

CLEAN ENERGY DEVELOPMENT IS ALREADY GOOD BUSINESS FOR MINNESOTA

Repowering the Midwest presents a 20-year plan for moving Minnesota to a cleaner energy future. Many Minnesota businesses and thousands of workers are already part of the growing clean energy business sector, including:

MINNESOTA BUSINESSES		
Company	Location	Business Product
Anderson Windows	Bayport	Window & Door Manufacturer
Cardinal Glass Industries	Minneapolis	Window Glass Manufacturer
Honeywell	Minneapolis	Building Controls
Marvin Windows & Doors	Warroad, Eagan	Window and Door Manufacturer
Navitas Energy	Minneapolis, Hendricks	Wind Power Developer

In addition, thousands of Minnesota businesses have already invested in modern energy efficiency technologies ranging from new industrial motors and HVAC systems to efficient commercial lighting. Countless homeowners and renters have installed energy efficient refrigerators, air conditioners and compact fluorescent lighting.

CARDINAL IG MINNEAPOLIS, MINNESOTA

Energy Efficient Windows

Ten years ago Cardinal Corporation had 1,000 employees across the country. Today, thanks in large part to energy efficient building codes in several states, Cardinal now employs 4,000 people across the US, with more than half of these in the Midwest. Two of the main manufacturing facilities and the corporate headquarters are located in Minnesota. Manufacturing energy efficient glass accounts for more than 80% of their production.

Cardinal produces approximately 20 million insulated glass units per year. The design of the insulated glass reduces the solar gain through the windows, thereby lessening the amount of energy needed in the summer to cool and in the winter to heat. It is estimated that approximately 170 MW of peak power alone could be saved from the Texas/Arkansas border to south of Chicago just by replacing old windows with more efficient ones.

“The growth we have experienced and who we are today is a direct result of the energy efficient products we produce. The amount of electricity that has been saved from energy efficient products in the last 10 years is substantial. A company doesn’t double every 5 years in size unless there is some real discernible benefits.”

- Jim Larsen, Director of Technology Marketing

REPOWERING THE MIDWEST – THE CLEAN ENERGY DEVELOPMENT PLAN FOR THE HEARTLAND

CAPTURING 21ST CENTURY OPPORTUNITIES FOR CLEAN ENERGY

Repowering the Midwest, issued by the Environmental Law and Policy Center in 2001, presents a strategic clean energy development plan that implements smart policies and practices to capture readily achievable environmental, public health and economic development benefits. This sustainable development strategy is good for both the economy and our environment. The Clean Energy Development Plan proposes policies to implement underutilized energy efficiency technologies and to aggressively develop renewable energy resources. By diversifying the regional power supply which relies too heavily on old, highly polluting coal plants and nuclear plants, Midwest and Great Plains states can reduce pollution, improve electricity reliability, create new manufacturing and installation jobs, and provide “clean energy cash crops” for farmers. **In Minnesota alone, implementing the Clean Energy Development Plan will produce 14,600 net new jobs and \$1.1 billion in increased economic output by 2020.**

THE CLEAN ENERGY DEVELOPMENT PLAN

Minnesota should seize the opportunity to develop its clean energy resources: modern energy efficiency technologies and wind, biomass and solar power. The Clean Energy Development Plan achieves large environmental, public health and economic development benefits. Moreover, investing in energy efficiency and renewable energy will diversify the region’s electricity portfolio, thereby improving reliability.

FIGURE 1: ECONOMIC IMPACTS OF THE CLEAN ENERGY PLAN FOR MINNESOTA

Clean Energy	Employment Impacts (# of net new jobs created)		Economic Output Impacts (2001\$)	
	2010	2020	2010	2020
Energy Efficiency	4,006	8,196	\$187 Million	\$399 Million
Renewable Energy	3,899	6,415	\$410 Million	\$674 Million
Total-Net	7,905	14,611	\$597 Million	\$1.1 Billion

The Clean Energy Development Plan:

1. Aggressively implements the newest, as well as “tried and true,” energy efficiency technologies.
2. Develops and implements renewable energy technologies—wind, biomass and solar power— so that they provide 8 percent of the region’s electricity generation by 2010, and 22 percent by 2020.
3. Develops and implements efficient natural gas uses in appropriate locations, especially Combined Heat and Power (CHP), district energy systems and fuel cells, so that they provide an additional 10 percent of the region’s electricity generation by 2010, and an additional 25 percent by 2020.
4. Retires selected older, less efficient and highly polluting coal plants.
5. Applies sustainable development strategies to aggressively link environmental improvement and economic development policies.

“JOB JOLT”: THE ECONOMIC IMPACTS OF REPOWERING THE MIDWEST

The Regional Economics Applications Laboratory (REAL) of the University of Illinois, a research group involved in urban and regional economic forecasting, evaluated the economic impacts of implementing the Clean Energy Development Plan. Using sophisticated econometric modeling and the data and assumptions contained in *Repowering the Midwest*, REAL quantified the net new jobs and increased economic output that would be created in each state within the region. For Minnesota, the study projects:

- ➔ New Jobs: 7,900 net new jobs by 2010 and 14,600 by 2020, in almost every sector of the state’s economy.
- ➔ Economic Growth: \$600 million of increased economic output by 2010 and \$1.1 billion by 2020.
- ➔ Energy Cost Savings: \$300 million in annual net electricity cost savings by 2020 from investments in energy efficiency. These savings will be re-spent by businesses and residential consumers to bolster Minnesota’s economy.

Environmental Law and Policy Center

The Environmental Law and Policy Center is the Midwest’s leading environmental legal advocacy and eco-business innovation organization. We believe that environmental progress and economic development can be achieved together, and we put that principle into practice through clean energy development and other initiatives to protect natural resources and improve environmental quality. For more information, please contact the Environmental Law and Policy Center at 312-673-6500 or www.repowermidwest.org.

Regional Economics Applications Laboratory

The Regional Economics Applications Laboratory (REAL) was formed in 1989 to provide analytical capability to a range of policy and decision makers in the Midwest through the construction and application of economic models of urban, metropolitan and state economies. Applications have ranged from impacts of cultural events to the role and impact of international trade on interstate trade among the Midwestern state economies.



- Generation from renewable energy resources and efficient natural gas increases. By 2010, these sources will be 29% of Minnesota's electricity generation and by 2020, they will be 65% as shown in Figure 3.
- Generation from older, less efficient and highly polluting coal and nuclear plants decreases from 86% of Minnesota's power mix today to 23% by 2020.

ECONOMIC BENEFITS OF INVESTING IN MODERN ENERGY EFFICIENCY TECHNOLOGIES

Minnesota has long been a leader in manufacturing energy efficiency products. As these industries grow, new jobs will be created not only in manufacturing, but also installing and maintaining these efficiency products ranging from industrial motors to advanced commercial lighting. In addition, businesses investing in energy efficiency measures will re-channel some of their energy cost savings into capital investment and increased payroll. Household energy cost savings from using efficient lighting, air conditioners, and appliances will also be re-spent on the Main Streets of Minnesota's cities and towns.

Implementing modern cost-effective energy efficiency technologies – commercial and residential lighting, heating, ventilation and cooling (HVAC), industrial motors, and refrigerators and other appliances – will reduce Minnesota's electricity demand over the next two decades as shown in Figure 2. That will save 21,152 gigawatt-hours of electricity by 2020 – equal to about seven power plants—and reduce electricity demand by 16% in 2010 and 28% in 2020 compared to “business as usual.”

Figure 4 identifies the economic impacts of implementing *Repowering the Midwest's Energy Efficiency Plan* in Minnesota.

Investments in cost-effective energy efficiency will produce \$300 million in net electricity cost savings for both business and residential consumers. As the benefits from energy efficiency are spread across the Minnesota economy, the decline of jobs in the utility sector due to flattened demand for electricity is greatly offset by the large numbers of new jobs created in many other business sectors.

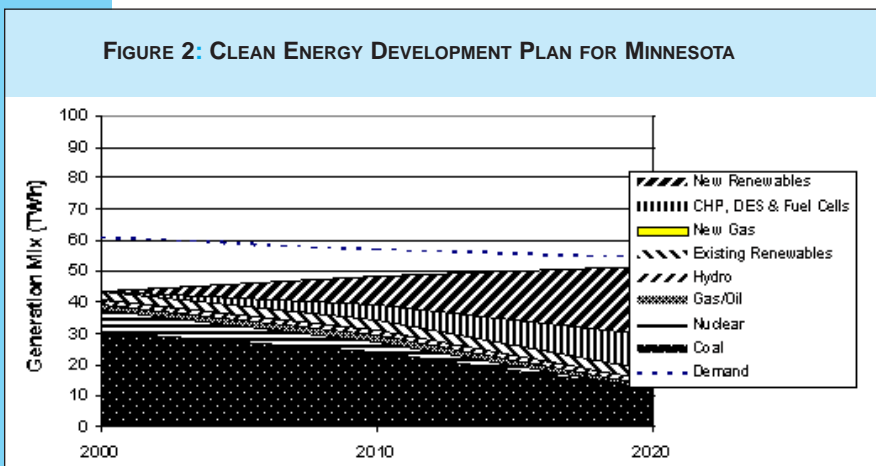


ECONOMIC BENEFITS OF DEVELOPING CLEAN RENEWABLE ENERGY AND EFFICIENT GENERATION

Under the Clean Energy Development Plan, renewable energy – especially wind power and biomass energy – and clean efficient uses of natural gas focused on combined heat and power applications (CHP) will be 29% of Minnesota's generation mix by 2010 and 65% by 2020.

This clean energy development will generate thousands of new jobs and significant economic growth benefits in both urban and rural areas. The winners will be businesses engaged in: manufacturing, installing and servicing renewable and clean energy equipment; farmers who lease their land for wind turbines or grow and harvest energy crops; businesses engaged in related services; and communities with renewable and clean energy projects that gain from this increased economic activity.

Figure 5 identifies the projected economic impacts of implementing *Repowering the Midwest's Clean Energy Generation Plan* in Minnesota.



THE CLEAN ENERGY DEVELOPMENT PLAN IN MINNESOTA

As Figure 2 shows, implementing the Clean Energy Development Plan in Minnesota means:

- Energy efficiency measures flatten out electricity demand, and therefore, the need for new generation. By 2010, electricity demand will be 16% lower than a “business as usual” baseline, and by 2020, demand will be 28% lower—avoiding the construction of seven new power plants to meet this demand.

FIGURE 3: MINNESOTA'S CLEAN ENERGY DEVELOPMENT PLAN — MEGAWATTS OF NEW CLEAN GENERATION

Generation Type	2010	2020
Wind Power	1,586 megawatts	4,474 megawatts
Biomass Energy	502 megawatts	1,186 megawatts
Efficient Natural Gas, CHP	603 megawatts	1,471 megawatts
Photovoltaics	8 megawatts	29 megawatts
Total	2,699 megawatts	7,160 megawatts

Source: Regional Economics Applications Laboratory.

FIGURE 4: MINNESOTA ECONOMIC IMPACTS OF INVESTING IN ENERGY EFFICIENCY

Employment Sector	Employment Impacts (# of net new jobs created)		Economic Output Impacts (Additional economic activity in 2001\$)	
	2010	2020	2010	2020
Agriculture/Mining	876	2,449	\$35 Million	\$96 Million
Construction/Manufacturing	1,601	3,038	\$297 Million	\$561 Million
Utilities/Transport/Communications	-888	-1,525	-\$395 Million	-\$686 Million
Wholesale/Retail Trade	1,028	1,785	\$65 Million	\$116 Million
Services/Government	1,390	2,451	\$184 Million	\$312 Million
Total-Net	4,007	8,198	\$186 Million	\$399 Million

Source: Regional Economics Applications Laboratory.



FIGURE 5: MINNESOTA ECONOMIC IMPACTS OF INVESTING IN CLEAN ENERGY GENERATION

Employment Sector	Employment Impacts (# of net new jobs created)		Economic Output Impacts (additional economic activity in 2001\$)	
	2010	2020	2010	2020
Agriculture/Mining	580	965	\$19 Million	\$31 Million
Construction/Manufacturing	1,345	2,164	\$220 Million	\$344 Million
Utilities/Transp/Communications	143	278	\$37 Million	\$79 Million
Wholesale/Retail Trade	585	949	\$39 Million	\$62 Million
Service/Government	1,246	2,059	\$96 Million	\$156 Million
Total-Net	3,899	6,415	\$410 Million	\$674 Million

Source: Regional Economics Applications Laboratory.