

## MEPs want stricter air pollutant caps

Member states should meet stricter 2025 and 2030 air pollution reduction targets, says the Parliament's Environment Committee.

► Page 3

## Film: 1.5 stay alive

New 50-minute documentary and Caribbean music film about climate change in the coastal zone of the Caribbean Region has been released.

► Page 6

## Launch of European Coal Map

There is now a comprehensive overview of existing and planned coal power plants that also displays key information on pollution and health impact, presented by the Climate Action Network (CAN).

► Page 8

## Deal on pollution

While EU-wide application of readily available emission abatement techniques would reduce NO<sub>x</sub> emissions by more than 80 per cent by 2025, the new directive will deliver less than half of this reduction.

► Page 9

## 140 000 life-years lost each year in London

Inclusion of the impact of nitrogen dioxide for the first time suggests that more than twice as many people as previously thought die prematurely from air pollution in London.

► Page 12

## Pledges for the 2015 UN climate agreement

As the Paris-conference is approaching, countries are submitting their plans for greenhouse gas reductions.

► Page 18



# 1.5°C target adequate for Paris agreement

The 2°C goal for global warming is inadequate. Risks increase significantly between 1.5 and 2°C, a UN review of climate targets concludes.

In four sessions of the UN Climate Convention, which brought more than 70 experts in a face-to-face dialogue with policy makers, the Structured Expert Dialogue (SED) on the 2013–2015 Review assessed the state of the science relevant for an evaluation of the adequacy of the long-term 2°C global goal and the overall progress made towards it. This comprehensive assessment of different long-term global goals such as 2°C or 1.5°C, drawing upon the IPCC AR5 as well as more recent literature, makes the

report an indispensable source of information for any assessment of the adequacy of the long-term global goal.

The report on the SED finds that the 'guardrail' concept, in which up to 2°C of warming is considered safe, is inadequate. In fact, the report confirms significant climate impacts are already occurring at the current level of global warming and additional magnitudes of warming will only increase the risk of severe, pervasive and irreversible impacts.

Page 4 ►

## Acid News

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

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

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

### Air Pollution & Climate Secretariat

Norra Allégatan 5, 413 01 Göteborg, Sweden  
Tel: +46 31 711 45 15  
Fax: +46 31 711 46 20  
E-mail: [info@airclim.org](mailto:info@airclim.org)  
Internet: [www.airclim.org](http://www.airclim.org)

Editor: Maria Adervall Berglund

Assistant editors: Christer Ågren & Reinhold Pape

Layout: Karin Didring

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

### The Air Pollution and Climate Secretariat

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

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

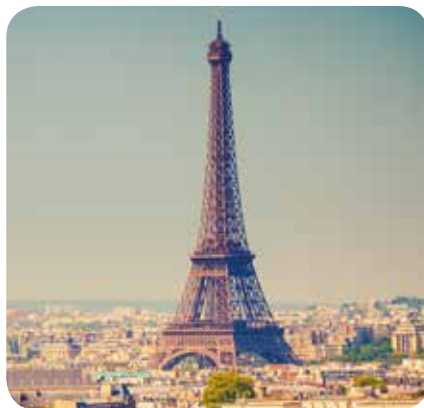
In furtherance of these aims, the Secretariat:

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

## Editorial

**At the UN** climate conference in December 2015 in Paris, 196 countries will hopefully adopt a new global agreement for strong greenhouse gas reductions. Back in 1992 all the UN countries agreed that rich countries should take the first step to stabilize GHG emissions by the year 2000. This was unfortunately not a legally binding agreement and it failed. The USA refused for more than 20 years to fulfil this agreement, refused to join the Kyoto Protocol for modest GHG reductions of five per cent and instead increased CO<sub>2</sub> emissions by nearly 10 per cent between 1990 and 2013. Under the leadership of the European Union, in a legally binding agreement process under the Kyoto Protocol (adopted in 1997), some industrialized countries stabilized and started to reduce GHG emissions, by almost 20 per cent between 1990 and 2013.

Lessons should be learned from this and it is therefore important that key parts of the new Paris agreement are legally binding. The agreement has also to confirm the principle of common but differentiated capabilities based on equity. A



© S.BORISOV - SHUTTERSTOCK.COM

balance must be achieved in the agreement between mitigation, adaptation, finance, technology transfer, capacity building and

**“The road from Paris demands serious ratcheting up of CO<sub>2</sub> reduction commitments so that the target of below 1.5 °C can be achieved”**

transparency. The industrialized countries must also agree to establish a mechanism that will enable the poorest and most vulnerable countries to deal with the loss and damage caused by climate change. By 1 October, more than 110 countries had submitted their national targets for GHG reductions to the UN. Different as-

essments of these targets suggest that the combined efforts from all these proposals would still lead to a global temperature increase of 3–4 °C by 2100. This should be compared with IPCC business-as-usual scenarios, which predict a global temperature increase of more than 5–6 °C by 2100, and the targets submitted by countries at

the Copenhagen and Cancun UN conferences in 2009 and 2011, which add up to 4–5 °C by 2100.

The Paris agreement will only be the first step and must be strengthened soon after. The road from Paris therefore demands serious ratcheting up of CO<sub>2</sub> reduction commitments so that the target of below 1.5 °C can be achieved. The 1.5 °C target is already demanded by more than 100 countries, and the UN Review on the adequacy of a 1.5 or 2 °C target in 2015 came to the same conclusion (see cover article). For the Paris agreement, Climate Action Network is demanding an “ambition-accelerating mechanism”, which includes a regular review of countries’ commitments and most importantly that the first commitment period should be only five years, from 2020 to 2025, and not as presently suggested until 2030. The proposed mechanism would also allow countries to regularly upgrade reduction targets and immediately add them to the Paris agreement.

Reinhold Pape



# Environment MEPs want stricter air pollutant caps

Member states should meet stricter 2025 and 2030 air pollution reduction targets and mercury should also be included in the National Emission Ceilings directive, says the Parliament's Environment Committee.

**In a vote** on 15 July, the European Parliament's Environment Committee agreed on tougher new national emission reduction commitments on air pollutants than those proposed by the European Commission. The vote was about the revision of the National Emission Ceilings (NEC) directive, which will set limits on emissions of pollutants in each of the 28 EU member countries for the years 2020, 2025 and 2030 (see AN 2/15).

"The Environment Committee has shown leadership in the fight against air pollution," said Louise Duprez, senior policy officer for air quality at the European Environmental Bureau (EEB). "It wants to tackle air pollution and help bring about healthier and longer lives, lower health bills and greater economic productivity. This makes perfect sense given that the benefits of cleaner air far outweigh any costs of taking action."

The NEC directive is the EU's key legal instrument to improve air quality, as it sets national emission caps for a number of air pollutants, thus tackling cross-border pollution. It is also essential for implementing the EU's international commitments under the Convention on Long-Range Transboundary Air Pollution.

**Air pollution** in the EU causes over 400,000 premature deaths and between €330 billion and €940 billion in health-related damage every year.

In the text adopted by the Environment Committee, the emission reduction targets are more stringent than in the Commission's original proposal. The targets for 2025, which the Commission proposed to be only indicative, have become binding, and mercury has been added to the list of pollutants covered by the directive. (The pollutants covered by the current NEC directive are sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds and ammonia, and the Commission have also proposed to include particulate matter (PM<sub>2.5</sub>), and methane.)

Despite heavy lobbying from the agricultural sector and efforts by centre-right and conservative MEPs to relax targets for ammonia and remove those for methane, the environment committee voted in favour of stricter targets for ammonia and for keeping methane targets in the directive.

British MEP Seb Dance, spokesperson for the Socialist & Democrat group (S&D) described the vote as "an important first step to ensure appropriate action is taken by all sectors in the economy to improve air quality."

**A coalition of** socialist, liberal, left and green MEPs voted in favour of the stricter targets, while most centre-right and conservative MEPs voted against. The committee adopted the report by 38 votes to 28, with two abstentions.

Somewhat surprisingly, the report's author, British Conservative MEP Julie Girling, of the ECR group, voted against it, essentially arguing that it was too ambitious.

There was however wide agreement in the committee on a number of changes to the proposed directive, such as improved reporting, clearly stated long-term objectives, better access to justice, and the addition of a review clause. It was also agreed to remove a Commission proposal for flexibility that would have allowed members states to offset reductions in emissions from international shipping, since such offsets would be extremely difficult to apply and would exclude landlocked countries.

Moreover, MEPs called on the Commission and member states to strengthen rules on motor vehicle emissions-testing, including for diesel vehicles, to ensure that the tests reflect real-world driving emissions and that vehicles remain compliant as they get older.

The European Parliament will adopt its formal position at a plenary session in late October, after which negotiations will begin with national governments in the Council.

Christer Ågren

<http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A8-2015-0249+0+DOC+PDF+V0//EN>



# Key Message: Impacts of Climate Change

Continued from front page 1

Consequently, the report suggests that a long-term goal of below 2°C is defined as a 'defence line', rather than a 'guardrail', confirming that warming of less than 2°C would be much more preferable and implying that a 1.5°C target would be more adequate. The report advises the pursuit of emission pathways in the immediate short term that are consistent with limiting warming to below 2°C and keeping the option of limiting warming to 1.5°C open. In addition to that, the defence line concept implies the need for high-probability below 2°C pathways that will be consistent with 1.5°C, indicating that it is only by aiming for 1.5°C that a target of below 2°C could be secured.

The outcome of SED should lead to increased recognition of the legitimacy and significance of the 1.5°C goal by all stakeholders in the climate negotiations.

## 1. Key Message: Impacts of Climate Change differ substantially between 1.5°C and 2°C

**The SED report** confirms that risks increase significantly between 1.5°C and 2°C: three out of five "Reasons for Concern" as identified by the IPCC are rated as transitioning from moderate to high risk between these warming levels. The report finds that limiting global warming to below 1.5°C would avoid or substantially reduce risks, including risks to food production or unique and threatened systems such as coral reefs or many parts of the cryosphere (glaciers, ice sheets of Greenland and Antarctica) and the risk of sea level rise.

In relation to the risks for the five "Reasons for Concern" identified by the IPCC, the SED finds for a warming of 2°C that:

- Unique and threatened systems would be at high risk, in particular systems

with limited or barely any adaptive capacity (e.g. Arctic sea ice and coral reefs).

- Extreme weather events would pose a high risk for human health, urban housing and infrastructure in megacities, and in relation to the urban heat island effect, air pollution and differential vulnerabilities; displacement and permanent migration; livelihood struggles and conflict in resource-dependent livelihoods, such as agriculture and pastoralism; and high impacts on livelihood (trapped populations are more vulnerable to environmental change because of their inability to move).



- The risks will be increasingly unevenly distributed, and are generally greater for disadvantaged people and communities in countries at all levels of development; populations that experience shifts from transient to chronic poverty and related social marginalization and food insecurity; and the elderly, children, the socially marginalized, and outdoor workers, who are disproportionately at risk from heat stress.

- Global aggregated impacts show a moderate economic impact, but these aggregates may mask impacts across sectors and regions (evaluations are incomplete, in part because they do not take into account large-scale singular events affecting several sectors at once or other effects from disrupted interdependencies).
- The risk of large-scale singular events, such as the disintegration of ice sheets in Greenland and Antarctica, would be moderate.

## 2. Key Message: The 2°C limit should be seen as a defence line, while less warming would avoid substantial impacts

**The SED finds** that the 'guardrail' concept, in which up to and including 2°C of warming is considered 'safe', is inadequate and would therefore be better seen as a defence line that needs to be stringently defended, while less warming would be preferable. Significant climate impacts are already occurring at the current level of global warming and additional magnitudes of warming will only increase the risk of severe, pervasive and irreversible impacts. Arguably this conclusion was already recognized in Copenhagen with insistence by many parties that the 2°C warming goal be qualified as limiting warming "below 2°C". The SED findings confirm this policy judgment from 2009 and extend it by referencing the substantially reduced impacts and risks at 1.5°C.

The proposed defence line concept has substantial implications for the assessment of potential emission trajectories. For a defence line that needs to be stringently defended, while "less warming would be preferable", an emission pathway that only has a likely chance (> 66%) of avoiding a 2°C increase, as specified in IPCC AR5 for example, may not provide the sufficient level of security. Consequently pathways



with higher probability (85% or above) would appear far more consistent with the SED's findings. While the SED does not provide information on the specific characteristics of such high-probability emission pathways, scientific results from the IPCC AR5 and the 2014 UNEP Emissions Gap report, and other recent scientific literature, provide guidance on this: Emission pathways that hold warming below 2°C throughout the 21st century with a high probability (above 85%) also limit warming below 1.5°C by 2100 with a 50% or greater probability.

### **3.Key Message: Limiting global warming below 2°C is still feasible and will bring about many co-benefits, but poses substantial technological, economic and institutional challenges**

**While the world** is not on track to achieve a long-term global goal of 2°C, the report confirms that limiting global warming to below 2°C is still feasible and will, while posing substantial technological, economic and institutional challenges, bring about many co-benefits. To hold warming below a 2°C target with a likely probability (>66% chance), the SED cites IPCC AR5 findings that a reduction of global greenhouse-gas emissions of 40–70 per cent by 2050 relative to 2010 levels is required. Cost-effective pathways are characterized in particular by immediate action. The costs are manageable, even without taking into account the co-benefits of mitigation, and various policy options could be deployed to manage the risks of the necessary mitigation action. The technologies required for the 1.5°C scenarios are the same as for the 2°C pathway, but need to be deployed faster, and energy demand needs to be reduced earlier, implying a higher direct mitigation cost than in the 2°C scenarios.

On the comparison of costs and avoided impacts between the 1.5°C and 2°C warming limits, the IPCC drew a distinction between mitigation costs and net benefits, noting that a simple cost-benefit analysis is inadequate to determine whether or not to pursue the 1.5°C warming limit.

Carl-Friedrich Schleussner, Michiel Schaeffer, Bill Hare, Climate Analytics  
<http://climateanalytics.org>

# **A future based on 100% renewable energy for all is achievable by 2050**

**Greenpeace has launched** the new edition of the popular Energy [R]evolution report “How to Achieve 100% Renewable Energy for All by 2050”.

The report delivers the evidence that the transition to 100 per cent renewables will not only create new jobs in the energy industry – nearly 20 million over the next 15 years – but the investment required is more than paid for by savings on future fuel costs.

100 per cent renewable energy means: quality of life, health and education. Renewable energy for all means equal access to electricity, including the one-third who currently have none.

**Key points from** the report “How to Achieve 100% Renewable Energy for All by 2050”:

- 100% renewable energy for all is achievable by 2050, and is the only way to ensure the world does not descend into catastrophic climate change.
- We need to stop burning fossil fuels.
- The renewable energy sector is proving it can transform power generation.
- Heating and transport can also switch to renewables.
- The switch to 100% renewable energy will create jobs.
- The costs are huge, but the savings are even bigger.
- There is growing support for 100% renewables.
- There are no major economic or technical barriers to moving towards 100% renewable energy by

2050. It just requires the political will to make the change.

The Energy [R]evolution scenario is a scientific report, written by Greenpeace's Dr Sven Teske, in collaboration with the scientific community led by the German Aerospace Centre. It demonstrates how to achieve the transition to 100 per cent renewable energy by 2050, phasing out coal, oil, gas and nuclear energy. It shows the impact on jobs, and how such a transition could be funded.

The Energy [R]evolution scenarios have been published regularly since 2005 (this is the fifth report). Their predictions on the potential and market growth of renewable energy have proved more accurate than many of the world's biggest energy agencies, including the IEA and the US Department of Energy.

Previous scenarios mapped the route to 80 per cent renewable energy. This one shows how we could reach 100 per cent renewable energy – a target which a growing number of scientists, engineers and activists believe is realistic and essential.

Source: Press release from Greenpeace

<http://www.greenpeace.org/usa/news/greenpeace-report-finds-100-percent-renewable-energy-possible-by-2050>



© SERGEY NIVENS - SHUTTERSTOCK.COM

# 1.5 Stay Alive

AirClim has co-published a 50-minute documentary and Caribbean music film about climate change in the coastal zones of the Caribbean Region.

**The campaign film** highlights the threat of global warming for coastal zones and especially for the second largest coral reef in the world, the Mesoamerican and Caribbean coral reef system, which stretches from Florida to Trinidad Tobago. The IPCC concluded in its fifth assessment report in 2013/2014 that the world's coral reef ecosystems will be one of the first global ecosystems that will disappear with a global temperature increase of more than 1–2 degrees C. Several research articles published recently in “Science” and “Nature” have confirmed this very large threat.

In the study published in “Science” in July 2015, changes to the ocean, its ecosystems, and to the goods and services they provide, are evaluated under two contrasting CO<sub>2</sub> scenarios: the current high-emissions trajectory and a stringent emissions scenario consistent with the Copenhagen Accord of keeping the mean global temperature increase below 2°C in the 21st century. To do this, the scientists write that they “draw on the consensus science in the latest assessment report of the Intergovernmental Panel on Climate Change and papers published since the assessment.” The scientists conclude that “warming and acidification of surface ocean waters will increase proportionately with cumulative CO<sub>2</sub> emissions. Warm-water corals have already been affected, as have mid-latitude seagrass, high-latitude pteropods and krill, mid-latitude bivalves, and fin fishes. Even under the stringent emissions scenario (RCP2.6), warm-water corals and mid-latitude bivalves will be at high risk by 2100. Under our current rate of emissions, most marine organisms evaluated will have very high risk of impacts by 2100 and many by 2050. These results – derived from experiments, field observations, and modelling – are consistent with evidence from high-CO<sub>2</sub> periods in the paleorecord.”

“These impacts will be cumulative or synergistic with other human impacts, such as overexploitation of living resources, habitat destruction, and pollution. Fin




© ETHAN DANIELS - SHUTTERSTOCK.COM




# CORAL BLEACHING

Have you ever wondered how a coral becomes bleached?


**HEALTHY CORAL**  
1. Healthy coral has a symbiotic relationship with algae that live in its tissue. The algae provide the coral with food and the coral provides the algae with a home.



**STRESSED CORAL**  
2. When the coral is stressed, it begins to expel the algae living in its tissue. The coral turns white or pale.



**BLEACHED CORAL**  
3. If the coral is stressed for a long time, it will die. The coral turns completely white and the structure begins to erode.



**WHAT CAUSES CORAL BLEACHING?**

- Temperature: Corals are sensitive to temperature changes. A rise of just 1°C can cause them to bleach.
- Light: Too much light can cause coral to bleach.
- Nutrients: Too many nutrients can cause coral to bleach.

takes decades for the reef to recover – but recovery is only possible if the reefs are undisturbed. After corals die, reefs degrade and the structures corals build are eroded away, providing less shoreline protection and less habitat for fish and shellfish.

<http://www.noaanews.noaa.gov/stories2015/images/coralbleaching.jpg>

## Use the Air-o-Meter!

In June, the European Environmental Bureau (EEB) launched its new Air-o-Meter on-line tool, which gives citizens an opportunity to compare different sets of National Emission Ceilings (NEC) that are currently being discussed by the EU co-legislators for 2020, 2025, and 2030.

The results displayed in the Air-o-Meter stem from the expected impact of reducing emissions of the five pollutants covered in the revision of the NEC Directive. For each policy scenario, impacts on health, economy and environment can be visualized, either for a specific member state or for the entire EU.

The Air-o-Meter: [www.eeb.org/air-o-meter](http://www.eeb.org/air-o-meter)

## Cutting ammonia emissions from agriculture

Ammonia released by nitrogen fertilisers in Spanish agriculture could be reduced by up to 82 per cent with only a very minimal impact on crop yield, finds new research. This could be achieved by combining optimised management of manure with the use of non-urea synthetic fertilisers.

This study aimed to identify the most effective measures to optimise the use of nitrogen-based fertilisers at regional and country-wide levels to minimise ammonia emissions without reducing crop yields. Incorporating manure into soils had the biggest impact of the individual options, reducing national ammonia emissions by more than 57 per cent.

Of the 11 scenarios investigated, four led to a significant reduction in emissions while maintaining, or even increasing, crop yields compared with the baseline. Five of the scenarios led to reduced crop yields. The study demonstrates that significant reductions in ammonia emissions could be achieved without sacrificing crop yields, thus helping to achieve the dual goals of food security and environmental protection.

Source: Science for Environmental Policy #414, 21 May 2015

The study: "Yield-scaled mitigation of ammonia emission from N fertilization: the Spanish case." Environmental Research Letters 9(12):125005. DOI:10.1088/1748-9326/9/12/125005.

fisheries at low latitudes, which are a key source of protein and income for millions of people, will be at high risk."

"Impacts on key marine and coastal organisms, ecosystems, and services are already detectable, and several will face high risk of impacts well before 2100, even under the low-emissions scenario. These impacts will occur across all latitudes, making this a global concern beyond the north/south divide," the scientists conclude.

**Also in July** 2015 the US National Oceanic and Atmospheric Administration NOAA reported "unusually warm ocean temperatures cover the north Pacific, equatorial Pacific, and western Atlantic oceans. NOAA scientists expect greater bleaching of corals on Northern Hemisphere reefs potentially leading to the death of corals over a wide area and affecting the long-term supply of fish and shellfish."

Earlier this year, NOAA reported on "coral bleaching in the South Pacific, including the Solomon Islands, Papua New Guinea, Nauru, Fiji, American

Samoa as well as in the Indian Ocean, including the British Indian Ocean Territory and the Maldives."

In an article in "Nature" in 2012, scientists argued that "limiting global warming to 2°C is unlikely to save most coral reefs. Mass coral bleaching events have become a widespread phenomenon causing serious concerns with regard to the survival of corals. Triggered by high ocean temperatures, bleaching events are projected to increase in frequency and intensity. Preserving >10% of coral reefs worldwide would require limiting warming to below 1.5°C (atmosphere-ocean general circulation models (AOGCMs) range: 1.3–1.8°C) relative to pre-industrial levels."

Reinhold Pape

Link to film "1.5 Stay Alive" co-produced by AirClim. Caribbean music and climate change in the coastal zones of the Caribbean Region.

<https://www.youtube.com/watch?v=ckMVASFRxUK>



© DMYTRO PYLYPENKO - SHUTTERSTOCK.COM

# Exposing the role of coal in Europe – launch of European Coal Map

There is now a comprehensive overview of existing and planned coal power plants that also displays key information on pollution and health impact, presented by the Climate Action Network (CAN).

**Despite its claim** of being a leader in the fight against climate change, the European Union still has around 280 coal power plants, operating in 22 different EU member states. The majority of these plants are more than 30 years old, meaning they are inefficient, polluting and outdated. Burning coal caused 17 per cent of greenhouse gas emissions in the European Union in 2014. Still, European countries continue to invest tens of billions in the ailing industry.

Climate Action Network (CAN) Europe exposes these shocking and disturbing facts on the coal business in the online Coal Map of Europe ([www.coalmap.eu](http://www.coalmap.eu)). Based on extensive research into Europe's non-transparent coal fleet and using a range of public data sources, CAN Europe has calculated key figures on the coal industry. The NGO has visualised the most crucial aspects of the story of coal power in eight different maps.

For the first time there is now a full and comprehensive overview of the fleet of existing and planned coal power plants that also displays key information on pollution and health impacts from burning coal. The Coal Map also highlights how governments are still heavily involved in this industry through state-owned companies, as well as by providing enormous subsidies.

## European Coal Map

The interactive Coal Map of Europe gives an overview of the role of coal in our electricity society.

**The Coal Map** introduces fifteen reports of local and national fights against coal power plants and mines. From Scotland to Turkey, citizens and NGOs are tied in lengthy legal battles to get rid of coal. And not without success: in recent years, the majority of new coal project proposals have been cancelled.

The local fight is quickly turning into a pan-European story against coal. In Italy an operating power plant was shut down on court orders in March 2014, on the basis of manslaughter. Legal experts in the Czech Republic managed to link the fate of the islands of Micronesia to upgrading a power plant in the country. In Germany, the

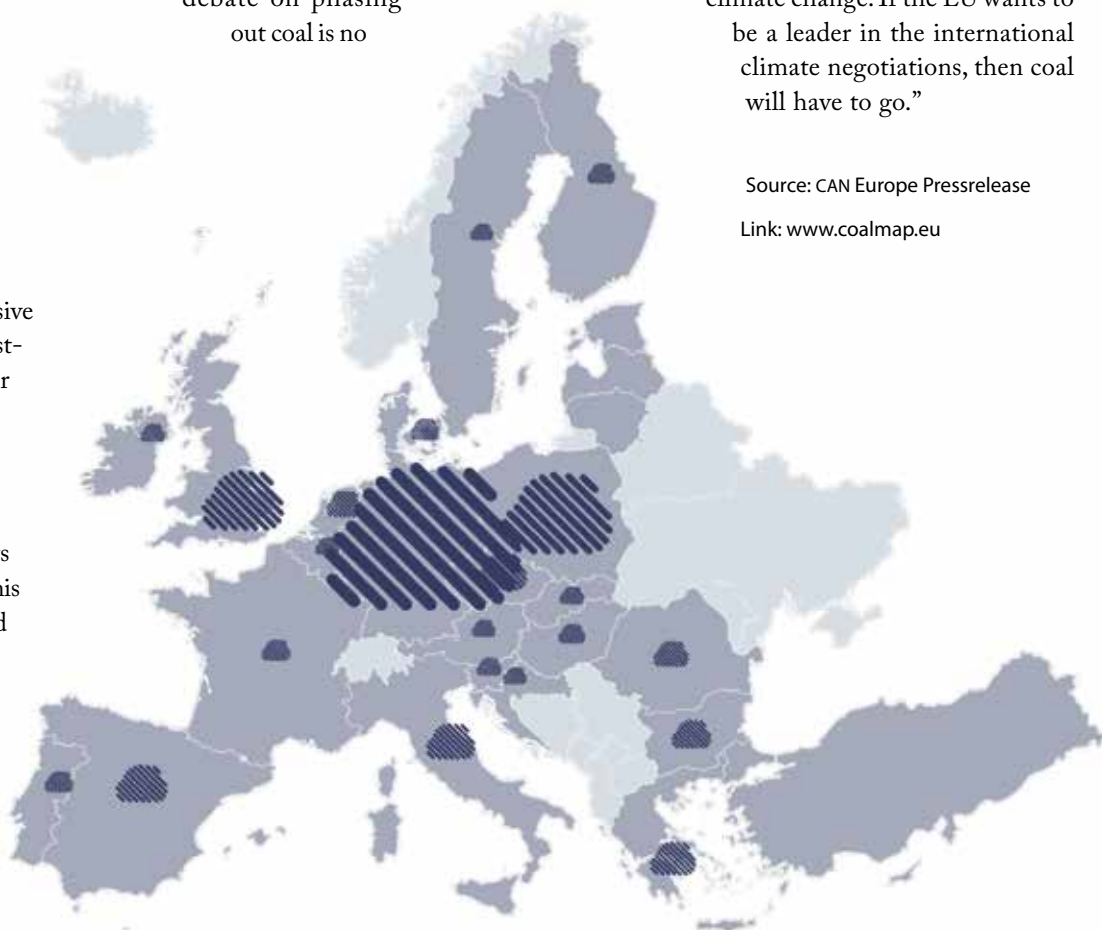
debate on phasing out coal is no

longer about if, but about when and how. Norway's parliament decided that the Norwegian Sovereign Wealth fund is to divest from several coal businesses across the world, after months of international protests.

"European countries are still addicted to coal for the production of electricity, but opportunities for phasing out coal altogether have never been better," says Kathrin Gutmann, Coal Policy Coordinator at CAN Europe. "Renewables are booming and energy demand is going down, so utilities are already losing billions of euros a year on their coal assets. Therefore we need more governments to act now and get rid of coal. Coal really is the low-hanging fruit in the fight against climate change. If the EU wants to be a leader in the international climate negotiations, then coal will have to go."

Source: CAN Europe Pressrelease

Link: [www.coalmap.eu](http://www.coalmap.eu)





# Deal on pollution from medium combustion plants

While EU-wide application of readily available emission abatement techniques would reduce NO<sub>x</sub> emissions from these plants by more than 80 per cent by 2025, the new directive will deliver less than half of this reduction.

In late June, the European Parliament and the Council agreed a compromise deal on new EU legislation to control air pollutant emissions from combustion installations with a thermal input between 1 and 50 megawatts (MW).

The new directive will cover more than 140,000 medium-sized combustion plants (MCPs) now in operation in the EU, which in 2010 together emitted some 554 thousand tons (kt) of nitrogen oxides (NO<sub>x</sub>), 301 kt of sulphur dioxide (SO<sub>2</sub>) and 53 kt of particulate matter (PM).

Binding emission limit values (ELVs) are set for NO<sub>x</sub>, SO<sub>2</sub> and dust, and are differentiated according to plant capacity, age and type of installation, with the strictest standards for new plants. The limits will apply to all new plants, and will take effect three years from the date of publication, which is likely to be before the end of this year.

The agreed emission standards for new plants are largely in line with those in the Commission's proposal dated December 2013, which were strongly criticised by environmental organisations for their failure to reflect what could be achieved by state-of-the-art emission control technology. In fact they are even less strict than ELVs that have been in place in some member states for several years, especially regarding NO<sub>x</sub> control.

**Regarding existing plants,** the agreed emission standards are in some cases significantly weaker than those proposed by the Commission, especially those for the smaller (1–5 MW) plants.

Despite a widespread agreement on the urgent need to cut emissions in order

to improve air quality in the EU, existing installations are given very generous transition periods, up to 2025 for the larger (5–50 MW) plants and up to 2030 for the smaller ones.

On top of these long transition periods, the agreement introduces a large number of derogations, including the possibility for member states to further extend compliance deadlines up to 2030 for district heating plants above 5MW and facilities that burn biomass as their main fuel. Moreover, member states can exempt plants that do not operate for more than 500 hours per year (as three- or five-year rolling averages) from compliance with the emission limit values.

While the Commission had proposed that countries should apply more stringent emission limit values (called benchmark values, said to reflect the best available techniques) to MCPs in zones that do not comply with the EU's air quality standards, the final text stipulates only that member states "shall assess the need to apply" stricter limits for plants in such zones.

**In order to** further reduce the cost of implementing the directive, operators will not necessarily require permits, as is the case for large combustion plants. Instead it is up to the member states to decide if permits will be required or if operators will need only to notify the competent authorities, which in turn will ensure registration. For existing plants, the deadlines for registration/permit application are set at 1 January

2024 and 2029, for larger and smaller plants respectively.

The monitoring and reporting obligations have also been set at a minimal level, only requiring periodic measurements once every three years for the smaller (up to 20 MW) plants and annually for the bigger plants. Member states will need to report to the Commission on the implementation one year and nine months after the compliance dates for existing plants, i.e. in 2026 and 2031.

A review clause has been included, stating that by 1 January 2020 the Commission shall assess the benefits of setting minimum energy efficiency standards in line with best available techniques. In addition, by 1 January 2023, the Commission shall assess the need to amend the emission limit values set out in Annex II for new plants, on the basis of state-of-the-art technologies, and consider the opportunity to set specific emission limit values for carbon monoxide (CO).

The legislation does not prevent member states from keeping or introducing tougher domestic standards than those required by the directive.

The agreed new directive text will be submitted to the European Parliament for a vote at first reading and then to the Council for final adoption.

Christer Ågren

Sources: Council press release 30 June 2015 and European Parliament Environment Committee press release 23 June 2015.

Note: Medium combustion plants are used, among other things, for electricity generation, residential heating and cooling, and providing heat or steam to industry. While they are a major source of air pollution they have until now not been regulated at EU level. Emissions from large combustions plants (>50 MW) are covered by the industrial emissions directive (IED), and emissions from new small (domestic) combustion installations (<1MW) by the Ecodesign Directive.





# Weak EU coal pollution standards carry high costs

Draft new EU emission limits for coal-fired power stations are so weak that they could result in health damage, including the loss of over 23 million working days, which would cost over €52 billion between 2020 and 2029.

**A new study** by environmental economist Mike Holland, commissioned by environmental groups European Environmental

Bureau (EEB) and Greenpeace, shows that the EU's draft new power plant pollution regulation could lead to 71,000 avoidable

deaths in the decade after 2020 because the currently proposed standards do not require application of the readily avail-



**Table:** Cumulative health impacts from 2020 to 2029 – difference between proposed EU standards and BAT standards.

| Health impact                              | Unit       | Difference |
|--|------------|------------|
| Mortality (30+ yr)                         | Deaths     | 71,200     |
| Acute bronchitis (children 6–12 yr)        | Cases      | 204,500    |
| Chronic bronchitis (27+ yr)                | Cases      | 60,600     |
| Respiratory hospital admissions (all ages) | Admissions | 29,000     |
| Cardiac hospital admissions (18+ yr)       | Admissions | 28,800     |
| Asthma symptom days (children 5–19 yr)     | Days       | 2,160,200  |
| Restricted activity days (all ages)        | Days       | 83,484,800 |
| Lost working days (15–64 yr)               | Days       | 23,222,700 |
| IQ loss from mercury                       | IQ points  | 29,600     |
| Overall costs                              | billion €  | 52.45      |

able, most effective emission abatement techniques.

Coal-fired power plants are the largest source of sulphur dioxide (SO<sub>2</sub>) and mercury emissions in Europe and one of the largest industrial sources of emissions of nitrogen oxides (NO<sub>x</sub>), arsenic, lead and cadmium. Emissions of SO<sub>2</sub>, NO<sub>x</sub>, and dust particles from coal plant smokestacks are key contributors to increased concentrations of particulate matter (PM<sub>2.5</sub>), a pollutant that has been found to increase the risk of stroke, heart disease and lung cancer.

The EU is currently in the process of updating its emission standards for large combustion plants, including lignite- and coal-fired power plants. The standards are published in “best available techniques reference documents” (BREF) (see Box) and are – as indicated by the name – meant to be based on the best available techniques (BAT), but the current EU proposal is far weaker than standards at existing coal plants in China, Japan and the United States (see AN 2/15, p. 16–17).

**The new EU** standards would apply from 2020–2029 and set emission limit values for toxic air emissions, including sulphur dioxide, nitrogen oxides, mercury, and dust particles – pollutants that all have significant documented effects on health and the environment.

“EU decision-makers should not bring ‘state-of-the-art’ environmental standards down to the levels of industry laggards or base them on least-cost options,” said Christian Schaible, EEB policy manager on industrial pollution.

Official EU data has been used in the study to model the health impacts of the proposed new EU emission standards, comparing them to the impacts of standards based on BAT. The numbers for deaths, illnesses and costs express the difference between application of the two standards.

It is estimated that the health damage from the excess pollution that could result from the weak standards would cost over €52 billion over 2020–2029 (see table). It should be noted that this figure is based on the most conservative estimate of the health benefits, and that it would increase by roughly a factor three if the upper bound for economic impacts were used instead.

**Greenpeace EU energy** policy adviser Tara Connolly said: “The human, environmental and economic cost of a sell-out to the coal industry is huge. Children will pay the heaviest price, with hundreds of thousands of avoidable cases of asthma, lung cancer and heart conditions. There is no justification for politicians who refuse to apply existing technology that can bring down deadly coal pollution. Coal causes irreparable damage and it’s high time for the EU to set a pathway to start phasing it out.”

Christer Ågren

The report: “Health and economic implications of alternative emission limits for coal-fired power plants in the EU” (May 2015).

Link: <http://www.greenpeace.org/eu-unit/en/News/2015/Weak-EU-coal-pollution-standards-could-cause-71000-avoidable-deaths-report/>



© MOMENTE - SHUTTERSTOCK.COM

## BREF for large combustion plants

The decision-making process under the EU’s Industrial Emissions Directive defines best available techniques (BAT) in BREF documents which are to be used by member states to set binding emission limit values for toxic emissions, such as sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), mercury and particulate matter (PM<sub>2.5</sub>).

The draft conclusions were discussed at a meeting in Seville in June with participants from member states and stakeholders, and EU member states are expected to vote on the proposal by the end of this year, followed by formal adoption in early 2016. The new definitions of best available techniques and related emission limits must be included in updated environmental permits within four years of adoption.

As updated versions of BREF documents should be published no later than eight years after the previous version, and the latest one was published in 2006, this BREF is already two years behind schedule.

# 140 000 life-years lost each year in London because of air pollution

Inclusion of the impact of nitrogen dioxide for the first time suggests that more than twice as many people as previously thought die prematurely from air pollution in London.

**According to** a new study by King's College London, nearly 9,500 people die early each year in London due to long-term exposure to the air pollutants particulate matter (PM<sub>2.5</sub>) and nitrogen dioxide (NO<sub>2</sub>). The figures, which cover the year 2010 – the most recent year for which quantified figures are available – are higher than previous estimates because they combine the effects of both pollutants.

Commissioned by the Greater London Authority and Transport for London, the study is believed to be one of the first to attempt to quantify how many city dwellers are being harmed by NO<sub>2</sub> – an air pollutant that emanates largely from diesel-driven cars, lorries and buses.

It is estimated that in 2010 there were 5,900 premature deaths in London associated with exposure to NO<sub>2</sub>, and 3,500 deaths associated with PM<sub>2.5</sub>.

A previous study that was based on 2006 levels of air pollution in London attributed 4,300 annual premature deaths to PM<sub>2.5</sub>. Since that year, the levels of PM<sub>2.5</sub> have slightly fallen, and there has also been a change in methodology that excludes natural sources of PM<sub>2.5</sub>, together resulting in the figure falling to 3,537 premature deaths for the year 2010 in the new study.

**This reduction in** deaths due to PM<sub>2.5</sub> is however more than cancelled out by the addition of an estimated 5,879 deaths from NO<sub>2</sub> each year.

Most of the health damage linked to NO<sub>2</sub> was caused by emissions from diesel vehicles and other sources within London, while a larger proportion of deaths caused by PM<sub>2.5</sub> arose from particles that originated from emission sources outside the city rather than within it.

According to the Guardian, the Committee on the Medical Effects of Air Pollutants (COMEAP), which advises the government on this issue, is expected to conclude later this year that across

Britain up to 60,000 early deaths can be attributed annually to the two pollutants, because NO<sub>2</sub> will be factored in for the first time. The figure would represent a more than doubling of the current 29,000 deaths from PM<sub>2.5</sub>, and would put air pollution much closer to smoking, which kills around 100,000 people a year.

Airqualitynews.com reported that in addition to unveiling the new estimated mortality figures for NO<sub>2</sub> and PM<sub>2.5</sub>, the Mayor of London has also published an update to his Air Quality Strategy detailing progress on more recent policy measures aimed at cutting air pollution in the capital.

**Measures added to** the strategy include £65 million towards helping taxi drivers reduce emissions and supporting the roll-out of 9,000 zero-emission-capable taxis by 2020, as well as the planned ultra-low emission zone (ULEZ).

The Mayor, Boris Johnson, said these measures taken together would ensure that 80 per cent of central London meets EU legal limits for nitrogen dioxide by 2020.

But campaigners said the evidence showed the need for more action. Alan Andrews, lawyer at ClientEarth, said: "As shocking as they are, these deaths are really only the tip of the iceberg. For every person who dies early from air pollution, many more are made seriously ill, have to visit hospital or take time off work."

"Following our supreme court victory earlier this year, the government must produce plans to bring deadly nitrogen dioxide pollution within legal levels as soon as possible. Current plans won't achieve legal limits in London until after 2030 – condemning thousands more Londoners to an early death for every year of delay."

Jenny Bates, air pollution campaigner at Friends of the Earth, said: "People have no choice with the air they breathe. This means we have to redouble our efforts,



© PRUDKOV - SHUTTERSTOCK.COM

stop tinkering around the edges, and take really bold immediate action with a mix of cleaner vehicles and cutting traffic levels, massive investment in safe cycling and walking, and London-wide road charging."

**Clean Air in** London campaigner Simon Birkett called for a ban on diesel vehicles in the capital. He said: "There can no longer be any doubt – air pollution affects all of us and the vulnerable most. We must ensure that today's news means the death of diesel in the capital, not the deaths of Londoners. Let's ban diesel from the most polluted places by 2018 as we banned coal burning so successfully almost exactly 60 years ago."

Christer Ågren

The report "Understanding the Health Impacts of Air Pollution in London." By H. Walton, D. Dajnak, S. Beevers, M. Williams. King's College, London.

Link: <http://www.london.gov.uk/priorities/environment/publications/understanding-health-impacts-of-air-pollution-in-london>

Sources: The Guardian and Airqualitynews.com, 15 July 2015



# Lower speed – less emissions?

**Ships in the Mediterranean Sea have reduced their speed by more than 30 per cent since 2008, which has led to a 45 per cent cut in average ship NOx emission factors.**

**Lowering the speed** of ships – also known as slow steaming – became more widespread from 2008 because shipping companies needed to cut costs by saving on fuel, as fuel prices had doubled over just a few years, and to reduce overcapacity, as transport demand fell due to the global economic recession. In practice, slow steaming means reducing the speed of a vessel from about 20–25 knots to 16–19 knots. As a result, fuel use and accompanied fuel costs for ship voyages are cut significantly. In addition, emissions of air pollutants, such as sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>), and of the greenhouse gas carbon dioxide (CO<sub>2</sub>) decrease sharply with reduced ship speed.

Using satellite measurements, a group of researchers have analysed changes in European ship NO<sub>x</sub> emissions between 2005 and 2012, looking at four European shipping lanes in the Mediterranean, Bay of Biscay, North Sea, and Baltic Sea.

Their results show that European ship NO<sub>x</sub> emissions increased by about 15 per cent from 2005 to 2008. This increase

was followed by a reduction of some 12 per cent in 2009 – a result of the global economic downturn in 2008–2009, after which emissions remained relatively stable from 2009 to 2012.

The impact of slow steaming was estimated for shipping in the Mediterranean Sea. Observations of ship passages through the Suez Canal and satellite-derived ship densities suggest that ships in the Mediterranean have reduced their speed by more than 30 per cent since 2008. Ship average NO<sub>x</sub> emissions increased from 2005 to 2008, then decreased by 46 per cent from 2008 to 2009, to stay relatively constant, at 30 per cent below the 2005 levels, in the years from 2009 onwards.

The lower ship NO<sub>x</sub> emission factors from 2009 coincide with the implementation of slow steaming in 2008–2009. The fact that average emission factors per ship have remained low since 2009 indicates that slow steaming has remained a common practice in the Mediterranean Sea.

According to the study, the implementation of slow steaming in 2009

contributed to offsetting the 2005–2007 increase in ship NO<sub>x</sub> emissions, but the relative contribution of the shipping sector to total European NO<sub>x</sub> emissions still increased from 11 per cent in 2005 to 14 per cent in 2012.

So in spite of the implementation of slow steaming, the emission estimates suggest that one in seven of all NO<sub>x</sub> molecules emitted in Europe in 2012 originated from the shipping sector, up from one in nine in 2005.

The study concludes that the growing share of the shipping contribution to overall European NO<sub>x</sub> emissions suggests a need for the shipping sector to implement additional emission abatement measures.

Christer Ågren

Study: "Ships going slow in reducing their NO<sub>x</sub> emissions: changes in 2005–2012 ship exhaust inferred from satellite measurements over Europe" (July 2015). By K F Boersma, G C MVinken and J Tournadre. Published in Environmental Research Letters 10 (2015) 074007. Link: <http://iopscience.iop.org/1748-9326/10/7/074007>

One in seven of all NO<sub>x</sub> molecules emitted in Europe in 2012 originated from the shipping sector.



© ALEKKOL PHOTOGRAPHY - SHUTTERSTOCK.COM

# Emissions keep on slowly shrinking

Air pollutant emissions from land-based sources are continuing to fall slightly, but considerably slower than before. Some of the reductions on land are also countered by rising emissions from international shipping.

|                              | Sulphur dioxide (SO2) |              |              |             | Nitrogen oxides (NOx) |              |              |              |  |
|------------------------------|-----------------------|--------------|--------------|-------------|-----------------------|--------------|--------------|--------------|--|
|                              | 1980                  | 1990         | 2000         | 2013        | 1980                  | 1990         | 2000         | 2013         |  |
| Austria                      | 360                   | 74           | 32           | 17          | 246                   | 195          | 210          | 162          |  |
| Belgium                      | 828                   | 362          | 174          | 46          | 442                   | 401          | 347          | 208          |  |
| Bulgaria                     | 2050                  | 1100         | 861          | 194         | 416                   | 249          | 145          | 123          |  |
| Croatia                      | 150                   | 174          | 59           | 16          | 60                    | 95           | 84           | 56           |  |
| Cyprus                       | 28                    | 31           | 50           | 14          | 13                    | 17           | 22           | 16           |  |
| Czech Republic               | 2257                  | 1876         | 301          | 138         | 937                   | 742          | 283          | 181          |  |
| Denmark                      | 452                   | 176          | 32           | 14          | 307                   | 275          | 224          | 124          |  |
| Estonia                      | 287                   | 274          | 97           | 36          | 70                    | 74           | 37           | 30           |  |
| Finland                      | 584                   | 263          | 79           | 47          | 295                   | 323          | 201          | 145          |  |
| France                       | 3214                  | 1354         | 628          | 219         | 2024                  | 1865         | 1610         | 990          |  |
| Germany                      | 7514                  | 5292         | 645          | 416         | 3334                  | 2882         | 1925         | 1269         |  |
| Greece                       | 400                   | 473          | 591          | 174         | 306                   | 329          | 450          | 254          |  |
| Hungary                      | 1633                  | 1010         | 428          | 29          | 273                   | 238          | 206          | 121          |  |
| Ireland                      | 222                   | 182          | 142          | 25          | 73                    | 121          | 137          | 79           |  |
| Italy                        | 3440                  | 1794         | 754          | 145         | 1585                  | 2014         | 1456         | 821          |  |
| Latvia                       | 96                    | 105          | 15           | 2           | 83                    | 65           | 44           | 34           |  |
| Lithuania                    | 311                   | 222          | 37           | 19          | 152                   | 158          | 51           | 46           |  |
| Luxembourg                   | 24                    | 15           | 3            | 2           | 23                    | 39           | 42           | 31           |  |
| Malta                        | 26                    | 29           | 23           | 5           | 9                     | 14           | 9            | 8            |  |
| Netherlands                  | 490                   | 192          | 73           | 30          | 583                   | 566          | 395          | 240          |  |
| Poland                       | 4100                  | 3210         | 1451         | 847         | 1229                  | 1280         | 844          | 798          |  |
| Portugal                     | 253                   | 295          | 250          | 42          | 158                   | 234          | 262          | 161          |  |
| Romania                      | 1055                  | 1311         | 818          | 259         | 523                   | 546          | 291          | 210          |  |
| Slovakia                     | 780                   | 542          | 127          | 53          | 197                   | 215          | 107          | 80           |  |
| Slovenia                     | 234                   | 198          | 93           | 11          | 51                    | 60           | 52           | 43           |  |
| Spain                        | 2913                  | 2097         | 1464         | 272         | 1068                  | 1224         | 1300         | 743          |  |
| Sweden                       | 491                   | 105          | 42           | 27          | 404                   | 269          | 207          | 126          |  |
| United Kingdom               | 4852                  | 3707         | 1217         | 393         | 2580                  | 2885         | 1798         | 1020         |  |
| <b>Total EU28</b>            | <b>39044</b>          | <b>26463</b> | <b>10486</b> | <b>3492</b> | <b>17441</b>          | <b>17375</b> | <b>12739</b> | <b>8119</b>  |  |
| Albania                      | 72                    | 78           | 10           | 13          | 24                    | 22           | 15           | 18           |  |
| Belarus                      | 740                   | 888          | 170          | 89          | 234                   | 379          | 194          | 161          |  |
| Bosnia & Herzegovina         | 482                   | 484          | 192          | 217         | 79                    | 73           | 35           | 32           |  |
| Iceland                      | 18                    | 21           | 35           | 86          | 21                    | 27           | 27           | 20           |  |
| Macedonia                    | 107                   | 110          | 106          | 105         | 39                    | 46           | 32           | 34           |  |
| Moldova                      | 308                   | 175          | 8            | 4           | 115                   | 131          | 23           | 18           |  |
| Montenegro                   | 0                     | 0            | 14           | 40          | 0                     | 0            | 9            | 14           |  |
| Norway                       | 136                   | 52           | 27           | 17          | 191                   | 190          | 202          | 154          |  |
| Russia                       | 7323                  | 4330         | 1807         | 1519        | 3634                  | 4641         | 2777         | 2215         |  |
| Serbia                       | 406                   | 593          | 474          | 429         | 192                   | 165          | 144          | 137          |  |
| Switzerland                  | 116                   | 41           | 15           | 10          | 170                   | 145          | 108          | 72           |  |
| Ukraine                      | 3849                  | 3921         | 1390         | 1151        | 1145                  | 1753         | 888          | 673          |  |
| <b>Total Non-EU</b>          | <b>13557</b>          | <b>10693</b> | <b>4248</b>  | <b>3680</b> | <b>5844</b>           | <b>7572</b>  | <b>4454</b>  | <b>3548</b>  |  |
| <b>Total Europe</b>          | <b>52601</b>          | <b>37156</b> | <b>14734</b> | <b>7172</b> | <b>23285</b>          | <b>24947</b> | <b>17193</b> | <b>11667</b> |  |
| Int. ship: Baltic Sea        | 139                   | 168          | 170          | 54          | 215                   | 236          | 285          | 267          |  |
| Int. ship: Black Sea         | 35                    | 45           | 50           | 52          | 52                    | 62           | 83           | 75           |  |
| Int. ship: Mediterran.       | 725                   | 858          | 931          | 956         | 1000                  | 1234         | 1578         | 1410         |  |
| Int. ship: North Sea         | 277                   | 361          | 406          | 81          | 395                   | 508          | 677          | 608          |  |
| Int. ship: N.E. Atlantic     | 550                   | 384          | 433          | 442         | 772                   | 565          | 733          | 655          |  |
| <b>Total internat. ship.</b> | <b>1726</b>           | <b>1816</b>  | <b>1990</b>  | <b>1585</b> | <b>2434</b>           | <b>2605</b>  | <b>3356</b>  | <b>3015</b>  |  |
| <b>Total Europe + ships</b>  | <b>54327</b>          | <b>38972</b> | <b>16724</b> | <b>8757</b> | <b>25719</b>          | <b>27552</b> | <b>20549</b> | <b>14682</b> |  |
| Turkey                       | 1030                  | 1519         | 2335         | 1939        | 364                   | 691          | 840          | 1047         |  |



**Since 1980, total** European emissions of sulphur dioxide (SO<sub>2</sub>) – the most significant acidifying pollutant and an important precursor to health-damaging secondary fine particles (PM<sub>2.5</sub>) – from land-based emission sources have fallen by 86 per cent, from around 53 million tonnes in 1980 to 7.2 million tonnes in 2013.

Emissions of nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (VOCs), and ammonia have also gone down, although to a lesser extent. VOCs

have more than halved (-58 per cent) since 1980, while NO<sub>x</sub> and ammonia emissions have dropped by 46 and 34 per cent, respectively.

Historic emissions of primary particulate matter (PM<sub>2.5</sub>) are not as well documented as those of other air pollutants, and many countries lack emissions data for the 1990s. Between 2000 and 2013 it is estimated that emissions of PM<sub>2.5</sub> from land-based sources have fallen only by 13 per cent, from 3 to 2.6 million tonnes.

Although overall emissions continue to fall, the downward trend has flattened out over the last five-ten years, especially in the case of ammonia and primary particles.

Looking specifically at the 28 member states of the European Union, between 1980 and 2013 the emissions of SO<sub>2</sub> came down by as much as 91 per cent, while those of NO<sub>x</sub> and VOCs fell respectively by 53 and 60 per cent. Emissions of ammonia – which emanate primarily from agricultural activities – fell by only 27

**Table 1:** European emissions of sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (as NO<sub>2</sub>), non-methane volatile organic compounds (NM-VOC), ammonia (NH<sub>3</sub>), and particulate matter (PM<sub>2.5</sub>) (kilotonnes). Data for 2000 and 2013 is from the 2015 EMEP report, while data for 1980 and 1990 is from earlier EMEP reports. Russia in the table refers only to the western part of the Russian Federation. (separat bilaga)

| Non-Methane Volatile Organic Compounds (NM-VOCs) |              |              |              | Ammonia (NH <sub>3</sub> ) |             |             |             | Particulate Matter (PM <sub>2.5</sub> ) |             |
|--|--------------|--------------|--------------|----------------------------|-------------|-------------|-------------|---|-------------|
| 1980   | 1990         | 2000         | 2013         | 1980                       | 1990        | 2000        | 2013        | 2000                                    | 2013        |
| 437  | 276          | 164          | 126          | 52                         | 65          | 67          | 66          | 24                                      | 18          |
| 274  | 315          | 227          | 137          | 89                         | 120         | 83          | 62          | 41                                      | 33          |
| 309  | 620          | 99           | 89           | 144                        | 133         | 41          | 30          | 23                                      | 29          |
| 105  | 113          | 76           | 46           | 37                         | 51          | 41          | 34          | 15                                      | 15          |
| 14   | 17           | 13           | 7            | 8                          | 5           | 6           | 5           | 4                                       | 1           |
| 275  | 374          | 261          | 136          | 156                        | 157         | 92          | 69          | 41                                      | 26          |
| 194  | 166          | 174          | 114          | 138                        | 114         | 98          | 74          | 24                                      | 21          |
| 81   | 70           | 45           | 33           | 24                         | 25          | 10          | 11          | 22                                      | 20          |
| 210  | 239          | 166          | 95           | 39                         | 38          | 38          | 37          | 41                                      | 35          |
| 2734   | 2589         | 1681         | 758          | 795                        | 704         | 748         | 718         | 311                                     | 181         |
| 3224   | 3128         | 1600         | 1138         | 835                        | 692         | 696         | 671         | 158                                     | 113         |
| 255  | 268          | 312          | 180          | 79                         | 85          | 57          | 52          | 66                                      | 40          |
| 215  | 205          | 176          | 120          | 157                        | 124         | 94          | 81          | 37                                      | 30          |
| 111  | 93           | 112          | 90           | 112                        | 107         | 115         | 108         | 21                                      | 16          |
| 2032   | 2015         | 1524         | 906          | 441                        | 468         | 453         | 402         | 163                                     | 168         |
| 152  | 102          | 102          | 87           | 38                         | 48          | 14          | 15          | 25                                      | 24          |
| 100  | 108          | 72           | 63           | 85                         | 84          | 39          | 40          | 19                                      | 21          |
| 15   | 19           | 14           | 8            | 7                          | 5           | 5           | 5           | 3                                       | 2           |
| 2  | 8            | 5            | 3            | 5                          | 1           | 2           | 2           | 1                                       | 1           |
| 579  | 477          | 239          | 150          | 234                        | 355         | 182         | 134         | 25                                      | 13          |
| 1036   | 831          | 575          | 636          | 550                        | 508         | 284         | 263         | 157                                     | 145         |
| 189  | 295          | 248          | 170          | 96                         | 63          | 65          | 49          | 61                                      | 44          |
| 829  | 616          | 393          | 296          | 340                        | 300         | 183         | 169         | 159                                     | 116         |
| 252  | 122          | 67           | 63           | 63                         | 66          | 32          | 25          | 23                                      | 29          |
| 39   | 55           | 53           | 33           | 24                         | 20          | 21          | 17          | 12                                      | 12          |
| 1392   | 1006         | 960          | 534          | 285                        | 316         | 397         | 377         | 95                                      | 65          |
| 528  | 359          | 224          | 174          | 54                         | 55          | 59          | 52          | 25                                      | 22          |
| 2100   | 2762         | 1567         | 803          | 361                        | 360         | 322         | 271         | 121                                     | 82          |
| <b>17683</b>                                     | <b>17248</b> | <b>11149</b> | <b>6995</b>  | <b>5248</b>                | <b>5069</b> | <b>4244</b> | <b>3839</b> | <b>1717</b>                             | <b>1322</b> |
| 31   | 43           | 29           | 31           | 32                         | 28          | 18          | 20          | 8                                       | 9           |
| 549  | 497          | 228          | 184          | 142                        | 215         | 115         | 154         | 58                                      | 51          |
| 51   | 48           | 52           | 36           | 31                         | 21          | 17          | 20          | 16                                      | 15          |
| 8  | 12           | 8            | 4            | 3                          | 3           | 3           | 3           | 1                                       | 2           |
| 19   | 21           | 29           | 18           | 17                         | 15          | 10          | 8           | 14                                      | 11          |
| 105  | 123          | 25           | 27           | 53                         | 61          | 17          | 15          | 11                                      | 10          |
| 0  | 0            | 10           | 8            | 0                          | 0           | 6           | 3           | 4                                       | 5           |
| 173  | 289          | 379          | 134          | 20                         | 20          | 26          | 27          | 42                                      | 30          |
| 3410   | 3772         | 2692         | 2060         | 1189                       | 1191        | 551         | 538         | 723                                     | 787         |
| 142  | 158          | 145          | 124          | 90                         | 74          | 82          | 104         | 39                                      | 36          |
| 323  | 289          | 143          | 84           | 77                         | 73          | 66          | 62          | 11                                      | 8           |
| 1626   | 1053         | 574          | 436          | 729                        | 682         | 302         | 266         | 388                                     | 359         |
| <b>6437</b>                                      | <b>6305</b>  | <b>4314</b>  | <b>3146</b>  | <b>2383</b>                | <b>2383</b> | <b>1213</b> | <b>1220</b> | <b>1315</b>                             | <b>1323</b> |
| <b>24120</b>                                     | <b>23553</b> | <b>15463</b> | <b>10141</b> | <b>7631</b>                | <b>7452</b> | <b>5457</b> | <b>5059</b> | <b>3032</b>                             | <b>2645</b> |
| 5  | 8            | 9            | 7            |                            |             |             |             | 19                                      | 10          |
| 1  | 2            | 3            | 2            |                            |             |             |             | 6                                       | 6           |
| 21   | 41           | 47           | 42           |                            |             |             |             | 104                                     | 106         |
| 9  | 18           | 20           | 15           |                            |             |             |             | 45                                      | 21          |
| 15   | 19           | 22           | 20           |                            |             |             |             | 48                                      | 49          |
| <b>51</b>  | <b>88</b>    | <b>101</b>   | <b>86</b>    |                            |             |             |             | <b>222</b>                              | <b>192</b>  |
| <b>24171</b>                                     | <b>23641</b> | <b>15564</b> | <b>10227</b> | <b>7631</b>                | <b>7452</b> | <b>5457</b> | <b>5059</b> | <b>3254</b>                             | <b>2837</b> |
| 359  | 636          | 955          | 868          | 321                        | 373         | 482         | 1090        | 471                                     | 508         |



per cent. Primary PM<sub>2.5</sub> particles were reduced by 23 per cent between 2000 and 2013.

Emissions of SO<sub>2</sub> from international shipping in European waters showed a steady increase up to around 2006, after which emissions have fallen, primarily as a result of sulphur regulation. The emission reductions were particularly marked in the northern Sulphur Emission Control Areas (SECA), which cover the Baltic Sea and the North Sea, including the English Channel. Between 1980 and 2013, overall ship SO<sub>2</sub> emissions came down by about 10 per cent.

**Ship NOx emissions** appear to have stabilised, and even come down somewhat, during the economic crisis (2008–2009), but because of a lack of effective ship NOx regulation, they are likely to start increasing again as the economy and trade grow. Compared to 1980, ship NOx emissions have increased by nearly a quarter.

The data in Table 1 is based on figures reported by countries themselves to the Convention on Long-range Transboundary Air Pollution, and was compiled by the European Monitoring and Evaluation Programme (EMEP). The Convention's EMEP keeps track of the ways in which emissions from one country affect the

environment in others. The EMEP report also provides an overview of calculations for source-receptor relationships (including transboundary movements between countries), covering acidifying, eutrophying, photo-oxidant, and particle pollution.

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

Since land-based emissions of SO<sub>2</sub>, NOx and PM<sub>2.5</sub> have been falling much faster than those from international shipping, shipping's contribution to pollutant depositions and concentrations has been getting bigger and bigger over time. For 2013 it was estimated that ship emissions were responsible for ten per cent or more of the total depositions of both sulphur and oxidised nitrogen compounds in many countries (see Table 2). In the coastal areas of these countries, shipping's contribution to the overall pollution load is even higher. Countries that are particularly exposed to air pollution from shipping include Portugal, Denmark, Norway, Sweden, Ireland, the Netherlands, Spain, France and the United Kingdom.

Christer Ågren

Report: "Transboundary particulate matter, photo-oxidants, acidifying and eutrophying components." EMEP Report 1/2015. [www.emep.int](http://www.emep.int)

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

| Sulphur     |      | NOx-Nitrogen |      |
|-------------|------|--------------|------|
| Portugal    | 26 % | Norway       | 28 % |
| Denmark     | 24 % | Sweden       | 26 % |
| Netherlands | 22 % | Denmark      | 26 % |
| Ireland     | 20 % | Portugal     | 24 % |
| Norway      | 19 % | Greece       | 23 % |
| Spain       | 18 % | Ireland      | 23 % |
| Sweden      | 17 % | Netherlands  | 19 % |
| France      | 15 % | Finland      | 18 % |
| UK          | 13 % | Spain        | 18 % |
| Italy       | 13 % | UK           | 18 % |
| Belgium     | 10 % | Italy        | 15 % |
| Greece      | 9 %  | France       | 14 % |



## Weaker machinery pollution rules

The European Parliament's environment committee voted on 15 September to grant temporary exemptions from more stringent emission limit values proposed by the European Commission last year for mobile cranes, engines for inland waterway vessels, and machines.

The new law aims to cut air pollution from non-road mobile machinery (NRMM), including tractors, lawn mowers and bulldozers. These account for about 15 per cent of all NO<sub>x</sub> and five per cent of PM emissions in the EU.

The Committee urged member states to take measures to encourage the retrofitting of existing engines with pollution-reducing technology in densely populated urban areas or those areas that fail to comply with EU air quality standards.

Green group T&E welcomed the retrofit addition, but criticised the additional exemptions as well as the Committee's rejection of amendments that would have required similar retrofits for diesel train engines.

The adopted position will be used in informal negotiations with member states in the EU Council, with the aim of finding an agreement on the new directive.

Source: ENDS Europe Daily, 16 September 2015

Link T&E: [www.transportenvironment.org](http://www.transportenvironment.org)

## Just one in 10 new diesel cars is as clean as the legal limit

Every major car manufacturer is selling diesel cars that fail to meet EU air pollution limits on the road in Europe, according to data obtained by sustainable transport group Transport & Environment (T&E).

On average, new EU diesel cars produce emissions about five times higher than the allowed limit. The results are compiled in the new report "Don't breathe here", in which T&E analyses the reasons for and solutions to air pollution caused by diesel machines and cars.

Just three out of 23 tested vehicles met the new standards when tested on the road. The main reason is that the EU's testing system is obsolete, allowing carmakers to use cheaper, less effective exhaust treat-

## Belgium, Bulgaria and Sweden must act to reduce PM levels

In June, the European Commission referred Belgium and Bulgaria to the EU Court of Justice over persistently high levels of particulate matter (PM<sub>10</sub>). EU legislation has set limit values for PM<sub>10</sub> since 2005. In case of exceedance of such limit values, member states shall adopt air quality plans and ensure that such plans set appropriate measures so that the exceedance period can be kept as short as possible.

The main limit values for which there are compliance problems in the EU are PM<sub>10</sub> and nitrogen dioxide (NO<sub>2</sub>), and for PM<sub>10</sub> there are court cases against 16 member states. For NO<sub>2</sub>, there are six procedures under way.

The Commission also sent a reasoned opinion to Sweden for poor air quality. Sweden has previously been condemned by the Court for not meeting PM<sub>10</sub> limit values between 2005 and 2007. If Sweden fails to act, the Commission may take the matter to the EU Court of Justice.

In addition, letters of formal notice on NO<sub>2</sub> were sent to France, Germany and Spain.

Source: European Commission press release, 18 June 2015

ment systems in cars sold in Europe. In contrast, diesel cars sold by the same manufacturers in the US, where limits are tighter and tests are more rigorous, have better exhaust treatment systems and produce lower emissions.

A new on-road test will, for the first time, measure diesel-driven cars' "real-world" emissions, but this test will not apply to all new cars until 2018 at the earliest. According to T&E, carmakers are continuing to try to delay and weaken the introduction of the tests by demanding further changes to the rules only agreed in July.

Source: T&E press release, 14 September 2015

The report "Don't breathe here: Tackling air pollution from vehicles" as well as an executive summary of the report can be downloaded from: <http://www.transportenvironment.org/publications/dont-breathe-here-tackling-air-pollution-vehicles>

## New ozone standards in the US

On 1 October, the US Environmental Protection Agency (EPA) set a new national ambient air quality standard of 70 parts per billion (ppb) for ground-level ozone, down from the current level of 75 ppb set in 2008.

But the new limit is the least restrictive that the agency had been considering, and health experts complained it does not go far enough. The EPA had been considering a range of 60 to 70 ppb before settling on a level at the top end of this range.

Harold P. Wimmer of the American Lung Association, said: "Given the health threats from ozone, greater health protections are clearly needed. The level chosen of 70 ppb simply does not reflect what the science shows is necessary to truly protect public health. Protecting the public health is the fundamental requirement of the national standard under the Clean Air Act. An ozone limit of 60 ppb would have given Americans much greater health protections. According to EPA's proposal, a 60 ppb standard would have prevented up to 1.8 million asthma attacks in children, 1.9 million school days missed, and 7,900 premature deaths nationwide."

The public health benefits of the 70 ppb standard are estimated at US\$2.9 to 5.9 billion annually in 2025, outweighing the estimated annual costs of US\$1.4 billion.

Depending on the severity of their ozone problem, states would have until between 2020 and 2025 to meet the standards. But California has been given until 2037, 12 years longer than the rest of the country, to meet the standard.

The Clean Air Act requires EPA to review the ozone standards every five years to determine whether they should be revised in light of the latest science.

Sources: EPA press release and American Lung Association statement, 1 October 2015.

Links: [www.epa.gov](http://www.epa.gov) and [www.lung.org](http://www.lung.org)

# Pledges for the 2015 UN climate agreement

South Korea plans to cut emissions by 37 percent by 2030, and China plans to boost renewables. As the Paris conference approaches, countries are submitting their plans for greenhouse gas reductions.

**By 1 October** this year, 113 countries had submitted their national plans for greenhouse gas reductions covering 80 per cent of global emissions. Here are examples of reduction targets published by the climate news agency Climate Home for industrialized countries and several large developing countries.

- 1/10 – India: Would reduce carbon emissions relative to its GDP by 33% to 35% from 2005 levels by 2030. India also pledged that 40% of the country's electricity would come from non-fossil fuel-based sources, such as wind and solar power, by 2030.
- 30/9 – Ukraine: Emissions will not exceed 60% of 1990 levels by 2030.
- 30/9 – Israel: Cut greenhouse gases 26% below 2005 levels by 2030.
- 28/9 – Brazil: Unconditional pledge to cut greenhouse gas emissions by 37% from 2005 levels by 2025, with an “indicative” target of 43% by 2030.
- 25/9 – South Africa: Aims to “peak, plateau and decline” emissions by 2030, requires \$53 billion for adaptation to climate impacts.
- 25/9 – Belarus: Aims to cut GHGs 28% below 1990 levels by 2030.
- 25/9 – Georgia: Commits to 15% cut on business as usual by 2030, which could rise to 25% with international support.
- 24/9 – Indonesia: Unconditional 29% greenhouse gas emissions cuts on business as usual by 2030. With international support this could rise to 41%.
- 11/8 – Australia: 26–28% cuts on 2005 levels by 2030. Overall design of Australia's 2030 target policy framework will be further considered in detail in 2017–2018.
- 5/8 – Macedonia: 30% cuts on business-as-usual levels by 2030, rising to 36% with finance.

- 29/7 – Monaco: 50% greenhouse gas cuts on 1990 levels by 2030.
- 17/7 – Japan: will cut greenhouse gas emissions by 26% from 2013 levels by 2030.
- 7/7 – New Zealand: will cut greenhouse gas emissions 30% below 2005 levels by 2030, equal to a reduction of 11% on 1990 levels.
- 3/7 – Singapore: intends to peak emissions “around 2030” and cut carbon emissions per unit of GDP by 36% from 2005 levels by 2030.
- 30/6 – South Korea: cut emissions by 37% from business-as-usual levels by 2030. Domestic action makes up 25.7% of cuts; 11.3% from buying international carbon credits.
- 30/6 – China: intends to peak emissions before 2030, cut levels of carbon emissions per unit of GDP by 60–65% from 2005 levels by 2030, boost share of renewables and nuclear in energy mix to 20% by 2030.
- 30/6: Iceland: aims to match EU's 40% reduction on 1990 levels by 2030.
- 30/6 – Serbia: 9.8% cut by 2030 on 1990 levels.
- 15/05 – Canada: 30% greenhouse gas

emissions cut from 2005 levels by 2030. Curbs on methane leaks and regulations on fertilisers.

- 23/4 – Liechtenstein: 40% GHG cuts on 1990 levels by 2030, covering all sectors. Expects EU climate and energy policies to contribute to goal.
- 31/3 – Russia: 25–30% reduction from 1990 levels by 2030, “subject to the maximum possible account of absorbing capacity of forests”.
- 31/3 – US: 26–28% cuts on 2005 levels by 2025.
- 27/3 – Mexico: Emissions peak by 2026, 25% reduction compared to business as usual in 2030 (includes black carbon).
- 27/3 – Norway: 40% cuts on 1990 levels by 2030.
- 9/3 – European Union: “At least” 40% cuts on 1990 levels by 2030.
- 27/2 – Switzerland: 50% GHG cuts on 1990 levels by 2030.

Before the Paris climate conference the UNFCCC will publish a synthesis report of all submitted national plans.

Reinhold Pape  
Source: Climate Home



© RAWPIXEL - SHUTTERSTOCK.COM

# Dirty diesel cars tested

Emissions tests on 32 Euro 6 diesel passenger cars from ten different manufacturers and with different abatement technologies show that most cars fail to meet the NO<sub>x</sub> emissions standards under more realistic driving conditions.

**As of September** 2015, all new diesel passenger cars will have to meet the Euro 6 NO<sub>x</sub> emission limit of 80 mg/km. While all diesel car manufacturers have managed to meet this requirement during the regulated laboratory test, which is done using an outdated emissions certification driving cycle (the New European Driving Cycle, NEDC), many studies have shown that the “real-world” NO<sub>x</sub> emissions of diesel passenger cars are substantially higher than the certified limit.

From 2017, the NEDC will be replaced by the more realistic Worldwide Harmonized Light Vehicles Test Cycle (WLTC) that better represents actual on-road emissions. But according to the study, the biggest challenge for diesel passenger car manufacturers arises not from the certification cycle but from the real-driving emissions (RDE) test, which is scheduled to become a mandatory step for the type approval of passenger cars in the EU in January 2016. Under this new testing framework, diesel passenger cars will have to prove that they can keep NO<sub>x</sub> emissions at reasonably low levels during a test that more closely represents real-world driving situations.

The study analyzes the results of emissions tests on 32 Euro 6 diesel passenger cars from ten different manufacturers, equipped with different types of exhaust after-treatment technologies, tested over both the NEDC and WLTC driving cycles.

**Three main technologies** are available for controlling NO<sub>x</sub> emissions from modern diesel passenger cars: inner-engine modifications coupled with exhaust gas recirculation (EGR), lean-burn NO<sub>x</sub> adsorbers (also called lean NO<sub>x</sub> traps, or LNT), and selective catalytic reduction (SCR).

Of the Euro 6 diesel cars sold last year in the EU, about 55 per cent were

equipped with LNT technology, 40 per cent with SCR, and 5 per cent with EGR.

It should be noted that in the US market, combined after-treatment systems are featured in some models that otherwise use a single NO<sub>x</sub> control technology in their European market versions. This is explained by different regulatory frameworks, since the US has a tougher NO<sub>x</sub> emission limit value, a more demanding test cycle, and a robust enforcement and compliance programme that the EU lacks.

Of the 12.5 million passenger cars sold in the EU in 2014, 6.6 million (53%) were powered by diesel.

In the US, 16.4 million passenger vehicles were sold in 2014, but only 138,000 (0.84%) were diesel-driven.



## The test results

showed that 31 out of the 32 vehicles met the limit of 80 mg/km over the less demanding NEDC cycle. Most EGR- and SCR-equipped vehicles performed better than LNT-equipped vehicles over the WLTC cycle, but their average emissions were still far higher than those over the NEDC (by a factor of 2.3 for EGR-equipped vehicles and 2.8 for SCR-equipped vehicles). The same factor was 8.0 for the average of all LNT-equipped vehicles.

Three LNT-equipped vehicles showed very poor performance over the WLTC, with one car emitting up to 1,167 mg/km of NO<sub>x</sub>, i.e. 15 times higher than the limit. The authors conclude that this casts a shadow of doubt over the real-world performance of all current NO<sub>x</sub> control approaches, especially those relying on LNT, and underscores the importance of engine and after-treatment calibration to realize the full potential of available

technologies and achieve satisfactory real-world performance.

This autumn, the European Commission is about to propose emissions limit multipliers that will apply to the new on-road vehicle emissions tests. These “conformity factors” will have a large impact on the deployment of emissions control technologies, and thus on the real-world emissions performance of new diesel cars.

**The European Commission** will phase in RDE testing in two subsequent steps with increasing levels of stringency. The report says that it is widely expected that the initial step of conformity factors (applicable from September 2017 onward) will lie around a value of 2 for NO<sub>x</sub> emissions from diesel cars, which would mean that these vehicles will still be allowed to emit about twice as much as the limit of 80 mg/km during the on-road test, effectively making this the first time that the Euro standards will be changed to raise an emission limit instead of lowering it. Moreover, since RDE does not include cold-start emissions, the allowed increase will be substantially higher than is indicated by the conformity factor.

The second step of RDE is expected to apply from 2019 onward and bring conformity factors close to 1, thus making Euro 6 diesel cars come closer to delivering on their promise, albeit seven years after their initial market introduction.

The ICCT points out that since the RDE testing cannot apply retroactively to existing Euro 6 type approval certificates, it is essential to act fast and ensure that high emitters of NO<sub>x</sub> are prevented from entering the market.

Christer Ågren

The report “NO<sub>x</sub> control technologies for Euro 6 diesel passenger cars – Market penetration and experimental performance assessment” (September 2015) can be downloaded from: [www.theicct.org](http://www.theicct.org)

© KZENON - SHUTTERSTOCK.COM



# Lignite villages have been needlessly destroyed

Lignite has a low energy output and requires huge quantities to be mined, which has a devastating impact on landscapes and settlements. Even so, many countries are still committed to the fuel.

**Burning lignite, or** brown coal, produces less energy than any other fossil fuel. With a thermal value a third that of hard coal, huge quantities are needed for electrical power generation. Germany extracted 178 million tonnes of lignite by surface mining in 2014 alone, removing five times the amount of overlying soil<sup>1</sup>. This incessant earthmoving activity has been equivalent to digging the 1869 Suez Canal every four weeks, resulting in the continuing destruction of landscapes and settlements.

Certain other countries are even more committed to the fuel. Greece produces over six tonnes of lignite per inhabitant

to satisfy 30 per cent of energy demand. Despite the high local potential for solar power, the Greek lignite industry requires no additional capital to continue mining – an important consideration during the current financial crisis.

Renewable energies in Germany, by contrast, already supply more electrical power than is produced from lignite. Due to unsteady generation, four times the renewable capacity is required for the same amount of electricity. While high capital investments are thus necessary, the enduring expenses of mining devastation are avoided.

The German grid once carried only

about three per cent of renewable power. Increased generation has now imposed the frequent need to shed electricity to other countries, or to reduce the output of conventional power plants. For both reasons, the overall demand for coal and lignite has declined.

Due to rising supply surpluses, furthermore, earlier wholesale electricity prices of around €60 per MWh at the European Energy Exchange EEX<sup>2</sup> have fallen to half that level<sup>3</sup>. In Germany, green energy is supplied to the transmission grid on a priority basis in whatever quantities are available, and with no consideration of contracted prices. The photovoltaic



installations connected at the beginning of the century, for instance, still receive over €500 for each MWh of electricity fed into the grid under the 20-year price guarantees of the Renewable Energy Sources Act of 2000<sup>4</sup>.

By contrast, coal, lignite, and natural gas plants often cannot cover the costs

of mining operations. The neighbouring village of Breunsdorf had already been eliminated a decade earlier. However, the adjacent municipalities of Zwenkau, Böhlen, and Neukieritzsch have now been obliged to return millions of euros in taxes to Vattenfall, testifying to the increasing risks of lignite dependency.

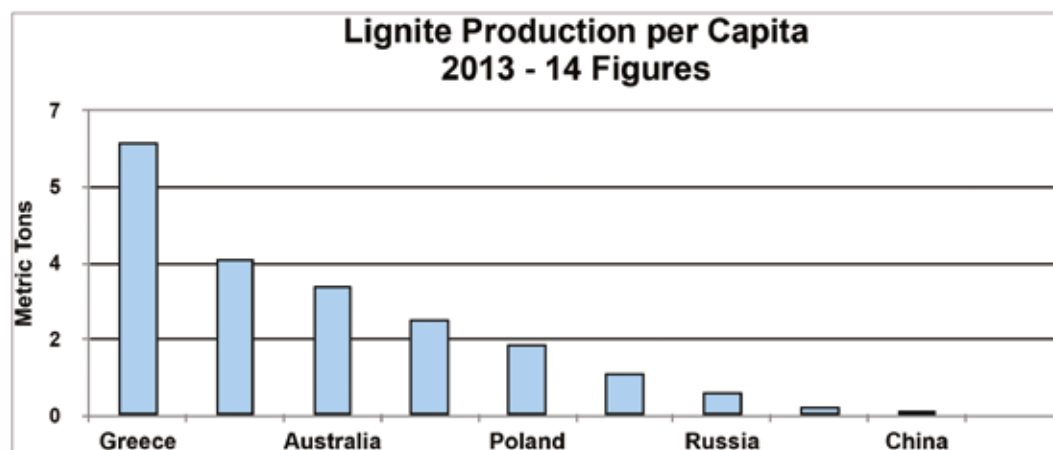
Furthermore, MIBRAG intends to terminate annual deliveries of 1.3 million tonnes of lignite by rail to the Czech Republic<sup>8</sup> by the end of 2015<sup>9</sup>. This elimination of lignite exports likewise weakens market demand.

Comparable developments in the Rhineland and in Lusatia additionally confirm that it is unnecessary to destroy villages for lignite power generation. The Czech Republic already changed its mining law in 2012 to prohibit the expropriation of private property for resource extraction<sup>10</sup>.

In all, more than 300 German communities have been devastated by the lignite mining industry. With renewable energies increasing on the power grid, however, fossil fuel power plants are now running fewer hours per year. Human habitats need no longer be sacrificed for producing more electrical power than needed.

Jeffrey H. Michel

1. [www.kohlenstatistik.de](http://www.kohlenstatistik.de).
2. European Energy Exchange: [www.eex.com](http://www.eex.com).
3. Lang, Martin and Annette Lang (August 26, 2015): "Bloomberg: German Electricity Wholesale Prices Tumbled to 12-Year Low on Monday". German Energy Blog: [www.german-energyblog.de](http://www.german-energyblog.de).
4. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (March 2000): Act on Granting Priority to Renewable Energy Sources. BMU: Berlin, Section 8.
5. Johanssen, Frank (August 20, 2015): "Vattenfall verlangt Steuern zurück". Leipziger Volkszeitung: Leipzig, p. 8.
6. Michel, Jeffrey (November 17, 2014): "Wishing away lignite – EU climate policy ignores elephant in the room". Energy Post: [www.energypost.eu](http://www.energypost.eu).
7. Zentner, Birger and Steffen Höhne (April 24, 2015): "Mibrag stoppt Kraftwerksneubau Profen". Mitteldeutsche Zeitung: Halle.
8. Michel, Jeffrey (June 30, 2015): "Lignite in Europe: fighting back renewables". Energy Post: [www.energypost.eu](http://www.energypost.eu).
9. Schroeter, Stefan (April 28, 2015): "Mibrag verspricht ein Ende der Braunkohle-Exporte". [www.stefanschroeter.com](http://www.stefanschroeter.com).
10. Wikipedia: "Brown coal mining limits in North Bohemia". [www.wikipedia.org](http://www.wikipedia.org).



of fuel, personnel, and maintenance in order to remain competitive. In eastern Germany, Vattenfall recently obtained a refund of commercial taxes paid in 2014 and 2015 to local communities after revenue losses had diminished profitability<sup>5</sup>. In the Rhineland, 17 of 20 RWE lignite power plants have been running a deficit<sup>6</sup>.

### Lignite surpluses

Vattenfall's Lippendorf power station near Leipzig uses lignite from the MIBRAG Schleenhain mine. The community of Heuersdorf, which originally had 347 inhabitants, was destroyed in 2009 as part

The presumed 40-year profitability of the Lippendorf power station was decisive in 2004 for the parliament of Saxony to legislate the destruction of Heuersdorf. However, that assumption has since proved to be unsubstantiated.

MIBRAG is experiencing other cases of reduced lignite demand, as well. In April 2015, the company stated that its planned 660 MW power plant at Profen near Halle would not be built<sup>7</sup>. That project alone would have required three times the amount of lignite excavated at Heuersdorf, but now this fuel is not needed.

### Lignite & renewable power generation in Germany 2014

|                  | Operational capacity<br>GW | Generation thousand<br>GWh |
|------------------|----------------------------|----------------------------|
| Lignite          | 23.1                       | 155.8                      |
| Total Renewables | 91.8*                      | 161.8                      |
| Onshore wind     | 38.1                       | 56.0                       |
| Offshore wind    | 1.0*                       | 1.2                        |
| Photovoltaic     | 38.2                       | 34.9                       |
| Bioenergy        | 8.8                        | 49.1                       |
| Hydroelectric    | 5.6                        | 20.5                       |
| Geothermal       | 24 MW                      | 0.1                        |

Agentur für Erneuerbare Energien e. V.

(\* An additional 1.3 GW of installed offshore wind capacity was not yet operational.)



# EU air pollution emission limits still exceeded

Ten EU countries breached at least one of their air pollutant emission ceilings in 2013, preliminary data from the European Environment Agency (EEA) shows.

**The EU's National Emission Ceilings (NEC)** directive sets legally binding national limits for maximum allowed emissions for four air pollutants, namely sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), ammonia (NH<sub>3</sub>) and non-methane volatile organic compounds (NMVOCs), that were to be achieved by 2010 and not to be exceeded in the years to follow.

Preliminary data for 2013 shows that ten countries breached at least one emission ceiling, compared to twelve countries in 2012. The most commonly breached ceilings were those for NO<sub>x</sub> and NH<sub>3</sub>, with six member states exceeding their limits.

Germany and France reported the highest absolute exceedances of NO<sub>x</sub> limits, with 218 kilotonnes and 180 kt, respectively. In percentage terms, Luxembourg (41%) and Austria (32%) exceeded their NO<sub>x</sub> emission ceilings by the greatest amounts in 2013.

**Road transport contributes** around 40 per cent of total NO<sub>x</sub> emissions in the EU and is one of the main factors behind the large number of NO<sub>x</sub> exceedances. Reductions from this sector – and espe-

cially from diesel-driven cars – have not been as large as originally anticipated, partly because road transport has grown more than expected, and partly owing to the increased number of diesel vehicles, which emit much more NO<sub>x</sub> than petrol vehicles.

Agriculture, especially the use of fertilisers and the handling of animal manure, is responsible for almost 95 per cent of NH<sub>3</sub> emissions. Compared with other pollutants covered by the NECD, agriculture emissions have not decreased to the same extent. In 2013, Germany had the highest NH<sub>3</sub> breach of 121 kt, exceeding its limit by 22 per cent.

Emission ceilings for NMVOCs were breached by three countries (Denmark, Germany and Ireland). For the third year in a row, all member states met their SO<sub>2</sub> limits.

Several countries have persistent problems meeting their national emission limits – for example, Austria, Belgium, France, Germany, Ireland and Luxembourg have now breached their NO<sub>x</sub> ceilings for four consecutive years, and Austria, Denmark, Finland, Germany, Netherlands and Spain have

all breached their NH<sub>3</sub> ceilings for four years running (2010–13).

**Germany was the** only country that exceeded three of the four emission ceilings, while Austria, Denmark and Ireland exceeded two ceilings in 2013.

Despite multiple breaches of the NEC directive ceilings, emissions of all four pollutants have decreased in the EU overall between 2010 and 2013.

In December 2013 the European Commission presented a new Clean Air Policy Package, including a proposal to revise the NEC directive, with new 2020 and 2030 national emission reduction commitments for the four currently covered pollutants, as well as new ceilings for two additional pollutants – fine particulate matter (PM<sub>2.5</sub>) and methane (CH<sub>4</sub>). This proposal is currently debated in the European Parliament and the Council.

Christer Ågren

Source: EEA, 11 June 2015

The report: "NEC Directive status report 2014", EEA Technical report No. 7/2015 Link: <http://www.eea.europa.eu/publications/nec-directive-status-report-2014>



## Air pollution costs France €100 billion per year

The effects of air pollution cost France some €100 billion each year, according to a French Senate committee report.

The study said air pollution is not merely a health threat, but also represents “an economic aberration” that costs the French state and businesses billions annually in treating illness, and financing employee sick leave, lost productivity, reduced agriculture yields and cleaning up sooty buildings and other venues.

It estimated the economic damage of atmospheric pollution to health at between €68 and 97 billion per year. Non-health damage, such as lower crop production and the cleaning of blackened buildings, was estimated at €4.3 billion.

Source: AFP, 15 July 2015

Link to the report: [http://www.senat.fr/commission/enquete/cout\\_economique\\_et\\_fancier\\_de\\_la\\_pollution\\_de\\_lair.html](http://www.senat.fr/commission/enquete/cout_economique_et_fancier_de_la_pollution_de_lair.html)

## Updated European pollutant release data

Detailed industrial pollution data covering around 32,000 facilities across Europe are now available for 2013. The dataset covers 91 substances released to water, land, wastewater and air.

The European Pollutant Release and Transfer Register (E-PRTR) is a comprehensive online register with information on releases and transfers of pollutants from industrial installations in 32 European countries. The new dataset also includes updates of 2007–2012 data from some countries.

Source: EEA, 29 May 2015

Link: <http://prtr.ec.europa.eu/Home.aspx>



© STOKKETE - SHUTTERSTOCK.COM



© EVANTRAVELS - SHUTTERSTOCK.COM

## Ships need PM emissions control

New research suggests improved regulations and particle filtration devices should be introduced to limit the amount of particulate matter (PM) released from vessels. Residents in port cities and coastal areas are especially affected by the emissions from ships' engines.

A team of researchers from Germany's University of Rostock and the Helmholtz Virtual Institute of Complex Molecular Systems in Environmental Health (HICE) exposed human lung cells to marine diesel fuel and heavy fuel oil emissions, and negative impacts were found for both types of fuel.

“The study shows that heavy fuel oil is in particular responsible for high concentrations of known toxic and carcinogenic substances in the air such as heavy metals and hydrocarbons. We really underline the recommendation of the scientists to urgently switch to low-sulphur fuels together with effective emission abatement techniques,” said Dietmar Oeliger, transport expert at Nature and Biodiversity Conservation Union (NABU).

Source: NABU press release, 5 June 2015

Link to the study: <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126536>

## NGO publishes ‘Clean Air in Ports’ manual

The German Nature and Biodiversity Conservation Union (NABU) has published a “Clean Air in Ports” manual with information on the effects of air pollution, the level of emissions found in ports, emissions reduction measures and environmental port policies.

“It seems as if the impact of ports on air quality in Europe is currently underestimated and little investigated. This is more of a problem where ports are located either close to or even in city centres such as in Antwerp, Amsterdam and Hamburg,” the organisation stated in the manual's opening pages.

Source: Sustainable Shipping News, 12 June 2015

Link to the manual: <https://nabu.de/ports>

## Research recommends ban on ship scrubber discharge

EU countries should ban wastewater discharge generated by scrubbers to limit ships' environmental impact, a study for the German environmental protection agency UBA has recommended. Limiting the discharge generated by scrubbers is the best way to prevent potential damage, such as the release of pollutants, increased acidity and increased temperature and turbidity, the researchers said.

“In principle, the use of clean liquid (diesel) and gas (LNG) fuels is preferable to an exhaust gas after treatment for the purpose of sulphur reduction,” the researchers said. German coastal waters are already under heavy pressure from shipping, and the contaminated wastewater “adds a further stress factor for marine organisms in the North Sea and Baltic Sea as well as the adjacent catchment areas supporting shipping traffic”, they argued.

Source: ENDS Europe Daily, 12 August 2015

Link to the study: <http://www.umweltbundesamt.de/publikationen/impacts-of-scrubbers-on-the-environmental-situation>

Air Pollution & Climate Secretariat  
Första Långgatan 18  
413 28 Göteborg  
Sweden

## Recent publications from the Secretariat

Reports can be downloaded in PDF format from [www.airclim.org](http://www.airclim.org)

### Gasping for air

Air pollution is one of Europe's gravest environmental threats. Every year 400,000 people die prematurely because of poor air quality, but the European Parliament has the power to change that. Members of the European Parliament are now starting to work on a number of EU laws, including the National Emissions Ceilings and Medium Combustion Plants Directives, which could substantially improve the air we breathe.

Twelve factsheets reveal how air pollution affects us, from our health to our economy, and explain what the main sources of pollution are. Crucially, they contain policy recommendations to MEPs that will help clean up our air. Everywhere.

### The 10 best climate measures in Northern Europe

A number of national environmental NGOs were asked to describe and rank their ten best climate measures.

There is a great diversity among these measures. Hardly any country seems to have noticed what their neighbours are doing. So all climate policymakers should take a look, not only at the ten winners, but at the full smorgasbord of measures in neighbouring nations.

### Carbon Capture and Storage in Norway – The moon landing that failed

The Norwegian interest in CCS depends largely on the oil and gas sector. In the 1990s, oil companies operating in Norway began research and development. In 2005 the government took the lead. Prime minister Jens Stoltenberg announced the building of a full-scale CCS plant at Mongstad outside Bergen in 2006, a project equivalent to the moon landing, in his own words. For a period the per capita investment in CCS research and development was among the highest in the world. In 2013 the project to build a full-scale CCS plant at Mongstad in Norway was ended.

## Coming events

#### 4th session of the Ad Hoc Working Group on the Durban Platform for Enhanced Action.

Bonn, Germany, 19 - 23 October 2015. Information: <http://unfccc.int/>

**Acid Rain 2015.** Rochester, NY, USA, 19 - 23 October 2015. Information: <http://acidrain2015.org/>

**ACCEPTED Final Meeting – Health effects of air pollution in cities.** Brussels, Belgium, 23 October 2015. Information: <http://www.acceptedera.eu/news-and-meetings/project-meetings/>

**EU Environment Council.** Brussels, Belgium, 26 October 2015. Information: <http://europa.eu/newsroom/calendar/>

**Métropoles du monde: La course à l'air pur?** Paris, France, 23 November 2015. Information: <http://www.lesrespirations.org>

**People's Climate March.** Paris, London and other major cities, 28 - 29 November 2015. Information: <http://www.timetoact2015.org>

**UNFCCC Conference of the Parties (COP) 21.** Paris, France, 30 November - 11 December 2015. Information: <http://unfccc.int/>

**CLRTAP Working Group on Strategies and Review and Executive Body.** Geneva, Switzerland, 15 - 18 December 2015. Information: [www.unece.org/env/lrtap/](http://www.unece.org/env/lrtap/)

**EU Environment Council.** Brussels, Belgium, 18 December 2015. Information: <http://europa.eu/newsroom/calendar/>

**IMO PPR 3 (Sub-Committee on Pollution Prevention and Response).** London, UK, 15 - 19 February 2016. Information: [www.imo.org](http://www.imo.org)

**10th International Conference on Air Quality – Science and Application.** Milan, Italy, 14 - 28 March 2016. Information: <http://www.airquality-conference.org/>

**IMO MEPC 69 (Marine Environment Protection Committee).** London, UK, 18 - 22 April 2016. Information: [www.imo.org](http://www.imo.org)

**21st International Transport and Air Pollution (TAP) Conference.** Lyon, France, 24 - 26 May 2016. Information: <http://tap2016.sciencesconf.org>

**Environment for Europe Ministerial Conference.** Batumi, Georgia, 8 - 10 June 2016. Information:

**7th International Nitrogen Initiative (INI 2016).** Melbourne, Australia, 4 - 8 December 2016. Information: <http://www.ini2016.com/>

## Subscribe to Acid News via email

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

This way, you'll get access to *Acid News* at least two weeks before the printed copy arrives in the mail.  
[airclim.org/acidnews/an\\_subscribe.php](http://airclim.org/acidnews/an_subscribe.php)