



# **RENEWABLE ENERGY TODAY**

SUCCESSFUL DEMONSTRATIONS IN NORTHEASTERN WISCONSIN

# INTRODUCTION

This booklet provides information about a variety of renewable energy technologies in Northeast Wisconsin, how they are working and how much they cost.

Renewable energy is an increasingly important part of our energy mix in Wisconsin. It expands the diversity of the state's energy mix while tapping local energy sources and creates local employment opportunities. In addition, using renewable resources increases economic growth and reduces the negative environmental impacts due to burning fossil fuels.

From 1999 to 2002, the Focus on Energy Renewable Energy pilot program encouraged the adoption of renewable energy in 23 counties in Northeast Wisconsin that comprised the Focus on Energy pilot area. Cost sharing grants were made available to businesses and consumers to install renewable energy technologies and demonstrate those installations. The 15 demonstration sites in this booklet can be visited, although some require advance arrangements.

## **Multiple Technology Locations**

A number of locations described in this booklet demonstrate multiple technologies. Two sites (sites 2 and 13) demonstrate four or more technologies. These are the Midwest Renewable Energy Association (MREA) and the University of Wisconsin – Green Bay (UWGB). These educational demonstrations were installed as part of their mission to make information on sustainable technologies available to the public.

The MREA's ReNew the Earth Institute is a passive solar building with working renewable energy systems, hands-on educational displays, demonstration gardens, a resource library, and a workshop/conference room.

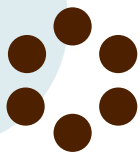
UWGB, with the help of Wisconsin Public Service Corporation (WPSC), incorporated several renewable energy technologies into a new building on campus and installed a data acquisition system to monitor the photovoltaic systems. Information about these technologies, and performance data, is available via the Internet and also at an information kiosk at the facility.

One of the demonstrations represents installations at multiple locations. These were installed as part of WPSC's SolarWise® for Schools program. Fifteen high schools in the WPSC area have installed SolarWise photovoltaic systems and are producing electricity: Green Bay East, Southern Door, Antigo, De Pere, Mosinee, Waupaca, Crandon, Pulaski, Oshkosh-West, Denmark, Laona, Lourdes-Oshkosh, Green Bay Southwest, Merrill, and Wausaukee high schools.

### **Additional Information**

A number of the sites featured in this booklet are open to the public during the American Solar Energy Society's National Tour of Solar Buildings. The tour is held each year in October. More information about the tour is available from [www.ases.org](http://www.ases.org). Information about Wisconsin tours is available through the MREA at [www.the-mrea.org](http://www.the-mrea.org).

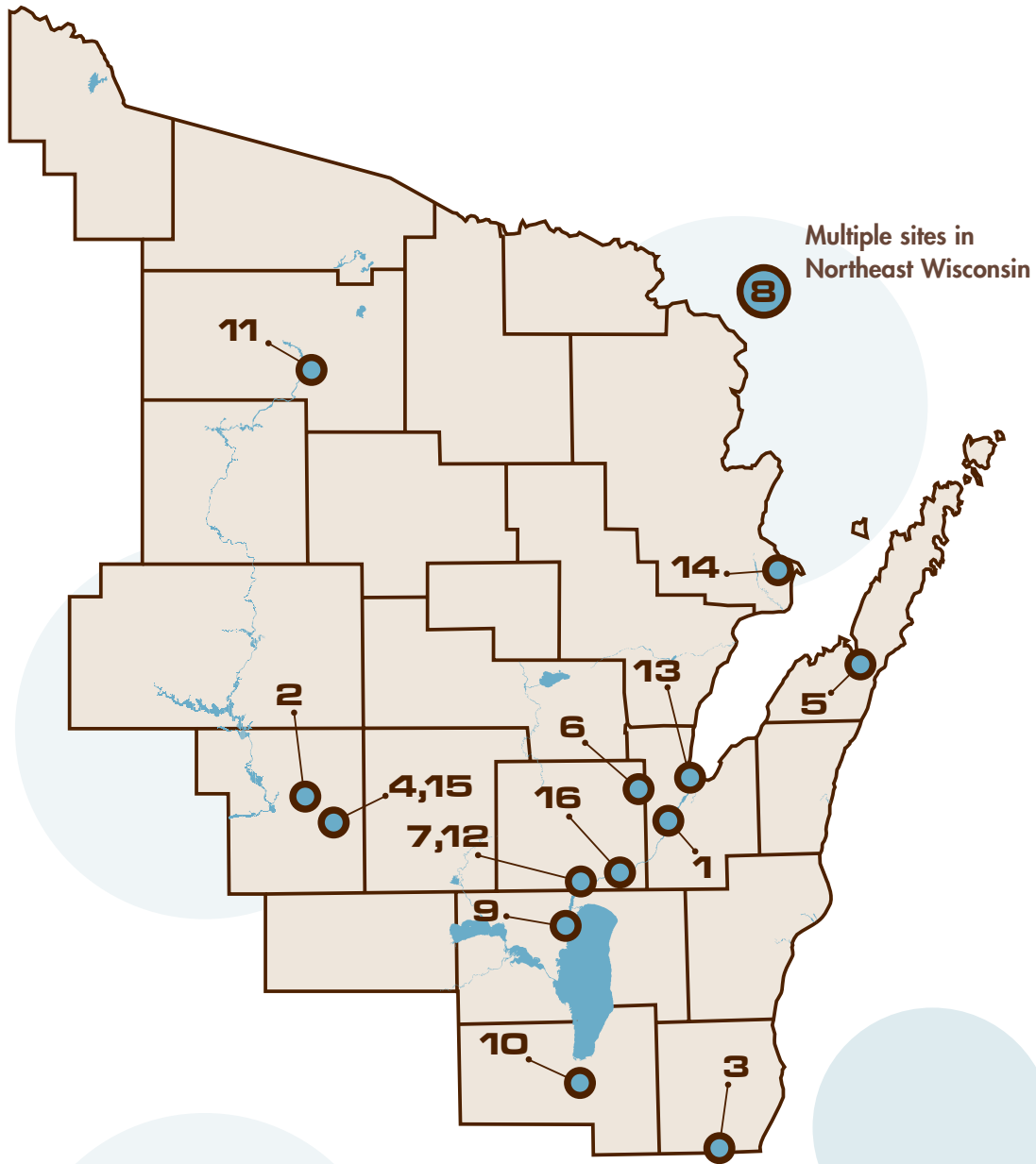
The Focus on Energy Renewable Energy program has expanded with the statewide Focus on Energy Program. This will lead to more demonstration sites around the state. Information about the Renewable Energy program, and other renewable energy information, is available on the Web at [www.focusonenergy.com](http://www.focusonenergy.com) or by calling 1-800-762-7077. Additional resources for information about the demonstration sites and the technologies can be found in the back of this booklet.



**focus on energy**<sup>sm</sup>

*The power is within you.*

# NORTHEAST WISCONSIN DEMONSTRATION SITE MAP



- ① Bircher Home
- ② Midwest Renewable Energy Association
- ③ Ritger Law Office
- ④ Gimme Shelter Construction
- ⑤ Lake Michigan Wind and Sun
- ⑥ Oneida Environmental Resources Board
- ⑦ Appleton Elementary Schools
- ⑧ SolarWise® Projects
- ⑨ St. Mary's Central High School
- ⑩ Fond du Lac High School
- ⑪ Nicolet College
- ⑫ Fox Valley Technical College
- ⑬ UW-Green Bay
- ⑭ Northern Lights Master Gardener's Assn.
- ⑮ Gordondale Farms

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- 4 Wood and Sun Give Company All its Heat

## Solar Hot Water

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- 6 Oneida Nation Building Solar Legacy
- 9 St. Mary Central High School's Environmental Energy Education Center

## Photovoltaics

- 1 Sunshine Cuts Energy Bill in Half for De Pere Family
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- 10 Geothermal Heat Pump Heats and Cools in Fond du Lac

## Education

- 8 SolarWise® for Schools
- 9 St. Mary Central High School's Environmental Energy Education Center

# REFERENCES

## PUBLIC LOCATIONS

### Fox Valley Technical College

Randy Tenpas  
P.O. Box 2277  
1825 Bluemound Drive  
Appleton, WI 54912-2277  
920-735-5673

### Gimme Shelter Construction

P.O. Box 176  
Amherst, WI 54406  
715-824-7200  
[www.gimmeshelteronline.com](http://www.gimmeshelteronline.com)

### Lake Michigan Wind & Sun

1015 County U  
Sturgeon Bay, WI 54235-8353  
920-743-0456  
[www.windandsun.com](http://www.windandsun.com)

### Mary Ann Cofrin Hall University of Green Bay

University of Wisconsin-Green Bay  
2420 Nicolet Drive  
Green Bay, WI 54311  
920-465-2039  
[www.uwgb.edu/admissions/tour/mach.htm](http://www.uwgb.edu/admissions/tour/mach.htm)  
[www.buildingsolar.com](http://www.buildingsolar.com)

### Midwest Renewable Energy Association

7558 Deer Road  
Custer, WI 54423  
715-592-6595  
[www.the-mrea.org](http://www.the-mrea.org)

### Northern Lights Master Gardeners Association

UW Extension  
Courthouse  
1926 Hall Avenue  
Marinette, WI 54143-1717  
715-732-7510  
[www.uwex.edu/ces/cty/marinette/ag\\_hort/nlmg/nlmg.html](http://www.uwex.edu/ces/cty/marinette/ag_hort/nlmg/nlmg.html)

### Nicolet Area Technical College

Lake Julia Campus  
County Highway G  
Rhineland, WI 54501  
715-365-4474  
[www.nicoletcollege.com/homer.htm](http://www.nicoletcollege.com/homer.htm)

## PROJECT CONTRACTORS

### Renewable Energy Yellow Pages

Available from Focus on Energy or  
[www.focusonenergy.com](http://www.focusonenergy.com)

### Architectural Energy Corporation

2540 Frontier Avenue, Suite 201  
Boulder, CO 80301  
303-444-4149  
[www.archenergy.com](http://www.archenergy.com)

### Artha Farm

9784 County Road K  
Amherst, WI 54406-9355  
715-824-3463  
[artha@wi-net.com](mailto:artha@wi-net.com)

### Community Builders

William Hurrle  
4280 Algoma Road  
New Franklin, WI 54229  
920-866-3648  
[wmh@online.dct.com](mailto:wmh@online.dct.com)

### GHD, Inc.

Steve Dvorak  
P.O. Box 69  
Chilton, WI 53014  
920-849-9797  
[ddghd@TDS.net](mailto:ddghd@TDS.net)

### Great Northern Solar

Christopher LaForge  
Route 1, Box 176  
Port Wing, WI 54865  
715-774-3374  
[gosolar@cheqnet.net](mailto:gosolar@cheqnet.net)

### J. F. Ahern Co.

855 Morris Street  
P.O. Box 1316  
Fond du Lac, WI 54936-1316  
920-907-5554

### Jindra Plumbing & Heating

5929 County Road B  
Manitowoc, WI 54220  
920-683-3600  
[mail@jindraplghtg.com](mailto:mail@jindraplghtg.com)

### Miller Wagner Coenen McMahon Inc.

Corporate Headquarters:  
1445 McMahon Drive  
Neenah, WI 54956  
920-751-4200  
[mcm@mcmgrp.com](mailto:mcm@mcmgrp.com)

### Photovoltaic Systems Co.

James Kerbel  
7910 Highway 54  
Amherst, WI 54406  
715-824-2069 (M-F 6 a.m. to 6 p.m.)

### Pipkorn Energy Systems

P.O. Box 37 W2810  
Butler, WI 54007  
414-796-1596

### Sun Research and Marketing

4538 N. French Road  
Appleton, WI 54915  
920-954-5545  
[www.sunroofing.net/Solar](http://www.sunroofing.net/Solar)

### Solar Mining

Richard Lane  
4226 Whisper Lane  
De Pere, WI 54115  
920-983-7610

### Solar Design Associates

P.O. Box 242  
Harvard, MA 01451-0242  
978-456-6855  
[www.solar design.com](http://www.solar design.com)

### Somerville, Inc.

2100 Riverside Drive  
Green Bay, WI 54301-12390  
920-437-8136  
[www.somervilleinc.com](http://www.somervilleinc.com)

### Specialty Associates, Inc.

11122 W. Rogers Street  
West Allis, WI 53227  
414-327-6066  
[info@sairoofing.com](mailto:info@sairoofing.com)

### Stiegler Electric Electrical Contractor

1758 Western Avenue  
Green Bay, WI 54303-2549  
920-865-7690

### Thelen Engineering & Associates

120 E. Wisconsin Avenue  
P.O. Box 104  
Oconomowoc, WI 53066  
262-367-3500

### Van Den Heuvel Electric Inc.

940 Oak  
De Pere, WI 54115  
920-336-6766

## GOVERNMENT AND ORGANIZATIONS

### Focus on Energy

800-762-7077  
[www.focusonenergy.com](http://www.focusonenergy.com)

### American Solar Energy Society

2400 Central Avenue, Suite G-1  
Boulder, CO 80301  
303-443-3130  
[www.ases.org](http://www.ases.org)

### Daylighting Collaborative

Energy Center of Wisconsin  
595 Science Drive  
Madison, WI 53711  
800-864-6254  
[www.daylighting.org](http://www.daylighting.org)  
[www.ecw.org](http://www.ecw.org)

### Energy Efficiency and Renewable Energy Clearinghouse (EREC)

P.O. Box 3048  
Merrifield, VA 22116  
1-800-363-3732  
[www.eren.doe.gov/consumerinfo/](http://www.eren.doe.gov/consumerinfo/)

### Wisconsin Geothermal Association

P.O. Box 248  
Rice Lake, WI 54868  
Toll-Free 1-888-436-7040  
715-736-4361  
[www.wisgeo.org/index.html](http://www.wisgeo.org/index.html)

### Wisconsin Department of Administration

Division of Energy  
P.O. Box 7868  
Madison, WI 53707-7868  
608-266-8234

# REFERENCES

## FACT SHEETS AVAILABLE FROM U.S. DEPARTMENT OF ENERGY

[www.eren.doe.gov/consumerinfo/factsheet.html](http://www.eren.doe.gov/consumerinfo/factsheet.html)

### GENERAL SOLAR INFORMATION

[www.eren.doe.gov/RE/solar\\_basics.html](http://www.eren.doe.gov/RE/solar_basics.html)

[www.eren.doe.gov/erec/factsheets/climate.html](http://www.eren.doe.gov/erec/factsheets/climate.html)

## DIRECTORY OF MANUFACTURERS AND INSTALLERS

[www.seia.org/](http://www.seia.org/)

[www.solaraccess.com/](http://www.solaraccess.com/)

[www.ixj.com/yearbook/index.html](http://www.ixj.com/yearbook/index.html)

[www.homepower.com/community/directory.cfm](http://www.homepower.com/community/directory.cfm)

## US DEPARTMENT OF ENERGY REFERENCE LISTS

### **Solar and Energy Efficiency**

[www.eren.doe.gov/consumerinfo/refbriefs/vi2.html](http://www.eren.doe.gov/consumerinfo/refbriefs/vi2.html)

### **Solar heating**

[www.eren.doe.gov/consumerinfo/refbriefs/vg6.html](http://www.eren.doe.gov/consumerinfo/refbriefs/vg6.html)

### **Sunspaces**

[www.eren.doe.gov/consumerinfo/refbriefs/vg9.html](http://www.eren.doe.gov/consumerinfo/refbriefs/vg9.html)

### **PV**

[www.eren.doe.gov/consumerinfo/refbriefs/vc8.html](http://www.eren.doe.gov/consumerinfo/refbriefs/vc8.html)

### **BIPV**

[www.eren.doe.gov/consumerinfo/refbriefs/v135.html](http://www.eren.doe.gov/consumerinfo/refbriefs/v135.html)

### **Wind**

[www.eren.doe.gov/consumerinfo/refbriefs/vi3.html](http://www.eren.doe.gov/consumerinfo/refbriefs/vi3.html)

[www.eren.doe.gov/consumerinfo/refbriefs/ta4.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ta4.html)

### **Wood**

[www.eren.doe.gov/consumerinfo/refbriefs/t357.html](http://www.eren.doe.gov/consumerinfo/refbriefs/t357.html)

### **Anaerobic digestion**

[www.eren.doe.gov/consumerinfo/refbriefs/ab5.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ab5.html)

### **Geothermal heat pumps**

[www.eren.doe.gov/consumerinfo/refbriefs/t354.html](http://www.eren.doe.gov/consumerinfo/refbriefs/t354.html)

### **Radiant floor heating and cooling systems**

[www.eren.doe.gov/consumerinfo/refbriefs/t354.html](http://www.eren.doe.gov/consumerinfo/refbriefs/t354.html)

### **ENERGY-EFFICIENT DESIGN:**

<http://www.weccusa.org/wesh/>  
<http://yosemite1.epa.gov/estara/homebuyers.nsf/content/WhatAreESLHs.htm>  
[www.ase.org/checkup/home/index.html](http://www.ase.org/checkup/home/index.html)  
[www.eren.doe.gov/consumerinfo/refbriefs/ea2.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ea2.html)

### **PASSIVE SOLAR DESIGN:**

[www.eren.doe.gov/erec/factsheets/passive\\_solar.html](http://www.eren.doe.gov/erec/factsheets/passive_solar.html)  
[www.eren.doe.gov/der/passive\\_solar\\_design.html](http://www.eren.doe.gov/der/passive_solar_design.html)  
[www.nrel.gov/clean\\_energy/home\\_passive.html](http://www.nrel.gov/clean_energy/home_passive.html)

### **SOLAR SPACE AND WATER HEATING:**

[www.eren.doe.gov/erec/factsheets/heat.html](http://www.eren.doe.gov/erec/factsheets/heat.html)  
[www.eren.doe.gov/erec/factsheets/solwatr.html](http://www.eren.doe.gov/erec/factsheets/solwatr.html)  
[www.eren.doe.gov/femp/prodtech/sw\\_water.html#about](http://www.eren.doe.gov/femp/prodtech/sw_water.html#about)  
[www.eren.doe.gov/consumerinfo/refbriefs/ad4.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ad4.html)

### **PHOTOVOLTAICS:**

[www.solarelectricpower.org/](http://www.solarelectricpower.org/)  
[http://64.243.182.248/going\\_solar/ABCs\\_PVs.cfm](http://64.243.182.248/going_solar/ABCs_PVs.cfm)  
[www.fsec.ucf.edu/PVT/pvbasics/index.htm](http://www.fsec.ucf.edu/PVT/pvbasics/index.htm)  
[www.solaraccess.com/education/solar.jsp?id=pv](http://www.solaraccess.com/education/solar.jsp?id=pv)  
[www.nrel.gov/ncpv/faq.html](http://www.nrel.gov/ncpv/faq.html)  
[www.eren.doe.gov/erec/factsheets/pvbasics.html](http://www.eren.doe.gov/erec/factsheets/pvbasics.html)  
[www.eren.doe.gov/solarbuildings/pvbldgs.html](http://www.eren.doe.gov/solarbuildings/pvbldgs.html)

### **MASONRY HEATER:**

[www.gimmeshelteronline.com/stoves.htm](http://www.gimmeshelteronline.com/stoves.htm)  
[www.eren.doe.gov/consumerinfo/refbriefs/ac8.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ac8.html)

### **WIND:**

[www.awea.org/](http://www.awea.org/)  
[www.eren.doe.gov/consumerinfo/refbriefs/ja2.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ja2.html)  
[www.eren.doe.gov/erec/factsheets/wind.html](http://www.eren.doe.gov/erec/factsheets/wind.html)  
[www.eren.doe.gov/wind/web.html](http://www.eren.doe.gov/wind/web.html)

### **GREEN BUILDINGS:**

[www.wgba.org/](http://www.wgba.org/)  
[www.buildinggreen.com/](http://www.buildinggreen.com/)  
[www.greenguide.com/](http://www.greenguide.com/)

### **GEOHERMAL HEAT PUMPS:**

[www.eren.doe.gov/geothermal/whatisgeoenergy.html](http://www.eren.doe.gov/geothermal/whatisgeoenergy.html)  
[www.eren.doe.gov/erec/factsheets/geo\\_heatpumps.html](http://www.eren.doe.gov/erec/factsheets/geo_heatpumps.html)  
[www.eren.doe.gov/erec/factsheets/ghp\\_homeowners.html](http://www.eren.doe.gov/erec/factsheets/ghp_homeowners.html)  
[www.eren.doe.gov/geothermal/ghp\\_homeowners.html](http://www.eren.doe.gov/geothermal/ghp_homeowners.html)  
[www.eren.doe.gov/geothermal/ghp\\_schools.html](http://www.eren.doe.gov/geothermal/ghp_schools.html)  
[www.wisgeo.org/](http://www.wisgeo.org/)  
[www.geoexchange.org/](http://www.geoexchange.org/)  
[www.igshpa.okstate.edu/Publications/Brochures/Do\\_It\\_Naturally/din.htm](http://www.igshpa.okstate.edu/Publications/Brochures/Do_It_Naturally/din.htm)

### **HEAT RECOVERY VENTILATION:**

[www.eren.doe.gov/consumerinfo/refbriefs/ea5.html](http://www.eren.doe.gov/consumerinfo/refbriefs/ea5.html)  
<http://hem.dis.anl.gov/eehem/96/9603vent.html>  
[www.pnl.gov/techguide/4.htm](http://www.pnl.gov/techguide/4.htm)

### **BUILDING INTEGRATED PHOTOVOLTAIC:**

[www.advancedbuildings.org/main\\_t\\_elect\\_build\\_photovoltaics.htm](http://www.advancedbuildings.org/main_t_elect_build_photovoltaics.htm)  
[www.eren.doe.gov/solarbuildings/integrated.html](http://www.eren.doe.gov/solarbuildings/integrated.html)

### **ANAEROBIC DIGESTION:**

[http://manure.unl.edu/adobe/v7n10\\_01.pdf](http://manure.unl.edu/adobe/v7n10_01.pdf)  
[www.alliantenergy.com/news/news.php?issueID=112](http://www.alliantenergy.com/news/news.php?issueID=112)  
[www.ecw.org/ecw/infopackagedetailc.jsp?infoPackageId=18](http://www.ecw.org/ecw/infopackagedetailc.jsp?infoPackageId=18)  
[www.mrec.org/anaerobic\\_digestion\\_text.html](http://www.mrec.org/anaerobic_digestion_text.html)  
[www.discoveryfarms.org/methanepubbw.pdf](http://www.discoveryfarms.org/methanepubbw.pdf)