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My testimony will focus on a main outcome of the Forest Products Industry Technology Alliance. (This “Agenda 2020” program is a partnership between governments, the forest products industry and academia to develop technologies capable of increasing energy efficiency, reducing environmental impacts, and improving industry economics).

The Alliance highlighted the need to establish a proper **Technology Deployment Organization** that will work very closely with the industry user, the funding agencies, the state and the federal regulatory agencies, and *the business developing and marketing the technology*. Once a technology has been identified, it must be presented properly to the industry. Understanding the **conservative nature of this industry**, it is very critical that the new technology be presented in one-on-one meetings with industry representatives at three levels: 1) Company executive (focus on profit potential), 2) Research executive (focus on technical merit), and 3) Operating personnel (focus on how risk can be minimized). In addition to establishing the Technology Deployment organization, the concept of a “**Biorefinery**” has to be further explored. This concept has the **potential for doubling profits** to the industry by producing **value-added products** from biomass on site, while the industry can continue making their conventional paper products. We need your support for these initiatives, the **dedicated Technology Deployment Organization and Biorefineries**.

Today I will share with you a Wisconsin **Technology Deployment** model that could easily be replicated throughout the US, with some modifications depending upon each state’s need, to improve the competitiveness of our US Forest Products Industry. The Wisconsin Department of Administration through its Focus on Energy Program, created a non-profit organization in 2002 called the Center for Technology Transfer (CTT), which is basically a Technology Deployment Organization. The mission of CTT is to improve the competitiveness of Wisconsin industry clusters, including the Forest Products Industry. As you know, Wisconsin is still the number one paper-producing state in the nation. In order to expedite the commercialization and implementation of federally-funded technologies, this organization presents a package to the industry which includes the technology, funding for technology demonstration, energy and tax incentives for a limited period to early adopters, etc.

Governor Jim Doyle of Wisconsin and his administration are fully committed to help the forest products industry in Wisconsin. His administration has made important progress in reducing permitting times and reforming the way state agencies do business. They have negotiated and signed legislation creating the “Green Tier” program within the Wisconsin Department of Natural Resources (DNR). This voluntary program encourages greater environmental performance by recognizing companies with superior environmental performance. More importantly, **it rewards them with increased flexibility and less regulatory risk when trying new technologies**. He also signed legislation to create a sales tax exemption on energy used in manufacturing. Energy is a major cost for manufacturers in the paper industry, the largest consumer of energy in Wisconsin. The bill will help companies stay competitive, stay in business, and stay in Wisconsin. This shows our state’s serious commitment to providing a business-friendly environment.

Governor Jim Doyle has announced his strong support for developing Wisconsin's renewable energy resources. The Farm Bill's Energy Title provides federal resources that complement Wisconsin's Focus on Energy program (CTT is part of this Program) and other efforts. **With your support, the Farm Bill Energy Title programs can reach their full potential for our state and our nation**. Looking to the future, we hope you will support an aggressive expansion of these programs in the next Farm Bill to meet the many challenges we face. **With your support, Wisconsin can continue to lead the nation in developing renewable resources and supporting rural communities**.

The Governor also created a **Governor's Council on Forestry** in Wisconsin. In a recent meeting on June 17, 2004, the Council discussed priority issues for Wisconsin Woodlands which are owned by 260,000 people and others (about 61% of the acreage total). They identified invasive species as the top priority. John Cutis, Wisconsin's foremost expert on vegetation in the state, found in the 1920-30's a healthy number of native species. Recent inventories of those same plots found a dramatic decrease in the variety of native species, and an alarming increase of non-native species that are destroying our natural ecosystems. This has the potential to do substantial damage to our wood-using industry and the economy of Wisconsin. **Federal programs for forest health are important if we want to retain the vital forestry industry base in Wisconsin.**

This document provides further details on some of the issues I have outlined here. I hope the information provided here will help you make the decisions that are needed to improve the **competitiveness** of our Forest Products Industry.

## **CTT Model: A Technology Deployment Organization in Wisconsin**

The Center for Technology Transfer Inc. (CTT) is fueling Wisconsin's long-term economic growth by helping state researchers and entrepreneurs bring new energy- and cost-saving technologies to market. Based in Madison, WI, CTT is a one-stop-shop for commercializing new technologies. The private, nonprofit corporation helps established and early stage companies statewide move new technologies along the path from discovery to successful implementation in the marketplace, where they make state businesses more competitive and retain and create jobs.

### **Services to established companies**

Identify and bring industry-specific technologies. In the competitive global environment, retaining jobs has become as critical as creating them. Implementing new technologies to reduce production costs is one way to retain high paying manufacturing jobs in Wisconsin. By understanding the nature of key Wisconsin industry clusters, CTT can help facilitate this process by:

- Arranging one-on-one-meetings with key industry managers to identify their industry-specific technology needs
- Searching for available technologies, particularly those that are funded by federal agencies like the U.S. Department of Energy, which are near commercialization or have been commercialized elsewhere
- Conducting initial technology, business, and financial due-diligence in cooperation with an established vendor with industry credibility
- Presenting appropriate technologies to senior managers of potential customers along with the vendor and developer.

The now prescreened technology can be evaluated by industry to determine if the output and investment's rate of return are acceptable. A plant demonstration on a pilot scale is the likely next step.

Provide funding for technology demonstration. To minimize risk to the industry, CTT can provide up to \$250,000 to fund technology demonstrations. These funds are provided to the technology developer either in the form of equity, loans (secured or unsecured) or a combination of both. CTT can also leverage its funds by bringing in additional funds if needed.

Identify business and policy issues that are barriers to implementing technology. During one-on-one meetings with an industry cluster's representatives, CTT may identify barriers to implementing technologies. In response, CTT may prepare unbiased research reports comparing Wisconsin business incentives and policy issues with those of neighboring states and abroad. CTT will then arrange personal meetings with industry leaders, state agencies and others to develop strategies to overcome these barriers. CTT has completed such a review for the Forest Products cluster, and additional reviews are in progress.

Provide education and training. CTT provides industry-specific technology and training through interaction with trade organizations, universities, and technical colleges. Our current focus is to bring available technologies to users through existing conferences, trade shows, and the like.

### **Services to early stage start-up companies**

CTT's assistance typically falls into one or more of the following areas:

Project Funding, including secured low-interest loans, unsecured loans, bridge loans for repayment or conversion to equity, and equity investment.

Business Mentoring, including offering a database of service providers, conducting due-diligence reviews, providing business planning advice and assistance, serving on boards of directors and boards of advisors, and advising on strategic negotiation with potential business partners.

Grant Assistance, including identifying available grants, providing personalized grant writing training, writing and reviewing grant applications, providing grant administration assistance, conducting technical due-diligence reviews, helping obtain letters of support and collaboration for grant applications, offering matching funds, and arranging bridge loans to sustain clients between federal grant phases.

Intellectual Property Assistance, including developing intellectual property strategies and assisting in the patenting and licensing of inventions, particularly for non-university inventors.

## **Wisconsin Forest Products Industry Challenges**

The following list of perceived challenges facing the Wisconsin forest products industry are based primarily on five individual discussions between a task force and representatives from three paper mills and two sawmills.

### **FORESTRY BUSINESSES IN GENERAL**

#### **International:**

##### ***Policy***

- Foreign governments absorb some of the workers compensation through government paid benefits like health insurance.
- Foreign entities cannot own public utility power generating facilities in the US.
- Global environmental regulations vary—businesses need a level playing field.
- International Trade Barriers affect market access.
- Disparity between tariffs levied on imports into our domestic market and those imposed by other countries need correcting.

##### ***Business***

- All facilities surveyed face international competition. The forest products industry is rapidly being integrated into the global economy.
- Effective global marketing strategies are needed for the forest products industry in Wisconsin.
- Increased competition from China in furniture and paperboard, Canada in softwood products, Europe and others in pulp and paperboard, and other forest products from Chile, Scandinavia, New Zealand, and Russia.
- Exchange rates affect multinational company decisions on where to make facility/capacity investments.

### ***Education***

- Organize a national seminar broadening what Bob Seavey, Dept. of Wood & Paper Science, University of Minnesota set up. "Manufacturing Strategies for Profitability in the 21<sup>st</sup> Century: Surviving Globalization" March 7, 2003.
- Develop a compilation of successful strategies used by companies to find niche markets and other methods to cope with globalization.

### **National:**

- Present tax laws do not favor investment.
- There is a lack of available fiber from national forests in Wisconsin. (It has been suggested that different national forests are able to provide significantly different quantities of wood for use by industry.)
- It would be helpful to overhaul the Fair Labor Standards Act (FLSA) so that it allows an employer to give incentives to all employees without having to endure onerous calculations to adjust for overtime considerations each time you choose to award bonuses.
- Need to work with Department of Commerce to help solve policy issues.
- The Byrd amendment regarding softwood lumber needs to be reviewed.
- Need a study of present infrastructure to determine what adjustments can be made to improve it. (Need to encourage innovative research to support infrastructure improvements.)
- Need approval of categorical exclusions for small timber sales on federal lands.

### **State:**

### **PERMITS:**

#### **Policy**

- Permits are a major problem due to complexity and long time delays. Some companies believe there is no real way to cooperate with State of Wisconsin permitting agencies. Companies are reluctant to make even small changes because of the permit process.
  - It takes too long to get things done. Supposedly the problem is due to lack of sufficient WDNR staffing to process permits.
  - Timeliness for getting permits appears to be completely out of line with other states.
  - Policy issues at the WDNR make it very difficult to get the job done, and usually result in high capital expenditures.
  - Need to push proactively for fast track permitting.
  - Streamline permitting to allow greater use of coal.
  - Difficulty dealing with the WDNR bureaucracy in Madison.
- Regulatory framework to support the implementation of emerging technologies. (i.e. permit for air emission relating to new combustion technologies or new fuel use)
- Need standardized requirements for reporting of Volatile Organic Compound (VOC) emissions on raw materials and like production units.

- Need innovative state and federal programs that will establish environmental and energy goals for the industry and eliminate regulatory barriers to achieving them.
- Allow permit credits for innovative technology applications (provide motivation to change).
- Need consistent and aligned rules or regulations governing the environmental aspects of the industry
- Determine cost/benefit on rulings for run-off, environmental regulations.  
(Major issues are storm-water run-off and air emissions.)
- Establish how so called “pollutants” fit into the natural system.
- State emissions regulations should match but not exceed federal regulations.
- Rules should apply through life of asset.
- Need to encourage innovative research to support infrastructure improvements.
- Need to develop and rewrite environmental policy from a command and control philosophy to a policy based on accomplishment.
- The WDNR and companies need to work together to better understand what the real problems are with permits and try to resolve them. It is important to standardize the process throughout the state.
- One way to speed up the process is to have automatic approval in x number of days if no action is taken by WDNR.
- Develop programs that give industry ownership and incentives to excel in environmental issues.
- Consider a hybrid version of International Standard Organization (ISO) 14000 environmental certification. Such a system, if mutually agreed upon, stands to take industry out of a defensive posture with regards to their environmental track record/history and gives them a chance to be proactive in policy development improvement and implementation.

#### ***Business***

- There is a disproportionate negative impact of increased regulations on small mills. (High labor and capital costs)

#### ***Capital***

- High capital costs to meet environmental concerns.

#### ***Technical***

- Benchmark the permit processes used by other states.
- Need science-based regulations: facts and data to guide effluent quality requirements.
- Need to determine full range of permits involved, air, water, VOC, wetland, etc. and see if any of the permit processes used are examples of success.

#### ***Education***

- Promote the triple bottom line for industry accounting.

### **PERCEIVED WISCONSIN BUSINESS CLIMATE:**

#### ***Policy***

- Wisconsin doesn’t give forestry the kind of attention that it deserves.
- Feeling by some that Wisconsin is anti-business.
- The industry has advocacy groups but no real middlemen to help solve the complex issues facing forestry businesses.
- Wisconsin does not see itself as a manufacturing state.
- Other states are perceived to be pro business and work to make business feel welcomed.

- Current regulations hinder joint co-generation projects. (Viewed as public utility, regulations increase exponentially.)
- The state Family Medical Leave Act (FMLA) needs to be standardized to the Federal Act.

#### ***Business***

- Need for sharing information on technology advancements—working together as an industry.
- Need more positive public relations and community support.
- It is believed that Wisconsin is less generous with economic policies than other states.
- Need aggressive programs to find means to implement new ideas.

#### ***Technical***

- It is important that Wisconsin benchmark their present policies with other states such as Michigan, and Minnesota.
- Important for the Center for Technology Transfer (CTT) and the Forest Products Laboratory (FPL) to work together.

#### ***Education***

- Need for a single organization in the state that could handle the problems and questions of the forest industry.
- Need to develop a comprehensive program to increase awareness of the importance of the wood industry to the state in terms of jobs, tax revenue, community stability, forest health, clean water, wildlife and recreation.

### **TAXATION:**

#### ***Policy***

- Government subsidies and tax breaks vary between states and countries.
- Need exemption from sales tax on fuel and electricity used in manufacturing.
- Need to implement a single sales factor for corporate income tax apportionment.
- Provide solutions to include investment and educational incentives.
- Provide incentives that encourage new research and development (R & D).
- Provide incentives to phase out obsolete or inefficient capacity.
- Provide incentives to existing businesses—taxation, labor support/credits, investment/technology, tariffs / supports.

#### ***Business***

- Benchmark taxes against other states.
- Benchmark taxes against other countries that compete.

#### ***Capital***

- Industrial revenue bond investments to build new mills can negatively affect existing mills.

#### ***Education***

- Complete a study and report on the use of the Wisconsin Forestry mill tax and its positive and negative impacts.

### **FOREST RESOURCES:**

#### ***Policy***

- Need to assure plentiful and suitable timber or other fiber resources for the state industry.

- Fragmentation of the forest is happening at an alarming rate. This affects ability of businesses to procure raw materials. Lack of available wood supply.
- Need to reduce concentration of excessive material in overstocked forests.
- Present legislation has pushed farmers to abandon programs that are aimed to help forestry. Farmers are once again allowing their cattle to graze in the timberlands. (Limited grazing may be helpful if properly done. Bacterial infections are one problem associated with grazing)
- Long time (up to 12 months) taxpayers have to wait for certain tax credits or payments.

#### ***Business***

- Complete a study of the increase in Wisconsin growing stock, the limits of its availability for utilization, and options.

#### ***Technical***

- Provide help to Non-Industrial Private Forest (NIPF) landowners in the development of forest management plans and assistance in working with loggers and lumber companies to meet their forest plans.
- Non-industrial woodland is not properly managed.

#### ***Education***

- Many private woodlands are not managed because of lack of trained foresters to make or approve forest plans. (Continuing need to educate landowners)
- Need to bridge consumer/public disconnect with science/study findings on forest management.
- Review the literature and provide a report on possible utilization of each species. For example the use of saw-dry-rip to utilize species that are hard to dry without severe defect. This would help industry to better utilize species that are not commonly used, but are in abundance.

### **ENERGY:**

#### ***Policy***

- Need for reliable energy supplies over time.
- Need to improve the electrical grid inside state and linking Wisconsin to other states, especially to the west. Transmission capacity is becoming a critical concern with deregulation.
- Need regulated pricing mechanism for fixed and interruptible power.
- Price volatility: Improve control of natural gas pricing.
- Need ability to access open energy markets.
- Need to open the generation market to Independent Power Producers.
- Need reliable sources of fuel—renewable, less fossil fuel dependent.
- Dam removal issues: balance environmental improvements versus renewable energy. Hydropower needs to be revived.
- Use of artificial wetlands for final finishing of wastewater treatment (low energy and tertiary treatment).

#### ***Business***

- Need to replace oil and gas for steam production by wood, wind, solar, or other renewable energy source, for building and process heating.
- Ability to remain energy competitive while utilizing aged steam-generating systems.

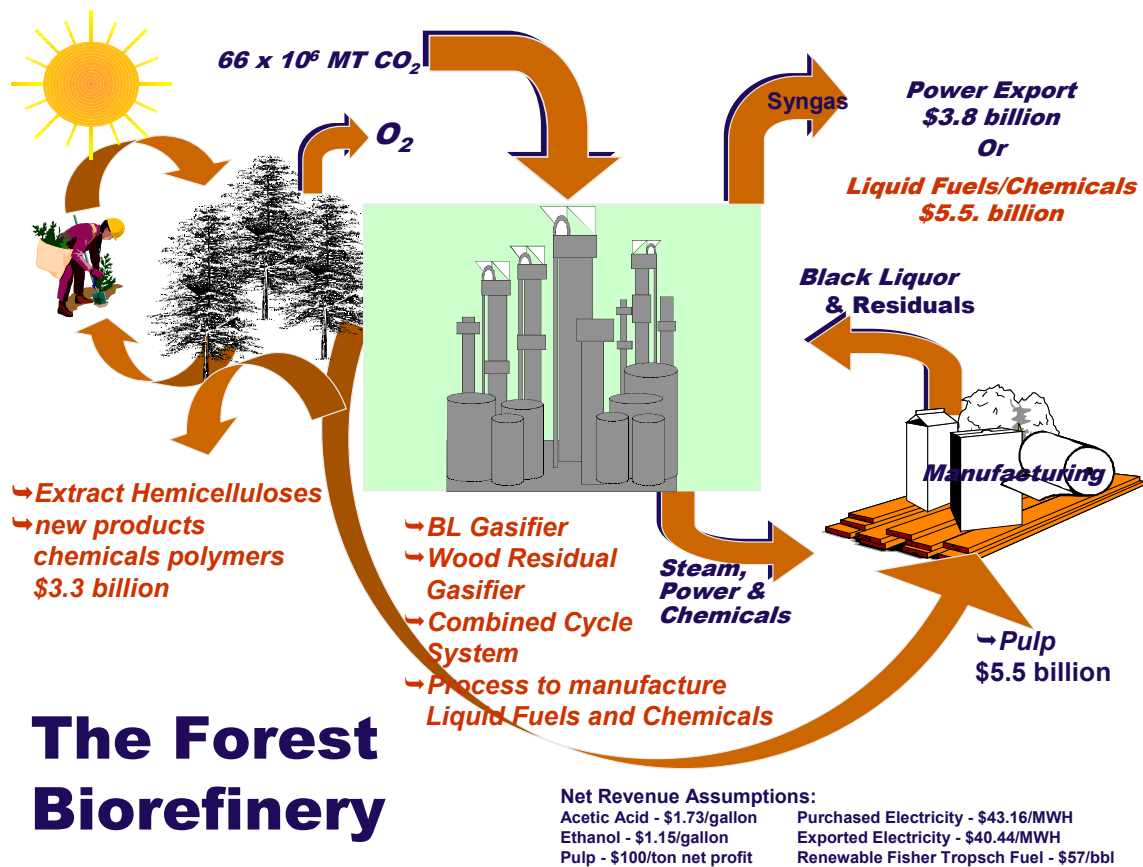


- Need to review the WDNR report on good sites for district heating and follow-up on opportunities.

#### Technical

- Need clean, economical energy source to produce steam and electricity.
- Need to develop flexibility in fuel uses to optimize facility costs and environmental factors.
- Need to develop a portable cogeneration unit for utilization of dead and down material in fire prone forest areas. Work is progressing on a 1 MW unit that is portable. It should be ready in three years. It will take 3 semis to transport the unit.

### The Forest BioRefinery



Consists of three parts:

1. Sustainable Forest Productivity
2. Extracting Value Prior to Pulping
3. New Value Streams from residuals and spent pulping liquors
  - This means traditional tree growing and liberation of fibers while inefficiently burning spent liquors becomes the old technology.
  - In its place is forest stewardship and the processing of wood in a way to extract fiber, fuel, chemicals, and power streams that are valued by society and the marketplace.
  - The intent is to evolve current chemical pulp mills into forest biorefineries, preserving infrastructure, jobs, supply chains & permits.

### Value Prior to Pulping

#### Description:

- Adding hot water extraction vessels (low pressure digesters),
- Extracting soluble hemicelluloses,
- Separating the acetic acid, and
- Fermenting the sugar to fuel grade ethanol with known processes.
- Ethanol is at the low end of potential products
- Removing the “sugars” will only improve the throughput potential of existing operations as the “hemis” are removed in pulping. Further work is needed on the energy offsets.
- Development of further value includes a “fermentation system” to produce high value chemicals and produce ethanol with “residuals from the system”.
  
- Reference Mill:
  - 1580 BD unbleached TPD pulp, which a mill used in the Larson Gasification to Power Study.
  - Mill uses 2089 TPD BD hardwood and 1122 TPD softwood plus 318 TPD bark
  - This mill includes all energy required for the production of ~1,722 tpd of “freesheet”.
- Output:
  - ~19 million gallons ethanol
  - ~ 6 million gallons acetic acid
- Capital Cost: (preliminary estimate)
  - ~\$33 million for vessels, distillers, membranes & controls
- Operating Cost:
  - ~35 cents/gallon
- Net Revenue Increase:
  - ~\$33 million
- Basis Includes:
  - Studies at Syracuse and Maine show that 53% of the 27% xylose in certain wood can be extracted
  - Yields used in the calculations are very conservative
  - There are 76 ethanol fermentation plants in the U.S.
  - DOE and USDA projects show no way to meet the projected ethanol demand
  
- Needs Include:
  - A detailed fermentation process study and capital cost estimate
  - Research that would lead to the production of higher value added products

### New Value from Spent Liquors

- There are two choices:
  - power, or
  - fuel/chemicals
- For each choice, there is:
  - an incremental capital analysis
  - and full capital analysis

### New Value from Spent Liquors (Power)

#### Description:

- Add a gasifier and turbine power island.
- Convert to polysulfide pulping because chemicals are available.

- Convert the “off gas” to power the mill and sell excess to grid.
- Reference mill increases biomass consumption by ~50%. (Case from Larson Study.)
- Better economics are possible with acquisition of additional biomass.
- Profit potential is limited by the historically slow moving wholesale electrical prices IN AREAS WHERE COAL DOMINATES, like the southeastern U.S.
  
- Reference Mill:
  - Same
- Output:
  - 833,800 mwh to cover mill purchases (\$43.16/mwh assumed)
  - 121,500 mwh for export to grid (\$40.44/mwh assumed selling)
  - 226 BD tpd of wood not purchased (\$50.26/BD ton assumed)
- Capital Cost: (engineered estimate)
  - Incremental: \$70 million
  - Full: \$191 million including \$122 million diverted from recovery
- Added Operating Cost: (engineered estimate)
  - Incremental: \$7 million
  - Full: \$7 million
- Net Revenue:
  - Incremental: \$38 million
  - Full: \$38 million
- This is economically attractive only when the recovery boiler is at the end of its useful life.
  
- Basis Includes:
  - Polysulfide pulping is semi-commercial
  - Black liquor and biomass gasification commercial at Weyerhaeuser, New Bern, NC, and in startup at Norampac, Trenton, Canada, and GP, Big Island, VA.
  - Pilot plants have run successfully at 2 mills in U.S., 2 in Sweden, and with a 3rd in startup.
  - Gas turbine technology is commercial in many FPI mills and other industries.
  
- Needs Include:
  - More economical hot gas cleanup and/or a non sulfur added pulping process.
  - A premium for “green power”

#### New Value from Spent Liquors (Fuel)

##### Description:

- Install a black liquor gasifier.
- Add a Fischer Tropsch unit and convert all the BLG off gases to Renewable Fischer Tropsch Fuel (RFTF) for sales to the petrochemical industry.
- Convert the old chemical recovery unit to a biomass boiler.
- Procure additional biomass to run the mill and install a condensing turbine to convert excess steam into power.
- This is a very rough way to configure a mill.
- Higher values can be obtained by configuring a mill with a proper steam/electrical balance and by adding distillation columns to produce fuels (versus basestock).
  
- Reference Mill:
  - Same
- Output:

- 1,090,000 barrels “RFTF”
- Capital Cost: (part engineered estimate, part preliminary)
  - Incremental: \$83 million
  - Full: \$205 million
- Added Operating Cost:
  - Incremental: \$19 million
  - Full: \$19 million
- Net Revenue:
  - Incremental: \$55 million
  - Full: \$55 million
- This is economically attractive only when the recovery boiler is at the end of its useful life.
- Basis Includes:
  - Polysulfide pulping is semi-commercial
  - Gasification – same as previous case
  - Fischer Tropsch units are commercial in other industries and have been trialed on black liquor
- Needs include:
  - A detailed liquid fuels process study, market study, and capital cost estimate.
  - More economical hot gas cleanup and/or a non sulfur added pulping process
  - Integration into commercial plant operations

## Farm Bill

Please support full funding for the Energy Title of the Farm Security and Rural Investment Act of 2002 ("Farm Bill"). The Energy Title's innovative programs help America and Wisconsin tackle challenges on many fronts: rural economic development, energy security, and pollution.

Section 9006, the Renewable Energy and Energy Efficiency Improvements program, is a merit-based cost-share incentive program that authorizes USDA to issue up to \$23 million annually in grants, loans and loan guarantees to farmers, ranchers and rural small businesses. Section 9006 was very successful in its first year: USDA awarded more than \$21 million in grants to more than 110 recipients in FY 2003. These grants leveraged over \$100 million in investment.

Wisconsin received the fifth highest amount of any state, \$1.7 million for 11 projects. With new rule changes this year favoring smaller farms, we hope that many more Wisconsin farms will benefit.

Unfortunately, Section 9006 is at risk of funding cuts this year reducing the funding to \$10.8 million annually from \$23 million. ***We ask you to support restoring full funding to this program on a consistent basis.*** Fluctuating funding undermines our nation's commitment to renewable energy and threatens program success.

The Energy Title's approach to clean energy and rural development has great merit. Locally, the Energy Title helps rural communities, and statewide and nationally it reduces air and water pollution and promotes a more robust and secure energy system. Also, bear in mind that Wisconsin has no indigenous fossil energy resources, so the power we generate from renewable energy reduces our reliance on imported fuels and keeps dollars in our local economy.

Rural renewable energy programs provide vitally needed economic development opportunities by helping farmers develop new - and stable - income sources. At a time of rapidly rising energy costs, energy efficiency on the farm can help farmers manage costs. As commodity price supports are challenged under international trade agreements, this innovative program can provide valuable incentives that are immune from challenge under trade agreements.