

Acid News

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LARGE POINT SOURCES

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Significant health effects across Europe

EMISSIONS OF nitrogen oxides and sulphur dioxide from large point sources in Europe are calculated to cause the loss of more than one million life years in Europe every year. Some of the worst polluting plants may each be responsible for the annual loss of between 10,000 and 20,000 life years.

These are some of the results from a new study¹ prepared for the Swedish NGO Secretariat on Acid Rain by Mike Holland at EMRC. The study combines the health impact assessment methodology used by the EU's Clean Air For Europe (CAFE) programme with an emissions database² for European large point sources, to assess health damage linked to emissions of nitrogen oxides and sulphur dioxide on a plant-by-plant basis.

Analysis under the CAFE programme has highlighted substantial health impacts linked to particles in ambient air, with a best estimate of 3.6 million life years lost in the year 2000 attributable to emissions of nitrogen oxides (NO_x), sulphur dioxide (SO₂), fine particles (PM_{2.5}) and ammonia (NH₃). (See AN 2/05, p. 9.)

This translates to 350,000 premature deaths annually being linked to particle exposure. A further 20,000 premature deaths were linked to ozone exposure. Significant numbers of other health effects were also quantified, including hospital admissions and new incidences of bronchitis.

In this new study on large point sources, the health impacts were quantified against sulphate and ni-

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Acid News

A newsletter from the Swedish NGO Secretariat on Acid Rain, 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 SWEDISH NGO SECRETARIAT ON ACID RAIN

The Secretariat has a board consisting of one representative from each of the following organizations: Friends of the Earth Sweden, the Swedish Anglers' National Association, the Swedish Society for Nature Conservation, the Swedish Youth Association for Environmental Studies and Conservation, and the World Wide Fund for Nature Sweden.

The essential aim of the secretariat is to promote awareness of the problems associated with air pollution, and thus, in part as a result of public pressure, to bring about the needed reductions in the emissions of air pollutants. The aim is to have those emissions eventually brought down to levels - the so-called critical loads - that 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 organizations, 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 organizations 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

Coal-fired power stations top damage league

LARGE COAL-FIRED power stations in Spain, Poland, Ukraine, and Bulgaria are topping the list of the most health-damaging point sources of emissions in Europe. These high-emission plants are each estimated to be responsible for the loss of between 10,000 and 20,000 life years, or roughly 1000 to 2000 premature deaths, every year.

The figures come from a new survey of the health impacts of emissions from large point sources, which is presented in this issue of Acid News.

In economic terms, the total health damage attributable to exposure to fine particles originating from SO₂ and NO_x emissions from large point sources in the EU25 is in the order of 59-170 billion euro per year, depending on which figure for mortality valuation is applied.

Even if the lowest figure for mortality valuation is used, the analysis indicates that health damage costs per unit of electricity produced typically range from about 2 to 20 euro-cent per kilowatt-hour (kWh). This compares with European wholesale electricity prices of around 3-6 euro-cent/kWh.

So if health costs were included in generation costs, the price per kWh for electricity generated by the coal-fired plants would increase by at least 30 to 600 per cent. If other external costs are also taken into account, such as those relating to impacts from climate change, acidification, eutrophication and ground-level ozone, prices would increase even more.

This would have many implications, for example the relative costs of energy efficiency and renewable energy sources would be greatly reduced, increasing their economic potential significantly.

Emissions from large point sources are regulated by EU legislation - primarily by Directive 1996/61/EC on Integrated Pollution Prevention and Control (IPPC), and Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP).

A comparison between the emis-

sion limit values of the LCP directive and the "best available technique" standards for emissions to air from coal-fired plants produced for the IPPC directive, demonstrates clearly that power plants can achieve emission levels, using conventional technology, that are considerably lower than the current LCP directive standards.

Such reductions could be attained either by revising and strengthening the LCP directive, or by member states implementing stricter emission standards for this category of plant than are currently required in the directive, or both.

Moreover, experience from the Nordic countries shows that economic instruments, such as taxes and/or charges on air pollutant emissions, can bring additional emission reductions.

On top of exploiting the full potential of conventional "end-of-pipe" abatement technologies, the power sector could achieve significant emission reductions by for example improving energy efficiency, applying gasification techniques, switching to cleaner fuels, and increasing the share of renewable sources of energy. Such structural measures would offer the double advantage of reducing emissions of traditional air pollutants as well those of the dominant greenhouse gas carbon dioxide.

Consequently, there is a great potential for multiple benefits from smart emission abatement strategies, i.e. the introduction of strict technology-forcing emission standards that are designed to both promote energy efficiency and a switch from the dirtiest fuels (e.g. coal) to cleaner, primarily renewable sources of energy.

The big remaining question is why most member states, as well the European Commission, still allow a large number of highly polluting plants to operate in a manner that destroys our environment and significantly shortens the life of EU citizens?

CHRISTER ÅGREN

New car emissions standards proposed

THE PROPOSED new emission standards for light vehicles that the European Commission sent out for consultation just before summer (see AN 3/05) were put forward without any major amendments as a proposed directive in December.¹

The proposal, commonly referred to as the 'Euro 5' standards, will reduce particulate emissions from diesel cars by 80 per cent and nitrogen oxides (NO_x) by 20 per cent, compared with the standards currently in effect. For petrol cars the limits for NO_x and hydrocarbons are both reduced by 25 per cent. See table.

According to the proposal the new requirements will take effect 18 months after entry into force of the new directive, in other words probably at the start of 2009.

In the case of particulates it is technically feasible to reduce emissions well below the 5 mg/m³ level that is now proposed. The proposed level does however mean that all new diesel cars will have to be fitted with particulate filters. The particulate requirements apply also lean-burn petrol engines, a category that can produce high emissions.

It will be possible to meet the new NO_x requirements without special treatment of exhaust gases. For diesel cars, which the proposal would allow to emit more than three times as much NO_x per km as petrol cars, it would be possible to achieve much lower levels. The limit that will shortly come into force in the US is much lower. The US limit requires the treatment of exhaust gases, a process for which carmaker DaimlerChrysler, and others, have intro-

duced technical solutions.

Environmentalist organizations in Brussels were disappointed with the Commission's proposal, particularly the NO_x requirement for diesel vehicles. Jos Dings of the European Federation for Transport and Environment (T&E) said:

"It's sad and ironic that Europe will now reserve its cleanest cars for a foreign market while at the same time member states are struggling to achieve their EU air quality targets."

The proposal also contains some minor adjustments to the existing regulations. At present very heavy passenger cars (over 2,500 kg) are grouped with light commercial vehicles, which means that emission requirements are milder for the heaviest passenger cars than for lighter cars. The Commission wants to remove this inconsistency. It also wants to extend manufacturers' durability period for emission control devices from 80,000 km to 160,000 km.

Before being finally adopted, the proposal will now be considered by the Parliament and the Council of Ministers, a policy process that usually takes one or two years.

The Commission has already announced that it "intends to review ... the issue of further improvement of emissions", but that this process won't begin until after the Euro 5 standard comes into force.

PER ELVINGSON

¹ Proposal for a regulation on type approval of motor vehicles with respect to emissions and on access to vehicle repair information. COM(2005) 683 final. Can be downloaded at <http://europa.eu.int/comm/enterprise/automotive/directives/proposals.htm>

A comparison of emission standards for passenger cars effective from 2005 (Euro 4) and the proposed Euro 5 standards (mg/km).

	Petrol-driven cars		Diesel-driven cars	
	Euro 4	Proposal	Euro 4	Proposal
Hydrocarbons (HC)	100	75	(50)	(50)
Nitrogen oxides (NO _x)	80	60	250	200
HC + NO _x	-	-	300	250
Particulates (PM)	-	5 ¹	25	5
Carbon monoxide	1000	1000	500	500

¹ Applicable only to petrol-fuelled "lean-burn direct injection engines".

A clean diesel for the US market

Rising fuel prices have prompted growing interest in diesel vehicles in the US. At the Detroit Motor Show in January DaimlerChrysler announced its intention to launch diesel-engined cars in the US market, starting in autumn. Special emission control technology known as BLUETEC allows them to meet emission requirements. The technology is based on a combination of selective catalytic reduction (SCR) and particulate filters.

Paradoxically the best emission control technology for nitrogen oxides will be fitted to European cars in the US, since emission requirements are considerably stricter there than in the EU.

BLUETEC can only achieve its full effect when the diesel fuel has a sulphur content of less than 15 ppm. Low-sulphur diesel has already been introduced in the EU and is expected to become available in the US in autumn of 2006.

Further information: www.daimlerchrysler.com

Public spending for "clean" vehicles

In conjunction with its proposed Euro 5 requirements the Commission presented a proposal for new legislation aimed at contributing towards the creation of a market for "clean" vehicles.

The proposed directive provides that public bodies will be obliged to allocate a minimum quota of 25 per cent of their annual procurement (purchasing or leasing) of heavy-duty vehicles to "enhanced environmentally friendly vehicles" (EEV).

EEV is a voluntary certification level that sets lower limits on emissions of pollutants such as particulates and nitrogen oxides than current obligatory requirements, and somewhat stricter than those that will come into effect for heavy vehicles in 2008 (Euro V). EEVs can be clean diesel or gaseous fuel vehicles. However no requirements are imposed on energy efficiency or CO₂ emissions.

The "clean" vehicle procurement obligations are initially limited to those vehicle categories for which the market shares accounted for by public bodies are significant. The Commission estimates that purchases of 17,000 buses and 35,000 other heavy-duty vehicles such as refuse lorries will be affected by the order.

Further information: Memo from the Commission, published 21 December 2005. EEV is defined in Directive 2005/55/EC (OJ L 275, 20.10.2005).

Significant health effects

Continued from front page

trate aerosols – so-called secondary particles that are formed in the atmosphere following the emissions of SO₂ and NO_x. Emissions of primary PM from the point sources, which in some cases may be significant, were not included in the assessment.

Results for the 25 EU member countries, plus Norway and Switzerland, are presented separately from those for other European countries. Moreover, the economic evaluation of health damage is limited to the former group of countries. The main reason for this split is that emission data and source-receptor modelling are considered more robust for the EU25, when compared to many other countries in Europe.

The results for the EU25 plus Norway and Switzerland are presented in Table 1. The total number of life years lost attributable to emissions from large point sources in these countries is estimated at 810,000, which represents 22 per cent of the loss of life calculated for the EU in 2000 in the CAFE analysis. Expressed differently, the emissions of SO₂ and NO_x from large point sources give rise to approximately 76,000 premature deaths per year.

There is also a large number of morbidity effects that affect a much greater number of people, including more than 20,000 cases of respiratory or cardiac hospital admissions, seven million respiratory medication use days and 75 million restricted activity days among the working age population each year.

In economic terms, the total damage is in the order of euro 59 billion/year, if using the lower end of the CAFE range for the value of a life year lost for mortality valuation. A higher value is also given, euro 91 billion/year, based on mortality valuation using the alternative approach of value of statistical life. If the upper end of the CAFE range for the value of statistical life is applied instead, the latter figure would nearly double, to euro 170 billion/year. These issues of valuation of course have no effect on the number of cases or health events estimated.

It is striking to note that half of the total health damage by large point sources is accumulated by the 126 most damaging plants, and 90 per cent by the 924 most damaging, out of a total of about 6,600 plants listed

in the database for this region.

For the countries outside the region containing the EU25, Norway and Switzerland, the total number of life years lost was estimated at 300,000, which is equivalent to ca 28,000 premature deaths per year.

Table 2 lists the 50 most damaging plant identified in the two regions of the study. The economic damage quantified in the table relates only to health impacts, based on the CAFE methodology. As this approach cannot directly be transferred to countries outside the EU, no figures are given in this column for plants in the non-EU states shown in the lower half of the table.

The two final columns of Table 2 show loss of life years and the number of deaths – these are simply different ways of expressing mortality impacts rather than separate effects. According to the report, loss of life years can be quantified more robustly, and by providing information on life shortening rather than “death”, it is often regarded as a more meaningful way to express the nature of the impact. Some, however, prefer to refer to “deaths” instead, and for that reason both types of result are given.

Although Table 2 primarily includes large point sources whose main purpose is to generate electricity, the analysis covered other source types, such as facilities for manufacturing metals and chemicals, coke plants, etc. Large power plants dominate the top of the listing, however, because of the large quantity of fuel that they use, but also because there are still many such plants in Europe – both inside and outside the EU – that have

not yet been equipped with modern flue gas cleaning technology, e.g. desulphurization and denitrification.

In addition to ranking the most damaging plants, as presented in Table 2, the study also investigated damage per unit of useful output, i.e. the amount of electricity (or heat, steel, coke, etc.) produced. This results in a different ranking, with a number of smaller plants of apparently much lower efficiency moving to the top of the list.

The report demonstrates that large point sources of SO₂ and NO_x generate very significant health damage across Europe. It also shows that substantial benefits would accrue to the European population if additional action were taken to further reduce the emissions from large point sources in Europe. Moreover, such action would bring additional benefits by also reducing the widespread damage to ecosystems by acidification, eutrophication and ground-level ozone.

CHRISTER ÅGREN

¹ **Health Impacts of Emissions from Large Point Sources** (February 2006). By Mike Holland, EMRC, UK. Air Pollution and Climate Series No. 19. Published by the Swedish NGO Secretariat on Acid Rain. Available at www.acidrain.org/pages/publications/reports.asp

² The SENCO database provides an extensive listing of data on emissions and performance of large industrial facilities throughout Europe. It contains information on the names and locations of plants, their purpose and useful outputs, and emissions of SO₂, NO_x, PM and CO₂. For more information see “Atmospheric emissions from large point sources in Europe” (2004), by Mark Barrett, SENCO Consultants, UK. Available at www.acidrain.org/pages/publications/reports.asp

Table 1. Estimated health impacts from secondary PM and their economic equivalent for emissions of SO₂ and NO_x from large point sources in the EU25, Norway and Switzerland.

Health effect	Total cases	Economic equivalent (euro millions)
Chronic mortality (life years lost, population aged > 30)	810,000	42,000
Chronic mortality (deaths in population aged > 30)	76,000	74,000
Infant mortality (infants aged 1 - 12 months)	130	200
Chronic bronchitis, population aged > 27	36,000	6,700
Respiratory hospital admissions, all ages	13,000	27
Cardiac hospital admissions, all ages	8,300	17
Restricted activity days (RADs) working age population	75,000,000	6,200
Respiratory medication use by adults	6,400,000	6.4
Respiratory medication use by children	770,000	0.77
Lower Respiratory Symptom (incl. cough), adults with chronic symptoms	61,000,000	2,300
Lower Respiratory Symptom (including cough), children	40,000,000	1,500
Total (using number of life years lost)		59,000
Total (using number of deaths)		91,000

Table 2. The 50 most health damaging plants identified in each of the two regions considered, with estimates of annual economic damage and impacts on mortality. PS = Power Station. Ind. = Industry.

EU25 Member States, Norway and Switzerland							Countries outside the EU, Norway and Switzerland					
	Plant	Country	Type	Damage (million euro/yr)	Life years lost/yr	Deaths /year		Plant	Country	Type	Life years lost/yr	Deaths /year
1	Puentes	Spain	PS	1,400	19,000	1,800	1	Krivorozhskaya	Ukraine	PS	14,000	1,300
2	Belchatow	Poland	PS	1,300	18,000	1,600	2	Maritsa East II	Bulgaria	PS	14,000	1,300
3	Teruel	Spain	PS	700	9,600	890	3	Burshtynskaya	Ukraine	PS	13,000	1,200
4	Turow	Poland	PS	690	9,500	890	4	Zmiyevskaya	Ukraine	PS	11,000	980
5	Adamow	Poland	PS	600	8,200	760	5	Lodyzhinskaya	Ukraine	PS	10,000	980
6	Patnow	Poland	PS	540	7,400	690	6	Kurakhovskaya	Ukraine	PS	9,300	870
7	Longannet	UK	PS	540	7,400	690	7	Pridneprovskaya	Ukraine	PS	8,700	810
8	Cottam	UK	PS	530	7,300	680	8	Seyitomer Soemtes	Turkey	PS	7,900	740
9	West Burton	UK	PS	510	7,000	660	9	Starobeshevskaya	Ukraine	PS	7,600	710
10	Porto Tolle	Italy	PS	500	6,800	630	10	Zuevskaya	Ukraine	PS	7,400	690
11	Eggborough	UK	PS	450	6,100	570	11	Mosenergo 22	Russia	PS	6,300	590
12	Oroszlany	Hungary	PS	440	6,000	560	12	Uglegorskaya	Ukraine	PS	6,100	570
13	Drax	UK	PS	420	5,700	540	13	Tripolskaya	Ukraine	PS	6,000	560
14	Prunerov	Czech Rep.	PS	410	5,600	520	14	Zaporozhskaya	Ukraine	PS	5,600	530
15	Ferrybridge	UK	PS	380	5,200	480	15	Mosenergo 4	Russia	PS	5,400	510
16	Pomorzany	Poland	PS	370	5,100	470	16	Luganskaya	Ukraine	PS	5,300	500
17	Taranto	Italy	Ind.	370	5,100	470	17	Craiova II	Romania	PS	4,100	390
18	Jänschwalde	Germany	PS	360	5,000	460	18	Troitskaya	Russia	PS	4,100	390
19	Belfast West	UK	PS	360	4,900	460	19	Kostroma-1	Russia	PS	4,000	370
20	Compostilla	Spain	PS	350	4,700	440	20	Maritsa East I	Bulgaria	PS	3,900	360
21	Matra	Hungary	PS	330	4,600	430	21	Uglegorsk	Ukraine	PS	3,600	330
22	Krakow	Poland	PS	330	4,500	420	22	Zaporizhzhya	Ukraine	PS	3,500	330
23	Didcot	UK	PS	330	4,500	420	23	Afsin Elbistan A	Turkey	PS	3,500	330
24	Meirama	Spain	PS	330	4,400	420	24	Turceni	Romania	PS	3,500	320
25	Ledvice	Czech Rep.	PS	310	4,300	400	25	Drobeta-Turnu Severin	Romania	PS	3,300	310
26	La Robla	Spain	PS	300	4,100	380	26	Cherepetskaya	Russia	PS	3,100	290
27	Aberthaw	UK	PS	290	4,000	370	27	Slavyanskaya	Ukraine	PS	3,100	290
28	Schwedt	Germany	Ind.	290	3,900	370	28	Novocherkasskaya	Russia	PS	3,100	290
29	Rugeley	UK	PS	280	3,900	360	29	Kangal	Turkey	PS	2,400	230
30	Kingsnorth	UK	PS	280	3,800	360	30	Tuncbilek B Tutes B	Turkey	PS	2,300	220
31	Rybnik	Poland	PS	270	3,800	350	31	Hrazdan	Armenia	PS	2,300	210
32	Rotterdam/P/Shell	Netherlands	Ind.	260	3,600	330	32	Moscow Central Fuel Co	Russia	Ind.	2,200	210
33	Ironbridge	UK	PS	250	3,400	320	33	Bobovdol	Bulgaria	PS	2,200	210
34	Sage	UK	Ind.	250	3,400	320	34	Lukoml	Belarus	PS	2,200	200
35	Novaky	Slovakia	PS	250	3,400	320	35	Novo-Moskovskaya	Russia	PS	2,100	200
36	Litvinov	Czech Rep.	PS	240	3,300	310	36	Moscow-26	Russia	PS	2,000	190
37	Lippendorf	Germany	PS	240	3,300	310	37	Kostroma-Gres2	Russia	PS	2,000	190
38	High Marnham	UK	PS	240	3,300	310	38	Varna	Bulgaria	PS	1,900	180
39	Tisova	Czech Rep.	PS	240	3,300	310	39	Starobeshev	Ukraine	PS	1,900	170
40	Moneypoint	Ireland	PS	230	3,200	300	40	Voskresensk cement	Russia	Ind.	1,800	170
41	Megalopolis	Greece	PS	230	3,100	290	41	Soma	Turkey	PS	1,800	170
42	Fiddlers Ferry	UK	PS	230	3,100	290	42	Kiev 5	Ukraine	PS	1,800	160
43	Gravenchon	France	Ind.	220	3,100	290	43	Catalagzi B [Yates B]	Turkey	PS	1,700	160
44	Grain	UK	PS	220	3,000	280	44	Ryazanskaya	Russia	PS	1,700	160
45	Lynemouth	UK	PS	220	3,000	280	45	Kemerkoey	Turkey	PS	1,600	150
46	Setubal	Portugal	PS	220	3,000	280	46	Maritsa East III Dimo Dit.	Bulgaria	PS	1,600	150
47	Bacton	UK	Ind.	210	2,900	270	47	Ryazan Sdeps	Russia	PS	1,600	150
48	Melnik	Czech Rep.	PS	210	2,900	270	48	Moscow-23	Russia	PS	1,500	140
49	Pocerady	Czech Rep.	PS	200	2,800	260	49	Govora	Romania	PS	1,500	140
50	Weisweiler	Germany	PS	200	2,800	260	50	Brasov	Romania	PS	1,400	130

EPER to expand

The EU European Pollution Emission Register, EPER, which has been published online since 2004, is to be extended into a European pollutant release and transfer register, PRTR. Reporting under the new regime will start reaching the public from 2009.

The PRTR builds on the principle of the EPER, but will cover a wider range of plants and more pollutants, while reporting will be annual rather than every three years.

The directive's objective has been amended to aim explicitly for greater public participation in environmental decision-making and prevention and reduction of pollution.

Further information: www.eper.cec.eu.int/eper/

Regulation can support the economy

Good environmental regulation can support a clean, competitive economy and a healthy environment, according to a paper published jointly by 29 Environmental Protection Agencies in Europe.

The paper cites evidence from several sources to show that strong policy produces strong companies. It is tabled as a "contribution to the current debate" on the importance of environment policy in a European political climate perceived by some to have marginalized it in favour of economic growth policies.

Further reading: **The contribution of good environmental regulation to competitiveness.** November 2005. Available at http://org.eea.eu.int/news/Ann1132149255/index_html

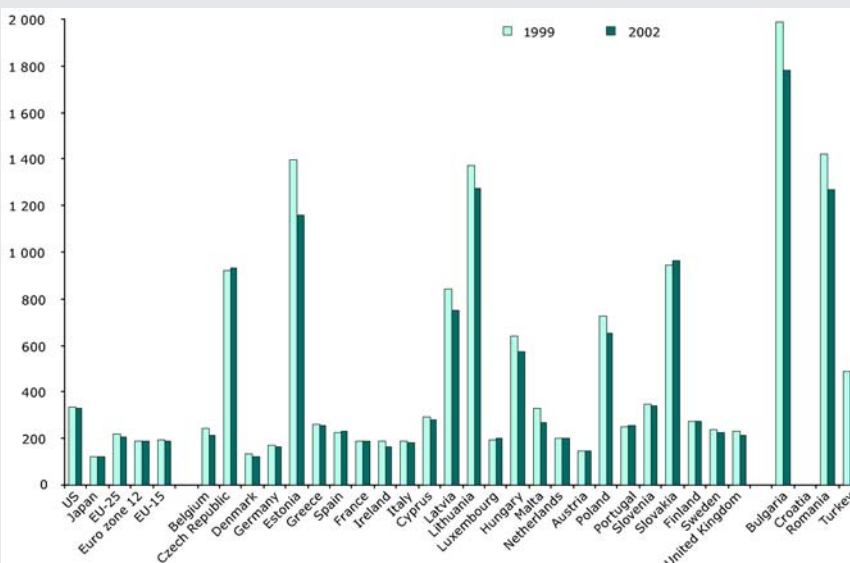
Strategy on urban environment adopted

The European Commission's thematic strategy to improve the urban environment, adopted on 13 January, does not include any binding commitments for cities to develop and implement environmental management and clean transport programmes, following the resistance by many cities and member states.

In draft proposals two years ago the Commission said it wanted all cities with a population over 100,000 to be required to draw up such plans. Instead a voluntary approach is proposed, where it is up to each city to decide whether to take action. The strategy sets out a range of initiatives to facilitate them, including technical guidance, best practice exchange, financial support and training.

Further information: http://europa.eu.int/comm/environment/urban/home_en.htm

Energy intensity of the economy. There are large differences between individual countries within the EU in the levels of energy efficiency.



Gross inland consumption of energy divided by GDP (at constant prices, 1995=100). Kilogram of oil equivalent per 1000 Euro.

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ENERGY EFFICIENCY

No binding EU targets

IN DECEMBER the European Parliament and Council of Ministers agreed on a compromise regarding the end-use energy efficiency and energy services directive, which was tabled by the Commission in 2003 (see Acid News 3/05, p. 17).

At the first reading the Parliament required binding national targets for energy efficiency with a collective improvement over business as usual of 11.5 per cent between 2006 and 2015. The compromise instead sets an indicative (non-binding) target of a nine-per-cent cut in energy use over business-as-usual over the nine-year period from 2008 to 2017, which matches the original requirement of the Council.

The Parliament's requirement that the public sector should be set a more ambitious target was also withdrawn. The directive merely requires public authorities to play an "exemplary role".

Parliament did however get through a requirement for member states to issue national energy efficiency action plans for the years 2007, 2011 and

2014. The first of these plans will have to include a national indicative energy savings target for 2011.

The European Commission will be required to assess each plan and to propose further measures in case of insufficient progress – though it will not have powers to enforce their take-up.

Under the directive the Commission has the task of developing harmonized energy efficiency indicators and benchmarks. Governments will have to gradually integrate these into their action plans.

The compromise was criticized by the environmentalist organization WWF, which believes that the EU has the potential to save at least 2.5 per cent a year.

Source: Environment Daily, 7 December 2005.

The Commission's proposal COM(2003)739 and subsequent documents can be found by searching at <http://europa.eu.int/prelex>. The directive has not yet been formally adopted.

See also "The Energy Efficiency Challenge" by WWF European Policy Office 2005. Can be downloaded from www.panda.org/epo.

Weak new standards proposed in the US

JUST BEFORE CHRISTMAS the US Environmental Protection Agency (EPA) proposed revisions to its national air quality standards for particulate matter. The main provisions of the proposal are:

PM_{2.5} 24-HOUR STANDARD: The standard limiting daily concentration would be tightened to 35 µg/m³, from the current 65 µg/m³.

PM_{2.5} ANNUAL STANDARD: The current standard of 15 µg/m³ remains unchanged.

PM_{10-2.5} 24-HOUR STANDARD: A daily standard of 70 µg/m³ is proposed for particles between 2.5 and 10 µm. The new PM_{10-2.5} category would include coarse particles that come from sources typically found in urban areas, such as high-density traffic on paved roads, industrial sources and construction activities. The standard would not cover coarse particles from such sources as windblown dust and soils, agricultural or mining sources.

PM₁₀ 24-HOUR STANDARD: The current standard of 150 µg/m³ would be revoked, except in urban areas with a population of 100,000 or more.

The proposed standards are weaker

than the recommendation of the EPA's Clean Air Scientific Advisory Committee. The EPA staff paper of June 2005 called for a stricter PM_{2.5} limit of 14 to 13 µg/m³, and for a daily limit of 35 to 30 µg/m³. Health and environmental groups have called for an even stronger annual standard.

"If EPA adopts the standard as proposed, the Agency will have failed the most fundamental task required by the Clean Air Act – to protect public health from one of the major air pollutants," said John L. Kirkwood, President of the American Lung Association (ALA), in a statement. "For the first time, EPA will have ignored recommendations from its own staff scientists and from its official outside review panel of scientists; both groups have advised setting a stronger standard than EPA has proposed."

The current PM_{2.5} standards were adopted in 1997, but due to legal challenges they were not enforced until 2004.

Further reading: EPA proposal, www.epa.gov/air/particles/actions.html, American Lung Association, www.lungusa.org

Health experts deplore unambitious proposals

In a letter to EU environment ministers, the European Public Health Alliance Environment Network (EEN) has expressed its serious concern about the "severe lack of ambition" of the Thematic Strategy on Air Pollution.

EEN and the other co-signatories of the letter hope for some strong reactions against its lamentable content. "If changes are not demanded, we predict there will be very little benefit to either health or air quality for European citizens," said Genon Jensen, EEN Director.

The letter describes how European legislation associated with the 6th Environmental Action Programme required the Commission to produce a strategy "that considers strict air quality standards to reduce the health burden".

However, the current proposal is likely to result in more lax limits than exist currently – and therefore do nothing to improve air quality in Europe.

"It attempts to reduce existing limit values, ignores recommended standards based on European-funded research on the health effects, and offers no effective and legally-binding mechanism to ensure reduced exposure," said Genon Jensen.

Note: The European Public Health Alliance, www.epha.org, represents over 100 non-governmental and other not-for-profit organizations working on public health in Europe.

Air pollution the most important factor

Air pollution is the environmental factor with the greatest impact on health in Europe and is responsible for the largest burden of environment-related disease, states the European Environment Agency (EEA) in a new report, which also highlights the following facts:

- Recent estimates indicate that 20 million Europeans suffer from respiratory problems every day.
- Particulate matter and especially small particles with a diameter less than 2.5 micrometres (PM_{2.5}) are associated with increased mortality, especially from cardiovascular and cardiopulmonary diseases.
- Recent estimates made in the CAFE programme found that in the EU about 350,000 people died prematurely in 2000 due to the outdoor air pollution caused by fine particulate matter (PM_{2.5}) alone. This corresponds to an average loss of

life expectancy of about nine months for every EU citizen.

- Current levels of ozone have severe health implications, such as bringing forward the deaths of more than 20,000 people per year.
- Respiratory health improves when air quality improves. One of the best examples is a labour dispute that shut down a large steel mill in Utah Valley. Respiratory hospital admissions in children were clearly decreased during the strike and returned to pre-strike levels after the dispute ended.

The report also examines other environmental factors that affect people's health, including noise and endocrine disruptors.

Further reading: **Environment and health.** EEA Report No. 10/2005. Can be downloaded from the EEA website (http://reports.eea.eu.int/eea_report_2005_10/en)

Voluntary agreements reduce Danish coal power emissions

The Danish energy sector has reduced its emissions of sulphur dioxide by 98 per cent and nitrogen oxides by 80 per cent. Voluntary agreements have forestalled legislation.

BETWEEN 1985 and 2001 total Danish emissions of sulphur dioxide (SO₂) fell from 339,455 to 25,351 tonnes, a reduction of just over 93 per cent.

The main reason was measures taken by the energy sector, whose emissions dropped from 214,568 to 11,139 tonnes over the period.

This is shown by an official Danish report to the EU Commission on fulfilment of the directive on national emission ceilings. In the case of sulphur, Denmark has made excellent progress. Emissions are already below the ceiling for 2010.

The simple, but not entirely straightforward, explanation can be summarized in two words: voluntary agreements.

In the late 1980s the energy industry agreed with the Danish government that it would implement emission reductions early, before international undertakings were upgraded into binding requirements.

“The drawback was that Denmark had higher energy prices than the countries we were competing with. The advantages were naturally improvements in the environment, and the fact that the energy sector took measures in those areas where they were most effective. That way they avoided taxes on emissions that could be reduced by purely technical means,” says Jørgen Nielsen, department manager with the Rambøll consultancy, and former environmental manager with the Danish power company, Elsam.

The agreements between the big power plants and the authorities led to the setting up of a reduction plan that was reviewed in annual quota negotiations.

In addition to the agreed measures a sulphur charge was introduced in 1996. This helped spur on the reductions that had already begun. The sulphur charge had the effect of accelerating investment.



Fynsværket in Odense runs on coal, oil and natural gas. It has an output of 640 MW and produces electricity and district heating. The plant is equipped for flue gas desulphurization and emitted 970 tonnes of sulphur dioxide in 2004. With a specific emission level of 27 mg SO₂/Nm³ the plant was well below the 400 mg/Nm³ limit value.

It became financially attractive to remove up to 98 per cent of the sulphur from flue gases, for a number of reasons. One reason is that many Danish desulphurization plants are designed for fuel with a higher sulphur content than the fuel that is

“People still regard energy supply as a national product”

actually used. Another reason is the use of chalk instead of crushed limestone in the process.

“Chemically, limestone and chalk are the same thing, but chalk is younger than limestone and contains distinct remains of marine molluscs. Because of their origin, chalk particles have a larger surface area than can be achieved by crushing lime-

stone. This increases the efficiency of the process. One alternative to using chalk is to add adipic acid, which acts as a chemical buffer in the desulphurization plant,” says Folmer Fogh, a chemist with the power company Elsam.

Jørgen Nielsen explains the voluntary approach taken in Denmark by the eco-political climate that existed in the late 1980s:

“There was political pressure from the government. The switchover by the energy sector from oil to coal was a consequence of the energy crisis. In a similar way environmental investments were a consequence of the debate about acid rain and the Gothenburg Protocol. What Denmark did was to go home and try to introduce the limitations that would later become law. The reason lay in the political mood and in Danish undertakings to do something about the acid rain problems in Norway and Swe-

den," Jørgen Nielsen says.

The Danish power producers invested roughly DKK 10–30 billion (approx. 1.3–4 billion euro) in desulphurization equipment. Most of the technology was proven and familiar, but the power plants also developed and optimized various technical solutions.

When sulphur emissions began to fall, attention gradually switched to reducing emissions of nitrogen oxides (NO_x), again using relatively well-known technology. The big power plants are now reducing NO_x emissions by 80 per cent.

However there are more challenges involved in reducing NO_x than in reducing SO₂, points out Jørgen Nielsen. The reason is the growing, and desirable, burning of biomass, particularly straw and wood chips.

Burning straw produces a large amount of dust, which passes into the catalytic converter that is used to remove NO_x. To extract this dust the flue gases have to be cooled down, but to reduce NO_x the flue gases must be heated up.

"If you use more biomass, you produce less of the greenhouse gas, carbon dioxide, but more NO_x. It's relatively easy to achieve an NO_x reduction of up to 60 per cent when burning biomass. But if you want to achieve the theoretical 80 per cent it requires a careful balancing act. So reducing NO_x is rather more complicated. It's not a simple process that you can just ramp up or down at the press of a button," says Jørgen Nielsen.

However there are further environmental benefits to be gained from combining desulphurization and NO_x reduction:

"Together, the two processes mean that more heavy metals are bound up in waste products such as fly ash. For example over 80 per cent of the mercury in the flue gases can be captured. If these waste products are then used sensibly, as hardcore for asphalt roads, for example, it makes a very neat solution."

The extensive Danish investments in emission reduction measures were mostly made at a time when the electricity market was regulated. The costs could be passed on to customers' electricity bills without major problems.

"When production costs are DKK 0.15 per kilowatt hour, but the electricity price is around DKK 1.00, you

don't really notice an extra per cent on the bill," reckons Jørgen Nielsen.

But that mechanism is no longer guaranteed, now that electricity is bought at market prices across borders.

Jørgen Nielsen believes that environmental spokespeople and commentators in general have a poor understanding of how prices are set in a deregulated market, and of the consequences this has.

He describes how the choice of electricity generation method is controlled by production costs:

Hydropower is cheapest, and then wind power. These are followed in order of rising cost by nuclear power, coal-fired CHP and coal-fired condensing plants. Near the bottom of the list are gas-fired power plants, and last of all is biomass.

"The price of electricity in the markets today is on a par with the cost of power from coal-fired CHP plants and coal-fired condensing plants. But not many people understand the pricing mechanism. It's great that Danish power plants are investing in NO_x reduction. But if that means that German, Dutch and Polish plants ramp up their production, then the effect will simply be to shift emissions from Denmark to Germany, the Netherlands and Poland. When you have a derestricted electricity market everyone must compete on the same terms. Otherwise you don't get the full return from your environmental investments," says Nielsen.

So the conclusion is that in a deregulated electricity market you need to impose the same requirements, standards and production conditions on all producers in order for environmental measures to be effective?

"Yes, unless you are going to go back and nationalize the energy sector, in which case you naturally have other steering mechanisms."

Is this insight not widely shared in the energy industry?

"No, surprisingly few people share it. People still regard energy supply as a national product that can be increased or decreased as we wish. Of course, in reality it just means that you shift production and emissions across borders," says Jørgen Nielsen.

STAFFAN DAHLLÖF

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Support for aviation emissions trading

EU environment ministers have signalled their strong support for plans to bring the aviation sector into the emissions trading scheme for carbon dioxide (see AN 4/05). At their meeting in December, they called on the Commission to put forward legislation before the end of 2006, based on a model "that can be extended or replicated world-wide". Both CO₂ and non-CO₂ impacts should be covered "to the extent possible", the conclusions state.

Meanwhile, American officials have warned the EU about forcing non-EU airlines to be part of the scheme. The EU says that as any payment would be for a permit and thus a charge rather than a tax, it could include all airlines, but the US Federal Aviation Administration says it will instruct lawyers to challenge the legality of the ETS if it were extended to non-EU airlines.

Source: T&E Bulletin, December 2005.

Big emissions from small appliances

Recent studies have shown that Denmark's 700,000 domestic wood-burning heating appliances are responsible for up to 50 per cent of fine particulate emissions (PM_{2.5}). A study in Norway a few years ago arrived at a 60-per-cent share.

The Danish government is now looking at the possibility of introducing standards to cover these point sources, which can easily produce emission levels similar to those of a modern diesel car. In its Thematic Strategy on Air Pollution, which sets out measures over the next five years, the Commission states that harmonized technical standards will be developed for domestic combustion appliances and their fuels.

Source: Environment Daily, 19 January 2006.

NGO positions on the Thematic Strategy

Three environmental NGO networks in Europe have presented joint position papers regarding the Thematic Strategy on Air Pollution and the Air quality directive proposal. One main point of criticism is the fact that the costs have been overestimated and the emission reduction potential underestimated.

Both papers can be downloaded in pdf format from www.acidrain.org/pages/news/news_main.asp#news05

Go-ahead for kilometre taxes

A compromise on the Eurovignette directive between the Council of Ministers and the European Parliament in December means that EU member states are now entitled to charge lorries for using the entire road network, not just motorways. In addition, vehicles of 3.5 tonnes and above will be covered. The current minimum weight is 12 tonnes.

As with current rules, it will be possible to charge higher tolls for the more polluting lorries. But from 2010 it will be mandatory to differentiate charges on this basis. Member states will also be allowed to charge up to 15 per cent more for roads that run through sensitive mountain regions. The agreement also means that those member countries that wish to do so can include the external costs of traffic when setting charges.

A dismantling of existing strategies

The European Commission's so-called high-level group on future car regulation, CARS 21, published its 10-year "road map" in December.

On carbon dioxide emissions, the group advocates an "integrated approach", whereby the car industry's own responsibilities to cut emissions are shifted to others. Instead of modifying vehicles it recommends eco-driving and biofuels as means to achieve appointed targets. This contradicts the existing strategy agreed by ministers in 1996, which said the EU's reduction target for new cars could be "supplemented" with other measures.

Jos Dings, director at T&E, the European Federation for Transport and Environment, comments:

"Instead of giving us a plan to clean up new cars, the group has simply dismantled or watered down elements of the existing strategy. Commissioner Verheugen, the chairman of the group, has repeatedly called for Europe to produce the 'cleanest cars in the world', but the EU is further from reaching this goal today than it was before CARS 21 was set up."

The European Automobile Manufacturers Association (ACEA) was pleased with the group's report, while the oil industry lobby group Europia called the recommendation to increase biofuel use "premature".

Source: *T&E Bulletin*, December 2005.



CONGESTION CHARGING

Better than expected

SINCE 3 January motorists who drive in and out of central Stockholm during the day have had to pay a congestion charge. In the first month the reduction in traffic was twice as high as expected.

All vehicles, with a few exceptions, that enter or exit the central Stockholm area on weekdays during the hours of 6:30 am to 6:29 pm have to pay. The charge is between 10 and 20 kronor (approx. 1-2 euro) depending on the time of day, with an upper limit of 60 kronor (six euro) a day.

The aim of the charge was to reduce traffic volume by 10-15 per cent.

The actual reduction measured during January was a full 25 per cent. Traffic queues in the city have largely disappeared. Measurements of journey times showed that in many cases these were reduced by a massive 80 per cent.

As in London, which introduced similar charges in 2003, the introduction in Stockholm went smoothly, without any traffic queues outside the charging zone or chaos on public transport. All the technology worked as expected. The charging system uses infrared cameras to identify the license plates of vehicles passing in and out of the centre.

To pay the charge, drivers have been encouraged to install a transponder in their cars that automatically registers each time they pass a toll station, and then transfers the appropriate amount from the owner's bank account. Car owners who do not

equip their vehicle with a transponder have five days to pay the charge at banks, various stores or over the Internet.

To meet the expected increase in commuting by bus and tube, public transport has been extended with 197 new buses and 16 new buslines. This provides an effective and fast alternative for travelling at peak hours from the municipalities surrounding Stockholm into the inner city.

The charging scheme in Stockholm will remain on trial until the end of July. There will then be a referendum in September to give residents of the city the opportunity to decide whether it should be permanent or not.

PER ELVINGSON

Further info: www.stockholmsforsoket.se

Charging in London

Most residents of London were critical before the congestion charging scheme was introduced in February 2003. But opinion turned soon after its introduction. Transport for London, TfL, reports:

The number of vehicles that drive into the zone has fallen by 18 per cent.

Traffic jams within the zone have fallen by 30 per cent.

Levels of nitrogen oxides and airborne particulates have fallen by 12 per cent.

The number of traffic accidents has fallen, now that over 50,000 people have left their cars at home.

Further information: www.cclondon.com

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Biomass action plan proposed

Measures proposed by the Commission could more than double biomass use in the EU by 2010.

IN EARLY DECEMBER the European Commission adopted an action plan designed to increase the use of energy from forestry, agriculture and waste materials.

According to the Commission it is desirable to increase the use of biomass as a source of energy for several reasons: it will reduce dependence on imported energy, cut greenhouse gas emissions, protect jobs in rural areas and extend the EU's technological leadership in these sectors.

The plan announces more than 20 actions in the three sectors of heating, electricity and transport, most of them to take place in 2006. The main measures proposed are:

- legislation supporting the use of biomass for heating and cooling,
- reduced VAT on district heating,
- stronger implementation of the renewable electricity directive,
- regulation and removal of barriers to biofuels in transport, including ensuring the environmental sustainability of biofuel production,

- measures for promotion of energy crops as part of EU agricultural policy,
- increased use of forest residues,
- more use of recovered materials from waste as energy,
- more use of structural funds for biomass and other renewable energy,
- research and development.

The Commission estimates that the measures in the plan will double the use of biomass to about 150 Mtoe by 2010, compared with 69 Mtoe in 2003, without increasing the intensity of agriculture or significantly affecting domestic food production.

It forecasts that this will reduce greenhouse gas emissions by 209 million tonnes of CO₂ equivalent per year; provide direct employment for 250,000-300,000 people; and reduce reliance on imported energy from 48 to 42 per cent.

Environmentalist organizations BirdLife International, WWF, Greenpeace, and the European Environmental Bureau issued a joint comment on the Commissions' proposal.

In principle they support increased investment in bioenergy and believe that it can become a key source of energy in the future.

They are however concerned that environmental and social safeguards could be overlooked. Biomass production affects biodiversity, water and soil. This is already a major problem in the tropics, where millions of hectares of forest have been converted into soya, sugarcane and palm oil plantations. The groups are calling on the EU to ensure such projects will not be supported through biofuel imports into EU member states.

"Travelling in a car fuelled by biodiesel seems like a great, environmentally-friendly thing to do," said BirdLife's Ariel Brunner. "However, if the biodiesel has come from soya planted in the Brazilian Amazon or palm oil from Indonesia, the green consumer is likely to be unwittingly driving another nail into the coffin of the world's great ecosystems."

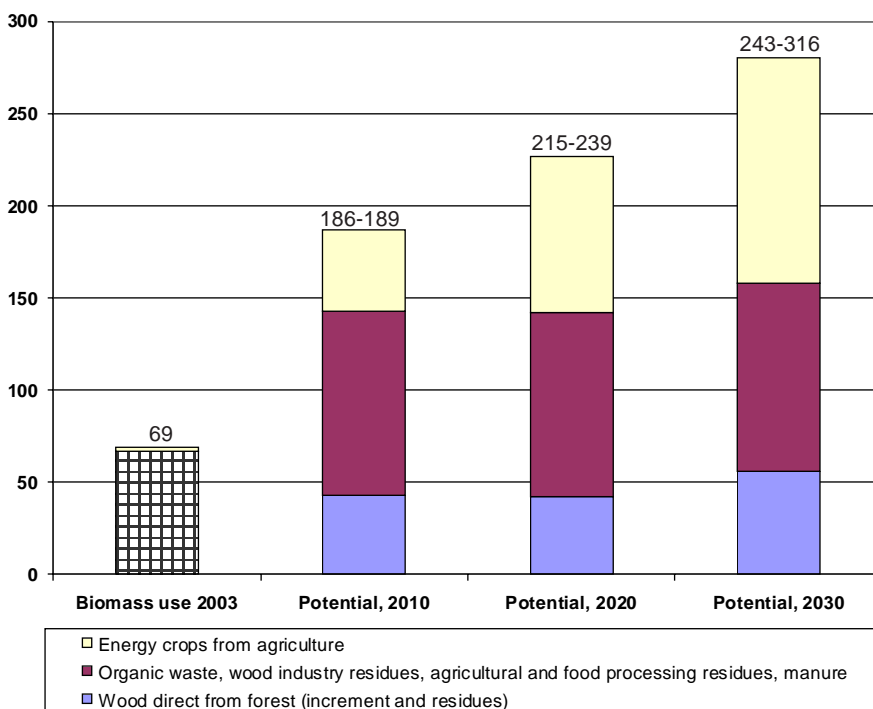
The Commission has also adopted a report on the different support schemes for producing electricity from renewable energy sources. It concludes that more than half of the 25 EU member states are not giving enough support to green electricity.

The Commission regards it as premature to propose a harmonized support scheme and argues that governments need to step up efforts to cooperate among themselves and optimize their support schemes as well as to remove administrative and grid barriers to green electricity.

PER ELVINGSON

Further information: Biomass action plan, COM(2005) 628 final. Can be downloaded from <http://europa.eu.int/comm/energy/>

EU25 potential to produce biomass for energy use (Mtoe). The bars show average values, and the figures above each bar are the estimated range. The 2003 figure includes 59 Mtoe of wood and wood waste, 3 Mtoe of biogas and 5 Mtoe of municipal solid waste.



A strategy for biofuels

On 8 February the EU Commission adopted a separate strategy for increasing the use of biofuels in the transport sector,¹ with a range of potential measures to boost production of fuels from agricultural materials.

¹An EU Strategy for Biofuels. COM(2006) 34 final.

Some countries still defaulting

Greece, Norway and Spain have still not reduced their emissions as required.

THREE COUNTRIES are still failing to comply with the emission reduction demands of protocols to the Convention on Long-range Transboundary Air Pollution, and several countries are failing to comply with the obligation to report. This is apparent from last year's review conducted by its Implementation Committee¹, which was discussed at the convention's Executive Body (EB) meeting in December 2005.

Despite the sharp reprimands that were issued in 2004 by the convention's EB (which includes representatives from all the member countries), three countries – Greece, Norway and Spain – have still not reduced their emissions as required by the protocols.²

In 2005, the committee examined the following five countries for non-compliance with emission targets.

GREECE. The latest reported data shows emissions of nitrogen oxides (NO_x) to have been higher in recent years than they were in 1987, the base year for the 1988 NO_x protocol. In 2002 they rose to 331,000 tonnes, compared to 285,000 tonnes in 1987. The EB expressed serious concern at the continuing failure of Greece to take effective measures to reduce its emissions, and also expressed disappointment at Greece's inability to achieve compliance before 2010, by which time it will have been failing to comply for thirteen years. The committee strongly urged Greece to consider taking additional measures and to implement earlier the measures it has already planned.

ITALY. It was noted in a previous review that Italy had failed to make the 30-per-cent reduction in volatile organic compounds (VOCs) by 1999, as required in the VOC protocol. New data submitted by Italy in 2005 does however show that Italy complied with its obligation in 2002.

IRELAND. Emission data shows the country's emissions of NO_x to have been above the level for the base year 1987 in all seven years from 1996 to 2002. The committee noted that new

data submitted by Ireland in 2005 shows that the country complied with its obligation in 2003.

NORWAY. According to its own data and projections, Norway continued to fail its obligation under the VOC protocol, but it expects that it will achieve compliance by 2005/06. The EB expressed its disappointment at Norway's inability to shorten the seven years it anticipated it will remain in non-compliance.

SPAIN. Emissions of NO_x were reported to have been above the level of the base year in all ten years from

*Several parties have
still not reported
complete emission data*

1994 to 2003. Spain also failed to comply with the VOC protocol – it has still far from achieved the required 30-per-cent reduction. Spain has stated that it tentatively expects to achieve compliance with the NO_x protocol by 2007 and with the VOC protocol by 2010. The EB expressed continued serious concerns at the failure of Spain to fulfil its obligations to take effective measures to attain compliance.

The committee also followed up Slovenia's non-compliance with regard to the 1994 Sulphur Protocol. The problem related to excessive emissions from the 360 MW Trbovje power plant, which uses brown coal with a sulphur content of up to three per cent. Slovenia has now retrofitted the plant with flue-gas desulphur-

ization, effective as of October 2005, but the emission standards were to be achieved from 1 July 2004.

As to the obligation to report on emission data, the committee noted that despite a general improvement there are still several parties that have not reported final and complete emission data.

Parties to the convention are also required to report strategies and policies for abating air pollution generally, and six parties were found to be still not complying with their reporting obligations for 2004. The report¹ contains country-by-country tables giving an overview of the current status of reporting.

This inadequate reporting is a serious matter, as the information that is being asked for is essential not only for tracking compliance with agreed commitments, but also to provide information for the forthcoming reviews and possible revisions of the protocols under the Convention.

In 2006, the committee will outline a plan for an in-depth review of compliance with the 1999 Gothenburg Protocol, which entered into force in May 2005.

CHRISTER ÅGREN

¹ The eighth report of the CLRTAP Implementation Committee (EB.AIR/2005/3, plus Add.1 and Add. 2). Can be downloaded from www.unece.org/env/eb/

² Under the 1988 NO_x Protocol, countries agreed to restrict their NO_x emissions to 1987 levels after 1994. The obligation under the 1991 VOC Protocol is for most countries to reduce their VOC emissions by 30 per cent by 1999, as compared to a base year, which in most cases is 1988.

CLRTAPNEWS. The Executive Body (EB) of the Convention on Long-range Transboundary Air Pollution met in Geneva 12-15 December 2005. Progress regarding the ongoing review of the 1998 protocols on heavy metals and persistent organic pollutants, respectively, was discussed. The EB decided to aim for a completion of the review of the heavy metals protocol in 2006, if possible. It also decided to initiate a review of the 1999 Gothenburg Protocol (which among other things sets national emission ceilings for SO₂, NO_x, VOCs, and NH₃), with an aim to complete this review in 2007. Negotiations on the revision of these protocols are likely to get started as soon as their respective review processes are finalized.

Good buy to emissions?

Under the EU emission trading scheme anyone is entitled to buy or sell emission credits. Through the Swedish Society for Nature Conservation (SSNC) individuals and companies can easily buy individual emission credits, each of which corresponds to a tonne of carbon dioxide, while a small donation also goes to the society to support its climate work. The emission rights are kept by SSNC, which guarantees they will never be put on the market.

“If you buy a tonne of carbon dioxide it means that someone else has to save a tonne. This reduces the market availability of emission rights, so the price goes up. Companies then have the choice to buy or to invest in effective technology to reduce their emissions,” explains Svante Axelsson, Secretary General of SSNC.

Further information (in Swedish only): <http://skarv.snf.se/snf/co2/>

Strict demands from EU Parliament

The European Parliament adopted a report on winning the battle against climate change on 16 November 2005.

The Parliament recommended EU emission reductions of 30 per cent by 2020 and between 60 and 80 per cent by 2050; vigorous promotion of research and innovation for sustainable energy technologies and an end to “perverse incentives” such as fossil fuels subsidies; binding targets to reach 40-per-cent energy savings potential; targets to be set for annual reductions in energy intensity in the order of 2.5–3 per cent; mandatory limits for emissions of carbon dioxide for cars, down to 80-100 g/km in the medium term (replacing the current voluntary scheme) and introduction of a European ecotax by 2009.

Further information: “Report on Winning the Battle Against Global Climate Change” (2005/2049(INI)) by Anders Wijkman can be found at www.europarl.eu.int

Warmest in a century

2005 may have been the warmest year in a century, according to a report by NASA, the US National Aeronautics and Space Administration. The five warmest years over the last century occurred in the last eight years. The warmest was 2005, then 1998, 2002, 2003 and 2004. Current warming is most pronounced at high latitudes in the northern hemisphere.

Source: NASA, www.nasa.gov/vision/earth/environment/2005_warmest.html



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EU EMISSION TRADING SCHEME

Stricter caps necessary

New guidelines from the Commission for the next trading period

BEFORE THE END OF June EU member states must inform the Commission of their draft plans for allocation of carbon allowances in the second phase of the EU emission trading scheme (ETS). These plans must be finalized and then approved by the Commission before the end of the year.

The Commission says its experience with the first round of National Allocation Plans (NAPs), covering the 2005-2007 trading period, has shown that the plans need to be more transparent and easier to implement. The Commission has therefore published guidelines that offer a consistent methodology for EU member states.

Member states not on track towards their overall Kyoto emission commitments will have to set stricter emission caps in phase two, the Commission says. In Austria, Belgium, Denmark, Finland, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Slovenia and Spain more needs to be done – but this does not imply that further measures are not necessary in other member states as well.

The Commission suggests that if

the ETS is used to contribute “proportionately” to emission cuts, the total number of allowances in the EU25 should be around six per cent lower in phase two than in phase one, but with a great variation between countries.

The countries can however choose to demand larger cuts from other sectors or to buy emission rights from outside. But the Commission says governments will have to justify any such decisions before it will allow more generous allocations under the ETS.

The end of June is the deadline not only for member states to submit their NAPs for 2008-2012 to the Commission, but also for the Commission to report to the Council and Parliament on experience to date with the ETS as a whole and to make proposals as appropriate. Preparations for the review are ongoing.

Further information: **Further guidance on allocation plans for the 2008 to 2012 trading period of the EU Emission Trading Scheme.** COM(2005) 703 final. More about the trading scheme at www.europa.eu.int/comm/environment/climat/emission.htm

GAINS model expanding to Asia, Africa and South America

THE Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) computer model is an extension of the RAINS (Regional Air pollution Information and Simulation) model developed by the International Institute for Applied Systems Analysis (IIASA).

The RAINS model covers traditional air pollutants, such as SO₂, NO_x, VOC, NH₃, fine particles (PM), and ground-level ozone, and can be used to investigate cost-effective policy options for attaining given environmental and health objectives.

Analyses based on the RAINS model have formed the basis for several important environmental policy developments in Europe, including the 1999 Gothenburg Protocol to the LRTAP Convention and the EU National Emission Ceilings (NEC) directive. The model is currently used for the reviews of the NEC directive and the Gothenburg Protocol.

In 2002 a two-year project was initiated to extend the RAINS model to include the six greenhouse gases covered by the Kyoto Protocol. The idea being that since air pollution and climate change originate from common sources (energy and agriculture), there are important links and synergies that need to be taken into account to support policy development. The project that resulted in the GAINS Europe model is now ready and can and will be used for policy making.

In the mid-1990s, the World Bank, the Asian Development Bank, and Japan, jointly supported the development of the RAINS Asia model, which has been widely disseminated in the region. The European Commission recently commissioned a project to extend the RAINS Asia model for India and China to a GAINS Asia model. There is now a proposal to develop GAINS model versions also for Africa and South America.

Africa and South America

Due to increasing use of energy, industrial development, more transpor-

tation and higher agricultural production in Africa and South America, emissions are growing, resulting in negative impacts on health and ecosystems. Even though this damage is probably quite significant, it is usually not taken into account in policy decisions aimed at economic development. Consequently, environmental policies are mostly seen as costs instead of benefits. Moreover, the effects of air pollutant emissions are not limited to one country – they are often transboundary. Lack of data on the costs and benefits of action/inaction is currently hindering and restraining both conventional eco-

Exploiting the synergies of combined abatement

nomical development policy and environmental policy.

The GAINS models for these regions could be a useful instrument to link economic development with air pollution, as well as climate change. The models could demonstrate the potential for synergies and benefits of sustainable economic development. These models could also be seen as a helpful tool to facilitate discussion amongst countries within a region on the development of policies that offer the largest positive effects and are as cost-effective as possible.

An important goal when developing these models would be to ensure that they are disseminated in appropriate institutions where they will be used both for policy preparation and education. The models should therefore be developed “bottom-up” and not only by scientists. At the same time mechanisms should be explored to involve local and regional policy institutions such as UN regional bodies or (related) cooperative programmes and existing monitoring networks. The GAINS models could then serve the countries in these re-

gions to prepare and commit to policy decisions, based on cost-effectiveness and cost-benefit analyses of air pollution and abatement of greenhouse gases, seen in relation to future economic developments.

The Commission on Sustainable Development

The GAINS Africa/South America project would consist of two phases: a preparatory phase of about half a year and a project phase (i.e. to develop the two GAINS models) of about two years. The preparatory phase was commissioned in December 2005. The outcome of the preparatory phase will be a project plan to develop both GAINS models. In the preparatory phase possible stakeholders should be contacted and encouraged to take part in the actual project.

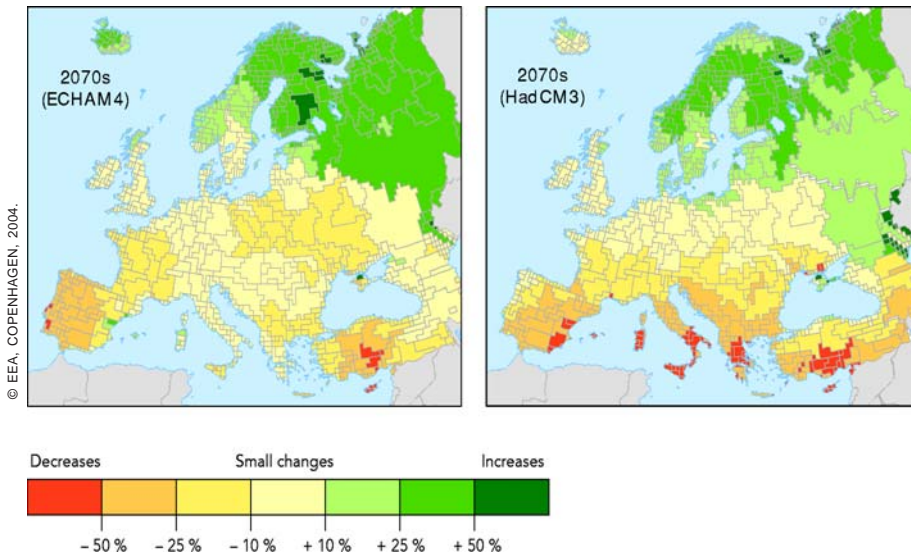
The project plan should be presented at the 14th session of the Commission on Sustainable Development (CSD) in May 2006. The CSD is focusing efforts over its current three-year cycle (2005–2007) on energy, climate change, industrial development and air pollution/atmosphere. If the project plan is broadly accepted and, not least, the funding for it is secured, then the actual project can start. At the 15th CSD session a progress report on the GAINS Africa and GAINS South America models together with some preliminary scenario results could be presented. Since the GAINS Asia model is expected to be ready at CSD15, results from the Asian application could also be presented.

CSD14 and 15 could play an important role in facilitating discussions in the different regions of the world on the interrelated effects of economic development (energy use and agricultural development), air pollution and climate change, based on analytical work and the development and use of computer modelling tools.

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Change in annual average river discharge for European river basins in the 2070s, compared with 2000, using the climate model ECHAM4 (left) and HadCM3 (right).



EUROPE

Widespread effects of climate change expected

Far-reaching climate effects can be expected over the next few hundred years, according to a summary of current research.

A VARIETY of research studies presented in recent years have described how Europe could be affected by a warmer climate. A report from the European Environment Agency presents detailed information on the likely extent of effects grouped by region and type. It also highlights what is being done and should be done to adapt society to a warmer climate.

Vulnerability by region

South-eastern Europe, the Mediterranean and central European regions are the most vulnerable to climate change. Here, considerable adverse impacts are projected to occur on natural and human systems that are already under pressure from changes in land use.

In mountains and sub-arctic areas, the impact of temperature rise on snow cover, glaciers and permafrost are likely to have adverse effects on winter tourism. There could also be an increased risk of natural hazards, and loss of plant species and habitats. Mountainous regions, like the

Alps, are particularly vulnerable to climate change and are already suffering from higher than average increases in temperature.

Climate change could have profound impact on coastal zones due to sea level rise and changes in frequency and/or intensity of storms. This would result in threats to ecosystems, infrastructure and settlements, the tourism industry and human health. Habitats and coastal ecosystems around the Baltic, Mediterranean and Black Seas in particular are at risk.

Vulnerability by issue

ECOSYSTEMS AND BIODIVERSITY: Observed temperature rises and changes in precipitation patterns already affect various aspects of Europe's natural systems. The most vulnerable ecosystems are the European arctic and mountains, coastal wetlands and ecosystems in the Mediterranean region. Projected climate change is expected to lead to considerable losses of species and habitats throughout the European continent.

AGRICULTURE AND FISHERIES: In the south and parts of eastern Europe the impact of climate change is likely to be negative. In fisheries, changes in fish migration patterns are expected to occur.

FORESTRY: Climate change will probably result in yield increases in commercial forests in northern Europe. However, Mediterranean regions and continental Europe will experience decreases in yield due to more frequent droughts and increased risks of fire.

WATER RESOURCES: Temperature rise and changing precipitation patterns are expected to exacerbate the already acute water shortage problem in southern and south-eastern regions.

TOURISM: Unreliable snow cover resulting from temperature rise is likely to lead to a loss in winter tourism. Water shortage, water quality problems, and more frequent and intense heat waves in southern Europe could cause notable reductions in summer tourism.

HUMAN HEALTH: Changes in the frequency and intensity of extreme weather and climate events could pose a serious threat to human health. These threats may either be direct, such as heat waves and flooding, or indirect, for example by the spread of tick-borne diseases.

ENERGY: Temperature rise is likely to increase energy demand for air conditioning in the summer, particularly in southern Europe.

Adaptation measures

Even if emissions of greenhouse gases stop today, changes would continue for many decades, and in the case of sea level for centuries. This is due to the historical build-up of the gases in the atmosphere and time lags in the response of climatic and oceanic systems to changes in the atmospheric concentration of the gases.

These developments point to the need for adaptation strategies. The EEA mentions flood defences, public health, water resources and management of ecosystems. A long list of possible and desirable measures are described in the report.

PER ELVINGSON

Further reading: **Vulnerability and Adaptation to Climate Change in Europe.** EEA Technical report No 7/2005. Available at http://reports.eea.eu.int/technical_report_2005_1207_144937/en

USA third from bottom

In a ranking of climate change performance among the 53 countries that account for 90 per cent of global carbon dioxide emissions, the top places are taken by Switzerland, Iceland, the UK and Germany, with Saudi Arabia bottom of the list. China is ranked 28th, Japan 30th and the USA 51st.

The list was drawn up by the German-watch organization with the aid of an index based on emission trends, evaluations of each country's domestic policy efforts and their positions in international diplomacy.

Source: *Environment Daily*, 29 November 2005. For more information, see www.germanwatch.org.

Regional initiative

Seven states in north-eastern USA have reached agreement on the first mandatory cap-and-trade programme to control carbon dioxide emissions in the United States. Called the Regional Greenhouse Gas Initiative, the programme will reduce carbon dioxide through a mandatory emissions cap on the electricity generating sector, coupled with a market-based trading programme to achieve the lowest possible compliance costs. Beginning in 2009, the initiative will stabilize emissions from power plants in the region at current levels through 2015, and reduce emissions by 10 per cent from current levels by 2019.

Source: *Environment News Service*, 20 Dec 2005.

Economic gains in emission reductions

California's strict environmental laws saved consumers and businesses US\$56 billion through gains in efficiency since the first major oil price spike in the 1970s, according to the study "No Reason to Wait", released by Stanford University. The California example is one of many in the study that shows that it pays to invest in reducing pollution.

Source: *Planet Ark* (Reuters), 5 December 2005.

Costly disasters

The largest financial losses ever due to weather-related natural disasters occurred in 2005, according to preliminary estimates by the Munich Re Foundation. It put the economic losses at more than US\$200 billion with insured losses running at more than US\$70 billion.

Source: www.ens-newswire.com, Dec 7, 2005.

Mixed reactions to Montreal conference

WHEN THE UN Climate Change Conference in Montreal concluded on the morning of 10 December many people were pleased with the outcome. Others regarded it as a major failure, however.

The delegates, representing 189 countries, agreed to start urgent negotiations on a new round of emission reduction targets for the second commitment period under the Kyoto Protocol.

The current protocol expires in 2012. The subsequent commitment period is expected to run from 2013 to 2017. A new working group will start work in May 2006 to ensure that these negotiations are concluded as soon as possible.

The delegates also agreed to a five-year plan of action on adaptation, to help least developed countries cope with the effects of climate change. This program will begin to address the fact that climate change already impacts the world's poorest, and that

it will get much worse in the coming decades.

Many environmental groups were pleased with the outcome. "The Kyoto Protocol is stronger today than it was two weeks ago," said Bill Hare, Greenpeace International Climate Policy Advisor.

But others were more sceptical, saying the meeting had done nothing more than agree to keep talking. They point out that the US signed up for talks only after a clause was added stipulating that the dialogue "will not open any negotiations leading to new commitments". For many, this made the dialogue pointless.

The Montreal conference drew around 9,500 delegates, including 2,800 government officials.

Further information: **Climate Action Network**, www.climnet.org; **Earth Negotiations Bulletin** www.iisd.ca/climate/cop11/; **UN Climate Convention's secretariat**, www.unfccc.int.

EU target within reach

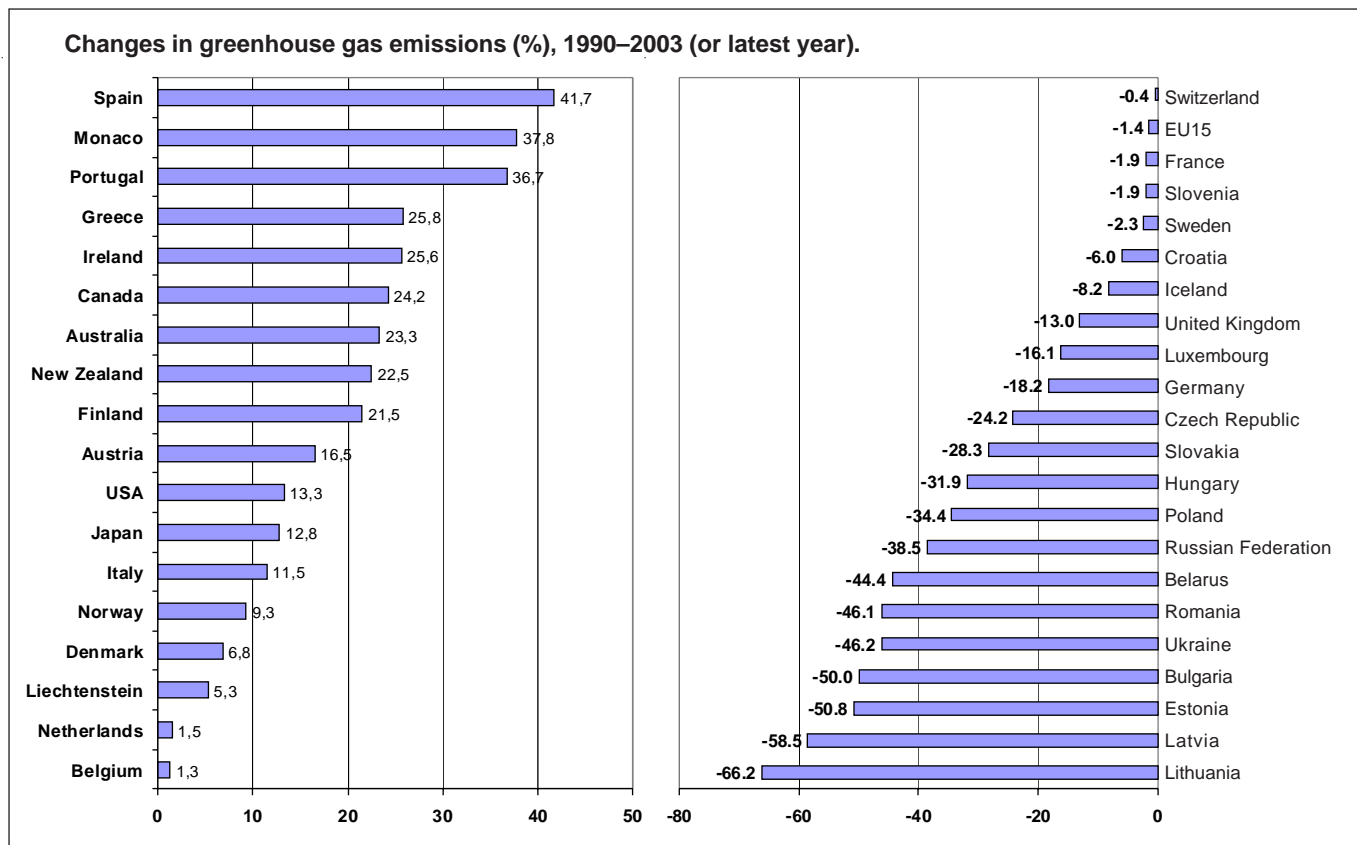
THE FIFTEEN EU "pre-2004" members, or EU15, have a collective commitment under the Kyoto Protocol to reduce emissions by eight per cent between 1990 and 2010 (in the latter case measured as an average for the years 2008-12). According to the latest forecast, based on the countries' own assessments as submitted to the climate convention in December, emissions will fall by 9.3 per cent.

Existing policies and measures – those already implemented – are projected to reduce combined emissions by 1.6 per cent below 1990 levels by 2010. Additional domestic policies and measures being planned would take the reduction to 6.8 per cent. Plans by 11 of the EU15 to obtain emission credits through Kyoto's project-based mechanisms would further increase the total emission savings to 9.3 per cent in 2010.

Several member countries look set to miss their targets, however, including Spain and Portugal. The report indicates that Austria, Belgium, Finland, France, Germany, Greece, Luxembourg, the Netherlands, Sweden and the UK are projected to be on track in 2010.

By 2003 – the latest year for which complete data are available – greenhouse gas emissions had been reduced by 1.7 per cent in the EU15 compared with base year levels (in most cases, 1990), while the economy had grown by 27 per cent, according to the Commission.

Further information: **Greenhouse gas emission trends and projections 2005**. EEA Report No. 8/2005, published by European Environment Agency and available at http://reports.eea.eu.int/eea_report_2005_8



GREENHOUSE GASES

Big differences in emission trends

The United States is responsible for by far the biggest increase in emissions since 1990.

EMISSIONS OF greenhouse gases by the industrialized countries (those listed in Annex I of the Climate Convention) fell by 5.9 per cent between 1990 and 2003, according to recently published data reported by the countries themselves to the Convention's secretariat.

However, this reduction is due entirely to economic recession and restructuring of industry in eastern Europe and the former Soviet Union at the start of the 1990s. These countries are known as "parties with economies in transition" (EIT) and their emissions fell by almost 40 per cent between 1990 and 2003, from 5.7 to 3.4 billion tonnes, calculated as CO₂ equivalent.

On the other hand, emissions from the other Annex I countries rose over the same period, from 12.7 to 13.9 billion tonnes CO₂ equivalent – an increase of 9.2 per cent.

Since the late 1990s greenhouse gas emissions from both EITs and non-EITs have been relatively stable.

But the forecasts submitted by the countries themselves indicate that emissions could rise by 10.6 per cent above 1990 levels by 2010. Total emissions from EIT parties are projected to be 18.3 per cent below the 1990 level, and total emissions from non-EIT parties 19.5 per cent above.

There are very wide variations in the trends between countries however. Lithuania had made the sharpest cuts, at 66.2 per cent below 1990 levels in 2003, followed by its Baltic neighbours, Latvia with 58.5 per cent, and Estonia with 50.8 per cent.

At the other end of the scale, Spain was furthest from the target with a 42-per-cent rise in emissions between 1990 and 2003, followed by Monaco with 38, Portugal with 37, and Greece and Ireland with 26 per cent.

The United States was 13.3 per cent over 1990 levels by 2003. In absolute terms this is by far the largest increase, at 811 million tonnes. In 2003 the US emissions totalled 6,894 million tonnes, which is 40 per cent

of the total emissions of the Annex I group (the corresponding share in 1990 was 33 per cent).

The EU15 countries reduced emissions by 1.4 per cent. This group's share of emissions from Annex I countries totalled 24 per cent in 2003.

Data is also given for 121 countries that are not listed under Annex I of the convention (developing countries), but this is generally older, mostly for 1990 and 1994, and not as detailed.

PER ELVINGSON

Further information: Key GHG Data. Greenhouse Gas Emissions Data for 1990–2003 submitted to the UN Framework Convention on Climate Change. Available at http://unfccc.int/essential_background/background_publications_htmlpdf/items/3604.php

The data presented in the report covers the same six greenhouse gases as the Kyoto Protocol and is given as CO₂ equivalents, a measure that weighs together the global warming potential (GWP) of the various gases.

Baltic Sea hit by nitrogen deposition

Agriculture is the most significant sector contributing to the airborne inputs.

APPROXIMATELY A QUARTER of the total nitrogen input into the Baltic Sea comes from airborne nitrogen deposited directly into the sea, according to a recent report¹ produced for the Helsinki Commission (HELCOM). In addition, some of the waterborne nitrogen input into the Baltic Sea originates from air pollution deposited in the catchment area.

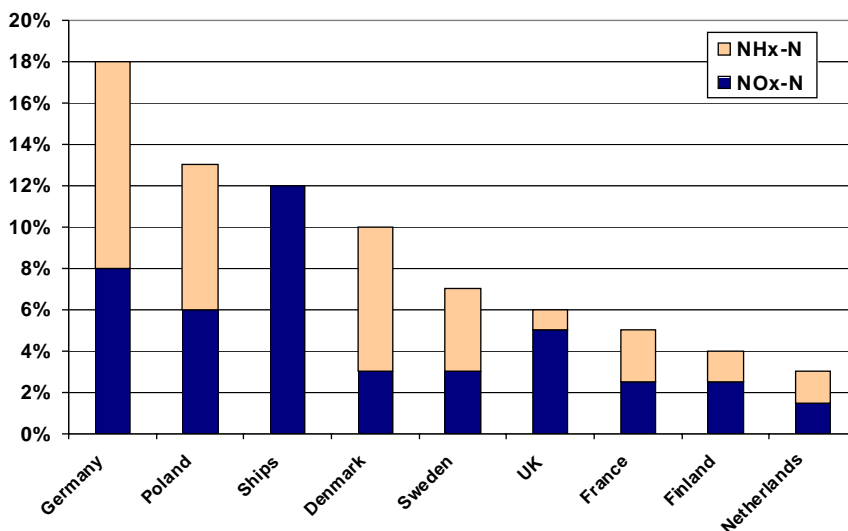
The Baltic Sea is ecologically unique in that it is one of the world's largest bodies of brackish water, and due to its special characteristics it is also very environmentally sensitive. Large inputs of nutrients, especially nitrogen and phosphorus, have caused severe eutrophication problems, including intense algal blooms, oxygen depletion, and damage to biodiversity. As much as 90 per cent of the marine and coastal biotopes in the Baltic Sea area are to some degree threatened, and many of these are important habitats for rare or endangered species.

The total annual input of nitrogen into the Baltic Sea has been estimated to amount to more than one million tonnes for the year 2000, of which three-quarters are waterborne inputs and the remaining one-quarter comes from direct atmospheric deposition of air pollutants.

Airborne nitrogen compounds are either in the form of oxidized nitrogen (i.e. nitrates), which is emitted into the air as nitrogen oxides (NO_x), primarily from combustion in the transport and energy sectors. Or they take the form of chemically reduced nitrogen (i.e. ammonium), which is emitted as ammonia (NH_3), the main source being agricultural activities.

According to the report, agriculture is the most significant sector contributing to airborne nitrogen inputs into the Baltic Sea. As it is also the major source of the waterborne discharges, the need to take action to reduce agricultural emissions becomes increasingly important.

While overall European emissions of nitrogen pollutants into the air have decreased over the last 10 to 20



Top contributors to atmospheric nitrogen (oxides + ammonia) deposition onto the Baltic Sea in 2003. Source: EMEP Status Report 1/2005.

years, those from one sector – international shipping – have increased. Emissions from shipping in the Baltic Sea itself are estimated to account for about six per cent of the total nitrogen deposition, and additional contributions come from ships plying the North Sea.

More importantly, between 2000 and 2020, NO_x emissions from shipping are expected to increase by two-thirds, and under current projections, by 2020 emissions from international shipping around Europe will surpass those from all land-based sources in the 25 EU member states combined.

The report includes a brief discussion on actions that can be taken to reduce air pollutant emissions, with

special focus on agriculture and shipping. The current report is to be followed by another one resulting from an ongoing HELCOM project, "Assessment of implications of different policy scenarios on nutrient inputs."

It is intended that the outcome of these studies should be used as input from HELCOM to the review and revision of the EU directive on national emission ceilings (NEC) and the 1999 Gothenburg Protocol to the Convention on Long-range Transboundary Air Pollution.

CHRISTER ÅGREN

¹ Airborne nitrogen loads to the Baltic Sea (2005). By the Baltic Marine Environment Protection Commission of the Helsinki Commission. Available at http://www.helcom.fi/publications/en_GB/publications/

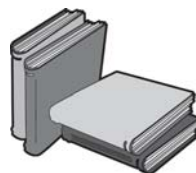
Regulation to reduce shipping emissions

The California Air Resources Board has adopted a regulation to reduce emissions from the use of auxiliary diesel engines and diesel-electric engines operated on ocean-going vessels in Californian waters.

Reductions will be accomplished through the use of cleaner burning marine distillate fuels or equally effective emission controls. The regulation is expected to yield immediate emission reductions upon implementation in 2007. For the nearly 75 per cent of vessels now using heavy fuel oil in their auxiliary engines, compliance with this measure will result in an estimated 75-per-cent reduction in PM, 80-per-cent reduction in SO_x , and six-per-cent reduction in NO_x .

Source: Car Lines, No.6, December 2005.

Recent publications



263 pp. £50.00. ISBN 1-84407-241-X.
Published by Earthscan/James & James,
www.earthscan.co.uk.

Particulate matter: a closer look. The state of affairs in the particulate matter dossier from a Dutch perspective (2005)

By the Netherlands Environmental Assessment Agency and the National Institute for Public Health and the Environment. Report 5000370011. Available at www.mnp.nl or www.rivm.nl

Consequences for the Netherlands of the EU thematic strategy on air pollution

By the Netherlands Environmental Assessment Agency. Report 500034002/2005. Available at www.mnp.nl

European Critical Loads and Dynamic Modelling. CCE Status Report 2005

Presents results from work on mapping and modelling of critical loads under the Working Group on Effects of the Convention on Long-range Transboundary Air Pollution.

By the Netherlands Environmental Assessment Agency. Report 259101016/2005. Available at www.mnp.nl/[cce](http://www.mnp.nl)

Critical Loads of Cadmium, Lead and Mercury in Europe (2005)

Based on work under the Convention on Long-range Transboundary Air Pollution, the report describes critical loads of cadmium, lead and mercury and identifies areas in Europe where depositions of these metals are too high.

By the Netherlands Environmental Assessment Agency. Report 259101015/2005. Available at www.mnp.nl/[cce](http://www.mnp.nl)

Science for Environment Policy

The environment directorate of the European Commission has launched a weekly alert service aimed at bringing new scientific findings relevant to EU environmental policy making to a wider audience.

Subscriptions free of charge. See http://europa.eu.int/comm/environment/integration/research_alert_en.htm

CAFE programme and the thematic strategy on air pollution

Please note that an extended version of the fact sheet distributed with the previous issue of Acid News is now available. Detailed country-by-country figures have been added showing how many people are affected and how many square kilometres of forest and ecosystems are damaged. Please download in pdf format from www.acidrain.org/pages/publications/factsheet/factsheet19.htm

Cleaner is Cheaper (2005)

An easy-to-read analysis of why EU climate policy for cars is failing, and what can be done about it. Published by the European Federation for Transport and Environment. T&E Report 05/5. Can be downloaded from www.t-e.nu.

Cars of the future (2005)

An overview of the potential for the automotive industry to cope with the environmental problems of today and tomorrow. The background research was conducted by consultants in close cooperation with the Netherlands Society for Nature and Environment. Available in pdf format at www.natuurenmilieu.nl

The European environment - State and outlook 2005

A five year assessment across 31 countries, provides an overview of Europe's environment and points to challenges of which climate change is just one. Other areas of concern include biodiversity, marine ecosystems, land and water resources, air pollution and health.

Available from EEA, http://reports.eea.eu.int/state_of_environment_report_2005_1/en/

Sustainable use and management of natural resources (2005)

This analysis from the European Environment Agency (EEA) focuses on a selection of natural resources, among them fossil fuels. EEA Report No 9/2005. Available in pdf format at http://reports.eea.eu.int/eea_report_2005_9

Household consumption and the environment (2005)

Analyzes the environmental effects of household consumption in Europe, and policy measures that can be taken to "bend the trend" towards sustainability. The focus is on four sectors: food and drink, housing, transport and tourism. EEA Report 11/2005, available at http://reports.eea.eu.int/eea_report_2005_11/en

Health and climate change: the now and how. A policy action guide (2005)

A WHO-coordinated project on climate change and adaptation strategies for human health (cCASHh) has identified a range of general and specific measures that could be carried out by European policy-makers to prevent, prepare and respond to the effects of weather and climate variability on people's health.

Available in pdf format from WHO Eu-

ropean Office, www.euro.who.int/eprise/main/WHO/Progs/GCH/Publications/20051202_1

The environmental effectiveness and economic efficiency of the EU ETS: Structural aspects of the allocation

The EU Emission Trading Scheme (ETS) is the first international trading system for carbon dioxide emissions in the world. This report by Öko-Institut evaluates the way these allowances have been distributed. The question of distribution heavily affects the incentives for investing in cleaner, less carbon-intensive technologies and the economic efficiency of the scheme.

Available from WWF European Policy Office, www.panda.org/epo.

Plan B 2.0: Rescuing a Planet Under Stress and a Civilization in Trouble

By Lester R. Brown. An examination of the limitations and possibilities that exist to create a rich life for the entire population of the Earth. Many examples relate to China's growing economy.

Published by Earth Policy Institute, see www.earthpolicy.org for details.

Tourism and Global Environmental Change (2005)

Tourism is often put forward as a solution to economic problems in many poor countries. As a result of the rapid increase in air travel, however, tourism makes a major contribution to the greenhouse effect and harms poor countries most.

\$39.95. 320 pp. Published by Routledge. ISBN 041536132X.

Annual European Community CLRTAP emission inventory 1990-2003 (2005)

EEA Technical Report No 6/2005, available from EEA, http://reports.eea.eu.int/technical_report_2005_6

Arrested Development. Energy Efficiency and Renewable Energy in the Balkans

Regional outlook for the South Eastern European energy sector, and country-by-country overview of Bulgaria, Macedonia, Romania, Serbia. Published by Stability Pact Watch Group, available at http://terraiii.ngo.ro/publicatii_en.htm

Switching to Renewable Power: A Framework for the 21st Century (2005)

This book analyzes strategies for promoting renewable energy within the context of a rapid energy transition, using case studies from different countries over the past 30 years.

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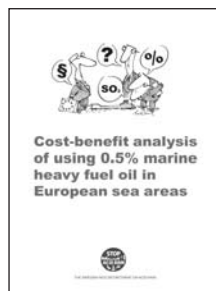
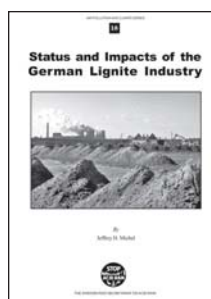


Health Impacts of Emissions from Large Point Sources

This study combines the health impact assessment methodology used by EU's CAFE programme with an emissions database for European large point sources, to assess health damage linked to emissions of nitrogen oxides and sulphur dioxide on a plant by plant basis. It finds that the emissions from large point sources in Europe could be responsible for more than one million life years lost in Europe every year. Some of the worst polluting plants may each be responsible for the annual loss of between 10,000 and 20,000 life years. By Mike Holland, EMRC, February 2006.

Status and Impacts of the German Lignite Industry

This report includes a historical treatment of German lignite use and discusses many of the hidden costs involved: excessive greenhouse gas emissions, depletion of groundwater resources, and destruction of hundreds of villages. Special consideration is paid to eastern Germany, where lignite accounts for up to 85 per cent of electrical power consumption in some regions. By Jeffrey H. Michel, April 2005.

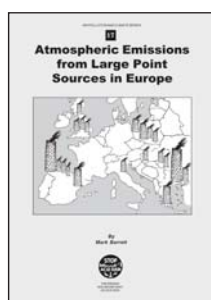


Cost-benefit analysis of using 0.5% marine heavy fuel oil in European sea areas

A lowering of the sulphur content of marine heavy fuel oil to 0.5 per cent would reduce SO₂ emissions from international shipping around Europe by more than three quarters by 2010. The benefits of such a measure clearly outweigh the costs, according to this study. By Christer Ågren, January 2005.

Atmospheric emissions from large point sources in Europe

This report identifies and lists the 200 largest emitters of sulphur dioxide and the 200 "best" fossil-fuelled power stations, in terms of SO₂ and NO_x emissions per useful output. By Mark Barrett, SENCO. Published 2004.



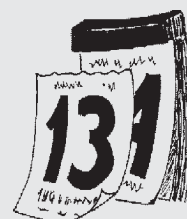
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EU Environment Council. 9 March.

CAFE Working Group of National Emissions Ceilings and Policy Instruments. Brussels, Belgium, 15 March 2006.

Bioenergy Europe 2006. London, UK, 16-17 March. *Info:* www.environmental-finance.com/ads/BIO.pdf

IMO Marine Environment Protection Committee 54. London, 20-24 March.

EU Transport, Telecoms and Energy Council. 27-28 March 2006.

3rd Conference on Future Urban Transport. Göteborg, Sweden, 2-5 April 2006. *Information:* www.fut.se.

CLRTAP Workshop on economic impacts of air pollution on cultural heritage. Catania, Italy, 6-7 April 2006.

CLRTAP Working Group on Strategies and Review. Geneva, 19-21 April.

CAFE Steering Group. Brussels, Belgium, 27-28 April 2006.

North Sea Ministerial Meeting on Environmental Impacts of Shipping and Fisheries. Gothenburg, Sweden, 4-5 May.

ECOMM 2006. Annual conference on mobility management. Groningen, the Netherlands, 10-12 May. *Information:* www.ecomm2006.nl

CLRTAP Task Force on Integrated Assessment Modelling. Rome, 17-19 May.

CLRTAP Task Force on Hemispheric Transport of Air Pollution. Moscow, Russia, 6-8 June 2006.

EU Transport, Telecoms and Energy Council. 8-9 June 2006.

Particles in Europe. Antwerp, Belgium, 13-14 June 2006. *Info:* www.aamg-rsc.org

8th International Conference on Greenhouse Gas Control Technologies. Trondheim, Norway, 19-23 June 2006. *Information:* www.ieagreen.org.uk/ghgt8.html

EU Environment Council. 26-27 June.

21st European Photovoltaic Solar Energy Conference and Exhibition. Dresden, Germany, 4-8 September. *Information:* www.photovoltaic-conference.com