contains regulations to prevent air pollution from ships, of the International Convention for the Prevention of Pollution from Ships (MARPOL) entered into force globally on 1 July 2010.

As from this date, the fuel sulphur limit for ships operating in designated Emission Control Areas (ECAs) is lowered from 1.50 per cent to 1.00 per cent. A further reduction to 0.10 per cent will take effect from 1 January 2015. The regulation allows for ships to use alternative methods to reduce emissions to an equivalent level.

The revised Annex VI allows for Emission Control Areas (ECAs) to be designated for sulphur oxides (SOx) and particulate matter (PM), or nitrogen oxides (NOx), or all three types of emissions from ships, subject to a proposal from a party or parties to the Annex. Such proposals will be considered for adoption by the International Maritime Organisation (IMO) if supported by a demonstrated need to prevent, reduce and control one or all three of those emissions from ships.

Two existing SOx-ECAs, namely the Baltic Sea and the North Sea (including the English Channel), are already listed in the revised Annex. A new North American ECA for SOx, PM and NOx was adopted by IMO in March 2010. The regulations to implement this ECA are expected to enter into force in August 2011, with the ECA becoming effective from August 2012.

As from 1 January 2012, the global fuel sulphur cap is reduced from the current 4.50 per cent to 3.50 per cent. This global limit is further lowered to 0.50 per cent from 1 January 2020, subject to a feasibility review to be completed not later than 2018.

Progressive reductions in NOx emissions from new-built marine engines are now also coming into force, with the most stringent controls on so-called Tier III engines. This emission standard will apply to new engines installed on ships constructed on or after 1 January 2016 when operating in NOx-ECAs.

The revision of MARPOL Annex VI was formally adopted by the IMO's Marine Environment Protection Committee (MEPC) in October 2008. So far, it has been ratified by 59 countries, representing more than 84 per cent of the gross tonnage of the world's merchant shipping fleet.

Source: IMO press briefing, 30 June 2010.

MARIUSZ NIEDWIEDZKI/FOTOLIA

Caribbean ECA proposal

In June, the United States submitted a proposal to the International Maritime Organization (IMO) to designate an emission control area (ECA) for the coastal waters around Puerto Rico and the US Virgin Islands.

In its proposal the US concludes that the residents of Puerto Rico and the Virgin Islands are US citizens and that the US Government has a fundamental interest and responsibility in protecting the public health of all US citizens and the environment in these areas, and in ensuring that these citizens receive the same degree of protection from ship emissions as those living under the protection of the recently designated North American ECA.

According to the proposal, the burden on international shipping as a result of the proposed ECA is expected to be small, while the improvements in air quality and associated health and environmental benefits resulting from designation of this ECA are expected to be significant, both within in the proposed area and potentially in downwind areas.

Ships currently contribute between 26 and 37 per cent of man-made emissions of nitrogen oxides (NOx), sulphur oxides (SO_2), and particulate matter ($PM_{2.5}$) within the proposed ECA. Reducing ship emissions from today's performance to ECA standards is estimated to reduce ship emissions of NOx, SO_2 and $PM_{2.5}$ in 2020 by approximately 10,000, 28,000 and 3,000 tonnes respectively.

The northern and southern boundaries of the proposed area would extend roughly 50 nautical miles and 40 nautical miles, respectively, from the territorial sea baseline of the main island of Puerto Rico.

It is concluded that the costs of implementing and complying with the ECA standards are small, both absolutely and compared to the costs of achieving similar emissions reductions through additional controls on land-based sources. Total costs are estimated at approximately US$70 million in 2020.

The economic impacts on ships engaged in international trade are expected to be modest. For example, it is estimated that the cost of shipping a 20-foot container will increase by less than one per cent, and that the price of a cruise will also increase by less than one per cent.

The estimated cost-effectiveness in 2020 is US$600 per tonne of NOx removed, US$11,000 per tonne of $PM_{2.5}$ removed, and US$1,100 per tonne of SO_2 removed – which compares favourably to the cost-effectiveness of land-based programmes in the US.

IMO's Marine Environmental Protection Committee (MEPC) will consider the Caribbean ECA proposal at its meeting in London in the last week of September 2010. If approved, the proposal may be adopted at the next MEPC meeting in July 2011, and entry into force could then take place in 2014.

Source: IMO documents MEPC 61/7/3 and MEPC 61/INF.9, 25 June 2010.

New emission ceilings for 2020 underway

A new study shows significant scope for additional air pollutant reductions in Europe, along with the accompanying health and environmental improvements.

Negotiations under the Convention on Long-Range Transboundary Air Pollution (LRTAP) are currently looking into options for revising the 1999 Gothenburg multi-pollutant and multi-effect protocol, which establishes binding national emission ceilings for four air pollutants to be attained by 2010.

To provide negotiators with up-to-date information on cost-effective emission abatement options up to 2020, a computer model for integrated assessment is being used. This model was developed by the International Institute for Applied Systems Analysis (IIASA) and is called GAINS (Greenhouse gas – Air pollution Interactions and Synergies).

The cost-effectiveness analysis is performed through the following steps:

1. Baseline projections up to 2020 are developed that illustrate the likely development of emissions and air quality resulting from the expected economic development and implementation of existing emission control legislation within Europe.

2. The scope of further emission reductions that could be attained by full implementation of all available technical emission control measures are explored. The costs of these measures are calculated, and it is estimated to what extent their implementation would improve air quality in Europe.

3. Different combinations of environmental targets with various levels of ambition are investigated.

4. The optimisation feature of the GAINS model is used to identify the least-cost combinations of measures for Europe as a whole that achieve given environmental targets.

5. Negotiators analyse the outcome, for example, the costs and benefits to individual countries and how they are distributed in the various least-cost scenarios. From these, a main negotiating scenario is selected. The resulting allocation of emission reductions is used as a quantitative starting point for the negotiations which aim to arrive at a new multi-effect and multi-pollutant protocol that sets binding national emission ceilings to be attained by 2020.

Watch out: the ceilings are getting lower.

A recent study,[1] presented in September to the convention's negotiating forum, the Working Group on Strategies and Review, shows that the baseline emission projections – assuming full implementation of existing legislation – is expected to result in considerable environmental and health improvements over the next ten years. But it also shows that significant problems still remain in 2020:

- Pollution by fine particles ($PM_{2.5}$) will shorten statistical life expectancy by 4.5 to 5 months on average;
- There will be almost 25,000 premature deaths every year caused by excess levels of ground-level ozone;
- Biodiversity will be threatened by excessive levels of nitrogen deposition on 1.4 million square kilometres (km^2) of European ecosystems; and,
- More than 100,000 km^2 of forest ecosystems will continue to receive unsustainable levels of acid deposition.

However, a wide range of specific emission abatement measures that could improve this situation are available. If these measures were applied, loss in life expectancy could be reduced by a further 50 per cent compared to the baseline case, and the number of premature deaths from ozone could be cut by an additional 20 per cent. The ecosystem area threatened from excess nitrogen deposition could be cut by a further 60 per cent (down to 560,000

What is LRTAP?

The Convention on Long-Range Transboundary Air Pollution (LRTAP) dates back to 1979 and covers 51 parties in Europe and North America. Its most recent agreement is the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, which aims to reduce air pollution damage by setting national emissions ceilings for SO_2, NOx, VOCs and NH_3, to be achieved by 2010.

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

km^2), and the forest area endangered by acidification by 75 per cent, compared to the baseline case for 2020.

Implementing these so-called maximum technically feasible reductions (MTFR) is estimated to increase total emission control costs in Europe by 70 per cent compared to the baseline case, or by about €80 billion per year.

In a subsequent step of the analysis, the GAINS model was used to identify combinations of measures that lead to cost-effective environmental improvements and identify those measures that attain a large share of the feasible improvements at a fraction of the MTFR costs.

Clearly, the chosen ambition level of the environmental targets as well as their spatial distribution across Europe will strongly influence the outcome of such an optimisation analysis. The study has looked at several different policy options for choosing environmental targets for the revision of the Gothenburg Protocol.

One option aims at equal relative improvements in environmental quality compared to a base year, similar to the gap-closure concept used for earlier protocols under the LRTAP convention. However this approach is now difficult as it is constrained by the presence of several countries with untypical situations.

Another option aims at equal progress in feasible environmental improvements (i.e. between the baseline and the MTFR) – a concept that was used for the EU's Clean Air For Europe programme for ecosystem related targets. This was found to lead to feasible and more equitable distributions of costs and benefits, but is sensitive to the defined reference points of the baseline and MTFR.

Applying this option for achieving 75 per cent of the feasible improvement in a cost-effective way requires only about 12 per cent of the costs of the MTFR case, showing the large cost-saving potential of using a cost-effectiveness optimisation. The estimated additional cost of €9.8 billion per year on the baseline scenario equals approximately 0.06 per cent of the countries' combined Gross Domestic Product (GDP) in 2020.

A third option aims at achieving given environmental improvements across Europe irrespective of the location. This may result in environmental benefits being unevenly distributed between countries, but emission control efforts are converging in European countries. However, such a target might not efficiently protect unique ecosystems that occur only at specific locations.

Optimisation based on this last option would lead to lower costs than target setting that includes equity criteria. For a 75 per cent reduction without an equity constraint, additional emission control costs would drop to €5.5 billion per year on top of the baseline scenario.

Negotiations to revise and strengthen the Gothenburg Protocol, including widening its scope to include fine particulate matter ($PM_{2.5}$), are ongoing. The aim is to adopt a revised protocol in December 2011 that will set new, stricter national emission ceilings to be achieved by 2020.

Christer Ågren

[1] **Scope for further environmental improvements in 2020 beyond the baseline projections.** CIAM Report 1/2010. By M. Amann et al, IIASA, Austria. Available at: *http://gains.iiasa.ac.at/index.php/policyapplications/clrtap-emep-ciam*

Clean Air Act benefits

Preliminary analysis by the United States Environmental Protection Agency (EPA) shows that in 2010, the Clean Air Act's fine particles and ozone programs will prevent more than 160,000 premature deaths. The economic value of air quality improvements is estimated to reach almost US$2 trillion for the year 2020, a value that exceeds the costs to comply with the 1990 Clean Air Act and related programs.

When fully implemented in 2030, vehicle and fuel programs will produce US$186 billion in air quality and health benefits, with only US$11 billion in costs, a nearly 16:1 benefit to cost ratio.

The EPA's acid rain program has reduced damage to water quality in lakes and streams, and improved the health of ecosystems and forests. Reductions in fine particle levels yielded benefits including the avoidance of about 20,000 to 50,000 premature deaths annually. The benefits of the acid rain program outweigh the costs by at least 40:1.

Source: US EPA, 14 September 2010. Web link: *http://epa.gov/oar/caa/40th.html*

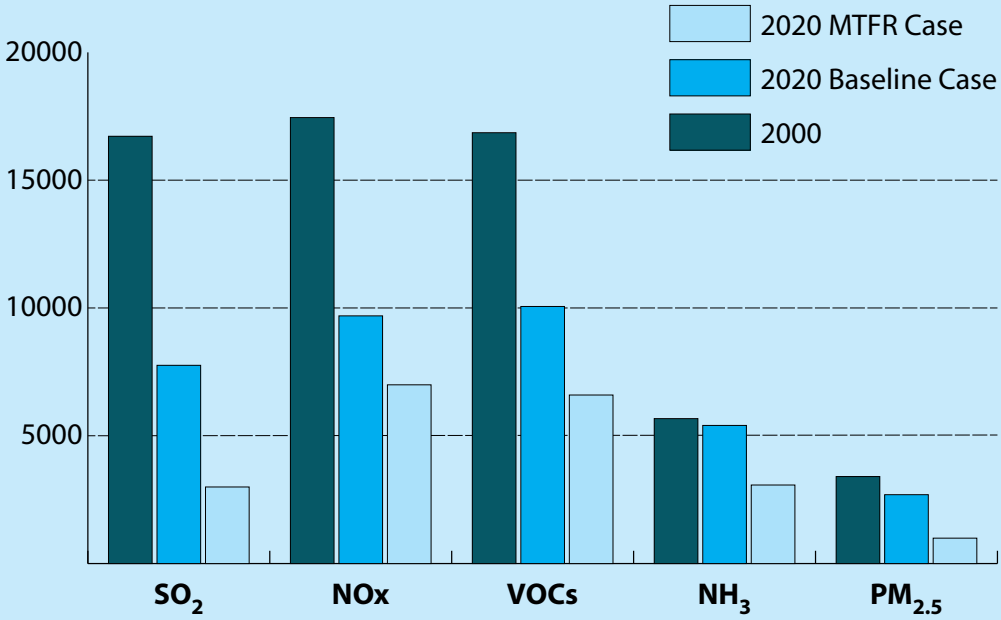


Table: European land-based emissions of air pollutants in 2000 and in 2020 under two scenarios, the baseline current legislation (CLE) and the maximum technically feasible reductions (MTFR) scenarios, in kilotonnes.

Agreement on Industrial Emissions Directive

Many years in the work, agreement has been reached on the new Industrial Emissions Directive, replacing seven existing directives and tightening standards – but not by enough.

The EU Parliament and Council reached a compromise agreement on the new Industrial Emissions Directive on 18 June, bringing more than two years of negotiations to a close. The Directive was subsequently approved by the Parliament on 7 July and now awaits the Council's rubber stamp. Whilst potentially representing a substantial improvement on existing directives, the compromise Directive represents a substantial weakening by certain EU member states acting through the Council compared to that proposed by the Parliament.

RAGESOSS, CREATIVE COMMONS

The new Directive incorporates into a single legal text the older Integrated Pollution Prevention and Control (IPPC) Directive and six sector directives –the Large Combustion Plants (LCP) Directive, the Waste Incineration Directive, the Solvent Emissions Directive and three titanium dioxide directives. The new standards to apply to LCPs were particularly controversial in the negotiations. Countries still reliant on old coal power stations, such as the UK and Poland, have successfully watered down the legislation by introducing a range of exceptions for LCPs.

Under the Directive, new plants will have to comply with binding emission limit values (ELVs) from 2012 for NOx, SO_2, dust, and in the case of gas turbines, carbon monoxide emissions. While binding limits are also to apply to some existing plants from 2016, a significant opt-out has been created that allows countries to implement a "Transitional National Plan". Until June 2020, this allows for compliance across the whole of or part of the sector within the country and delays the application of ELVs for those existing plants taking this option. The date represents a compromise between the Parliament, whose Environment Committee had sought a deadline of June 2019, and the Council's proposed date of December 2021.

The Council had originally sought a much longer derogation, but this was opposed by the Parliament. "Allowing Transitional National Plans for a whole decade are nothing else than legalising air pollution from ancient coal-fired power plants," said German MEP Holger Krahmer, who was responsible for coordination the legislation in the Parliament.

Agreement was also reached on a "limited lifetime derogation", which exempts from compliance with ELVs plants with less than 17,500 hours of remaining operational life, to be used between 2016 and the end of 2023. While the UK and others have argued such an arrangement will allow them to transition directly from coal to renewables without the need to employ gas to meet any temporary energy shortfall, environmentalists have universally condemned the exception as allowing the oldest and dirtiest coal plants to continue to profit from pollution for an additional eight years.

In addition, plants that burn indigenous solid fuels such as lignite will be exempt from ELVs for SO_2 provided that they meet mandated desulphurisation rates over that period. This will run until 2019, when it will be reviewed.

The agreed Directive also strengthens the role of the Best Available Techniques Reference Documents (BREFs). These are large technical documents setting out the EU benchmark BAT standards for each industrial sector or cross-sectoral issue. BAT (Best Available Techniques) are those techniques that best protect the environment whilst remaining economically viable, and the benchmark BAT standards are defined through industry, government and NGO agreement. However, they have previously suffered from not being legally binding. The new directive now clearly states that the BREF standards shall be the reference for setting the site-specific BAT contained in the legally binding permits set for each plant.

However, a derogation facility means that the site-specific BAT assessments have significant scope to deviate from these benchmarks. In the past, BAT has been interpreted inconsistently and weakly across the Member States. In response, the Parliament had proposed to implement much stricter rules for when sites could deviate from BREFs, and to require a public justification when doing so. The public justification requirement remains, but the compromise Directive permits derogations from BAT where costs would be disproportionate to environmental benefits, due to technical reasons or other local geographical or environmental circumstances. But it does require that there should not be any significant pollution caused and a high level of protection for the environment as a whole must be achieved.

However, the fear remains that such concessions will allow Member States to unilaterally weaken ambition and environmental protections. It is therefore thought that a provision for the Commission to set guidance criteria on what constitutes a proper use of derogations could be critical in ensuring improved environmental standards.

"Not providing for clear criteria [for derogations from BAT] in the legal text could lead to 'business as usual'... [creating] an uneven level of environmental protection for EU citizens, who ultimately pay the price," said Christian Schaible from the European Environment Bureau.

Paul Ferris

VERITY CRIDLAND, CREATIVE COMMONS

UK ship CO_2 emissions up to six times higher

A new report published by the Tyndall Centre for Climate Change Research says that Britain has consistently calculated its emissions of carbon dioxide (CO_2) from shipping incorrectly by only including bunker fuel sold at UK ports. According to the report, this is misleading because the majority of vessels sailing to and from Britain refuel at nearby ports, such as Rotterdam, where fuel prices are lower.

On the basis of its international bunker fuel sales, UK shipping emissions for 2006 – the last figures available – were around seven million tonnes (Mt) of CO_2.

But the report argues it is fairer to calculate shipping emissions on the basis of goods exported from or imported into the country. If doing so, UK ship emissions rise to 31 or 42 Mt CO_2 respectively.

The global shipping industry, despite traditionally being viewed as one of the most energy efficient means of transport, releases increasing amounts of harmful emissions into the atmosphere every year.

The International Maritime Organisation (IMO) estimates that ship emissions could increase by 150 to 250 per cent by the year 2050 in line with the expected continued growth in international seaborne trade.

"As the rest of the world strives to avoid dangerous climate change, the global shipping industry's carbon emissions could account for almost all of the world's emissions by 2050 if current rates of growth continue", says the report.

Source: The Guardian, 23 September 2010, and **Shipping and climate change: Scope for unilateral action**, August 2010. Available at: *http://www.tyndall.ac.uk/sites/default/files/Shipping_and_climate_change.pdf*

Societal costs of ship emissions investigated

The socioeconomics of ship emissions and abatement measures has been analysed in recent study by the in Swedish Environmental Protection Agency. The report, which is in Swedish with 6-page summary in English, demonstrates that the benefits to society of implementing a range of measures to reduce emissions of SO_2, NOx and CO_2 from shipping significantly exceed the costs.

Available at: *http://tinyurl.com/swepa*

Cut PM_{10}, says European Commission

The European Commission has continued to maintain a hard line against countries that are yet to comply with EU air quality legislation limiting fine particulate matter (PM_{10}) concentrations. Belgium, Greece and Romania have all been requested to come into compliance with the legislation, or face possible referral to the Court of Justice of the EU. A second and final warning has been sent to the UK, which also faces a potential legal case over PM_{10} levels.

As reported previously in *Acid News* (see 2/2010, p. 5, and 1/2010, p. 9), the European Commission has repeatedly denied the majority of requests for time extensions in meeting the binding PM_{10} limits. While full compliance should have been achieved in 2005, under the 2008 Directive on Ambient Air Quality, extensions until June 2011 can be granted in strict circumstances. This includes the requirement that countries demonstrate they will achieve compliance within the extended time period. In declining the requests of Belgium, Greece and the UK for extensions, the Commission was not satisfied these requirements had been met.

The issue is a potential embarrassment for London Major Boris Johnson, reported the Guardian newspaper. A study commissioned by Johnson himself had earlier found that poor air quality was causing 4,300 deaths and costing £2 billion each year in London.

Sources: Commission press releases 24 June and 3 June; John Vidal, "London air pollution 'worst in Europe'", *The Guardian*, 25 June 2010. Web link: *europa.eu/rapid/*

Pollutant emissions fall

While air pollutant emissions from land-based sources in Europe continue to fall slightly, some reductions are countered by rising emissions from international shipping.

Since 1980, total European emissions of sulphur dioxide (SO_2) – the most significant acidifying pollutant – from land-based emission sources have fallen by more than 80 per cent, from around 53 million tonnes in 1980 to 10.2 million tonnes in 2008.

Emissions of nitrogen oxides (NOx), non-methane volatile organic compounds (VOCs), and ammonia have also gone down, although to a lesser extent. VOCs have halved since 1980, while NOx and ammonia emissions have dropped by about a third.

Sulphur		NOx-nitrogen	
Denmark	39%	Denmark	28%
Netherlands	31%	Sweden	25%
Sweden	25%	Ireland	23%
Norway	25%	Portugal	23%
Portugal	22%	Norway	23%
Ireland	20%	Netherlands	21%
UK	18%	UK	20%
France	18%	Estonia	17%
Italy	15%	Finland	17%
Spain	15%	Belgium	16%
Estonia	14%	Italy	15%
Belgium	13%	Spain	15%
Finland	12%	France	15%

Table 1: European countries where the proportion of air pollutant depositions of sulphur and oxidised nitrogen coming from ships is the most marked.

Since the late 1990s, emissions of fine particles ($PM_{2.5}$) have been attracting increasing attention, primarily because of their negative impacts on health. However, these emissions are not as well documented as those of other air pollutants, and many countries lack emissions data for the 1990s. Between 2000 and 2008 it is estimated that emissions of $PM_{2.5}$ from land-based sources have fallen by some 17 per cent, from 2.9 to 2.4 million tonnes.

Although overall emissions continue to fall, the downward trend has flattened out over the last few years, especially in the case of NOx.

Emissions from international shipping in European waters show a steady increase. Since 1980, ship emissions of SO_2 have gone up from 1.7 to 2.5 million tonnes (a 47 per cent increase), and those of NOx from 2.4 to 3.9 million tonnes (61 per cent).

The data in Table 2 on the opposite page is taken from figures reported by countries themselves to the Convention on Long-range Transboundary Air Pollution, and was compiled by the European Monitoring and Evaluation Programme (EMEP).

The Convention's EMEP keeps track of the ways in which emissions from one country affect the environment in others. The EMEP report also provides an overview of calculations for source-receptor relationships (including transboundary movements between countries), covering acidifying, eutrophying, photo-oxidant, and particle pollution.

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

For 2008 it was estimated that ship emissions were responsible for ten per cent or more of the total depositions of both sulphur and oxidised nitrogen compounds in at least fourteen European countries (see Table 1).

In some countries, such as Denmark, Sweden, Norway, the Netherlands, Ireland, Portugal and the United Kingdom, ship emissions already make up approximately one fifth or more of total pollutant depositions.

Christer Ågren

1. **Transboundary acidification, eutrophication and ground level ozone in Europe in 2008.** EMEP Status Report 1/2010. Available at: *www.emep.int*

EU SO_2 emissions fall

A European Union air pollutant emission inventory report compiled by the European Environment Agency (EEA) and released in July shows that the EU27 has cut SO_2 emissions by 78 per cent since 1990. The decline was particularly sharp – more than 20 per cent – from 2007 to 2008, most probably as a result of the entry into force of stricter emission standards for old large coal-fired power plants. SO_2 pollution acidifies ecosystems and forms harmful fine particulate matter (PM) in the atmosphere.

The emissions of the three ozone precursors NOx, VOCs and CO also continued their downward trend. Ground-level ozone is a harmful pollutant that can trigger respiratory problems, contribute to premature mortality and also damage plants, reducing agricultural crop yields.

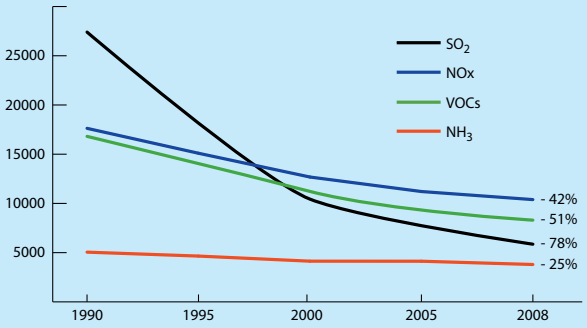


Figure: Emissions of sulphur dioxide (SO_2), nitrogen oxides (NOx), non-methane volatile organic compounds (VOCs) and ammonia (NH_3) in EU27 1990-2008 (kilotonnes).

Emission trends for health-damaging primary fine particles ($PM_{2.5}$ and PM_{10}) have not improved much in the last five years, with emissions actually increasing slightly (by 0.2 per cent) in 2008 compared to the previous year.

The full report: European Union emission inventory report 1990–2008 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP). EEA Technical report No 7/2010. Available at: *www.eea.europa.eu*

	Sulphur dioxide				Nitrogen oxides				VOCs				Ammonia				$PM_{2.5}$	
	1980	1990	2000	2008	1980	1990	2000	2008	1980	1990	2000	2008	1980	1990	2000	2008	2000	2008
Austria	360	74	32	22	246	212	207	207	436	284	177	163	52	69	65	63	22	21
Belgium	828	361	172	99	442	382	332	241	274	305	203	119	89	112	84	69	33	20
Bulgaria	2,050	2,007	918	735	416	363	184	192	309	214	123	123	144	144	56	58	59	34
Cyprus	28	46	46	22	13	19	22	20	14	16	13	12	8	5	6	5	3	3
Czech Republic	2,257	1,876	264	174	937	742	321	261	275	374	227	166	156	157	74	58	28	21
Denmark	451	176	29	20	307	266	201	152	194	166	143	106	138	134	88	74	22	28
Estonia	287	274	95	69	70	74	36	34	81	71	40	35	24	26	10	10	21	20
Finland	584	259	90	70	295	299	210	166	210	221	168	118	39	38	33	37	37	36
France	3,213	1,333	621	358	2,024	1,829	1,642	1,272	2,734	2,414	1,865	1,086	795	787	797	754	378	282
Germany	7,514	5,289	637	498	3,334	2,878	1,854	1,393	3,224	3,584	1,581	1,267	835	758	594	587	137	110
Greece	400	487	493	448	306	299	328	357	255	281	299	219	79	79	74	63	49	63
Hungary	1,633	1,011	486	88	273	276	185	183	215	252	173	141	157	124	71	69	26	27
Ireland	222	186	139	45	73	119	135	108	111	111	69	57	112	114	122	104	12	10
Italy	3,440	1,795	749	293	1,585	1,945	1,448	1,061	2,032	2,023	1,595	1,126	441	405	446	403	160	122
Latvia	96	97	15	3	83	69	40	38	152	73	56	54	38	47	13	16	23	25
Lithuania	311	263	43	32	152	158	47	68	100	136	61	71	85	82	25	29	17	10
Luxembourg	24	26	2	3	23	20	16	18	15	16	11	10	7	7	7	4	3	2
Malta	26	29	24	16	9	14	8	11	2	8	3	3	5	1	2	2	1	1
Netherlands	490	189	73	52	583	549	390	293	579	491	227	160	234	249	155	135	25	19
Poland	4,100	3,278	1,511	999	1,229	1,581	838	831	1,036	832	599	583	550	511	322	285	135	131
Portugal	253	317	281	107	158	243	299	252	189	273	244	198	96	55	63	51	98	97
Romania	1,055	1,310	760	562	523	527	297	295	829	517	522	449	340	289	206	187	116	133
Slovakia	780	542	127	69	197	215	108	95	252	122	67	68	63	66	34	25	32	27
Slovenia	234	198	99	14	51	63	50	47	39	53	49	38	24	25	20	18	15	14
Spain	2,913	2,166	1,463	527	1,068	1,247	1,395	1,236	1,392	1,135	1,018	815	285	329	380	358	127	125
Sweden	491	117	41	31	404	306	211	154	528	443	199	173	54	55	56	50	28	27
United Kingdom	4,851	3,699	1,226	512	2,580	2,932	1,877	1,403	2,099	2,396	1,488	942	361	382	330	282	103	81
Sum EU27	38,891	27,405	10,436	5,868	17,381	17,627	12,681	10,388	17,576	16,811	11,220	8,302	5,211	5,050	4,133	3,796	1710	1489
Albania	72	74	32	31	24	23	22	27	31	30	29	33	32	23	22	24	7	7
Belarus	740	888	162	81	234	379	208	165	549	497	340	222	142	215	142	147	40	28
Bosnia & Herz.	482	484	420	431	79	73	53	51	51	48	40	43	31	21	17	17	20	19
Croatia	150	178	64	55	60	88	73	79	105	105	100	128	37	53	41	39	9	11
Iceland	18	9	34	59	21	9	27	26	8	12	8	7	3	4	4	4	1	0
Macedonia	107	110	90	114	39	46	39	37	19	21	25	28	17	15	14	7	9	9
Moldova	308	175	13	7	115	131	27	32	105	123	21	35	53	61	25	26	2	6
Montenegro	0	0	0	15	0	0	0	7	0	0	0	15	0	0	0	4	0	7
Norway	136	53	27	20	191	224	202	174	173	295	385	169	20	20	23	23	59	42
Russia	7,323	6,113	1,997	1,710	3,634	3,600	2,357	3,509	3,410	3,659	2,450	2,293	1,189	1,204	650	578	693	461
Serbia	406	593	396	419	192	165	137	130	142	158	141	126	90	74	65	57	45	37
Switzerland	116	42	16	14	170	156	100	78	323	262	141	92	77	68	63	64	12	10
Ukraine	3,849	3,921	1,599	1,386	1,145	1,753	871	825	1,626	1,053	641	311	729	682	485	206	289	276
Sum Non-EU	13,707	12,640	4,850	4,342	5,904	6,647	4,116	5,140	6,542	6,263	4,321	3,502	2,420	2,440	1,551	1,196	1186	913
Sum Europe	52,598	40,045	15,286	10,210	23,285	24,274	16,797	15,528	24,118	23,074	15,541	11,804	7,631	7,490	5,684	4,992	2896	2402
Int. ship: Baltic Sea	139	168	216	185	215	236	303	354	5	8	10	13	-	-	-	-	22	24
I. ship: Black Sea	35	45	58	66	52	62	80	93	1	2	3	3	-	-	-	-	6	7
I. ship: Mediterran.	725	858	1,108	1,309	1,000	1,234	1,593	1,870	21	41	54	66	-	-	-	-	123	148
I. ship: North Sea	277	361	464	400	395	508	652	762	9	18	23	28	-	-	-	-	50	54
I. ship: N.E. Atlantic	550	384	492	583	772	565	724	845	15	19	24	30	-	-	-	-	57	69
Sum Int. ship.	1,726	1,816	2338	2543	2,434	2,605	3,352	3,924	51	88	114	140	-	-	-	-	258	302
Sum Europe + Int. ships	54,324	41,861	17,624	12,753	25,719	26,879	20,149	19,452	24,169	23,162	15,655	11,944	7,631	7,490	5,684	4,992	3154	2704
Turkey	1,030	1,519	2,000	1,490	364	691	1118	1200	359	636	794	1306	321	373	402	409	305	247

Table 2: European emissions of sulphur dioxide, nitrogen oxides (as NO_2), VOCs, and ammonia (kilotonnes). Data for 2000 and 2008 is from the 2010 EMEP report, while data for 1980 and 1990 is from earlier EMEP reports. Note that Russia in the table refers only to the western parts of the Russian Federation.

Emission ceilings may be further postponed

The EU Environment Commissioner Janez Potocnik is seeking to delay until 2013 the already long-overdue revision of the National Emissions Ceilings Directive.

Key legislation to further reduce air pollutant emissions in the European Union may be delayed another three years. In an interview with Le Monde, published on 30 June, Environment Commissioner Janez Potocnik said that the revision of National Emissions Ceilings (NEC) Directive will not take place until 2013 as the foreseen abatement measures are too costly to implement.

His comment was immediately attacked by environmental and health organisations, who said that such a postponement would put the health of millions of European citizens at risk. They also stated that the Commission's own analysis has clearly shown that the benefits to health, the environment and the economy of a revised NEC directive will significantly outweigh the costs involved.

The NEC directive is one of the pillars of the EU's air pollution control legislation and plays a vital role in achieving the goals of the EU's sixth environmental action programme (EAP). The directive was adopted in 2001, and was originally intended to be reviewed and possibly revised in 2005, when the Commission's Thematic Strategy on Air Pollution was presented.

A revised directive is expected to determine the much-needed new interim air quality targets for 2020, and set national caps on five pollutants. Tighter limits on emissions of sulphur dioxide, nitrogen oxides, volatile organic compounds, and ammonia are expected, plus the first-ever national caps on emissions of fine particulate matter ($PM_{2.5}$), to be achieved by member states by 2020.

Anne Stauffer of the Health and Environment Alliance (HEAL), said: "Commissioner Potocnik's announcement is particularly bad news for the health of children and those suffering from respiratory diseases. Air pollution is known to increase respiratory problems and diseases, such as asthma. In order to reduce the burden of disease and death caused by air pollution, action is needed now."

EUROPEAN UNION

Air pollutants are estimated to cause close to half a million premature deaths each year in the EU, as well as severe damage to the environment through eutrophication, acidification and ground-level ozone. Air quality limit values are currently exceeded in most member states, and in order to avoid this, new legislation capping overall emissions is urgently needed.

Four environmental organisations had already sent a joint letter to Commissioner Potocnik on 9 June, calling on the Commission to prioritise action to cut air pollutant emissions, principally through the revision of the NEC directive.

In mid-July the four organisations received a response from Commissioner Potocnik, stating that he shares the sense of urgency to tackle air pollution in Europe, and that a revision of the NEC directive is necessary. On the issue of timing, he wrote that "I intend to propose to my fellow Commissioners that the college discusses the direction and timing of a broad and coherent air pollution review which is foreseen during the mandate of this Commission."

The EU's Directive on Ambient Air Quality - which sets minimum air quality standards - is scheduled for review in 2013. Potocnik's response to the environmentalist organisations, while ambiguous, may thus confirm his statement to Le Monde that he intends to delay the NEC directive review until 2013, to coincide with the revision of the ambient air quality directive.

Christer Ågren

Information: Press release by the EEB and HEAL, 2 July 2010. Available at: *http://tinyurl.com/NECdelay1*; Letter from environmental NGOs, 9 June 2010. Available at: *http://www.airclim.org/news/documents/NGO_Call_for_action_on_air.pdf*

The NEC directive

Directive 2001/81/EC on national emission ceilings (NECs) for certain atmospheric pollutants aims to gradually improve, through the stepwise reduction of air pollutant emissions, the protection of both human health and the environment throughout the EU.

By setting binding national emission ceilings for the four air pollutants that cause acidification, eutrophication, and the formation of ground-level ozone, namely SO_2, NOx, VOCs, and NH_3, the directive is the key legislation for the achievement of the air quality objectives of the EU's sixth environmental action programme, as well as for attaining air quality standards for a number of pollutants, including SO_2, NO_2, fine particles (PM_{10} and $PM_{2.5}$), and ozone.

In the absence of new legislation, the current NEC directive remains in force and requires that future emissions stay below the existing national ceilings after 2010.

Further cuts in power plant air pollution

On 6 July 2010, the US Environmental Protection Agency (EPA) proposed a regulation, called the transport rule, that will target power plant air pollution that drifts across the borders of 31 eastern states and the District of Columbia. By 2014, the transport rule and other state and EPA actions would reduce SO_2 and NOx emissions by respectively 71 and 52 per cent over 2005 levels.

The measures would yield more than US$120 billion in annual health benefits in 2014, including avoiding an estimated 14,000 to 36,000 premature deaths, 23,000 nonfatal heart attacks, 21,000 cases of acute bronchitis, 240,000 cases of aggravated asthma, and 1.9 million days when people miss school or work due to ozone- and particle pollution-related symptoms. These benefits would far outweigh the annual cost of compliance with the proposed rule, which EPA estimates at US$2.8 billion in 2014.

More information: *http://www.epa.gov/airtransport*

Fine particles killing 9000 a year in California

Approximately 9,000 people in California die prematurely each year as a result of fine particle air pollution, a new report published 31 August by the California Air Resources Board has found. The report was issued as part of a periodic Environmental Protection Agency review of national air quality standards for fine particles ($PM_{2.5}$). The report focused exclusively on premature deaths and did not consider additional health impacts or costs.

The full report: *http://www.arb.ca.gov/*

BREWBOOKS, CREATIVE COMMONS

Free ride for company cars

Under-taxation increases CO_2 emissions from cars by 8%.

The under-taxation of company cars in the EU increases annual emissions of carbon dioxide (CO_2) from cars by between four and eight per cent, or between 21 and 43 million tonnes, a new study has found. The study also found that this under-taxation results in between eight and 21 million more cars on European roads.

Company Car Taxation, produced by Copenhagen Economics for the European Commission, comprehensively examined taxation arrangements in 19 EU member states. It found that significant subsidies exist for company cars, distorting the market by encouraging a higher rate of car ownership. The study also found that these subsidies encourage owners to drive a higher number of kilometres and to own larger cars, thereby increasing the associated emissions of greenhouse gases and other air pollutants.

In many taxation systems, both employers and employees can reduce their effective tax burden by providing the employee with a company car. For example, employers may not be liable for social security contributions on employee remuneration provided in this form, while employees may benefit from generous tax rules that result in a lower rate of personal taxation on this income.

Company cars are a very large section of the car market, comprising 50 per cent of all new car sales in the EU. Despite their privileged tax status, pure business use accounts for only 20 to 30 per cent of company car use, with the rest being private.

In addition to the environmental costs, under-taxation also results in substantial economic losses, with the study finding that it costs 0.5 per cent of EU GDP in direct revenue losses alone. The level of subsidies varied greatly between the member states investigated. One of the worst offenders was Belgium, where the direct cost of subsidies on company cars amounted to 1.2 per cent of GDP.

Paul Ferris

The full report: *http://tinyurl.com/companycartax*

Air pollutant emissions to exceed limits

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

Thirteen countries – Austria, Belgium, France, Germany, Ireland, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Spain, Sweden and the UK – are projected to miss their respective ceilings for at least one of the four pollutants if additional actions to reduce emissions are not taken.

Three countries – namely Austria, Germany and Malta – anticipate missing two of their emission ceilings, while Spain is forecast to miss as many as three.

The national emission ceilings (NEC) directive sets legally binding emission ceilings that each member state must meet by 2010. A new report[1] published by the European Environment Agency on 24 September presents information from the latest reporting round (deadline 31 December 2009) for the four pollutants covered by the directive: sulphur dioxide (SO_2), nitrogen oxides (NOx), volatile organic compounds (VOCs) and ammonia (NH_3).

The latest data available covers past emissions up until 2008, and not all member states have yet fully incorporated the effects of the recession into their projections for 2010. For these countries, decreased economic activity may improve the chances of meeting their obligations.

However, member states must ensure that future emissions stay within their national ceilings after economic recovery, as the NEC directive limits also apply beyond 2010.

As Figure 2 opposite shows, in most cases it is the emission ceiling for NOx that poses the greatest problem, with eleven countries predicting they will miss their ceilings, unless they take additional measures.

Several countries, including Slovenia, Sweden and the United Kingdom, expect to exceed their respective NOx ceilings by relatively small margins (less than five per cent). In contrast, France and Spain expect to exceed their ceilings by 261 kilotonnes and 236 kilotonnes respectively — equivalent to surpluses of 32 per cent and 28 per cent. Other countries, while expecting lower surpluses in absolute terms, would exceed their limits by even larger percentage margins, notably Austria (42 per cent), Belgium (43 per cent) and Ireland (47 per cent).

The road transport sector contributed around 40 per cent of total EU NOx emissions in 2008, and although its overall emissions have decreased since 1990, the reduction has not always been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because vehicle emission standards, especially those for diesel vehicles, have not always delivered the foreseen level of NOx reductions.

The projected NOx emissions for the EU27 are four per cent above the aggregated national ceilings for 2010, and 14 per cent above the Annex II ceiling (see Figure 1).

Three member states – Austria, Portugal and Spain – report that they do not envisage meeting their VOC ceilings in 2010. Projections for the EU27 as a whole are 15 per cent below the aggregated ceiling target, and marginally below the Annex II ceiling.

Regarding SO_2, only Malta does not expect to meet its ceilings in 2010. The EU as a whole is projected to be 30 per cent below the aggregate ceiling, and 25 per cent below the Annex II ceiling.

22 member states have already reduced ammonia emissions below their respective ceilings. Germany, Netherlands and Spain report that they will not reach the target for 2010 with the current measures in place. The projections for the EU27 as a whole are eight per cent below the aggregated EU ceiling targets for 2010.

Christer Ågren

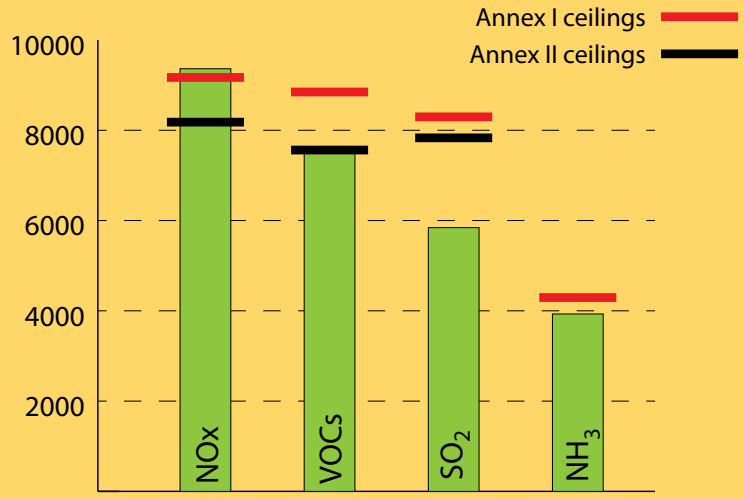


Figure 1: Aggregated "with measures" projected emissions for 2010 as reported by member states, compared with the ceilings defined in Annex I and Annex II of the directive, measured in kilotonnes.

[1] **NEC Directive status report 2009**. EEA Technical Report No. 10/2010. Available from the EEA: *http://www.eea.europa.eu/publications/nec-directive-status-report-2009*

Member state compliance with emission ceilings

	NOx	VOCs	SO_2	NH_3
Austria	X	x		
Belgium	X			
Bulgaria				
Cyprus				
Czech Rep.				
Denmark				
Estonia				
Finland				
France	X			
Germany	x			X
Greece				
Hungary				
Ireland	X			
Italy				
Latvia				
Lithuania				
Luxemburg	X			
Malta	X		X	
Netherlands				x
Poland				
Portugal		x		
Romania				
Slovakia				
Slovenia	x			
Spain	X	X		x
Sweden	x			
UK	x			
Total complying	16	24	26	24
Total exceeding	11	3	1	3

Figure 2: key

X — Anticipated exceedance by more than 10 per cent.

x — Anticipated exceedance by less than 10 per cent.

Anticipated compliance.

30% climate target would save billions on health care

Substantial public health benefits and billions of savings in health care costs could be made by raising the EU's climate target for 2020 to 30 per cent, according to a study released on 14 September. The anticipated benefits amount to up to €30.5 billion across the EU, in the form of avoided death and ill health costs such as restricted activity and hospital costs. Published by health and environmental NGOs, the report "Acting now for better health" identifies that cuts must be made domestically, rather than through international offsets, if maximum health benefits and savings are to be realised.

These €30.5 billion in benefits come on top of the estimated €52 billion in public health gains under the existing 20 per cent target. The report also finds that the health savings alone would be enough to cover two-thirds of the estimated additional costs of implementing a 30 per cent target.

Source: Acting NOW for better health: A 30% reduction target for EU climate policy. Available at: *http://www.env-health.org/a/3585*

20% EU carbon cut close to done in 2009

Estimates by the European Environment Agency (EEA) show that greenhouse gas emissions in the EU decreased to about 17.3 per cent below 1990 levels in 2009, meaning that the current target of 20 per cent by 2020 has almost already been met. A significant component of this reduction was due to decreased economic activity in 2009 due to the recession, which saw coal use drop by 12.7 per cent drop in coal use in the EU. However, for many environmentalists, the numbers re-stress the viability of increasing the 2020 target to 30 per cent.

Source: EEA, 10 September 2010. Available at: *http://www.eea.europa.eu/*

EU 20% efficiency target threatened

The European Union will fail to meet its 20 per cent energy efficiency target for 2020 under current policies, says a new study. Commissioned by the European Climate Foundation (ECF) and the Regulatory Assistance Project (RAP), the report also finds that this target can be met cost-effectively, cutting energy bills for consumers and business by €78 billion annually in 2020. Current policies mean that Europe is realising only one-third of potential cost-effective energy savings.

Source: Energy Savings 2020: how to triple the impact of energy saving policies in Europe. Available at: *http://roadmap2050.eu/contributing_studies*

EU can reduce transport emissions 89% by 2050

The EU can reduce its emissions from the transport sector by 89 per cent by 2050 compared to 1990 levels, a new study by AEA for the European Commission shows. In order to achieve such a reduction, all existing technologies as well as demand-reducing and behavioural strategies would need to be employed.

According to the AEA, implementation of all existing technical options, including the extensive use of biofuels, can reduce emissions from transport by 36 per cent by 2050. To achieve an 89 per cent reduction, a range of non-technical measures would also be needed, including fiscal and spatial planning changes.

Source: AEA press release, 2 September 2010. Available at: *http://www.aeat.co.uk/cms/assets/MediaRelease/EU-Transport-GHG-Sept10.pdf*

TIERO/FOTOLIA

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.

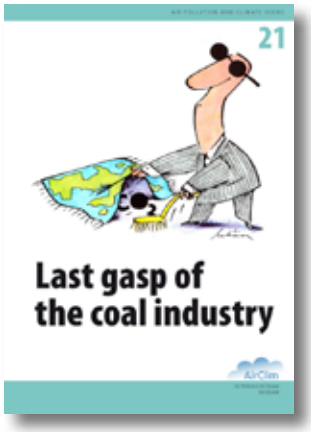
A rough calculation of the emission reduction potential indicates that application of an emissions charge, as outlined in the report, could cut NOx emissions from ships in the Baltic Sea by around 60 per cent.

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 the topic is 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.



Last Gasp of the Coal Industry

By Gabriela von Goerne and Fredrik Lundberg, October 2008.

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

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

How to order

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

Coming events

IMO MEPC 61. London, UK, 27 September-1 October, 2010. Information: *www.imo.org*

TIREC - Turkish international renewable energy congress. Istanbul, Turkey, 28 September-1 October 2010. Information: *www.greenpowerconferences.com/tirec*

United Nations Climate Change Conference. Tianjin, China, 4-9 October 2010. Information: *www.unfccc.int*

European Transport Conference 2010. Glasgow, Scotland, 11-13 October 2010. Information: *www.aetransport.org/lc_cms/page_view.asp?id=22*

EU Environment Council. Luxembourg, 14 October 2010.

Local Renewables Freiburg 2010. Freiburg, Germany, 14-15 October 2010. Information: *www.local-renewables-conference.org/freiburg2010*

Road Dust - Health Effects and Abatement Strategies conference. Stockholm, Sweden, 18-19 October 2010. Information: *www.slb.nu/roaddust*

Cleaner Air on a Shoestring. Birmingham, UK, 3 November 2010. Information: *www.environmental-protection.org.uk*

Better Air Quality (BAQ) 2010. Singapore, 9-11 November 2010. Information: *www.cleanairinitiative.org*

Eco2 Transport. London, UK, 16-18 November 2010. Information: *www.eco2transport.co.uk*

Sustainable Biomass for European Energy. Brussels, Belgium, 29-30 November 2010. Information: *www.biomassconference.eu*

UNFCCC COP 16 and CMP 6. Cancun, Mexico, 29 November-10 December 2010. Information: *unfccc.int/*

Fourth International Conference on Plants & Environmental Pollution. Lucknow, India, 8-11 December 2010. Information: *isebindia.com*

CLRTAP Executive Body. Geneva, Switzerland, 13-17 December 2010. Information: *www.unece.org/env/lrtap*

EU Environment Council. Brussels, 20 December 2010.