

Economy-Wide Impacts of MN/Regional Policy
Analysis by CRA International

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MG = Midwest Governors Association states (region impacted by a Midwest Cap and Trade)
MN = Minnesota
US = Entire United States, including policy-covered Midwest region
Baseline = model that assumes no regional cap and trade but includes conservation and RES goals
Alternative/alt. = model that assumes regional cap and trade policy/achievement of MN's 2007 Laws
2008\$ = dollars are in real 2008 dollars

Background on Data

Data are outputs of a model that assumes full execution of MN's GHG goals and significant changes to MN's energy landscape over the next 40 years. These assumptions are described in detail in CRA's full report and provide the necessary context for interpretation of the data listed below.

CATEGORY	GEOGRAPHIC REGION	MEASUREMENT	MODEL	DESCRIPTION	2010	2015	2020	2025	2030	2035	2040	2045	2050
CO2 Permit Price	MG	2008\$/metric ton of CO2	Alt.			\$ 23	\$ 29	\$ 38	\$ 48	\$ 61	\$ 78	\$ 99	\$ 126
Percent Change in Gross Domestic Product	US	Percent change	Alt	compared to US baseline	0.0%	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Percent Change in Gross State Product	MN	Percent change	Alt	compared to MN baseline	-0.2%	-0.3%	-0.4%	-0.4%	-0.5%	-0.6%	-0.5%	-0.5%	-0.6%
Gross State Product	MN	Billions, 2008\$	Baseline		302	360	429	508	599	703	823	962	1,121
Gross State Product	MN	Billions, 2008\$	Alt.		301	359	428	506	596	699	819	957	1,115
Percent Change in Household Consumption	US	Percent change	Alt.	compared to US baseline	0.0%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%	-0.1%
Percent Change in Household Consumption	MN	Percent change	Alt.	compared to MN baseline	-0.4%	-0.7%	-0.8%	-0.8%	-0.9%	-0.9%	-1.0%	-1.0%	-1.1%
Household Consumption	MN	Billions, 2008\$	Baseline	Reductions	189.24	215.79	249.95	289.63	335.58	388.96	450.90	522.74	605.85
Household Consumption	MN	Billions, 2008\$	Alt.	Reductions	188.40	214.30	248.05	287.23	332.70	385.41	446.58	517.44	599.26
Job Loss (Gain)	Rest of US	Number of jobs	Alt.	compared to US baseline	7,530	4,741	11,977	(8,950)	(39,403)	(37,527)	(42,430)	(42,187)	(33,807)
Job Loss (Gain)	MN	Number of jobs	Alt.	compared to MN baseline	(2,138)	21,342	27,078	30,357	32,686	38,026	39,921	45,730	54,501
Job Loss (Gain)	MG	Number of jobs	Alt.	compared to MN baseline	(3,352)	107,565	130,711	143,959	182,003	200,175	211,113	240,668	285,883
Percent Change in Household Natural Gas Price	MN	Percent	Alt.	compared to MN baseline	0.2%	11.4%	14.9%	17.8%	21.5%	26.4%	32.5%	40.1%	49.5%
Price of Delivered Natural Gas	MN	2008\$/MMBtu	Baseline		\$11.87	\$10.59	\$10.33	\$10.85	\$11.46	\$11.89	\$12.36	\$12.85	\$13.37
Price of Delivered Natural Gas	MN	2008\$/MMBtu	Alt.		\$11.89	\$11.79	\$11.87	\$12.78	\$13.92	\$15.03	\$16.38	\$18.01	\$19.99
Percent Change in Gasoline Price	US	Percent	Alt.	compared to US baseline	0.0%	0.4%	0.5%	0.6%	0.8%	0.9%	1.1%	1.4%	1.6%
Percent Change in Gasoline Price	MN	Percent	Alt.	compared to MN baseline	0.2%	4.5%	6.1%	7.7%	9.6%	11.9%	14.7%	18.1%	22.1%
Percent Change in Household Electricity Price	US	Percent	Alt.	compared to US baseline	0.1%	0.9%	1.5%	1.4%	1.4%	1.7%	1.5%	1.4%	2.0%
Percent Change in Household Electricity Price	MN	Percent	Alt.	compared to MN baseline	0.7%	17.0%	21.2%	28.9%	27.8%	39.8%	43.0%	47.6%	51.5%
Price of Delivered Electricity	MN	2008¢/kWh	Baseline		9.66	9.75	10.23	10.15	10.46	10.05	10.06	10.24	11.98
Price of Delivered Electricity	MN	2008¢/kWh	Alt.		9.72	11.41	12.39	13.08	13.37	14.05	14.39	15.11	18.15
Incremental Costs per Household	US	2008\$	Alt.	compared to US baseline	\$35	\$50	\$58	\$62	\$66	\$70	\$74	\$78	\$88
Incremental Costs per Household	MN	2008\$	Alt.	compared to MN baseline	\$374	\$578	\$640	\$696	\$721	\$767	\$804	\$849	\$912

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CATEGORY	GEOGRAPHIC REGION	MEASUREMENT	MODEL	DESCRIPTION	2010	2015	2020	2025	2030	2035	2040	2045	2050
CO2 Emissions	MG	Million Metric tons	Alt.		604	508	444	402	332	286	239	204	256
CO2 Emissions	MN/IA region within MG	Million Metric tons	Alt.		181	164	158	159	147	130	123	117	113
CO2 Emissions	KS/WI/IL region within MG	Million Metric tons	Alt.		422	374	342	332	290	277	276	272	266
CO2 Offsets	MG	Million Metric tons	Alt.			-30	-56	-90	-105	-120	-159	-185	-123
CO2 Emissions	Rest of US	Million Metric tons	Alt.		5,033	5,390	5,726	6,140	6,528	6,805	7,247	7,710	8,145
CO2 Emissions	US	Million Metric tons	Alt.	Includes impact of policy in MG states	5,637	5,899	6,170	6,541	6,860	7,091	7,487	7,913	8,400
CO2 Emissions	MG	Million Metric tons	Baseline		606	642	649	684	717	738	779	820	867
CO2 Emissions	MN/IA	Million Metric tons	Baseline		181	186	184	191	199	197	208	215	228
CO2 Emissions	KS/WI/IL	Million Metric tons	Baseline		425	455	465	493	518	541	571	605	640
CO2 Emissions	Rest of US	Million Metric tons	Baseline		5,054	5,349	5,650	5,992	6,364	6,632	7,028	7,468	7,982
CO2 Emissions	US	Million Metric tons	Baseline	Includes impact of policy in MG states	5,660	5,991	6,299	6,676	7,081	7,370	7,807	8,288	8,849
Electricity Demand	US	TWh	Baseline		4,199	4,562	4,774	5,081	5,462	5,698	6,057	6,404	6,783
Electricity Demand	US	TWh	Alt.		4,198	4,545	4,735	5,036	5,404	5,618	5,981	6,327	6,679
Electricity Demand	MN	TWh	Baseline		64.66	69.90	72.95	76.14	80.35	82.20	85.46	88.74	92.64
Electricity Demand	MN	TWh	Alt.		64.56	66.41	67.22	66.72	68.27	65.90	67.27	68.38	71.10
Electric Sector Coal Use	US	TBtu	Alt.	Includes impact of policy in MG states	22,732	24,847	27,501	30,361	32,584	33,188	35,216	37,379	39,637
Electric Sector Coal Use	US	TBtu	Baseline		22,743	25,364	28,293	31,142	34,083	35,213	37,449	39,931	42,720
Percent Change in Electric Sector Coal Use	US	Percent	Alt.	compared to US baseline	0.0%	-2.0%	-2.8%	-2.5%	-4.4%	-5.8%	-6.0%	-6.4%	-7.2%
Electric Sector Coal Use	MG	TBtu	Alt.		2,912	2,238	1,763	1,594	1,023	624	541	462	359
Electric Sector Coal Use	MG	TBtu	Baseline		2,921	3,182	2,986	2,927	2,920	2,841	2,670	2,637	2,738
Percent Change in Electric Sector Coal Use	MG	Percent	Alt.	compared to MG baseline	-0.3%	-29.7%	-40.9%	-45.5%	-65.0%	-78.0%	-79.7%	-82.5%	-86.9%
Coal Retirements	US	MW	Alt.	Includes impact of policy in MG states	0	2,590	1,426	1,544	1,723	2,425	1,651	0	0
Coal Retirements	US	MW	Baseline		0	275	0	0	0	0	0	0	0
Coal Retirements (US) - Incremental	US	MW	Alt. - Baseline	Increase	0	2,315	1,426	1,544	1,723	2,425	1,651	0	0
Coal Retirements	MG	MW	Alt.		0	2,361	1,426	1,544	1,659	2,425	1,651	0	0
Coal Retirements	MG	MW	Baseline		0	46	0	0	0	0	0	0	0
Coal Retirements (Covered) - Incremental	MG	MW	Alt. - Baseline	Increase	0	2,315	1,426	1,544	1,659	2,425	1,651	0	0
Coal Retirements	US less MG	MW	Alt.		0	229	0	0	64	0	0	0	0

Sector/Industry Impacts Analysis by CRA International

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SECTOR/INDUSTRY	GEOGRAPHIC REGION	MEASUREMENT	MODEL	DESCRIPTION	2010	2015	2020	2025	2030	2035	2040	2045	2050
Sectoral Output - Non-Energy													
Agriculture	US	Percent change in output value	Alt.	compared to US baseline	0.01%	-0.13%	-0.20%	-0.22%	-0.25%	-0.29%	-0.32%	-0.36%	-0.44%
Energy-Intensive Industry	US	Percent change in output value	Alt.	compared to US baseline	0.02%	-0.05%	-0.07%	-0.07%	-0.07%	-0.08%	-0.08%	-0.10%	-0.14%
Commercial Transportation	US	Percent change in output value	Alt.	compared to US baseline	0.00%	-0.09%	-0.12%	-0.14%	-0.17%	-0.19%	-0.22%	-0.26%	-0.31%
Commercial/Services	US	Percent change in output value	Alt.	compared to US baseline	-0.02%	-0.03%	-0.03%	-0.03%	-0.04%	-0.04%	-0.04%	-0.04%	-0.05%
Manufactured and Processed Goods	US	Percent change in output value	Alt.	compared to US baseline	0.07%	0.04%	-0.01%	-0.01%	-0.05%	-0.06%	-0.07%	-0.09%	-0.14%
Agriculture	MN	Percent change in output value	Alt.	compared to MN baseline	0.40%	-1.26%	-1.96%	-2.38%	-2.62%	-3.06%	-3.42%	-3.90%	-4.49%
Energy-Intensive Industry	MN	Percent change in output value	Alt.	compared to MN baseline	0.16%	-1.05%	-1.34%	-1.54%	-1.77%	-2.04%	-2.02%	-2.24%	-2.61%
Commercial Transportation	MN	Percent change in output value	Alt.	compared to MN baseline	0.10%	-1.56%	-2.04%	-2.42%	-2.90%	-3.39%	-3.88%	-4.53%	-5.29%
Commercial/Services	MN	Percent change in output value	Alt.	compared to MN baseline	-0.04%	-0.04%	-0.17%	-0.20%	-0.28%	-0.30%	-0.29%	-0.32%	-0.34%
Manufactured and Processed Goods	MN	Percent change in output value	Alt.	compared to MN baseline	0.58%	0.21%	-0.08%	-0.24%	-0.38%	-0.52%	-0.46%	-0.54%	-0.72%
Sectoral Output - Energy													
Coal Production Sector	US	Percent change in output value	Alt.	compared to US baseline	0.00%	-1.47%	-2.11%	-2.95%	-3.82%	-4.46%	-4.96%	-5.46%	-5.92%
Crude Oil Production Sector	US	Percent change in output value	Alt.	compared to US baseline	-0.01%	0.01%	0.01%	0.00%	0.00%	0.01%	0.01%	0.00%	0.01%
Electric Generation Sector	US	Percent change in output value	Alt.	compared to US baseline	-0.05%	-0.54%	-0.95%	-0.86%	-1.08%	-1.35%	-1.21%	-1.14%	-1.55%
Natural Gas Production Sector	US	Percent change in output value	Alt.	compared to US baseline	-0.02%	0.06%	0.10%	-0.11%	-0.19%	-0.23%	-0.20%	-0.17%	0.01%
Refined Petroleum Products Sector	US	Percent change in output value	Alt.	compared to US baseline	-0.02%	-0.19%	-0.27%	-0.32%	-0.39%	-0.49%	-0.59%	-1.08%	-1.68%
Coal Production Sector	MN	Percent change in output value	Alt.	compared to MN baseline									
Crude Oil Production Sector	MN	Percent change in output value	Alt.	compared to MN baseline									
Electric Generation Sector	MN	Percent change in output value	Alt.	compared to MN baseline	-0.19%	-16.99%	-17.66%	-21.94%	-25.59%	-32.15%	-33.95%	-35.13%	-34.77%
Natural Gas Production Sector	MN	Percent change in output value	Alt.	compared to MN baseline									
Refined Petroleum Products Sector	MN	Percent change in output value	Alt.	compared to MN baseline	-0.07%	-2.49%	-3.43%	-4.29%	-5.27%	-6.53%	-7.93%	-13.49%	-20.20%

Impact on Energy Sources Analysis by CRA International

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SOURCE	GEOGRAPHIC REGION	MEASUREMENT	MODEL	SECTOR	2010	2015	2020	2025	2030	2035	2040	2045	2050
Natural Gas Consumption	US	TBtu	Baseline	Electric Sector	5,345	5,112	3,304	2,916	1,931	1,859	2,052	2,293	2,878
Natural Gas Consumption	US	TBtu	Baseline	Non-Electric Sector	16,284	16,670	16,826	17,105	17,167	17,405	17,740	18,049	18,400
Natural Gas Consumption	US	TBtu	Alt.	Electric Sector	5,341	5,206	3,469	3,033	2,027	1,954	2,171	2,451	3,210
Natural Gas Consumption	US	TBtu	Alt.	Non-Electric Sector	16,282	16,603	16,724	17,008	17,038	17,262	17,566	17,834	18,075
Natural Gas Consumption	MN	TBtu	Baseline	Electric Sector	12	14	10	6	4	3	3	4	8
Natural Gas Consumption	MN	TBtu	Baseline	Non-Electric Sector	234	240	245	250	253	257	262	266	272
Natural Gas Consumption	MN	TBtu	Alt.	Electric Sector	12	17	21	26	5	8	8	13	42
Natural Gas Consumption	MN	TBtu	Alt.	Non-Electric Sector	233	232	232	231	223	220	219	217	215
Coal Consumption	US	TBtu	Baseline	Electric Sector	22,743	25,364	28,293	31,142	34,083	35,213	37,449	39,931	42,720
Coal Consumption	US	TBtu	Alt.	Electric Sector	22,732	24,847	27,501	30,361	32,584	33,188	35,216	37,379	39,637
Coal Consumption	MN	TBtu	Baseline	Electric Sector	416	429	400	419	432	398	419	423	447
Coal Consumption	MN	TBtu	Alt.	Electric Sector	414	332	294	285	226	126	74	48	29
Oil Consumption	US	TBtu	Baseline	All sector consumption	37,738	38,901	40,476	41,900	43,686	45,553	47,575	49,712	52,002
Oil Consumption	US	TBtu	Alt.	All sector consumption	37,731	38,834	40,378	41,776	43,526	45,344	47,309	49,198	51,163
Oil Consumption	MN	TBtu	Baseline	All sector consumption	642	661	687	711	740	771	804	840	877
Oil Consumption	MN	TBtu	Alt.	All sector consumption	641	645	665	682	703	723	744	731	705