Appendix A: Mercury Emissions Associated with Electricity Production and Consumption in Minnesota, 2006-2007

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 other energy production activities, taconite processing and releases from the use of mercury in products. Emissions sources and impacts are summarized at the end of this document. In 2007, the Minnesota Pollution Control Agency (MPCA) established an emissions reduction goal and is now implementing stakeholder recommendations to meet the goal. More information about Minnesota's mercury emissions and reduction strategies can be found at http://www.pca.state.mn.us/air/mercury.html.

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 2006 and 2007 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 that generate fewer than 150 British thermal units (Btu) per hour, (3) generation units with a maximum output of 15 megawatts or less, and (4) combustion facilities that emit less than three pounds of mercury in a given year. Therefore, generation facilities that do not emit any mercury, such as nuclear, wind and hydroelectric, are not reported here.

Although not required to annually report to the MPCA, Tables 1 and 2 include some combustion facilities that emit less than three pounds per year because of excellent pollution control or because they use 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 another. 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 62 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, oil or natural gas for fuel.

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

Included in Table 2 are Minnesota distribution cooperatives that 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, in milligrams per megawatt-hour (mg/MWh) from each supplier may vary because of varying amounts of electricity purchased from the grid and because of the varying amounts of hydroelectric power used by each distribution cooperative.

For 2006, facilities in Minnesota reported the emission of 1,746 pounds of mercury in the production of 36,566,484 MWh of electricity and a median release rate of 15 mg/MWh. For 2007, reported emissions

decreased to 1,302 pounds in the production of 35,557,082 MWh, an average emission rate of 16 mg/MWh.

Reports of electricity consumed in Minnesota, but produced outside the state, in 2006 totaled 18,467,858 MWh associated with mercury-emitting facilities. These facilities emitted 1,491 pounds of mercury, with a median emission rate of 33 mg/MWh. Reports for 2007 were similar, totaling 18,865,932 MWh and 1,475 pounds of mercury emitted. The median emission rate for 2007 was 32 mg/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 (32 to 33 mg/MWh) compared to Minnesota producers (15 to 16 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 2006, 3,237 pounds of mercury were reported as emitted in the production of 57,034,342 megawatt MWh. In 2007, 2,777 pounds of mercury were reported as emitted in the production of 54,423,014 MWh. A significant proportion of mercury emissions associated with Minnesota's electrical production and consumption occurred outside the state: about 46 percent in 2006 and 53 percent in 2007.

Minnesota Mercury Emission Sources

In addition to electricity generation, mercury emissions are associated with a variety of other activities in Minnesota which the MPCA divides into three categories: (1) emissions incidental to energy production (including electricity), (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.

In 2007, the MPCA established a goal of reducing mercury emissions by about 76 percent from 2005 levels to below 800 pounds. This target was established through the development of a Total Maximum Daily Load (TMDL) study as part of Clean Water Act requirements to address impaired waters in the state. Achieving this target will reduce Minnesota's contribution to mercury contamination of fish. The MPCA is currently implementing stakeholder developed strategies to reach this goal by 2025. More on Minnesota's plan for reducing mercury is available at http://www.pca.state.mn.us/air/mercury-reductionplan.html.

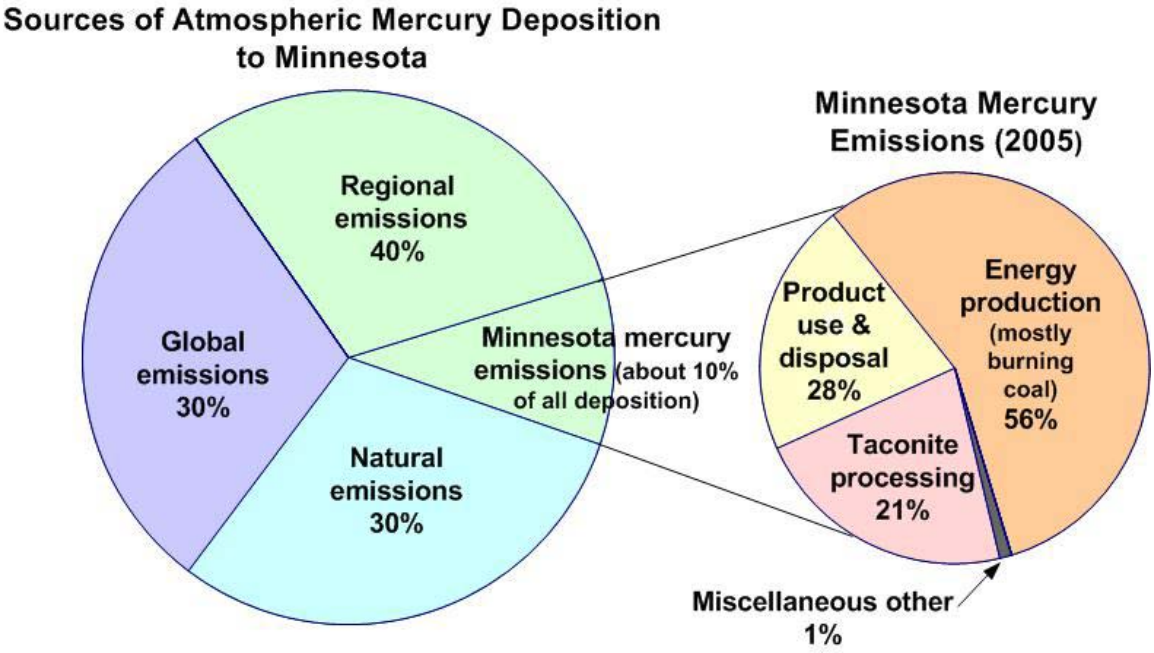

Figure 1. Sources of Atmospheric Deposition to Minnesota, 2005 Minnesota Emissions

Mercury Deposition and Fish Contamination

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 contamination 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. 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.

Table 1. Reported 2006 and 2007 emissions of mercury from electrical production facilities in Minnesota

Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Produced (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Produced (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Austin NE Power Plant	Unit 1	coal, gas	126,652	6.72	24	81,729	4.51	25
Covanta Hennepin Energy Resource Co	Unit 1[c]	MSW[a]	129,314	3.29	12	126,675	2.44	9
Covanta Hennepin Energy Resource Co	Unit 2[c]	MSW[a]	129,159	2.26	8	130,904	3.45	12
Great River Energy	Cambridge Station[c,d]	oil	150	0.00	0	81,957	0.00	0
Great River Energy	Elk River Station[c]	oil, gas, MSW[a]	181,973	1.78	4	196,296	2.01	5
Great River Energy	Lakefield Station [c,d]	oil, gas	265,322	0.00	0	396,806	0.00	0
Great River Energy	Maple Lake Station[c,d]	oil	289	0.00	0	190	0.00	0
Great River Energy	Pleasant Valley Station[c,d]	oil, gas	327,571	0.00	0	270,395	0.00	0
Great River Energy	Rock Lake Station[c,d]	oil	206	0.00	0	308	0.00	0
Great River Energy	St. Bonifacius Station[c]	oil	NA	NA	0.00	NA	NA	0.00
Hibbing Public Utilities	Unit 1A[h,c]	coal, oil	see unit 3A	2.13		see unit 3A	3.07	
Hibbing Public Utilities	Unit 2A[h,c]	coal, oil	see unit 3A	1.75		see unit 3A	3.07	
Hibbing Public Utilities	Unit 7A[h,c]	wood	0	0.00		see unit 3A	1.67	
Hibbing Public Utilities	Unit 3A[h]	coal, oil	65,649	5.39	37	126,621	6.99	25
Interstate Power and Light Company, Sherburn, MN	Fox lake Power Station #3[f]	oil, gas	49,501	0.10	exempt[g]	69,431	0.30	exempt[g]
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 1	coal, oil	523,774	19.00	16	507,073	20.00	18
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 2	coal, oil	497,428	17.00	16	460,783	18.00	18
Minnesota Power(Taconite Harbor Energy Center)	Taconite Harbor Energy Center Unit 3	coal, oil	522,512	19.00	16	524,081	21.00	18
Minnesota Power	Boswell Unit 1	coal, oil	560,769	16.00	13	493,392	15.00	14
Minnesota Power	Boswell Unit 2	coal, oil	540,866	9.00	8	426,171	8.00	9
Minnesota Power	Boswell unit 3	coal, oil	2,568,880	81.00	14	2,271,522	80.00	16
Minnesota Power	Boswell Unit 4[e]	coal, oil	4,072,175	171.00	19	3,522,886	164.00	21
Minnesota Power	Hibbard 3-4	coal, gas	79,731	6.00	34	53,354	4.00	34
Minnesota Power	Laskin Unit 1 & 2	coal, oil	688,548	24.00	16	280,759	11.00	18
Minnesota Power (Rapids Energy Center)	Rapids Energy Center 5-6[c]	coal, wood	NA	2.00		NA	2.00	
Northshore Mining Company	Silver Bay Power Plant PB 1[c]	coal, oil, gas	341,163	1.30	2	330,171	1.30	2
Northshore Mining Company	Silver Bay Power Plant PB 2[c]	coal, gas	438,198	1.60	2	500,032	1.80	2
Xcel Energy	AS King 1	coal, gas, petroleum coke	1,665,905	36.50	10	814,620	5.40	3

Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Produced (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Produced (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Xcel Energy	Black Dog 3	coal, gas	539,591	33.70	28	512,650	28.80	25
Xcel Energy	Black Dog 4	coal, gas	1,062,386	60.30	26	1,074,710	56.80	24
Xcel Energy	Black Dog 5[c,d]	gas	486,015	0.00	0	692,938	0.00	0
Xcel Energy	Blue Lake 1-3[c]	oil, gas	9,360	0.10	5	19,143	0.10	2
Xcel Energy	Blue Lake 7-8[c,d]	gas	136,788	0.00	0	123,186	0.00	0
Xcel Energy	Granite City 1-4[c,d]	oil, gas	2,889	0.00	0	3,744	0.00	0
Xcel Energy	High Bridge 5	coal, gas	488,779	24.10	22	248,585	11.40	21
Xcel Energy	High Bridge 6	coal, gas	722,219	31.70	20	558,651	23.20	19
Xcel Energy	Inver Hills 1-6[c]	oil, gas	61,134	0.02	0	133,652	0.20	1
Xcel Energy	Key City 1-4[c,d]	gas	2,988	0.00	0	3,717	0.00	0
Xcel Energy	Minnesota Valley 4[c,d]	coal, oil, gas	0	0.00	0	0	0.00	0
Xcel Energy	Red Wing 1 Waste-to-Energy	gas, RDF[b]	51,155	3.40	30	63,072	3.60	26
Xcel Energy	Red Wing 2 Waste-to-Energy	gas, RDF[b]	59,160	4.80	37	57,609	3.80	30
Xcel Energy	Riverside 6/7	coal, oil, gas	727,965	36.90	23	920,476	20.70	10
Xcel Energy	Riverside 8	coal, oil, coke	1,033,588	45.10	20	1,432,175	58.50	19
Xcel Energy	Sherburne 1	coal, oil	4,823,259	325.30	31	3,879,590	183.90	22
Xcel Energy	Sherburne 2	coal, oil	4,101,904	276.60	31	5,091,550	239.70	21
Xcel Energy	Sherburne 3 (Xcel owned portion)	coal, oil	3,947,613	249.50	29	4,327,541	148.40	16
Xcel Energy	Wilmarth 1 Waste-to-Energy[c]	RDFb, gas	53,856	2.30	19	63,395	2.90	21
Xcel Energy	Wilmarth 2 Waste-to-Energy[c]	RDFb, gas	57,822	1.90	15	67,502	2.40	16
Otter Tail Power	Hoot Lake #2 & 3	coal, oil	870,558	27.37	14	493,860	17.56	16
Rochester Public Utilities	Silver Lake 3	coal, gas	82,295	2.28	exempt[g]	88,591	2.96	exempt[g]
Rochester Public Utilities	Silver Lake 4	coal, gas	156,652	1.65	exempt[g]	224,405	2.64	exempt[g]
Rochester Public Utilities	Cascade Creek Station 1	oil, gas	5	0.01	exempt[g]	457	0.01	exempt[g]
Rochester Public Utilities	Cascade Creek Station 2-3	oil, gas	4,247	0.01	exempt[g]	6,466	0.01	exempt[g]
Sappi-Cloquet	Power Boiler 7[h]	oil, gas, wood	126,552	0.76	exempt[g]	125,680	0.76	exempt[g]
Sappi-Cloquet	Power Boiler 8[h]	gas	171,784	0.00	exempt[g]	182,192	0.00	exempt[g]
Sappi-Cloquet	Power Boiler 9[h]	oil, gas, wood	101,810	2.94	exempt[g]	111,182	2.98	exempt[g]
Sappi-Cloquet	Power Boiler 10[h]	gas		1.00	exempt[g]		1.06	exempt[g]

Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Produced (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Produced (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Southern Minnesota Municipal Power Agency	Faribault Energy Park	oil, gas			exempt[g]	229,362	0.02	exempt[g]
Southern Minnesota Municipal Power Agency	Sherburne 3 (SMMPA owned portion)	coal, oil	2,777,484	178.50	29	3,008,779	101.30	15
Southern Minnesota Municipal Power Agency	Minnesota River Station Combustion Turbine[d]	oil, gas			exempt[g]	12,446	0.01	exempt[g]
Verso Paper- Sartell	BBC Turbine/Boiler	coal, oil, wood, sludge	89,681	5.81	29	87,642	5.75	30
Willmar Municipal Utilities	Boiler 3	coal, natural gas	41210	3.48	38	45,978	3.53	35
		Summary of Reports	**36,566,484**	**1,746**	**median = 15**	**35,557,082**	**1,302**	**median = 16**

	Total Reported 2006 Electricity Produced (MWh)	Total Reported 2006 Mercury Emissions (lb)	Median Reported 2006 Mercury Emissions per Megawatt-hour (mg/MWh)	Total Reported 2007 Electricity Produced (MWh)	Total Reported 2007 Mercury Emissions (lb)	Median Reported 2007 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]34 pounds of mercury in 2006 and 33 pounds mercury in 2007 associated with electricity sold out of state.

[f]5.21% for 2006 and 5.23% for 2007 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

Table 2. Reported 2006 and 2007 emissions of mercury from electrical production facilities outside of Minnesota for which the electricity was likely consumed in Minnesota.

Company	Electrical Supplier, if not generated by the Reporting Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Consumed in Minnesota (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Consumed in Minnesota (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 1, Dubuque IA	coal, nat gas	8,031	0.21	12	8,825	0.23	12
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 5, Dubuque IA	coal, nat gas	7,882	0.38	22	7,709	0.36	21
Interstate Power and Light Company, Dubuque, IA (Alliant Energy)		Dubuque 6, Dubuque IA	coal, nat gas	24	0.03	501	17	0.02	552
Interstate Power and Light Company, Lansing, IA (Alliant Energy)		Lansing 3, Lansing IA	coal, oil	6,136	0.07	5	8,081	0.10	6
Interstate Power and Light Company, Lansing, IA (Alliant Energy)		Lansing 4, Lansing IA	coal, oil	61,802	8.53	63	76,035	10.46	62
Interstate Power and Light Company, Clinton, IA (Alliant Energy)		ML Kapp 2, Clinton IA	coal, gas	47,941	5.65	53	55,312	6.44	53
Interstate Power and Light Company, Louisa County, IA (Alliant Energy)		Louisa 1/Louisa Co. IA	coal, gas	232,747	0.70	1	192,532	0.52	1
Interstate Power and Light Company, Sioux City, IA (Alliant Energy)		Neal 3, Sioux City IA	coal, gas	187,988	3.16	8	188,301	3.00	7
Interstate Power and Light Company, Sioux City, IA (Alliant Energy)		Neal 4, Sioux City IA	coal, oil	235,588	3.53	7	238,995	3.45	7
Interstate Power and Light Company, Burlington, IA (Alliant Energy)		Burlington Station #1	coal, nat gas	60,078	5.92	45	64,609	6.33	44
Interstate Power and Light Company, Ottumwa, IA (Alliant Energy)		Ottumwa Station #1	coal, oil	95,999	6.61	31	99,356	7.54	34
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #1a-2	coal, gas	4,179	0.38	41	2,459	0.37	68
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #3	coal, oil, gas	4,798	0.06	6	5,175	0.58	50
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Prairie Creek Station #4	coal, gas	31,001	1.24	18	35,499	1.37	18
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #1	coal, gas	10,582	0.39	17	11,240	0.41	17
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #2	coal, gas	10,669	0.42	18	11,362	0.45	18
Interstate Power and Light Company, Marshalltown, IA (Alliant Energy)		Sutherland Station #3	coal, gas	31,042	0.29	4	30,492	0.25	4
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #2	coal, oil, gas	NA	NA	NA	NA	NA	NA
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #3-4	coal, gas	346	0.08	109	375	0.11	127
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #5-6	coal, gas	678	0.50	335	1,086	0.26	107
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #7-8	coal, gas	3,670	0.19	24	2,563	0.30	53
Interstate Power and Light Company, Cedar Rapids, IA (Alliant Energy)		Sixth Street Station #9-10	coal, gas	1,340	1.01	341	1,762	0.96	248
Minnesota Power	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	2,069,699	294.00	64	1,533,185	210.00	62
Marshall Municipal Utilities	Heartland Power		sub coal	422,630	20.96	22	421,114	20.89	22

Company	Electrical Supplier, if not generated by the Reporting Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Consumed in Minnesota (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Consumed in Minnesota (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Marshall Municipal Utilities	Missouri River Energy		sub coal	65,816	3.26	22	76,478	3.79	22
Northern Municipal Power Agency, Thief River Falls	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	139,009	18.20	59	154,293	20.10	59
Northern Municipal Power Agency, Thief River Falls	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	86,073	12.80	67	79,289	10.80	62
Northern Municipal Power Agency, Thief River Falls	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	71,264	6.80	43	72,158	8.50	53
People's Cooperative Services	Dairyland Power Cooperative	Alma 1-5	Bit/Sub Coal	42,450	1.56	17	42,302	1.70	18
People's Cooperative Services	Dairyland Power Cooperative	JP Madgett	Sub bituminous coal	91,640	7.81	39	97,633	6.71	31
People's Cooperative Services	Dairyland Power Cooperative	Genoa	Bit/Sub Coal	93,527	3.96	19	88,447	2.24	11
People's Cooperative Services	Dairyland Power Cooperative, Great River Energy/G3	Great River Energy/G3	Bit/Sub Coal	503	0.02	18	659	0.02	14
People's Cooperative Services	Dairyland Power Cooperative,	Seven Mile Creek	Landfill gas	747	0.00	NA	579	0.00	0
Tri-County Electric Cooperative	Dairyland Power Cooperative	Alma 1-5	Sub Coal	58,806	2.16	17	59,769	2.41	18
Tri-County Electric Cooperative	Dairyland Power Cooperative	JP Madgett	Bit/Sub coal	127,037	10.83	39	137,948	9.49	31
Tri-County Electric Cooperative	Dairyland Power Cooperative	Genoa	Bit/Sub Coal	129,653	5.48	19	124,968	3.16	11
Tri-County Electric Cooperative	Dairyland Power Cooperative	Great River Energy/G3	Bit/Sub Coal	697	0.03	20	931	0.02	10
Tri-County Electric Cooperative	Dairyland Power Cooperative	Seven Mile Creek	Landfill gas	1,036	0.00	NA	818	0.00	0
Freeborn-Mower Cooperative Services	Dairyland Power Cooperative	Alma 1-5	Bit/Sub Coal	35,012	1.29	17	35,516	1.43	18
Freeborn-Mower Cooperative Services	Dairyland Power Cooperative	JP Madgett	Sub bituminous coal	75,635	6.45	39	81,972	5.64	31
Freeborn-Mower Cooperative Services	Dairyland Power Cooperative	Genoa 3	Bit/Sub Coal	77,193	3.26	19	74,259	1.88	11
Freeborn-Mower Cooperative Services	Dairyland Power Cooperative	Great River Energy/G3	Bit/Sub Coal	415	0.02	22	553	0.01	8
Freeborn-Mower Cooperative Services	Dairyland Power Cooperative	Seven Mile Creek	Landfill gas	617	0.00	NA	486	0.00	0
Agralite Electric Cooperative	Great River Energy		lignite coal	146,778	10.63	33	159,966	11.27	32
Arrowhead Electric Cooperative	Great River Energy		lignite coal	66,666	4.83	33	70,478	4.97	32
Benco Electric Cooperative	Great River Energy		lignite coal	248,555	18.01	33	279,404	19.69	32
Brown County Rural Electrical Ass'n	Great River Energy		lignite coal	86,550	6.27	33	115,369	8.13	32
Connexus Energy	Great River Energy		lignite coal	2,259,138	163.66	33	2,386,500	168.17	32
Cooperative Light and Power	Great River Energy		lignite coal	86,614	6.27	33	95,339	6.72	32
Crow Wing Power	Great River Energy		lignite coal	508,850	36.86	33	585,880	41.29	32
Dakota Electric Ass'n	Great River Energy		lignite coal	1,857,635	134.58	33	1,958,956	138.04	32
East Central Energy	Great River Energy		lignite coal	895,667	64.89	33	938,888	66.16	32
Federated Rural Electric	Great River Energy		lignite coal	136,812	9.91	33	153,316	10.80	32
Goodhue County Cooperative Electric Ass'n	Great River Energy		lignite coal	81,970	5.94	33	92,340	6.51	32

Company	Electrical Supplier, if not generated by the Reporting Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Consumed in Minnesota (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Consumed in Minnesota (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Itasca-Mantrap Co-op. Electrical Ass'n	Great River Energy		lignite coal	172,337	12.48	33	196,540	13.85	32
Kandiyohi Power Cooperative	Great River Energy		lignite coal	112,471	8.15	33	130,119	9.17	32
Lake Country Power	Great River Energy		lignite coal	627,754	45.48	33	706,366	49.78	32
Lake Region Electric Cooperative	Great River Energy		lignite coal	280,820	20.34	33	325,093	22.91	32
McLeod Cooperative Power Ass'n	Great River Energy		lignite coal	160,097	11.60	33	181,531	12.79	32
Meeker Cooperative Light & Power Ass'n	Great River Energy		lignite coal	128,045	9.28	33	147,074	10.36	32
Mille Lacs Electric Cooperative	Great River Energy		lignite coal	182,239	13.20	33	205,512	14.48	32
Minnesota Valley Electric Cooperative	Great River Energy		lignite coal	593,992	43.03	33	613,111	43.20	32
Nobles Electric Cooperative	Great River Energy		lignite coal	136,812	9.91	33	111,995	7.89	32
North Itasca Electric Cooperative, Inc.	Great River Energy		lignite coal	49,487	3.03	28	55,639	3.36	27
Redwood Electric Cooperative	Great River Energy		lignite coal	26,206	1.90	33	30,164	2.13	32
Runestone Electric Ass'n	Great River Energy		lignite coal	158,673	11.50	33	181,916	12.82	32
South Central Electric Ass'n	Great River Energy		lignite coal	136,336	9.88	33	147,965	10.43	32
Stearns Electric Ass'n	Great River Energy		lignite coal	370,485	26.84	33	423,484	29.84	32
Steele-Waseca Cooperative Electric	Great River Energy		lignite coal	226,532	16.41	33	245,423	17.29	32
Todd-Wadena Electric Cooperative	Great River Energy		lignite coal	121,976	8.84	33	139,591	9.84	32
Wright-Hennepin Cooperative Electric Ass'n	Great River Energy		lignite coal	796,099	57.67	33	819,870	57.77	32
Clearwater-Polk Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	33,457	4.40	60	31,120	4.10	60
Clearwater-Polk Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	20,716	3.10	68	15,992	2.20	62
Clearwater-Polk Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	17,152	1.60	42	14,554	1.70	53
North Star Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	42,986	5.60	59	48,346	6.30	59
North Star Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	26,616	4.00	68	24,845	3.40	62
North Star Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	22,037	2.10	43	22,610	2.60	52
PKM Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	33,305	4.40	60	40,938	5.30	59
PKM Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	20,662	3.10	68	21,038	2.90	63
PKM Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	17,074	1.60	43	24,001	2.20	42
Red Lake Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	43,641	5.70	59	50,314	6.60	60
Red Lake Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	27,022	4.00	67	25,856	3.50	61
Red Lake Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	22,373	2.10	43	23,531	2.80	54
Red River Valley Cooperative Power Ass'n	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	44,279	5.80	59	51,321	6.70	59
Red River Valley Cooperative Power Ass'n	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	27,417	4.10	68	26,373	3.60	62
Red River Valley Cooperative Power Ass'n	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	22,700	2.20	44	24,001	2.80	53
Roseau Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	58,570	7.70	60	65,831	8.60	59
Roseau Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	36,266	5.40	68	33,830	4.60	62

Company	Electrical Supplier, if not generated by the Reporting Company	Generating Facility	Major Fuel Type(s)	2006 Electricity Consumed in Minnesota (MWh)	2006 Mercury Emissions (lb)	2006 Mercury Emissions per Megawatt-hour (mg/MWh)	2007 Electricity Consumed in Minnesota (MWh)	2007 Mercury Emissions (lb)	2007 Mercury Emissions per Megawatt-hour (mg/MWh)
Roseau Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	30,027	2.90	44	30,787	3.60	53
Wild Rice Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	89,408	11.70	59	103,117	13.40	59
Wild Rice Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	55,361	8.20	67	52,991	7.20	62
Wild Rice Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	45,836	4.40	44	48,225	5.60	53
Beltrami Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #1, Center, ND	lignite coal	172,106	22.50	59	190,119	24.80	59
Beltrami Electric Cooperative	Minnkota Power Cooperative	Milton R. Young #2, Center, ND	lignite coal	106,566	15.90	68	97,700	13.30	62
Beltrami Electric Cooperative	Minnkota Power Cooperative	Coyote Station, Beulah, ND	lignite coal	88,231	8.40	43	88,913	10.40	53
Sioux Valley-Southwestern Electric Coop	L & O Electric (Purchases from Basin Elec.)		coal	59,571	4.04	30.79	69,889	6.07	39.38
Lyon-Lincoln Electric Cooperative	East River Electric Power Cooperative		lignite coal	61,772	4.20	31	66,713	5.27	36
Minnesota Valley Coop. Light & Power Ass'n	Basin Electric		lignite coal	14,434	0.91	29	146,374	11.56	36
Traverse Electric Cooperative	Basin Electric		lignite coal	29,232	1.99	31	31,309	2.47	36
Wright-Hennepin Cooperative Electric Ass'n	Basin Electric		lignite coal	20,730	1.72	38	108,037	8.53	36
Renville Sibley Cooperative Ass'n	East River Electric Power Cooperative		lignite coal	117,953	8.02	31	123,045	9.72	36
Minnesota Valley Electric Cooperative	Utilities Plus		lignite, sub coal	54,990	3.74	31	95,339	6.72	32
Stearns Electric Association	Utilities Plus		sub coal, lignite	26,280	1.79	31	0	0.00	0
Wright-Hennepin Cooperative Electric Ass'n	Utilities Plus		lignite, sub coal	65,989	4.49	31	0	0.00	0
Willmar Municipal Utilities	Coal Creek, ND		sub coal	238,809	17.29	33	231,179	16.30	32
Otter Tail Power		Big Stone Power, Big Stone, SD	coal, oil	873,400	39.46	20	681,254	34.53	23
Otter Tail Power		Coyote Station, Beulah, ND	coal, oil	513,313	52.91	47	533,467	63.38	54
			Summary of Reports	**18,467,858**	**1,491**	**33**	**18,865,932**	**1,475**	**32**
				Total Reported 2006 Electricity Produced (MWh)	Total Reported 2006 Mercury Emissions (lb)	Median Reported 2006 Mercury Emissions per Megawatt-hour (mg/MWh)	Total Reported 2007 Electricity Produced (MWh)	Total Reported 2007 Mercury Emissions (lb)	Median Reported 2007 Mercury Emissions per Megawatt-hour (mg/MWh)

Notes

NA indicates data was either not available or not submitted to MPCA

[a]used Basin Electric lb Hg/MWh emission factor to calculate estimated emissions