



CLEAN ENERGY RESOURCE TEAMS

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# Madelia Model: Powering a Community and an Economy through Biomass Energy

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**CERTS PARTNERS**

- University of Minnesota Regional Sustainable Development Partnerships
- The Minnesota Project
- Southwest Regional Development Commission
- Green Institute
- Minnesota Department of Commerce

Linda Meschke’s interest and work with water quality issues in Southern Minnesota has lead to an entirely new bio-based development plan for the city of Madelia, Minnesota, and ideas and plans from this project are spreading to other communities.

Planting more perennial grasses for agricultural crops is one effective way to reduce soil and nutrient runoff into area waterways. Meschke saw that along with the water quality benefits of perennial plants, they also are a great biomass source for renewable energy that can make a community less dependent on fossil fuel energy sources and more self-sustaining. This idea would also position a community to be a unique leader in bio-industrial development, creating a unique angle to draw industry to the area. With all the benefits of planting more perennials, Meschke, President of the non-profit organization Rural Advantage, looked for a community who would be interested in exploring this new energy potential.

The process of developing what would become the Madelia Model began in 2004 with Meschke and others from Rural Advantage meeting with community government and municipal utility leaders around Southern Minnesota. After meeting with many communities, “Madelia rose to the top,” said Meschke. Madelia’s interest and city leaders’ understanding of what the idea was about really stood out among the communities. Key people in the city, within the economic development and Madelia public utility, quickly grasped the idea and were enthusiastically on board with the project.

The project received a \$10,000 grant from the Minnesota Pollution Control Agency Prevention and Assistance Division and a \$2,500 matching grant from Madelia Light and Power. Rural Advantage received funding from the McKnight Foundation, the Bush Foundation, and the Legislative Commission on Minnesota Resources (LCMR) for staff support. The

University of Minnesota Extension Service also assisted with the project.

The Eco-Industrial Assessment is intended to guide Madelia community leaders and planners as they plan how the city can further develop with renewable energy leading the way in attracting new businesses. By specializing in biomass and other renewable energy technologies, Madelia could have a unique competitive advantage in attracting new businesses and residents trained in the field.

The Madelia Bio-Based Eco-Industrial Assessment surveyed the biomass potential in a 25 mile radius of the city of Madelia in Southern Minnesota of approximately 2400 people. The Eco Assessment included a renewable energy and materials flow analysis. [Click here to read the full report.](#)

Agriculture-related biomass supply was determined using local and USDA Agricultural Census data. A survey was developed and sent to 164 area industries and businesses to help identify potential major biomass generators. Results of the inventory estimate over 20 million tons of biomass available annually in the region with a potential of producing over 38 trillion BTUs of energy.

The next step of the assessment was to identify the energy demand of the region. Energy demand was divided into four sectors for tabulation: residential, industrial, commercial, and agricultural. Information was collected from survey responses and a variety of public data resources. Results show an estimated total energy demand from the region of over 47 trillion BTUs with thermal demand at 17.588 trillion BTUs; electrical demand at 14.95 trillion BTUs; and transportation fuels at 14.651 trillion BTUs.

The final Assessment was released in February 2007. Key findings from this assessment are: (1) on a net basis, there is more energy demand than could be

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supplied from biomass sources under the current cropping system; and (2) it is unrealistic to expect that 100% of the energy demand for the region to be supplied from within the 25 mile radius area due to site-specific energy demands and distribution limitations with existing infrastructure.

The study also examined the potential to lure new bio-industry businesses to the area if the town chose to follow the recommendations of the study.

Key objectives in pursuing this kind of facility include:

- energy security from locally-grown energy production
- increased economic and environmental sustainability of family farms
- improved ecological health, including water quality
- a more vibrant community and sense of place

Following the report release, Madelia and Rural Advantage officials held a forum to unveil the study to community members and hear feedback. After this meeting the residents of Madelia by consensus developed a sustainable community vision for the area (see below). The project team is now examining the next phases of the project plan, including the potential to install an anaerobic digester and a biomass gasification plant at a local food processor facility. The team is looking to have these technologies installed within three to five years at a rough estimate of 25-30 million dollars.

Meschke emphasized that for a project like the Madelia Model to succeed, the community needs to buy into the idea. Without interested community members, businesses, and leaders, any assessment done will have no impact. Meschke also shared that it is very important to get in contact with the local utility in the area to see if they are interested in the plan. If the local utility doesn't back the project, there is very little chance for it to succeed.

With Madelia moving forward with the results of the Eco-Industrial Assessment, other communities have seen the success of the project so far and are duplicating the idea. The methods and some results of the Eco-Assessment have a high transferability to other communities such as Winona and Crookston, Minnesota, who are pursuing similar biomass inventories. Meschke is traveling the state to share the model with interested cities, nonprofits, and utilities who want to learn if a model like Madelia's could work in their community.

The City of Madelia and Madelia Light and Power have adopted by resolution Madelia's Sustainable Community Vision which includes the following principles:

#### *Economic*

- Local ownership of renewable energy opportunities
- Nurture industries and businesses that provide living wage jobs
- Opportunity for all community members to benefit and profit from the Madelia Model
- Incentives for employees of businesses and industries to live in the Madelia community

#### *Environmental*

- Manage the landscape in a diversified and sustainable manner through alternative perennial crops
- Utilize local products for value added processing
- Create and utilize sustainable and renewable energy
- Clean air and water with no noxious fumes or pollutants

#### *Social/Community*

- Have stable and consistent leadership
- Consistent community support for those in leadership
- Maintain a safe, healthy and attractive family environment
- Available space for recreational opportunities
- Respect for all citizens



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