Estimating the Net Economic Impact of Minnesota's Carbon Reduction Policies

SUMMARY REPORT: ECONOMIC ANALYSIS OF MINNESOTA AND MIDWEST CLIMATE POLICIES

Analysis conducted by CRA International on behalf of Partners for Affordable Energy and a coalition of Minnesota trade associations and organizations

Background:

In August 2008, Partners for Affordable Energy, along with several Minnesota trade associations and utilities, commissioned CRA International to conduct an economic analysis of energy policies impacting Minnesota. The analysis included elements of Minnesota's Next Generation Energy Act of 2007, including greenhouse gas reduction goals, and a regional cap-and-trade system in the states currently engaged in the Midwestern Governors Association planning. The regional policy model accounts for carbon reductions in all sectors but does not count non-CO2 emissions.*

Other assumptions based on execution of Minnesota law include: restrictions on imports of emitting sources from other states, elimination of coal and natural gas imports (due to costs), no new nuclear plants and efficient regulatory processes to allow transmission of renewable power.

Minnesota's Future Energy Landscape

An economic analysis of a policy must allow for successful achievement of that policy regardless of the costs. The results in this report reflect Minnesota successfully reducing carbon emissions within the 80 percent greenhouse gas emission reduction goals by 2050.

**There is no reliable data available on non-CO2 emissions on a regional level.*

To achieve the goals of the policy, the study assumes Minnesota will take significant steps to change its energy profile. Based on this analysis, the resulting state is a very different Minnesota than the one that exists today. It assumes Minnesota will:

- Double usage of electric generation from nuclear power (generated outside of Minnesota).
- Streamline regulatory processes for new transmission and develop more transmission corridors to import large quantities of renewable energy sources.
- Identify and develop additional renewable sources beyond wind, including sources not in wide use today.
- Retire most of Minnesota's existing coal plants, which currently supply more than 60 percent of Minnesota's power.
- Institute large-scale investments to rapidly advance development of carbon capture and sequestration technology to continue production of baseload sources.
- Adopt behavioral changes within every Minnesota household that significantly alter daily lives in order to reduce energy consumption.

An Economically Disadvantaged State: **Minnesota's existing energy policies, coupled with a regional cap-and-trade system, would result in significant negative economic consequences for Minnesota's economy, industries and workers.**

Rising Energy Costs for Minnesota Industries and Households

Baseline = policy model that assumes no regional cap-and-trade but includes current conservation and renewable energy standard goals   RCP = regional climate policy model that assumes a regional cap-and-trade

	2010	2015	2020	2025	2030	2035	2040	2045	2050
Industrial Electricity Rates (2008¢ per kWh)									
Baseline (no regional carbon policy)	4.99¢	5.17¢	5.64¢	5.56¢	5.87¢	5.46¢	5.46¢	5.63¢	7.37¢
Regional climate policy	5.05¢	6.85¢	7.83¢	8.53¢	8.81¢	9.50¢	9.83¢	10.56¢	13.60¢
% Increase over baseline	1%	33%	39%	53%	50%	74%	80%	87%	84%
Industrial Natural Gas Rates (2008$/MMBtu)									
Baseline (no regional carbon policy)	$9.12	$7.78	$7.97	$8.50	$9.48	$10.08	$10.73	$11.44	$12.19
Regional climate policy	$9.13	$9.03	$9.56	$10.43	$11.89	$13.14	$14.68	$16.53	$18.84
% Increase over baseline	0%	16%	20%	23%	25%	30%	37%	44%	55%
Household Electricity Rates									
Price of electricity (per kWh) - Baseline	9.66¢	9.75¢	10.23¢	10.15¢	10.46¢	10.05¢	10.06¢	10.24¢	11.98¢
Price of electricity (per kWh) - RCP model	9.72¢	11.41¢	12.39¢	13.08¢	13.37¢	14.05¢	14.39¢	15.11¢	18.15¢
% increase in MN household price vs. baseline model	1%	17%	21%	29%	28%	40%	43%	48%	52%
Household Natural Gas Rates									
Price of natural gas (per MMBtu) - Baseline	$11.87	$10.59	$10.33	$10.85	$11.46	$11.89	$12.36	$12.85	$13.37
Natural gas price (per MMBtu) - RCP model	$11.89	$11.79	$11.87	$12.78	$13.92	$15.03	$16.38	$18.01	$19.99
% increase in MN household price vs. baseline model	0%	11%	15%	18%	22%	26%	33%	40%	50%

Statewide Economic Declines

With increased energy costs comes a tightening of family budgets and less disposable income, which will result in declining household spending. By 2015, the average Minnesota household will pay **$575 more each year** for energy (electricity, home heating and auto fuel) and consumer goods and services that are affected by energy price increases. Through a combination of household and industrial impacts, Minnesota will experience ripple effects across the economy.

	Description	2010	2015	2020	2025	2030	2035	2040	2045	2050
MN gross regional product (RCP model)	Percent Change	-0.2%	-0.3%	-0.4%	-0.4%	-0.5%	-0.6%	-0.5%	-0.5%	-0.6%
Declines in household consumption* vs. baseline model	MN Household (billions, 2008$)	$-0.84	$-1.49	$-1.91	$-2.40	$-2.88	$-3.55	$-4.32	$-5.29	$-6.59
Net job loss (RCP model)	Including investments in new energy sources	2,138	-21,342	-27,078	-30,357	-32,686	-38,026	-39,921	-45,730	-54,501

**Consumption is the total household spending on consumer goods and services.*

FINDING: *By 2020, increasing energy prices due to a regional cap-and-trade policy will cause Minnesota households to collectively decrease discretionary spending by a total of $2 billion per year.*

Hamstringing Minnesota's Industries

Under a regional cap-and-trade policy, Minnesota industries will be severely handicapped compared to other states in the nation due to higher energy costs. As these impacts spread throughout the state economy, the degree of impact on some of Minnesota's "bread and butter" industries, including paper manufacturing, mining and agriculture, is most concerning.

FINDING: *Minnesota industries will see electricity prices rise 33 percent by 2015, and 53 percent by 2025, making closures and consolidation a necessity.*

Loss of Minnesota Jobs

As businesses experience significant cost increases, some will likely move business operations out of state in search of less expensive energy supply, while others will reduce output in response to higher energy costs.

While the analysis reveals gains in "green jobs" associated with increased investment in renewables generation and energy efficiency-related industry, the job losses in other sectors of the economy far exceed these gains.

FINDING: *Even with "green jobs," Minnesota will see a net loss of an estimated 21,000 jobs by 2015 and more than 30,000 by 2025.*

Increased Cost Burden on Minnesota Households

While the consequences of energy policies are experienced most severely by Minnesota industries, there is no question that homeowners and rate payers will feel the effects of a regional carbon policy. Although the average electricity price nationally will remain relatively flat, Minnesota households will see dramatic cost increases in energy prices with these policies.

FINDING: *Minnesota households will see electricity prices increase by 17 percent by 2015, and prices will continue to increase faster until they are nearly 40 percent higher in 2035 compared to having no regional policy.*

Demand Remains Steady While Availability of Affordable Baseload Sources Declines

Even with a significant slowdown in the statewide economy, a loss of business activity and an acceleration of conservation, electricity demand in Minnesota will remain steady over the next 40 years (0.2 percent increase per year). At the same time, Minnesota will experience dramatic declines in the availability of its lowest cost source of baseload power (coal) due to the costs imposed by a regional cap-and-trade policy. Baseload power sources are those that assure electricity is available for homes and businesses 24 hours/day.

The goal of Minnesota's energy policies is to reduce the amount of power generated from emitting sources. However, Minnesota currently generates more than 60 percent of its power from coal. Limiting the supply of coal power will increase the cost of producing power, which will leave a **significant gap between Minnesota's demand for a steady supply of power and the availability of electricity from affordable, reliable sources.**

	Description	2010	2015	2020	2025	2030	2035	2040	2045	2050
Electricity demand (TWh – RCP model)	MN	64.56	66.41	67.22	66.72	68.27	65.90	67.27	68.38	71.10
Change in coal use vs. baseline model	MGA Region	-0.3%	-29.7%	-40.9%	-45.5%	-65.0%	-78.0%	-79.7%	-82.5%	-86.9%

ABOUT PARTNERS FOR AFFORDABLE ENERGY: Partners for Affordable Energy is a coalition of Minnesota businesses, organizations, associations and individuals interested in policies that create affordable and reliable energy. Some of these include the Minnesota Chamber of Commerce, Minnesota Forest Industries, Iron Mining Association of Minnesota, Printing Industry of Minnesota, Minnesota Agri-Growth Council, the Minnesota Association of Co-ops, Southern Minnesota Beet Sugar Cooperative, Minnesota Grocers Association, Minnesota Beverage Association, the Midwest Food Processors Association, Central Minnesota Municipal Power Agency, Northern Municipal Power Agency, Minnesota Rural Electric Association, Minnesota Utility Investors, Dairyland Power Cooperative, the North Dakota lignite mining industry, and individual utility companies.

Squeezing the Foundation of Minnesota's Economy

With the rise in energy costs, maintaining a competitive standing will be a challenge for some of the state's major employers:

Paper Manufacturing

The cost of production is a critical factor in the competitiveness of this industry. The increase in natural gas and electricity prices will drive up production costs. However, as commodity producers in a highly competitive industry, paper manufacturers do not have the option of passing costs on to customers.

"The choice in the paper industry will become whether to absorb the costs or shut down Minnesota operations."
— ANNE SMITH, CRA INTERNATIONAL

Mining

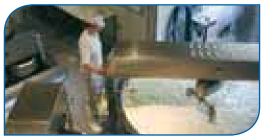
Energy costs are the primary cost driver for Minnesota's mining industry. Electricity and motor fuels combine to represent nearly a quarter of direct costs for taconite production and other fuels (coal, natural gas, biomass) are critical sources for mining processes. Minnesota operators' competitive advantage is diminished by those operating without carbon restrictions and lower production costs.

"Minnesota mining companies may be overcome by foreign competition."
— ANNE SMITH, CRA INTERNATIONAL

Crop Production

The rise in energy costs will increase planting/harvesting costs as well as fertilizer/chemical costs. Increased energy costs cut directly into the margins of the growers in a commodity market where a price is set based on national or global supply/demand.

"As prices rise, consolidation may become necessary to take advantage of economies of scale in crop production."
— ANNE SMITH, CRA INTERNATIONAL



Food Processing

Food processing companies experience a triple impact of production cost increases (electricity/gas), transportation cost increases (fuels) and raw materials cost increases (crops), all within a commodity market.

"Minnesota operators' advantage is being close to ag-production areas — the combination of increased costs of local feed and increased costs for production could price Minnesota producers completely out of the market."
— ANNE SMITH, CRA INTERNATIONAL

Regional Policy Fails to Slow National Emissions

Under a regional cap-and-trade policy, Minnesota's emission reductions will be far overshadowed by the continued steady rise in national emissions. Minnesota carbon emissions will be 38 percent lower in 2050 than they are projected to be in 2010 while U.S. carbon emissions in the remainder of the country **will increase at least 49 percent during this time**, even with a Midwest cap-and-trade policy.

	Description	2010	2015	2020	2025	2030	2035	2040	2045	2050
Emissions (MMTons) - RCP model	MN/IA*	181	164	158	159	147	130	123	117	113
Emissions (MMTons) - RCP model	U.S. (Including MGA Region)	5637	5899	6170	6541	6860	7091	7487	7913	8400

** For economic analysis purposes, regional groupings are created to match electricity market characteristics among states. In this model, MN and IA are a "region" within the covered Midwest states.*

Under a regional policy, Minnesotans are projected to incur costs of $42 billion* over the next 40 years to reduce Minnesota emissions while having no impact on efforts to reduce national emissions. ** Costs are incremental in todays dollar's. The best measure of cost is the loss of welfare: the overall change in consumer surplus and producer surplus.*

Moving Minnesota's Energy Policy Forward

Most Minnesotans agree that we need to address climate change. Unfortunately, the findings of this report call into question the benefits of a single region moving forward on climate change policy independently from the rest of the nation.

Doing nothing is not an option; but finding innovative approaches is essential for Minnesota to meet both environmental and economic goals. This approach includes five key elements:

1. **Address climate change at an international or national level.** An aggressive "go it alone" cap-and-trade policy will isolate Minnesota from the rest of the nation. A national or international approach is necessary to effectively reduce emissions, which have no geographic borders.
2. **Support a reliable and affordable mix of renewable energy sources.** Minnesota can achieve the 25 percent by 2025 Renewable Energy Standard if we make the proper investment in diverse sources and provide the necessary infrastructure, such as an open and accessible transmission grid.
3. **Increase conservation.** Citizens and industries need to continue to make better choices about how much energy they consume in their daily lives. Reducing usage today drops demand for Minnesota plants tomorrow.
4. **Enhance existing infrastructure by investing in R&D needed for environmentally sound production of baseload electricity.** Billions of dollars have already been spent on existing power plants – without efforts to improve those facilities, Minnesota is throwing away its investment. Research and development will only advance with a public-private partnership to invest enough capital to find the best method of carbon capture and sequestration.
5. **Keep Minnesota's borders open.** Currently, more than 120,000 Minnesota customers, many in rural areas, are served with electricity generated from coal plants outside of Minnesota. In addition, millions benefit from hydro-electric power from Manitoba. Without these sources, Minnesota will have to make costly investments to make up the difference in baseload power sources.

For a copy of the full CRA International report and other study materials, please visit **www.poweringourlives.com.**