

Renewable energy is one of the most promising and important opportunities for value-added products in Wisconsin agriculture. It has been said, “Anything that can be generated from a barrel of oil can be generated from biomass.” The type of renewable energy technology used in agriculture depends on the type of energy required, access to the renewable energy source and the design of the agricultural facilities and processes.

Agriculture energy users include all kinds of farming facilities and equipment used for growing crops and raising animals, including the farmhouse. In Wisconsin, these facilities use energy mainly for equipment such as water heaters, milk coolers, vacuum pumps, lighting, irrigation pumps, crop dryers and ventilation.

BENEFITS

Along with energy efficiency, renewable energy can help you meet the energy needs of your agricultural facility. Renewable energy technologies can help you:

- Reduce building operation costs
- Decrease reliance on imported fossil fuels
- Cut pollution and greenhouse gas generation
- Enhance state and local economies by creating jobs

Certain renewable energy technologies can also provide:

- Reduced peak demand for electricity
- Waste mitigation and odor management
- Compliance with environmental regulations

AGRICULTURAL RENEWABLE ENERGY OPTIONS

TECHNOLOGY	APPLICATION	REQUIRES	ADDED BENEFITS
Bioenergy fuels used in fuel cells, gas engines and turbines, internal combustion engines, or steam engines and turbines	Electricity, space heating and cooling, process heating and cooling, water heating and cooling, biodiesel fuel	Continuous source of organic material from farm wastes, wood wastes, food processing wastes, waste water treatment, and agricultural crops	Reduced pollution from waste streams, control of odors, control of gas emissions, reduced operating costs, back-up power
Daylighting	Natural lighting	Buildings designed for daylighting	Lower lighting and HVAC costs, productivity benefits
Geothermal heat pump	Space heating and cooling, water heating and cooling	Land available for vertical or horizontal shafts or wells, summer cooling requirement	Increased comfort with in-floor radiant, or exchanger-driven heating and cooling systems, no roof mounted components
Hydroelectric	Electricity	Stream or river with reliable flow, permit required for water diversion	Latest technologies do not require drop in water elevation
Solar electric (also known as photovoltaics)	Electricity	Unobstructed access to the sun	Electricity production usually matches electricity use, can be incorporated into building structure as roofing or glazing
Solar space heating — thermal mass heating	Space heating	Under-floor heating for barns, milking parlors, processing facilities	Improved comfort
Solar space heating — transpired air collector	Space preheating and heating, process heating	Large south-facing wall, high ventilation requirements	Improved air quality
Solar water heating	Hot water, preheated water	Unobstructed access to the sun	Hot water production usually matches hot water use
Wind machine	Electricity	Good wind resource, space for tower	Small footprint, land surrounding tower available for other uses

EXAMPLES IN WISCONSIN

Many Wisconsin agricultural facilities, large and small, have already installed renewable energy systems. Among them are:

- **Deer Ridge Farm, Nelsonville** — Anaerobic digestion of manure, bedding product, under-floor facility heat, sale of electricity
- **Tinedale Farm, Wrightstown** — Anaerobic digestion of manure and whey, compost, sale of electricity
- **W. Lehrner Farm, Mt. Horeb** — Photovoltaics, wind turbine, electricity net energy billing
- **Double "S" Dairy, Markesan** — Anaerobic digestion of manure, bedding product, sale of electricity
- **Wholesome Dairy, Hilbert** — Anaerobic digestion of manure, bedding product, sale of electricity

TAX BENEFITS

Certain renewable energy technologies are eligible for tax benefits. Below are brief descriptions of federal and Wisconsin tax policies related to renewable energy. For more information on these tax policies, see the Database for State Incentives for Renewable Energy at www.dsireusa.org. Also, be sure to consult your tax advisor because tax benefits change frequently.

SOLAR AND GEOTHERMAL BUSINESS ENERGY TAX CREDIT (FEDERAL)

The federal business energy tax credit is a 10 percent tax credit available to commercial businesses that invest in or purchase energy property in the United States. Energy property is defined as either solar or geothermal energy. Solar energy property includes equipment that uses solar energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat. Geothermal energy property includes equipment used to produce, distribute, or use energy derived from a geothermal deposit.

WIND AND BIOMASS RENEWABLE ELECTRICITY PRODUCTION CREDIT OR WIND ENERGY PRODUCTION TAX CREDIT (FEDERAL)

The Renewable Electricity Production Credit, also called the Wind Energy Production Tax Credit, is a per kilowatt-hour tax credit for electricity generated by qualified energy resources defined as wind, closed-loop biomass or poultry waste. Available during the first ten years of operation, the Renewable Electricity Production Credit provides a 1.5 cents per kWh credit adjusted annually for inflation. The adjusted credit amount for 2002 is 1.8 cents per kWh.

SOLAR AND WIND ENERGY EQUIPMENT EXEMPTION (WISCONSIN)

This statute exempts taxpayers from any value added by a qualified renewable energy source for property tax purposes. Qualified equipment includes any active solar equipment and any wind devices as well as transmission equipment, but "does not include equipment or components that would be present as part of a conventional energy system or a system that operates without mechanical means."

JOB CREATION AND WORKER ASSISTANCE ACT OF 2002 SPECIAL DEPRECIATION (FEDERAL)

The Job Creation and Worker Assistance Act of 2002 allows businesses to take an additional 30 percent depreciation on solar, wind and geothermal property in the first year. The 30 percent depreciation only applies to property purchased after September 10, 2001 and before September 11, 2004, which is placed in service before January 1, 2005. This depreciation allowance can be taken along with the depreciation allowance provided under the Solar, Wind and Geothermal Modified Accelerated Cost Recovery System.

SOLAR, WIND AND GEOTHERMAL MODIFIED ACCELERATED COST RECOVERY SYSTEM (FEDERAL)

Under the Modified Accelerated Cost Recovery System, businesses can recover investments in solar, wind and geothermal property through depreciation deductions. This benefit establishes a set of class lives for various types of property, ranging from three to 50 years, over which the property may be depreciated. For solar, wind and geothermal property placed in service after 1986, the current property class is five years. This depreciation allowance can be taken along with the depreciation allowance provided under the Job Creation and Worker Assistance Act of 2002.

FINANCIAL INCENTIVES

Focus on Energy Incentives include Cash-Back Rewards and grants for feasibility studies.

NET ENERGY BILLING

All investor-owned electric utilities (and many municipal utilities and electric cooperatives) allow customers who have renewable electric systems with a capacity of 20 kW or less to direct surplus power back to the grid when their system is generating more power than they require and draw power from the grid when the customer needs more power. Contact your electric utility for more information.

POWER PURCHASE AGREEMENTS

A power purchase agreement with a utility typically pays the producer of renewable electricity a premium above the utility's "avoided cost," which is the price the utility pays for electricity produced from fossil fuels.

UTILITY PROGRAMS

Some utilities offer equipment leasing programs, rebates, low interest loans, ownership of equipment and grant programs. Contact your electric utility for more information.

EDUCATIONAL OPPORTUNITIES

WORKSHOPS

Scholarships are available for attending workshops on renewable energy, which offer practical information that can help you select the renewable energy technologies appropriate for your facility.

DEMONSTRATION SITES

Demonstration sites and tours are available that show renewable energy systems in action on agricultural facilities throughout Wisconsin.

SITE ASSESSMENTS

If you would like more in-depth information about how renewable energy can be added to your facility, we can arrange for a consultant to visit you.

FOR MORE INFORMATION

focusonenergy.com

Visit this site for fact sheets on various renewable energy topics; case studies about industries that have implemented renewable energy technologies; the Renewable Energy Yellow Pages, which consists of consultants, contractors and suppliers of renewable energy technologies, and workshop and demonstration site information.

www.dsireusa.org

The Database of State Incentives for Renewable Energy (DSIRE) is a comprehensive source of information on state, local, utility and selected federal incentives that promote renewable energy. Visit this site for more information on incentives available for renewable energy technologies.

the-mrea.org

The Midwest Renewable Energy Association is a nonprofit network for sharing ideas, resources and information with individuals, businesses and communities to promote a sustainable future through renewable energy and energy efficiency. Visit this site for a list of renewable energy workshops, information about the Wisconsin Tour of Solar Homes and the Midwest Renewable Energy and Sustainable Living Fair.

Focus on Energy is a public-private partnership offering energy information and services to energy utility customers throughout Wisconsin. The goals of this program are to encourage energy efficiency and use of renewable energy, enhance the environment and ensure the future supply of energy for Wisconsin. **800.762.7077** focusonenergy.com

