NO. 1, MARCH 2016

Acid News

"The moon landing that failed"

Despite project failures, the government in Norway still has its hopes up for CCS as the key to mitigation of CO2 emissions.

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Member states weaken NEC targets

The relaxed targets agreed by member states could result in an additional 130,000 premature deaths by 2030.

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EU without an energy strategy to fulfil Paris agreement

The European Commission continues to promote fossil gas and gas infrastructure despite agreements in Paris to phase-out fossil fuels.

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Nitrogen on the table

Halving the consumption of meat and dairy in the EU would cut agricultural nitrogen losses by more than 40% and GHG emissions by 25–40%.

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Harmful air pollution

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The polluter-pays principle or the polluter-profits principle?

Coal phase-out in Germany caught between planet and profits.

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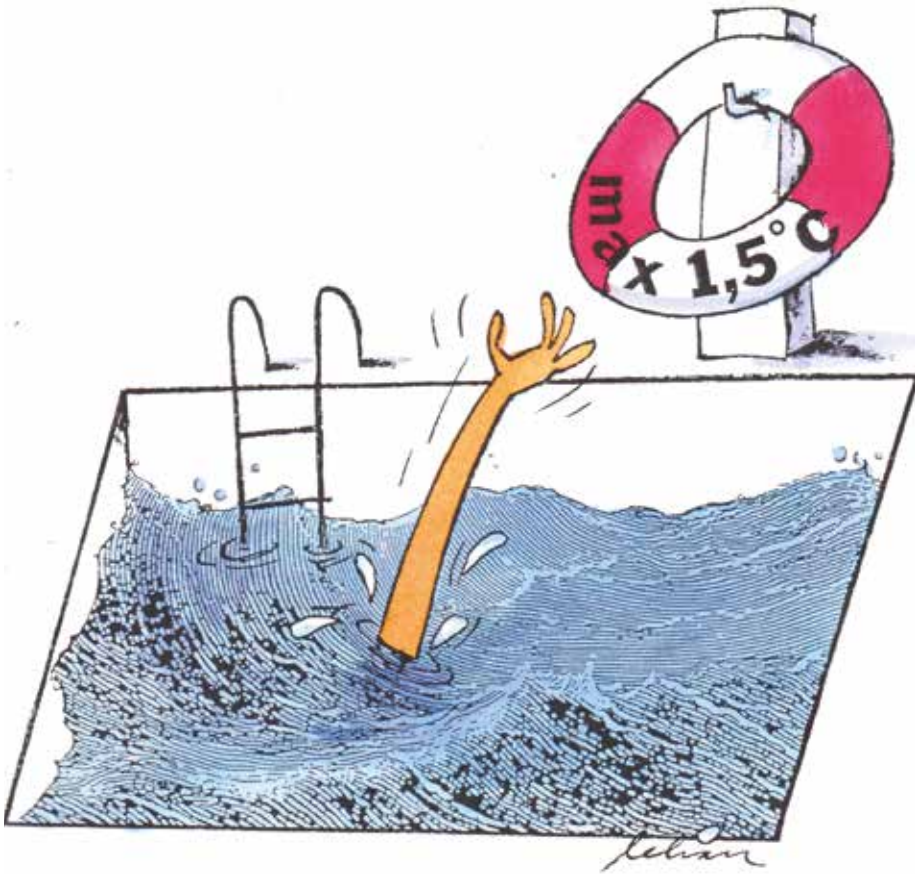

A 1.5 target is needed to save the Baltic Sea

Effects of global temperature increases on the biodiversity of the Baltic Sea.

AirClim has published a report (1) about the possible effects of climate change in the Baltic Sea. The intention of the report is to try and predict what global warming of 2 or 4 degrees C may mean for the biodiversity of the Baltic Sea.

At the UN Climate Conference in Paris in December 2015 on how to mitigate increased global warming it was decided among other things that:

- global warming shall be limited to "well below 2 degrees" as compared with the pre-industrial era,
- and the aim is to limit warming to just 1.5 degrees.

It is crucial that these decisions and goals are attained, but they will be virtually impossible to achieve unless we can curb current emissions of greenhouse gases like carbon dioxide. If these emissions continue at the present level the temperature is likely to rise by more than 4 degrees by 2100 according to the IPCC. The European Union still has a temperature target of below 2 degrees, but this report suggests that such a target is not strong enough to save the Baltic Sea ecosystems from dangerous climate change.

Below I have therefore tried to analyze

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Acid News

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

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

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

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

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

In furtherance of these aims, the Secretariat:

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

Editorial

AirClim

The EU must now sharpen its climate policy targets as a consequence of the international agreement in Paris last December. 196 governments agreed on the long-term target to limit global temperature rise to 1.5 degrees C compared with preindustrial times. This follows the conclusion of the scientific review by the United Nations during 2013–2015, which concluded that dangerous climate change would occur even below 2 degrees. The risks include threats to food security, low-lying islands and coastlines, and several global ecosystems.

"EU must sharpen 2030 targets!"

There is a special concern about global habitats such as sea ice, glaciers, high mountains, boreal forests, tropical mountain rainforests, coral reefs and oceans that would not survive in their present state at 2 degrees warming. One example could be the Baltic Sea, and the possible risks are presented in this issue of Acid News (pages 1–4).

Climate Action Network (CAN International) is therefore demanding that we stay below 1.5 C. This is also the demand of the Alliance of Small Island States (AOSIS) and Least Developed Countries (LDCs), which include more than 100 countries. Scientists have for example reported that the Greenland Ice Sheet could melt between 1.2 and 2 degrees global temperature rise.

The main demand of CAN International is to phase out all fossil fuel emissions and to phase in a 100% renewable energy future with sustainable energy access for all, as early as possible, but not later than 2050. This means that the EU, as one of the wealthiest regions in the world, for equity reasons, has to reduce its greenhouse gas emissions even earlier, by around 2030–2035, to give developing countries 15 extra years to phase out their use of fossil fuels by 2050.

Leading scientific and climate policy experts (1) therefore recommend that the EU should phase out the use of coal by 2025. Several countries in Europe, including Austria and the United Kingdom, have now taken such decisions. Such a coal phase-out plan is also being debated in Germany, as described in this issue (page 18), and the EU must now decide on a similar plan.

The development of carbon capture and storage schemes has failed and should not be promoted by the EU. The Norwegian example is a reminder of how a false strategy has created hope for 20 years and contributed to delaying climate action (see article on page 3 and the new APC 33 report published by AirClim). Public opposition to CCS is very strong in the EU, as described in the article on page 22. Furthermore, the viability of CCS for reducing industrial emissions has not been proven, and industry should instead work on alternative production technologies and methodologies.

In my opinion CO_2 emissions from energy production and land use, must be reduced to zero globally by 2035. The EU must therefore now also start to discuss the phasing out of natural gas, a fossil fuel. A new AirClim report presented on page 10 describes the current situation and the problems with the fossil gas industry.

Leading scientific and climate policy experts (1) are also suggesting that to avoid exceeding the 1.5 C target the EU should make sure all vehicles are electrified by 2035. The political decisions must be taken now by the EU to implement this transport policy proposal due to the long life of new vehicles.

The EU and the UN must also take steps to control emissions from bunker fuels and prepare steps to phase out fossil fuels from these sectors. Bunker fuels were not included in the Paris agreement even though CO_2 emissions from these fuels already accounted for 3–4 per cent of global emissions in 2012, and these emissions are expected to rise by 200 per cent. ICAO and IMO are extremely slow to decide about regulating emissions from these sectors and the EU and UN must therefore deliver strong regulatory decisions in this area now!

Reinhold Pape

https://newclimateinstitute.files.wordpress.com/2016/02/160222_klimaschutz_paris_studie_02_2016_fin_neu1.pdf

CCS in Norway – still a long way from the goal

AirClim has published a new report explaining the failure of CCS development.

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The CCS project at Mongstad in western Norway was finally cancelled in 2013, causing sarcastic comments about "The Moon landing that failed". The then Norwegian Prime Minister Jens Stoltenberg invited these comments by hailing the start of the project in 2006 as the Norwegian equivalent to the real Moon landing. The present Norwegian government, led by Erna Solberg, still has as its official goal to establish one full-scale CCS demonstration plant by 2020, not necessarily in Norway. The slow development of CCS projects in the EU frustrates the Norwegian government's efforts to finance CCS abroad. Domestically, it is supporting several small test projects, all of which are due for completion by 1 June 2016. A decision will be made after the national elections in 2018 about which project to follow up. If a plant is to be up and running by 2020, an investment decision for a full-scale CCS plant must be made in 2016. Bellona, a long-term supporter of CCS, concludes that the goal of a full-scale CCS plant by 2020 will not be reached.

The long-term storage of CO_2 in geological formations in the North Sea seems like a better prospect. The government has given the Norwegian oil company Statoil the task of finding suitable areas for long-term CO_2 storage facilities at three different locations in the Norwegian part of the North Sea. This search should also be completed by 1 June 2016.

Professor Peter M. Haugan at the Institute for Geophysics, University of Bergen, Norway, has previously stated that finding safe storage for CO_2 in the North Sea is very costly and may take anywhere between three years at the best, and 10 years in difficult cases. There is no guarantee that the process will find a safe storage site that satisfies the EU directive for CO_2 storage. It is therefore difficult to envision that five months of exploration will lead to the finding of three new safe storage facilities.

Statoil is optimistic about the long-term prospects for CO_2 storage beneath the North Sea, but also cautious. According to Statoil, there are no large commercial CO_2 storage facilities anywhere in the world. Further research is needed on a number of issues. All existing CCS plants use the captured CO_2 either for EOR – Enhanced Oil Recovery – or in industrial processes. There are at present no large-scale CCS plants anywhere in Europe that may need a place to store CO_2. The price of CO_2 emissions in Europe is also far too low to make a commercial CO_2 storage facility economically viable. The CO_2 price must be at least 50 USD/ton, while at present it is just 6 USD/ton CO_2.

Norway has entered into an agreement with the EU, with the intent of becoming a full member of the EU Emission Trading System – the ETS. About half of Norwegian greenhouse gas emissions are already part of the ETS. The Norwegian ambition is to become a full member of the EU "Climate Bubble". An agreement may make it easier for Norway both to finance CCS in the EU, and get credit for its obligation under the EU common obligation. The details of this agreement have not been concluded, but will have to wait until the EU has reached its own decision about the future of the ETS in late 2016/early 2017.

The Norwegian emission mitigation plan has in the past relied heavily on CCS and buying emission certificates from other countries. Recent developments may indicate that there is no major deviation from this line in the policies of the present government.

Tore Braend

About the author: Tore Braend is an Energy and Climate Policy Specialist and Consultant who lives in Norway. He has for many years worked as an expert for environment and development NGOs and other institutions and has participated in many scientific and governmental hearings.

AIR POLLUTION AND CLIMATE SERIES 33
Carbon Capture and Storage in Norway – The moon landing that failed, 2nd Edition, By Tore Braend, Published in March 2016

A 1.5 target is needed to save the Baltic Sea

Continued from front page 1

the biological effects of increasing temperatures by 2 or 4 degrees and other drivers of environmental change on the biodiversity in the Baltic Sea. An additional effect of emissions of carbon dioxide is that they act as the primary source of ocean acidification, because one-third of the carbon dioxide emitted is absorbed by the world's oceans. In the oceans it reacts with calcium and water to produce carbonic acid, which leads to a lowering of the pH. At lower trophic levels there will be decreased availability of carbonate ions, which are essential building blocks required by marine organisms to build their skeletons, shells and other calcareous structures. This phenomenon has already caused severe implications for the global distribution of economically important fish species and other sources of seafood, so global seafood security is at risk. In addition to the effects of temperature increase and increased acidification on marine biodiversity it should be mentioned that other drivers of biodiversity loss will also affect marine biodiversity, e.g. habitat modification, pollution, invasive exotic species and the extinction of species and unique local populations.

The longest continuous programme of monitoring atmospheric carbon dioxide was started back in 1958 by Charles Keeling at the Mauna Loa Observatory in Hawaii. His son Ralph continues his work. The Keelings have found a 3 per cent annual increase, and as early as 1963 Keeling and his colleagues predicted that carbon dioxide emissions at that time could raise global surface temperatures by as much as 4 degrees by 2063 (Figure). If this scenario takes place it is also logical to speculate what effect it will have on the biodiversity of the Baltic Sea. On a global time scale, species extinctions are already above the highest rates found in the fossil record, and past climate changes were much slower than those anticipated for the 21st century. Even so, slow rates of change in the past drove significant ecosystem shifts and mass extinctions of species.

What consequences could a temperature increase of 2 degrees have on Baltic Sea ecosystems?

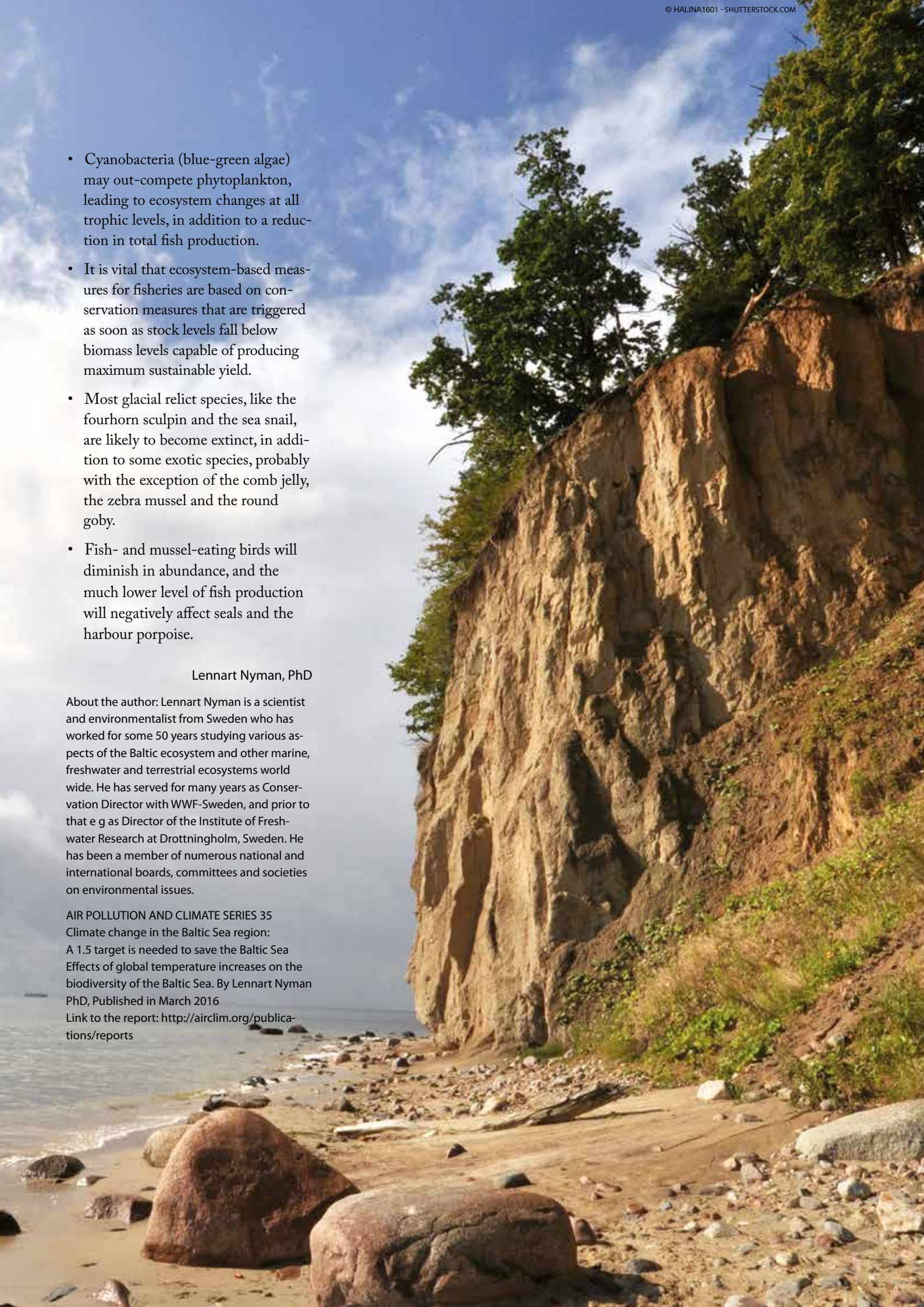
Any sustained temperature increase in the Baltic will favour warm-water species and be harmful to cold-water species. A decrease in salinity, which is a likely side effect, will induce further stress in marine species, and changes in the oxygen concentration and pH are other climate-driven parameters that have profound effects on ecosystems. Those four factors will shape ecosystems in the Baltic Sea. Another factor mainly influencing human settlements and industries is the projected sea-level rise, the extent of which is still debated.

- The sea-level rise will increase erosion of coastal ecosystems, mainly in the southern and eastern Baltic Proper. Even with an ambitious climate policy, sea levels are projected to increase by 20 to 60 centimetres by the end of this century.
- Basically, marine species at all trophic levels, including fish, will be negatively affected. These effects will be most pronounced in the northernmost parts of the Bothnian Bay, in the Gulf of Finland and in shallow coastal waters of the Baltic states, Poland and Germany.
- Logically, warmer and less saline water will benefit almost all freshwater species, but species that are dependent on low temperatures will become less abundant
- There may be increased production of cyanobacteria (blue-green algae), which will influence both biomass and the composition of benthos (bottom-living organisms), phytoplankton, zooplankton and fish communities negatively.
- Few exotic organisms will benefit from this moderate temperature increase, with the exception of the comb jelly, which on the other hand is capable of changing the entire marine ecosystem, as it has done in the Black Sea.
- Freshwater fish such as pike, pikeperch and perch may extend their ranges and increasingly support local coastal fisheries.
- On the other hand, stronger fishing quota restrictions must be applied to species such as cod, herring and sprat, and possibly also include a ban on off-shore fisheries targeting salmon and sea-trout. Otherwise, wild salmon populations in the Baltic Proper will face severe survival problems.
- Reduced availability of mussels and other benthic micro- and macro-invertebrates as well as small shallow-water fishes may limit access to food for birds that rely on these resources. Such species include cormorants, long-tailed ducks, guillemots, eider ducks, terns, gulls, mergansers and common golden-eyes.
- Decreased winter ice cover in the Baltic Sea will disfavour the reproduction of ringed seals.

What consequences could a temperature increase of 4 degrees have on Baltic Sea ecosystems?

It is hardly unexpected that this temperature increase will have much more severe impact on present day ecosystems in the Baltic Sea. Let us hope that this scenario will never take place. Below I have summarized what I believe might happen.

- Coastal erosion and flooding of low-lying shore areas will impact human settlements, industries and present coastal nature reserves. The reserves will have to be extended further inland from the present shoreline. This impact will be particularly strong in the eastern, southern and south-western parts of the Baltic Proper.
- The effects of this level of temperature increase depend on factors such as future discharge of nutrients, salinity and oxygen levels, but it is likely that the entire biomass of fish will diminish so much that open-sea fisheries will come to an end. Local coastal fisheries may still operate though.



- Cyanobacteria (blue-green algae) may out-compete phytoplankton, leading to ecosystem changes at all trophic levels, in addition to a reduction in total fish production.
- It is vital that ecosystem-based measures for fisheries are based on conservation measures that are triggered as soon as stock levels fall below biomass levels capable of producing maximum sustainable yield.
- Most glacial relict species, like the fourhorn sculpin and the sea snail, are likely to become extinct, in addition to some exotic species, probably with the exception of the comb jelly, the zebra mussel and the round goby.
- Fish- and mussel-eating birds will diminish in abundance, and the much lower level of fish production will negatively affect seals and the harbour porpoise.

Lennart Nyman, PhD

About the author: Lennart Nyman is a scientist and environmentalist from Sweden who has worked for some 50 years studying various aspects of the Baltic ecosystem and other marine, freshwater and terrestrial ecosystems world wide. He has served for many years as Conservation Director with WWF-Sweden, and prior to that e g as Director of the Institute of Freshwater Research at Drottningholm, Sweden. He has been a member of numerous national and international boards, committees and societies on environmental issues.

AIR POLLUTION AND CLIMATE SERIES 35
Climate change in the Baltic Sea region:
A 1.5 target is needed to save the Baltic Sea
Effects of global temperature increases on the biodiversity of the Baltic Sea. By Lennart Nyman PhD, Published in March 2016
Link to the report: http://airclim.org/publications/reports

Consumption emissions:

How to account for emissions of greenhouse gases from imported goods?

Carbon emissions have dropped in many rich countries, Sweden among them. Or is it just that the emitting industries have moved to China? A technical discussion is getting intensely political.

Sweden's greenhouse gas emissions dropped by 22 per cent between 1990 and 2013, as reported to the climate convention. But what if emissions caused by imported goods are included? Would there be no emissions drop or an even bigger drop? Results go in all directions, and are of interest far beyond academia.

In April 2015, the Swedish Environmental Agency, SNV, claimed that if consumption-induced emissions are added to the emissions from Swedish territory, the results are as follows:

	1990 million tonnes CO_2eq.	2012 million tonnes CO_2eq.
Emissions from Sweden	54.13	37.81
From consumption	46	68.67
Total	100.13	106.48

So in reality, Sweden's emissions increased instead of decreasing! That, at least, was the Swedish media take on the SNV press release. (There is no actual report, just a few html pages.)

Other reports have come to different conclusions.

According to Glenn Peters et al., Sweden imported less CO_2 in 2008 than in 1990. This means that the emission cuts, so far, were real (although data quality for the early 1990s is poor).

Astrid Kander et al., write: "Several European countries – Sweden, France, Ireland and Austria – are large net importers of embodied carbon emissions according to CBA (consumption-based accounting), but are instead net exporters when the carbon footprint is adjusted for technology differences in exports". This also means that emission cuts are real. (The technology element is explained below.)

The studies disagree.

Accounting for CO_2 emissions in a nation is (relatively) simple. Production and import data for fossil fuels are collected for administrative reasons.

Consumption-based emissions are much harder to measure. Look at a mobile phone. Parts and materials come from all over the world, using thousands of different technologies, each of them ranging from the best available technology to the worst current technology. A serious effort would result in an ocean of data, but still with a high degree of uncertainty regarding emissions.

A bottom-up approach is impractical. Indirect emissions have to be modelled as products of trade volumes in money and greenhouse gas intensities. The data is aggregated, so for example "chemical industry" can include GHG-intensive production (fertilizer, chlorine) and the low-emitting pharmaceutical industry.

There are three reasons why greenhouse

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gases are reported as they are to the Climate Convention. First, the reports present a picture of a nation's emissions and trends, which is useful even if it is not the whole truth. Second, there is no cheating because there is an agreed methodology. This is quite an achievement. Third, the emissions within a country are roughly within its own control: a government can influence energy standards for buildings, tax on petrol, push down coal power emissions through environmental legislation etc.

This was good enough for an agreement on the Kyoto protocol in 1997 and later for burden sharing within the EU. In all probability it will be the base for a Paris agreement in 2015.

There are however flaws, which are easy to spot.

Some countries have carbon-intensive production, and thus high emissions, whereas others have less emissions but import goods produced in the former countries. The geography is not fair. Nations that increase their exports of steel, cement, aluminium and silicon should be encouraged to do so if they can produce them with lower emissions than the world average, as this decreases global emissions. Conversely, nations that close down dirty industries but import more and more materials produced by dirty industries in other countries actually add to global emissions, and should have stricter climate targets.

There is also a historical disparity. Some countries have a tradition of high-emitting industry. Industrial structure can change but usually not very fast.

The consumption-based view as presented by SNV above does not take exports into consideration, but adds territorial emissions to imported emissions. This obviously overstates Sweden's GHG global footprint.

Less obviously, it misrepresents what kind of economy Sweden is, what has been achieved and what has not. In greenhouse terms, Sweden is not a "services economy". It produces very large amounts of iron ore, ore-based steel, paper and pulp, oil refinery products, cement, copper, aluminium etc., much of it for export. It is also a big net exporter of power. It imports a mix of products, many of which are not very GHG-intensive.

A popular notion is that dirty industries have moved to China, while consumption of imported goods from China is increasing in the OECD, including Sweden. But is that a fact?

After all, the heavy CO_2 emitters in Sweden – oil refineries and producers of cement, lime, steel, paper and pulp – have not moved abroad. They are still in Sweden. They have invested and have stepped up their production.

The decarbonization of heat and electricity in Sweden, which is the main explanation for the reported emissions decrease, is no statistical artifact. It is real. The increasing export of electricity, from wind and biomass, in recent years has also led to less use of coal power in neighbouring countries. There have also been real improvements in some industries.

If the models do not represent this, they are not very useful. It is hard to conceive that the present system should be switched to consumption-based accounting (CBA), but it could be used to complement it.

The models are so far not good enough, but if they can be improved they would be useful for evaluating the performance of different countries, for their national targets, which in the long run will also influence international negotiations.

Kander et al. propose a "technology adjusted" CBA, which would be a great improvement. An example: the Swedish pulp industry uses less fossil fuel than its competitors, and also less than it used to. Higher exports of pulp and paper will, all other things being equal, decrease world emissions.

It is difficult to change the method of accounting, but it would be welcome to add a note about how consumption and exports contribute to our GHG footprint, and whether our heavy industries are really best-in-class and improving at a reasonable rate.

International transport is not included in the emission total, though such data are attached. This is of course not good, as trade and travel cause substantial and increasing emissions. But there is a reason: aeroplanes and ships are fuelled where it is convenient. It has little to do with the destination for goods and people. If a simple attribution formula for international transport could be negotiated, it would be a good thing, but this is perhaps not high on the agenda.

The underlying assumption of any climate negotiation is the "contract and converge" notion, aiming for a smaller and more equal per capita footprint. But if every nation aims for the same per capita emissions, some have to work much harder than others, for geographical and historical reasons. Norway can produce all its electricity from hydropower, whereas Denmark has no hydro. On the other hand Denmark is densely populated, which makes cycling and public transport easier than in mountainous Norway. Differences cancel out over larger areas, and if they don't there is the option to trade between nations, at a probably modest cost.

The geographical problem can be mitigated very much by pooling resources, not necessarily through mechanisms in the Kyoto Protocol. Denmark is the world champion of wind power and gets 40 per cent of its electricity from wind. This is possible because it can balance surpluses and deficits through trade with Norway and Sweden. If there is a will, there is a way.

Anyway, differences can be acknowledged in climate negotiations, as they were in the Kyoto Protocol and in EU burden sharing, and more recently in the US-China climate agreement and other national commitments. These reflect common but differentiated responsibilities.

It is not possible to capture everything in one formula.

The problem may also be decreasing. The historical and geographical excuses for special treatment and high emissions are becoming less and less credible. New production methods or power plants look pretty much the same everywhere in the world.

Fredrik Lundberg

1. http://naturvardsverket.se/sv/Sa-mar-miljon/Statistik-A-O/Vaxthusgaser--utslapp-av-svensk-konsumtion/ (in Swedish)

2. Growth in emission transfers via international trade from 1990 to 2008, www.pnas.org/cgi/doi/10.1073/pnas.1006388108 Excel appendix

3. National greenhouse gas accounting for effective climate policy on international trade, Nature Climate Change, May 2015, DOI:10.1038/NCLIMATE2555

Member states opt for weakening air pollution targets

Compared to the Commission's proposal, the relaxed targets agreed by member states could result in an additional 130,000 premature deaths by 2030.

By watering down proposed new air pollution targets, EU environment ministers chose not to grasp the opportunity on 16 December to prevent several thousands of annual premature deaths in Europe. The Council position thereby weakens significantly the ambition level of the revised National Emissions Ceilings (NEC) directive proposed by the European Commission and supported by the European Parliament (see AN 4/2015).

In the Commission's proposal, premature mortality from air pollution would by 2030 be reduced by 52 per cent, compared to the base year 2005. The Council's position lowers this to 48 per cent – just six percentage points more than would anyway be achieved under business as usual. Compared to the Commission's proposal, the Council's relaxed targets have been estimated to result in an additional 16,000 annual premature deaths in 2030.

Moreover, member states removed the ozone precursor methane completely from the directive and introduced a variety of additional flexibilities in order to make it easier for them to comply. The Commission already included three flexibilities in its original proposal, and the Council has now added five more.

A recent paper by a coalition of environmental organisations has strongly criticised these flexibilities, claiming that they will result in higher emissions; delayed reductions; more avoidable deaths and environmental damage; more unnecessary administration; and an unenforceable directive.

Because flexibilities are usually based on complex rules and methodologies, they are confusing to the public, media, local authorities and business, thereby undermining both the effectiveness and legitimacy of the legislation. This complexity also increases the risk of abuse by member states, which raises the question of whether the Commission has the willingness and capacity to ensure effective enforcement.

Looking at the specific Emission Reduction Commitments (ERC) for each member state, the countries want to lower 77 of the 140 targets for 2030, while agreeing to keep 52 at the level proposed by the Commission, and offering more ambitious targets in just 11 cases (see Table).

At the bottom of the league among member states we find Denmark, Bulgaria, Greece and Romania, who all have chosen to weaken their ERCs for all five pollutants, while Italy and the UK want lower targets for four owf the pollutants.

In contrast, Finland accepts all its targets, closely followed by Belgium, Netherlands and Sweden, which stick to four out of the five targets. As icing on the cake, Finland

Table 1: Country-by-country emission reduction targets for 2030 in per cent as compared to the base year 2005. (COM = Commission's proposal, as adjusted in early 2015; Council = Council's general approach as adopted in December 2015).

	SO_2		NO_x		VOC		NH_3		$PM_{2.5}$	
	COM	Council	COM	Council	COM	Council	COM	Council	COM	Council
Austria	–41	–41	–71	–71	–40	–36	–18	–18	–49	–46
Belgium	–66	–66	–59	–59	–35	–35	–13	–13	–41	–38
Bulgaria	–93	–88	–63	–58	–69	–42	–18	–9	–66	–41
Croatia	–86	–82	–62	–57	–50	–48	–23	–23	–62	–55
Cyprus	–95	–93	–70	–55	–50	–50	–21	–20	–78	–70
Czech Rep.	–73	–66	–64	–64	–50	–50	–38	–22	–50	–60
Denmark	–62	–52	–66	–58	–49	–37	–32	–24	–56	–41
Estonia	–72	–68	–46	–30	–28	–28	–1	–1	–41	–41
Finland	–34	–34	–47	–47	–48	–48	–15	–20	–34	–34
France	–77	–75	–69	–69	–52	–52	–23	–13	–56	–56
Germany	–57	–58	–64	–64	–35	–24	–38	–29	–42	–42
Greece	–92	–88	–69	–50	–64	–62	–31	–10	–71	–45
Hungary	–73	–73	–66	–66	–58	–58	–43	–25	–64	–48
Ireland	–82	–85	–71	–69	–32	–32	–10	–5	–39	–41
Italy	–71	–71	–68	–65	–49	–46	–22	–14	–54	–40
Latvia	–42	–46	–41	–34	–42	–38	3	–1	–46	–43
Lithuania	–65	–60	–51	–51	–47	–47	–2	–10	–48	–35
Luxembourg	–45	–45	–85	–82	–49	–41	–24	–22	–43	–40
Malta	–95	–95	–79	–79	–27	–27	–24	–24	–76	–50
Netherlands	–58	–58	–61	–61	–22	–15	–21	–21	–40	–40
Poland	–77	–69	–51	–39	–55	–26	–22	–22	–46	–46
Portugal	–83	–83	–61	–61	–44	–38	–19	–14	–68	–51
Romania	–92	–85	–62	–57	–67	–43	–28	–22	–69	–39
Slovakia	–82	–82	–48	–48	–32	–32	–43	–30	–63	–40
Slovenia	–88	–91	–65	–65	–59	–53	–26	–15	–76	–58
Spain	–87	–87	–66	–62	–39	–39	–21	–16	–62	–50
Sweden	–14	–22	–66	–66	–39	–36	–17	–17	–17	–19
UK	–89	–87	–74	–72	–39	–39	–24	–11	–53	–45
EU28	**–81**	**–78**	**–65**	**–62**	**–46**	**–40**	**–25**	**–18**	**–51**	**–45**

has opted for a tougher target for ammonia, and Sweden has opted for tougher targets for both sulphur dioxide and $PM_{2.5}$.

For the EU as a whole, ammonia is the pollutant for which the ambition level has been downgraded the most, by seven percentage points. This is particularly remarkable as the emission cuts achieved so far for ammonia have been very modest compared to those for the other four pollutants, and even more so when considering that the proposed reduction target for 2030 is much less ambitious than for the other pollutants.

According to the European Environmental Bureau (EEB), Denmark, Romania, Poland, Italy, Spain, the UK and Bulgaria have been particularly vociferous in calling for lower emissions reduction targets, and some member states, such as France and Germany, seem preoccupied with protecting large-scale industrial farming, which produces high ammonia emissions that are responsible for around 30,000 of these deaths, rather than protecting their citizens.

The EEB has calculated that approximately 130,000 EU citizens could die prematurely in the coming years if the air pollution ERCs are weakened in line with the Council's position. The figure represents the cumulative extra deaths between 2016 and 2030, and has been derived by assuming a linear emission reduction from 2016 to the target year 2030.

Commenting on the Council's position, Louise Duprez, senior air quality policy officer at the EEB, said: "It is astonishing that governments are pushing for weaker laws which would kill even more of their own citizens. The industrial farming lobby has been fighting tooth and nail to weaken these laws – first by trying to exclude methane, and then by undermining ammonia targets. Why should one sector receive special treatment, when air pollution affects us all?"

Representatives of all three institutions (Council, Parliament and Commission) began negotiations in late February with the aim of reaching a final compromise by June 2016.

Christer Ågren

The NGO paper on flexibilities can be downloaded from: http://www.eeb.org/index.cfm/library/flexibilities-in-the-national-emission-ceilings-nec-directive-undermining-effective-law-making/

The EEB's press release on calculation of cumulative premature deaths can be found at: http://www.eeb.org/index.cfm/news-events/news/analysis-over-100-000-eu-citizens-could-die-because-of-member-states-push-for-weaker-air-quality-laws/

The EU should phase out fossil gas

AirClim has published a new report analyzing the gas industry.

AirClim has published a new report (1) about the need to phase out the use of fossil gas as soon as possible in order to meet the climate targets agreed at the UN Paris Climate Conference in December 2015.

Unfortunately the EU has not yet adopted the energy strategy that would enable it to fulfil this agreement. One example is that in February 2016 the European Commission continued to promote fossil gas and proposed its so-called "security of supply" package, which included a Liquefied Natural Gas (LNG) and Gas Storage Strategy and a proposal for the revision of the Gas Security of Supply (SoS) Regulation. These include legal proposals on security of gas supply, requiring member states to help their neighbours during severe crises, and on energy supply agreements between non-EU and EU countries, giving the Commission oversight powers.

The EU said in a press release that the Union needs more gas infrastructure and gas imports even if it meets its climate and clean energy goals, and that an expected expansion of around 50 per cent in LNG supply in the coming years presents a "major opportunity" for Europe to improve gas security and resilience.

Climate Action Network Europe said that "the main problem with the gas documents is that the EU does not factor in the positive impacts of energy savings and the further development of renewable energy sources on gas demand". "The gas package proposal fails to recognise that renewables and energy efficiency can secure Europe's energy supply. It defies the commitments taken under the Paris climate agreement last December," said CAN Europe.

Greenpeace EU said: "It's like the Paris agreement never happened and the Commission is stuck on gas, dishing out a costly proposal that will keep Europe hooked on energy imports. It is high time Europe embraces the renewable energy transition. Only if it focuses on renewables and energy efficiency will Europe meet its climate targets and reduce its dependence on foreign energy supplies".

One of the countries in Europe promoting the use of fossil gas is Norway, and its industry is planning to increase production of its own fossil fuels, including fossil gas. As one of the biggest oil and gas producers in the world it intends to expand production in some of the riskiest and most environmentally sensitive areas. In January 2016, Norway issued 56 new licenses to allow 36 companies to explore areas around the Lofoten Islands, in the North Sea and Barents Sea.

Brussels Airport is a symbol for the strong lobbying of Norway and its industry to promote fossil gas use in Europe. Passengers arriving by plane at the airport are bombarded with slogans at the gangways advertising gas from Norway. Hopefully the days of such greenwashing are numbered.

Reinhold Pape

About the author: Fredrik Lundberg is an energy policy specialist in Sweden. He has worked for many years as a consultant and researcher for NGOs and government bodies.

AIR POLLUTION AND CLIMATE SERIES 34
Phasing out fossil gas, By Fredrik Lundberg, Published in March 2016Link to the report: http://airclim.org/publications/reports

Sanctions missing for ship sulphur sinners

Efficient control and enforcement needed to ensure compliance.

In the first year of stricter standards in the Sulphur Emission Control Areas (SECA) of the Baltic Sea, the North Sea and the English Channel, Swedish authorities took 441 ship fuel oil samples. They discovered 15 violations of the sulphur limit, but none of these resulted in fines or other types of sanctions.

According to Caroline Petrini, an environmental expert and legal assistant at the Swedish Transport Agency, the problem lies with the Swedish criminal law that requires solid evidence that the non-compliance was intentional. As it is not possible to investigate any infringement after the ship has left the port, which is usually the case, since analysis of the fuel sample takes two to three days, it was decided by the prosecutor not to initiate further investigations of the reported instances.

By using environmental legislation instead, the authority could issue a fine on the spot, which has led the Swedish Transport Agency to propose changing the jurisdiction from criminal law to an administrative fine.

The idea is that inspectors can use hand-held fuel sampling equipment to get an indication of whether the sulphur level is exceeded. If non-compliance is suspected, an administrative fine can be issued. Then the ships must put up collateral in the form of a deposit until a detailed fuel analysis has been done in a laboratory, and if the analysis results show that the sample exceeds the permitted levels, the deposit will be used for payment of the fine. If the sample shows that everything is in order, the deposit will be paid back.

However, until the new system is agreed and put into practice, there is very little risk for ships using non-compliant fuel to be fined in Sweden.

In comparison, the Norwegian authorities in 2015 issued three fines out of eleven measurements that showed too high a sulphur content, while Denmark is still working on convicting its first sulphur sinner.

On 5 January, the Danish Environmental Protection Agency and the Danish Maritime Authority published an action plan for 2016 on efficient enforcement of regulations on ships' sulphur emissions.

The stated goal of the new Danish action plan is to further pursue the experiences gained in 2015 through surveillance from the air and control in ports. It is noted that collection of data from various sources will be needed to enable all SECA countries to improve their enforcement, and that international cooperation in the EU and the IMO as well as in the networks established between the SECA countries must be extended.

"Until now, surveillance has shown that only very few ships violate the regulations. This is positive. But, there is still a need for efficient control and enforcement in both Denmark and the other SECA countries," said Michel Schilling, vice director of the Danish EPA.

Christer Ågren

Sources: ShippingWatch 9 February 2016 and press release from the Danish Environmental Protection Agency 5 January 2016 (www.dma.dk).

New rules on emissions from medium combustion plants adopted

Despite a widespread agreement on the urgent need to cut emissions to improve air quality, existing installations are given very generous transition periods.

On 10 November 2015, the Council adopted a new directive to limit the emissions from medium-sized combustion plants, i.e. those with a thermal input of between 1 and 50 megawatts (MW). The new rules result from the Clean Air for Europe programme, which was presented by the Commission in December 2013 and aims at improving air quality in the EU.

While air pollutant emissions from new combustion plants smaller than 1 MW are covered by the Ecodesign Directive and those from existing and new plants bigger than 50 MW are covered by the Industrial Emissions Directive (IED), the emissions from medium combustion plants were not previously regulated at EU level.

Medium combustion plants (MCP) are used for a wide variety of purposes, including heating and cooling, electricity generation and providing steam for industrial processes. The approximate number of medium combustion plants in the EU is over 140,000.

The new directive sets specific emission limit values (ELVs) for the three air pollutants sulphur dioxide (SO_2), nitrogen oxides (NOx) and dust (see table), with different deadlines depending on the age and size of plants.

Table : Emission limit values expressed as milligrams per cubic metre (mg/m3) for medium combustion plants other than engines and gas turbines.

	Existing plants 1–5 MW			Existing plants 5–50 MW			New plants 1–50 MW		
	SO_2	NO_x	Dust	SO_2	NO_x	Dust	SO_2	NO_x	Dust
Solid biomass	200	650	50	200	650	30	200	300	20
Other solid fuels	1100	650	50	400	650	30	400	300	20
Gas oil	-	200	-	-	200	-	-	200	-
Liquid fuels other than gas oil	350	650	50	350	650	30	350	300	20
Natural gas	-	250	-	-	200	-	-	100	-
Gaseous fuels other than natural gas	200	250	-	35	250	-	35	200	-

Note that there are a number of derogations from the ELVs given in the table, e.g. existing plants between 5 and 20 MW burning "other soild fuels" are allowed higher emissions of SO_2 (1100 mg/m_3) and dust (50 mg/m_3); those burning "liquids other than gas oil" are allowed higher emissions of SO_2 (850 mg/m_3); and new plants smaller than 20 MW are allowed higher emissions of dust (50 or 30 mg/m_3). Note also that the ELVs in the table apply to "combustion plants" – the directive sets separate ELVs for existing and new "engines and gas turbines".

For new plants, the deadline is after a transposition period of two years following entry into force of the directive, i.e. as from 20 December 2018.

Existing plants are defined as those put into operation before 20 December 2018. For bigger existing plants (5–50 MW), the emission limit values apply from 1 January 2025 and for smaller existing ones (1–5 MW) from 2030.

Extended compliance deadlines until 2030 may be granted to some plants, such as district heating systems, plants that burn biomass as their main fuel, plants in small isolated systems and plants linked to a national gas transmission system. Moreover, member states may exempt MCPs operating for less than 500 hours per year – in some cases they may exempt plants operating for less than 1000 h/yr – provided that the plants still comply with some minimum (safeguard) ELVs for dust.

The directive also requires member states to set up a register over their medium combustion plants. New plants, i.e. those put into operation after 20 December 2018, are to be permitted or registered before operation. Existing MCPs greater than 5 MW are to be covered by 1 January 2024, while smaller existing plants (1–5 MW) have until 1 January 2029.

Since the directive sets minimum standards, member states are free to maintain or introduce more stringent ELVs. For example, in areas not complying with the EU's air quality limit values, member states shall – as part of the development of air quality plans – assess the need to apply stricter ELVs than those set out in the directive.

By January 2020, the Commission shall review progress regarding the energy efficiency of MCPs and assess the benefits of setting minimum energy efficiency standards in line with best available techniques. And by January 2023, the Commission shall review the ELVs for new plants, on the basis of state-of-the-art technologies. As part of this review, the Commission shall also assess if there is also a need to regulate CO emissions from MCPs.

Christer Ågren

Note: The full name of the new directive is: Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants.

Source: Press release from the Council, 11 November 2015.

Link: http://www.consilium.europa.eu/en/press/press-releases/2015/11/10-medium-combustion-plants/

Cutting meat and dairy intake is beneficial for health, the environment and climate

Halving the consumption of meat and dairy in the EU would cut agricultural nitrogen losses by more than 40 per cent and GHG emissions by 25–40 per cent.

A new research report quantifies how much reducing meat and dairy in our diets would cut agricultural pollution of the air and water. It also considers the health benefits of lowered meat and dairy consumption.

Livestock production in the EU is the cause of around 80 per cent of the nitrogen losses from agriculture – losses that cause a number of environmental problems, including eutrophication of ecosystems from excess nutrient nitrogen, health damage from air pollution, and enhanced global warming. The high consumption of meat, dairy products and eggs in the current European diet leads to an intake of saturated fat and red meat that exceeds health recommendations.

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Halving the current consumption of meat and dairy in the EU would not only have considerable direct health benefits through changes in food consumption patterns, but would also reduce agricultural nitrogen losses by more than 40 per cent and greenhouse gas emissions from agriculture by 25–40 per cent.

These are some of the conclusions of the report "Nitrogen on the table", which was presented at an event in the European Parliament in mid-January. The study was prepared by an international group of researchers engaged in the Task Force on Reactive Nitrogen of the Convention on Long-range Transboundary Air Pollution.

According to the report, around 80 per cent of the total emissions of ammonia, nitrates and nitrous oxide from EU agriculture are related to livestock production, including the emissions from feed production (e.g. cereal and fodder crops). The study investigates the effects of a 25 to 50 per cent reduction in the intake of meat and dairy on human health and the European environment.

Reducing the consumption of meat and dairy would result in food consumption patterns that are better aligned with international dietary recommendations and lower the prevalence of cardiovascular diseases and colorectal cancer. However only the most radical change investigated – a 50 per cent reduction in all meat and dairy consumption – brings the average intake of saturated fats within a range recommended by the World Health Organization (WHO). This scenario is also the only one in which the average intake of red meat is reduced to only slightly above the maximum recommended by the World Cancer Research Fund (WCRF).

Lower consumption of meat and dairy products, accompanied by a proportional reduction in livestock production in the EU, would reduce nitrogen losses and greenhouse gas emissions as well as the area of land use per EU citizen. In the case of a 50 per cent reduction in all meat and dairy, nitrogen losses would come down by around 40 per cent. In particular, ammonia emissions would be reduced, as these are highly related to livestock production, whereas both livestock and arable field-based activities contribute large amounts of nitrous oxide and nitrate emissions. Greenhouse gas emissions from agriculture would be cut by 25–40 per cent.

Reductions in meat and dairy production would also free up large areas of farmland for other purposes such as food export or bioenergy crops.

The authors conclude that reductions in reactive nitrogen emissions will have benefits not only within the EU but at continental and global scales, because both atmospheric ammonia and nitrates in water-bodies cross national frontiers and contribute to international pollution. The reduced emissions of the greenhouse gases methane, nitrous oxide and carbon dioxide are relevant both at EU level and globally.

It is noted that the EU Common Agricultural Policy could help to transform the current agricultural system into one that sustains healthier dietary choices and has lower environmental impacts. If livestock farmers were rewarded by retailers and consumers for higher environmental and animal welfare standards, the economic impact on the livestock sector could, to some extent, be mitigated.

Christer Ågren

The report "Nitrogen on the Table: The influence of food choices on nitrogen emissions and the European environment" is published by the Centre for Ecology & Hydrology, Edinburgh, UK, as a special report of the European Nitrogen Assessment. Link: http://www.clrtap-tfrn.org/webfm_send/592

Sector targets for aviation and shipping wanted

In the absence of additional action, international shipping and aviation will be responsible for close to 40 per cent of global CO_2 emissions by 2050.

Global greenhouse gas emissions grew by 25 per cent between 1990 and 2010, from approximately 40 to almost 50 billion tonnes of CO_2 equivalents. In the same time period, emissions from international aviation and shipping increased by 70 per cent, nearly three times faster.

As a result, international transport increased its share of global CO_2 emissions from 2.2 per cent in 1990 to 3.1 per cent in 2010. Not included in these numbers is the fact that that emissions from aviation also impact cloud formation, ozone generation and methane reduction, and these effects increase the impact of aviation on climate change by a factor of at least two.

A recent study prepared for the European Parliament provides an overview of potential CO_2 mitigation targets for international aviation and shipping, and analyses which targets would be compatible with a global long-term goal of keeping temperature increase below 2°C compared to pre-industrial levels.

According to the study, initiatives and actions by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to address greenhouse gas (GHG) emissions, started late and are clearly insufficient. In the long run, measures proposed by IMO and ICAO will mitigate the growth in CO_2 emissions from the two sectors, but not lead to absolute emission reductions.

If efforts in aviation and shipping continue to lag behind those in other sectors, their shares of total global CO_2 emissions are expected to rise substantially. In the baseline scenario they would reach 22 per cent for aviation and 17 per cent for shipping by 2050. Together these two sectors would then be responsible for almost 40 per cent of global CO_2 emissions. If all technological and operational improvements deliver the expected results, the sectors would still be responsible for 25 per cent of the global permissible CO_2 emissions of a 2°C path.

The study investigated several possible mitigation targets, ranging from a somewhat lowered increase in future emissions, over stabilisation at 2020 levels, to full decarbonisation by 2050. While achieving full decarbonisation within 30 years may seem unrealistic, stabilising emissions at 2020 levels (i.e. carbon neutral growth as from 2020) is clearly not enough.

It was calculated that to stay below a 2°C temperature increase, aviation emissions in 2030 should not exceed 39 per cent of 2005 emission levels, and by 2050 they should be 41 per cent lower than in 2005. Shipping emissions should be 13 and 63 per cent lower in 2030 and 2050, respectively, compared to 2005 levels. If non-CO_2 impacts are also included, these targets would need to be even more stringent.

According to the study, these reduction targets are unlikely to be achieved by purely technological and operational improvements within the sectors. Additional measures will be needed, such as encouraging behavioural change that leads to reduced demand for international transport services and enabling offsetting of transport emissions by financing emission reductions in other sectors. Moreover, it is pointed out that the non-CO_2 climate impacts of aviation in particular will not be reduced if fossil fuels are replaced by hydrocarbons extracted from renewable sources. Only electric propulsion, demand reduction or offsetting remaining emissions will enable full decarbonisation of the aviation sector.

The International Council on Clean Transportation (ICCT) has shown that bigger reductions in shipping emissions are possible by more widespread application of existing best technologies and practices. If all ships were to achieve the energy efficiency of the top five per cent of the current fleet by 2035, global emissions from international shipping would decline despite the increased growth in demand. The most important measure for achieving such improved efficiency is designing for and operating at lower speeds.

Since the Paris agreement of the Framework Convention on Climate Change did not include provisions on limiting emissions from international aviation and shipping, the initiative still rests primarily with ICAO and IMO.

Christer Ågren

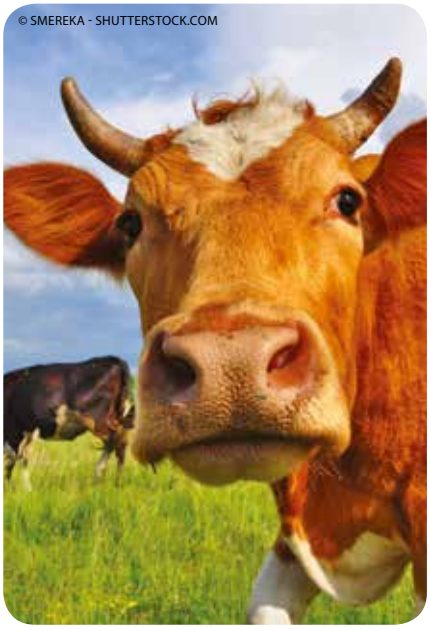
The report "Emission Reduction Targets for International Aviation and Shipping" (November 2015) was prepared by Ökoinstitut for the European Parliament's Environment Committee, and is available at: http://www.europarl.europa.eu/studies.

Livestock causes 80% of agriculture emissions

Livestock production is the dominant cause of EU agriculture's impact on climate change, air pollution and biodiversity loss, EU-funded research has found. Its contribution is 78 per cent for terrestrial biodiversity loss, 80 per cent for soil acidification and air pollution (ammonia and nitrogen oxides emissions which contribute to the formation of particulate matter and tropospheric ozone with a detrimental impact on air quality), 81 per cent for global warming, and 73 per cent for water pollution (both nitrogen and phosphorus). The agriculture sector itself is one of the major contributors to these environmental impacts, ranging between 12 per cent for global warming and 59 per cent for nitrogen water quality impact.

The figure includes emissions caused by agriculture in other sectors or occurring outside of the EU territory, such as feed imports and transport, and emissions from land-use change. To address these environmental impacts, a combination of technical measures reducing emissions and land-use intensity, and demand-side measures to reduce food waste and change dietary habits is needed, according to the authors.

Source: ENDS Europe Daily, 17 November 2015. The article: "Impacts of European livestock production: nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity." By Adrian Leip et al. Environmental Research Letters 10 (2015) 115004.



Poland referred to Court for breaching the PM limit

The European Commission has referred Poland to the EU Court of Justice over high levels of dust particles that pose a major risk to public health. In Poland, the daily limit values for the airborne particles (PM_{10}) have been persistently exceeded in 35 out of 46 air quality zones for at least the last five years, including 2014. Moreover, in nine zones the annual limit values have also been persistently exceeded. In Poland, PM_{10} pollution is predominantly caused by low-stack emissions from household heating, and the measures taken so far to limit the non-compliance have been deemed insufficient. The decision follows an additional reasoned opinion, which was sent to Poland in February 2015.

Source: European Commission press release, 10 December 2015

Solar club builds up powerful alliance

A new solar power club of 122 nations has been founded in Gurgaon, India, by the Indian Prime Minister, Narendra Modi, and the French President, François Hollande – cementing an agreement the two leaders made at the Paris climate talks last December.

The idea of the International Solar Alliance (ISA), which promises a massive increase in investment in solar power in the tropics, started with the coming together of countries between the Tropic of Cancer and Tropic of Capricorn that have 300-plus days of sunshine a year.

For all of them, solar power is potentially the cheapest form of generating electricity. And the plan is to provide electricity to millions of people who do not have access to power at present, while at the same time preventing the building of dozens of power plants that burn fossil fuels.

http://www.theguardian.com/environment/2015/nov/30/india-set-to-unveil-global-solar-alliance-of-120-countries-at-paris-climate-summit

Europeans still exposed to harmful air pollution

A new report by the European Environment Agency estimates that air pollution continues to be responsible for more than 430 000 premature deaths in Europe.

Air pollution shortens people's lifespan and contributes to serious illnesses such as heart disease, respiratory problems and cancer. Between 2011 and 2013, up to 93 per cent of the EU urban population was exposed to levels of fine particulate matter ($PM_{2.5}$) exceeding the air quality guidelines established by the World Health Organization (WHO) to protect people's health. And about 98 per cent of EU urban citizens were exposed to ozone levels above the WHO's guideline value. See Table 1.

In its annual air quality report, the European Environment Agency (EEA) presents new estimates of the health impacts of air pollution based on 2012 data on concentrations and exposure. In the 40 countries considered, 432 000 premature deaths are attributed to $PM_{2.5}$ exposure and 75 000 and 17 000 premature deaths to nitrogen dioxide (NO_2) and ozone (O_3) exposure, respectively. Table 2 shows the best estimate figures for total mortality due to exposure to $PM_{2.5}$, NO_2 and O_3 per country, for all the European countries included in the analysis.

On top of the health impacts, air pollutants also have significant harmful effects on plant life and ecosystems. These problems, including eutrophication caused by excess nitrogen input (from ammonia and nitrogen oxides), as well as damage to plants and trees caused by increased levels of ozone, are still widespread across Europe.

Some key findings for the different air pollutants are summarized below.

Particulate matter (PM) can cause or aggravate cardiovascular and lung diseases, heart attacks and arrhythmias. It can also cause cancer. The EU limit and target values for PM_{10}, which should originally have been met by 2005, were exceeded widely in 2013, with the daily limit value being exceeded in 22 of the 28 member states. The target value for $PM_{2.5}$ was exceeded in 7 member states.

In 2013, a total of 17 per cent of the EU urban population was exposed to PM_{10} levels above the daily limit value and approximately 61 per cent to concentrations exceeding the stricter WHO guideline value. Regarding $PM_{2.5}$, 9 per cent of the urban population was exposed to levels above the EU target value (which changes to a limit value from 2015 onwards) and approximately 87 per cent to concentrations exceeding the stricter WHO guideline.

PM in ambient air originates both from primary particles emitted directly into the air and from secondary particles produced as a result of chemical reactions of PM precursor pollutants, namely sulphur dioxide (SO_2), nitrogen oxides (NO_X), ammonia (NH_3) and volatile organic compounds (VOCs). New research shows that PM concentrations can be considerably reduced by additional cuts in agricultural NH_3 emissions.

The benefits of improving Europe's air quality are clear – meeting the WHO air quality standard throughout the EU would lead to average $PM_{2.5}$ concentrations dropping by about one-third, resulting in 144 000 fewer premature deaths compared with the current situation.

Ozone (O_3) can cause respiratory health problems and lead to premature mortality. It can also damage vegetation, including forest trees and agricultural crops. Ozone is a secondary pollutant, formed from precursor pollutants, primarily NOx, VOCs, methane and carbon monoxide. Exposure in cities is very high – 98 per cent of EU urban inhabitants were exposed to concentrations above the WHO reference level in 2013, while 15 per cent were exposed to concentrations above the laxer EU target value. The long-term objective for the protection of vegetation from $O_3$was exceeded in 86 per cent of the total EU agricultural area, and the critical level for the protection of forests was exceeded on two-thirds of the EU forest area.

Nitrogen dioxide (NO_2) affects the respiratory system directly, but also contributes to the formation of PM and O_3. In 2013, 9 per cent of the urban population in the EU were exposed to NO_2 concentrations

Table 1: Percentage of the urban population in the EU-28 exposed to air pollutant concentrations above EU and WHO reference levels (2011–2013).

Pollutant	EU reference value (µg/m3)	Exposure estimate (%)	WHO air quality guideline (µg/m3)	Exposure estimate (%)
$PM_{2.5}$	Year (25)	9–14	Year (10)	87–93
PM_{10}	Day (50)	17–30	Year (20)	61–83
O_3	8-hour (120)	14–15	8-hour (100)	97–98
NO_2	Year (40)	8–12	Year (40)	8–12
BaP	Year (1 ng/m3)	25–28	Year (0.12 ng/m3)	85–91
SO_2	Day (125)	< 1	Day (20)	36–37
Colour coding:	< 5%	5–50%	50–75%	> 75%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above the EU standards, which are set at the same level as the WHO guidelines. The annual limit value was exceeded at one or more stations in 19 member states, with 93 per cent of all exceedances occurring close to roads.

Nitrogen oxides are also a major cause of eutrophication (over-fertilisation that may negatively affect biodiversity and cause excessive plant and algal growth in marine ecosystems) and acidification. Eutrophication is still a widespread problem – 63 per cent of EU's ecosystem areas and 73 per cent of the area covered by Natura 2000 protected sites were exposed to nitrogen deposition in 2010 that exceeded eutrophication limits.

Benzo(a)pyrene (BaP) is a carcinogen. Usually formed as a result of domestic solid fuel burning, exposure to BaP pollution is widespread, in particular in central and eastern Europe. A quarter of the EU urban population were exposed to BaP concentrations above the target value in 2013, and as much as 91 per cent were exposed to BaP concentrations above the estimated reference level based on WHO risk figures.

Sulphur dioxide (SO_2) causes acidification and contributes to PM formation. Emissions have been reduced significantly over past decades, and there were only a few exceedances of the EU limit value in 2013. However, more than one third of the EU urban population was exposed to SO_2 levels exceeding the WHO guideline.

Carbon monoxide, benzene and heavy metal (arsenic, cadmium, nickel and lead) concentrations in outdoor air were generally low in the EU in 2013, with few exceedances of the respective limit and target values set by EU legislation. However, atmospheric deposition of toxic metals into the environment contributes to the exposure of ecosystems and organisms to these and, therefore, to the risk of bioaccumulation. Depositions of mercury are estimated to exceed the critical loads in more than half of the area of sensitive ecosystems in the EU.

Commenting on the report, EEA Executive Director Hans Bruyninckx, said: "Despite continuous improvements in recent decades, air pollution is still affecting the general health of Europeans, reducing their quality of life and life expectancy. It also has considerable economic impacts, increasing medical costs and reducing productivity through working days lost across the economy."

Christer Ågren

Air quality in Europe – 2015 report. EEA Report No 5/2015. Available at: http://www.eea.europa.eu/publications/air-quality-in-europe-2015

Table 2: Estimates of premature deaths attributable to exposure to $PM_{2.5}$, O_3 and NO_2 in 40 European countries.

	$PM_{2.5}$	O_3	NO_2
Austria	6100	320	660
Belgium	9300	170	2300
Bulgaria	14100	500	700
Croatia	4500	270	50
Cyprus	790	40	0
Czech Republic	10400	380	290
Denmark	2900	110	50
Estonia	620	30	0
Finland	1900	60	0
France	43400	1500	7700
Germany	59500	2100	10400
Greece	11100	780	1300
Hungary	12800	610	720
Ireland	1200	30	0
Italy	59500	3300	21600
Latvia	1800	60	90
Lithuania	2300	80	0
Luxembourg	250	10	60
Malta	200	20	0
Netherlands	10100	200	2800
Poland	44600	1100	1600
Portugal	5400	320	470
Romania	25500	720	1500
Slovakia	5700	250	60
Slovenia	1700	100	30
Spain	25500	1800	5900
Sweden	3700	160	10
United Kingdom	37800	530	14100
Total EU28	**402660**	**15550**	**72390**
Albania	2200	140	270
Andorra	60	4	0
Bosnia & Herzegovina	3500	200	70
Iceland	100	2	0
Lichtenstein	20	1	3
Macedonia	3000	130	210
Monaco	30	2	7
Montenegro	570	40	20
Norway	1700	70	200
San Marino	30	2	0
Serbia	13400	550	1100
Switzerland	4300	240	950
Total all	**431570**	**16931**	**75220**

A new era for the debate on coal phase-out in Germany

Ökoinstitut explains how the phase-out of CO2-intensive assets should be actively managed.

2015 was not only the year of the ground-breaking climate agreement in Paris. It also marked a new era in political efforts on a more actively managed phase-out of power generation from coal and lignite mining in Germany. After the phase-out decisions on nuclear energy in 2000 and 2011 and hard coal mining in 2007 and 2011, the phase-out of lignite mining and power generation from coal was ultimately established in the German energy and climate policy arena during the course of 2015.

The complicated process that led to this situation was strongly linked to the run-up to the climate conference in Paris. It began in 2014 when the German government was no longer able to ignore the fact that the country was definitely not on course to meeting its ambitious greenhouse gas emission reduction targets for 2020. A comparative analysis of different projections showed that without additional efforts Germany would miss the emission reduction target of -40% for the period 1990 to 2020 by six to seven percentage points. The analysis also found that the country is not on track to meet its emission reduction targets of -55% by 2030, -70% by 2040 and -80 to -95% by 2050.

A significant part of the lack of progress was attributed to the power sector. The heavily coal-reliant power generation constituted a share of approx. 40% of total and greenhouse gas emissions and 45% of total CO_2 emissions in Germany. After an 18% emission reduction from 1990 to 2000, which was mainly due to the collapse and/or the modernisation of the East German economy, the emissions of the power sector stagnated more or less at levels of approx. 380 million tons of CO_2 (out of total greenhouse gas emissions of 945 million tons in 2013). Given the enormous growth in power generation from renewable energy sources, from a share of 6% in 2000 to 24% in 2013, this seems counterintuitive. A closer look at the data shows that the increase in electricity generation from renewables far exceeded the decrease in power production from nuclear power plants (by almost threefold) and that the emission trend essentially results from the huge increase in electricity exports to neighbouring countries. In other words: CO_2-intensive power generation, especially from lignite, was not substituted by the growing electricity generation from renewables but was increasingly exported, substituting (mostly cleaner) power generation in other countries. One of the crucial blind spots of Germany's energy transition (Energiewende) thus became evident: it is not sufficient to roll out clean and sustainable power options; the phase-out of CO_2-intensive assets needs to be actively managed as a complementary policy approach.

Based on this analysis, the German government had no alternative but to turn special attention on the power sector in its Climate Action Programme 2020, which was approved in December 2014. Among other policies and measures for almost all emitting sectors, the plan foresaw an emission reduction for the German power sector of 22 million tons of CO_2 beyond the projected emission reduction of 375

to 312 million tons in the policy-as-usual case. After the emissions of the power sector decreased to approx. 350 million tons in 2014 (mainly due to the warm weather of that year), the German power fleet would have needed to reduce its emissions by approx. 10 million tons annually from 2015 to 2020 and beyond in order to reach the 2020 and long-term targets.

On the basis of the Climate Action Programme for 2020, the German Ministry for Economic Affairs and Energy analysed different options and presented a proposal for a climate levy in March 2015. The concept of this mechanism was based on the finding that addressing the outdated coal fleet with a special focus on lignite plants would be the most effective and most efficient way of achieving the necessary emission cuts in the electricity sector. Lignite-based power generation constitutes approx. half of the power sector emissions and dominates the power market due to its ostensibly cheap fuel costs. The proposed mechanism consisted of adding a premium to the carbon price in the Emissions Trading System of the European Union (EU ETS) – a premium that is dependent on the age of each plant and some additional parameters (price levels on the fuel, electricity and carbon markets), essentially forming a modernisation-oriented price floor to the EU ETS. The fact that outdated and carbon-intensive power plants would have needed to pay the levy, while modern and less carbon-intensive power plants would not, would have decreased the fuel switching costs and the power price effects of the instrument significantly. In addition to this, the levy was to have been paid by cancelling the equivalent number of EU ETS allowances, thereby making a contribution to an accelerated reduction of the allowance surplus within the EU ETS.

The proposal received broad support from analysts, stakeholders, electric utilities and other sections of the policy arena but also met with enormous and extremely aggressive resistance from the three German lignite utilities, the East German coal states of Brandenburg, Saxony and Saxony-Anhalt as well as the West German coal state of North Rhine-Westphalia, the mining trade union and parts of the Social-Democratic (SPD) and the conservative CDU/CSU party alliance.

The specific situation of the vertically integrated coal mining and power generation companies became the central battlefield. The Swedish-owned Vattenfall in the Lusatian mining region, the Czech-owned Mibrag in the East German central mining region and the publicly traded RWE in the Rhenish mining region own both the open pit mines and the power plants located mostly nearby. These utilities are able to shift costs and revenues between the mines (mainly fixed and/or sunk costs) and the power plants (mostly variable costs) and presented their economic situation so that even small reductions in power generation at the oldest plants or the closure of individual outdated plants would lead to the collapse of the whole lignite system and the loss of thousands of jobs in the mining regions. Due less to the robustness of their (largely weak) argumentation and more to the emerging and (to a certain extent) new coalition between the mining trade union and the conservative party in North Rhine-Westphalia, the Social Democratic Minister for Economic Affairs and Energy watered down the planned efforts at the beginning of June 2015, essentially reflecting the political challenge arising for the Social Democrats as the close traditional ally of the mining trade unions. The ambition level of the new instrument was lowered and a range of alternative mechanisms to support energy efficiency and combined heat and power production were proposed, which are useful in principle but will hardly be able to fill the new gap in emission reductions.

On 1 July 2015 the German government rejected the proposal of the climate levy and fundamentally changed the planned course. The leaders of the ruling parties agreed on an alternative mechanism consisting of a shutdown premium for seven lignite power plant units with a total capacity of 2,700 megawatts. Given the fact that the closure of two of these units (RWE's Frimmersdorf plant units P and Q) was already planned for 2018 anyway and the shutdown premium for one unit needs to be seen as a bailout of a failed business model (Mibrag's project to transport lignite over more than 150 kilometres to the Buschhaus power plant) the decommissioning will only lead to net CO_2 emission reductions of 11 million tons, which is approximately half of the emission reduction that the power sector initially had to deliver by 2020. Instead of putting a price on carbon, the lignite utilities will receive more than 1.6 billion euro, approx. 650 million euro for Vattenfall, 800 million euro for RWE and 250 million euro for Mibrag. The polluter-pays principle has thereby been replaced by the polluter-profits principle …

The extremely intense controversy about the phase-out pathway for the German lignite industry has, however, finally destroyed the fiction that business-as-usual is still an option for the German lignite industry or that the EU ETS could deliver the necessarily steady decline in CO_2 emissions from lignite use at least for the next 15 years. In combination with the fact that the German government has committed itself to drawing up another climate plan in 2016 to outline a more robust framework towards a more or less full decarbonisation of the German energy system by 2050, the debate on the controlled coal decline in Germany has irreversibly established itself in the German policy arena.

Felix Chr. Matthes, PhD

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Explaining vehicle emissions

Why diesel NOx emissions are much too high.

A new report by the European Environment Agency (EEA) provides a non-technical guide that describes why, for certain pollutants, vehicles can emit substantially higher emissions on the road than official emissions tested in laboratories. It gives a simplified explanation of the often complex information available on road transport emissions as well as the technologies to reduce them.

Standardised measurements are made in laboratories to check that vehicles meet the official requirements for exhaust emissions. However, the testing procedures currently used in the EU are not representative of real driving conditions. For example, emissions of nitrogen oxides (NOx) from new diesel cars can be more than seven times higher in real driving conditions than in official tests. Moreover, new vehicles can emit up to 40 per cent more carbon dioxide (CO_2) than official measurements would indicate. And this gap has increased in recent years.

The report outlines three main reasons for these discrepancies:

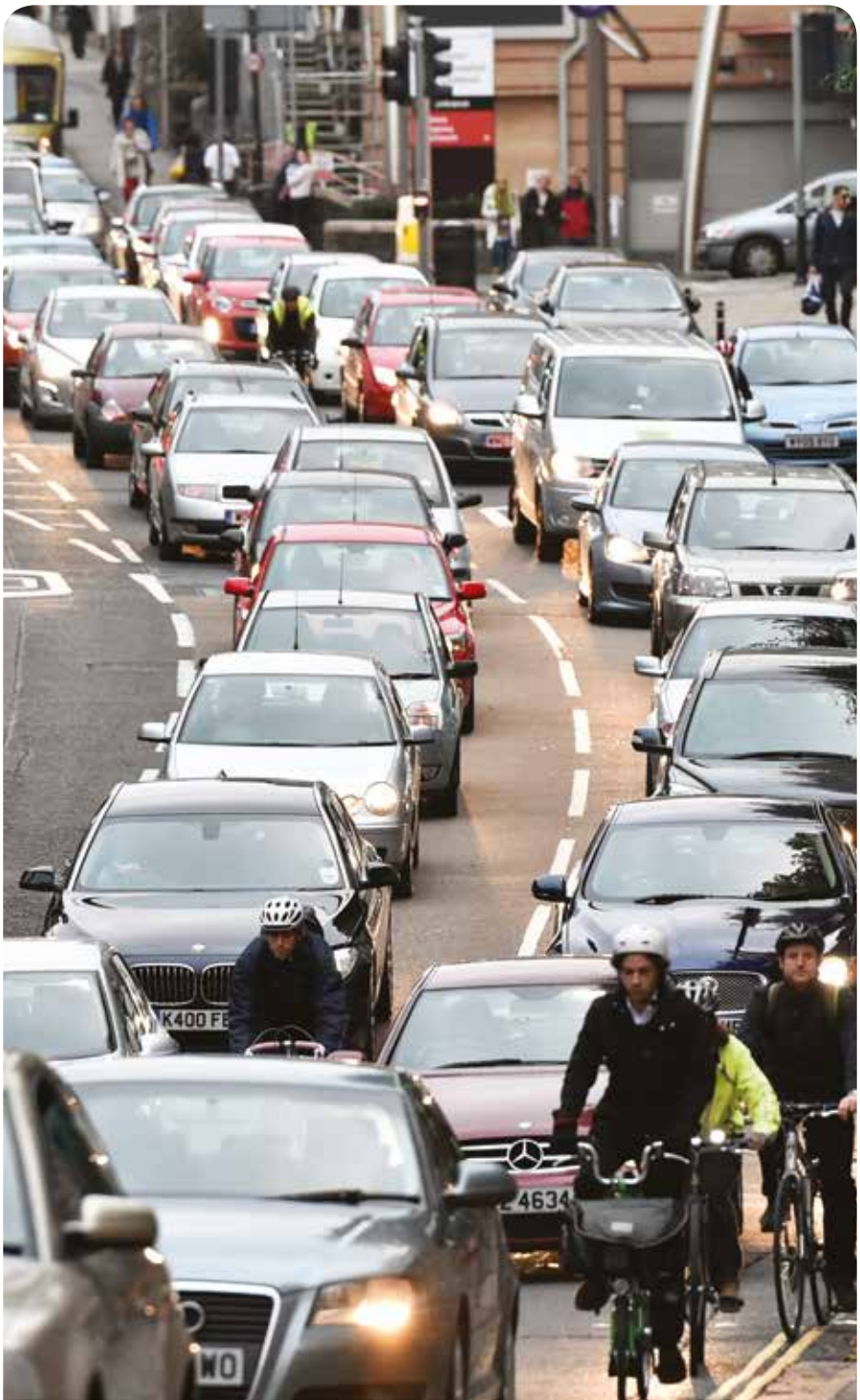
- The EU is using an outdated test procedure that does not reflect real driving conditions;
- Car manufacturers exploit the permitted flexibilities in the current test procedure to "optimise" certain testing conditions, thereby achieving lower fuel consumption and emission values;
- Various in-use factors which are driver-dependent (e.g. driving style) or independent (e.g. environmental conditions).

Work is ongoing in the EU to improve future consistency between official vehicle emissions and real driving performance. This includes changing the outdated official test procedure to one that is more representative of real driving emissions, and introducing a procedure for measuring the real driving emissions of vehicles on the road.

The European Commission is planning to introduce a new test cycle (known as the WLTP) in the EU with a focus on improving CO_2 emissions testing – the timing of this is still to be agreed.

A new real driving (RDE) procedure will measure emissions of NOx, and later also particle numbers, using portable emission measurement systems (PEMS) attached to the car. The new protocol will require the real driving emissions from cars to be lower than the legal limits multiplied by a "conformity factor". This factor expresses the ratio of on-road PEMS emissions to the legal limits. The NOx conformity factor has been set at 2.1 (i.e. 110% above the Euro 6 limit) from 1 September 2017 for new models and two years later for all new vehicles. In a second step, it will be reduced to 1.5 (i.e. 50% above the Euro 6 limit) from 1 January 2020 for new models and one year later for all new vehicles.

The report "TERM 2015, Evaluating 15 years of transport and environmental policy integration" (Dec. 2015) can be downloaded at: http://www.eea.europa.eu/publications/term-report-2015



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Health impacts of air pollution in the UK

A new study concludes that around 40,000 deaths are attributable each year in the UK to exposure to outdoor air pollution. The health problems resulting from exposure to air pollution have a high cost, adding up to more than €25.6 billion every year. The report offers a number of reform proposals to tackle air pollution. These include:

- Application of the polluter-pays principle. Political leaders at a local, national and EU level must introduce tougher regulations, including reliable emissions testing for cars.
- Local authorities need to act to protect public health when air pollution levels are high and have the power to take mitigation actions such as traffic restrictions.
- Air pollution monitoring results should be clearly and proactively communicated to the public.
- Further research into the economic benefits of air pollution mitigation policies is needed.

The report "Every breath we take: the lifelong impact of air pollution" is available at: https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution

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National record for renewable energy

Last year, on Saturday 25 July, Germany set a new national record for renewable energy by meeting 78 per cent of the day's electricity demand with renewable sources, exceeding the previous record of 74 per cent set in May of 2014. Wind and solar generated 40.65 gigawatts (GW) of power. Renewable sources accounted for 32.5 percent of Germany's power consumption in 2015, up from 27.3 percent in 2014.

http://news.yahoo.com/germany-breaks-renewable-energy-record-224630870.html

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80% reduction in US GHG in 15 years possible

The US could reduce greenhouse gas emissions from electricity generation by 80 per cent below 1990 levels within 15 years just by using renewable sources such as wind and solar energy, according to Dr Alexander MacDonald, a distinguished meteorologist, who was until recently the head of NOAA's Earth System Research Laboratory in Boulder, Colorado.

The nation could do this using only technologies available right now, and by introducing a national grid system connected by high-voltage direct current (HVDC), which could deliver the power with minimal losses to those places that needed it most, when they needed it. He and his colleagues at the University of Colorado report in Nature Climate Change that instead of factoring in fossil fuel backup, or yet-to-be-invented methods of storing electricity from wind and solar sources, they took a new look at the simple problems of supply and demand in a nation that tends to be sunny and warm in the south and windy in the north, but not always reliably so in either place.

http://www.eurekalert.org/pub_releases/2016-01/uoca-rae012216.php

UK coal closures good for climate and air quality

Of the UK's remaining 11 coal power stations, five have announced they will close this year. These five coal power stations alone emitted 32 million tonnes of CO_2 in 2014, equal to six per cent of UK greenhouse gas emissions. They also emitted 18 per cent of the country's sulphur dioxide emissions, seven per cent of the nitrogen oxides, and 527 kg of mercury. Their health damage from 2008 to 2012 was assessed by the European Environment Agency, and calculated to be between €5.5 and 17.5 billion.

The remaining six coal power stations emit even more CO_2 – equal to ten per cent of the UK's total GHG emissions in 2014. In addition, they

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emitted a further 13 per cent of the SO_2 and 11 per cent of the NOx in 2013. Their health impacts were also slightly higher, at €6.4 to 20.8 billion from 2008 to 2012.

It is for these reasons that it is necessary to ensure the UK Government legislates to phase out coal by 2025 at the latest. That is almost ten years away, which is surely plenty of time to build enough renewables, gas power stations, electricity storage, interconnectors and demand response capability, to ensure we can at last phase-out dirty coal forever.

Source: sandbag.org.uk.blog, 9 February 2016. Link: https://sandbag.org.uk/blog/2016/feb/9/uk-coal-closures-will-make-uk-cleaner-greener-plac/

CCS sidelined by public opposition

In the EU, coal power currently accounts for about one fourth of electricity generation. Although many plants are scheduled for closure, new installations could impede EU climate policy for decades. Theoretically, CO_2 from the plants could be piped by a carbon capture and storage (CCS) network into subterranean geological formations. However, the CO_2 storage Directive 2009/31/EC estimates that by 2030 only "15% of the reductions required in the Union" would be achievable by these means.

Based on the approximately 50 million tons of greenhouse gas emissions reduced in the EU annually, CCS would therefore account for a decidedly small fraction of carbon dioxide avoidance. However, the actual capture figure would be much higher. First, additional coal energy would be required for CO_2 separation, compression, and long-distance pipeline transport. Furthermore, two to three times the current greenhouse gas reductions will be necessary to limit global warming to 2°C.

Storing vast quantities of compressed carbon dioxide underground challenges the plausibility of CCS proposals. The CO_2 would have to be forced into deep geological brine formations at energies sufficient to unleash minor earthquakes. Ice Age glaciers have carved long furrows into ancient sediments throughout Northern Europe. The highly pressurized CO_2 could extrude salt water through numerous fissures into overlying strata, imperiling the drinking water supplies of future generations.

Public opposition groups such as "Kein CO_2 Endlager" (No CO_2 Repository) in Germany and "Skifergas nej tak" against shale gas extraction in Denmark have assessed possible groundwater contamination from injecting carbon dioxide and fracking fluid at pressures of up to several hundred atmospheres. These opponents are critical of any "CO_2 time bombs" laid under areas of human habitation. Government mining authorities discount such figurative references in favour of substantiated geological evidence. However, appropriate verification would be impossible before millions of tons of carbon dioxide had been irretrievably injected into subterranean geological formations.

Extensive preparations are required even before storage operations begin. In 2008, RWE planned to transport 2.6 million metric tons of CO_2 annually from its Hürth lignite power plant in the Rhineland to near the Danish border. Following the 530 km pipeline route announcement, a petition with 100,000 signatures against carbon dioxide transport and storage was presented by "Kein CO_2 Endlager" to German parliament. RWE soon cancelled the project and later closed the Hürth plant in 2015.

In contrast to widely distributed renewable energy technologies, CCS requires a single long equipment chain that must be fully functional to perform as intended. The additional energy and water requirements of capturing and compressing carbon dioxide have often been overlooked.

In Hamburg, for instance, a Vattenfall 1,640 MW coal power station on the Elbe River was approved by the city administration in 2007 under the condition of advanced-technology CO_2 avoidance. Friends of the Earth (BUND), however, warned that circulating river water through the auxiliary plant equipment for cooling would inadmissibly raise fish habitat temperatures. As the CCS application deadline approached in 2014, the necessary prerequisites for plant retrofitting, CO_2 transport, and geological storage proved unattainable. The conventional Moorburg plant therefore entered service in 2015 as a climate policy liability.

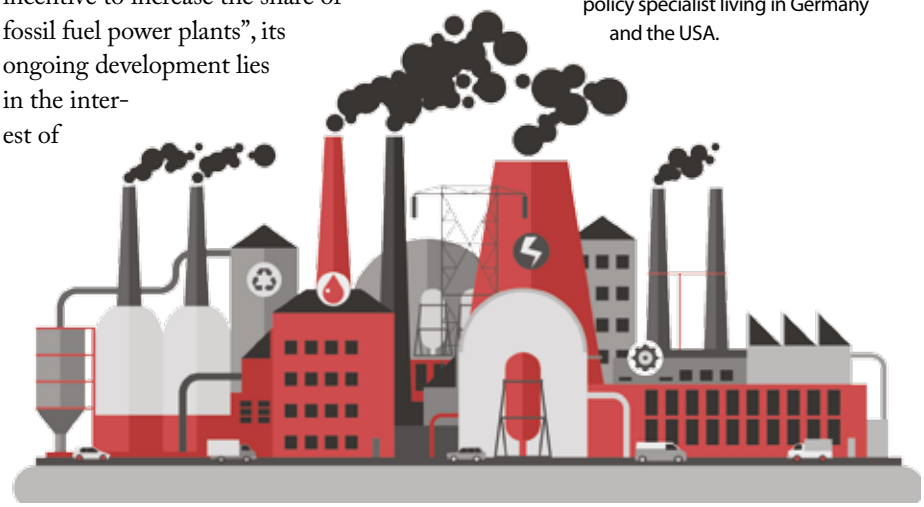
While Directive 2009/31/EC stipulates that CCS "should not serve as an incentive to increase the share of fossil fuel power plants", its ongoing development lies in the interest of steam turbine manufacturers and pipeline construction companies. In 2009, the European Commission provided subsidies of up to €180 million each for a half-dozen pilot ventures in Member States to demonstrate various carbon capture and storage technologies.

None of these projects has fulfilled expectations. A 250 MW oxyfuel plant at Vattenfall's 3,000 MW Jänschwalde site near Berlin was initially funded until faulty planning compelled its cancellation. A 300 km pipeline had been proposed to the largely depleted Altmark gas fields north of Magdeburg for CO_2-enhanced natural gas extraction. The opposition group "Kein CO_2 Endlager Altmark", however, found the area to be perforated with abandoned gas wells. The subsequent prospect of shale gas fracking in the region is now being closely scrutinized.

If the European Commission had acknowledged the critical evidence provided by citizen interest groups at an early stage, EU energy policy would have been more accountable. A recent €3.9 million government grant in Germany for CCS research has again made this issue relevant. While carbon usage techniques might be appended to certain industrial processes, their evaluation would be enhanced by increased public awareness. Nevertheless, these specialized applications offer no prospect of averting climate change by neutralizing relatively small quantities of CO_2.

Jeffrey H. Michel

The author, Jeffrey H. Michel, is an energy policy specialist living in Germany and the USA.



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Need to decarbonise transport

Policies needed to stimulate behavioural changes.

A recent report from the European Environment Agency (EEA) analyses the evolution of the EU's transport sector (freight and passengers) and its impacts on the environment since 2000. It notes, for instance, that transport is the only main economic sector for which greenhouse gas (GHG) emissions have increased over the last few decades.

In 2013, transport accounted for almost one-quarter of the EU's total GHG emissions (one-fifth excluding international aviation and maritime emissions). Passenger cars contribute almost 45 per cent and heavy-duty vehicles a further 20 per cent of the transport sector's emissions.

Transport emissions of three important air pollutants (sulphur dioxide, nitrogen oxides and particulate matter) decreased in the period 2000 to 2013. However, particularly for nitrogen oxides from diesel cars, but also for carbon dioxide, there is an increasing difference between official emission measurements done in laboratories and real-world driving emissions.

Another concern is the increasing dieselisation of Europe's vehicle fleet. The fraction of road transport fuel that is diesel has continued to increase, and in 2014 it amounted to just over 70 per cent, compared with 52 per cent in 2000.

A sharp fall in freight demand occurred after the 2008 economic crisis and, following a limited recovery, freight volumes have since remained largely stable. In 2013, total freight transport was 7.3 per cent higher than in 2000. In the same time period, the number of passenger-kilometres increased by 8.4 per cent.

The report concludes that a decarbonisation of the transport sector will require not just technological solutions but also policies that stimulate significant behavioural changes, including the correct pricing of transport externalities and planning approaches that stimulate the use of more sustainable modes of transport.

Despite EU policies designed to encourage greater use of less polluting transport modes, car transport remains the dominant mode of passenger transport and air transport is the fastest growing mode of passenger transport.

As improvements in energy efficiency alone are insufficient to reduce transport's environmental impacts, a modal shift must be a central element in the EU's decarbonisation ambitions. Achieving a modal shift would require significant investments in infrastructure, complemented by other measures to promote more environmentally friendly transport models.

The report "TERM 2015, Evaluating 15 years of transport and environmental policy integration" (Dec. 2015) can be downloaded at: http://www.eea.europa.eu/publications/term-report-2015

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Recent publications from the Secretariat

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

Gasping for air

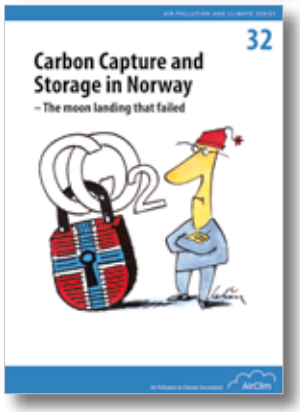
Air pollution is one of Europe's gravest environmental threats. Every year 400,000 people die prematurely because of poor air quality, but the European Parliament has the power to change that. Members of the European Parliament are now starting to work on a number of EU laws, including the National Emissions 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.

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Coming events

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

Air quality policies of the future: individual responses and societal challenges. Brussels, Belgium, 20 April 2016. Information: http://www.sefira-project.eu/ad/air-quality-policies-of-the-future-individual-responses-and-societal-challenges/

CLRTAP Executive Body. Geneva, Switzerland, 2 - 4 May 2016. Information: www.unece.org/env/lrtap/welcome.html

UNFCCC meeting of subsidiary bodies. Bonn, Germany, 16 - 26 May 2016. Information: http://unfccc.int/

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

World Bioenergy trade fair and conference. Stockholm, Sweden 24 - 26 May 2016. Information: http://www.elmia.se/en/worldbioenergy/

Environment for Europe Ministerial Conference. Batumi, Georgia, 8 - 10 June 2016. Information: http://efebatumi.com/en/

EU Environment Council. Brussels, Belgium, 20 June 2016. Information: http://europa.eu/newsroom/calendar/

Air Pollution 2016: The 24th International Conference on Modelling, Monitoring and Management of Air Pollution, Crete, Greece, 20 - 22 June 2016. Information: http://www.wessex.ac.uk/conferences/2016/air-pollution-2016

European Photovoltaic Solar Energy Conference and Exhibition (EU PVSEC 2016). Munich, Germany 20 - 24 June 2016. Information: http://www.photovoltaic-conference.com

17th IUAPPA World Clean Air Congress and 9th Better Air Quality Conference – Clean Air for Cities – Perspectives and Solutions. Busan, South Korea, 29 August - 2 September 2016. Information: www.wcac2016.org

IMO MEPC 70 (Marine Environment Protection Committee). London, UK, 24 - 28 October 2016. Information: www.imo.org

UNFCCC Conference of the Parties (COP) 22. Marrakesh, Morocco, 7 - 18 November 2016. Information: http://unfccc.int/

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

CLRTAP Working Group on Strategies and Review + Executive Body. Geneva, Switzerland, 13 - 16 December 2015. Information: www.unece.org/env/lrtap/welcome.html