

Appendix A: Mercury Emissions Associated with Electricity Production and Consumption in Minnesota, 2004-2005

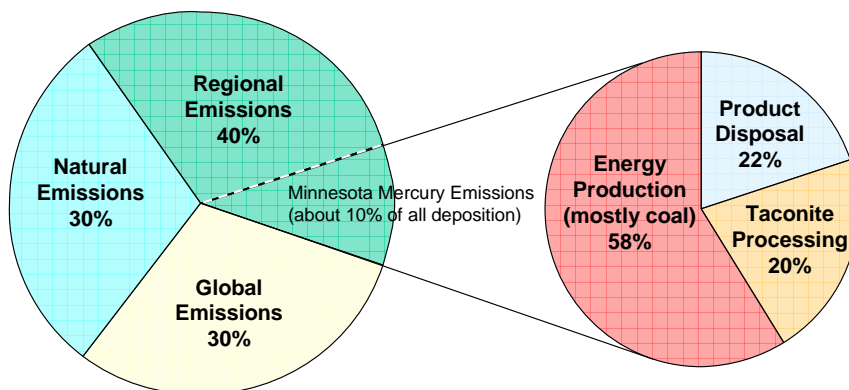
Introduction

In accordance with Minnesota statute §116.925, this appendix reports mercury emissions associated with electricity production and consumption in Minnesota. In addition to electricity, mercury emissions are associated with a variety of other activities in Minnesota which are summarized below. The MPCA has historically considered mercury separately from other air pollutants because it is the subject of a special MPCA initiative with legislatively mandated reports in 2001 and 2005. For more information on mercury emissions, please see the 2005 Mercury Reduction Progress Report to the Legislature at <http://www.pca.state.mn.us/air/mercury.html#publications>

Background

Mercury contamination of fish is a well-documented problem in Minnesota. The Minnesota Department of Health advises people to restrict their consumption of sport fish due to mercury on virtually every lake tested. Nearly all—more than 95 percent—of the mercury in Minnesota lakes and rivers comes from the atmosphere. About 30 percent of mercury in the atmosphere is the result of the natural cycling of mercury. But 70 percent of the mercury is a result of human activities that have increased the release of mercury from the geological materials in which it had been locked up. These activities include the mining of mercury ores, the use of this mercury in products and manufacturing, and the incidental release of trace concentrations of mercury naturally present in coal, crude oil, and metal ores, such as taconite.

Because mercury vapor can be transported long distances by the atmosphere, most of Minnesota's emissions are deposited in other states and countries, and Minnesota receives some of their emissions. Only about 10 percent of mercury deposition in Minnesota is the result of emissions within the state.



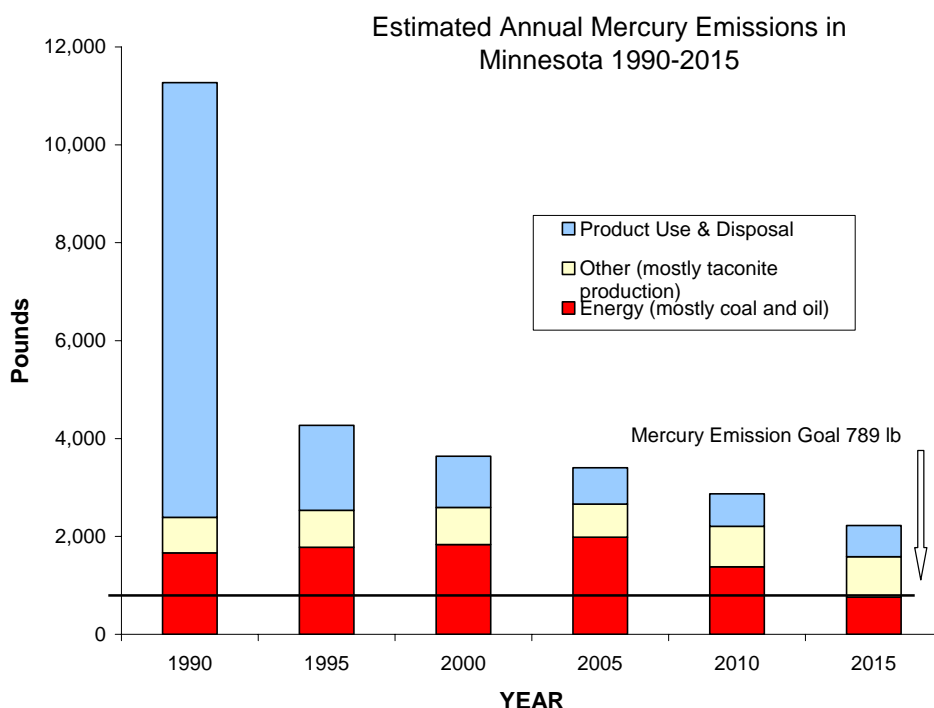
Sources of Atmospheric Deposition to Minnesota, 2005 Minnesota Emissions

Sources and Emissions

Mercury emitted to the atmosphere due to human activities is divided by the MPCA into three categories: (1) emissions incidental to energy production, (2) emissions due to purposeful use, and (3) emissions due to material processing. The MPCA estimates that in 2005 emissions from Minnesota sources totaled 3,341 pounds.

Since 1990, the MPCA estimates that mercury emissions in the state have declined by about 70 percent. Most of this decline is due to reductions in releases of mercury in products. In 1990, emissions from products accounted for nearly 79 percent of emissions in the state. By 2005 product-related emissions had been reduced to only 22 percent, largely due to the removal of mercury from latex paint, batteries and pesticides. Emissions from the two other large sectors, taconite processing and coal fired electricity generation have changed little since 1990 and currently account for 20 and 58 percent of annual mercury emissions respectively. For more information on past and current mercury releases, see the MPCA's 2006 Mercury report to the legislature at <http://www.pca.state.mn.us/air/mercury.html#reports>.

To address the state's largest emissions sources, the Mercury Reduction Act of 2006 requires 3 large electric power plants in the state to reduce emissions by 90 percent by 2014. This will result in a decrease of about 1200 pounds from current levels. This reduction, added to cuts pledged at other coal-fired plants in the state, means that emissions in the state will continue to decline overall despite anticipated increases from new mining and power generation and increases from eclectic generation at remaining coal plants. Planning for these reductions is currently underway and decreases will begin as early as 2010. By 2015, the MPCA predicts that emissions will have declined about 80 percent from 1990 levels.



Mercury Emissions from Electricity Generation

Minnesota statutes section 116.925 requires producers and retailers of electricity to report the amount of mercury emitted through the generation of electricity. This law also requires the MPCA to summarize this information in its biennial air toxics report to the legislature. Emissions from 2004 and 2005 are summarized in Tables 1 and 2.

Minnesota law exempts certain electric generation facilities from reporting mercury emissions: 1) those that operate less than 240 hours per year, 2) combustion units less than 150 British thermal units (Btu) per hour, 3) generation units with a maximum output of less than or equal to 15 megawatts, and 4) combustion facilities emitting less than three pounds of mercury in a given year. Therefore, generation facilities that do not emit any mercury, such as nuclear, wind, and hydro, are not reported here.

Although not required to annually report to the MPCA, this report does include some combustion facilities that emit less than three pounds because of excellent pollution control or because of the use of low-mercury fuel such as natural gas. In addition, because of variation in operating conditions, some facilities may emit more than three pounds one year and less than three pounds in the other. When emissions are less than three pounds, the actual emissions are either given or listed as exempt, depending on the wishes of the facility's management.

Submissions from about 60 generation units in Minnesota are summarized in Table 1. The major fuel for most units was coal, although some facilities depend on municipal solid waste for fuel. Some units are fueled by oil or natural gas.

The law also requires Minnesota retailers and wholesalers of electricity produced outside the state to report mercury emissions associated with production; the information is summarized in Table 2.

Included in Table 2 are about 50 Minnesota distribution cooperatives, which distribute electricity to consumers but do not generate any electricity. All retailers of electricity are required to report mercury emissions associated with the generation of the electricity they distribute. In the case of Minnesota's distribution cooperatives, most of their electricity was generated in North Dakota, South Dakota, and Wisconsin. The information is provided to the distribution cooperatives by their suppliers, Great River Energy, Dairyland Power, Minnkota Power, and East River Electric Power Cooperative. The calculated mercury emissions per megawatt-hour from each supplier (milligrams per megawatt-hour, mg/MWh) may vary because of varying amounts of electricity purchased from the grid and from the variable use of hydroelectric power by each distribution cooperative.

For 2004, facilities in Minnesota reported the emission of 1,793 pounds of mercury in the production of 37,495,502 megawatt hours (MWh) of electricity, an average release rate of 22 milligrams per megawatt hour (mg/MWh). For 2005, reported emissions decreased to 1,750 pounds in the production of 37,800,644 MWh, an average emission rate of 21 milligrams per MWh.

Reports of electricity consumed in Minnesota, but produced outside of Minnesota, in 2004 totaled 15,842,978 MWh associated with mercury-emitting facilities. These facilities emitted 1,179 pounds of mercury, for an average emission rate of 34 milligrams per MWh. Reports for 2005 were similar, totaling 16,524,481 MWh and 1,293 pounds of mercury emitted. The average emission rate for 2005 was 36 milligrams per MWh. The use of lignite coal as a fuel at power-

generating facilities outside the state appears to be largely responsible for the higher ratio of mercury emissions to MWh for out-of-state producers (34 to 36 mg/MWh) compared to Minnesota producers (21 to 22 mg/MWh). Lignite coal contains more mercury per Btu than other types of coal.

Summing Tables 1 and 2 yields estimates of mercury emissions associated with electricity production and consumption in Minnesota. In 2004, 2,959 pounds of mercury were reported as emitted in the production of 52,979,348 megawatt hours. In 2005, 3,024 pounds of mercury were reported as emitted in the production of 53,875,241 megawatt hours. A significant proportion of mercury emissions associated with Minnesota's electrical production and consumption occurred outside state borders; about 40% in 2004 and 43% in 2005.

Table 1. Reported 2004 and 2005 emissions of mercury from electrical production facilities in Minnesota.

Company	Generating Facility	Major Fuel Type(s)	2004 Electricity Produced (MWh)	2004 Mercury Emissions (lb)	2004 Mercury Emissions per Megawatt-hour (mg/MWh)	2005 Electricity Produced (MWh)	2005 Mercury Emissions (lb)	2005 Mercury Emissions per Megawatt-hour (mg/MWh)
Austin NE Power Plant	Unit 1	coal, gas	158,522	8.56	24	154,313	8.33	24
Covanta Hennepin Energy Resource Co	Unit 1	MSW ^a	130,336	27.02	94	132,091	5.36	18
Covanta Hennepin Energy Resource Co	Unit 2	MSW ^a	129,298	13.61	48	126,430	4.47	16
Great River Energy	Cambridge Station ^{c,d}	oil	532	0.00	0	341	0.00	0
Great River Energy	Elk River Station ^c	oil, gas, MSW ^a	212,071	2.40	5	215,736	2.15	5
Great River Energy	Lakefield Station ^c	oil, gas	146,362	0.01	0	331,349	0.02	0
Great River Energy	Maple Lake Station ^{c,d}	oil	401	0.00	3	240	0.00	5
Great River Energy	Pleasant Valley Station ^c	oil, gas	58,222	0.02	0	237,119	0.06	0
Great River Energy	Rock Lake Station ^{c,d}	oil	479	0.00	3	429	0.00	3
Great River Energy	St. Bonifacius Station ^c	oil	2,297	0.02	4	2,291	0.02	3
Hibbing Public Utilities	Unit 1A ^h	coal,oil	see unit 3A	2.10	exempt ^e	see unit 3A	2.21	exempt ^e
Hibbing Public Utilities	Unit 2A ^h	coal,oil	see unit 3A	0.89	exempt ^e	see unit 3A	1.67	exempt ^e
Hibbing Public Utilities	Unit 3A ^h	coal,oil	57,392	6.46	51	63,986	4.75	34
International Paper Sartell	BBC Turbine/Boiler	coal, oil, wood, sludge	90,526	9.09	46	94,489	5.93	28
Interstate Power and Light Company, Sherburn, MN	Fox lake Power Station #3 ^f	oil, gas	48,341	6.70	63	62,554	0.40	exempt ^e
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 1	coal, oil	463,099	27.00	26	558,811	22.00	18
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 2	coal, oil	532,254	27.00	23	477,785	18.00	17
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 3	coal, oil	570,542	22.00	17	460,621	17.00	17
Minnesota Power	Boswell Unit 1	coal	522,680	3.40	3	508,931	3.00	3
Minnesota Power	Boswell Unit 2	coal, oil	523,160	3.40	3	507,721	3.00	3
Minnesota Power	Boswell unit 3	coal, oil	2,818,211	109.00	18	2,486,714	90.00	16
Minnesota Power	Boswell Unit 4 ^e	coal, oil	3,029,905	135.00	20	4,365,221	184.00	19
Minnesota Power	Hibbard 3-4	coal, gas	82,567	5.10	28	87,805	6.00	31
Minnesota Power	Laskin Unit 1 & 2	coal, oil	690,878	18.00	12	765,623	21.00	12
Minnesota Power (Rapids Energy Center)	Rapids Energy Center 5-6	coal, wood	NA	1.80	exempt ^e	NA	1.80	exempt ^e
Northshore Mining Company	Silver Bay Power Plant PB 1 ^c	coal, oil, gas	309,941	1.40	2	335,695	1.30	2
Northshore Mining Company	Silver Bay Power Plant PB 2 ^c	coal, gas	478,107	1.90	2	474,778	1.70	2

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NSP dba Xcel Energy	AS King 1	coal, gas, petroleum coke	3,085,970	66.20	10	2,796,588	60.60	10
NSP dba Xcel Energy	Black Dog 3	coal, gas	518,740	23.80	21	520,519	32.20	28
NSP dba Xcel Energy	Black Dog 4	coal, gas	1,034,320	44.60	20	1,165,666	65.10	25
NSP dba Xcel Energy	Black Dog 5 ^{c,d}	gas	368,362	0.00	0	373,347	0.00	0
NSP dba Xcel Energy	Blue Lake 1-4 ^c	oil	5,342	0.04	3	17,787	0.16	4
NSP dba Xcel Energy	Blue Lake 7-8 ^c	gas	NA	NA	NA	120,173	0.00	0
NSP dba Xcel Energy	Granite City 1-4 ^c	oil, gas	14,234	0.01	0	678	0.00	0
NSP dba Xcel Energy	High Bridge 5	coal, gas	588,959	28.20	22	489,977	23.10	21
NSP dba Xcel Energy	High Bridge 6	coal, gas	926,613	39.30	19	875,626	36.60	19
NSP dba Xcel Energy	Inver Hills 1-6 ^c	oil, gas	55,156	0.14	1	78,558	0.04	0
NSP dba Xcel Energy	Key City 1-4 ^{c,d}	gas	1,451	0.00	0	5,614	0.00	0
NSP dba Xcel Energy	Minnesota Valley 4 ^{c,d}	coal, oil, gas	0	0.00	0	0	0.00	0
NSP dba Xcel Energy	Red Wing 1 Waste-to-Energy	gas, RDF ^b	54,997	5.20	43	51,155	5.30	47
NSP dba Xcel Energy	Red Wing 2 Waste-to-Energy	gas, RDF ^b	584,282	4.60	4	59,160	5.10	39
NSP dba Xcel Energy	Riverside 6/7	coal, oil, gas	758,828	37.60	22	917,505	45.50	22
NSP dba Xcel Energy	Riverside 8	coal, oil, coke	1,385,651	61.10	20	1,390,983	60.20	20
NSP dba Xcel Energy	Sherburne 1	coal, oil	4,437,353	294.80	30	4,972,513	333.70	30
NSP dba Xcel Energy	Sherburne 2	coal, oil	4,510,132	301.40	30	4,703,775	314.00	30
NSP dba Xcel Energy	Sherburne 3 (Xcel owned portion)	coal, oil	3,609,553	232.30	29	2,778,595	180.90	30
NSP dba Xcel Energy	Wilmarth 1 Waste-to-Energy	RDF ^b , gas	52,897	3.00	26	51,656	1.80	16
NSP dba Xcel Energy	Wilmarth 2 Waste-to-Energy ^c	RDF ^b , gas	53,954	1.50	13	53,770	1.80	15
NSP dba Xcel Energy	West Faribault 2-3 ^{c,d}	gas	412	0.00	0	243	0.00	0
Otter Tail Power	Hoot Lake #2 & 3 ⁱ	coal, oil	742,623	26.18	16	931,630	40.13	20
Rochester Public Utilities	Silver Lake 3	coal, gas	78,179	1.85	exempt ^e	71,641	1.39	exempt ^e
Rochester Public Utilities	Silver Lake 4	coal, gas	271,236	2.84	exempt ^e	190,909	1.68	exempt ^e
Rochester Public Utilities	Cascade Creek Station 1	oil, gas	50	0.01	exempt ^e	140	0.01	exempt ^e
Rochester Public Utilities	Cascade Creek Station 2-3	oil, gas	446	0.01	exempt ^e	616	0.01	exempt ^e
Sappi-Cloquet	Power Boiler 7 ^h	oil, gas, wood	127,761	0.72	exempt ^e	128,074	0.72	exempt ^e
Sappi-Cloquet	Power Boiler 8 ^h	gas	173,702	0.00	exempt ^e	177,173	0.00	exempt ^e
Sappi-Cloquet	Power Boiler 9 ^h	oil, gas, wood	124,097	2.04	exempt ^e	101,221	3.05	14

Company	Generating Facility	Major Fuel Type(s)	2004 Electricity Produced (MWh)	2004 Mercury Emissions (lb)	2004 Mercury Emissions per Megawatt-hour (mg/MWh)	2005 Electricity Produced (MWh)	2005 Mercury Emissions (lb)	2005 Mercury Emissions per Megawatt-hour (mg/MWh)
Southern Minnesota Municipal Power Agency	Faribault Energy Park	oil, gas	NA	NA		250,699	0.01	exempt ^e
Southern Minnesota Municipal Power Agency	Sherburne 3 (SMMPA owned portion)	coal, oil	2,819,979	179.50	29	2,019,722	129.40	29
Southern Minnesota Municipal Power Agency	Minnesota River Station Combustion Turbine ^d	oil, gas	5174	0.00	exempt ^e	12,116	0.00	exempt ^e
Willmar Municipal Utilities	Boiler 3	coal, natural gas	48927	3.78	35	41,742	3.67	40
Summary of Reports			37,495,502	1,793	median = 18	37,800,644	1,750	median = 16
			Total Reported 2004 Electricity Produced (MWh)	Total Reported 2004 Mercury Emissions (lb)	Median Reported 2004 Mercury Emissions per Megawatt-hour (mg/MWh)	Total Reported 2005 Electricity Produced (MWh)	Total Reported 2005 Mercury Emissions (lb)	Median Reported 2005 Mercury Emissions per Megawatt-hour (mg/MWh)

Notes

- a MSW is Municipal Solid Waste.
- b RDF is Refuse-Derived Fuel, which is sorted and processed municipal solid waste.
- c Facility has agreed to include for reporting mercury emissions of less than 3 pounds.
- d Mercury emissions round to less than 0.00 pounds mercury for one or both years.
- e 27 pounds of mercury in 2004 and 37 pounds mercury in 2005 associated with electricity sold out of state.
- f 5.20% for 2004 and 5.14% for 2005 of total energy production for all facilities is sold to Minnesota customers.
- g Exempt from reporting. (Facilities emitting under 3 pounds of mercury or less than 240 hours of operation per year.)
- h Due to common steam headers, calculation of mercury per electrical generation is not possible, electrical generation is from each individual turbine not from each boiler
- i 12.66 pounds of mercury in 2004 and 19.38 pounds mercury in 2005 associated with electricity sold out of state.

Table 2. Reported 2004 and 2005 emissions of mercury from electrical production facilities outside of Minnesota for which the electricity was likely consumed in Minnesota.

Company	Electrical Supplier*	Generating Facility	Major Fuel Type(s)	2004 Electricity Consumed in Minnesota (MWh)	2004 Mercury Emissions (lb)	2004 Mercury Emissions per Megawatt-hour (mg/MWh)	2005 Electricity Consumed in Minnesota (MWh)	2005 Mercury Emissions (lb)	2005 Mercury Emissions per Megawatt-hour (mg/MWh)
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 1, Dubuque IA	coal, nat gas	8,802	0.13	7	18	0.11	2690
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 5, Dubuque IA	coal, nat gas	7,988	0.12	7	8,551	0.20	11
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 6, Dubuque IA	coal, nat gas	547	0.02	17	9,312	0.01	0
Interstate Power and Light Company, Lansing, IA (Alliant Energy)		Lansing 3, Lansing IA	coal, oil	7,786	0.66	38	5,786	0.39	31
Interstate Power and Light Company, Lansing, IA (Alliant Energy)		Lansing 4, Lansing IA	coal, oil	66,895	5.63	38	67,490	4.62	31
Interstate Power and Light Company, Clinton, IA (Alliant Energy)		ML Kapp 2, Clinton IA	coal, gas	62,519	4.76	35	63,055	3.75	27
Interstate Power and Light Company, Louisa County, IA (Alliant Energy)		Louisa 1/Louisa Co. IA	coal, gas	21,618	1.33	28	9,479	0.54	26
Interstate Power and Light Company, Sioux City, IA (Alliant Energy)		Neal 3, Sioux City IA	coal, gas	45,557	2.85	28	55,988	3.28	27
Interstate Power and Light Company, Sioux City, IA (Alliant Energy)		Neal 4, Sioux City IA	coal, oil	65,224	3.94	27	54,210	2.86	24
Interstate Power and Light Company, Burlington, IA (Alliant Energy)		Burlington Station #1	coal, nat gas	61,339	4.91	36	58,637	5.21	40
Interstate Power and Light Company, Ottumwa, IA (Alliant Energy)		Ottumwa Station #1	coal, oil	105,477	12.79	55	76,735	9.24	55
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #1a-2	coal, gas	69,981	16.00	104	3,347	0.96	130

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Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #3	coal, oil, gas	4,790	0.80	76	5,084	0.91	81
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #4	coal, gas	40,709	3.02	34	36,317	3.00	37
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #1	coal, gas	9,704	0.85	40	7,892	0.59	34
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #2	coal, gas	9,299	0.83	40	7,775	0.61	36
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #3	coal, gas	26,312	1.73	30	20,900	1.21	26
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #2	coal, oil, gas	833	0.18	98	NA	NA	NA
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #3-4	coal, gas	1,298	0.22	77	555	0.16	130
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #5-6	coal, gas	NA	NA	NA	2,079	0.46	101
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #7-8	coal, gas	7,332	1.07	66	2,887	0.32	50
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #9-10	coal, gas	NA	NA	NA	2,624	0.65	113
Minnesota Power	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	2,005,776	322.00	73	2,268,397	318.00	64
Marshall Municipal Utilities	Heartland Power		sub coal	417,925	20.74	23	420,532	20.86	23
Marshall Municipal Utilities	Missouri River Energy		sub coal	37,575	1.86	23	52,637	2.61	23

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Northern Municipal Power Agency, Thief River Falls	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	152,522	17.40	52	155,377	20.50	60
Northern Municipal Power Agency, Thief River Falls	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	66,259	7.50	51	74,523	10.80	66
Northern Municipal Power Agency, Thief River Falls	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	73,876	6.00	37	76,672	7.50	44
People's Coop. Services	Dairyland Power Coop.	Alma 1-5	Bit/Sub Coal	38,578	1.35	16	0	0.00	15
People's Coop. Services	Dairyland Power Coop.	JP Madgett	Sub bituminous coal	84,019	3.28	18	96,846	8.31	39
People's Coop. Services	Dairyland Power Coop.	Genoa	Bit/Sub Coal	77,025	2.57	15	93,091	3.83	19
People's Coop. Services	Dairyland Power Coop., Great River Energy/G3	Great River Energy/G3	Bit/Sub Coal	514	0.02	18	221	0.01	21
People's Coop. Services	Dairyland Power Coop.	Seven Mile Creek	Landfill gas	NA	NA	NA	708	0.02	13
Tri-County Electric Coop.	Dairyland Power Coop.	Alma 1-5	Sub Coal	52,634	1.84	16	49,051	1.65	15
Tri-County Electric Coop.	Dairyland Power Coop.	JP Madgett	Bit/Sub coal	114,633	4.48	18	130,502	11.20	39
Tri-County Electric Coop.	Dairyland Power Coop.	Genoa	Bit/Sub Coal	105,090	3.51	15	125,443	5.16	19
Tri-County Electric Coop.	Dairyland Power Coop.	Great River Energy/G3	Bit/Sub Coal	702	0.02	13	297	0.01	15
Tri-County Electric Coop.	Dairyland Power Coop.	Seven Mile Creek	Landfill gas	NA	NA	NA	954	0.03	14
Freeborn-Mower Coop. Services	Dairyland Power Coop.	Alma 1-5	Bit/Sub Coal	29,123	1.02	16	27,986	0.94	15
Freeborn-Mower Coop. Services	Dairyland Power Coop.	JP Madgett	Sub bituminous coal	63,427	2.48	18	74,456	6.39	39
Freeborn-Mower Coop. Services	Dairyland Power Coop.	Genoa 3	Bit/Sub Coal	58,147	1.94	15	71,570	2.94	19
Freeborn-Mower Coop. Services	Dairyland Power Coop.	Great River Energy/G3	Bit/Sub Coal	388	0.01	12	170	0.01	27
Freeborn-Mower Coop. Services	Dairyland Power Coop.	Seven Mile Creek	Landfill gas	NA	NA	NA	544	0.02	17

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Agralite Electric Coop.	Great River Energy		lignite coal	174,354	7.63	20	137,831	8.57	28
Arrowhead Electric Coop.	Great River Energy		lignite coal	65,318	3.73	26	64,585	4.01	28
Benco Electric Coop.	Great River Energy		lignite coal	25,624	14.88	263	267,335	16.61	28
Brown County Rural Electrical Ass'n	Great River Energy		lignite coal	117,010	5.07	20	91,348	5.68	28
Connexus Energy	Great River Energy		lignite coal	2,046,465	118.75	26	2,212,059	137.47	28
Coop. Light and Power	Great River Energy		lignite coal	88,577	5.14	26	91,493	5.69	28
Crow Wing Power	Great River Energy		lignite coal	492,777	28.60	26	528,276	32.83	28
Dakota Electric Ass'n	Great River Energy		lignite coal	1,692,159	98.19	26	1,815,739	112.84	28
East Central Energy	Great River Energy		lignite coal	843,567	48.95	26	888,545	55.22	28
Federated Rural Electric	Great River Energy		lignite coal	180,349	7.82	20	144,560	8.98	28
Goodhue County Coop. Electric Ass'n	Great River Energy		lignite coal	84,065	4.88	26	87,964	5.47	28
Itasca-Mantrap Co-op. Electrical Ass'n	Great River Energy		lignite coal	170,102	9.87	26	179,151	11.13	28
Kandiyohi Power Coop.	Great River Energy		lignite coal	141,110	6.35	20	115,245	7.16	28
Lake Country Power	Great River Energy		lignite coal	661,595	38.39	26	674,129	41.89	28
Lake Region Electric Coop.	Great River Energy		lignite coal	351,696	16.02	21	291,925	18.14	28
McLeod Coop. Power Ass'n	Great River Energy		lignite coal	156,058	8.46	25	156,093	9.70	28
Meeker Coop. Light & Power Ass'n	Great River Energy		lignite coal	150,983	7.49	23	135,852	8.44	28
Mille Lacs Electric Coop.	Great River Energy		lignite coal	185,320	10.75	26	193,508	12.03	28
Minnesota Valley Electric Coop.	Great River Energy		lignite coal	528,192	30.65	26	583,169	36.24	28
Nobles Electric Coop.	Great River Energy		lignite coal	147,041	5.54	17	102,269	6.36	28

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Company	Electrical Supplier*	Generating Facility	Major Fuel Type(s)	2004 Electricity Consumed in Minnesota (MWh)	2004 Mercury Emissions (lb)	2004 Mercury Emissions per Megawatt-hour (mg/MWh)	2005 Electricity Consumed in Minnesota (MWh)	2005 Mercury Emissions (lb)	2005 Mercury Emissions per Megawatt-hour (mg/MWh)
North Itasca Electric Coop., Inc.	Great River Energy		lignite coal	49,661	2.43	22	51,409	2.72	24
Redwood Electric Coop.	Great River Energy		lignite coal	137,242	5.66	19	32,397	2.01	28
Runestone Electric Ass'n	Great River Energy		lignite coal	201,130	8.97	20	166,770	10.36	28
South Central Electric Ass'n	Great River Energy		lignite coal	137,242	5.66	19	130,230	8.09	28
Stearns Electric Ass'n	Great River Energy		lignite coal	370,868	18.87	23	353,107	21.94	28
Steele-Waseca Coop. Electric	Great River Energy		lignite coal	201,168	11.67	26	207,498	12.89	28
Todd-Wadena Electric Coop.	Great River Energy		lignite coal	153,370	7.14	21	129,556	8.05	28
Wright-Hennepin Coop. Electric Ass'n	Great River Energy		lignite coal	703,745	40.84	26	774,696	48.14	28
Clearwater-Polk Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	27,344	3.10	51	31,193	4.10	60
Clearwater-Polk Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	13,788	1.60	53	14,961	2.20	67
Clearwater-Polk Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	14,558	1.20	37	15,392	1.50	44
North Star Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	49,917	5.70	52	49,574	6.50	59
North Star Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	21,685	2.40	50	23,777	3.40	65
North Star Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	24,178	2.00	38	24,463	2.40	45
PKM Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	36,290	4.10	51	39,500	5.20	60
PKM Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	18,298	2.10	52	18,945	2.70	65
PKM Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	19,321	1.60	38	19,491	1.90	44
Red Lake Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	49,380	5.60	51	50,074	6.60	60
Red Lake Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	21,452	2.40	51	24,017	3.50	66
Red Lake Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	23,918	2.00	38	24,709	2.40	44

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Red River Valley Coop. Power Ass'n	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	50,363	5.80	52	51,745	6.80	60
Red River Valley Coop. Power Ass'n	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	21,879	2.50	52	24,818	3.60	66
Red River Valley Coop. Power Ass'n	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	24,394	2.00	37	25,534	2.50	44
Roseau Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	68,760	7.90	52	68,400	9.00	60
Roseau Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	29,871	3.40	52	32,806	4.80	66
Roseau Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	33,305	2.70	37	33,752	3.30	44
Wild Rice Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	95,638	10.90	52	100,177	13.20	60
Wild Rice Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	41,547	4.70	51	48,047	7.00	66
Wild Rice Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	46,323	3.80	37	49,433	4.80	44
Beltrami Electric Coop.	Minnkota Power Coop.	Milton R. Young #1, Center, ND	lignite coal	186,236	21.30	52	188,708	24.90	60
Beltrami Electric Coop.	Minnkota Power Coop.	Milton R. Young #2, Center, ND	lignite coal	80,904	9.10	51	90,509	13.10	66
Beltrami Electric Coop.	Minnkota Power Coop.	Coyote Station, Beulah, ND	lignite coal	90,206	7.40	37	93,119	9.10	44
Sioux Valley-Southwestern Electric Coop. ^a	L & O Electric (Elec.)	(Purchases from Basin	coal	63,791	3.57	25.40	56,701	3.75	30.01
Lyon-Lincoln Electric Coop.	East River Electric Power Coop.		lignite coal	56,372	2.70	22	59,768	2.87	22
Minnesota Valley Coop.. Light & Power Ass'n	Basin Electric		lignite coal	104,684	5.80	25	115,401	6.46	25
Traverse Electric Coop.	Basin Electric		lignite coal	27,444	1.32	22	29,238	1.40	22
Wright-Hennepin Coop. Electric Ass'n	Basin Electric		lignite coal	8,780	0.42	22	8,731	0.59	31
Renville Sibley Coop. Ass'n	East River Electric Power Coop.		lignite coal	101,663	4.88	22	107,987	5.18	22

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Minnesota Valley Electric Coop.	Utilities Plus		lignite, sub coal	47,908	2.30	22	43,265	2.94	31
Stearns Electric Association	Utilities Plus		sub coal, lignite	26,280	1.26	22	46,492	1.77	17
Wright-Hennepin Coop. Electric Ass'n	Utilities Plus		lignite, sub coal	57,490	2.76	22	51,918	3.53	31
Willmar Municipal Utilities	Coal Creek, ND		sub coal				197,224	12.26	28
Summary of Reports:				15,842,978	1,179	median = 26	16,524,481	1,293	median = 28
				Total Reported 2004 Electricity Produced (MWh)	Total Reported 2004 Mercury Emissions (lb)	Median Reported 2004 Mercury Emissions per Megawatt-hour (mg/MWh)	Total Reported 2005 Electricity Produced (MWh)	Total Reported 2005 Mercury Emissions (lb)	Median Reported 2005 Mercury Emissions per Megawatt-hour (mg/MWh)

Notes

NA Data was either not available or not submitted to MPCA

a Used Basin Electric lb Hg/MWh emission factor to calculate estimated emissions

* Electrical Supplier if not generated by the Reporting Company