

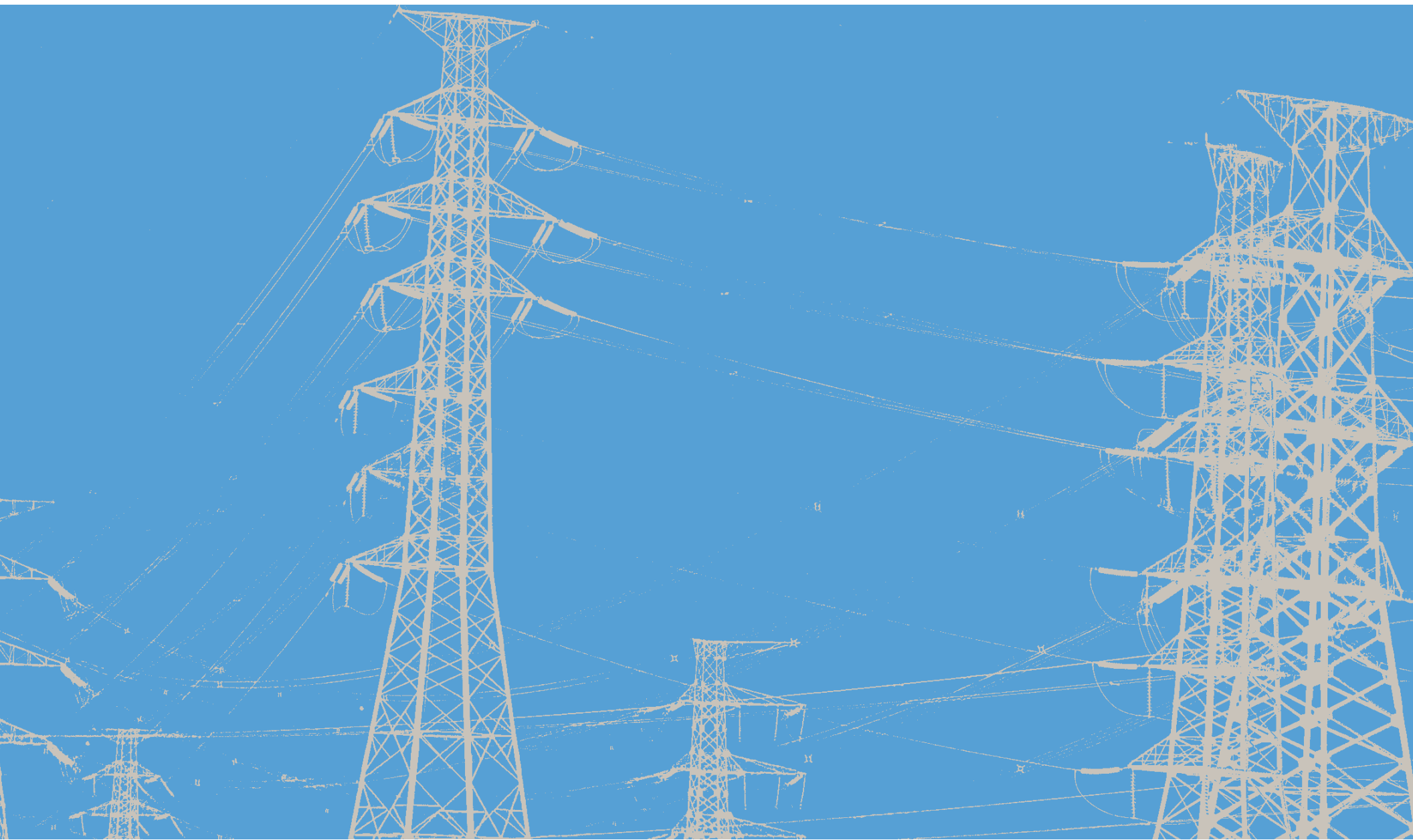


Benchmarking Air Emissions

OF THE 100 LARGEST ELECTRIC POWER PRODUCERS IN THE UNITED STATES



MAY 2013



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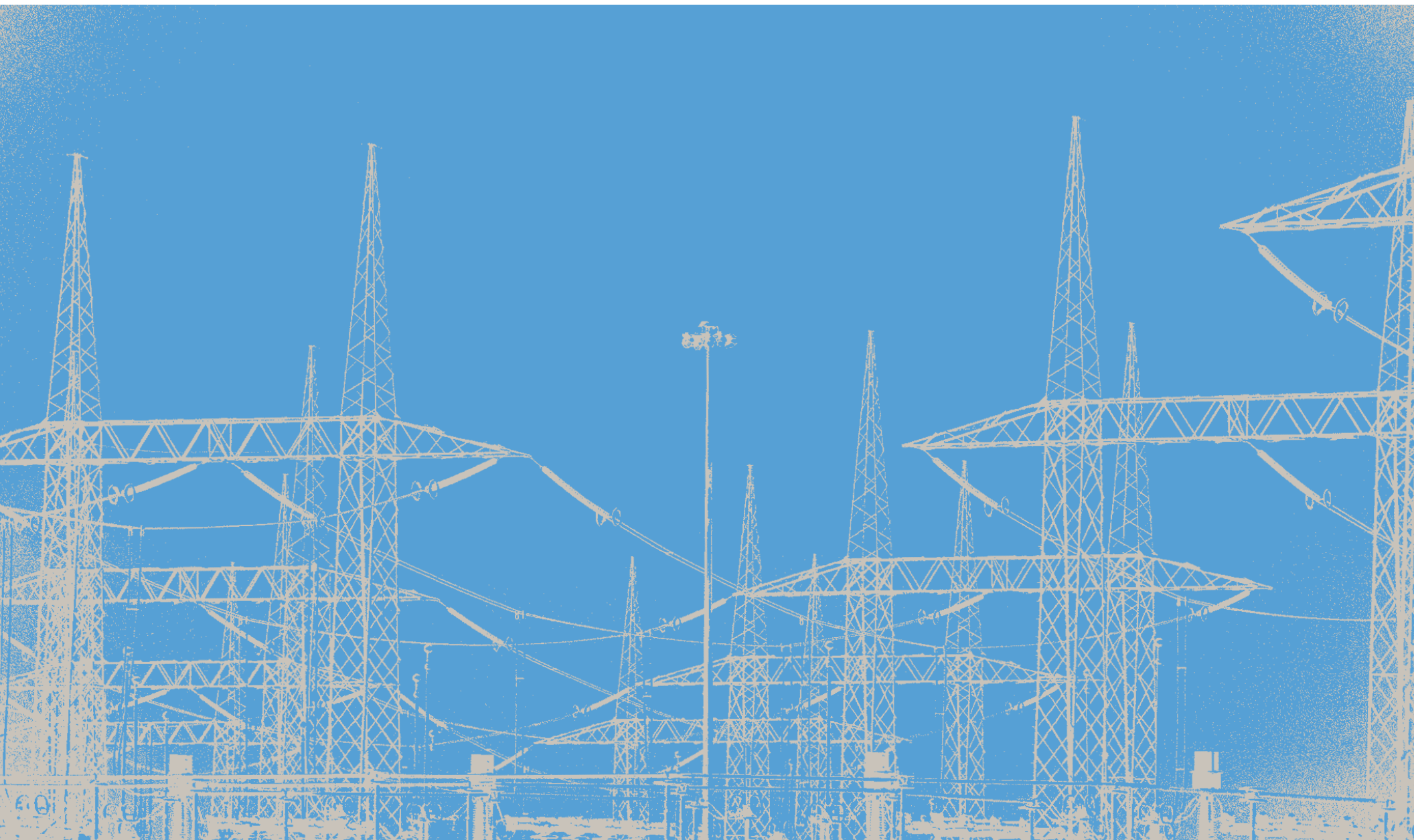
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Preface

The 2013 Benchmarking report is the ninth collaborative effort highlighting environmental performance and progress in the nation's electric power sector. The Benchmarking series began in 1997 and uses publicly reported data to compare the emissions performance of the 100 largest power producers in the United States. The current report is based on 2011 generation and emissions data. Traditionally, the report has been published every two years. However, in light of the changes that have been occurring within the industry, in terms of plant retirements and pollution control retrofits, we opted to issue a streamlined version of the report in 2013 that includes all of the data analysis provided in the 2012 version, but with less industry background and discussion of trends.

Data on U.S. power plant generation and air emissions are available to the public through several databases maintained by state and federal agencies. Publicly- and privately-owned electric generating companies are required to report fuel and generation data to the U.S. Energy Information Administration (EIA). Most power producers are also required to report air pollutant emissions data to the U.S. Environmental Protection Agency (EPA). These data are reported and recorded at the boiler, generator, or plant level, and must be combined and presented so that company-level comparisons can be made across the industry.

The Benchmarking report facilitates the comparison of emissions performance by combining generation and fuel consumption data compiled by EIA with emissions data on sulfur dioxide (SO₂), oxides of nitrogen (NO_x), carbon dioxide (CO₂), and mercury compiled by EPA; error checking the data; and presenting emissions information for the nation's 100 largest power producers in a graphic format that aids in understanding and evaluating the data. The report is intended for a wide audience, including electric industry executives, environmental advocates, financial analysts, investors, journalists, power plant managers, and public policymakers.

The report is available in PDF format at <http://www.ceres.org> and <http://www.nrdc.org>. Plant and company level data used in this report are available at <http://www.mjbradley.com>.

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Emissions of the 100 Largest Electric Power Producers

This report examines and compares the stack air pollutant emissions of the 100 largest power producers in the United States based on their 2011 generation, plant ownership, and emissions data. Table 1 lists the 100 largest power producers featured in this report ranked by their total electricity generation from fossil fuel, nuclear, and renewable energy facilities. These producers include public and private entities¹ (collectively referred to as “companies” or “producers” in this report) that own more than 2,600 power plants and account for 86 percent of reported electric generation and 88 percent of the industry’s reported emissions.

TABLE 1

100 Largest Electric Power Producers in the U.S., 2011

RANK	PRODUCER NAME	2011 MWh (millions)	RANK	PRODUCER NAME	2011 MWh (millions)	RANK	PRODUCER NAME	2011 MWh (millions)	RANK	PRODUCER NAME	2011 MWh (millions)
1	Southern	185.9	26	Dynegy	35.5	51	Sempra	15.3	76	Austin Energy	10.0
2	AEP	177.6	27	GenOn	35.3	52	Associated Electric Coop	15.0	77	Integrus	9.8
3	NextEra Energy	160.2	28	GDF Suez	34.7	53	Omaha Public Power District	13.8	78	BP	9.6
4	Exelon	152.9	29	Westar	27.4	54	LS Power	13.7	79	CLECO	9.4
5	Duke	147.4	30	Pinnacle West	27.3	55	Tri-State	13.7	80	EDP	9.3
6	Tennessee Valley Authority	145.1	31	San Antonio City	26.8	56	Occidental	13.6	81	El Paso Electric	9.0
7	Entergy	131.9	32	New York Power Authority	26.8	57	Iberdrola	13.6	82	UniSource	9.0
8	FirstEnergy	112.3	33	Santee Cooper	26.7	58	JEA	13.4	83	ALLETE	9.0
9	Dominion	99.7	34	OGE	26.5	59	Intermountain Power Agency	13.0	84	Entegra Power	8.8
10	Calpine	93.6	35	Great Plains Energy	26.0	60	ArcLight Capital	12.9	85	Portland General Electric	8.6
11	Progress Energy	88.7	36	SCANA	25.3	61	Exxon Mobil	12.8	86	Hoosier Energy	8.2
12	PPL	87.7	37	Salt River Project	25.0	62	Tenaska	12.5	87	Buckeye Power	8.1
13	MidAmerican	86.0	38	Oglethorpe	24.1	63	Municipal Elec. Auth. of GA	12.3	88	Puget Holdings	7.9
14	US Corps of Engineers	84.3	39	Wisconsin Energy	22.2	64	Los Angeles City	12.3	89	Grand River Dam Authority	7.7
15	Edison International	80.6	40	CMS Energy	20.4	65	East Kentucky Power Coop	12.1	90	Seattle City Light	7.5
16	Energy Future Holdings	78.0	41	Energy Capital Partners	20.2	66	NC Public Power	12.0	91	Sacramento Municipal Util Dist	7.5
17	Ameren	74.7	42	NV Energy	19.6	67	Dow Chemical	12.0	92	International Paper	7.3
18	Xcel	74.3	43	Alliant Energy	18.3	68	Lower CO River Authority	11.6	93	Arkansas Electric Coop	7.2
19	NRG	71.2	44	EDF	18.2	69	Rockland Capital	11.3	94	PowerSouth Energy Coop	6.9
20	AES	55.1	45	TECO	18.2	70	PNM Resources	11.0	95	TransCanada	6.9
21	PSEG	55.0	46	General Electric	17.3	71	Seminole Electric Coop	11.0	96	Avista	6.9
22	US Bureau of Reclamation	53.9	47	NE Public Power District	17.0	72	PUD No 2 of Grant County	10.7	97	TransAlta	6.8
23	Constellation	51.3	48	IDACORP	15.9	73	PUD No 1 of Chelan County	10.6	98	J-Power	6.8
24	DTE Energy	46.2	49	NISource	15.4	74	Big Rivers Electric	10.3	99	North Carolina EMC	6.1
25	PG&E	35.7	50	Basin Electric Power Coop	15.4	75	Great River Energy	10.2	100	Waste Management	6.0

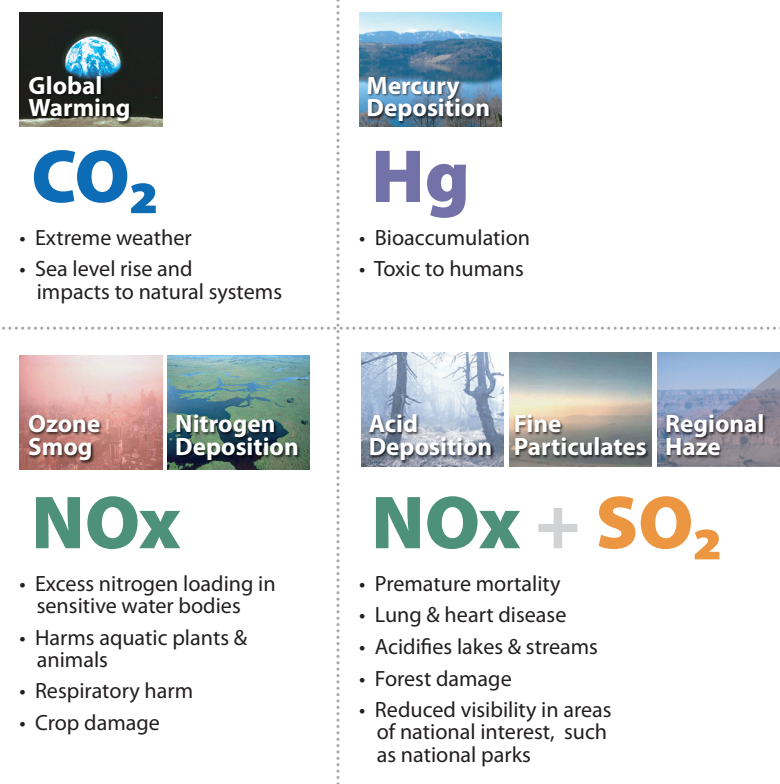
The report focuses on four power plant pollutants for which public emissions data are available: sulfur dioxide (SO₂), oxides of nitrogen (NO_x), mercury (Hg), and carbon dioxide (CO₂). These pollutants are associated with significant environmental and public health problems, including acid deposition, global warming, fine particle air pollution, 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.

In 2011, the 100 largest power producers in the U.S. generated 86 percent of the nation's electricity supply and 88 percent of the industry's air pollution emissions. Table 1 lists the 100 largest electric power producers in order of their total 2011 electric generation in megawatt hours. The three largest producers were responsible for 15 percent of the 3.5 billion megawatt hours of electricity generated by the 100 largest producers. The 100 largest power producers emitted in aggregate, approximately 4.1 million tons of SO₂, 1.7 million tons of NO_x, 25 tons of mercury, and 2.1 billion tons of CO₂. The top three producers were responsible for 21 percent of the SO₂, 15 percent of the NO_x, 15 percent of the mercury, and 16 percent of the CO₂ emissions of the 100 largest producers.

The average and median emission levels (tons) and emission rates (lbs/MWh) shown in Table 2 provide benchmark measures of overall industry emissions that can be used as reference points to evaluate the emissions performance of individual power producers.

FIGURE 1

Environmental Concerns Associated with Power Plant Emissions



Across the industry, power plant emissions of SO₂ and NO_x have decreased and CO₂ emissions have increased since 1990. In 2011, power plant SO₂ and NO_x emissions were 72 percent and 70 percent lower, respectively, than they were in 1990. In 2011, power plant CO₂ emissions were 20 percent higher than they were in 1990. In recent years, from 2008 through 2011, power plant CO₂ emissions decreased by 7 percent. Mercury emissions from power plants have decreased 40 percent since 2000 (the first year that mercury emissions were reported by the industry under the Toxics Release Inventory).

TABLE 2

Emissions Data for 100 Largest Power Producers
 in order of 2011 total generation

in order of 2011 total generation			2011 Generation (MWh)			2011 Emissions (tons)				Emission Rates (lbs/MWh)									
Rank	Owner	Ownership Type	Total	Fossil Fuel	Coal	SO ₂	NO _x	CO ₂	Hg*	All Generating Sources			Fossil Fuel Plants†			Coal Plants††			
										SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	Hg†††
1	Southern	investor-owned corp.	185,854,074	151,818,544	94,449,764	348,165	104,857	130,153,252	1.96	3.7	1.1	1,401	4.6	1.4	1,715	7.4	2.2	2,231	0.04
2	AEP	investor-owned corp.	177,648,950	158,134,007	138,783,150	512,265	137,942	157,646,924	2.42	5.8	1.6	1,775	6.5	1.7	1,994	7.4	1.8	2,110	0.03
3	NextEra Energy	investor-owned corp.	160,193,149	96,855,319	5,452,079	16,203	18,360	48,271,089	0.03	0.2	0.2	603	0.3	0.4	997	4.5	1.5	2,247	0.01
4	Exelon	investor-owned corp.	152,932,105	8,851,870	4,868,942	12,346	9,611	7,290,715	0.07	0.2	0.1	95	2.8	2.2	1,647	5.0	3.6	2,026	0.03
5	Duke	investor-owned corp.	147,439,511	100,564,364	85,592,134	231,562	76,307	93,461,832	0.58	3.1	1.0	1,268	4.6	1.5	1,859	5.4	1.8	2,025	0.01
6	Tennessee Valley Authority	federal power authority	145,055,720	78,885,095	69,394,664	210,118	63,473	80,380,998	0.86	2.9	0.9	1,108	5.3	1.6	2,038	6.1	1.8	2,193	0.02
7	Entergy	investor-owned corp.	131,906,935	50,355,230	15,407,716	48,444	47,842	38,615,244	0.40	0.7	0.7	585	1.9	1.9	1,534	6.2	2.6	2,242	0.05
8	FirstEnergy	investor-owned corp.	112,289,130	82,152,097	80,097,045	171,152	99,530	85,718,702	0.95	3.0	1.8	1,527	4.2	2.4	2,087	4.2	2.5	2,097	0.02
9	Dominion	investor-owned corp.	99,689,317	54,197,632	33,798,824	100,558	47,668	45,242,712	0.42	2.0	1.0	908	3.7	1.8	1,670	5.9	2.6	2,153	0.02
10	Calpine	investor-owned corp.	93,571,347	86,853,482	-	334	7,315	38,246,138	-	0.0	0.2	817	0.0	0.2	874	-	-	-	-
11	Progress Energy	investor-owned corp.	88,707,733	63,046,161	31,783,043	82,999	31,991	49,774,268	0.27	1.9	0.7	1,122	2.6	1.0	1,579	5.1	1.7	2,191	0.02
12	PPL	investor-owned corp.	87,696,269	67,213,349	62,344,753	140,537	74,215	67,958,312	0.86	3.2	1.7	1,550	4.2	2.2	2,022	4.5	2.3	2,100	0.03
13	MidAmerican	privately held corp.	86,027,891	68,684,920	61,579,060	103,662	82,196	71,792,628	0.93	2.4	1.9	1,669	3.0	2.4	2,090	3.4	2.6	2,230	0.03
14	US Corps of Engineers	federal power authority	84,339,520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Edison International	investor-owned corp.	80,584,500	51,510,248	42,272,014	155,479	48,931	51,968,682	0.40	3.9	1.2	1,290	6.0	1.9	2,012	7.4	2.3	2,276	0.02
16	Energy Future Holdings	privately held corp.	78,010,779	58,728,218	56,841,371	218,643	38,650	67,804,397	2.34	5.6	1.0	1,738	7.4	1.3	2,309	7.7	1.3	2,341	0.08
17	Ameren	investor-owned corp.	74,718,393	63,937,540	62,975,155	160,831	39,550	70,294,990	1.24	4.3	1.1	1,882	5.0	1.2	2,199	5.1	1.2	2,214	0.04
18	Xcel	investor-owned corp.	74,337,104	60,063,535	45,646,315	83,681	58,683	58,240,229	0.62	2.3	1.6	1,567	2.8	1.9	1,939	3.7	2.3	2,207	0.03
19	NRG	investor-owned corp.	71,164,951	60,742,171	46,456,334	129,541	40,181	60,029,737	1.24	3.6	1.1	1,687	4.3	1.3	1,971	5.5	1.5	2,216	0.05
20	AES	investor-owned corp.	55,084,078	52,122,745	39,724,810	131,922	39,766	49,084,818	0.48	4.8	1.4	1,782	5.1	1.5	1,883	6.6	2.0	2,153	0.02
21	PSEG	investor-owned corp.	54,985,420	24,753,171	7,799,235	14,416	11,819	16,094,344	0.07	0.5	0.4	585	1.2	1.0	1,298	3.7	2.6	2,171	0.02
22	US Bureau of Reclamation	federal power authority	53,934,886	4,119,281	4,114,763	1,128	4,821	4,499,957	0.07	0.0	0.2	167	0.5	2.3	2,185	0.5	2.3	2,187	0.03
23	Constellation	investor-owned corp.	51,279,024	34,079,377	13,077,586	29,222	16,655	23,777,800	0.08	1.1	0.6	927	1.7	1.0	1,395	4.4	2.4	2,211	0.01
24	DTE Energy	investor-owned corp.	46,206,099	36,577,736	35,595,245	139,897	40,674	39,842,329	0.87	6.1	1.8	1,725	7.6	2.2	2,179	7.8	2.2	2,204	0.05
25	PG&E	investor-owned corp.	35,690,580	5,083,755	-	10	122	2,247,795	-	0.0	0.0	126	0.0	0.0	884	-	-	-	-
26	Dynegy	investor-owned corp.	35,485,562	35,485,562	22,881,687	46,419	12,023	30,715,623	0.14	2.6	0.7	1,731	2.6	0.7	1,731	4.0	1.0	2,195	0.01
27	GenOn	investor-owned corp.	35,349,324	35,349,324	27,204,011	127,311	34,156	32,822,165	0.53	7.2	1.9	1,857	7.2	1.9	1,857	9.3	2.4	2,104	0.04
28	GDF Suez	foreign-owned corp.	34,697,837	32,893,651	7,351,898	18,916	8,139	20,192,633	0.26	1.1	0.5	1,164	1.2	0.5	1,227	5.1	1.6	2,269	0.07
29	Westar	investor-owned corp.	27,422,219	23,528,305	21,206,190	17,067	24,600	26,450,764	0.44	1.2	1.8	1,929	1.5	2.1	2,248	1.6	2.1	2,356	0.04
30	Pinnacle West	investor-owned corp.	27,324,299	18,192,063	12,411,991	9,508	25,192	16,202,216	0.22	0.7	1.8	1,186	1.0	2.8	1,781	1.5	4.0	2,200	0.04
31	San Antonio City	municipality	26,798,894	18,652,536	15,265,507	23,269	8,737	19,474,055	0.24	1.7	0.7	1,453	2.5	0.9	2,088	3.0	1.0	2,208	0.03
32	New York Power Authority	state power authority	26,785,961	4,683,525	-	12	218	2,210,130	-	0.0	0.0	165	0.0	0.1	944	-	-	-	-
33	Santee Cooper	state power authority	26,690,307	23,871,415	20,007,292	22,254	10,215	23,687,618	0.10	1.7	0.8	1,775	1.9	0.9	1,985	2.2	1.0	2,194	0.01
34	OGE	investor-owned corp.	26,486,516	25,826,080	15,482,795	46,056	34,201	22,601,619	0.24	3.5	2.6	1,707	3.6	2.6	1,750	5.9	3.6	2,273	0.03
35	Great Plains Energy	investor-owned corp.	25,977,297	21,946,901	21,391,179	37,359	17,425	24,122,935	0.32	2.9	1.3	1,857	3.4	1.6	2,198	3.5	1.6	2,220	0.03
36	SCANA	investor-owned corp.	25,347,922	19,965,810	12,519,380	33,639	10,822	15,863,171	0.11	2.7	0.9	1,252	3.4	1.1	1,589	5.4	1.7	2,051	0.02
37	Salt River Project	power district	24,958,682	19,200,133	15,575,424	12,542	23,761	19,302,607	0.33	1.0	1.9	1,547	1.3	2.5	2,011	1.6	3.0	2,284	0.04
38	Oglethorpe	cooperative	24,052,792	14,360,937	8,713,820	16,085	5,893	12,495,856	0.04	1.3	0.5	1,039	2.2	0.8	1,740	3.7	1.2	2,242	0.01
39	Wisconsin Energy	investor-owned corp.	22,213,528	21,541,370	19,119,741	27,159	14,578	24,076,099	0.21	2.4	1.3	2,168	2.5	1.4	2,235	2.8	1.5	2,405	0.02
40	CMS Energy	investor-owned corp.	20,395,361	19,342,487	15,594,800	58,124	16,832	19,020,408	0.36	5.7	1.7	1,865	6.0	1.7	1,929	7.4	2.0	2,195	0.05
41	Energy Capital Partners	privately held corp.	20,219,954	20,219,954	-	45	1,263	8,849,542	-	0.0	0.1	875	0.0	0.1	875	-	-	-	-
42	NV Energy	investor-owned corp.	19,577,591	19,539,774	4,642,935	3,822	7,250	11,822,159	0.08	0.4	0.7	1,208	0.4	0.7	1,210	1.6	2.7	2,303	0.04
43	Alliant Energy	investor-owned corp.	18,273,983	16,901,627	16,021,008	68,609	18,702	19,612,134	0.44	7.5	2.0	2,146	8.1	2.2	2,319	8.6	2.3	2,369	0.05
44	EDF	foreign-owned corp.	18,216,731	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	TECO	investor-owned corp.	18,208,269	18,208,269	10,847,787	10,180	5,425	15,991,101	0.05	1.1	0.6	1,756	1.0	0.6	1,593	1.7	0.9	2,056	0.01
46	General Electric	investor-owned corp.	17,268,462	17,184,781	1,440,807	4,274	2,218	8,491,039	0.01	0.5	0.3	983	0.5	0.3	986	5.9	2.0	2,164	0.02
47	NE Public Power District	power district	17,029,733	10,886,376	10,732,683	33,182	19,665	11,973,473	0.14	3.9	2.3	1,406	6.1	3.6	2,200	6.2	3.7	2,217	0.03
48	IDACORP	investor-owned corp.	15,939,646	4,954,954	4,807,851	5,327	5,489	5,337,808	0.10	0.7	0.7	670	2.2	2.2	2,155	2.2	2.3	2,184	0.04
49	NiSource	investor-owned corp.	15,379,945	15,319,415	12,957,330	35,271	10,861	16,765,878	0.31	4.6	1.4	2,180	4.6	1.4	2,189	5.4	1.7	2,435	0.05
50	Basin Electric Power Coop	cooperative	15,353,030	14,415,434	14,249,997	56,922	21,726	18,020,108	0.39	7.4	2.8	2,347	7.9	3.0	2,500	8.0	3.0	2,518	0.05
51	Sempra	investor-owned corp.	15,321,128	11,073,604	-	25	372	4,893,725	-	0.0	0.0	639	0.0	0.1	884	-	-	-	-
52	Associated Electric Coop	cooperative	14,990,761	14,990,761	11,772,561	26,728	13,017	14,319,206	0.14	3.6	1.7	1,910	3.6	1.7	1,910	4.5	2.2	2,186	0.02

*Mercury emissions are based on 2011 TRI data for coal plants

†Fossil fuel emission rate = pounds of pollution per MWh of electricity produced from fossil fuel

††Coal emission rate = pounds of pollution per MWh of electricity produced from coal

†††Mercury emissions rate = pounds of mercury per gigawatt hour (GWh) of electricity produced from coal

Rank	Owner	Ownership Type	2011 Generation (MWh)			2011 Emissions (tons)				Emission Rates (lbs/MWh)									
			Total	Fossil Fuel	Coal	SO ₂	NO _x	CO ₂	Hg*	All Generating Sources			Fossil Fuel Plants†			Coal Plants††			
										SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	Hg†††
53	Omaha Public Power District	power district	13,807,228	12,590,611	12,422,701	31,404	13,082	13,749,218	0.28	4.5	1.9	1,992	5.0	2.1	2,184	5.1	2.1	2,198	0.05
54	LS Power	privately held corp.	13,749,173	13,201,977	2,364,164	1,636	1,894	6,431,760	0.05	0.2	0.3	936	0.2	0.3	974	1.4	0.7	2,229	0.04
55	Tri-State	cooperative	13,702,485	13,702,485	13,126,963	8,846	17,680	15,598,840	0.10	1.3	2.6	2,277	1.3	2.6	2,277	1.3	2.7	2,321	0.02
56	Occidental	investor-owned corp.	13,613,412	13,545,397	-	9	629	6,268,629	-	0.0	0.1	921	0.0	0.1	919	-	-	-	-
57	Iberdrola	foreign-owned corp.	13,574,022	863,004	-	2	51	373,030	-	0.0	0.0	55	0.0	0.1	864	-	-	-	-
58	JEA	municipality	13,407,759	13,405,569	6,959,486	15,391	7,817	12,203,039	0.05	2.3	1.2	1,820	2.3	1.2	1,820	4.3	1.9	2,212	0.01
59	Intermountain Power Agency	power district	13,002,872	13,002,872	12,993,818	4,934	25,154	12,911,419	0.00	0.8	3.9	1,986	0.8	3.9	1,986	0.8	3.9	1,987	0.00
60	ArcLight Capital	privately held corp.	12,945,731	8,786,539	746,666	572	582	4,496,709	0.00	0.1	0.1	695	0.1	0.1	1,024	1.5	0.6	2,397	0.00
61	Exxon Mobil	investor-owned corp.	12,803,396	11,856,324	-	43	2,239	4,612,730	-	0.0	0.3	721	0.0	0.1	718	-	-	-	-
62	Tenaska	privately held corp.	12,482,022	12,397,504	-	31	869	5,550,144	-	0.0	0.1	889	0.0	0.1	895	-	-	-	-
63	Municipal Elec. Auth. of GA	municipality	12,327,070	5,672,411	4,385,956	8,092	2,782	5,472,184	0.02	1.3	0.5	888	2.9	1.0	1,929	3.7	1.2	2,242	0.01
64	Los Angeles City	municipality	12,320,616	9,035,227	3,589,834	1,007	4,424	6,893,491	0.06	0.2	0.7	1,119	0.2	1.0	1,526	0.5	2.3	2,187	0.03
65	East Kentucky Power Coop	cooperative	12,149,268	12,054,686	11,525,000	30,597	9,030	12,436,932	0.11	5.0	1.5	2,047	5.1	1.5	2,063	5.3	1.6	2,097	0.02
66	NC Public Power	municipality	12,045,908	1,022,435	1,013,332	1,522	500	1,101,714	0.01	0.3	0.1	183	3.0	1.0	2,155	3.0	1.0	2,164	0.01
67	Dow Chemical	investor-owned corp.	11,965,781	11,224,003	2,749	13	384	5,126,708	-	0.0	0.1	857	0.0	0.1	853	-	-	1,043	-
68	Lower CO River Authority	state power authority	11,602,728	11,392,404	6,847,796	3,421	4,839	10,154,351	0.11	0.6	0.8	1,750	0.6	0.8	1,783	1.0	1.2	2,329	0.03
69	Rockland Capital	privately held corp.	11,267,129	11,267,129	224,863	1,297	1,261	4,476,474	0.00	0.2	0.2	795	0.2	0.2	795	10.2	4.9	2,402	0.04
70	PNM Resources	investor-owned corp.	10,997,404	7,800,347	6,668,185	3,309	11,937	7,947,595	0.02	0.6	2.2	1,445	0.8	3.1	2,038	1.0	3.5	2,213	0.01
71	Seminole Electric Coop	cooperative	10,969,379	10,969,379	8,425,763	14,977	2,448	9,898,876	0.04	2.7	0.4	1,805	2.7	0.4	1,805	3.6	0.5	2,064	0.01
72	PUD No 2 of Grant County	power district	10,727,299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	PUD No 1 of Chelan County	power district	10,566,032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	Big Rivers Electric	cooperative	10,291,424	10,291,424	8,673,402	20,795	12,267	11,886,871	0.11	4.0	2.4	2,310	4.0	2.4	2,310	4.8	2.8	2,292	0.03
75	Great River Energy	cooperative	10,178,688	10,078,314	9,794,234	17,468	9,893	11,496,632	0.44	3.4	1.9	2,259	3.5	2.0	2,281	3.6	2.0	2,306	0.09
76	Austin Energy	municipality	9,969,940	6,711,396	3,917,576	1,961	3,494	6,087,169	0.06	0.4	0.7	1,221	0.6	1.0	1,814	1.0	1.2	2,329	0.03
77	Integrus	investor-owned corp.	9,757,191	9,068,495	8,888,570	20,411	6,213	10,112,518	0.17	4.2	1.3	2,073	4.5	1.4	2,230	4.6	1.4	2,253	0.04
78	BP	foreign-owned corp.	9,619,020	6,688,793	-	85	357	2,943,968	-	0.0	0.1	612	0.0	0.1	749	-	-	-	-
79	CLECO	investor-owned corp.	9,373,864	9,373,864	3,453,652	16,662	6,075	9,036,247	0.08	3.6	1.3	1,928	3.6	1.3	1,928	7.7	1.8	2,320	0.05
80	EDP	foreign-owned corp.	9,284,561	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	El Paso Electric	investor-owned corp.	8,980,428	4,036,398	706,012	608	4,368	2,894,338	0.01	0.1	1.0	645	0.3	2.2	1,434	1.7	5.5	2,071	0.03
82	UniSource	investor-owned corp.	8,975,033	8,964,811	7,903,398	6,170	10,511	9,409,477	0.08	1.4	2.3	2,097	1.4	2.3	2,099	1.6	2.6	2,233	0.02
83	ALLETE	investor-owned corp.	8,951,551	8,143,011	8,134,003	7,669	6,874	9,627,304	0.14	1.7	1.5	2,151	1.8	1.6	2,365	1.8	1.6	2,364	0.04
84	Entegra Power	privately held corp.	8,806,830	8,806,830	-	20	475	4,040,185	-	0.0	0.1	918	0.0	0.1	918	-	-	-	-
85	Portland General Electric	investor-owned corp.	8,553,518	6,134,395	3,995,100	10,387	5,164	5,286,624	0.07	2.4	1.2	1,236	3.4	1.7	1,724	5.2	2.5	2,192	0.03
86	Hoosier Energy	cooperative	8,174,729	8,154,578	7,787,097	18,310	4,443	8,636,180	0.07	4.5	1.1	2,113	4.5	1.1	2,118	4.7	1.1	2,173	0.02
87	Buckeye Power	cooperative	8,070,117	8,070,117	8,008,588	55,961	5,165	8,185,413	0.11	13.9	1.3	2,029	13.9	1.3	2,029	14.0	1.3	2,037	0.03
88	Puget Holdings	privately held corp.	7,906,615	6,108,548	4,278,235	4,029	5,288	5,882,622	0.02	1.0	1.3	1,488	1.3	1.7	1,926	1.9	2.4	2,370	0.01
89	Grand River Dam Authority	state power authority	7,742,949	7,250,749	5,441,345	15,241	12,330	7,592,289	0.29	3.9	3.2	1,961	4.2	3.4	2,094	5.6	4.5	2,498	0.11
90	Seattle City Light	municipality	7,532,799	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91	Sacramento Municipal Util Dist	municipality	7,464,777	4,418,488	-	10	623	1,985,324	-	0.0	0.2	532	0.0	0.3	899	-	-	-	-
92	International Paper	investor-owned corp.	7,285,881	1,721,848	430,488	-	2,622	889,892	-	-	0.7	244	-	3.0	1,034	-	6.1	1,598	-
93	Arkansas Electric Coop	cooperative	7,235,498	6,811,693	5,527,823	15,462	9,037	6,828,620	0.15	4.3	2.5	1,888	4.5	2.7	2,005	5.6	3.0	2,230	0.05
94	PowerSouth Energy Coop	cooperative	6,894,487	6,882,769	3,888,105	4,460	3,837	6,131,029	0.03	1.3	1.1	1,779	1.3	1.1	1,782	2.3	1.9	2,460	0.01
95	TransCanada	foreign-owned corp.	6,891,604	4,894,580	-	97	1,081	2,758,184	-	0.0	0.3	800	0.0	0.4	1,127	-	-	-	-
96	Avista	investor-owned corp.	6,887,082	2,062,186	1,336,734	1,256	1,630	1,886,601	0.01	0.4	0.5	548	1.2	1.6	1,830	1.9	2.4	2,370	0.01
97	TransAlta	foreign-owned corp.	6,842,793	5,472,866	5,199,973	1,138	6,693	6,279,824	0.12	0.3	2.0	1,835	0.4	2.4	2,295	0.4	2.5	2,365	0.05
98	J-Power	foreign-owned corp.	6,769,118	6,769,118	250,309	132	780	3,245,743	0.00	0.0	0.2	959	0.0	0.2	959	0.9	1.0	2,131	0.00
99	North Carolina EMC	cooperative	6,140,494	365,143	-	1	153	226,206	-	0.0	0.0	74	0.0	0.8	1,239	-	-	-	-
100	Waste Management	investor-owned corp.	6,023,484	477,694	368,423	470	442	630,372	0.01	0.2	0.1	209	2.0	1.9	2,639	2.6	2.4	3,148	0.05
Total (in thousands)			3,525,744	2,369,413	1,549,533	4,129	1,721	2,093,435	0.03										
Average (mean)			35,257,444	23,694,133	15,495,330	41,291	17,214	20,934,354	0.25	2.1	1.1	1,317	2.6	1.4	1,712	4.3	2.2	2,218	0.03
Median			15,337,079	12,226,095	7,569,497	12,444	7,566	10,133,434	0.08	1.3	1.0	1,403	2.2	1.4	1,858	4.4	2.1	2,213	0.03

Generation by Fuel Type

The 100 largest power producers in the U.S. accounted for 86 percent of the electricity produced in 2011. Coal accounted for 44 percent of the power produced by the 100 largest companies, followed by natural gas (23 percent), nuclear (22 percent), hydroelectric power (8 percent), non-hydroelectric renewables and other fuel sources (3 and 1 percent, respectively), and oil (less than 0.2 percent). Natural gas was the source of 36 percent of the power produced by smaller companies, followed by coal (32 percent), non-hydroelectric renewables/other (19 percent), hydroelectric power (8 percent), nuclear power (4 percent), and oil (2 percent).

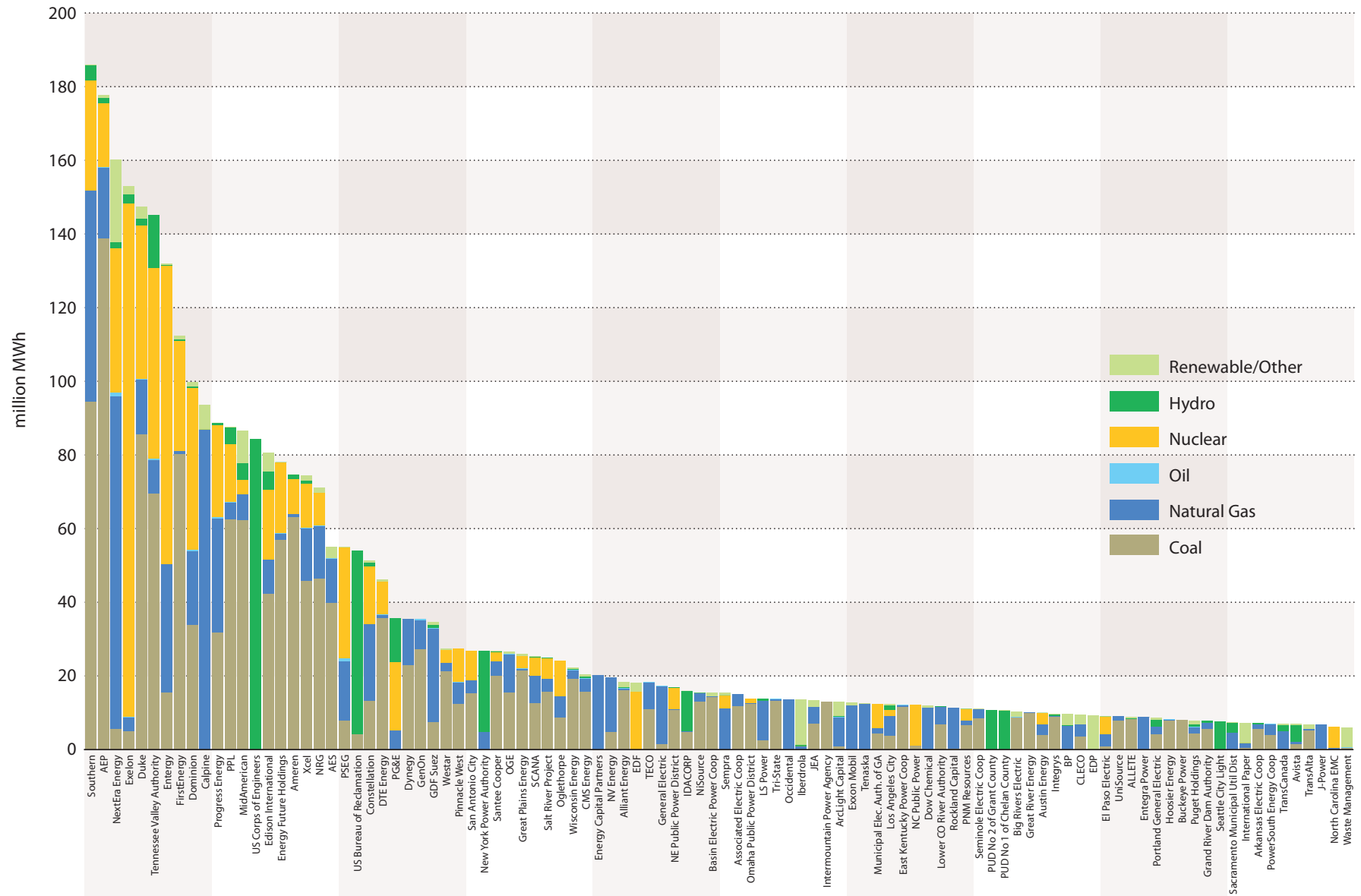
As a portion of total electric power production, the 100 largest producers accounted for 90 percent of all coal-fired power, 80 percent of natural gas-fired power, 39 percent of oil-fired power, 97 percent of nuclear power, 85 percent of hydroelectric power and 69 percent of non-hydroelectric renewable power.

Figure 2 illustrates the 2011 electricity generation by fuel for each of the 100 largest power producers. The generation levels, expressed in million megawatt hours, show production from facilities wholly and partially owned by each producer and reported to the EIA. Coal and nuclear accounted for over half the output of 58 out of the top 100 largest producers. Appendix B provides a detailed listing of the fuel mix of the 100 largest power producers.

These data reflect the mix of generating facilities that are directly owned by the 100 largest power producers, not the energy purchases that some utility companies rely on to meet their customers' electricity needs. For example, some utility companies have signed long-term supply contracts for the output of renewable energy projects. In this report, the output of these facilities would be attributed to the owner of the project, not the buyer of the output.

FIGURE 2

Generation of 100 Largest Power Producers by Fuel Type



Emissions Rankings

Table 3 shows the relative ranking of the 100 largest power producers by several measures—their contribution to total generation (MWh), total emissions and emission rates (emissions per unit of electricity output). These rankings help to evaluate and compare emissions performance.

Figures 3 through 6 illustrate SO₂, NO_x, CO₂, and mercury emission levels (expressed in tons for SO₂, NO_x and CO₂, and pounds for mercury) and emission rates for each of the 100 largest producers. These comparisons illustrate the relative emissions performance of each producer based on the company's ownership stake in power plants with reported emissions information. For SO₂ and NO_x, the report presents comparisons of total emission levels and rates for fossil fuel-fired facilities. For CO₂, the report presents comparisons of total emission levels and rates for all generating sources (e.g., fossil, nuclear, and renewable). For mercury, the report presents comparisons of total emissions levels and rates for coal-fired generating facilities only.

The mercury emissions shown in this report were obtained from EPA's Toxic Release Inventory (TRI). The TRI contains facility-level information on the use and environmental release of chemicals classified as toxic under the Clean Air Act. Because coal plants are the primary source of mercury emissions within the electric industry, the mercury emissions and emission rates presented in this report reflect the emissions associated with each producer's fleet of coal plants only. Other toxic air pollutant emissions, such as hydrogen chloride and hydrogen fluoride (acid gases), are also reported to EPA under the TRI program. However, we have not included these air toxics because of uncertainties about the quality of the data submitted to EPA. We will continue to evaluate whether these pollutants might be included in future benchmarking efforts. In general, there is a strong correlation between SO₂ reductions resulting from flue gas desulfurization (or "scrubber") installations and co-benefit reductions in acid gas emissions.

The charts present both the total emissions by company as well as their average emission rates. The evaluation of emissions performance by both emission levels and emission rates provides a more complete picture of relative emissions performance than viewing these measures in isolation. Total emission levels are useful for understanding each producer's contribution to overall emissions loading, while emission rates are useful for assessing how electric power producers compare according to emissions per unit of energy produced when size is eliminated as a factor.

The charts illustrate significant differences in the total emission levels and emission rates of the 100 largest power producers. For example, the tons of CO₂ emissions range from zero to almost 158 million tons per year. The total tons of emissions from any producer are influenced by the total amount of generation that a producer owns and by the fuels and technologies used to generate electricity.

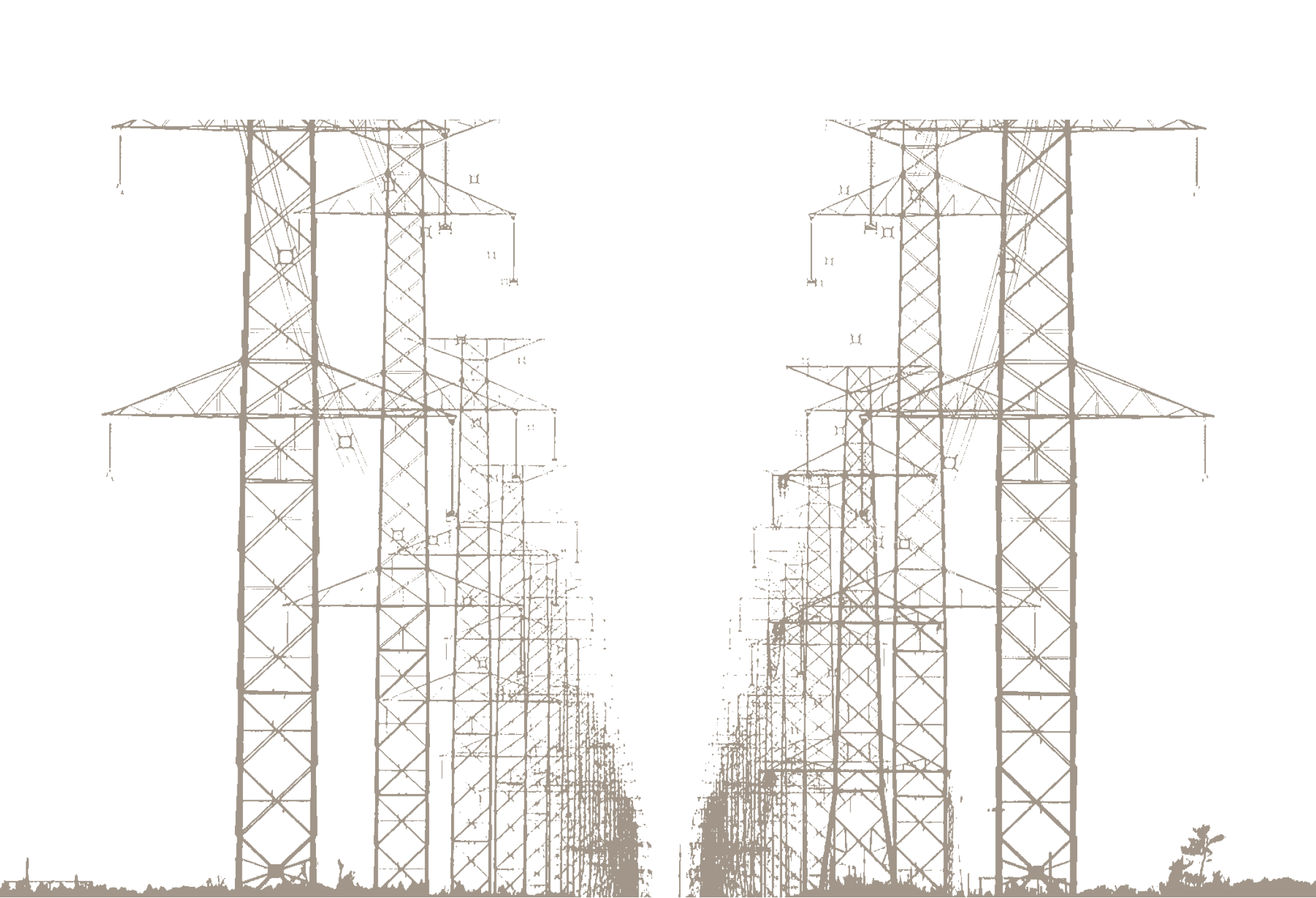
TABLE 3

Company Rankings for 100 Largest Power Producers
 in alphabetical order

		By Generation			By Tons of Emissions				By Emission Rates									
Owner	Ownership Type	Total	Fossil	Coal	SO ₂	NOx	CO ₂	Hg	All Generating Sources			Fossil Fuel Plants			Coal Plants			
									SO ₂	NOx	CO ₂	SO ₂	NOx	CO ₂	SO ₂	NOx	CO ₂	Hg
AEP	investor-owned corp.	2	1	1	1	1	1	1	6	26	31	7	33	36	10	49	66	29
AES	investor-owned corp.	20	16	13	11	14	14	14	10	29	28	13	42	46	13	45	63	48
ALLETE	investor-owned corp.	83	69	46	57	53	53	36	43	27	7	51	41	3	60	57	13	28
Alliant Energy	investor-owned corp.	43	39	23	18	26	29	17	2	11	8	2	19	4	4	34	11	5
Ameren	investor-owned corp.	17	10	6	7	15	7	5	14	44	21	14	53	14	29	65	40	22
Arclight Capital	privately held corp.	60	67	74	76	84	79	77	76	86	76	77	84	76	68	78	8	76
Arkansas Electric Coop	cooperative	93	74	55	45	46	64	35	15	6	20	19	8	35	21	13	34	7
Associated Electric Coop	cooperative	52	41	37	33	34	40	38	23	22	19	29	34	45	36	38	57	50
Austin Energy	municipality	76	76	66	67	69	69	59	64	58	53	67	58	51	72	69	16	35
Avista	investor-owned corp.	96	89	72	71	76	89	74	66	65	84	59	40	49	58	26	9	73
Basin Electric Power Coop	cooperative	50	42	29	20	24	33	21	3	3	1	3	6	2	5	11	2	6
Big Rivers Electric	cooperative	74	59	44	36	36	47	43	17	7	2	26	15	5	33	14	22	45
BP	foreign-owned corp.	78	77	-	81	90	83	-	80	88	80	80	88	93	-	-	-	-
Buckeye Power	cooperative	87	70	47	21	61	59	41	1	35	13	1	52	31	1	64	75	40
Calpine	investor-owned corp.	10	5	-	78	51	19	-	81	79	72	81	82	89	-	-	-	-
CLECO	investor-owned corp.	79	61	69	42	56	55	50	24	34	18	30	51	43	8	48	19	12
CMS Energy	investor-owned corp.	40	33	24	19	30	32	22	7	24	22	10	37	42	9	44	49	14
Constellation	investor-owned corp.	23	22	31	31	31	25	52	51	62	64	52	63	69	39	29	43	66
Dominion	investor-owned corp.	9	15	15	15	11	16	18	40	48	67	27	32	61	19	17	64	47
Dow Chemical	investor-owned corp.	67	55	80	87	88	75	-	88	89	71	91	92	91	-	-	80	-
DTE Energy	investor-owned corp.	24	19	14	10	12	17	8	5	21	36	4	21	19	6	37	46	11
Duke	investor-owned corp.	5	3	3	3	5	3	12	28	45	50	17	43	47	24	51	77	61
Dynegy	investor-owned corp.	26	20	18	23	37	21	39	34	60	35	42	71	58	42	74	50	65
East Kentucky Power Coop	cooperative	65	51	38	30	47	44	42	9	28	12	12	44	28	26	58	70	53
EDF	foreign-owned corp.	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Edison International	investor-owned corp.	15	17	12	8	9	12	19	20	37	49	9	30	33	12	35	24	54
EDP	foreign-owned corp.	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
El Paso Electric	investor-owned corp.	81	88	75	75	67	84	71	75	47	78	73	22	68	61	2	71	33
Energy Capital Partners	privately held corp.	41	30	-	82	77	56	-	85	83	70	88	85	88	-	-	-	-
Energy Future Holdings	privately held corp.	16	14	9	4	16	9	2	8	46	34	5	50	6	7	63	15	3
Entegra Power	privately held corp.	84	66	-	86	86	81	-	84	84	66	85	87	83	-	-	-	-
Entergy	investor-owned corp.	7	18	27	22	10	18	20	57	54	82	49	29	66	14	20	29	10
Exelon	investor-owned corp.	4	65	59	51	45	62	57	73	82	92	39	23	62	32	9	76	43
Exxon Mobil	investor-owned corp.	61	52	-	83	73	77	-	82	70	75	92	91	94	-	-	-	-
FirstEnergy	investor-owned corp.	8	6	4	6	3	4	6	29	20	43	25	13	27	41	24	69	49
GDF Suez	foreign-owned corp.	28	23	51	38	49	28	29	53	66	56	61	73	72	28	56	26	4
General Electric	investor-owned corp.	46	38	71	62	74	58	70	63	73	61	69	79	78	18	42	61	56
GenOn	investor-owned corp.	27	21	17	13	18	20	13	4	14	24	6	28	48	3	27	67	23
Grand River Dam Authority	state power authority	89	72	57	47	35	61	26	18	2	16	23	3	24	20	4	3	1
Great Plains Energy	investor-owned corp.	35	28	19	25	29	23	24	31	31	23	32	39	15	49	55	37	38
Great River Energy	cooperative	75	60	41	40	44	49	16	26	13	4	31	26	8	47	43	20	2
Hoosier Energy	cooperative	86	68	50	39	65	57	53	13	43	9	21	56	22	34	70	59	55
Iberdrola	foreign-owned corp.	57	92	-	92	94	93	-	93	93	94	90	86	90	-	-	-	-
IDACORP	investor-owned corp.	48	83	60	59	58	73	48	59	59	77	47	18	21	57	36	58	21
Integrus	investor-owned corp.	77	62	42	37	55	51	34	16	36	11	20	47	12	35	62	27	24
Intermountain Power Agency	power district	59	48	32	60	21	42	76	56	1	15	65	1	37	75	6	78	77
International Paper	investor-owned corp.	92	90	76	-	71	91	-	-	56	86	-	5	75	-	1	79	-
JEA	municipality	58	46	52	46	50	45	62	38	39	26	45	54	50	40	47	42	63
J-Power	foreign-owned corp.	98	75	78	79	81	82	78	78	74	62	79	80	80	74	71	65	78
Los Angeles City	municipality	64	63	68	74	66	63	58	72	57	58	76	61	67	76	30	55	30

A ranking of 1 indicates the highest absolute number or rate in any column: the highest generation (MWh), highest emissions (tons), or highest emission rate (lbs/MWh). A ranking of 100 indicates the lowest absolute number or rate in any column.

Owner	Ownership Type	By Generation			By Tons of Emissions				By Emission Rates											
		Total	Fossil	Coal	SO ₂	NO _x	CO ₂	Hg	All Generating Sources			Fossil Fuel Plants			Coal Plants					
									SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	SO ₂	NO _x	CO ₂	Hg		
Lower CO River Authority	state power authority	68	53	53	65	63	50	44	61	51	33	66	67	53	71	68	16	35		
LS Power	privately held corp.	54	47	70	68	75	65	60	69	72	63	74	77	79	69	77	36	18		
MidAmerican	privately held corp.	13	8	8	14	4	6	7	37	15	39	35	14	25	50	18	35	39		
Municipal Elec. Auth. of GA	municipality	63	80	62	56	70	72	68	47	67	69	37	60	41	44	66	31	70		
NC Public Power	municipality	66	91	73	69	85	90	73	68	87	88	36	62	20	52	73	62	64		
NE Public Power District	power district	47	58	40	28	25	46	37	19	9	47	8	2	13	15	7	38	44		
New York Power Authority	state power authority	32	85	-	88	91	87	-	90	92	90	83	89	81	-	-	-	-		
NextEra Energy	investor-owned corp.	3	4	56	43	27	15	65	71	75	81	72	76	77	38	60	28	67		
NiSource	investor-owned corp.	49	40	33	26	40	34	25	11	30	5	16	45	16	23	54	5	13		
North Carolina EMC	cooperative	99	94	-	93	92	94	-	92	90	93	82	68	71	-	-	-	-		
NRG	investor-owned corp.	19	12	10	12	13	10	4	22	40	38	22	49	39	22	59	39	8		
NV Energy	investor-owned corp.	42	32	61	64	52	48	49	65	53	54	71	70	73	63	15	21	26		
Occidental	investor-owned corp.	56	45	-	91	82	67	-	89	85	65	93	90	82	-	-	-	-		
OGE	investor-owned corp.	34	24	26	24	17	27	30	25	4	37	28	9	56	17	8	25	34		
Oglethorpe	cooperative	38	43	43	44	57	43	63	46	64	60	46	69	57	43	66	30	69		
Omaha Public Power District	power district	53	49	35	29	33	41	27	12	17	14	15	25	18	31	41	48	15		
PG&E	investor-owned corp.	25	82	-	89	93	86	-	91	94	91	89	94	86	-	-	-	-		
Pinnacle West	investor-owned corp.	30	37	36	54	20	35	32	58	18	55	62	7	55	67	5	47	27		
PNM Resources	investor-owned corp.	70	71	54	66	38	60	67	60	10	46	64	4	30	73	10	41	75		
Portland General Electric	investor-owned corp.	85	78	65	52	62	74	56	36	38	52	33	36	59	27	23	53	32		
PowerSouth Energy Coop	cooperative	94	73	67	61	68	68	66	48	42	29	57	55	54	55	46	4	62		
PPL	investor-owned corp.	12	9	7	9	6	8	9	27	23	41	24	20	32	37	32	68	41		
Progress Energy	investor-owned corp.	11	11	16	17	19	13	28	41	55	57	41	59	65	30	52	54	58		
PSEG	investor-owned corp.	21	25	49	49	39	36	55	62	69	83	60	64	70	45	19	60	57		
PUD No 1 of Chelan County	power district	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
PUD No 2 of Grant County	power district	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Puget Holdings	privately held corp.	88	79	63	63	60	70	69	54	32	44	55	35	44	59	25	9	73		
Rockland Capital	privately held corp.	69	54	79	70	78	80	75	70	76	74	75	81	92	2	3	7	25		
Sacramento Municipal Util Dist	municipality	91	86	-	90	83	88	-	87	78	85	86	78	84	-	-	-	-		
Salt River Project	power district	37	34	25	50	23	31	23	55	16	42	56	11	34	64	12	23	17		
San Antonio City	municipality	31	35	28	34	48	30	31	42	61	45	44	65	26	51	75	44	37		
Santee Cooper	state power authority	33	26	21	35	43	26	47	44	52	30	50	66	38	56	72	51	68		
SCANA	investor-owned corp.	36	31	34	27	41	38	45	33	50	51	34	57	64	25	53	74	59		
Seattle City Light	municipality	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Seminole Electric Coop	cooperative	71	57	45	48	72	52	64	32	68	27	40	74	52	48	79	72	72		
Sempra	investor-owned corp.	51	56	-	85	89	76	-	86	91	79	87	93	87	-	-	-	-		
Southern	investor-owned corp.	1	2	2	2	2	2	3	21	41	48	18	46	60	11	39	33	20		
TECO	investor-owned corp.	45	36	39	53	59	37	61	52	63	32	63	72	63	62	76	73	71		
Tenaska	privately held corp.	62	50	-	84	80	71	-	83	81	68	84	83	85	-	-	-	-		
Tennessee Valley Authority	federal power authority	6	7	5	5	7	5	10	30	49	59	11	38	29	16	50	52	46		
TransAlta	foreign-owned corp.	97	81	58	72	54	66	40	67	12	25	70	12	7	78	22	12	16		
TransCanada	foreign-owned corp.	95	84	-	80	79	85	-	79	71	73	78	75	74	-	-	-	-		
Tri-State	cooperative	55	44	30	55	28	39	46	49	5	3	58	10	9	70	16	18	60		
UniSource	investor-owned corp.	82	64	48	58	42	54	51	45	8	10	54	16	23	66	21	32	52		
US Bureau of Reclamation	federal power authority	22	87	64	73	64	78	54	77	77	89	68	17	17	77	30	55	31		
US Corps of Engineers	federal power authority	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Waste Management	investor-owned corp.	100	93	77	77	87	92	72	74	80	87	48	31	1	54	28	1	9		
Westar	investor-owned corp.	29	27	20	41	22	22	15	50	19	17	53	24	10	65	40	14	19		
Wisconsin Energy	investor-owned corp.	39	29	22	32	32	24	33	35	33	6	43	48	11	53	61	6	51		
Xcel	investor-owned corp.	18	13	11	16	8	11	11	39	25	40	38	27	40	46	33	45	42		



NO_x and SO₂ Emissions Levels and Rates

Figures 3 and 4 display NO_x and SO₂ emission levels and emission rates for fossil fuel-fired generating sources owned by each company.

“Fossil-only” emission rates are calculated by dividing each company’s total NO_x and SO₂ emissions from fossil-fired power plants by its total generation from fossil-fired power plants. Companies with significant coal-fired generating capacity have the highest total emissions of SO₂ and NO_x because coal contains higher concentrations of sulfur than natural gas and oil and coal plants generally have higher NO_x emission rates.

Figures 3 and 4 illustrate wide disparities in the fossil-only emission levels and emission rates of the 100 largest power producers. Their total fossil generation varies from 0 to 158 million megawatt hours and:

- NO_x emission rates range from 0 to 3.9 pounds per megawatt hour (Intermountain Power Agency), and total NO_x emissions range from 0 to 137,942 tons (AEP);
- SO₂ emission rates range from 0 to 13.9 pounds per megawatt hour (Buckeye Power), and total SO₂ emissions range from 0 to 512,265 tons (AEP).

FIGURE 3

Fossil Fuel - NOx Total Emissions and Emission Rates

Total emissions (thousand tons) and emission rates (lbs/MWh) from fossil fuel generating facilities

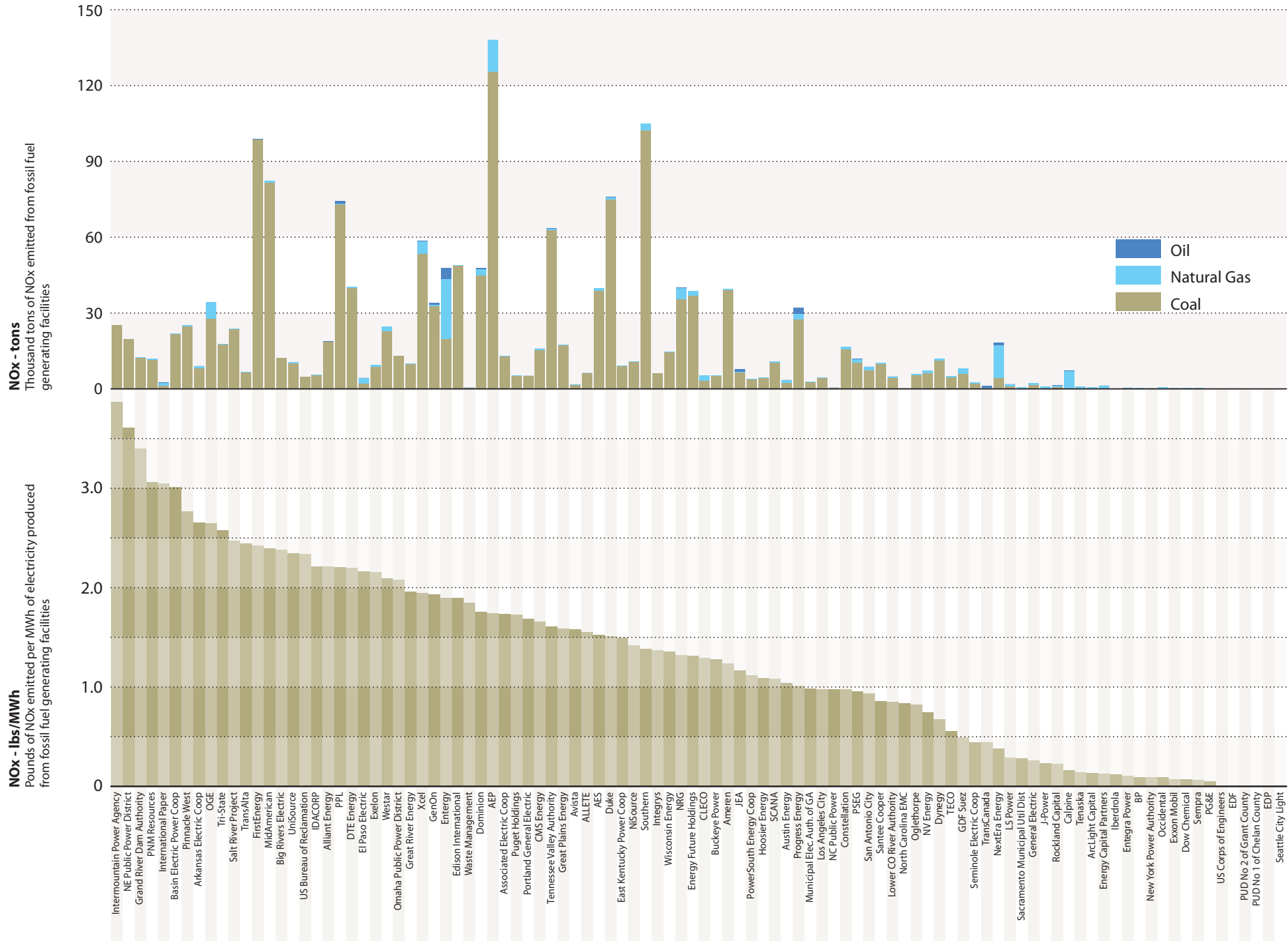
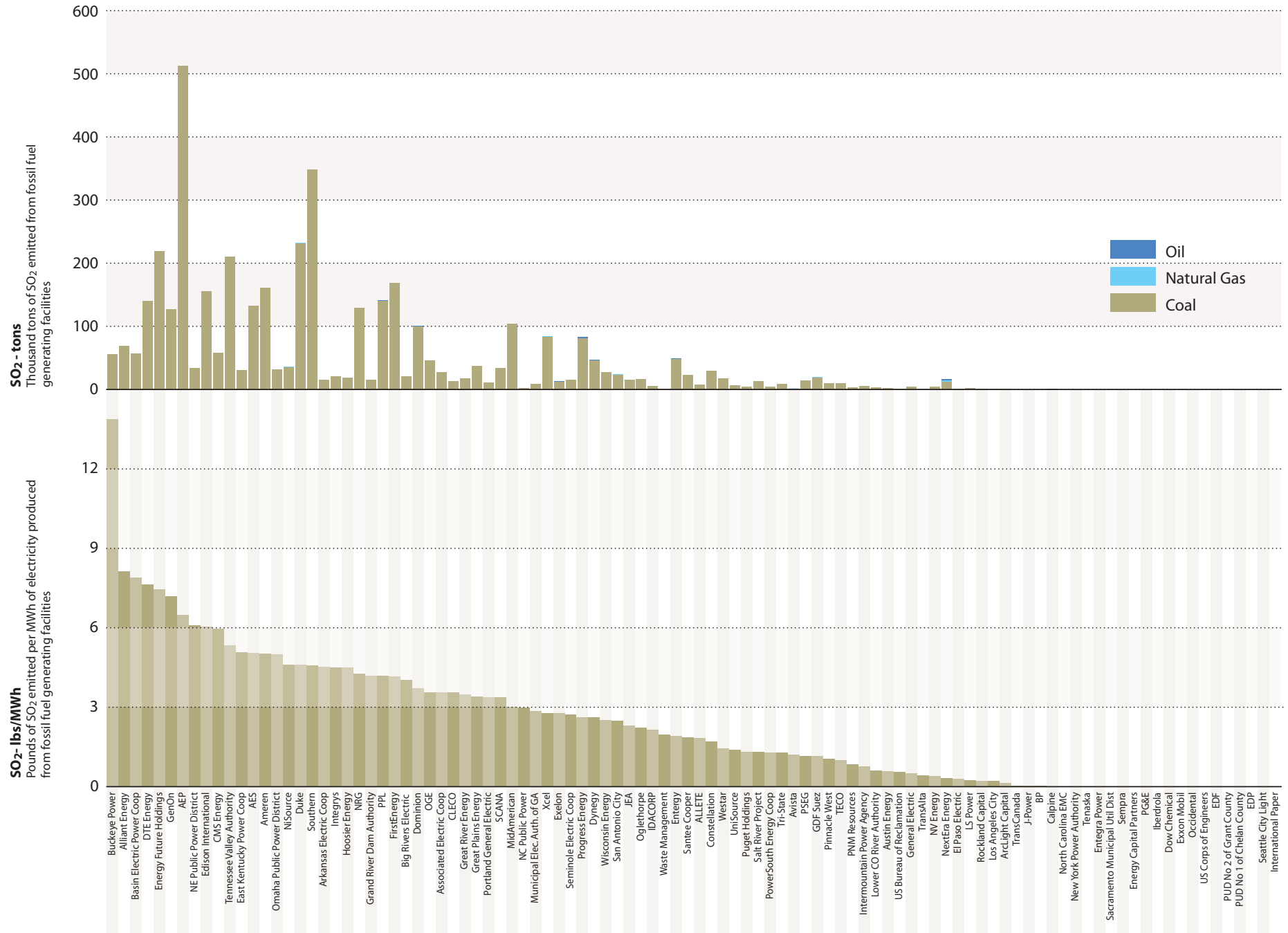


FIGURE 4

Fossil Fuel - SO₂ Total Emissions and Emission Rates

Total emissions (thousand tons) and emission rates (lbs/MWh) from fossil fuel generating facilities



CO₂ Emission Levels and Rates

Figure 5 displays total CO₂ emission levels from coal, oil, and natural gas combustion and emission rates based on all generating sources owned by each company.

“All-source” emission rates are calculated by dividing each company’s total CO₂ emissions by its total generation. In most cases, producers with significant non-emitting fuel sources, such as nuclear, hydroelectric and wind power, have lower all-source emission rates than producers owning primarily fossil fuel power plants. Among the 100 largest power producers:

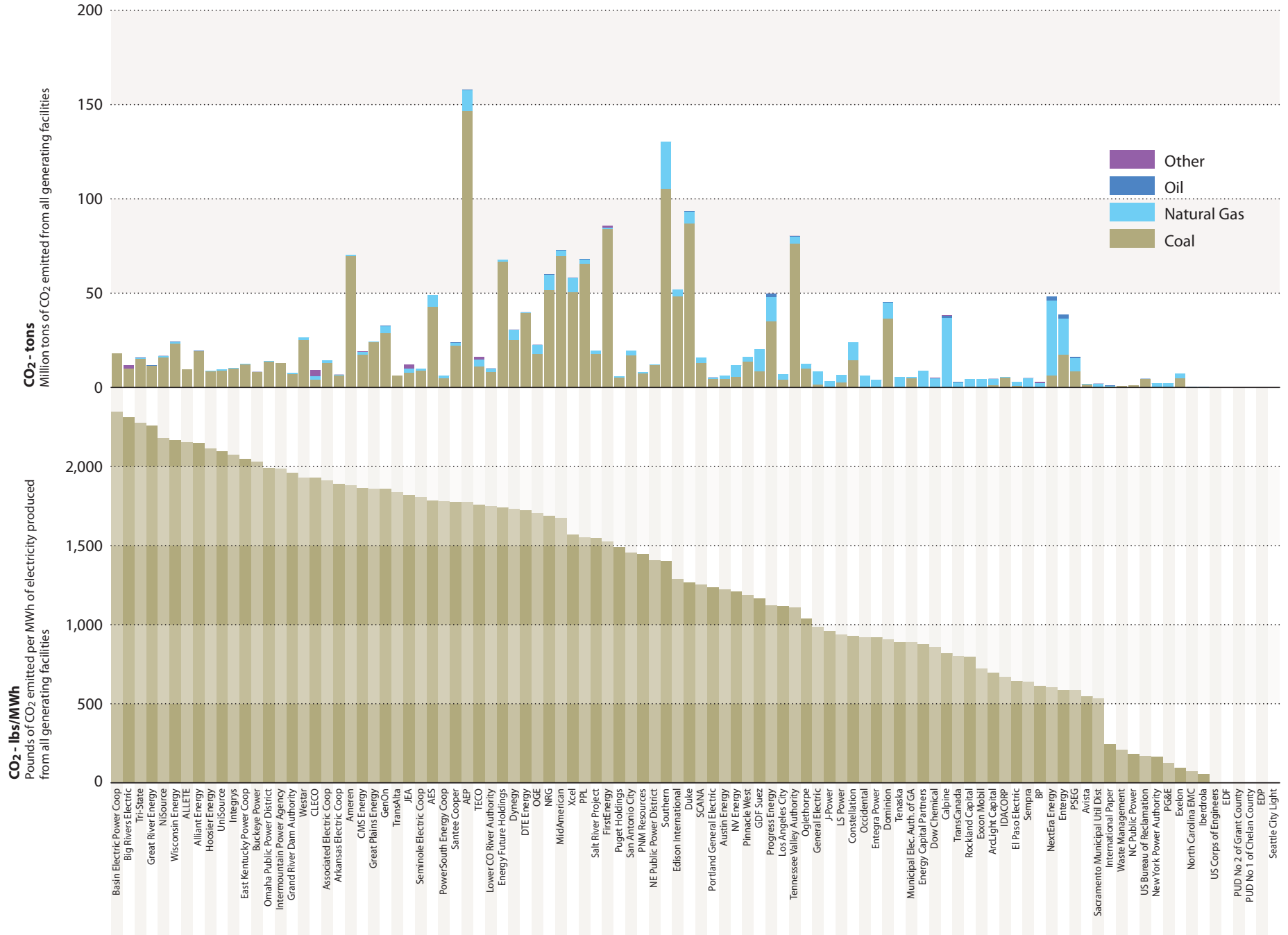
- Coal-fired power plants are responsible for 81.3 percent of CO₂ emissions;
- Natural gas-fired power plants are responsible for 17.6 percent of CO₂ emissions; and
- Oil-fired power plants are responsible 0.5 percent of CO₂ emissions.

Figure 5 illustrate wide disparities in the all-source emission levels and emission rates of the 100 largest power producers. Their total electric generation varies from 6 million (Waste Management) to 185.9 million megawatt hours (Southern) and their CO₂ emissions range from 0 to 157.6 million tons (AEP), and CO₂ emission rates range from 0 to 2,347.4 pounds per megawatt hour (Basin Electric Power Coop).

FIGURE 5

All Source - CO₂ Total Emissions and Emission Rates

Total emissions (million tons) and emission rates (lbs/MWh) from all generating facilities



Mercury Emission Levels and Rates

Figure 6 displays total mercury emission levels and emission rates from coal-fired power plants.

In 2005, EPA issued rules regulating mercury emissions from coal-fired power plants. However, in February 2008, the DC Circuit found the rules invalid and they never took effect. EPA has since developed emissions standards for coal- and oil-fired electric generating units to regulate emissions of mercury and other hazardous air pollutants. The standards are scheduled to go into effect in 2015, assuming that there are no delays due to on-going legal challenges to the rule. The differences in mercury emission rates seen in the following figures are largely due to the mercury content and type of coal used, and the effect of control technologies designed to lower SO₂, NO_x, and particulate emissions.

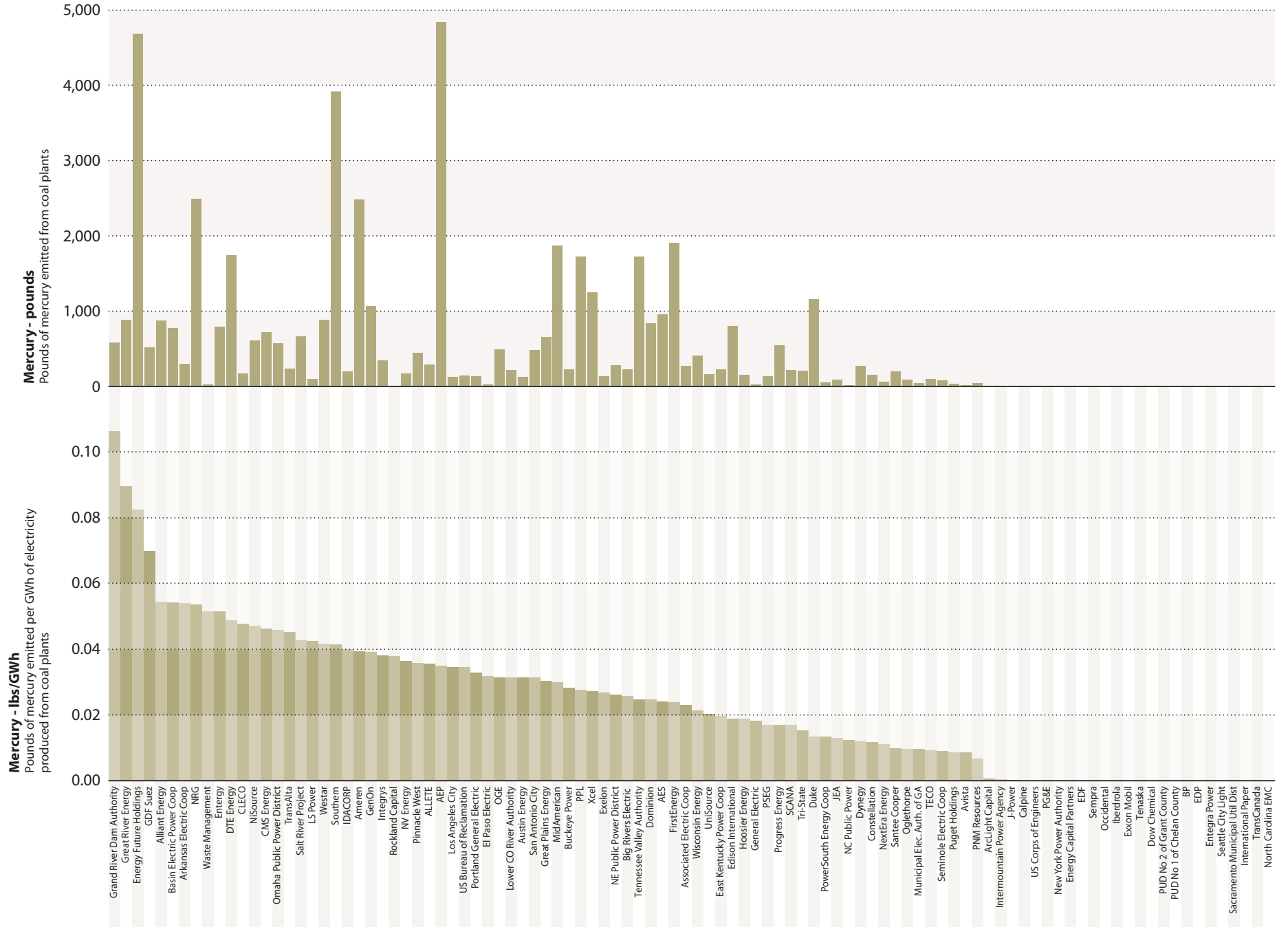
Coal mercury emissions from the top 100 power producers range from less than 1 pound (J-Power) to 4,839 pounds (AEP), and coal mercury emission rates range from 0.0002 (J-Power) to 0.106 (Grand River Dam Authority) pound per gigawatt hour (a gigawatt hour is 1,000 megawatt hours).

FIGURE 6

Coal - Mercury Emission Rates and Total Emissions

Emission rates (lbs/GWh) and total emissions (pounds) from coal plants

1 gigawatt-hour (GWh) = 1,000 MWh



Emissions Trends Analysis

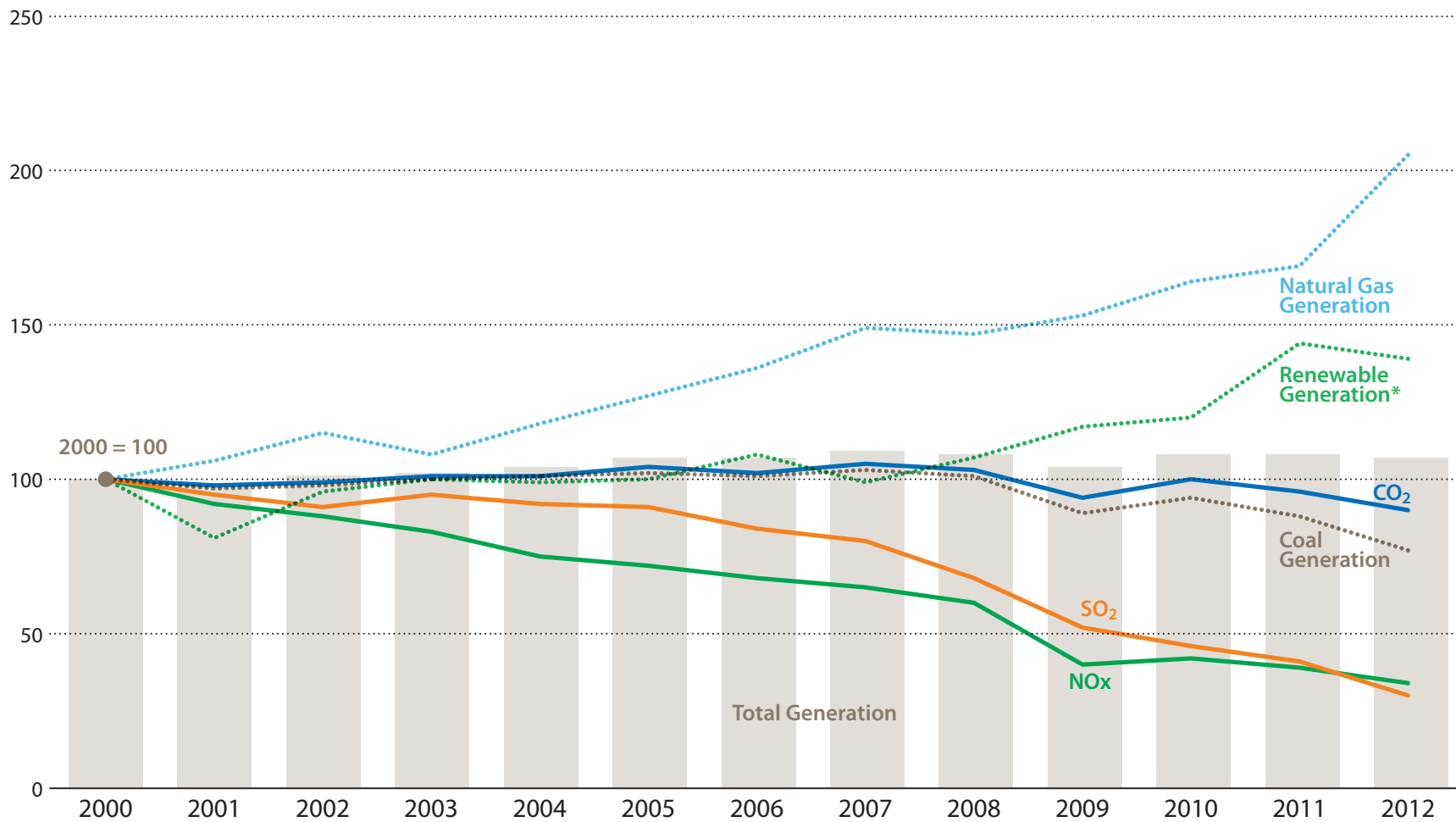
The electric power sector has made significant progress in terms of reducing its NO_x and SO₂ emissions over the past several decades. In 2011, power plant NO_x and SO₂ emissions were 70 percent and 72 percent lower, respectively, than they were in 1990 when Congress passed major amendments to the Clean Air Act. Less progress has been made in terms of reducing mercury and CO₂ emissions. Since 1990, power plant CO₂ emissions have increased by 20 percent. However, as illustrated in Figure 7, CO₂ emissions have declined in recent years. Power plant CO₂ emissions have declined by 7 percent from 2008 through 2011. Mercury emissions from power plants have decreased 40 percent since 2000 (the first year that mercury emissions were reported by the industry under the Toxics Release Inventory).

Figure 7 plots the trends in power plant NO_x, SO₂, and CO₂ emissions since 2000 (indexed to 2000 levels). Figure 7 also plots the total electricity generation by fuel type. The electric industry has cut its NO_x and SO₂ emissions even as overall electricity generation has increased. In the wake of the recent economic recession, power plant emissions declined significantly, in part due to a decline in overall electricity demand. Emissions then leveled off from 2010 through 2011, and have now resumed their downward trajectory. The major forces driving this recent drop in emissions are low natural gas prices, an increased level of pollution controls installed at coal plants, and coal plant retirements.

Recent projections of power plant emissions by the U.S. EIA suggest that SO₂ and mercury emissions will continue to decline with the implementation of EPA's Mercury and Air Toxics Standards (MATS). EIA's Annual Energy Outlook 2013 (Early Release) projects that SO₂ emissions will range from 1.0 million to 2.0 million tons per year beginning in 2016.² By comparison, companies reported about 3.3 million tons of SO₂ emissions in 2012.³ EIA projects that mercury emissions will decline from about 30 tons per year to about 6 tons per year beginning in 2016.⁴ (The MATS Rule sets an April 2015 compliance deadline; however, EIA assumes that a large number of coal-fired power plants will request extensions to comply with the rule.) EIA projects that NO_x emissions will range from 1.6 million to 1.9 million tons per year

FIGURE 7

Annual Electricity Generation and Emission Trends
(Indexed: 2000 = 100)



* INCLUDES HYDROELECTRIC, WIND, SOLAR, BIOMASS, GEOTHERMAL AND OTHER RENEWABLE SOURCES

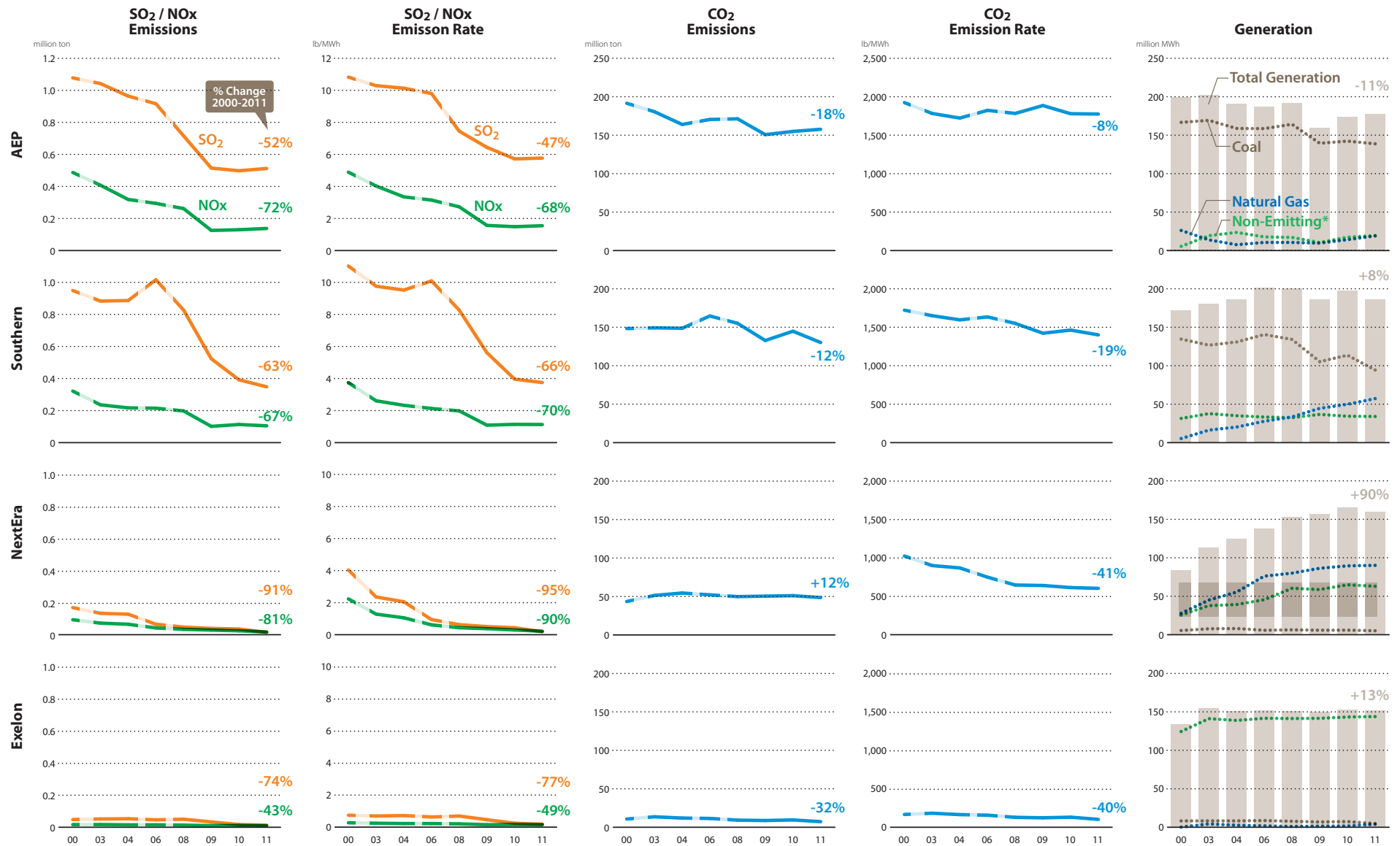
beginning in 2016.⁵ By comparison, companies reported about 1.75 million tons of NO_x emissions in 2012.⁶ EIA assumes implementation of the Clean Air Interstate Rule (CAIR)—limiting NO_x and SO₂ emissions—after an August 2012 federal court decision to vacate the Cross-State Air Pollution Rule (CSAPR). EIA projects a modest decline in electric sector CO₂ emissions in 2016 (down 3.5 percent from 2012 estimates); however, EIA projects that emissions will then begin to rise again through the remainder of their forecast (i.e., through 2040).⁷

The Emissions Benchmarking report can also be used to evaluate a company's individual performance over time. Figure 8 compares the emissions trends over the past several years of the four largest power producers based on the data reported in past versions of the Emissions Benchmarking report.⁸ A wide range of factors will influence a company's emissions, including plant utilization, pollution control retrofits, new plant construction, nuclear uprates, power plant divestitures and retirements, and mergers and acquisitions.

Figure 8 illustrates that AEP reduced its total SO₂ emissions by 52 percent, between 2000 and 2011, from 1.1 million tons to just over half a million tons. AEP added scrubbers to approximately 7,900 megawatts of coal-fired generating capacity between 2000 and 2011.⁹ AEP's total power generation has decreased 11 percent between 2000 and 2011. Southern Company added about 14,000 megawatts of natural gas-fired generating capacity between 2000 and 2011, reducing its average CO₂ emissions rate from 1,722 to 1,401 pounds per megawatt hour (a 19 percent improvement). Southern's total power generation has increased 8 percent between 2000 and 2011. NextEra Energy added more than 20,000 megawatts of wind, solar, and natural gas-fired generating capacity between 2000 and 2011, and nearly doubled its total power generation. Its CO₂ emissions rate fell from 1,023 to 603 pounds per megawatt hour (a 41 percent improvement). Exelon has one of the lowest CO₂ emissions rates among the 100 largest power producers (i.e., 92 out of 100) because of its large nuclear and renewable energy fleet and investments in nuclear uprates. Exelon reduced its total CO₂ emissions by 32 percent between 2000 and 2011, and its CO₂ emission rate by 40 percent.

FIGURE 8

Emissions and Electric Generation Trends: AEP, Southern, NextEra, and Exelon



NOTE: THE X-AXES IN THE CHARTS ABOVE DO NOT DENOTE EQUAL INTERVALS. DATA FOR YEARS 2001, 2002, 2005, AND 2007 ARE NOT SHOWN IN THE CHARTS ABOVE.

*INCLUDES NUCLEAR, HYDRO, AND RENEWABLE SOURCES

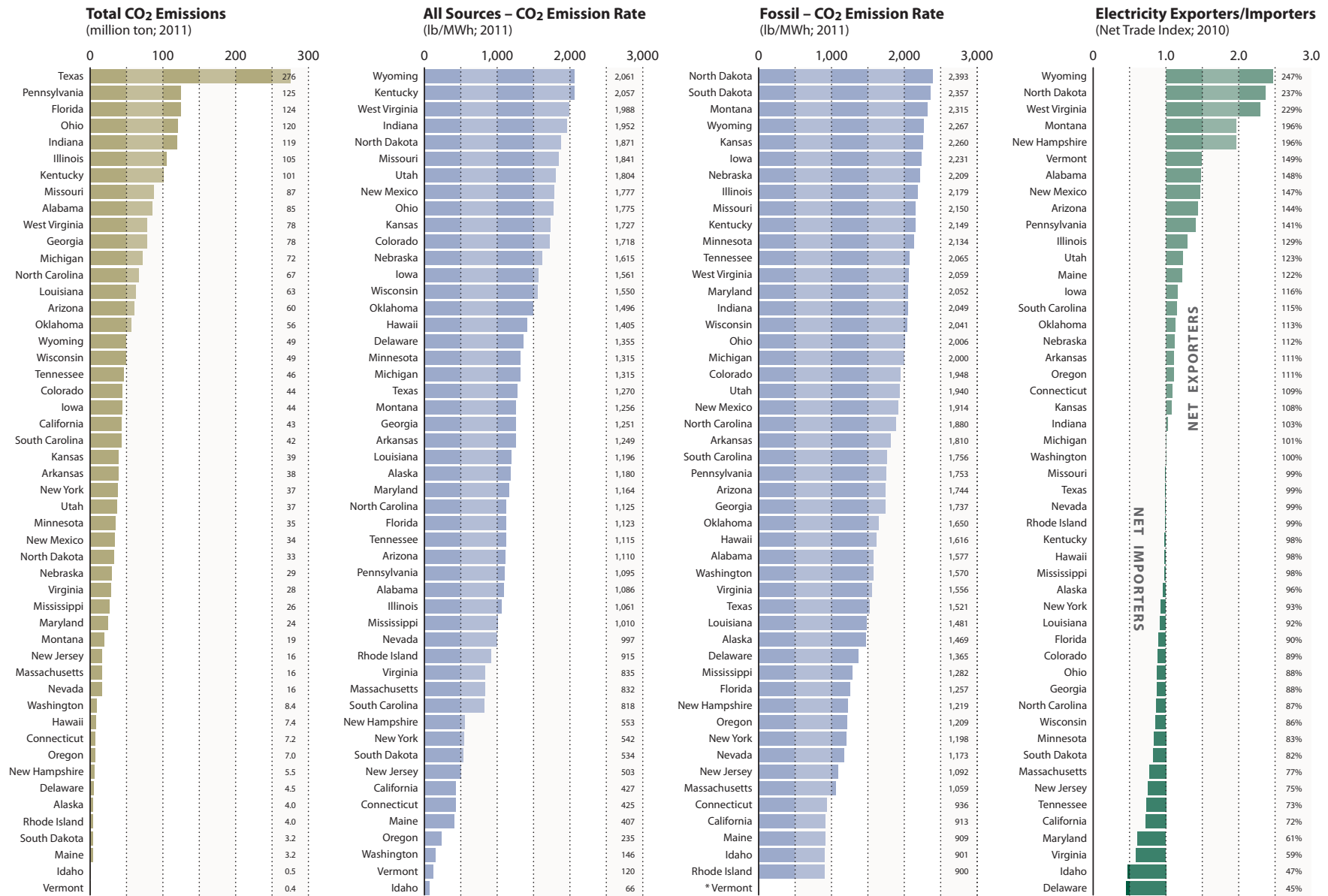
State-by-State Emissions Summary

Power plants are the largest source of CO₂ emissions in the U.S., and consistent with the U.S. Supreme Court's decision in *Massachusetts v. EPA*, the Agency has determined that greenhouse gas emissions endanger public health and welfare by causing long lasting changes in the global climate. As a result, EPA is planning to implement emissions standards for new and existing power plants. On March 28, 2012, EPA released its proposal for a New Source Performance Standard (NSPS) limiting greenhouse gas emissions from new fossil-fired power plants. EPA has yet to propose standards for existing power plants.

One of the challenges in developing a policy to regulate power plant CO₂ emissions will be to design an approach that recognizes the wide variability in the carbon intensity of the electric generating fleet. As illustrated in Figure 9, average CO₂ emission rates can vary significantly by state. Wyoming, Kentucky, West Virginia, and Indiana have the highest power plant CO₂ emission rates in the U.S. because of their heavy reliance on coal-fired power generation. In 2011, Wyoming produced 86 percent of its electricity from coal; Kentucky, 93 percent; West Virginia, 96 percent; and Indiana, 83 percent.¹⁰ By contrast, Idaho, with the lowest CO₂ emission rate, produced 80 percent of its electricity from hydroelectric resources in 2011.¹¹ A standard that would be easily achievable, in a state like Rhode Island, would be very difficult to achieve in a coal-dependent state like Wyoming or Michigan. Ironically, a state with relatively low emissions may find it more challenging to achieve further emissions reductions.

Also, states vary in terms of their import and export of electricity. Texas and Florida, for example, consume virtually all of the electricity that they generate with limited imports or exports. Wyoming, North Dakota, and West Virginia, in contrast, are large exporters of electricity. Figure 9 shows the net trade in electricity by state.

FIGURE 9



* FOSSIL-FIRED GENERATION OUTPUT IN THE STATE OF VERMONT IS TOO LOW TO CALCULATE A MEANINGFUL FOSSIL-ONLY EMISSION RATE.

% : TOTAL IN-STATE SUPPLY OF ELECTRICITY AS % SHARE OF TOTAL IN-STATE CONSUMPTION NEEDS.



Use of the Benchmarking Data

This report provides public information that can be used to evaluate electric power producers' emissions performance and risk exposure. Transparent information on emissions performance is useful to a wide range of decision-makers, including electric companies, financial analysts, investors, policymakers, and consumers.

Electric Companies

This provision of transparent information supports corporate self-evaluation and business planning by providing a useful “reality check” that companies can use to assess their performance relative to key competitors, prior years and industry benchmarks. By understanding and tracking their performance, companies can evaluate how different business decisions may affect emissions performance over time, and how they may more appropriately consider environmental issues in their corporate policies and business planning.

This report is also useful for highlighting the opportunities and risks companies may face from environmental concerns and potential changes in environmental regulations. Business opportunities may include increasing the competitive advantage of existing assets, the chance to generate or enhance revenues from emission trading mechanisms, and opportunities to increase market share by pursuing diversification into clean energy. Corporate risks that could have severe financial implications include a loss of competitive advantage or decrease in asset value due to policy changes, risks to corporate reputation, and the risk of exposure to litigation arising from potential violations of future environmental laws and regulations. Becoming aware of a company's exposure to these opportunities and risks is the first step in developing effective corporate environmental strategies.

Investors

The financial community and investors in the electric industry need accurate information concerning environmental performance in order to evaluate the financial risks associated with their investments and to assess their overall value. Air emissions information is material to investors and can be an important indicator of a company's management.

Evaluation of financial risks associated with SO₂, NO_x, and mercury has become a relatively routine corporate practice. By comparison, until recent years, corporate attention and disclosure of business impacts related to CO₂ has been more limited. This is likely to change with the U.S. Securities and Exchange Commission's (SEC) issuance, in January 2010, of interpretive guidance concerning corporate climate risk disclosure. All publicly-traded companies in the U.S. are required to disclose climate-related "material" effects on business operations – whether from new emissions management policies, the physical impacts of changing weather or business opportunities associated with the growing clean energy economy – in their annual SEC filings. Despite the SEC's guidance, not all publicly-traded companies mentioned climate change in their most recent annual Form 10-K filings. As a result, some have concluded that SEC requirements must be strengthened to ensure companies meet the expectations of their investors to disclose climate-related risks.

Numerous studies have pointed to the growing financial risks of climate change issues for all firms, especially those within the electric industry. Changing environmental requirements can have important implications for long-term share value, depending on how the changes affect a company's assets relative to its competitors. Especially in the context of climate change, which poses considerable uncertainty and different economic impacts for different types of power plants, a company's current environmental performance can shed light on its prospects for sustained value.

As the risks associated with climate change have become clearer and the prospect of regulation more imminent, the financial implications of climate change for the electric industry have drawn the attention of the financial community. Ratings agencies such as Moody's Investors Service and Standard and Poor's have issued reports analyzing the credit impacts of climate change for the power sector. In its *Annual Industry Outlook* published in January 2010, Moody's identified "regulatory risks [...] from increasingly stringent environmental mandates, especially potential carbon dioxide emission restrictions" as a key longer-term challenge for the industry.¹² In a February 2012 news release, Moody's identified environmental regulations as both a risk and opportunity for the industry. "Older coal plants face large capital costs for new emission control equipment that is unlikely to be recovered in today's depressed energy margins. On the other hand, newer gas-fired generation, renewable energy, nuclear, and fully scrubbed coal-fired plants are likely to benefit over the long term due to shrinking reserve margins."¹³ In May 2012, Standard and Poor's Rating Services predicted that over the next several years, "More-stringent environmental regulations for power plants [will] make it less likely that new coal-fired generation plants will be built in the U.S., creating doubt for future

coal demand.”¹⁴ Mainstream financial firms such as Citigroup, UBS, and Sanford C. Bernstein have issued reports evaluating the company-specific financial impacts of different regulatory scenarios on electric power companies and their shareholders.^{15,16}

Shareholder concern about the financial impacts of climate change has increased significantly over the past decade. Much of this concern is directed toward encouraging electric companies to disclose the financial risks associated with climate change, particularly the risks associated with the future regulation of CO₂. The Carbon Disclosure Project (CDP) was launched in 2000 and annually requests climate change information from companies. CDP now represents 655 institutional investors with combined assets of over \$78 trillion under management, and, as of 2012, requests climate strategy and greenhouse gas emissions data from over 3,000 of the world’s largest companies. In addition to its original Climate Change Program, CDP also recently introduced Supply Chain and Water Disclosure Programs that gather information from 50 and 190 companies, respectively. Since 2011, CDP has moved towards scoring companies not only on the comprehensiveness of their carbon disclosure, but also on their performance to combat climate change through mitigation, adaptation, and transparency. CDP notes that the performance score is a developing metric.

In 2003, the Investor Network on Climate Risk (INCR) was launched to address the risks and seize the opportunities associated with climate change. INCR, which now numbers 100 institutional investors representing assets of \$10 trillion, encourages companies in which its members invest to address and disclose material risks and opportunities to their businesses associated with climate change and a shift to a lower carbon economy.

Shareholders have demonstrated increasing support for proxy resolutions requesting improved analysis and disclosure of the financial risks companies face from CO₂ emissions and their strategies for addressing these risks. Shareholders continue to file resolutions with electric power companies that have not yet disclosed adequate information. According to the INCR, at least 66 shareholder resolutions relating to climate and environmental issues at more than 40 oil, coal and electric power companies were filed in the 2011 proxy season, a 50 percent increase over the number filed in 2010.

Policymakers

The information on emissions contained in this report is useful to policymakers who are working to develop long-term solutions to the public health and environmental effects of air pollutant emissions. The outcomes of federal policy debates concerning various regulatory and legislative proposals to improve power plant emissions performance will impact the electric industry, either in regard to the types of technologies or fuels that will be used at new power plant facilities or the types of environmental controls that will be installed at existing facilities.

Information about emissions performance helps policymakers by indicating which pollution control policies have been effective (e.g., SO₂ reductions under the Clean Air Act's Acid Rain Program), where opportunities may exist for performance and environmental improvements (e.g., SO₂ and NO_x emissions performance standards for large, older facilities under the Regional Haze Rule), and where policy action is required to achieve further environmental gains (e.g., the environmental and financial risks associated with climate change).

Electricity Consumers

Finally, the information in this report is valuable to electricity consumers. Accurate and understandable information on emissions promotes public awareness of the difference in environmental performance and risk exposure. In jurisdictions that allow consumers to choose their electricity supplier, this information enables consumers to consider environmental performance in power purchasing decisions. This knowledge also enables consumers to hold companies accountable for decisions and activities that affect the environment and/or public health and welfare.

The information in this report can also help the public verify that companies are meeting their environmental commitments and claims. For example, some electric companies are establishing voluntary emissions reduction goals for CO₂ and other pollutants, and many companies are reporting significant CO₂ emission reductions from voluntary actions. Public information is necessary to verify the legitimacy of these claims. Public awareness of companies' environmental performance supports informed public policymaking by promoting the understanding of the economic and environmental tradeoffs of different generating technologies and policy approaches.



Appendix A

Data Sources, Methodology and Quality Assurance

This report examines the air pollutant emissions of the 100 largest electricity generating companies in the United States based on 2011 electricity generation, emissions and ownership data. The report relies on publicly-available information reported by the U.S. Energy Information Administration (EIA), U.S. Environmental Protection Agency (EPA), Securities and Exchange Commission (SEC), state environmental agencies, company websites, and media articles.

Data Sources

The following public data sources were used to develop this report:

EPA AIR MARKETS PROGRAM DATA (AMP): EPA's Air Markets Program Data account for almost all of the SO₂ and NO_x emissions, and about 75 percent of the CO₂ emissions analyzed in this report. These emissions were compiled using EPA's on-line emissions database available at <http://ampd.epa.gov/ampd/>.

EPA TOXIC RELEASE INVENTORY (TRI): Power plants and other facilities are required to submit reports on the use and release of certain toxic chemicals to the TRI. The 2011 mercury emissions used in this report are based on TRI reports submitted by facility managers and which are available at http://iaspub.epa.gov/triexplorer/tri_release.chemical.

EIA FORMS 923 POWER PLANT DATABASES (2011): EIA Form 923 provided almost all of the generation data analyzed in this report. EIA Form 923 provides data on the electric generation and heat input by fuel type for utility and non-utility power plants. The heat input data was used to calculate approximately 25 percent of the CO₂ emissions analyzed in this report. The form is available at http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html.

EIA FORM 860 ANNUAL ELECTRIC GENERATOR REPORT (2011): EIA Form 860 is a generating unit level data source that includes information about generators at electric power plants, including information about generator ownership. EIA Form 860 was used as the primary source of power plant ownership for this report. The form is available at <http://www.eia.doe.gov/cneaf/electricity/page/eia860.html>.

EPA U.S. INVENTORY OF GREENHOUSE GAS EMISSIONS AND SINKS (2012): EPA's U.S. Inventory of Greenhouse Gas Emissions and Sinks report provides in Annex 2 heat contents and carbon content coefficients of various fuel types. This data was used in conjunction with EIA Form 923 to calculate approximately 25 percent of the CO₂ emissions analyzed in this report. Annex 2 is available <http://epa.gov/climatechange/emissions/downloads12/US-GHG-Inventory-2012-Annex-2-Emissions-from-Fossil-Fuel-Combustion.pdf>.

Plant Ownership

This report aims to reflect power plant ownership as of December 31, 2011. Plant ownership data used in this report are primarily based on the EIA-860 database from the year 2011. EIA-860 includes ownership information on generators at electric power plants owned or operated by electric utilities and non-utilities, which include independent power producers, combined heat and power producers, and other industrial organizations. It is published annually by EIA.

For the largest 100 power producers, plant ownership is further checked against self-reported data from the producer's 10-K form filed with the SEC, listings on their website, and other media sources. Ownership of

plants is updated based on the most recent data available. Consequently, in a number of instances, ultimate assignment of plant ownership in this report differs from EIA-860's reported ownership. This primarily happens when the plant in question falls in one or more of the categories listed below:

1. It is owned by a limited liability partnership shareholders of which are among the 100 largest power producers.
2. The owner of the plant as listed in EIA-860 is a subsidiary of a company that is among the 100 largest power producers.
3. It was sold or bought during the year 2011. Because form 10-K for a particular year is usually filed by the producer in the first quarter of the following year, this report assumes that ownership as reported in form 10-K is more accurate.

Power plant ownership reflected in this report does not include power purchase agreements.

Identifying “who owns what” in the dynamic electricity generation industry is probably the single most difficult and complex part of this report. In addition to the categories listed above, shares of power plants are regularly traded and producers merge, reorganize, or cease operations altogether. While considerable effort was expended in ensuring the accuracy of ownership information reflected in this report, there may be inadvertent errors in the assignment of ownership for some plants where public information was either not current or could not be verified.

Generation Data and Cogeneration Facilities

Plant generation data used in this report come from EIA Form 923.

Cogeneration facilities produce both electricity and steam or some other form of useful energy. Because electricity is only a partial output of these plants, their reported emissions data generally overstate the emissions associated with electricity generation. Generation and emissions data included in this report for cogeneration facilities have been adjusted to reflect only their electricity generation. For all such cogeneration facilities emissions data were calculated on the basis of heat input of fuel associated with electricity generation only. Consequently, for all such facilities EIA form 923, which report a plant's total heat input as well as that which is associated with electricity production only, was used to calculate their emissions.

NO_x and SO₂ Emissions

The EPA AMP database collects and reports SO₂ and NO_x emissions data for nearly all major power plants in the U.S. Emissions information reported in the AMP database is collected from continuous emission monitoring (CEM) systems. SO₂ and NO_x emissions data reported to the AMP account for all of the SO₂ and NO_x emissions assigned to the 100 largest power producers in this report.

The AMP database collects and reports SO₂ and NO_x emissions data by fuel type at the boiler level. This report consolidates this data at the generating unit and plant levels. In the case of jointly owned plants, because joint ownership is determined by producer's share of installed capacity, assignment of SO₂ and NO_x emissions to the producers on this basis implicitly assumes that emission rates are uniform across the different units. This may cause producers to be assigned emission figures that are slightly higher or lower than their actual shares.

CO₂ Emissions

CO₂ emissions reported through the EPA AMP account for approximately 75 percent of the CO₂ emissions used in this report. The remaining 25 percent was calculated using heat input data from EIA form 923 and carbon content coefficients of various fuel types provided by EPA. Table A.1 shows the carbon coefficients used in this procedure. Non-emitting fuel types, whose carbon coefficients are zero, are not shown in the table.

EIA form 923 reports heat input data by fuel type at the prime mover level. This report consolidates that data at the generating unit and plant levels. In the case of jointly owned plants, because joint ownership is determined by producer's share of installed capacity, assignment of CO₂ emissions to the producers on this basis implicitly assumes that emission rates are uniform across the different units. This may cause producers to be assigned emission figures that are slightly higher or lower than their actual shares.

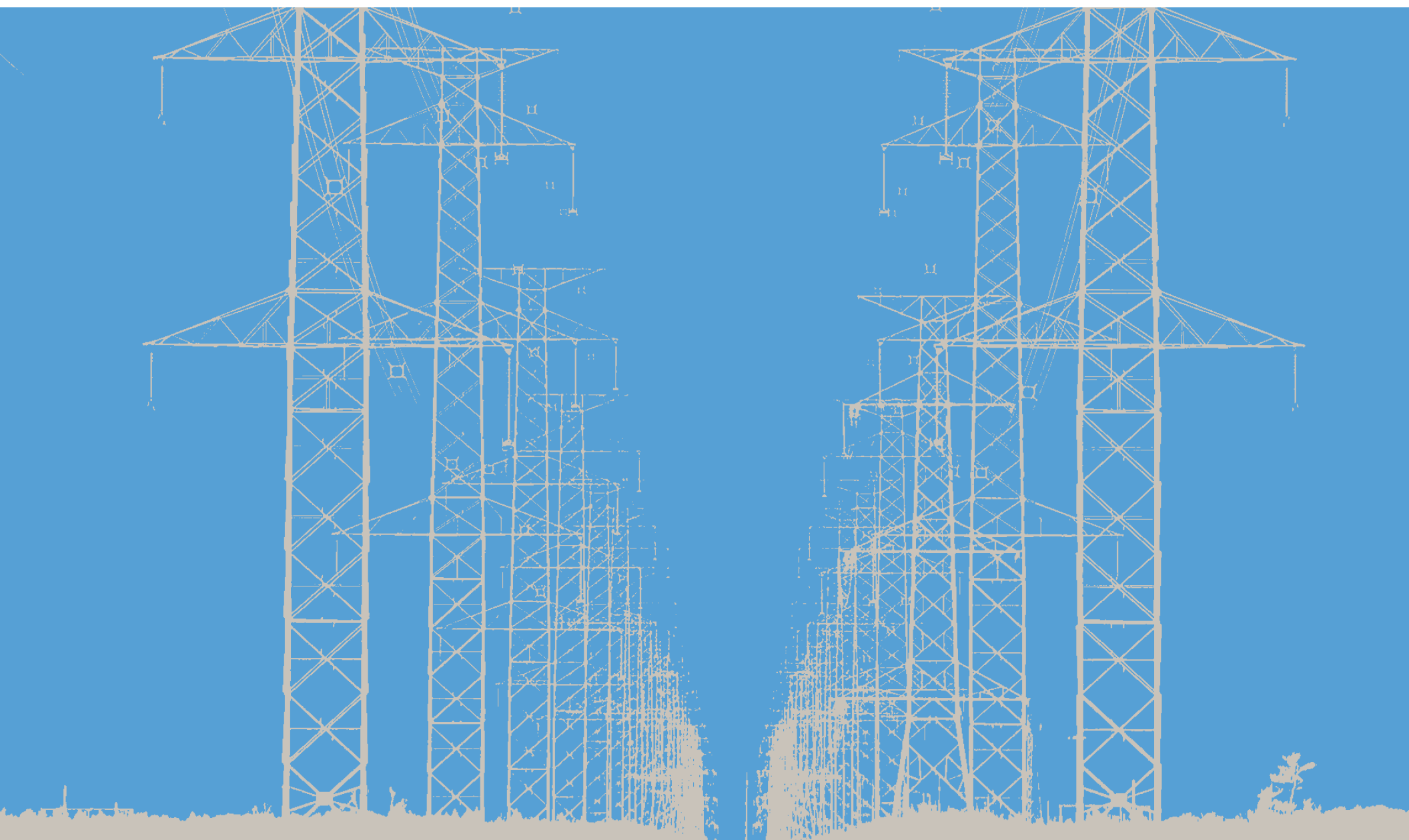
TABLE A.1

Carbon Content Co-efficients by Fuel Type

FUEL TYPE	CARBON CONTENT COEFFICIENTS (Tg Carbon/Qbtu)
COAL	
Anthracite Coal and Bituminous Coal	25.44
Lignite Coal	26.65
Sub-bituminous Coal	26.50
Waste/Other Coal (includes anthracite culm, bituminous gob, fine coal, lignite waste, waste coal)	26.05
Coal-based Synfuel (including briquettes, pellets, or extrusions, which are formed by binding materials or processes that recycle materials)	25.34
OIL	
Distillate Fuel Oil (Diesel, No. 1, No. 2, and No. 4 Fuel Oils)	20.17
Jet Fuel	19.70
Kerosene	19.96
Residual Fuel Oil (No. 5, No. 6 Fuel Oils, and Bunker C Fuel Oil)	20.48
Waste/Other Oil (including Crude Oil, Liquid Butane, Liquid Propane, Oil Waste, Re-Refined Motor Oil, Sludge Oil, Tar Oil, or other petroleum-based liquid wastes)	20.55
Petroleum Coke	27.85
GAS	
Natural Gas	14.46
Blast Furnace Gas	18.55
Other Gas	18.55
Gaseous Propane	14.46

Mercury Emissions

Mercury emissions data for coal power plants presented in this report were obtained from EPA's Toxic Release Inventory (TRI). Mercury emissions reported to the TRI are based on emission factors, mass balance calculations or data monitoring. The TRI contains facility-level information on the use and environmental release of chemicals classified as toxic under the Clean Air Act. Because coal plants are the primary source of mercury emissions within the electric industry, the mercury emissions and emission rates presented in this report reflect the emissions associated with each producer's fleet of coal plants only.



Appendix B

Fuel Mix of the Top-100 Power Producers

Table B.1 shows the 2011 fuel-mix for each of the 100 largest power producers. The share of each major fuel type – coal, gas, oil, nuclear, hydro, and renewable / other – is shown as a percentage share of total generation from facilities wholly and partially owned by each producer and reported to the EIA.

“Renewable / Other” comprises mostly generation from wind, solar, biomass, and geothermal, along with some small contributions from other miscellaneous fuel sources not classifiable into the main categories listed in the table. These include non-biogenic municipal solid waste, tire-derived fuel, manufactured and waste gases, etc.

Figure 2 in the main body of the report presents a graphical illustration of the data in Table B.1.

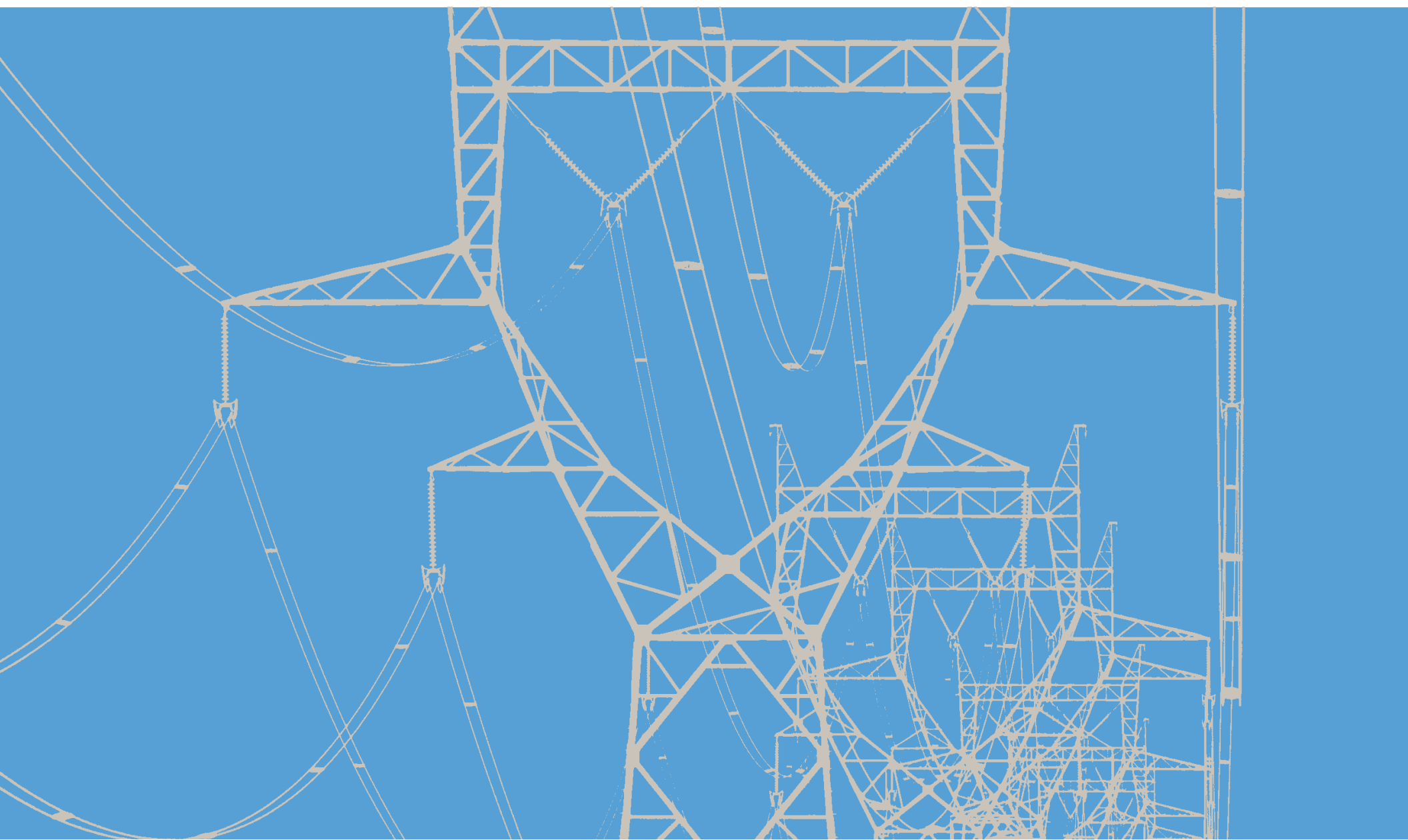
TABLE B.1

Fuel Mix of the 100 Largest Power Producers in 2011

RANK	HOLDING COMPANY	TOTAL (million MWh)	SHARE OF TOTAL						RANK	HOLDING COMPANY	TOTAL (million MWh)	SHARE OF TOTAL					
			COAL	GAS	OIL	NUCLEAR	HYDRO	RENEWABLE / OTHER				COAL	GAS	OIL	NUCLEAR	HYDRO	RENEWABLE / OTHER
1	Southern	185.9	51%	31%	0%	16%	2%	0%	51	Sempra	15.3	0%	72%	0%	24%	0%	4%
2	AEP	177.6	78%	11%	0%	10%	1%	1%	52	Associated Electric Coop	15.0	79%	21%	0%	0%	0%	0%
3	NextEra Energy	160.2	3%	56%	1%	24%	1%	14%	53	Omaha Public Power District	13.8	90%	1%	0%	8%	0%	0%
4	Exelon	152.9	3%	3%	0%	91%	2%	1%	54	LS Power	13.7	17%	79%	0%	0%	4%	0%
5	Duke	147.4	58%	10%	0%	28%	1%	2%	55	Tri-State	13.7	96%	4%	0%	0%	0%	0%
6	Tennessee Valley Authority	145.1	48%	6%	0%	36%	10%	0%	56	Occidental	13.6	0%	100%	0%	0%	0%	0%
7	Entergy	131.9	12%	26%	0%	61%	0%	0%	57	Iberdrola	13.6	0%	6%	0%	0%	2%	91%
8	FirstEnergy	112.3	71%	1%	0%	27%	0%	1%	58	JEA	13.4	52%	34%	0%	0%	0%	14%
9	Dominion	99.7	34%	20%	0%	44%	0%	1%	59	Intermountain Power Agency	13.0	100%	0%	0%	0%	0%	0%
10	Calpine	93.6	0%	93%	0%	0%	0%	7%	60	ArcLight Capital	12.9	6%	62%	0%	0%	2%	30%
11	Progress Energy	88.7	36%	35%	0%	28%	1%	0%	61	Exxon Mobil	12.8	0%	93%	0%	0%	0%	7%
12	PPL	87.7	71%	5%	0%	18%	5%	0%	62	Tenaska	12.5	0%	99%	0%	0%	0%	1%
13	MidAmerican	86.0	72%	8%	0%	4%	5%	10%	63	Municipal Elec. Auth. of GA	12.3	36%	10%	0%	54%	0%	0%
14	US Corps of Engineers	84.3	0%	0%	0%	0%	100%	0%	64	Los Angeles City	12.3	29%	44%	0%	14%	9%	3%
15	Edison International	80.6	52%	11%	0%	24%	6%	6%	65	East Kentucky Power Coop	12.1	95%	4%	0%	0%	0%	1%
16	Energy Future Holdings	78.0	73%	2%	0%	25%	0%	0%	66	NC Public Power	12.0	8%	0%	0%	92%	0%	0%
17	Ameren	74.7	84%	1%	0%	13%	2%	0%	67	Dow Chemical	12.0	0%	94%	0%	0%	0%	6%
18	Xcel	74.3	61%	19%	0%	16%	1%	2%	68	Lower CO River Authority	11.6	59%	39%	0%	0%	2%	0%
19	NRG	71.2	65%	20%	0%	13%	0%	2%	69	Rockland Capital	11.3	2%	98%	0%	0%	0%	0%
20	AES	55.1	72%	22%	0%	0%	0%	6%	70	PNM Resources	11.0	61%	10%	0%	29%	0%	0%
21	PSEG	55.0	14%	29%	1%	55%	0%	0%	71	Seminole Electric Coop	11.0	77%	23%	0%	0%	0%	0%
22	US Bureau of Reclamation	53.9	8%	0%	0%	0%	92%	0%	72	PUD No 2 of Grant County	10.7	0%	0%	0%	0%	100%	0%
23	Constellation	51.3	26%	41%	0%	30%	2%	1%	73	PUD No 1 of Chelan County	10.6	0%	0%	0%	0%	100%	0%
24	DTE Energy	46.2	77%	2%	0%	19%	0%	2%	74	Big Rivers Electric	10.3	84%	0%	0%	0%	0%	15%
25	PG&E	35.7	0%	14%	0%	52%	34%	0%	75	Great River Energy	10.2	96%	3%	0%	0%	0%	1%
26	Dynegy	35.5	64%	35%	0%	0%	0%	0%	76	Austin Energy	10.0	39%	28%	0%	33%	0%	0%
27	GenOn	35.3	77%	22%	1%	0%	0%	0%	77	Integrus	9.8	91%	2%	0%	0%	3%	4%
28	GDF Suez	34.7	21%	73%	0%	0%	2%	3%	78	BP	9.6	0%	66%	0%	0%	2%	32%
29	Westar	27.4	77%	8%	0%	13%	0%	2%	79	CLECO	9.4	37%	36%	0%	0%	0%	27%
30	Pinnacle West	27.3	45%	21%	0%	33%	0%	0%	80	EDP	9.3	0%	0%	0%	0%	0%	100%
31	San Antonio City	26.8	57%	13%	0%	30%	0%	0%	81	El Paso Electric	9.0	8%	37%	0%	55%	0%	0%
32	New York Power Authority	26.8	0%	17%	0%	0%	83%	0%	82	UniSource	9.0	88%	12%	0%	0%	0%	0%
33	Santee Cooper	26.7	75%	14%	0%	9%	1%	0%	83	ALLETE	9.0	91%	0%	0%	0%	5%	4%
34	OGE	26.5	58%	39%	0%	0%	0%	2%	84	Entegra Power	8.8	0%	100%	0%	0%	0%	0%
35	Great Plains Energy	26.0	82%	2%	0%	13%	0%	2%	85	Portland General Electric	8.6	47%	25%	0%	0%	23%	6%
36	SCANA	25.3	49%	29%	0%	20%	1%	1%	86	Hoosier Energy	8.2	95%	4%	0%	0%	0%	0%
37	Salt River Project	25.0	62%	14%	0%	22%	1%	0%	87	Buckeye Power	8.1	99%	1%	0%	0%	0%	0%
38	Oglethorpe	24.1	36%	23%	0%	40%	0%	0%	88	Puget Holdings	7.9	54%	23%	0%	0%	9%	14%
39	Wisconsin Energy	22.2	86%	11%	0%	0%	1%	2%	89	Grand River Dam Authority	7.7	70%	23%	0%	0%	6%	0%
40	CMS Energy	20.4	76%	18%	0%	0%	2%	3%	90	Seattle City Light	7.5	0%	0%	0%	0%	100%	0%
41	Energy Capital Partners	20.2	0%	100%	0%	0%	0%	0%	91	Sacramento Municipal Util Dist	7.5	0%	59%	0%	0%	38%	3%
42	NV Energy	19.6	24%	76%	0%	0%	0%	0%	92	International Paper	7.3	6%	16%	2%	0%	0%	76%
43	Alliant Energy	18.3	88%	3%	0%	0%	1%	8%	93	Arkansas Electric Coop	7.2	76%	18%	0%	0%	6%	0%
44	EDF	18.2	0%	0%	0%	85%	0%	15%	94	PowerSouth Energy Coop	6.9	56%	43%	0%	0%	0%	0%
45	TECO	18.2	60%	40%	0%	0%	0%	0%	95	TransCanada	6.9	0%	70%	1%	0%	25%	4%
46	General Electric	17.3	8%	91%	0%	0%	0%	0%	96	Avista	6.9	19%	11%	0%	0%	66%	4%
47	NE Public Power District	17.0	63%	1%	0%	34%	1%	1%	97	TransAlta	6.8	76%	4%	0%	0%	0%	20%
48	IDACORP	15.9	30%	1%	0%	0%	69%	0%	98	J-Power	6.8	4%	96%	0%	0%	0%	0%
49	NiSource	15.4	84%	15%	0%	0%	0%	0%	99	North Carolina EMC	6.1	0%	6%	0%	94%	0%	0%
50	Basin Electric Power Coop	15.4	93%	1%	0%	0%	0%	6%	100	Waste Management	6.0	6%	2%	0%	0%	0%	92%
Total (top-100 producers)											3,525.7	44%	23%	0%	22%	8%	3%
Total (all U.S. producers)											4,101.0	42%	25%	0%	19%	8%	6%

Endnotes

1. Private entities include investor-owned and privately held utilities and non-utility power producers (e.g., independent power producers). Cooperative electric utilities are owned by their members (i.e., the consumers they serve). Publicly-owned electric utilities are nonprofit government entities that are organized at either the local or State level. There are also several Federal electric utilities in the United States, such as the Tennessee Valley Authority.
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3. U.S. EPA, Air Markets Program Data, March 2013.
4. U.S. EIA, Annual Energy Outlook 2013 (Early Release), December 5, 2012.
5. Ibid.
6. U.S. EPA, Air Markets Program Data, March 2013.
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8. This analysis is based on 2000, 2003, 2004, 2006, 2008, 2009, 2010, and 2011 emissions benchmarking data.
9. American Electric Power Co, Fast Facts: Power Plant Emissions, <http://www.aepsustainability.com/fastfacts/plantemissions.aspx>.
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13. Public Power Weekly, *Moody's: Outlook remains mixed for power project sector*, February 27, 2012.
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