

Biomass Combustion Opportunities Through Focus on Energy

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Florence, WI
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Presentation Outline

- Focus on Energy Program Overview
- Wisconsin Biomass Tools
- Results/Project Examples

Focus on Energy

WI Energy Efficiency & Renewable Energy Program

Business Program



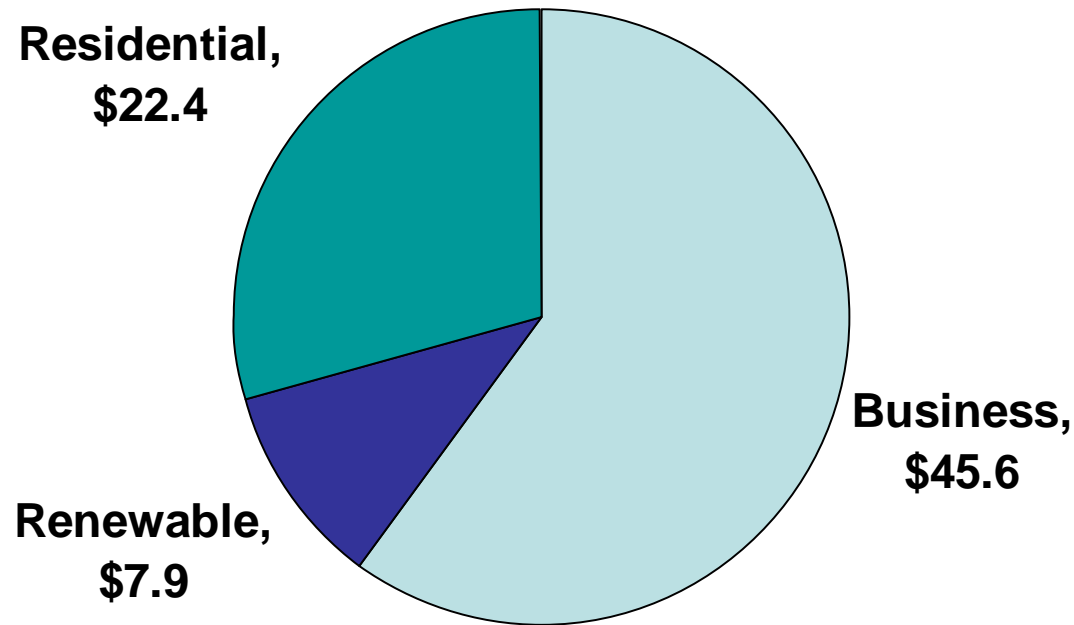
Residential Program



Renewable Energy Program



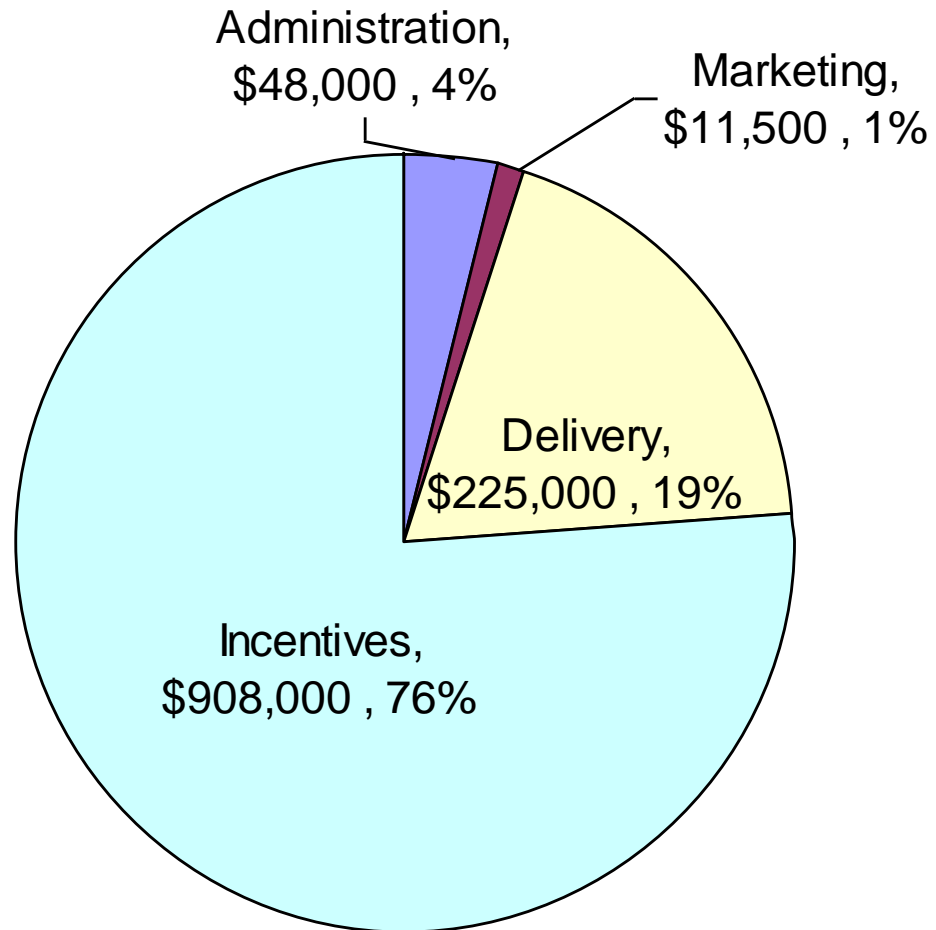
CY 09 Focus on Energy Budget \$75.9 million for 12 months



Focus on Energy Target Markets for Renewable Energy

- **Solar**
 - Electrical Generation
 - Water Heating
- **Wind (customer owned)**
- **Bioenergy**
 - Anaerobic Digestion
 - **Non-residential Biomass Combustion**

CY 09 WI Biomass Budget: \$1.2 Million

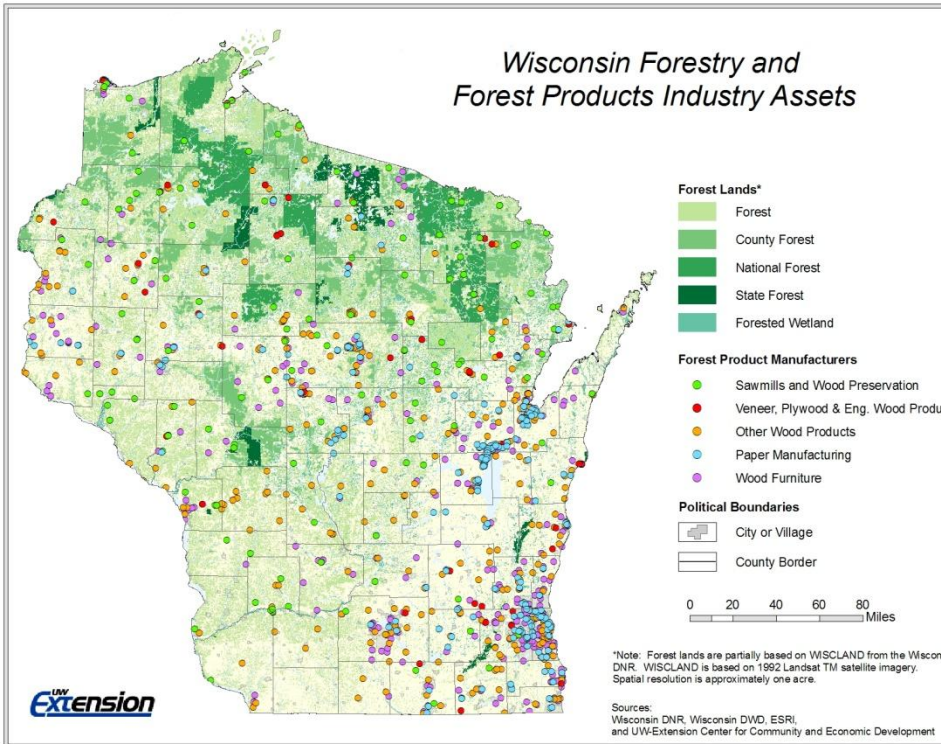


Tools for Priming the Biomass Combustion Market

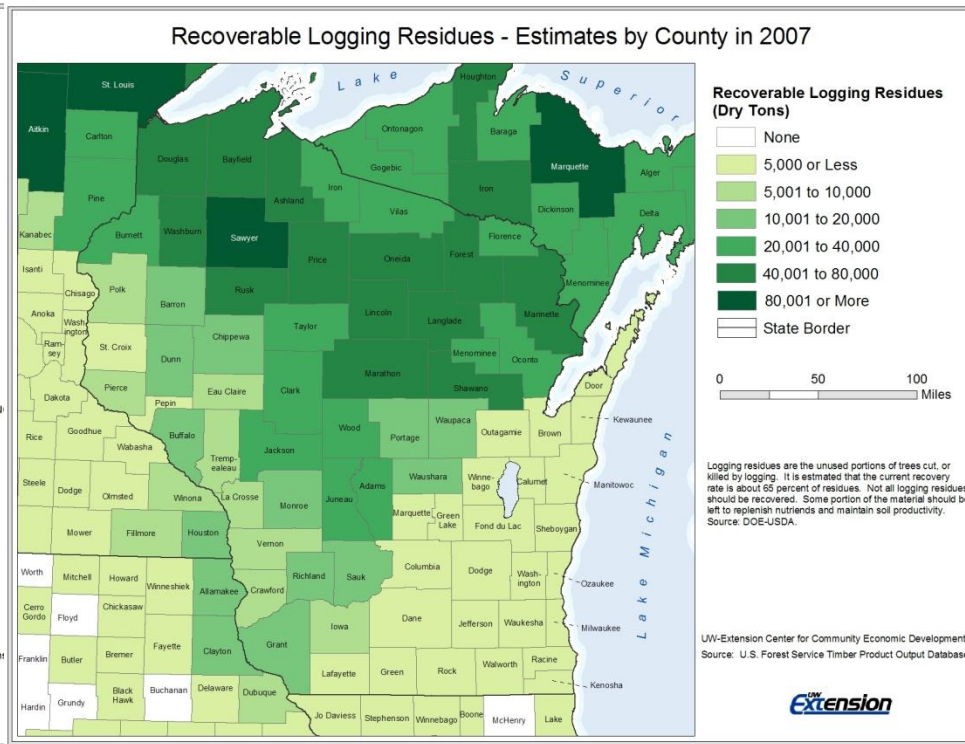
- Information
 - GIS Resource Assessment
 - Biomass Commodity Exchange
- Project facilitation – Connections
 - Marketing
 - Case studies and Conferences
 - Supply & Demand Lists
 - Pre-feasibility Studies
 - Industrial Solicitation
- Financial incentives

GIS Biomass Mapping

Wisconsin Forestry and Forest Products Industry Assets



Recoverable Logging Residues - Estimates by County in 2007





Facilitation

Ways to Connect

- Targeted mailings to potential customers
 - Forest products industry
 - Large schools in rural areas
- Sponsorship or appearances at workshops
- Press releases on successful projects
- Meetings with supply stakeholders
- Maintenance and publicized access to an installer, supplier and consultant vendor list
- Other facilitation to make a project happen

Fact Sheet & Case Studies

RENEWABLE ENERGY Pellet F Residence

RENEWABLE ENERGY FACT SHEET

WHAT IS PELLE
Pellet fuel is a type of biomass that is made from sawdust, wood chips and wood waste. It can be used in a pellet stove or even wood pellet boiler.

Pellet fuel or other biomass can also be used in a boiler to generate heat for a building.

To learn more about Focus on Energy, call 800.762.7077 or visit focusenergy.com

- BIOMASS
- GEOTHERMAL
- HYDROPOWER
- SOLAR
- WIND

RENEWABLE ENERGY Muscoda Wood-fired

RENEWABLE ENERGY CASE STUDY

Joseph Meister business in the 1920s. By 1985, Muscoda consolidated in Wisconsin, the company's natural cheese under the Meister brand. The company's traditions of employing...

The rising Meister general manager, environmental fuel, hard work...

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RENEWABLE ENERGY New Savings from an Old Boiler: Barron Area School District Wood Boiler Automation Project

RENEWABLE ENERGY CASE STUDY

In these days of rising fossil fuel costs, schools and other institutions are beginning to realize savings by using an old-fashioned and renewable energy source: wood. Some facilities are finding that their existing wood boilers can perform even better through installation of modern, efficient automation technologies.

The Barron Area School District installed a wood boiler system in 1980 to provide steam heat for the town's high school, elementary school, hospital and medical center, and the Maple Crofts Senior Rest Home. For fuel, the town has contracted to purchase green chipped wood from Piern Forest Products in Soken Springs, about 70 miles away. During the 2002-03 heating season they used 2,570 tons of wood at an average cost of \$28.37 per ton or \$80,323 per therm. Natural gas is also used in the system's two back-up gas-fired boilers.

The Barron Area School District boiler has been saving the town up to 30 percent of its heating fuel costs or about \$100,000 every year. However, after almost twenty-five years, the original manual mode control system had become unreliable. After exploring alternatives for replacement, District Administrator Monti Hallberg discovered that although the boiler continued to save costs by burning mostly wood rather than natural gas, there were opportunities to increase savings by reducing natural gas use even further. Through automatic monitoring and controlling the heat delivered to meet the various needs among the different buildings, it appeared that almost all use of natural gas might be eliminated.

In 2004, the Barron Area School District selected Johnson Controls, Inc. as its contractor to automate the controls of the boiler system. Johnson Controls recommended their DXB100 Automated Control with Network Controller to interface with the boiler system. The controller's primary function is to increase the efficiency of the boiler's combustion and heat delivery. The installation included sensors to integrate the wood boiler with the back-up gas boilers, and digital controls for boiler start and stop, fuel firing rate, induction draft fan and stoker speed. The system incorporates multiple monitoring functions, and provides alarms to notify on-duty personnel via telephone of operational problems.

This project has been in full operation since its successful completion in early 2005. The Barron Area School District realizes both annual energy cost savings and the efficient use of renewable resources. The boiler's new control system will assure its use of renewable wood energy for the next 20 years and beyond.

I would like to take this opportunity to thank you for the \$15,000 grant for our wood boiler automation project. The project was a great success and our wood boiler is running more efficiently than ever before.

Monti J. Hallberg, District Administrator
Letter dated July 26, 2005

Boiler plant maintenance supervisor, Stacy Hun shows the new Johnson Controls DXB100 control panel to Terry Stehr of the Focus on Energy Program. Maintenance staff can easily monitor the boiler's operation from the display on the panel.

PHOTO COURTESY OF JOHNSON CONTROLS

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Providing Access to Biomass Buyers and Sellers

- Full service biomass installers list
- List of biomass consultants
- List of pellet manufacturers
- List of wood energy brokers
- All information on Focus Web site:
<http://www.focusonenergy.com/Renewable/>



Industrial Biomass Solicitation

- New contract with Focus on Energy industrial efficiency subcontractors
- Includes 15 energy advisors to generate and pass along leads
- Initiated in 2008.
- Evaluating success stories to target message



Project Incentives

Based on expected natural gas savings

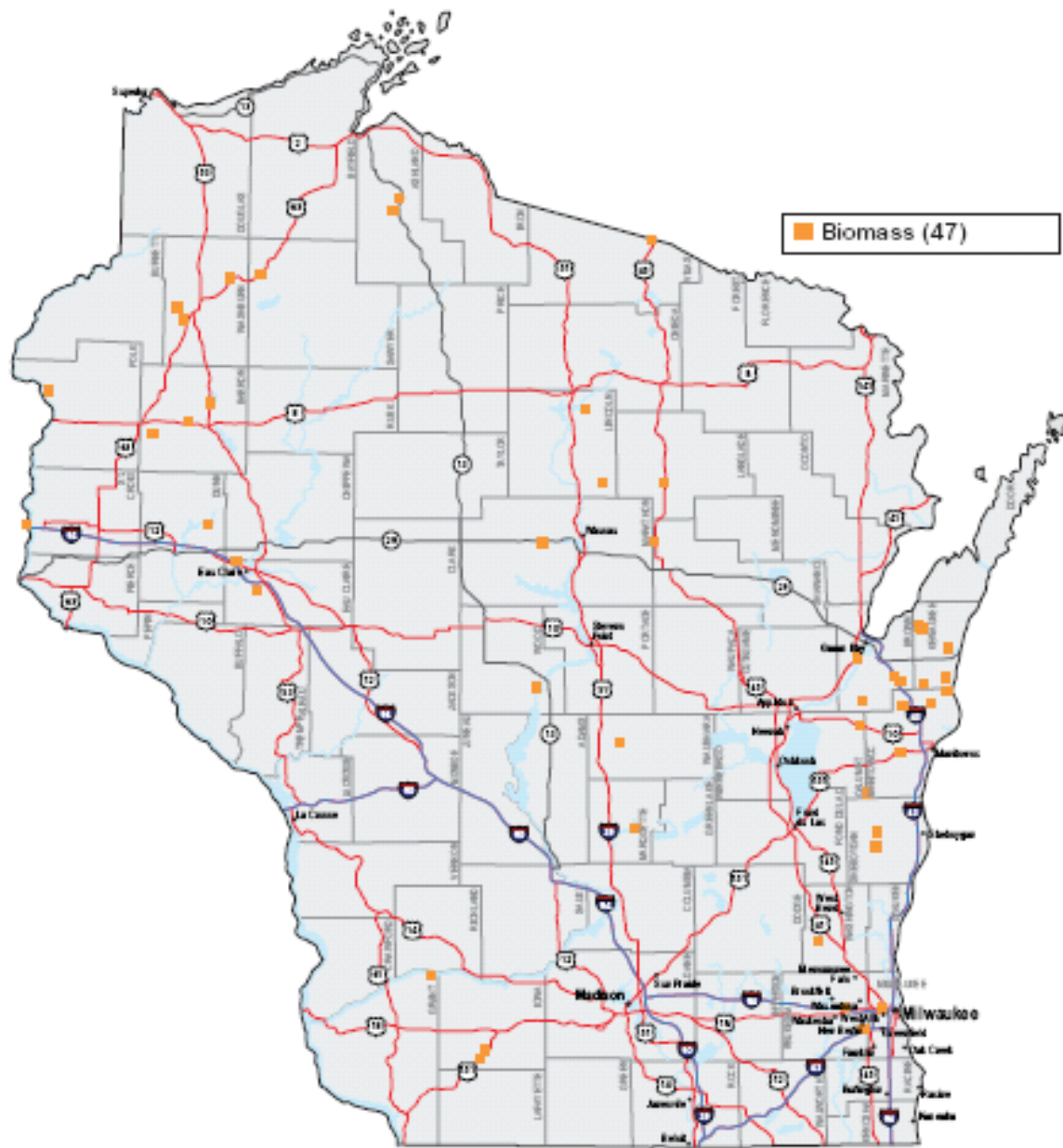
- **Cash Back Rewards** (<5000 therms per year)
 - Up to \$10,000, 25% project cost, \$2-3 per therm
- **Implementation Grants** (> 5000 therms per year)
 - Maximum of \$250,000, 25% of installed cost, formula approach: $\$50 \times (\text{therms/year})^{0.63}$,
- **Feasibility Studies** 50/50 cost share for projects less than \$2 million: \$10,000
- **Development grants** 50/50 cost share for projects greater than \$2 million: \$50,000
- **Business development grants** 50/50 cost share : \$10,000

Biomass Combustion Opportunity Grant

- Financial Support for Commercially Available Biomass Combustion System
- Competitive Award
- Maximum Grant Amount of \$500,000
- Grant Award Cannot Exceed 25% Cost
- Applications Due May 27, 2009

Wisconsin Biomass Combustion Market

- 61 completed projects
 - 5 feasibility projects
 - 56 biomass combustion projects
 - ~28,000 tons per year
 - ~\$7.9 million in project costs
- 16 projects in progress
 - 6 feasibility projects
 - 10 installation projects
 - ~88,000 tons per year



Wisconsin Renewable Energy Project Map
Projects co-funded by Focus on Energy 2002–2007

Types of Wood Combustion Applications

- Forest products (sawmills, furniture, paper, pallets, mulch)
- Food industry
- Community (schools, municipal)
- Grocery stores
- Green houses
- Apartment buildings
- Restaurants
- Farms
- Other commercial businesses

Project Examples

- Barron School District
- Vesper Pallet
- Muscoda Protein Products

Case Study: Barron School District



Case Study: Barron School District

- Wood boiler controls upgrade
 - Project cost of \$55,000
 - Focus on Energy contribution of \$15,000
 - Estimated annual savings of 75,000 therms
- System provides heat for elementary and high schools, hospital, medical center and nursing home

Case Study: Vesper Pallet

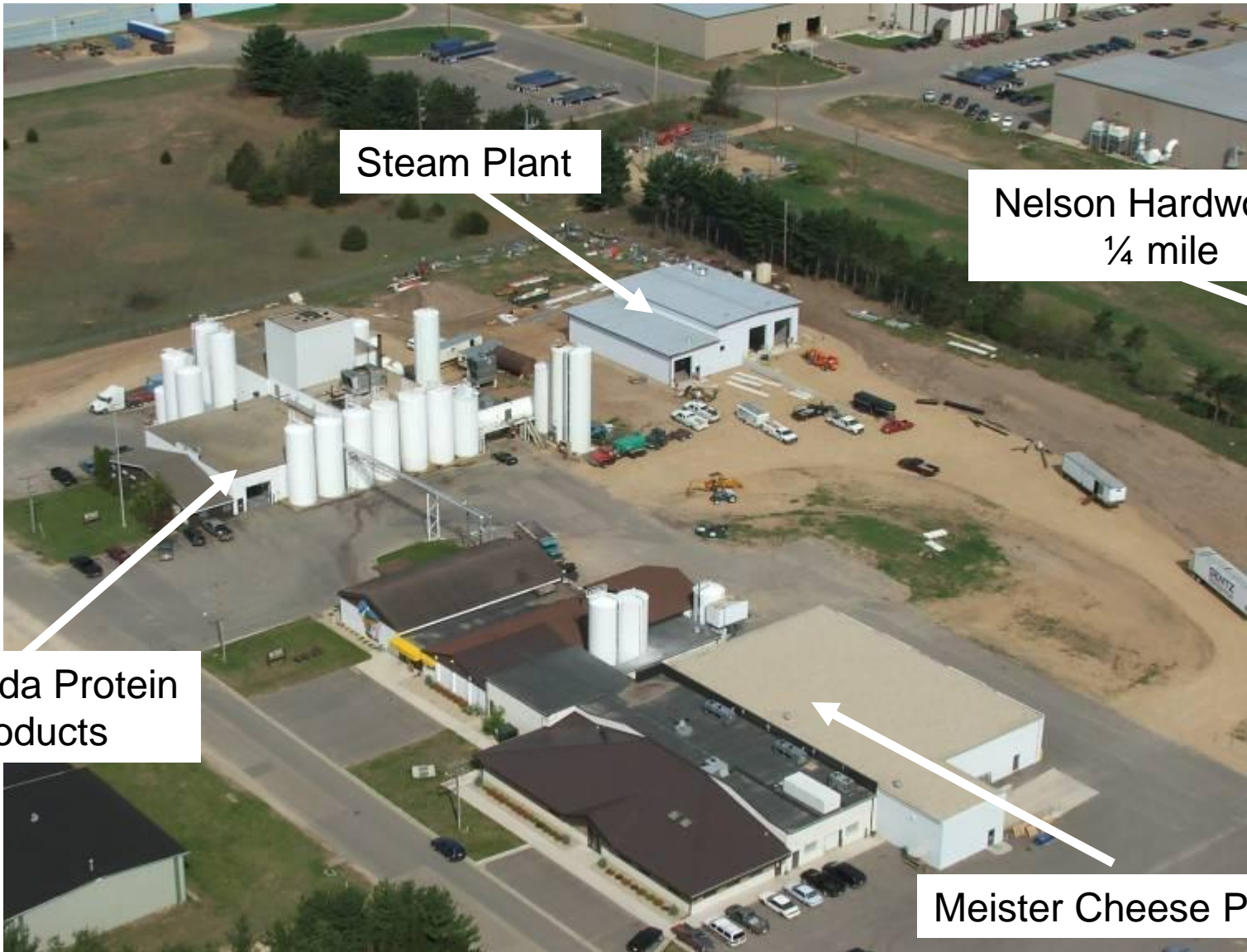


Case Study: Vesper Pallet

- Wood boiler installation project
 - 100 HP boiler
 - Project cost of \$300,000
 - Current Focus on Energy contribution would be \$40,000
 - Estimated annual savings of 41,000 therms of natural gas
- System provides process heat for wood drying

Case Study: Muscoda/Meister





Steam Plant

Nelson Hardwoods
1/4 mile

Muscoda Protein
Products

Meister Cheese Plant

Case Study: Muscoda Protein Products and Meister Cheese

- Wood boiler installation project
 - 400 HP boiler
 - Project cost of \$1,700,000
 - Current Focus on Energy contribution would be \$218,375
 - Estimated annual savings of 600,000 therms of natural gas with a four year payback
- System provides process heat for cheese plant and whey drying facility

Conclusions

- Multi-faceted intervention approach contributes to orderly development
- Use of all available program tools:
 - Information: GIS analysis, Pricing mechanisms
 - Connectors: Marketing, Feasibility assistance and Financing

All are needed to drive the biomass combustion market

Questions?

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Thank You