Air Quality & Climate Change Policy -- Documents

BBC Article – *Climate Risk to Millions of Species*, January 2004
http://news.bbc.co.uk/1/hi/sci/tech/3375447.stm

NRDC Study – *Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the U.S.* – 2004
http://www.nrdc.org/air/pollution/benchmarking/

BBC NEWS

Climate risk 'to million species'

By Alex Kirby
BBC News Online environment correspondent

Climate change could drive a million of the world's species to extinction as soon as 2050, a scientific study says.

The authors say in the journal Nature a study of six world regions suggested a quarter of animals and plants living on the land could be forced into oblivion.

They say cutting greenhouse gases and storing the main one, carbon dioxide, could save many species from vanishing.

The United Nations says the prospect is also a threat to the billions of people who rely on Nature for their survival.

Seeking cooler climes

In a report, Extinction Risk From Climate Change, the scientists describe their study of the six biodiversity-rich regions, representing 20% of the Earth's land area.

The study used computer models to simulate how the ranges of 1,103 species - plants, mammals, birds, reptiles, frogs, butterflies and other invertebrates - are expected to move in response to changing temperatures and climate.

The scientists considered three different possibilities - minimum, mid-range and maximum expected climate change, on the basis of data from the Intergovernmental Panel on Climate Change.

They also assessed whether or not animals and plants would be able to move to new areas.

Mission improbable

They concluded that from 15 to 37% of all the species in the regions studied could be driven to extinction by the climate changes likely between now and 2050.

Species at risk include:

- Boyd's forest dragon, an Australian lizard likely to lost at least 20% of its range
- South Africa's national flower, the king protea, and its relatives
- *Virola sebifera* , a Brazilian tree whose entire range is likely to have vanished by 2050
- the Scottish crossbill, found only in Scotland: its survival could demand an improbable migration to Iceland.

The study's lead author, Professor Chris Thomas, of the University of Leeds, UK, says: "If the projections can be extrapolated globally, and to other groups of land animals and plants, our

analyses suggest that well over a million species could be threatened with extinction."

Some species will no longer have any climatically suitable habitat left, and others may be unable to migrate far enough to reach hospitable surroundings.

The authors say: "Many of the most severe impacts of climate change are likely to stem from interactions between threats, factors not taken into account in our calculations, rather than from climate acting in isolation."

They single out as examples habitat fragmentation and loss, and competition from new invasive species.

But they have some encouragement as well. They say the minimum expected climate change scenarios for 2050 - the change they regard as inevitable - would mean about 18% of the affected species would vanish.

Reversing the trend

The medium projections suggest an extinction rate of 24%, and the highest one of 35%.

They conclude: "Minimising greenhouse gas emissions and sequestering [storing] carbon to realise minimum rather than mid-range or maximum expected climate warming could save a substantial percentage of terrestrial species from extinction."

John Lanchbery, of the UK's Royal Society for the Protection of Birds, has studied the science and diplomacy of climate change for many years.

He told BBC News Online: "It would appear there is really nothing we can do to avoid at least some extinctions. We are bound to be near to the study's minimum scenarios, even if we can avoid the higher ones."

Dr Klaus Toepfer, the head of the United Nations Environment Programme, said: "If one million species become extinct... it is not just the plant and animal kingdoms and the beauty of the planet that will suffer.

"Billions of people, especially in the developing world, will suffer too as they rely on Nature for such essential goods and services as food, shelter and medicines".

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/3375447.stm

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Executive Summary

Back to Main Page

This report examines and compares the air pollutant emissions of the 100 largest power producers in the United States, based on 2004 plant ownership and emissions data (see Table ES.1). These producers include public and private entities (collectively referred to as "companies" or "producers" in this report) that own nearly 2,000 power plants and account for 88 percent of reported electric generation and 89 percent of the industry's reported emissions.

The report focuses on four power plant pollutants for which public emissions data are available: sulfur dioxide (SO2), oxides of nitrogen (NOx), mercury (Hg), and carbon dioxide (CO2). These pollutants cause or contribute to significant environmental and public health problems, including acid deposition, global warming, fine particulates, mercury deposition, nitrogen deposition, ozone smog, and regional haze.

The report benchmarks, or ranks, each company's absolute emissions and its emission rate (determined by dividing emissions by electricity produced) for each pollutant against the emissions of the other companies.

TABLE ES.1

100 LARGEST ELECTRIC POWER PRODUCERS IN THE UNITED STATES, 2004

RANK	PRODUCER NAME	2004 MWh (millions)	RANK	PRODUCER NAME	2004 MWh (millions)
1	American Electric Power (AEP)	190.4	51	Associated Electric Coop	16.7
2	Southern Company	186.3	52	Basin Electric Power Coop	16.4
3	Tennessee Valley Authority	157.6	53	KeySpan	15.7
4	Exelon	150.9	54	NiSource	15.2
5	FPL Group	124.9	55	Intermountain Power Agency	14.4
6	Entergy	117.9	56	Goldman Sachs	14.4
7	Dominion	106.0	57	WPS Resources	13.9
8	Duke Energy	102.2	58	Los Angeles City	13.5
9	Progress Energy	93.3	59	IDACORP	13.4
10	Calpine	85.2	60	International Paper	13.1
11	Xcel Energy	81.3	61	Municipal Electric Authority of Georgia	13.1
12	FirstEnergy	78.2	62	Sierra Pacific Resources	12.7
13	Edison International	78.2	63	Delta Power	12.6
14	Ameren	75.0	64	Lower Colorado River Authority	12.5
15	US Corps of Engineers	69.8	65	Omaha Public Power District	12.2
16	TXU	67.9	66	Unisource Energy	11.5
17	Cinergy	65.8	67	TransAlta	11.5

MAJOR FINDINGS

Electric Industry Emission Trends

Since 1990, power plant emissions of SO2 and NOx have decreased and CO2 emissions have increased.

- Largely due to programs implemented under the 1990 Clean Air Act Amendments, SO2 and NOx emissions from power plants have decreased since 1990. In 2004 power plant SO2 emissions were 36 percent lower and NOx emissions were 44 percent lower than they were in 1990.
- CO2 emissions are not regulated at the federal level. In 2004, power plant CO2 emissions were 27 percent higher than they were in 1990.

Overall Emissions from Electricity

The electric industry in the United States is a major source of air pollution.

- In 2004, power plants were responsible for 69 percent of SO2 emissions, 22 percent of NOx emissions, 33 percent of stationary source mercury emissions, and 39 percent of CO2 emissions in the United States.
- In 2004, 26 percent of fossil fuel was consumed in units with post-combustion SCR controls for NOx. Of the remaining fossil fuels used to produce electricity, 2 percent was consumed in units with SNCR controls, 57 percent in units with combustion controls, and 15 percent in uncontrolled units.
- In 2004, 35 percent of the coal consumed to produce electricity was combusted in units that use scrubbers to lower SO2 emissions. Many of the uncontrolled units used low-sulfur coal to limit SO2 emissions.
- In 2004, fossil fuel power plants were not required to control mercury emissions. Therefore, no fossil fuel power plants had installed pollution controls specifically designed to remove mercury. Some control technologies designed to remove SO2, NOx and particulates also reduce mercury emissions with varying levels of effectiveness.
- There are no commercial applications of CO2 control technologies installed on power plants. Until carbon capture technologies become commercially established, CO2 emissions from the electric industry can be lowered by increasing production from lower- or zero-emitting sources or improving the efficiency of power generation.

Air Pollution Rankings and Comparisons

The 100 largest power producers generated 88 percent of electric power in the United States in 2004. The 100 largest producers generated 97 percent of all nuclear power, 93 percent of all coal-fired power, 87 percent of all hydroelectric power, 71 percent of all natural gas-fired power, and 29 percent of all non-hydroelectric renewable power.

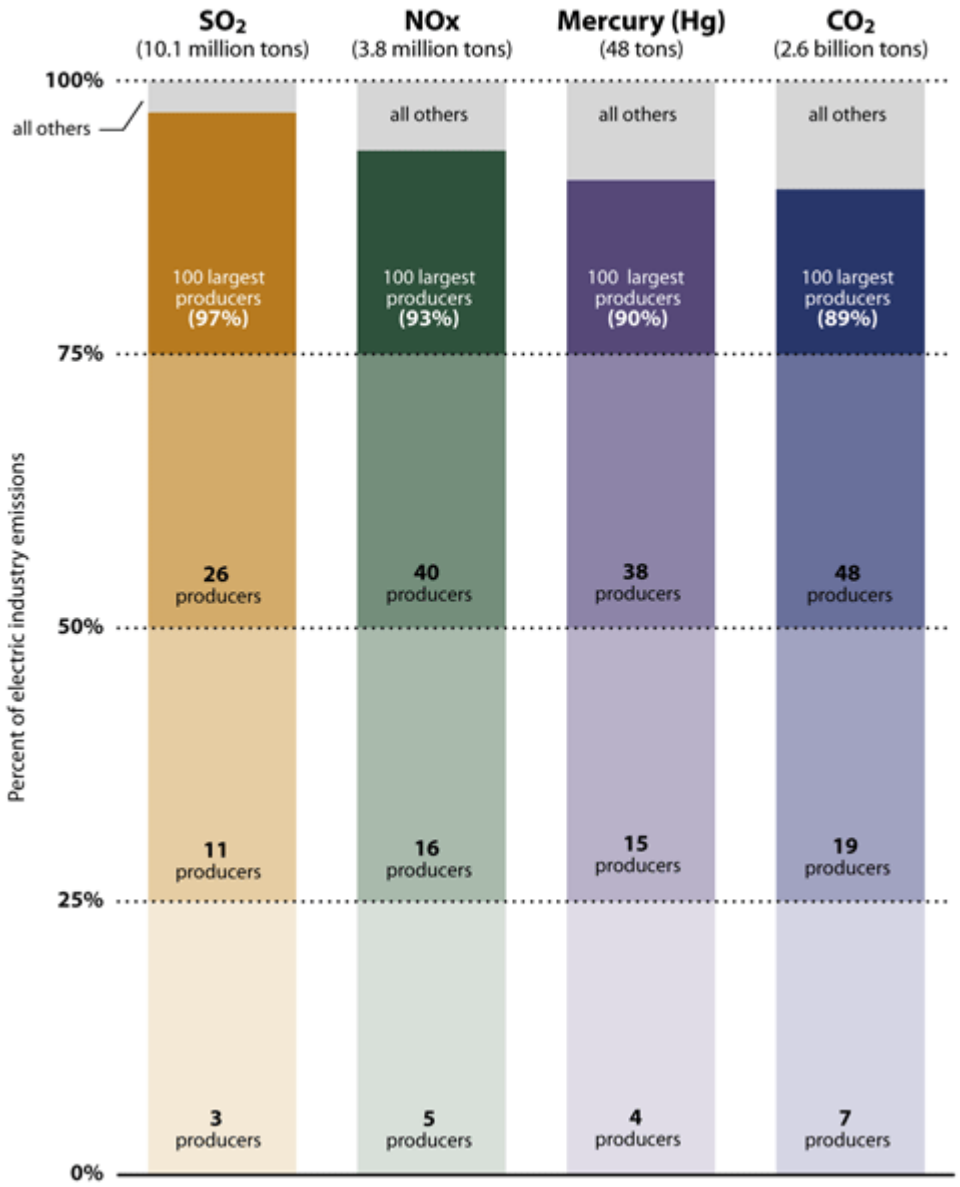
Air pollution emissions from power plants are highly concentrated among a small number of producers (see Figure ES.1).

- The three largest producers are responsible for nearly 20 percent of the combined SO2, NOx, mercury, and CO2 emissions within the electric sector.
- Three producers contribute 25 percent of the electric power industry's SO2 emissions, while 11 producers account for half of the industry's SO2 emissions.
- Five producers contribute 25 percent of the electric power industry's NOx emissions, and 16 producers account for half of the industry's NOx emissions.

- Four producers contribute 25 percent of the electric power industry's mercury emissions, and 15 producers account for half of the industry's mercury emissions.
- Seven producers contribute 25 percent of the electric power industry's CO2 emissions, while 19 producers account for half of the industry's CO2 emissions.

FIGURE ES.1

CONCENTRATION OF AIR EMISSIONS AMONG ALL ELECTRIC POWER PRODUCERS



Electric power producers' emission levels and emission rates vary signicantly due to the amount of power produced, the fuel used to generate the power, and installed pollution controls. In 2004 total generation among the 100 largest power producers varied from 6 million MWh to 190 million MWh and:

- SO2 emissions ranged from 0 to 964,000 tons, and SO2 emission rates ranged from 0.0 lbs/MWh to 18.1 lbs/MWh;
- NOx emissions ranged from 0 to 319,000 tons, and NOx emission rates ranged from 0.0 lbs/MWh to 5.47 lbs/MWh;

- CO2 emissions ranged from 0 to 164 million tons, and CO2 emission rates ranged from 0.0 lbs/MWh to 2,864 lbs/MWh

Electric power producers' mercury (Hg) emissions from coal plants ranged from 0.1 to 7,821 pounds, and Hg emission rates ranged from 0.0 lbs/GWh to 0.105 lbs/GWh.

Using this Report

The information in this report supports informed decision-making in several areas:

- It can be used by policymakers who are addressing the public health and environmental risks of SO2, NOx, mercury, and CO2 emissions. The EPA recently implemented new rules that place further restrictions on SO2 and NOx emissions for many power plants, and cap mercury emissions from coal-fired power plants. Although the EPA does not currently regulate CO2 emissions, several states have proposed regulations to limit CO2 emissions from power plants and other industrial facilities.
- It can be used by the investment community to assess the costs and business risks associated with compliance with future additional emission reduction requirements.
- It can be used by electric power companies and the public to assess corporate performance relative to key competitors, prior years, and industry benchmarks.

Back to Main Page

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