

Is air quality in Europe getting any better?

In 2010, 90–95 per cent of the EU's urban citizens were exposed to $PM_{2.5}$ levels higher than the reference values recommended by the WHO.

► Page 6

Great potential for changing behaviour

With a policy package that motivates citizens to change habits, emissions in the EU could be reduced by about a quarter for the non-ETS sector by 2020.

► Page 10

EU greenhouse gases fell by 2.5% in 2011

A mild winter and high prices for oil and gas have, despite an increase in the use of coal and lignite, put EU greenhouse gas emissions back on a downward track.

► Page 14

The Climate Bonus

Cleaner air, better health and a more efficient economy are some of the many co-benefits that we will get from investing in climate mitigation.

► Page 16

Cleaner ship fuels will dominate in 2020

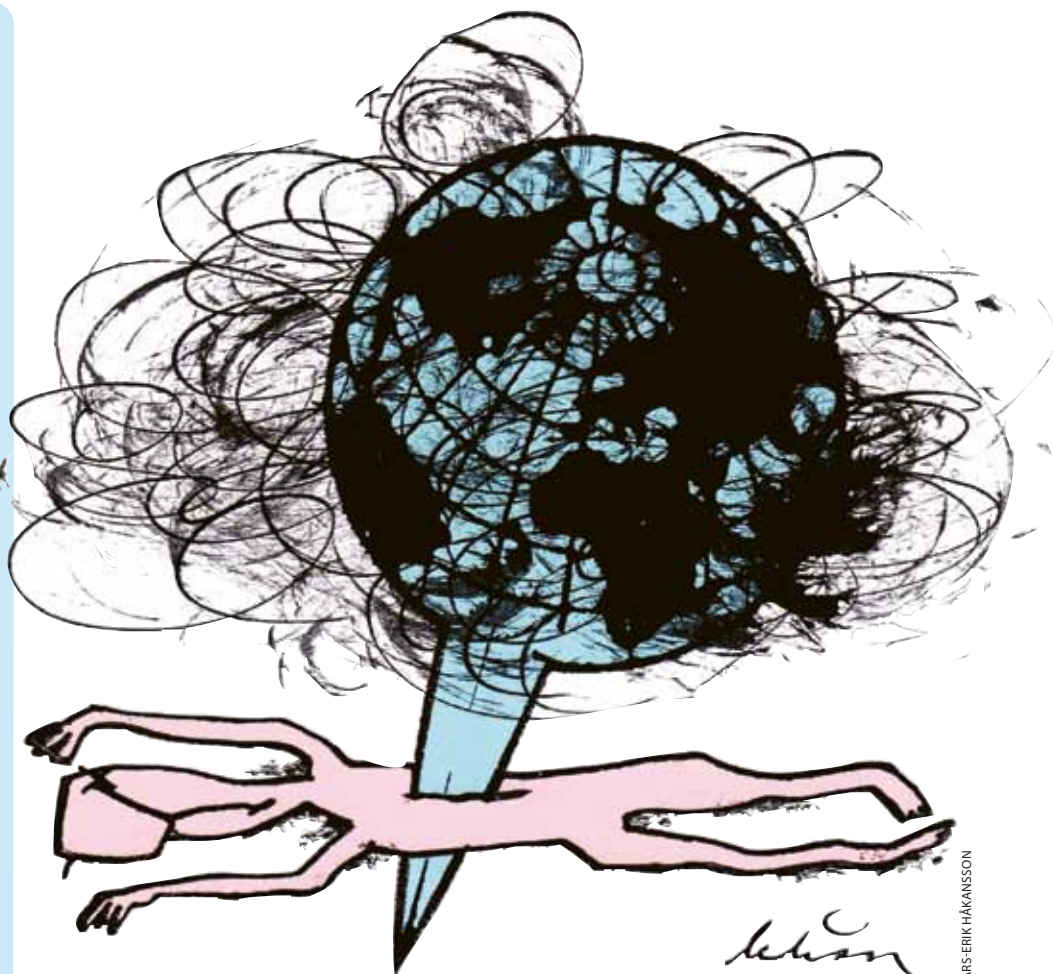
The preferred emission control options for ships trading in emission control areas after 2015 will be low-sulphur distillate fuel oil and liquefied natural gas, according to a study by DNV.

► Page 20

Arctic shipping threatens environment

Unless action is taken, the increase in shipping and other human activities in the sensitive Arctic ecosystem risk causing irreversible damage.

► Page 22



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The costs of climate change

Climate change already causes about 400,000 deaths per year and a 1 per cent loss of global GDP. By 2030 human and monetary losses may double.

What are the human and economic costs of climate change today? And what will they be in twenty years' time if today's level of inaction is maintained? An attempt to find a comprehensive answer to this question is given in the 2nd Climate and Vulnerability Monitor by DARA¹ for the Climate Vulnerable Forum. Most of the data and models used were derived after

2007, and are thus more recent than the latest IPCC assessment report.

DARA estimates that climate change is causing roughly 400,000 annual premature deaths today and that this number will have increased to 700,000 in 2030. Today's economic costs of climate change are estimated at 0.8 per cent of global

Acid News

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

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

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

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The Air Pollution and Climate Secretariat

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

The essential aim of the Secretariat is to promote awareness of the problems associated with air pollution and climate change, and thus, in part as a result of public pressure, to bring about the needed reductions in the emissions of air pollutants and greenhouse gases. The aim is to have those emissions eventually brought down to levels that man and the environment can tolerate without suffering damage.

In furtherance of these aims, the Secretariat:

- * Keeps up observation of political trends and scientific developments.
- * Acts as an information centre, primarily for European environmentalist organisations, but also for the media, authorities, and researchers.
- * Produces information material.
- * Supports environmentalist bodies in other countries in their work towards common ends.
- * Participates in the lobbying and campaigning activities of European environmentalist organisations concerning European policy relating to air quality and climate change, as well as in meetings of the Convention on Long-range Transboundary Air Pollution and the UN Framework Convention on Climate Change.

Editorial

Agriculture is the foundation of food production in a world that is facing the challenge of feeding nine billion people by 2050. However the agricultural sector is also responsible for significant emissions of the major greenhouse gases (CO₂, N₂O and CH₄) and of certain traditional air pollutants and their precursors (NH₃, CH₄ and PM).

For most other sectors that are sources of a fair share of these emissions we have seen the development of increasingly extensive regulations over the past decades: the Large Combustion Plants directive, CO₂ standards for cars, the Ecodesign directive, just to mention a few. For agriculture there are, however, no similar emission control regulations.

It must be said that agriculture in many ways differs from other kinds of production, as it is the direct result of biological processes. The rumen of a cow cannot be controlled to the same extent as an incinerator. In addition, emission sources are typically diffuse and difficult to measure. But difficult is not a strong enough reason to passively accept the 460 million tonnes of carbon dioxide equivalents and the 3.3 million tonnes of ammonia the sector is currently responsible for within the EU-27.

At EU level, there are at least three relevant and ongoing processes where far more could be done to reduce agricultural emissions: the Effort Sharing Decision (ESD) for climate, the National Emissions Ceilings directive (NEC) and the Common Agricultural Policy (CAP).

Right now discussions are taking place on how to continue the ESD beyond 2020. Specific targets for the agricultural sector, similar to the EU's targets for energy efficiency and renewable energy, could be developed for the agricultural sector.

The NEC directive is up for revision – the European Commission plans to publish its proposal next year. AirClim and two

**‘difficult is
not a strong
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to passively
accept’**

other environmental NGOs have jointly proposed that methane (in its capacity as an ozone precursor) should be added to the directive. This would force member states to take more concrete action on methane and probably also enforce measures in the agricultural sector, which accounts for a large share of these emissions.

The CAP had the initial purpose of increasing productivity and securing EU food supplies during the For agriculture there are, however, no similar emission control regulations. cold war. Environmental concerns are an element that has been added over time. The decoupling of direct payments from production through

earlier CAP reforms has led to a decrease in the number of livestock, resulting in lower methane emissions from enteric fermentation and lower nitrous oxide emissions due to smaller amounts of manure. One next step could be to link the direct payments more closely to environmental requirements, for example by applying best practices and best available technology, so-called “greening”. Potential areas from a greenhouse gas and air pollutant perspective are low-nitrogen feed and optimised fertiliser and manure management.

In addition to measures within the existing political framework it is also high time to seriously consider policy interventions in order to encourage citizens to adopt more sustainable diets (see article on page 10). Possible tools to promote healthier and more sustainable diets include a climate tax on food products, environmental requirements for meals served at public institutions and information campaigns.

Kajsa Lindqvist

Tighter standards for PM proposed in the US

Strengthening the annual fine particle pollution standard will improve health protection and provide benefits worth billions of dollars.

On 15 June the US Environmental Protection Agency (EPA) proposed to update its national air quality standard for fine particle pollution (PM_{2.5}). The proposal came in response to legal action filed by Earthjustice on behalf of the American Lung Association and the National Parks Conservation Association.

Pollution by fine particles causes serious health effects, including premature death, heart attacks and strokes, as well as acute bronchitis and aggravated asthma among children. It also contributes to the haze that envelops many US cities and national parks.

The proposal envisages a strengthening of the annual mean standard for harmful PM_{2.5} to a level within a range of 13 micrograms per cubic metre (µg/m³) to 12 µg/m³, to be compared to the current annual standard of 15 µg/m³. For comparison, the World Health Organization (WHO) has recommended an air quality guideline value of 10 µg/m³ as an annual mean.

It is also proposed by the EPA to set a separate fine particle standard to improve visibility, primarily in urban areas. This standard could be set at either 28 or 30 deciviews.

The EPA points out that the proposal has no impact on the existing daily standard for PM_{2.5} at 35 µg/m³ or the existing daily standard for coarse particles (PM₁₀) at 150 µg/m³, both of which would remain unchanged.

As a result of emission control action already taken or in the pipeline through the Clean Air Act, the EPA estimates that 99 per cent of all counties in the US will meet the proposed new standards without any additional action. EPA plans to make attainment/non-attainment designations by December 2014, with those

designations likely becoming effective in early 2015.

States would then have five years, until 2020, to meet the proposed health standards, and states may request a possible extension to 2025, depending on the severity of an area's PM pollution problems and the availability of pollution controls.

Under US law, EPA cannot consider costs in setting or revising national ambient air quality standards. However, to inform the public, the EPA is required to analyse the benefits and costs of implementing new standards. Therefore it will issue a regulatory impact analysis that estimates the potential benefits and costs of meeting a revised annual health standard in the year 2020.

EPA estimates that the proposed standards are expected to yield significant health benefits, valued at US\$2.3 billion to 5.9 billion annually for a proposed standard of 12 µg/m³ and at US\$88 million to 220 million annually for a proposed standard of 13 µg/m³. The estimated costs of implementing the proposal are US\$69 million

(for 12 µg/m³) and \$2.9 million (for 13 µg/m³). This would result in a return of US\$30 to US\$86 for every dollar invested in pollution control.

"This proposal is long overdue," said Paul Cort, the Earthjustice attorney who represented the Lung Association and NPCA in legal proceedings. "The fact that the EPA has been put back on track by the courts is an important first step in this process, but now the agency needs to set strong final standards to protect people from this deadly pollution. The law requires it, and the millions of Americans who live in areas made filthy by particle pollution desperately need it."

Earthjustice, the American Lung Association and Clean Air Task Force urge an annual standard of 11 µg/m³ and a daily standard of 25 µg/m³. The groups collaborated to last year produce a report entitled "Sick of soot: How the EPA can save lives by cleaning up fine particle pollution". According to this study, an annual standard of 11 µg/m³ and a daily standard of 25 µg/m³ could every year

spare the American public from 35,700 premature deaths; 2,350 heart attacks; 23,290 visits to the hospital and emergency room; 29,800 cases of acute bronchitis; 1.4 million cases of aggravated asthma; and 2.7 million days of missed work or school due to air-pollution-related ailments.

The EPA will accept public comment for 63 days after the proposed standards are published in the Federal Register, and will then issue a final ruling by 14 December 2012

Christer Ågren

Information on the EPA proposal:

www.epa.gov/pm

Comments from the American Lung Association: <http://www.lung.org/>



Less needed with tighter PM standards.

JESSICA WILSON/Flickr.com / CC BY-NC-ND



New name -
still watching.

SANKAX/FLICKR.COM / CC BY-NC

CDM Watch relaunched as Carbon Market Watch

CDM Watch has kept a close eye on the market for climate credits under the Climate Development Mechanism (CDM) since 2009. As the future for CDM is uncertain and other systems for carbon trading have evolved in parallel that need an independent review, the organisation was recently relaunched as Carbon Market Watch.

"The CDM has failed on many levels to achieve real emissions reductions. At the same time, plenty of new carbon market initiatives are planned and being implemented around the world. They all need watching. The launch of Carbon Market Watch is not only a name changer, it will be a game changer," Carbon Market Watch Director Eva Filzmoser commented.

Source: Carbon Market Watch Press release 16 November 2012 <http://carbonmarketwatch.org/>

Back-load of 900 million allowances proposed

The European Commission proposed on 12 November the "back-loading" of 900 million carbon allowances. These are allowances originally intended to be used in 2013–2015 that instead will be released to the market in 2019–2020. The final decision must be taken as an amendment to the EU emissions trading system (ETS) auctioning regulation by member state representatives on the Climate Change Committee.

Back-loading is believed to be a quick fix to restore the failing ETS market, where the oversupply of credits has been a major problem. The wind power trade association and the UK government have said that the measure is not enough and advocates that more allowances should be back-loaded or removed permanently from the auctioning period of 2013–2020.

Source: ENDS Europe Daily, 13 November 2012

The costs of climate change

Continued from front page

GDP and are expected to increase to 2.1 per cent in 2030.

When all the costs (and the few benefits) for continued inaction on climate change are added up, they significantly exceed the costs of mitigation (figure 1). The report concludes that even if developing countries are paying a higher price than the developed world for climate change in terms of human lives and in relation to their economy, all regions will benefit from climate action.

Hunger is the most common climate-related cause of death. Currently, approximately 225,000 people are estimated to die due to climate-induced hunger each year. That is five per cent of all famine deaths. By 2030 this figure is estimated to grow to nine per cent of all famine victims, adding up to a total of 380,000 deaths. About half of these incidents currently occur and will continue to occur in India. Other countries vulnerable to hunger induced by climate change are located in other parts of South East Asia and in sub-Saharan Africa. The most vulnerable groups are found among subsistence small-scale farmers and fishermen.

The second largest cause of climate-related death is diarrheal infections – currently one of the top causes of pre-

ventable deaths. About three per cent of total diarrheal deaths are now attributed to climate change, a share that is expected to double in 2030. Bacteria and viruses will benefit from higher temperatures and food will spoil faster. High precipitation will contaminate previously clean water sources, while drought can force people to use contaminated water.

It is hard to work when it is hot outside. When temperatures start to approach 40°C it can even be impossible to get something done without risking one's health. There is much uncertainty when it comes climate change, but one thing that we know for sure is that temperatures are going to be higher and that the number of extremely hot days is going to increase around the world. This will affect the part of the workforce that work outdoors or in inadequate climate-controlled indoor environments, and will have a huge impact on the economy. This already amounts to 0.5 per cent of GDP or US\$ 300 billion, and in twenty years losses due to decreased labour productivity are expected to be more than one per cent of global GDP or US\$ 2.5 trillion. There is a big difference in how countries are affected. Low-income countries in tropical and sub-tropical regions will experience much more severe losses. In parts of Africa GDP

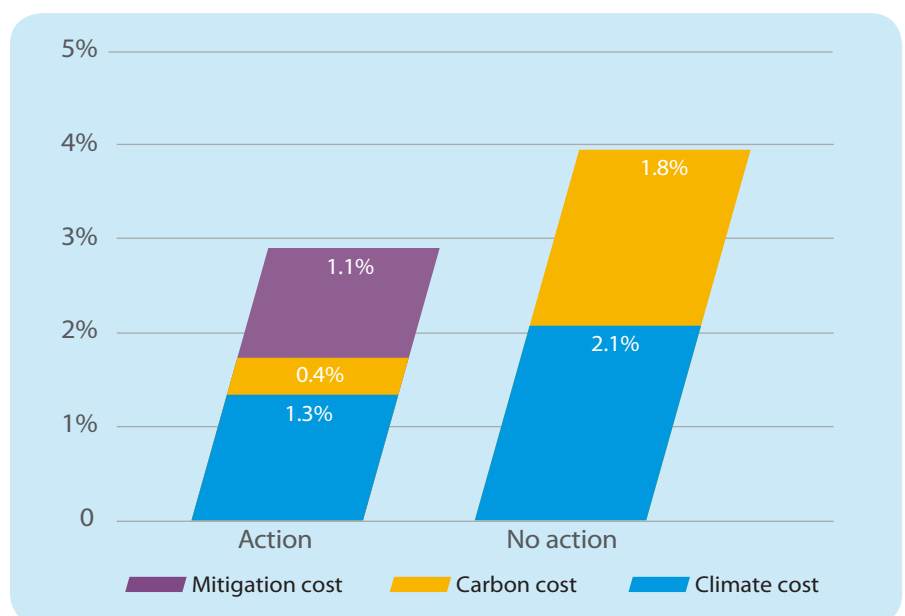


Figure. Action versus inaction over the 21st century. NPV of global climate/carbon costs and mitigation costs relative to GDP (nominal 2010–2100, 3% discount rate). Action equals 450 ppm (RCP 2.9). No action equals mid-point of two non-stabilization scenarios (RCP 8.5 and SRES A1B).

may be up to six per cent lower because of lost labour productivity in 2030. In some wealthy, northern countries labour productivity might even increase slightly.

Biodiversity loss is the second largest climate-related cost to the global economy.

The report estimates the economic value of present biodiversity losses at US\$ 80 billion a year. In 2030 this figure is expected to have increased fivefold. No part of the world will remain unaffected, but the impact will be greater in lower income countries where more people are directly dependent on ecosystem services. Climate-related biodiversity loss will put extra pressure on biodiversity that is already suffering from non-climate threats such as deforestation.

Agriculture not surprisingly is the economic sector that will have the biggest economic losses due to climate change. Climate-related losses are already estimated at US\$ 50 billion, and in twenty years this figure will have increased sevenfold. Fisheries and forestry also suffer present losses due to climate change and these are expected to increase in the near future. Hydropower is an industry that stands to gain from climate change due to the increase in rainfall, but this is not true everywhere – southeastern Europe and Central America will actually experience losses even in this sector.

The report only assesses what is going to happen by 2030. It does not take into account faster-accelerating and potentially catastrophic climate change that could happen if 1,500 gigatonnes of CO₂ from frozen sediments in the East Siberian Sea were released into the atmosphere or if some of the great ice sheets melt completely. It is hard to predict the exact consequences of this kind of event, but surely they will entail huge costs for all parts of the world.



Earlier economic impact assessments of climate change have sometimes anticipated benefits of carbon fertilization. The authors of the monitor argue that to get a proper analysis, both the pros and cons of all side-effects related to greenhouse gas emissions should be taken into account – not only this specific benefit. Consequently, there is also a chapter on the economic and humanitarian impacts of the carbon economy, which include impacts of air pollution, oil spills, acid rain, biodiversity loss, etc. The number of deaths due to the carbon economy easily exceed the number of deaths that are caused directly by climate change. Indoor air pollution, mainly from primitive cooking stoves, kills more than three million people a year, mostly women. Annual deaths related to outdoor air pollution amount to 1.4 million. Costs from carbon economy related biodiversity losses, including those caused by ground-level ozone and acid rain, amount to US\$ 1,750 billion per year.

Kajsa Lindqvist

Climate Vulnerability Monitor 2nd edition, DARA, <http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/>

¹ DARA is an independent non-profit organisation founded in 2003, specialising in conducting evaluations related to conflict, disasters and climate change.

World Bank warns of 4-degree future

The World Bank report “Turn Down the Heat” highlights the consequences of the 4-degree warming the world is heading for possibly as early as the 2060s, if the current level of inaction persists. Rising sea levels, extreme heat waves and decreasing crop yields will be the reality. What today is perceived as extreme weather, such as heat waves, will become the “new normal”.

“It is my hope that this report shocks us into action,” World Bank president Jim Yong Kim writes in the foreword.

The World Bank also stresses the fact that it is the poorest people in the poorest countries that will suffer most from climate change.

“We will never end poverty if we don’t tackle climate change. It is one of the single biggest challenges to social justice today,” Kim told Reuters.

Source: Worldbank press release, 18 November 2012

EU energy efficiency directive published

The EU energy efficiency directive, which was agreed in June, will come into force on 5 December 2012. Member states will have until June 2014 to transpose it into national law. Each year they will have to report on progress towards meeting their efficiency targets. National action plans must be issued every three years from April 2014.

The EU has agreed a 20-per-cent energy efficiency goal for the end of this decade. To achieve this no more than 1,474 million tonnes of oil equivalent (Mtoe) of primary energy or 1,078 Mtoe of final energy should be consumed in the EU by 2020. This directive is expected to cut energy use by at least 15 per cent below business-as-usual by then. Another two per cent could be delivered by tougher standards for cars and vans, and the remaining three per cent through new ecodesign measures.

Source: ENDS Europe Daily, 14 November 2012

The directive: http://ec.europa.eu/energy/efficiency/eed/eed_en.htm



Dreaming of an air-pollution-free christmas.

ALLES-SCHLUMPF/Flickr.COM / CC BY-NC-SA

Is air quality in Europe getting any better?

In 2010, 90–95 per cent of the EU's urban citizens were exposed to PM_{2.5} levels higher than the reference values recommended by the World Health Organization.

A new report by the European Environment Agency (EEA) shows that many parts of Europe have persistent problems with outdoor levels of airborne particulate matter (PM) and ground-level ozone. Almost a third of Europe's city dwellers are exposed to PM concentrations in excess of EU limit values. PM is one of the most important pollutants in terms of harm to human health as it penetrates sensitive parts of the respiratory system.

The report presents an overview and analysis of the status and trends of air quality from 2001 to 2010 in 38 European countries, including the 27 member states of the European Union. It is intended to support the development of more effective clean air policies.

While emissions of the main air pollutants in Europe have declined over the

last ten years, due to the complex links between emissions and air quality, this has not always resulted in a corresponding reduction in pollutant concentrations in ambient air, especially for PM and ground-level ozone.

Some key findings for the different air pollutants covered by the report are given below and summarised in the table.

Particulate matter (PM) is the most serious air pollution health risk in the EU, leading to health damage and premature mortality. In 2010, 21 per cent of the urban population was exposed to PM₁₀ concentrations higher than the daily EU limit value. Up to 30 per cent of the urban population was exposed to PM_{2.5} concentrations above the less stringent yearly EU limit values.

In 2006, the World Health Organization (WHO) published air quality guidelines values for a number of air pollutants, recommended to be achieved everywhere in order to reduce the adverse health effects of air pollution. The WHO recommended levels for PM are stricter than the limit values imposed by EU law.

The EEA report shows that some 80 per cent of EU urban dwellers were exposed to PM₁₀ concentrations that exceed the WHO guidelines set for the protection of human health, and 90–95 per cent of the urban population were exposed to PM_{2.5} concentrations in excess of the WHO guidelines.

PM in ambient air originates both from primary particles emitted directly into the air and from secondary particles produced as a result of chemical reactions

of PM precursor pollutants, namely SO₂, nitrogen oxides (NO_x), ammonia (NH₃) and volatile organic compounds (VOCs).

Ozone (O₃) can cause respiratory health problems and lead to premature mortality. It can also damage vegetation, including forest trees and agricultural crops. Ozone is a secondary pollutant, formed from precursor pollutants, primarily NO_x, VOCs, methane and carbon monoxide. Exposure in cities is very high – 97 per cent of EU urban inhabitants were exposed to ozone concentrations above the WHO reference level in 2010. 17 per cent were exposed to concentrations above the EU target value. Moreover, in 2009, 22 per cent of arable land in Europe was exposed to damaging concentrations of ozone, leading to agricultural losses.

Nitrogen dioxide (NO₂) is a major cause of eutrophication (over-fertilisation that may negatively affect biodiversity and cause excessive plant and algal growth in marine ecosystems) and acidification. NO₂ also contributes to the formation of PM and ozone. In 2010, seven per cent of Europeans living in cities were exposed to NO₂ levels above the EU limit values. Calculated exceedances of the critical loads for eutrophication cover most of continental Europe as well as Ireland and southern areas of the United Kingdom and Sweden. National emissions of nitrogen oxides in many EU countries still exceed emission ceilings set by EU legislation.

Benzo(a)pyrene (BaP) is a carcinogen. A considerable proportion of the urban population in the EU (20–29 per cent between 2008 and 2010) were exposed to

concentrations exceeding the EU target value, which must be met by 2013. The increase in BaP emissions in Europe in recent years is therefore a matter of concern.

Sulphur dioxide (SO₂) causes acidification and contributes to PM formation. Emissions of SO₂ have been reduced significantly in recent years. 2010 was the first year that the EU urban population was not exposed to SO₂ concentrations above the EU limit value. While the calculated exceedances of the critical loads for acidification have fallen significantly over the last decades, high exceedances still occur in Belgium, the north-west coast of France, the Netherlands and Poland.

Carbon monoxide, benzene and heavy metals (arsenic, cadmium, nickel, lead, mercury) concentrations in outdoor air are generally low, localised and sporadic in the EU, with few exceedances of the limit and target values set by EU legislation. However, the deposition of heavy metals contributes to the build-up of these pollutants in soils and sediments, and since they are persistent in the environment they may bio-accumulate in food chains. Depositions of mercury are estimated to exceed the critical loads in more than half of the area of sensitive ecosystems in the EU in 2010.

Commenting on the report, EEA Executive Director Jacqueline McGlade, said: “EU policy has reduced emissions of many pollutants over the last decade, but we can go further. In many countries, air pollutant concentrations are still above the legal and recommended limits that are set to protect the health of European citizens. In fact, air pollution reduces hu-

man life expectancy by around two years in the most polluted cities and regions.”

In a speech at the launch of the EEA air quality report, EU Environment Commissioner Janez Potočnik pointed out that: “Clean air is an investment that makes a lot of economic sense. We cannot afford not to act. Our current analysis shows that if we do nothing, we will see 200,000 premature deaths in the EU by 2020 due to particle emissions alone – but with concerted action, this number can be pushed down to 130,000. To invest in clean air means to invest in our future.”

Commissioner Potočnik also stressed that a strengthened air quality regime in the EU will actually benefit European competitiveness by giving a lead in growing markets, such as China. He continued: “Sustaining air quality is therefore not only an environmental objective, but also an economic opportunity. As part of the [EU air quality] review, I am considering setting up an innovation programme specifically targeted on clean air, to support our industry to invest in clean technologies for clean air.”

The European Commission is currently preparing a review of EU air pollution legislation in consultation with stakeholders (see AN 3/12) and will put a particular emphasis on air pollution policies in 2013.

Christer Ågren

Air quality in Europe – 2012 report (2012). EEA Report No 4/2012. Published by the European Environment Agency. Available at: <http://www.eea.europa.eu/publications/air-quality-in-europe-2012>

Commissioner Potočnik's speech at the launch of the EEA air quality report is available at: http://europa.eu/rapid/press-release_SPEECH-12-635_en.htm

Table. Percentage of the urban population in the EU exposed to air pollutant concentrations above the EU and WHO reference levels (2008–2010)

Pollutant	EU reference value	Exposure estimate (%)	WHO reference level	Exposure estimate (%)
PM _{2.5}	Year (20 ug/m ³)	16–30	Year (10 ug/m ³)	90–95
PM ₁₀	Day (50 ug/m ³)	18–21	Year (20 ug/m ³)	80–81
O ₃	8-hour (120 ug/m ³)	15–17	8-hour (100 ug/m ³)	> 97
NO ₂	Year (40 ug/m ³)	6–12	Year (40 ug/m ³)	6–12
BaP	Year (1 ng/m ³)	20–29	Year (0.12 ng/m ³)	93–94
SO ₂	Day (125 ug/m ³)	< 1	Day (20 ug/m ³)	58–61
CO	8-hour (10 mg/m ³)	0–2	8-hour (10 mg/m ³)	0–2
Pb	Year (0.5 ug/m ³)	< 1	Year (0.5 ug/m ³)	< 1
C ₆ H ₆	Year (5 ug/m ³)	< 1	Year (1.7 ug/m ³)	7–8

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

< 10 %	10–50 %	50–90 %	> 90 %
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Renewable energy law database launched

In mid-October the European Commission launched the RES Legal Europe database, which brings together all legislation on renewable energy generation in every member state as well as Norway, Iceland, Switzerland and Turkey. It includes all three energy sectors: electricity, heating, cooling and transport, as well as covering support schemes, grid issues and general policies. There is also a tool for comparing legislation on a specific issue for two or more countries.

Link: <http://www.res-legal.eu/>

First UK energy efficiency strategy

A transformation in the way energy is used across the UK economy could help boost growth and jobs, and investing in energy efficiency could save up to 22 power-stations-worth of energy by 2020, according to the UK's first national energy efficiency strategy.

The new strategy is aimed at changing the way energy is used in sectors such as housing, transport and manufacturing over the coming decades. The report shows that cost-effective investments in energy efficiency could save the UK 196 TWh in 2020, equivalent to the output from 22 power stations.

Implementing these recommended measures could reduce energy consumption by 11 per cent by the end of the decade, rising to savings of 13 per cent by 2025 compared to business as usual projections. The measures also have the potential to save 41 megatonnes of CO₂ equivalent emissions in 2020, according to the report.

Source: UK Department of Energy and Climate Change (DECC) press release, 12 November 2012



Energy efficiency - just roll it out!

BROZOVÁ/FOTOLIA.COM

Climate change evident in Europe

Further impacts of climate change in Europe are expected in the future, potentially causing high damage costs.

A new report by the European Environment Agency (EEA), "Climate change, impacts and vulnerability in Europe 2012", finds that higher average temperatures have been observed across Europe as well as decreasing precipitation in southern regions and increasing precipitation in northern Europe. The Greenland ice sheet, Arctic sea ice and many glaciers across Europe are melting, snow cover has decreased and most permafrost soils have warmed.

Extreme weather events such as heat waves, floods and droughts have caused rising damage costs across Europe in recent years. While more evidence is needed to discern the part played by climate change in this trend, growing human activity in hazard-prone areas has been a key factor. Future climate change is expected to add to this vulnerability, as extreme weather events are expected to become more intense and frequent. If European societies do not adapt, damage costs are expected to continue to rise.

Some key findings:

- The last decade (2002–2011) was the warmest on record in Europe, with European land temperature 1.3 °C warmer than the pre-industrial average. Various model projections show that Europe could be 2.5–4 °C warmer in the later part of the 21st Century, compared to the 1961–1990 average.
- Heat waves have increased in frequency and length, causing tens of thousands of deaths over the last decade. The projected increase in heat waves could increase the number of related deaths over the next decades.
- While precipitation is decreasing in southern regions, it is increasing in northern Europe. These trends are projected to continue. Climate change is projected to increase river flooding,

particularly in northern Europe, as higher temperatures intensify the water cycle.

- River flow droughts appear to have become more severe and frequent in southern Europe. Minimum river flows are projected to decrease significantly in summer in southern Europe but also in many other parts of Europe to varying degrees.
- The Arctic is warming faster than other regions. Record low sea ice was observed in the Arctic in 2007, 2011 and 2012, falling to roughly half the minimum extent seen in the 1980s. Melting of the Greenland ice sheet has doubled since the 1990s, losing an average of 250 billion tonnes of mass every year between 2005 and 2009. Glaciers in the Alps have lost approximately two thirds of their volume since 1850 and these trends are projected to continue.
- Sea levels are rising, raising the risk of coastal flooding during storm events. Global average sea level has risen by 1.7 mm a year in the 20th century, and by 3 mm a year in recent decades. Future projections vary widely, but it is likely that 21st century sea-level rise will be greater than during the 20th century. However sea level rise at European coasts varies, for example due to local land movement.
- Besides heat-related health impacts, other human health effects are also important. Climate change plays a part in the transmission of certain diseases. For example, it allows the tick species *Ixodes ricinus* to thrive further north, while further warming may make parts of Europe more suitable for disease-carrying mosquitos and sandflies. The pollen season is longer and arrives 10 days earlier than 50 years ago, also affecting human health.
- Many studies have measured widespread changes in plant and animal character-



Precipitation is increasing in northern Europe. These trends are projected to continue.

istics. For example, plants are flowering earlier in the year, while in fresh water phytoplankton and zooplankton blooms are also appearing earlier. Other animals and plants are moving northward or uphill as their habitats warm. Since the migration rate of many species is insufficient to keep pace with the speed of climate change, they could be pushed towards extinction in the future.

- While there may be less water available for agriculture in southern Europe, growing conditions may improve in other areas. The growing season for several crops in Europe has lengthened and this is projected to continue, alongside the expansion of warm-season crops into more northerly latitudes. However

the yield is projected to fall for some crops due to heat waves and droughts in central and southern Europe.

- As temperatures rise, demand for heating has also fallen, saving energy. However, this must be balanced against higher energy demands for cooling during hotter summers.

Jacqueline McGlade, EEA Executive Director said: "Climate change is a reality around the world, and the extent and speed of change is becoming ever more evident. This means that every part of the economy, including households, needs to adapt as well as reduce emissions."

Source: EEA press release, 21 November 2012.
<http://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012>

WHO levels exceeded for 94 per cent of Spaniards

According to a new report from Spanish group Ecologistas en Acción based on figures collected in 2011, 94 per cent of Spaniards are breathing air that exceeds the safe pollution levels recommended by the World Health Organization and 22 per cent of the population – 10.4 million people – are breathing air that exceeds European legal pollution limits.

Madrid has the worst record for air pollution levels, and one of the blackest spots is the area around its central Retiro Park. Other cities with areas that consistently show high levels of air pollution are Barcelona, Granada, Palma de Mallorca and Bilbao, according to the Environment Ministry.

Ecologistas en Acción say that although there has been a slight reduction in air pollution levels since 2008, this is attributed more to the depression that has hit the Spanish economy, which has prompted a reduction in car use, rather than any measures taken by the government or its agencies.

Source: AECC Newsletter, September-October 2012.

The report: <http://www.ecologistasenaccion.org/articulo24171.html>

Portugal's plea for NO₂ derogation rejected

Portugal will not be given more time to meet the EU's annual average limit on nitrogen dioxide (NO₂), the European Commission has ruled. The Portuguese government sought to delay meeting the limit value of 40 micrograms per cubic metre in the cities of Lisbon, Braga and Porto until 2015. The rejection puts Portugal in line for infringement action. Several other member states have had their requests for a derogation turned down.

Commission decisions on requests for NO₂ derogations from France, Germany, Luxembourg and Spain are expected by the end of the year.

Source: ENDS Europe Daily, 30 October 2012
European Commission on air quality derogations:
http://ec.europa.eu/environment/air/quality/legislation/time_extensions.htm

Great potential for changing behaviour

With a policy package that motivates citizens to take up a more healthy diet, replace their fossil fuel cars with electric cars and decrease room temperature, emissions in the EU could be reduced by about a quarter of the projections for the non-ETS sector by 2020.

Behavioural change is a relatively neglected area in climate change mitigation, but has a huge potential according to a new report, Behavioural Climate Change Mitigation Options, commissioned by the European Commission. The authors focus on emissions from household heating, transport and food, and identified 36 options for behavioural change that can lead to emission reductions within these areas. Based on existing barriers that discourage citizens from making specific behavioural changes and the scope for policy interventions to reduce these barriers, the mitigation potential of eleven of these options was assessed (table).

A shift to a vegetarian diet was found to have the highest potential by 2020. But a change to a healthier diet with fewer calories and more fruit and greens has almost as high a potential. The option of buying an electric car has a lower mitigation potential in the shorter term, but could have

a greater effect by 2050, since behavioural barriers are expected to significantly decrease over time. A lowering of the room temperature by two degrees had the highest potential among the household heating options, but that potential would be reduced over time since more housing is expected to get improved insulation over the years.

All these measures can not be implemented simultaneously. The maximum possible common reduction potential is approximately 600 million tonnes of CO₂ equivalents in 2020, which is about a quarter of the projected emissions in 2020.

Food accounts for a considerable amount of greenhouse gases

generated from EU citizens' consumption, half of which can be attributed to meat production. All three options examined result in reduced meat consumption, although in different contexts and scope:

- Shift to a vegetarian diet (no meat, fish or seafood, but still milk and dairy products)
- Reduced animal protein (14% less consumption of all animal-derived products, which equals one vegan day a week)
- Shift to a healthy diet (according to WHO recommendation, a maximum of 2,500 calories a day, and eating 500g of fruit and vegetables).

Cultural barriers are believed to be hard to overcome in encouraging EU citizens to switch to the first two diets. Over large parts of the continent there is a widespread perception that meat must be included in every meal. This attitude is supported by dietary habits, which

were identified as another strong factor in peoples' choice of food. Lack of knowledge about the environmental impact of meat is also believed to be a problem. On the other hand there are no economic barriers to change, since all three diets are cheaper than the average diet today. School initiatives and a taxation scheme on animal products are considered to be the most effective methods to motivate people to reduce their consumption of animal protein or shift to a vegetarian diet. Media campaigns and labelling are also suggested methods.

Motivating people to shift to a healthy diet is considered to be less challenging when it comes to cultural beliefs. Being fit and healthy are strong elements in modern consumer culture, but this may be partly offset by more traditional views, in which food with a high calorie content is highly valued. There is also a quite widespread awareness about the

benefits of eating healthily. In common with the other two diets, the healthy diet is also cheaper than the conventional diet, although it may be perceived as more expensive. Junk food usually has a low cost per calorie, which is often considered as good value by consumers. Fruit and vegetables on the other hand have a rather high price per calorie and are often ruled out by customers with a more limited budget. Another more general problem is the great abundance of unhealthy food in our society. So even though there is no real lack of healthy foods on supermarket shelves, many people encounter far too many unhealthy alternatives in a day to easily maintain a healthy

Table. Maximum realistic mitigation potential of behavioural changes in million tonnes CO₂ equivalents, relative to PRIMES/GAINS EU-27 reference scenario projections

Behavioural change	2020	2030	2050
Buying and using an electric car	96-174	330-371	420-462
Buying and using an plug-in hybrid	56-113	198-286	251-354
Buying and using a smaller car	80-96	74-88	71-84
Fuel efficient driving style	47	32	10
Teleworking	35-45	38-47	40-49
Virtual meetings	39	35	55
Reduction of room temperature by 1°C	22	19	16
Reduction of room temperature by 2°C	45	38	32
Optimised thermostat settings	11	10	9
Optimised ventilation behaviour	43	42	<<42
Shift to a vegetarian diet	266	270	271
Reduction of animal protein intake (one animal protein-free day per week)	50	50	50
Shift to a healthy diet	200	203	204

Note: The maximum realistic mitigation potential is defined as the reduction in GHG emissions achieved when the option is adopted by the largest number of people possible, taking into account realistic and structural constraints, and where possible indirect effects and rebound effects.



MAIT JÜRIADO / FLICKR.COM / CC BY-NC-SA

A new diet is one of the most effective ways to reduce greenhouse gas emissions.

diet. To persuade Europeans to decrease their energy intake and at the same time eat more fruit and greens, a multiple approach is suggested with consumption taxes on unhealthy food, improved food labelling and school initiatives.

In the transport sector, modal shifts from car to train, bicycle or by foot – although having great potential – were not examined closer since there already exists a wide range of studies on this topic. The four behavioural changes that were scrutinised, because of their potential and availability of adequate background research, were:

- Buying and using a plug-in hybrid or an electric car
- Buying and using a smaller car
- Adopting a fuel-efficient driving style
- Teleworking and switching to virtual meetings.

The main barriers for the first two options were found to be somewhat similar. Car owners are generally very concerned about the perceived social status of their cars. In one study it was shown that the single most important factor for the choice of car brand was which brand near neighbours had bought recently. Small cars are generally associated with a lower status than large vehicles. Electric cars and plug-in hybrids are unusual and can be perceived as a bit odd, however there is also a segment of customers that would buy an electric car because it fits well with their image. A connected problem is that there are still very few models of electric cars, which limits the possibility for expressing individuality.

There are also trade-offs in comfort. Small cars cannot carry as much as bigger models and owners might need to use home delivery when purchasing bulky

items or rent a bigger car for holidays. Electric cars need to be charged and this will influence driving and parking patterns. There is also a considerable economic barrier for electric cars, since they are still much more expensive than conventional cars. It is believed that other types of business models will develop for electric cars, such as leasing the battery, which is the single most expensive component of an electric car.

Information campaigns and economic incentives for consumers are proposed as possible ways of dealing with these barriers, as well as various types of initiatives aimed at manufactures and resellers to improve the range of models available. The authors also highlight the need to develop an electricity charging infrastructure if citizens are to invest in electric cars and plug-in hybrids.



AEDOPULTRONE/FILICOR.COM / CC BY-NC-ND

Great potential for changing ...

Continued from previous page

New pollution standard for motorcycles agreed

Negotiators from the European Parliament and member states agreed in late September on new rules to make motorcycles safer and less polluting. The new rules cover about 30 million vehicles in the "L-category", including mopeds, scooters, motorcycles, all-terrain vehicles, trikes and quad-bikes.

Following the agreement, motorcycles will be required to meet Euro 4 emission standards from 2016 and Euro 5 standards from 2020. (Euro 5 standards have been mandatory for new cars since 2009.) For mopeds, Euro 3 emission standards will apply from 2016, sixteen years after they came into force for cars. The Commission shall carry out a comprehensive environmental impact study by 1 January 2016 to evaluate the air quality and share of pollutants emitted by L-category vehicles.

Source: European Parliament press release, 28 September 2012

The greatest barriers to encouraging people to adopt more fuel-efficient driving styles are believed to be habits and lack of knowledge. This measure is believed to be less important over time since future models are expected to be equipped with technology that automatically leads to more fuel-efficient driving.

In the case of teleworking, the authors found that employees are worried about losing career opportunities and about social isolation, while employers worry about losing control. A regulatory framework for the employment conditions of teleworkers as well as increasing the cost of commuting are suggested as ways forward. Higher fuel prices are actually a measure that is suggested to encourage all four transport-related types of behavioural change that were studied.

To reduce emissions from the heating of houses the following types of behavioural change were considered:

- Lowering room temperature by 1 or 2 degrees.
- Optimising heating thermostat settings (e.g. leaving room temperatures at the same level, reducing temperature at night/if absent).
- Optimising ventilation behaviour.

Increasing awareness of household energy consumption is believed to be a key step in improving energy-saving behaviour. Underestimations of individual household consumption are very common and lead to a false perception that it is others who need to change. Economic incentives are also mentioned, and in this context the authors also address the issue that the change in behaviour only persists as long as the tax or subsidy is around. There can also be negative rebound effects in related areas, for example if taxes for heating are increased while those for electricity are not, this might encourage people to use more electricity.

This report, which does not claim to be a comprehensive review, only deals with a handful among thousands of possible behavioural changes that could contribute to a more sustainable Europe, but it clearly indicates that changes in behaviour must increasingly be set as political objectives and followed up with the policy measures that are needed to realise them.

Kajsa Lindqvist

Behavioural Climate Change Mitigation Options and Their Appropriate Inclusion in Quantitative Longer Term Policy Scenarios, CE Delft, 2012, http://ec.europa.eu/clima/policies/roadmap/studies_en.htm

Energy efficiency loophole shrinks

The new Energy Efficiency Directive enters into force on 4 December. One of the main features of the new directive is an obligation for energy suppliers to deliver energy savings among end-users of 1.5 per cent a year. To go along with this several member states required that savings made before 2014 could be counted as so-called early action. This loophole could then be used to cover 25 per cent of the required savings. Not all member

states were aware of an extra condition that in order to use this mechanism they are required to already have energy efficiency obligation schemes in place. Germany, Austria, Finland, and the Netherlands are among the countries that had planned to use the mechanism, but recently realised that they do not qualify.

Among the countries with the needed legislation in place are UK, France, Italy, Denmark

and Poland. But it is possible that they will also be prevented from using the mechanism. Since the deal was a so-called gentlemen's agreement, it has no legal basis in the actual directive. The Commission have said that their intention is to respect the gentlemen's agreement, but they may have to shift this position. Client Earth, an environmental law organisation, has already told the Commission that the early action is illegal.

Source: The ups and downs of EU energy efficiency policy - blog, 2 November 2012, <http://efficiency1st.blogactiv.eu>



Patching up loopholes.

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Spain turns down Moroccan solar exports

A 150 MW concentrating solar power plant in Morocco that exports power to the European electricity market would be the first real project for Desertec Industrial Initiative, a consortium in which several major energy companies are members. But Spain's representatives withdrew from the meeting where they, together with Germany, Italy, Malta, Luxembourg, France and Morocco were to sign a contract to enable the project. The difficult economic situation in Spain is believed to be the main reason for their hesitation to participate. Spain is an essential party to the project as the transfer line is planned to go through the country.

The prospects for large-scale Moroccan solar power in the

near future have not been totally ditched since other potential investors, including the World Bank, have shown interest.



Concentrating solar plant plans still just plans.

Desertec Industrial Initiative's vision is solar and wind power plants in North Africa and the Middle East, connected to a super grid with the ability to supply Europe with electricity. As much as 15 per cent of European electricity demand could be covered by 2050 according to the consortium.

Source: inhabitat.com, 30 October 2012, bloomberg.com, 7 November 2012 greenprophet.com, 13 November 2012

Change in policy on biofuels

The European Commission introduced a significant shift in biofuel policy in the new directive proposal published on 17 October, as it limits crop-based biofuels to five per cent of transport fuel, following concerns over the effect on food crops.

The change means that fuel suppliers will not, as originally planned, be held accountable for the indirect emissions biofuels cause by displacing food production into new areas, resulting in forest clearance and peatland draining known in EU jargon as "indirect land use change" (ILUC).

As a result, fuel suppliers will be able to continue blending biodiesel made from rapeseed, palm oil and soybeans into their fuels and claiming credit for cutting emissions, despite EU scientific studies showing that overall greenhouse gas emissions from biodiesel may be higher than from fossil fuel. "With this proposal, European citizens will have no guarantee that the biofuels they put in their cars are actually better for the climate," said Nusa Urbancic, fuels campaigner with green transport campaigners T&E.

EU Climate Commissioner Connie Hedegaard and Energy Commissioner Günther Oettinger confirmed in a joint statement that they wanted to cap the use of crop-based fuel. The proposal limits food crop-based biofuel to the current consumption level of five per cent up to 2020 while the target to raise the share of renewable fuel in the transport mix to ten per cent by 2020 remains.

Sources: AECC Newsletter, September-October 2012 and PlanetArk, 17 October 2012.

Tighter CO₂ standards for cars create jobs

Over 100,000 new manufacturing jobs could be created in Europe by investing in the development and manufacturing of fuel-efficient technologies to make cars greener, according to a new report published by Transport & Environment (T&E).

The report, conducted by the Dutch consultancy CE Delft, dispels industry's claims that reducing CO₂ emissions from cars would have a negative impact on automotive jobs and competitiveness in Europe. It also highlights the fact that money saved through using less fuel increases consumers' disposable income, which in turn creates extra jobs across the EU economy.

For drivers, a target of 95g will provide annual fuel savings of over €500. These savings will be much greater than the additional costs of buying a more fuel-efficient car, enabling drivers to recover their costs in 1.5 to 2.5 years. More importantly, the savings would rise to over €750 per year

and still pay back in around three years if a more ambitious target (80g/km) was adopted. Since Europe will also import less oil, it will also increase resiliency to oil price shocks and improve the balance of trade.

In 2009, legislation was adopted that requires cars sold in Europe to emit an average of 130 grams of CO₂/km by 2015 and 95 g by 2020. In July 2012, the Commission proposed to confirm the 95 g target for 2020 and the way it should be met.

"The Parliament and Council have the opportunity to improve the Commission proposal", Greg Archer at T&E, concludes, "by setting more ambitious targets and closing loopholes. Low-carbon vehicles are part of the solution to Europe's economic problems – good for jobs and the economy, good for drivers and good for the environment too."

Source: T&E press release, 11 October 2012

EU greenhouse gases fell by 2.5 per cent in 2011

A mild winter in 2011 and high prices for oil and gas have, despite an increase in the use of coal and lignite, put European Union greenhouse gas emissions back on a downward track.

Greenhouse gas emissions in the EU fell by 2.5 per cent in 2011 compared to the previous year, according to preliminary figures from the European Environment Agency (EEA). This means that emissions are once again falling after the 2.4 per cent increase in 2010.

In a Europe that has been shaken by economic crisis in recent years it is natural to assume that emission reductions are a result of decreasing economic activity. However a closer look at the economic development of individual member states and their emission trends in 2011 does not show such a clear link (figure 1). For example, Cyprus had a moderate increase in GDP but the greatest relative decline in emissions, while Bulgaria, which showed similar economic development, experienced an increase in emissions of more than 10 per cent.

A better explanation for the 2011 downward emission trend is the mild winter in the northern and central parts of Europe that year, which led to a lower demand for heating. Actually over 90 per cent of the emission reductions occurred in just two sectors:

- Residential and commercial (which to a large extent implies local heating of buildings) and
- Energy industries (i.e. centralised production of electricity and district heating)

In south-eastern Europe, however, it was colder than usual, which in combination with a shift from nuclear to coal can explain the increase of emissions in Bulgaria. Another six countries (Czech Republic, Estonia, Lithuania, Poland, Romania and Slovenia), all new member states, increased their emissions in 2011. Besides low winter temperatures in parts of the region, high activity in the construction industry in several of the eastern member states also contributed to the increase in emissions,

in particular from cement production. The United Kingdom was the member state with the largest absolute decrease, followed by France and Germany.

The majority of the member states are on track to meet their Kyoto targets for the commitment period 2008 to 2012. Exceptions are Italy and to a lesser degree Spain. Average emissions for Italy in 2009-2011 were 1.9 per cent lower than the base year, which can be compared with

their burden-sharing target of -6.5 per cent. The gap shrinks partly, but not completely, when emission reductions due to land use, land-use change and forestry (LULUCF) are included. Earlier, the Italian government announced that it will buy carbon credits corresponding to 0.4 per cent of its base year emissions, but EEA notes that this will not be enough to cover the gap. For Spain the gap is much smaller, at around 0.03 per cent of the base year, and this could be closed completely if for example emissions included in the European Trading Scheme (ETS) do not increase as expected.

This is not just a concern for Italy and Spain – if they fail to close these gaps by early 2015 it may prevent the EU15 from reaching its overall Kyoto target. Although the EU15 is on track for the common target of an 8 per cent reduction compared to 1990 levels, each country must also achieve their individual targets – surplus emission reductions in one country cannot



STUCK IN CUSTOMS/FLICKR.COM / CC BY-NC-SA
Coal and lignite consumption increased by 5.4 per cent in the EU in 2011. Seen here is Lippendorf power plant in northern Germany.

Figure 2 (right). Changes in total GHG emissions without LULUCF for the EU and its Member States, 2010–2011.

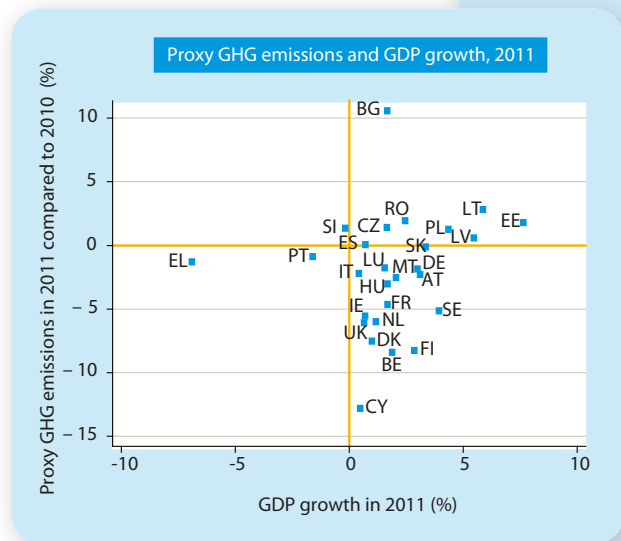
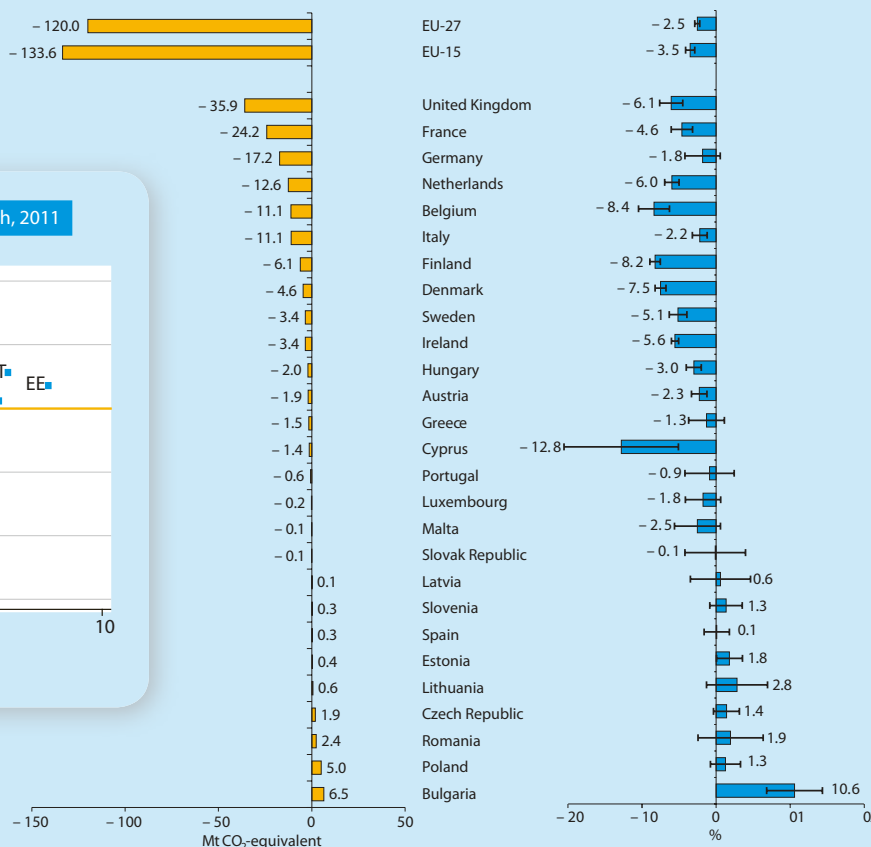


Figure 1 (above). GHG emissions and GDP growth, changes 2010–2011.



automatically compensate for insufficient reductions elsewhere.

A much bigger challenge for most member states is the EU's 20 per cent reduction target for 2020. Right now, six member states (Belgium, Ireland, Greece, Spain, Luxembourg and Malta) will have trouble achieving their commitments with present and planned measures. Another eight countries (Austria, Denmark, Estonia, Finland, France, Italy, Latvia and Slovenia) will probably not achieve their targets with existing measures, but are likely to manage if planned additional actions are taken.

In this context it is important to recall that even a 20 per cent GHG reduction by 2020 is far from enough to avoid dangerous climate change.

Examining trends for different fuels and other means of energy production helps to get a clearer picture of where greenhouse gas emissions are heading. The pattern for 2011 is, however, far from easy to interpret. The overall consumption of fossil fuels decreased by 2.4 per cent. This was mainly due to a fall in oil consumption and in western Europe a

reduction in gas consumption as well. In addition to the mild winter, the main explanation is higher energy prices. For ordinary consumers the oil price rose by 10 per cent and in the case of crude oil the price increased by 35 per cent. Gas prices rose by an average of 8 per cent for households and by 14 per cent for industry (the increase was higher in the EU15 than in the new member states). The high price of gas and oil also contributed to a shift to solid fossil fuels (coal and lignite), which despite the overall reduction in fossil fuels increased by 5.4 per cent.

Despite the shutdown of eight nuclear power plants in Germany, the total production of nuclear electricity in the EU remained stable in 2011 compared to the previous year. This was due to increases in nuclear production in other countries, particularly France and the United Kingdom (which in past years have had several reactors turned off due to technical problems). Use of energy from renewable sources (hydropower included) increased by 2.6 per cent. The largest relative increases were recorded in Belgium (49%), United Kingdom (44%) and Ireland (41%).

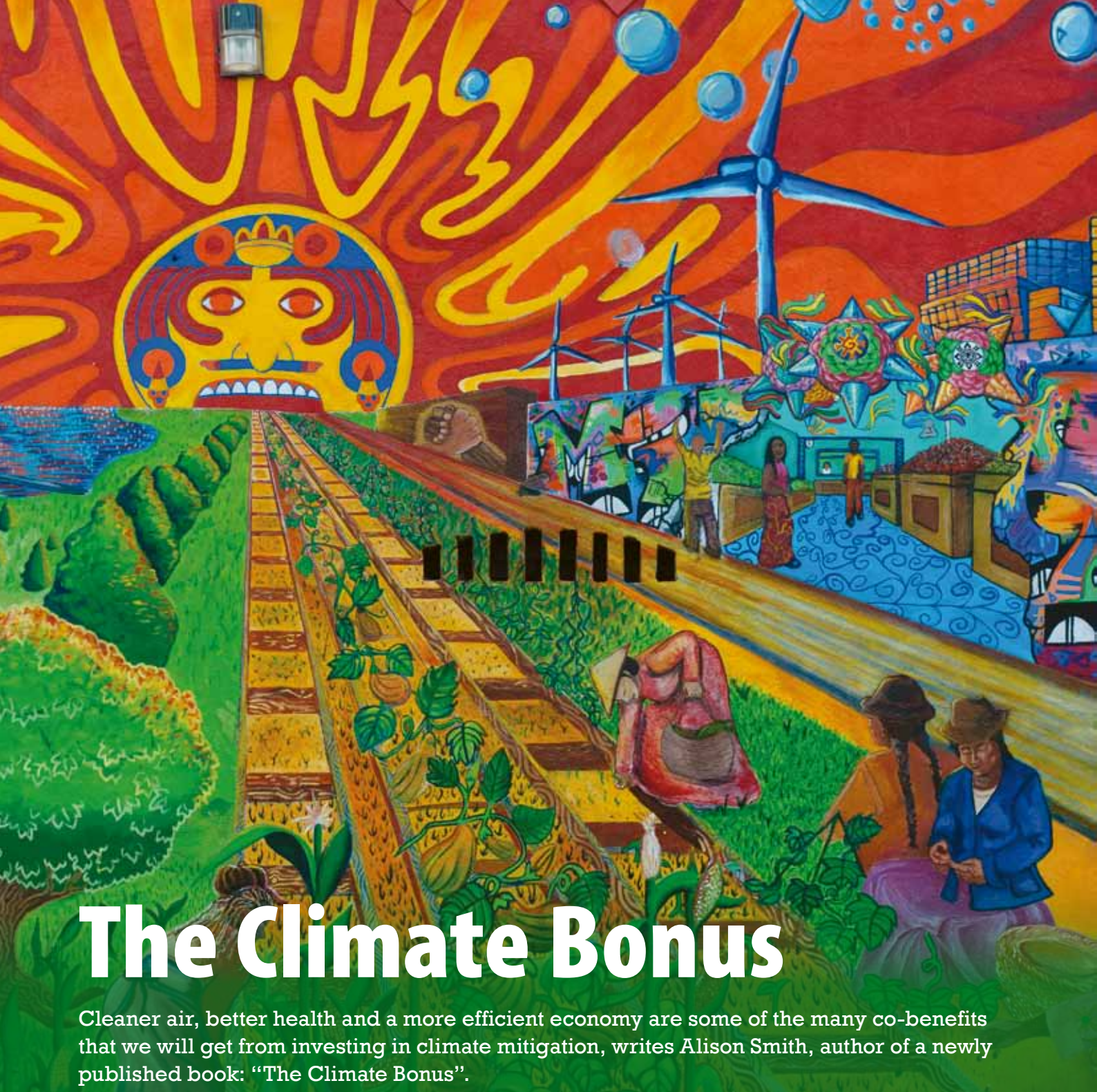
Emissions from the agricultural sector decreased slightly in 2011, mainly because the total numbers of livestock dropped, which resulted in lower methane emissions from enteric fermentation and lower nitrous oxide emissions due to smaller amounts of manure.

In recent years the prices for carbon credits within the ETS have dropped to a record low. Not very surprisingly non-ETS sectors achieved larger emission reductions (-3.0%) compared to the sectors within the trading system (-1.8%).

Kajsa Lindqvist

Greenhouse gas emission trends and projections in Europe 2012 – Tracking progress towards Kyoto and 2020 targets, European Environment Agency, <http://www.eea.europa.eu/publications/ghg-trends-and-projections-2012>

Approximated EU GHG inventory: early estimates for 2011, European Environment Agency, <http://www.eea.europa.eu/publications/approximated-eu-ghg-inventory-2011>



The Climate Bonus

Cleaner air, better health and a more efficient economy are some of the many co-benefits that we will get from investing in climate mitigation, writes Alison Smith, author of a newly published book: “The Climate Bonus”.

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Too often climate change is presented simply as a ‘bad news’ story, in which dire warnings about floods and famine compete with fears over the high cost of action. The public can become weary of all this ‘doom and gloom’, and that can undermine political support for climate policy, as we saw with the deafening silence over climate change during the recent presidential campaign in the USA. Yet climate policy should not be seen as a costly burden on society. If designed well, it can deliver huge co-benefits for health

and the economy: improved air quality, enhanced biodiversity, more sustainable agriculture, safer and more secure energy, more efficient use of resources, new jobs, stronger economies and healthier lifestyles. Even without the threat of climate change, many low-carbon policies can be justified in their own right.

My forthcoming book, ‘The Climate Bonus: co-benefits of climate policy’, presents a positive vision of how low-carbon lifestyles can lead to a cleaner, healthier, safer and more prosperous society. The

co-benefits can be grouped into five areas, as outlined below.

Cleaner Air. Fossil fuels are the main source of both greenhouse gases and air pollution, so the synergy here is obvious. If global greenhouse gas emissions were halved from 2005 to 2050, premature deaths from exposure to particle pollution would be reduced by 42 per cent compared to the business-as-usual case, avoiding more than 5 million early deaths per year by 2050. An integrated strategy

tackling climate change and air pollution together would be even more effective, achieving a 67-per-cent reduction in premature deaths. Benefits are highest in developing countries with low levels of pollution control: meeting a 2°C target by 2050 would save 29 million life years in China and 44 million in India. Health benefits would be worth over €6 trillion per year in Europe, China and India (using the same figure for the value of a life year in all countries). In Europe, the benefits would be worth €24 per tonne of CO₂ abated.

Further co-benefits can be gained by controlling methane, black carbon and ozone, which contribute to both climate change and loss of air quality. Fast action to control these pollutants could avoid 2.4 million premature deaths from outdoor air pollution and save 32–52 million tonnes in crop yields per year. Key actions included reducing soot emissions from cooking stoves and diesel vehicles, and stopping methane leaks from landfill sites, coal mines and oil and gas infrastructure.

Forests, food and farming. Protecting the ‘green carbon’ stored in soil and vegetation (three times more than is in the air) provides numerous co-benefits. Climate policy aimed at preventing deforestation, such as through ‘REDD’ forest carbon payment schemes, can protect biodiversity, prevent floods and soil erosion, safeguard water supplies and preserve the livelihoods of forest-dependent people. The synergies are strong: tropical forests, which are most at risk from deforestation, are high in both carbon and biodiversity. Climate-smart farming policies also have co-benefits: reducing the over-application of nitrogen fertilisers can cut air and water pollution and save money for farmers; adding organic matter to the soil can increase soil carbon levels as well as improving soil fertility and water retention; and planting fruit or fuelwood trees on farms can diversify and improve farm incomes and reduce soil erosion.

Safer and more secure energy. Oil prices are going up, as high-quality reserves are exploited and we are forced to turn to more expensive, dirty and risky options such as deep water and Arctic oil, tar sands and oil shale, and to rely more on imports. The

current glut of shale gas may be driving down gas prices in the US, but a dash for gas cannot meet climate targets, and there may well be opposition to drilling hundreds of wells in densely populated parts of Europe. Climate policy based on energy efficiency and home-produced renewable energy can help to provide secure, affordable energy supplies in the long term, and cut the risk of accidents such as oil spills and coal mine disasters.

A strong, efficient economy. Climate policy is often portrayed as a burden on the economy, but most modelling studies conclude that new jobs in renewable energy, recycling and other low-carbon industries will exceed the jobs lost in high-carbon activities. Investments in low-carbon infrastructure will be far outweighed by savings in fuel and resource costs and health benefits. An energy-efficient zero-waste economy will be more prosperous, competitive and innovative, especially as metals, minerals, fossil fuel, water and fertile land become increasingly scarce and expensive.

Lifestyle benefits. Low-carbon lifestyles can give surprisingly large benefits for health and well-being – even outweighing the substantial benefits from reduced air pollution. Two-thirds of all attributable deaths – 21 million deaths globally – are due to lack of exercise or unhealthy diet, and the problem is growing. Walking and cycling instead of driving, and eating less meat and dairy produce, can dramatically improve health and fitness, reducing the risk of obesity, heart disease, diabetes, strokes and cancer. More controversially, a low-consumption ‘buy less, work less’ lifestyle can promote well-being by reducing stress levels and giving more time for family, friends, leisure and community activities.

Looking for ‘win-win’ options. Of course, not all climate policies have co-benefits, and there can be conflicts or trade-offs between different objectives. Conflicts include hotly debated issues such as the visual impacts of wind turbines, the environmental and food security impacts of biofuels, the impact of increased energy prices on fuel poverty and the accident risks of nuclear power. These are very interesting from the policy point of view,

as they highlight the areas where careful analysis and well-informed decisions are most needed.

Policy makers need to look at the ‘big picture’, taking all the pros and cons of each technology or policy into account, rather than simply choosing options with the highest carbon reductions or the lowest costs. Geo-engineering through spraying sulphate aerosols into the stratosphere or dumping iron particles in the ocean, for example, not only fails to capture any co-benefits but also has potentially risky side-effects. Carbon capture and storage has some air quality benefits, but increases fuel consumption by around 25 per cent, which makes it costly and bad for energy security. Resource efficiency, however, has no conflicts and many co-benefits, provided that policies such as emission caps are in place to prevent resource savings being eroded through the ‘rebound effect’ where efficiency stimulates more economic growth, more consumption and more emissions.

Integrated policies can optimise the co-benefits and minimise any conflicts. For example, forest carbon schemes such as REDD require safeguards to prevent replacement of natural forests with bio-fuel plantations, and to stop ‘land grabs’ where forests are seized from local people. Objections to wind farms can be reduced with sensitive planning guidelines and by giving local people a stake in the project. Workers need retraining to enable them to move from high-carbon to low-carbon jobs, and low-income households need protection from fuel poverty.

The big advantage of looking at co-benefits is that they can mostly be achieved ‘here and now’, so that they can provide a far stronger incentive for action than hard-to-quantify climate benefits that may largely affect distant countries and future generations. By looking at the big picture, seizing the opportunities to tackle multiple problems at once and avoiding false solutions, we can deliver the Climate Bonus.

Alison Smith

Alison Smith is the author of **The Climate Bonus: Co-benefits of climate policy**, published by Routledge in December 2012.

Air pollution burden still too high, despite improvements

To adequately protect health and the environment, air pollutant emissions need to be further reduced, according to a new study by the European Environment Agency.

Emission cuts under the National Emission Ceilings (NEC) directive have resulted in environmental improvements and the EU appears to broadly have met its interim environmental objectives to reduce the impacts of air pollution, according to the original scientific understanding used to set the objectives.

But when currently available improved scientific understanding of air pollution is used to evaluate progress, it becomes clear that emissions need to be reduced even further to protect health and the environment, according to the European Environment Agency (EEA).

Originally proposed in 1999 and adopted in 2001, the NEC directive sets national emission ceilings for 2010 for four air pollutants: sulphur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOCs) and ammonia (NH₃). The ceilings proposed by the Commission were designed to ensure the attainment of first step interim environmental and health objectives, and to ensure that this would be done in a cost-effective manner.

However, when the directive was being negotiated in the Council, most member states adjusted their emission ceilings upwards. So the end result was a directive in which the national emission ceilings combined for EU15 were between 6 and 17 per cent higher than in the Commission's original proposal. But the interim environmental objectives, that were also to be achieved by 2010, remained the same.

It should also be noted that since the directive was adopted in 2001, more countries have joined the EU and emission ceilings for the twelve new member states have been added to the directive.

According to the EEA emission statistics, between 1990 and 2010 air pollutant emissions in the EU27 have come down significantly: SO₂ by 82 per cent, VOCs by 56 per cent, NO_x by 47 per cent and NH₃ by 28 per cent. Nevertheless, preliminary

emissions data for 2010, as documented in the EEA's "NEC directive status report 2011" published earlier this year, show that twelve member states exceeded at least one of the ceilings agreed for these air pollutants. The pollutant with most exceedances was NO_x.

In a new report, the EEA investigates whether the EU has actually achieved the interim environmental objectives set out for 2010 in the NEC directive. Such objectives were set to reduce the damaging effects of acidification, health-related ozone, vegetation-related ozone, and eutrophication.

Assessing whether environmental targets have been met can be done in different ways. In order to ensure that results are objective, EEA have used two different approaches. The first approach is based on "past knowledge" that applies the same tools and approaches that were used at the time the objectives were defined more than a decade ago. The second approach is based on "present knowledge" and applies a state-of-the-art assessment which uses, as far as feasible, the latest scientific understanding, including a more advanced methodology and air quality modelling with a higher resolution.

New knowledge and methods include an updated emissions inventory for the base year 1990; an improved air quality dispersion model that now accounts for ecosystem-specific depositions and has a higher level of resolution (from 150 x 150 km grid size to 50 x 50 km); and improved critical loads data and maps.

Using both these approaches showed that the impacts of air pollutants covered by the NEC directive are more serious than would have been evident from using solely past knowledge.

Acidification

The NEC directive's 2010 target was to reduce the area of sensitive ecosystems

where critical loads for acidification are exceeded by at least 50 per cent in each grid cell between 1990 and 2010. Sulphur dioxide, nitrogen oxides and ammonia emitted into the air contribute to acidification of fresh water and soils.

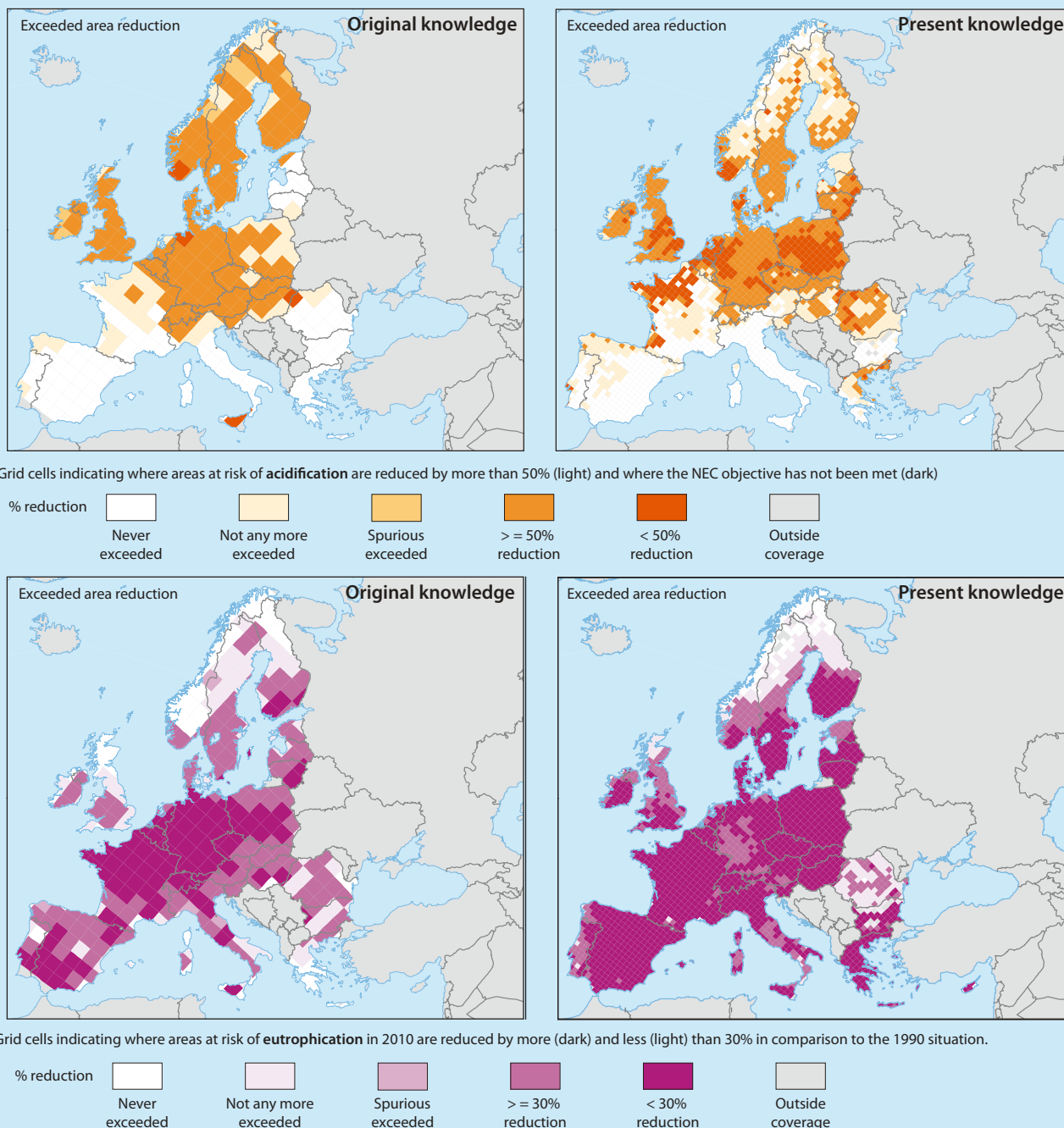
Based on "past knowledge" assumptions, this target has been largely met across the EU. Similarly, when "present knowledge" is used, the exceedance of critical loads appears to be markedly reduced, but there are still many areas where the acidification target is not yet met. A main reason for this is that the more advanced methodology takes into account the specific effects on different ecosystems, for example the higher rate of acid deposition in forests.

Eutrophication

High emissions of nitrogen oxides and ammonia result in excessive depositions of nutrient nitrogen in sensitive ecosystems, such as grasslands, heaths and nutrient-poor lakes. While the directive's target to reduce areas where the critical loads for eutrophication by 30 per cent was met according to the original assumptions, new methods indicate a smaller reduction of only around 23 per cent. Eutrophication caused by atmospheric deposition is still a major environmental problem, especially regarding its widespread impact on biodiversity.

Ozone – health

Breathing elevated levels of ozone can cause respiratory problems and contribute to premature death. The directive's target to reduce by two-thirds the human exposure to ozone levels higher than 120 micrograms per cubic metre (µg/m³) has been largely met, according to both methodologies, with the exception of some parts of southern Europe, particularly northern Italy. In this context it should be noted that the World Health



Organization (WHO) in 2006 updated its air quality guideline for ozone, lowering the eight-hour mean concentration limit from 120 to 100 $\mu\text{g}/\text{m}^3$.

Ozone – vegetation

Ozone also damages vegetation, such as crops and forests. According to the modelling results the directive's target to reduce by one-third the area where the critical level for protecting crops were exceeded, was mostly met, even when using the new methodology, with the exception of Spain and Portugal. However, the target to protect forests from ozone damage was clearly not achieved in most of the EU, with the exception of the Nordic countries

and the United Kingdom.

While this EEA report primarily looks at the adverse effects of air pollutants on the environment, another recent EEA report (Air quality in Europe – 2012 report, published in September) has assessed the state of air quality in Europe. It found that more than 90 per cent of European city dwellers are exposed to levels of PM and ozone pollutants in excess of the WHO air quality guidelines to protect health.

The European Commission is currently reviewing the European Union's air pollution policy (see AN 3/12). Amongst other initiatives, the Commission is expected to propose a revised NEC directive by 2013 at the latest, which is likely to set

new environmental and health objectives for 2020 and beyond as well as accompanying stricter emission ceilings for relevant air pollutants. In the meantime, the NEC directive remains in force and requires EU member states to keep emissions below their 2010 national ceilings.

Christer Ågren

Source: **Evaluation of progress under the EU National Emission Ceilings (NEC) Directive**, EEA Technical Report No 14/2012. Published 18 October, 2012. Available at: <http://www.eea.europa.eu/highlights/publications/evaluation-progress-nec-2012>

New rules on sulphur in marine fuels published

On 27 November, the final text of the revised directive limiting the sulphur content of marine fuels was published in the Official Journal of the European Union. The name is “Directive 2012/33/EU of the European Parliament and of the Council of 21 November 2012 amending Council Directive 1999/32/EC as regards the sulphur content of marine fuels.” It comes into force 20 days after the date of publication and member states must transpose it into national legislation before 18 June 2014.

The directive prescribes that a global limit of 0.50 per cent sulphur will apply in all EU seas by 2020. An even stricter sulphur limit of 0.10 per cent will apply as from 2015 in so-called Sulphur Emissions Control Areas (SECAs).

Link: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ%3aL%3a2012%3a327%3a0001%3a0013%3aEN%3aPDF>

Zero-emission ferry concept unveiled

A zero-emission propulsion concept has been developed by Future Ship for the Baltic shipping company Scandlines, and the technology is expected to be implemented on Baltic ferries within the next five years.

The vessel will run on a combination of solar power, fuel cells, batteries and wind power. It will be built with a streamlined hull designed to travel at up to 18 knots. Storage batteries hold some 2,400 kilowatt-hours of energy and a set of fuel cells with a total output of 8,300 kilowatts power the vessel engines. The fuel cells are powered by hydrogen gas stored in tanks located on deck that can accommodate 140 cubic metres of gas – enough for a passage of 48 hours. Turbines capture additional electricity from the wind. According to FutureShip, the cost of this design is approximately 25 per cent more than a conventional ferry.

“Short-sea applications are simply predestined for our zero-emission concept. The technology is there – it just has to be applied to shipping,” concluded Fridtjof Rohde, development engineer at FutureShip.

Source: Sustainable Shipping News, 24 October 2012

Cleaner fuels will dominate in 2020

The preferred emission control options for ships trading in emission control areas (ECAs) after 2015 will be low-sulphur distillate fuel oil and liquefied natural gas (LNG), according to a study by DNV.

In its **Shipping 2020** report, Det Norske Veritas (DNV) analyses several different scenarios, taking into account varying driving forces, such as the world economy and demand for seaborne transport; environmental regulations; trends in technology and energy efficiency; and fuel trends.

The model used by DNV predicts technology uptake in the world fleet¹ by simulating investment decisions of individual ship owners given different scenarios on regulatory requirements, world economic growth and fuel prices.

When the 0.1 per cent sulphur limit is enforced in the North American and northern European sulphur emission control areas in 2015, about 40 per cent of the world shipping fleet will be affected, and DNV expects that most vessels spending time inside these sulphur emission control areas will use distillate fuels, such as marine gas oil (MGO), to comply with the ECA sulphur limit.

On top of this, DNV concludes that if LNG prices remain competitive relative to fuel oil, LNG would become a cost-effective compliance option for ships spending more than 20–30 per cent of their sailing time inside the ECAs. Environmental advantages of using LNG as fuel include near to zero emissions of SO₂ and particulate matter (PM), an 80–90 per cent reduction in NO_x emissions, and somewhat lower emissions of greenhouse gases.

Exhaust gas cleaning (scrubbers) for controlling emissions of sulphur dioxide (SO₂) is not expected to be a significant option before 2020. But after that date, when the global sulphur limit of 0.5 per cent is foreseen to enter into force, scrubbers may be fitted to thousands of ships.

Key findings of the study with relevance to ship emissions of air pollutants and greenhouse gases:

By 2020, the demand for marine distillates will increase to around 200–250 million tonnes per year. The current global annual MGO demand is about 30 million tonnes, expected to increase to 45–50 million tonnes/year in 2015 as result of the ECA sulphur standard. But the really big increase in distillate fuel demand will be in 2020, following the introduction of the global sulphur limit of 0.5 per cent. Consequently, annual ship consumption of high-sulphur heavy fuel oil (HFO) is expected to fall dramatically from about 290 million tonnes in 2019 to 80–110 million tonnes in 2020. DNV estimates that the demand for LNG as



LNG carrier under construction.

a ship fuel will be 8–33 million tonnes in 2020.

Around thirty per cent of newly built ships in 2020 will be equipped with engines capable of running on gas.

In the coming eight years up to 2020, around 1,000 newly built ships, i.e. more than 1 in 10 new builds, will be delivered with either pure gas engines or dual-fuel engines, according to DNV. Dual-fuel engines have the flexibility to run on liquid fuel as well as on gas. Such an increase in LNG use by ships is however dependent on new investments in infrastructure for gas supply in ports and terminals.

Newly built ships in 2020 will emit 10–35 per cent less carbon dioxide (CO₂) than today's ships.

The global Energy Efficiency Design Index (EEDI) regulation, adopted by the International Maritime Organization (IMO) last year, is driving more than half of this improvement. The remaining CO₂ reduction is motivated by cost-efficiency alone and would be implemented regardless of the EEDI requirements.

Scrubbers will become a significant option after 2020.

DNV expects that there will be only a limited uptake – a few hundred installations per year – of scrubbers up to 2020. The main reason for this is said to be that only a limited number of ships spend enough time in ECAs to justify the costs of retrofitting scrubbers. After the entry into force of the global 0.5 per cent sulphur limit in 2020, however, the picture changes and scrubbers may then be fitted to several thousands of ships. A delay in implementation of the 0.5 per cent sulphur limit until 2025 would also delay scrubber uptake.

By 2016, at least 30–40 per cent of newly built ships will be fitted with efficient nitrogen oxides (NO_x) emission control.

The Tier III NO_x standards of the International Maritime Organization (IMO) require an 80-per-cent reduction in NO_x emissions from new ships trading in NO_x ECAs as from 2016 – a reduction that is expected to be met by techniques such as exhaust gas recirculation (EGR) or selective catalytic reduction (SCR). Ships propelled by LNG may achieve the Tier III standards without applying such techniques.

It is added that the full effect of the regulatory requirements on technology uptake will come only after 2020 when the IMO's global sulphur limit and Phase 2 of the EEDI are implemented. According to DNV, these two regulations are by far the strongest drivers and may lead to fundamental changes in the shipping industry.

Christer Ågren

¹ The DNV study has looked at the world fleet of around 50,000 ships, including all cargo-carrying ships but excluding passenger ships and service vessels.

Source: **Shipping 2020** (August 2012). By Det Norske Veritas (DNV), Norway. www.dnv.com

EU to monitor shipping emissions

Global steps to reduce greenhouse gas emissions from international shipping are moving too slowly, so the EU has for some time been considering different options to cut shipping emissions, such as a fuel or carbon taxes, mandatory emission reductions per ship or inclusion in the emission trading system (ETS).

As a starting point towards a globally-agreed market-based solution, the Commission is now expected to propose the establishing of a system for monitoring, reporting and verification of emissions based on fuel consumption.

Environmental groups were disappointed by the Commission's plan, saying monitoring did not address the main issue of reducing emissions from ships. International shipping accounts for around three per cent of the world's emissions of carbon dioxide, and this share could rise to 18 percent by 2050 if regulation is not in place, according to the International Maritime Organization.

Source: PlanetArk, 2 October 2012.

Slow-steaming cuts emissions

A speed limit of 12 knots, down from the current cruising speeds of 20 to 25 knots, would cut nitrogen oxides by 55 per cent and soot by almost 70 per cent, according to the University of California, Riverside study. It also would reduce emissions of the main greenhouse gas carbon dioxide by 60 per cent.

All ocean-going vessels, when they are within 10 nautical miles of a US port, must slow down, to typically 12 knots. The voluntary programmes in Los Angeles/Long Beach and New York-New Jersey slow them farther out, up to 40 miles offshore.

The study measured the emissions of two container vessels travelling between the Ports of Los Angeles/Long Beach and the Port of Oakland on the US West Coast. Emissions were measured near the ports and in international waters.

Source: Environmental Health News, 19 November 2012



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Increased Arctic shipping threatens the environment

Unless action is taken, the increase in shipping and other human activities in the sensitive Arctic ecosystem is likely to cause irreversible damage.

Recent research indicates the Arctic sea could be completely ice-free in the next thirty to forty years, and some scientists even suggest this may happen by the end of this decade. The lowest level of sea-ice ever recorded was registered in September this year.

Shipping activities are set to increase as the melting of Arctic ice accelerates. This will lead to increased emissions that will exacerbate Arctic melting and pose a growing threat to the environment in the region. In a new report, Transport & Environment (T&E) pinpoints the problems, suggests measures for how to reduce the environmental impact of shipping in the Arctic and urges the EU to take serious action to ensure the unique Arctic ecosystem survives.

Industry and governments see the melting ice as an opportunity for oil and gas extraction, mining, tourism and the development of other human activities. This would require more and more ships operating in Arctic waters with potentially catastrophic effects for that fragile ecosystem and a serious threat for the global environment.

“While Arctic melting is certainly an effect of climate change, we don’t want it to be a cause of it as well,” says Antoine Kedzierski, T&E policy officer for shipping. “The vicious circle that makes the ice melt, allowing more ships in the Arctic and again causing ice melting must be broken.”

In 2008, the international community recognised the possible threats that Arctic shipping could pose and commenced work



No soot please!

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on the so-called Polar Code, to mandate enhanced safety and environmental regulations for shipping activities in polar waters. The safety provisions of the draft code are well advanced but work on the environmental chapter has stalled.

In a communication from June 2012, the European Commission confirmed its commitment to address the growing issue of shipping emissions in the Arctic area, but failed to set out specific actions for the EU to pursue. So far a tangible commitment by the EU to ensure the inclusion of strong environmental provisions in the Polar Code is missing.

“The EU must take the lead in Arctic environmental protection,” Kedzierski

added. “At the end of the day, the EU is responsible for most of the shipping emissions in the Arctic, in that the majority of Arctic shipping departs or arrives at EU ports. Action on black carbon emissions from shipping is urgent and a strong Polar Code is vital to ensure the highest safety and environmental standards are observed. Tomorrow will be too late.”

In the report T&E suggests three priority measures to reduce the impact of shipping in the Arctic:

- Cut shipping emissions of black carbon, which absorbs heat from the sun and is one of the main causes of ice melting in the region;
- Ban the use by shipping of heavy fuel oil in Arctic waters, as has already been implemented in the Antarctic. This oil produces more toxic air pollutants and in the case of an oil spill would have catastrophic effects on ecosystems.
- Require ships to operate at slower speeds. Such a measure would minimise the risk of accidents and bring huge safety and environmental benefits.

Source: T&E press release 27 September, 2012.

Troubled waters: How to protect the Arctic from the growing impact of shipping. Published by Transport & Environment in September 2012. Available at: <http://www.transportenvironment.org/publications/troubled-waters-how-protect-arctic-growing-impact-shipping>.



California low-sulphur ship rule

A six-year legal battle over California's authority to impose low-sulphur fuel regulations on ships sailing within 24 nautical miles (nm) of its coastline has been put to rest.

"California's vessel fuel rules protect public health. They are technically feasible. They make economic sense. And today, we can finally conclude: they are legal," said Melissa Lin Perrella, senior attorney with the Natural Resources Defense Council (NRDC).

Last year, the California Air Resources Board (ARB) approved changes to the state's clean fuel regulations for ocean-going vessels (OGV), introducing a two-year delay in tightening the sulphur limit for the required distillate fuels to 0.1%. Despite this delay, it will introduce a 0.1% sulphur

limit in Californian waters in 2014. At present, the regulation requires OGVs to use either marine gas oil with a maximum of 1.00% sulphur, or marine diesel oil, with a maximum of 0.50% sulphur, within 24 nm of California's coast.

As from 2015 all ships within 200 nm of the US coastlines (i.e. inside the North American emission control area), will be required to use fuel that does not exceed 0.10% sulphur content, or use abatement technology to achieve equivalent sulphur emission reductions.

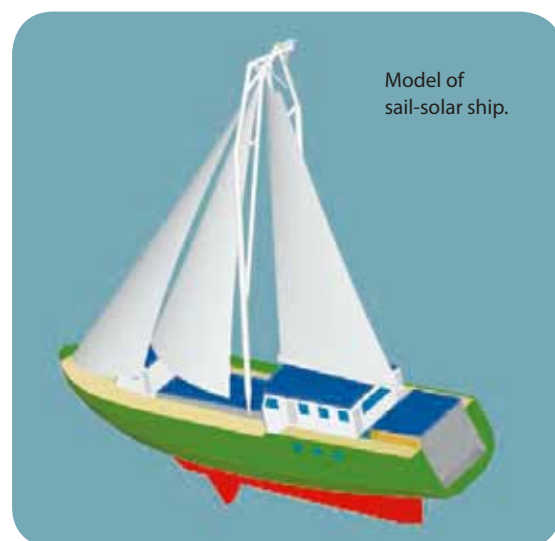
Source: Sustainable Shipping News, 20 November 2012

World's first fuel-free sail-solar ship

A small sail-solar ship specially designed to be used by developing countries will be built in Bangladesh and launched early next year. The ship, said to be the world's first fuel-free, container-ready commercial vessel, is being constructed by Greenheart, an international non-profit organisation based in Japan and Europe.

The ship, S/V Greenheart, will be designed as an ocean-going hybrid that uses a combination of traditional sail and solar power. According to its constructors, it will produce no emissions and will be simple to use and maintain, and extremely economical, thus well-suited to use in developing countries. With a shallow enough draft, the ship can also load and unload cargo directly from a beach where there is no port. The plan is for hundreds of these vessels to be owned and operated by the people and communities they serve.

Source: Greenport News, 13 November 2012



First ship engine using EGR to achieve Tier III limits

Engine producer MAN Diesel & Turbo has presented the first marine diesel engine using exhaust gas recirculation (EGR) techniques to achieve the stricter Tier III NOx emission standards of the International Maritime Organization (IMO). These standards will apply from 2016 to all new ships in dedicated NOx emission control areas (ECA).

According to MAN, this development means that strict emission limits can be

met without significantly compromising engine performance – testing showed a low fuel penalty, equivalent to 1–3 g/kWh. The engine can also run in a fuel-optimised Tier II mode resulting in an approximate 4 g/kWh fuel-oil consumption reduction, which means that the engine is more efficient than today's high-efficiency Tier II engines during transoceanic operation.

The engine will be installed in a Maersk Line C-class container vessel, currently

under construction, and due for delivery in the first quarter of 2013. It has been agreed to operate the engine 20 per cent of the time in IMO Tier III mode, and to otherwise favour the fuel-optimised Tier II mode with low EGR rate.

Source: Press release from MAN Diesel & Turbo, 26 October 2012

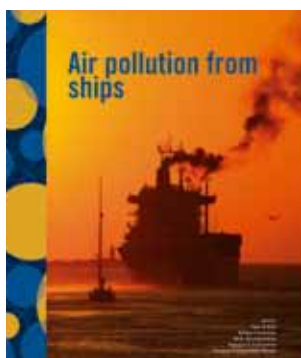
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For Clean Air Everywhere

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



Ship emissions

Shipping is a major cause of harmful air pollution in Europe and by 2020 shipping emissions of SO₂ and NO_x could exceed the emissions of these pollutants from all other EU sources.

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

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



Boreal Forest and Climate Change

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

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

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Coming events

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

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

Clean Air Everywhere: Blowing the winds of change into European air policy. Brussels, Belgium, 8 January 2013. Information: <http://www.eeb.org/EEB/index.cfm/news-events/news/>

IMO Sub-Committee on Bulk and Liquid Gases (BLG) 17. London, UK, 4-8 February 2013. Information: www.imo.org

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

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

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

EU Environment Council. Brussels, Belgium, 21 March 2013. Information: <http://europa.eu/newsroom/calendar/>

Informal Meeting of the Council of EU Environment Ministers. Dublin, Ireland 22-23 April 2013.

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

IMO Marine Environment Protection Committee (MEPC) 65. London, UK, 13 - 17 May 2013. Information: <http://www.imo.org/>

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

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

UN FCCC Meeting of Subsidiary Bodies. Bonn, Germany, 3 - 14 June 2013. Information: <http://unfccc.int/>

EU Environment Council. Brussels, Belgium, 18 June 2013. Information: <http://europa.eu/newsroom/calendar/>

Mercury 2013. Edinburgh, Scotland, UK, 28 July - 2 August 2012. Information: www.mercury2013.com

IUAPPA 16th Annual World Congress on Air Quality. Cape Town, South Africa, 29 September - 4 October 2013. Information: <http://www.iuappa.org/>