

# ENERGY WISE

## wind turbine and solar PV systems

### FAQ: MEMBER-OWNED RENEWABLE ENERGY

#### What are my options if I choose to install a renewable energy system?

##### Option 1: Off Grid

Your electric service would not be connected to the electric utility, and all your energy needs would be provided by your new renewable energy system.

##### Option 2: Grid Connected

Your electric service would continue to be connected to the electric utility. Your renewable system would be connected to your electric service. The energy in excess of what you use would be fed back into the distribution system.

#### How would I be compensated for the energy that is fed into the distribution system?

Electric utilities are required by state and federal law to allow member-owned renewable systems to be interconnected with the utility distribution system. The utility must purchase energy in excess of what the member uses at the existing service location at the average retail rate the member is paying the utility. This is called “net metering” and applies to renewable systems under 40 kW in Minnesota and 20 kW and under in Wisconsin.

*Example: Member uses 800 kWhs from utility, and renewable system sends 300 kWhs back to utility. Net bill for the month would be 800-300=500 kWhs billed to the member.*

#### I understand system sizes, but what is capacity factor?

Capacity factor is the ratio of actual output over time compared to output if producing at nameplate kW capacity 100% of the time. Wind turbine capacity is influenced primarily by tower height and wind availability at the site. Solar PV capacity factor is influenced primarily by sun exposure throughout the day and whether installation is tracking or a fixed system.

Your installer should conduct the testing to provide you with specific wind or solar availability at your site, as well as installation costs.

#### What can I expect a Solar PV or wind turbine system to produce if I decide to install one?

See reverse side for examples of how much you might expect the annual output of a renewable system to be.

#### Can you give me an idea of what system installation costs might be?

**Wind turbine cost: \$5-10,000/kW before incentives**

**Solar PV cost: \$3-7,000/kW before incentives**

The per kW costs shown above are provided by the MN Energy Information Center. These figures can vary greatly by site conditions, system size (the larger the system, the lower the cost per kW) and other variables. Specific installation costs should be obtained from your installer.

#### How long before a system pays for itself?

System payback is determined primarily by system cost, maintenance costs and system performance. Below are examples.

Payback Ex. 1: 10 kW wind turbine @ \$75,000 - 26% tax credit = \$55,500 / \$2,282 (@20% capacity factor) = 24.3 year payback

Payback Ex. 2: 15 kW solar PV @ \$75,000 - 26% tax credit = \$55,500 / \$2,567 (@15% capacity factor) = 21.6 year payback

#### Where can I learn about installers, incentives and general information on these systems?

Call the MN Department of Commerce Energy Information Center, 1-800-657-3710.

For ECE interconnection requirements and general information, call Rob Gehrke, 715-399-6175 or 1-800-254-7944, ext. 6175.

See reverse side for additional websites.



## Solar PV or Wind Turbine Production Chart\*

in dollars of energy produced per year

CAPACITY FACTOR	SYSTEM SIZE (IN kW)							
	5	10	15	20	25	30	35	39.9
5%	\$285	\$570	\$856	\$1,141	\$1,426	\$1,711	\$1,996	\$2,276
10%	\$570	\$1,141	\$1,711	\$2,282	\$2,852	\$3,422	\$3,993	\$4,552
15%	\$856	\$1,711	\$2,567	\$3,422	\$4,278	\$5,134	\$5,989	\$6,828
20%	\$1,141	\$2,282	\$3,422	\$4,563	\$5,704	\$6,845	\$7,986	\$9,104
25%	\$1,426	\$2,852	\$4,278	\$5,704	\$7,130	\$8,556	\$9,982	\$11,380
30%	\$1,711	\$3,422	\$5,134	\$6,845	\$8,556	\$10,267	\$11,979	\$13,656

\*Includes energy you use and excess energy that you don't use (which you might sell back to your utility).  
2022 ECE Cogeneration Residential kWh Rate = .13023 cents per kWh

**Buyer beware: There are renewable systems in ECE service territory that consistently operate at a 5% capacity factor range.**

Visit these websites for more information:

**Solar PV & wind turbine grants/tax incentives**

dsireusa.org  
energystar.gov

**Solar PV & wind turbine general information**

eastcentralenergy.com  
(residential/renewable energy, for monitored  
wind and solar system performance)  
eere.energy.gov  
renewwisconsin.org

**Solar PV general information**

energy.gov  
sepapower.org

**Wind turbine general information**

cleanpower.org

