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STATISTICAL RELEASE

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UK EMISSIONS OF AIR POLLUTANTS – 2009 ADDITIONAL RESULTS

This National Statistics release reports emissions of air pollutants that are covered by the UK Air Quality Strategy and the Convention on Long-Range Transboundary Air Pollution (CLRTAP). The [National Statistics publication of 16 December 2010](#) reported emissions of sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds and ammonia, which are covered by the National Emission Ceilings Directive (NECD). These pollutants are also presented here for completeness.

This notice will be updated in February 2012. Tables and charts are available in the [accompanying spreadsheet](#).

Headline results

- In 2009, there has been a continuation of the long-term trend of a reduction in emissions of the majority of the pollutants reported.
- With the exception of ammonia, which is unchanged from 2008 results, all pollutants covered in the UK Air Quality Strategy and their precursors have fallen between 2008 and 2009.
- Emissions of metals have seen an overall reduction between 2008 and 2009, with the exception of mercury, which increased from 6.4 to 7.3 tonnes. Emissions have however fluctuated around this value since 2002.
- There has been a decline in emissions of all reported persistent organic pollutants between 2008 and 2009.

Background

There has been a significant improvement in air quality in recent decades through measures to reduce emissions from transport, industrial and domestic sources. Despite this, there is still evidence of negative health effects and environmental damage caused by air pollutants. The statistics presented here provide the public with information on current levels of and trends in emissions of these pollutants, and are used to inform air pollution policies both nationally and internationally.

Air pollutant emissions initiatives

Although air pollution is an important local issue, the ability of many pollutants to be carried long distances means that the effects of emissions may be experienced many miles from their source. This means that air pollution is addressed at all levels, from local to international.

- The [UK Air Quality Strategy](#) contains policies for the assessment and management of air quality and implementation of European Union (EU) and international agreements. The pollutants covered are benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen oxides, ozone, particulates (PM₁₀ and PM_{2.5}), ammonia, polycyclic aromatic hydrocarbons and sulphur dioxide. Not all pollutants reported in this publication are covered in the Air Quality Strategy. These other pollutants are still important in terms of potential effects on health and the wider environment, but action is not required in the UK to meet a particular standard.
- The [National Emission Ceilings Directive \(NECD\)](#) sets ceilings for each EU Member State for emissions of ammonia, nitrogen oxides, sulphur dioxide and non-methane volatile organic compounds (NMVOCs). These pollutants are responsible for acidification and eutrophication of habitats, and formation of ground level ozone. Total UK emissions of these pollutants were presented in a separate National Statistics release, '[UK emissions of air pollutants – 2009 results](#)', published on 16 December 2010. They are also presented in Table 1.
- The [Convention on Long-range Transboundary Air Pollution](#) addresses some of the major environmental problems of the UNECE region through scientific collaboration and policy negotiation. Created in 1979, the Convention is extended by [eight protocols](#) that identify specific measures to be taken by Parties to cut their emissions of air pollutants. Parties develop policies and strategies to combat the discharge of air pollutants through exchanges of information, consultation, research and monitoring.

Emissions data

- The statistics presented are from the [UK National Atmospheric Emissions Inventory \(NAEI\)](#). For any given year considerable uncertainties may surround the estimates, although trends over time are likely to be more reliable. Historic data are recalculated each year to reflect changes in methodology, which is based on the most up-to-date information available. A full report, including methodology and detailed analysis of results, will be published later in the year. Last year's report can be found on the [NAEI website](#).
- Information on measured levels of pollutants in the air, along with their health effects, can be found on the [UK Air Quality Archive](#).
- The [European Environment Agency](#) houses European air quality data and analyses, and provides a summary of the policies in place.

Results

- Emissions of all pollutants except ammonia and mercury decreased between 2008 and 2009 (Table 1). Historically, a reduction in livestock numbers and changes in fertiliser use led to a decline in ammonia emissions, although this is now levelling off. Mercury emissions have fluctuated around 6-7 tonnes since 2002.
- Except for ammonia, which is unchanged, emissions of all pollutants covered by the UK Air Quality Strategy have decreased between 2008 and 2009. All have seen substantial long-term reductions. Chart 1 shows long-term trends using 1990 as a baseline year.
- A decline in coal use has been an important factor in the long-term reductions of a number of pollutants, including sulphur dioxide, particulates and certain metals.
- Road transport is a significant source for a number of pollutants, including particulates and nitrogen oxides. There have however been substantial long-term reductions due to measures such as introduction of catalytic converters, unleaded petrol, and reduced benzene content in fuel.
- The largest emission sources are not necessarily the greatest contributors to poor air quality. Exposure to air pollution also depends on other factors, such as proximity of the source and the efficiency of dispersion in the atmosphere.
- More detailed information on sources of pollutants for 2009 will be published in April.
- Ozone is covered in the UK Air quality Strategy, but is not included here because the majority of ground-level ozone arises from reactions between precursor pollutants (NO_x, NMVOCs and carbon monoxide) in the presence of sunlight. Direct emissions do not contribute significantly.
- Although ozone precursor emissions have been substantially reduced in the long-term, this is not reflected in ozone concentrations in the air (see [‘Air Quality Indicators – 2010 provisional UK results’](#) for more information). A similar lack of an apparent link between emissions reductions and levels of ozone in the air is seen more widely in Europe.

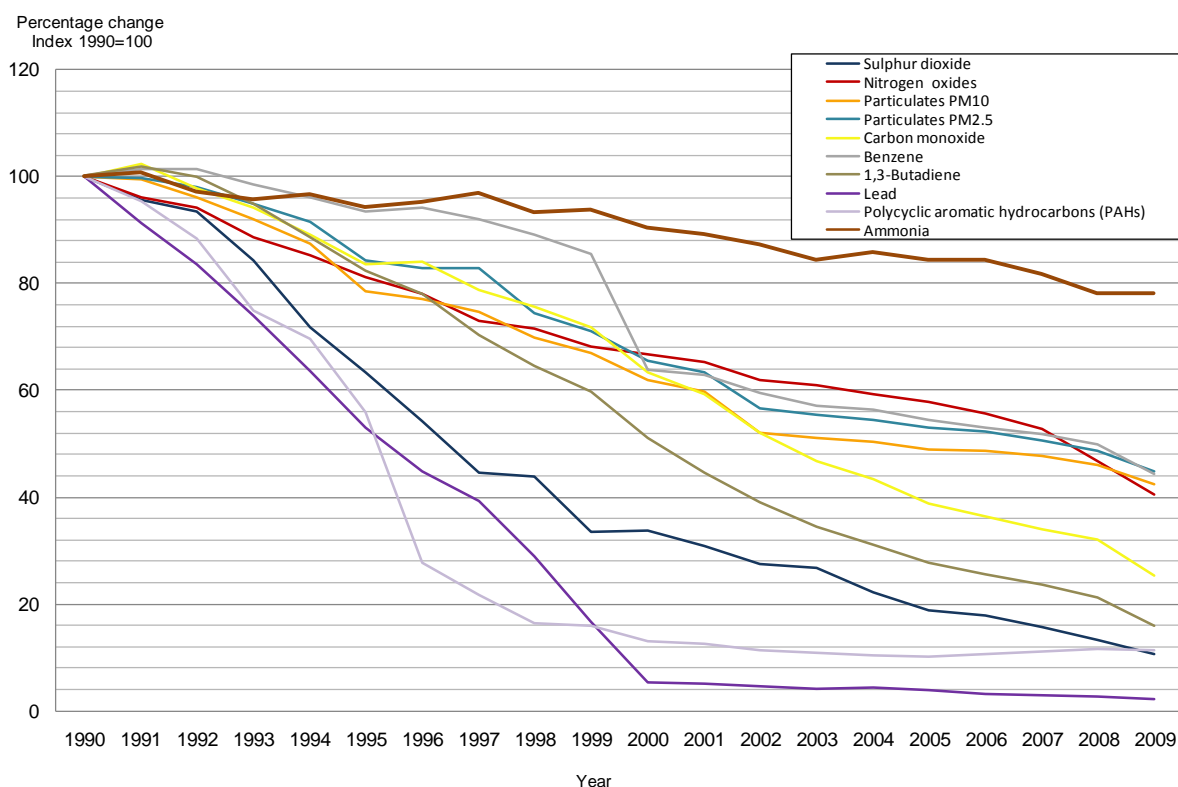
Table 1: Air pollutant emissions, 1970 – 2009, UK

Pollutants	Units	1970	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	% change 1990-2009	% change 2008-2009
Pollutants covered by the UK Air Quality Strategy (AQS)																
Sulphur dioxide (SO ₂) ¹	Kilotonnes	6,423	4,782	3,711	1,253	1,146	1,018	997	831	697	663	586	498	397	-89%	-20%
Nitrogen oxides (NO _x) ¹	Kilotonnes	2,570	2,523	2,683	1,789	1,753	1,664	1,635	1,587	1,553	1,495	1,414	1,252	1,086	-60%	-13%
Particulates <10µm (PM ₁₀)	Kilotonnes	498	328	280	174	167	145	143	141	137	136	133	129	119	-58%	-8%
Particulates <2.5µm (PM _{2.5})	Kilotonnes	244	172	158	103	100	89	87	86	84	82	80	76	70	-55%	-8%
Carbon monoxide	Kilotonnes	9,824	8,291	9,000	5,692	5,334	4,693	4,201	3,896	3,492	3,281	3,061	2,881	2,277	-75%	-21%
Benzene	Kilotonnes	34	32	40	25	25	24	23	22	22	21	21	20	18	-56%	-11%
1,3-Butadiene	Kilotonnes	8	11	15	7	6	6	5	5	4	4	3	3	2	-84%	-25%
Lead	tonnes	7,479	8,298	2,890	150	142	132	117	121	110	89	79	73	60	-98%	-17%
Polycyclic aromatic hydrocarbons (PAHs)	tonnes	Not reported	Not reported	5,520	718	694	620	589	563	555	584	614	637	616	-89%	-3%
Ammonia (NH ₃) ¹	Kilotonnes	Not reported	364	368	333	328	322	311	316	311	311	302	288	288	-22%	0%
Metals not covered by the UK AQS																
Arsenic	tonnes	79	54	46	20	17	15	15	14	14	14	14	14	13	-71%	-4%
Cadmium	tonnes	36	26	23	6	5	5	3	4	4	4	3	3	2	-90%	-16%
Chromium	tonnes	240	183	159	74	54	43	41	39	36	33	30	29	26	-84%	-10%
Copper	tonnes	217	158	142	81	70	64	67	65	61	60	59	61	52	-63%	-15%
Mercury	tonnes	63	43	38	8	8	7	7	6	7	7	7	6	7	-81%	15%
Nickel	tonnes	913	492	324	166	183	141	131	126	122	115	109	113	83	-74%	-27%
Selenium	tonnes	94	90	82	38	38	33	35	41	41	38	36	36	31	-62%	-14%
Zinc	tonnes	1,488	1,013	982	623	583	536	461	468	420	389	396	368	339	-65%	-8%
Persistent Organic Pollutants (POPs) not covered by the UK AQS																
Lindane (Gamma HCH)	tonnes	Not reported	Not reported	99	33	29	22	19	17	14	13	11	10	9	-91%	-12%
Pentachlorophenol (PCP)	tonnes	Not reported	Not reported	751	605	576	541	508	476	451	427	404	383	363	-52%	-5%
Hexachlorobenzene (HCB)	kilograms	Not reported	Not reported	3,170	80	70	66	64	75	71	66	62	58	33	-99%	-44%
Polychlorinated Biphenyl (PCB)	kilograms	Not reported	Not reported	6,698	1,406	1,342	1,256	1,225	1,195	1,137	1,085	1,046	1,001	906	-86%	-9%
Dioxins and furans	grams International Toxic Equivalent (TEQ) ²	Not reported	Not reported	1,059	265	258	242	244	264	234	218	197	201	193	-82%	-4%
Other pollutants not covered by the UK AQS																
Non-methane volatile organic compounds (NMVOCs) ¹	Kilotonnes	1,881	2,210	2,706	1,563	1,463	1,373	1,248	1,155	1,080	1,034	1,004	929	826	-69%	-11%
Hydrogen chloride	Kilotonnes	333	306	270	83	69	43	39	28	19	18	15	12	11	-96%	-10%
Hydrogen fluoride	Kilotonnes	14	11	10	4	4	5	5	5	5	5	5	4	3	-72%	-26%

Notes

- Figures for NO_x, SO₂ and NMVOCs have been subject to minor revisions (less than one per cent of the national total) since publication of the National Statistics release on 16 December 2010, due to inclusion of additional emissions from the gas production sector.
- Toxic Equivalent (TEQ) is a more appropriate measure than the total grams, as it reflects the toxicity of mixtures of compounds.

Chart 1: Changes in emissions of pollutants covered by the UK Air quality Strategy, 1990-2009, UK



Appendix 1 - Notes

1. The statistics presented are calculated from the National Atmospheric Emissions Inventory (NAEI), produced for Defra and the Devolved Administrations by AEA Energy & Environment. Additional results on sources of pollutants will be published in April. A full report will be published later in the year, including detailed methodology. For further information on the inventory see the [NAEI web site](#).

2. Results for greenhouse gases, also covered in the NAEI, are published by Department of Energy and Climate Change (DECC) in a separate National Statistics release. For further details visit the [DECC website](#).

A National Statistics publication

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