

Resources to Advance Clean Energy



Fritz Ebinger

Clean Energy Resource Teams (CERTs)

UMN Regional Sustainable Development Partnerships & Extension



CERTs: A Public Resource



CERTs Mission: Connect individuals and their communities to the resources they need to identify and implement community-based clean energy projects

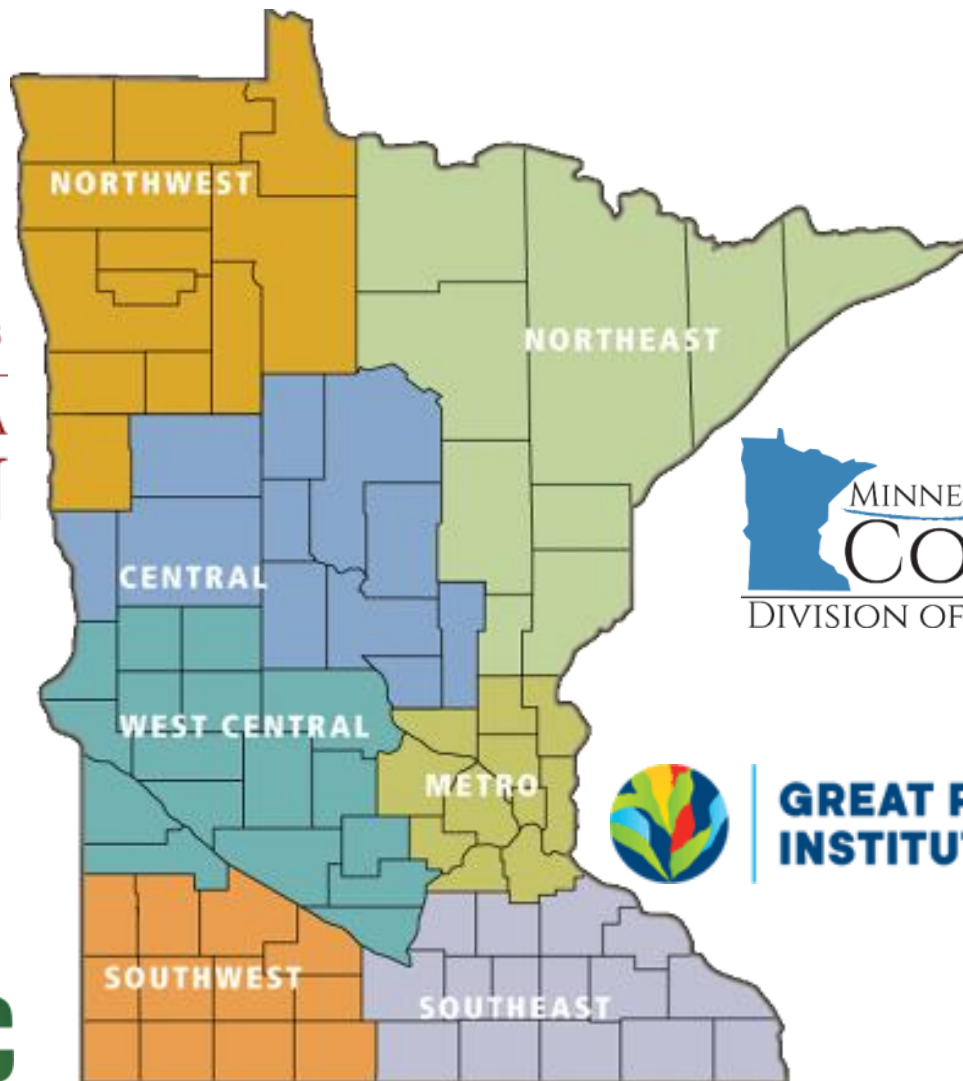


Statewide Partnership & Collaboration



Regional Sustainable
Development Partnerships

UNIVERSITY OF MINNESOTA
EXTENSION



**GREAT PLAINS
INSTITUTE**

Better Energy.
Better World.



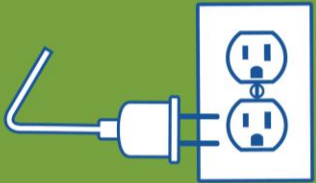
What Does CERTs Do?

LEARN



Write blog posts & case studies
Create educational guides
Manage diverse web-based tools

CONNECT



Host events, tours, and conferences
Help with community organizing
Connect people to technical resources

ACT



Provide seed grant funding and more
Deliver research-based campaigns
Spur other statewide programs

Right Light Guide



Right Light Guide for General Use Bulbs

Today there are many lighting options available. The right bulb for you depends on how much light you need, what color light you want, and its costs and features.

STEP 1 Decide How Much Light You Need

Focus on Brightness. Different amounts of light are needed for different uses. Instead of thinking about light bulbs based solely on the amount of energy they use, focus on their brightness level.

Lumen is the measurement of brightness—higher lumen bulbs produce brighter light.

Watt (W) is the measure of power consumption. Lower wattage bulbs can lower your electric bills.

If you like your bulb's current brightness, choose a CFL or LED with similar lumens to reduce your energy use. You may also consider a bulb that is less bright to save more.

Note: Lumen output listed on packages may vary. Light bulbs listing anywhere from 800 to 800 lumens are similar in light, for instance.

Brightness	Incandescent	CFL	LED
450 lumens *	40W	9-13W	4-6W
800 lumens *	60W	13-16W	8-10W
1500 lumens *	75W	17-23W	11-15W
1600 lumens *	100W	23-30W	16-21W

Least Efficient → Most Efficient

STEP 2 Decide What Color Light You Want

Choose Light Appearance. You'll be pleased with your new bulb by choosing a light appearance that you like. All of these colors are available for LEDs and CFLs and at most brightness levels.

Note: Choose warm or soft white (2700-3000 K) to match the color of incandescent bulbs.

Different Colors, Same Brightness

Warm White, Warm White, Cool White, Cool White, Natural Daylight

2700K 3000K 3500K 4000K 5000K 6000K

Pros (+) and Cons (-)

product, replacement, and energy costs because LEDs can last that long. Some are unavailable. The pros and cons of you.

Pros (+) and Cons (-)

- Saves 80% of energy use over incandescent
- Lasts 25 times longer than incandescent
- Great for dimming, recessed, or enclosed fixtures
- Performs well in cold temperatures
- Higher bulb cost

- Saves 75% of energy use over incandescent
- Lasts 10 times longer than incandescent
- Recessed & enclosed fixtures reduce bulb life
- Performs poorly in cold temperatures
- Contains mercury (recycling required)

22 bulbs in 22 years

Energy Cost \$2.81 total cost

per consume power, hours of use per day, residential and a full protocol (W), visit <http://www.energystar.gov>

g Facts For Bulb

800 lumens

Energy Cost \$1.14

Energy Star

ENERGY STAR

9.5 watts

Resources

to learn about lighting rebates and lighting mncerts.org to learn more options.

CERTs Partners

Great Plains Institute

BRDC

CERTified Campaigns



Efficient Spray Valves and Aerators: Make a Splash



Light Recycling:

RECYCLE
YOUR HOLIDAYS

LED Lighting for Turkey Barns:



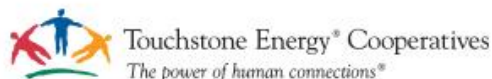
***GOBBLING UP
SAVINGS***

LED Lighting for Gas Station Canopies:

LIGHT UP YOUR STATION & SAVE

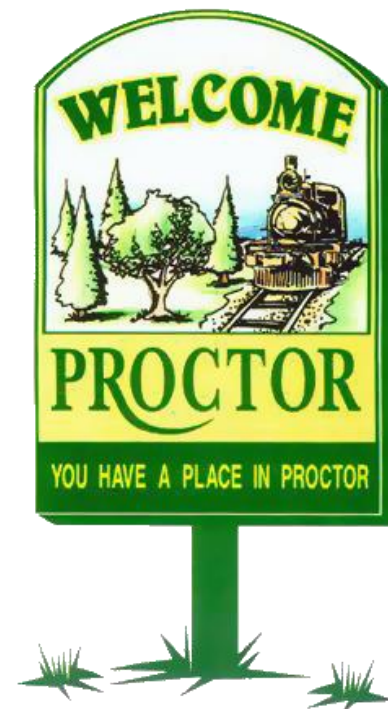


Small Business Blitzes

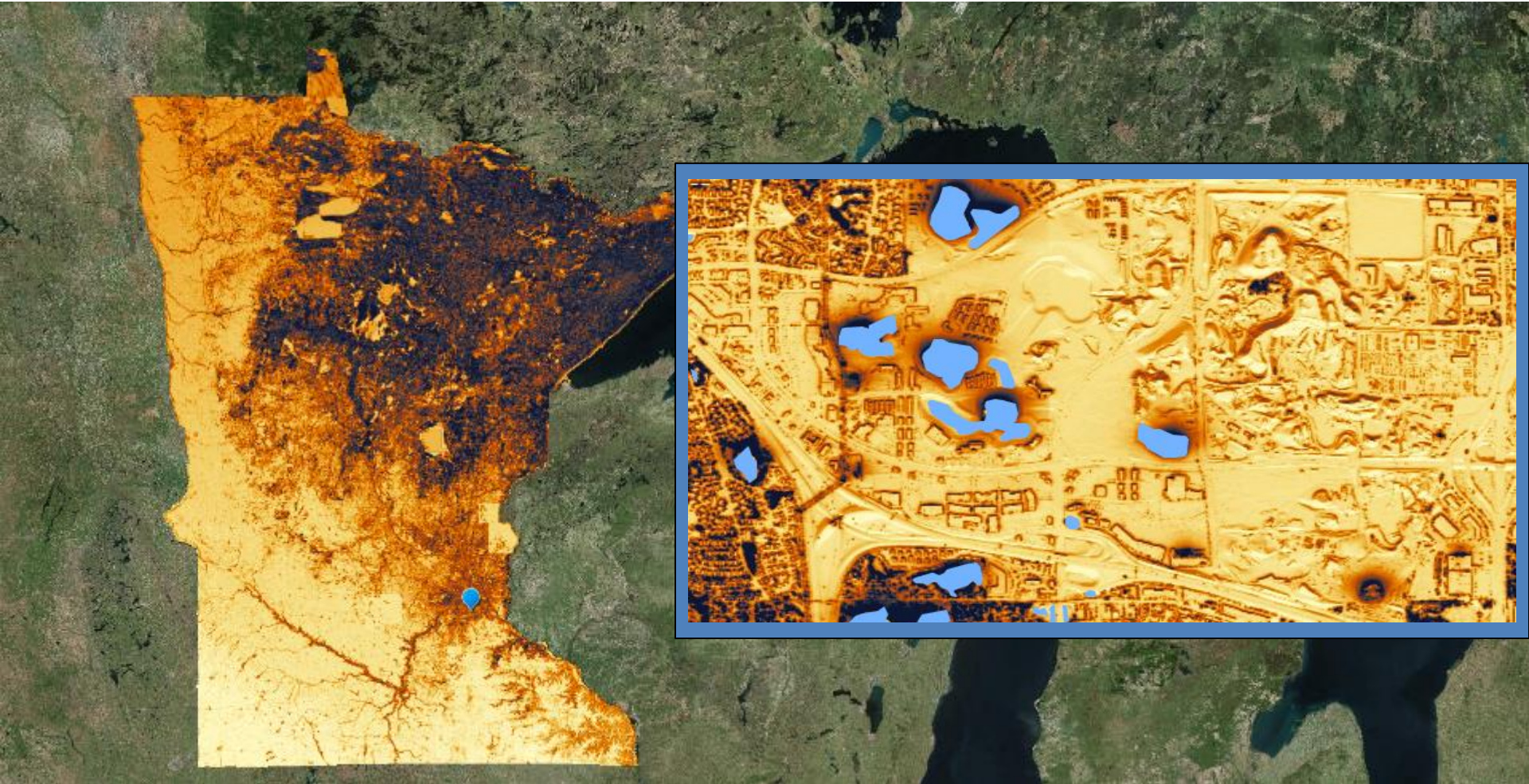


People's Energy Cooperative

Your Touchstone Energy® Cooperative



Solar Suitability App



mn.gov/solarapp

Clean Energy Project Builder



CLEAN ENERGY PROJECT BUILDER

HOME

COMPANIES

INSTALLATIONS

SOLAR GARDENS

RESOURCES

NEWS

ABOUT

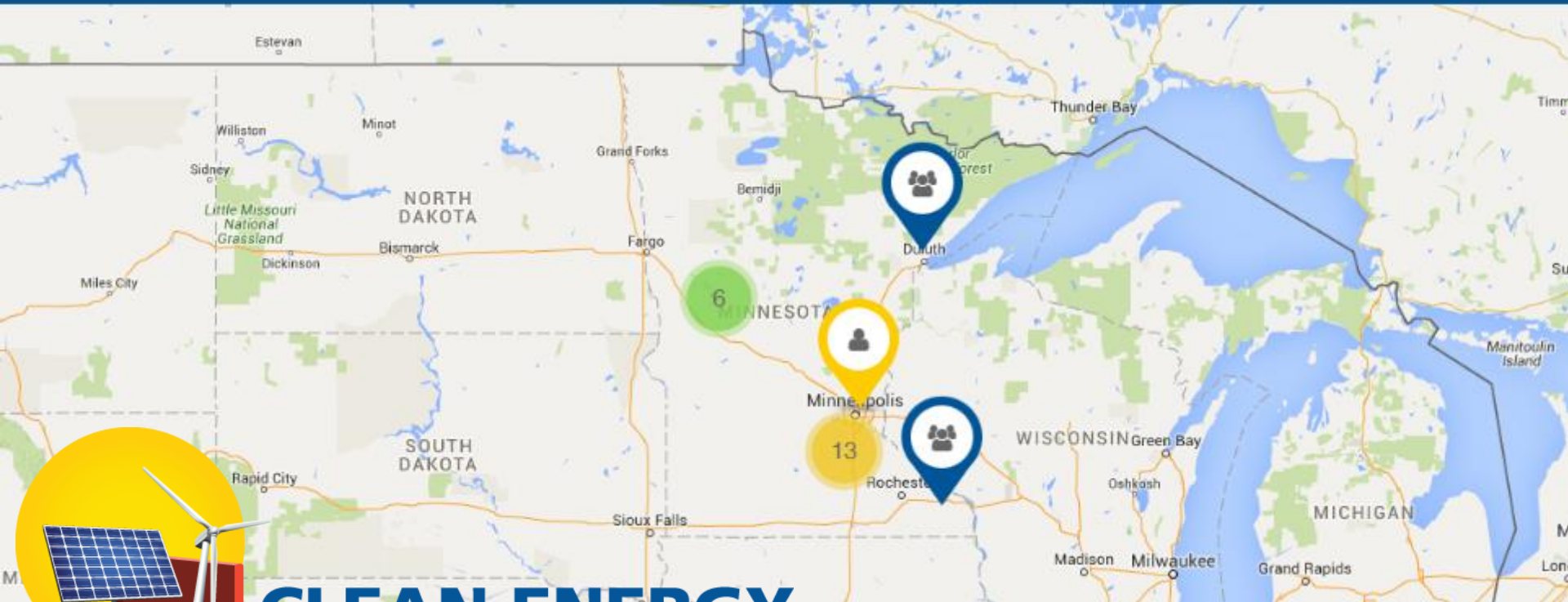
FIND SOLAR GARDENS

⚡ Electric Utility

☑ Availability

🌐 Eligible Counties

Search



**CLEAN ENERGY
PROJECT BUILDER**

cleanenergyprojectbuilder.org

Tools for Farms and Businesses



Renewable Energy for Greater Minnesota: Solar, wind, and biomass are plentiful sources of clean energy in Minnesota, and we're here to help farmers and rural small businesses get projects done. CERTs offers tools to pursuing renewable energy projects.

1. Renewable Energy System Sample Application



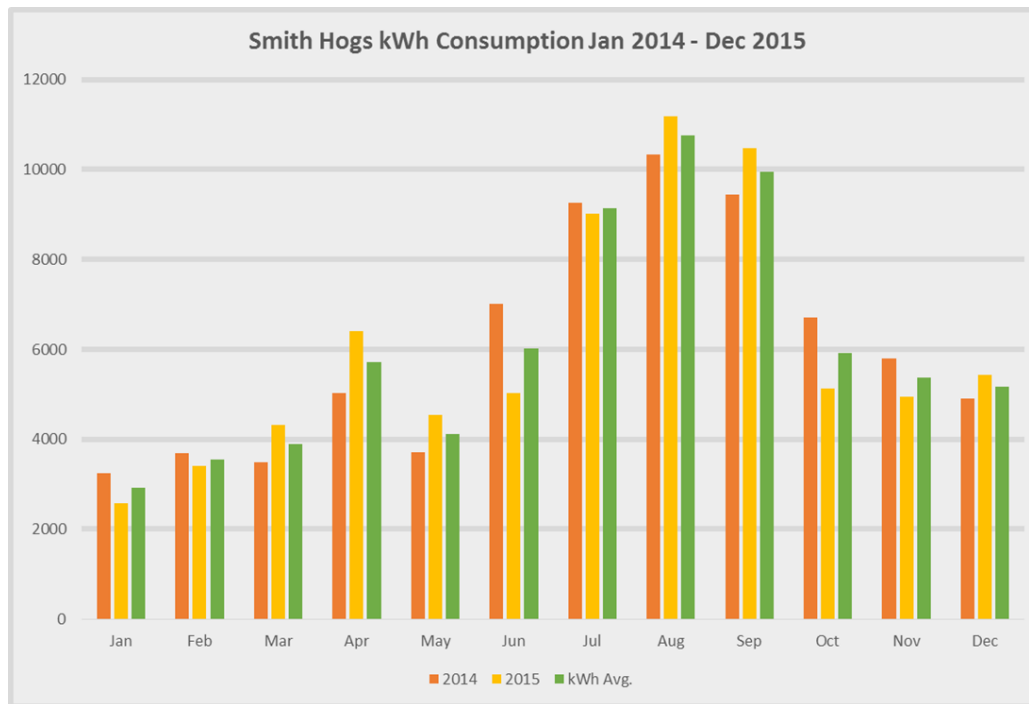
2. Energy Efficiency Project Sample Application



<http://www.cleanenergyresourceteams.org/project-planning/farmers>

R.E. for Greater Minnesota

- Starts with a load analysis
- How much energy use? What's the goal? Budget? Inefficiencies?



R.E. for Greater Minnesota



R.E. for Greater Minnesota



RESULTS



Print Results

51,265 kWh per Year *

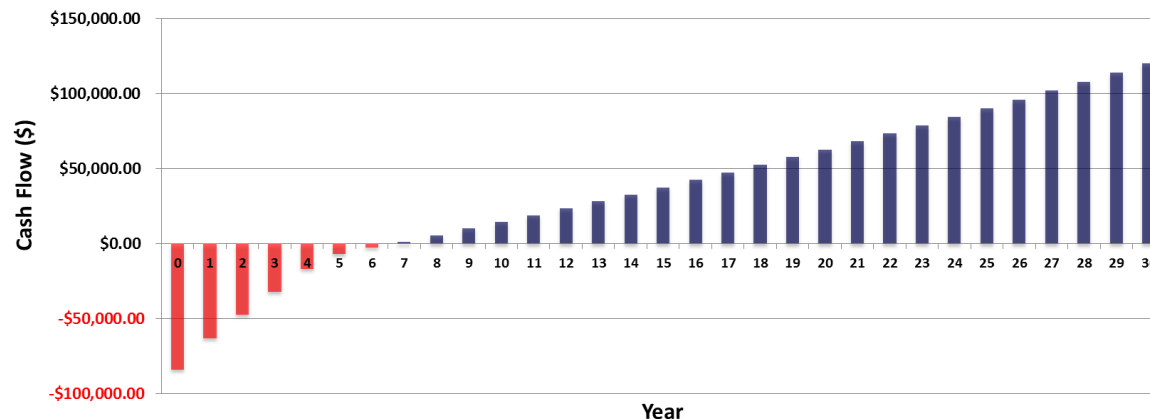
System output may range from 48,133 to 52,885kWh per year near this location.
Click [HERE](#) for more information.

Month	Solar Radiation (kWh / m ² / day)	AC Energy (kWh)	Energy Value (\$)
January	1.74	1,983	173
February	3.52	3,415	298
March	5.26	5,436	474
April	5.57	5,366	468
May	4.48	4,448	388
June	5.76	5,274	460
July	6.43	5,935	518
August	6.41	5,984	522

Summary of Financial Results

Initial Cost of PV System (Without Incentives)	\$159,800.00
Total Incentives	\$75,590.00
Net Cost of PV System After Incentives	\$84,210.00
First Year Utility Bill Savings	\$3,733.64
Number of Years to Cost Recovery	7.0 Years
Simple Payback	22.6 Years
Net Present Value (NPV) of PV System	\$37,603.13
Internal Rate of Return	10.57%
Profitability Index	1.45
Cumulative Cash Flow	\$120,259.80

Cumulative Cash Flow over PV System Lifetime



AGRI Biomass Grant



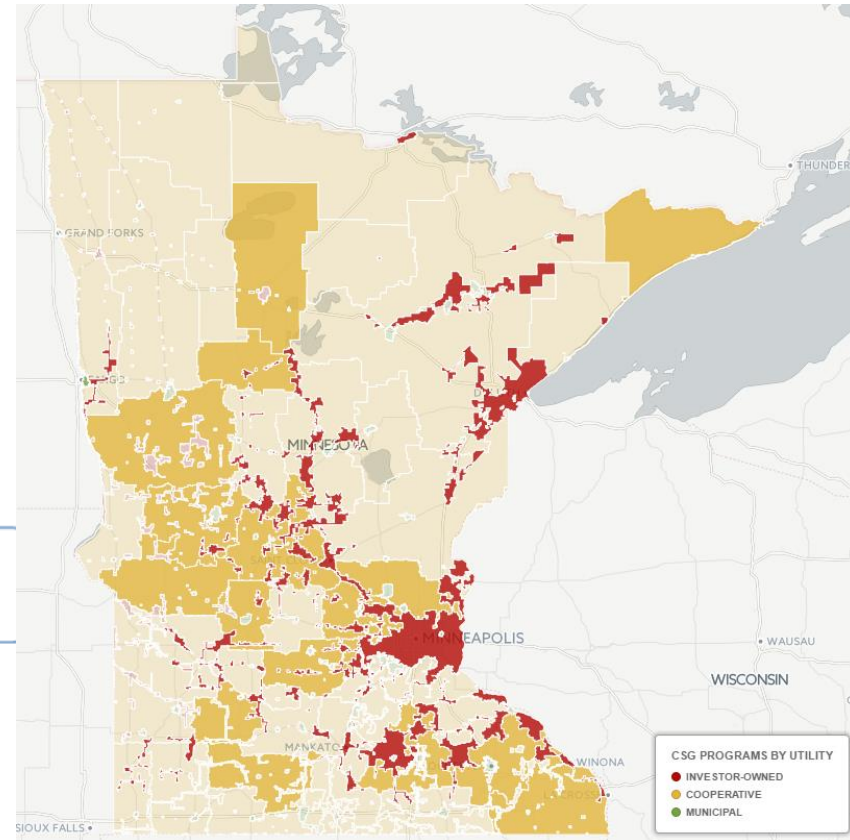
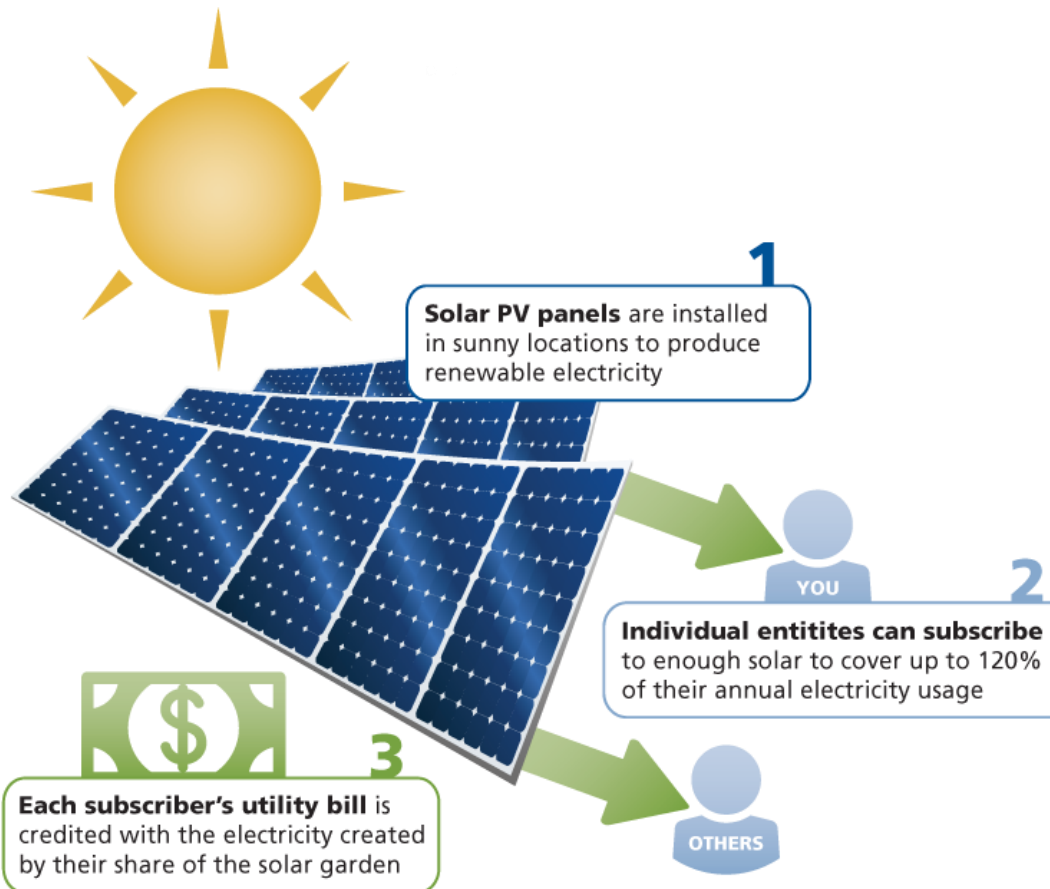
“Canned” project from Becky, Al and Jim Eincyk



- 1.65 MMBtu wood chip furnace
- 2-story broiler chicken barn
- Albany, MN
- Displacing 2/3 propane heat



Community Solar Gardens



Tools for Local Government and Landowners



**GUARANTEED ENERGY
SAVINGS PROGRAM**

<http://www.cleanenergyresourceteams.org/gesp>



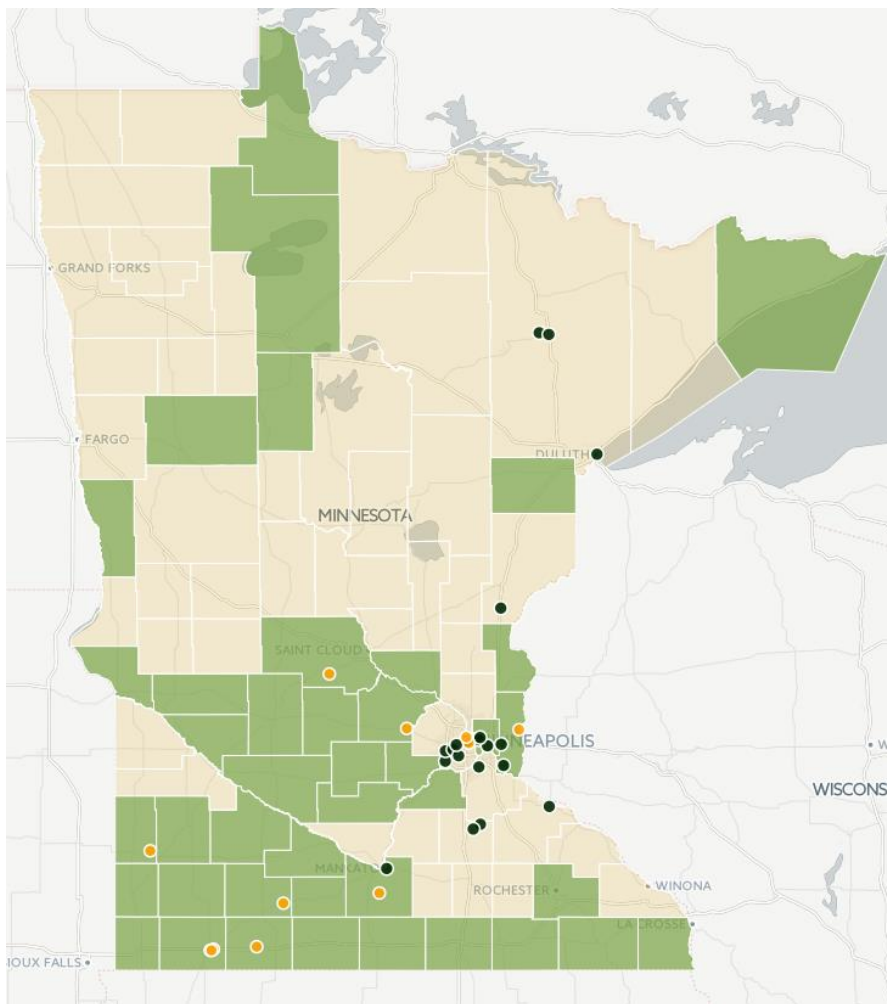
**Minnesota
GreenStep Cities**

<http://www.cleanenergyresourceteams.org/greenstep>



<http://www.cleanenergyresourceteams.org/pace>

Property Assessed Clean Energy



PACE financing sheds light on major energy savings at Blue Line Travel Center in Worthington, MN



Larry and Deb Potter own Blue Line Travel Center in Worthington, MN. For a long time they thought about saving energy with lighting upgrades, but they couldn't find the right financing to get it done. The availability of PACE financing shed new light on their goals.

[See lighting project details >>](#)

Parkwood Place in Mountain Lake, MN saving on energy costs with efficiency upgrades through PACE



Parkwood Place in Mountain Lake, MN provides assisted living and senior care options for elderly adults. They recently utilized the Rural Minnesota Energy Board's Property Assessed Clean Energy—or PACE—program to finance energy efficiency upgrades in their facility.

[Read the interview >>](#)

Solar made possible with PACE at Otten Bros. Garden Center and Landscaping in Long Lake, MN

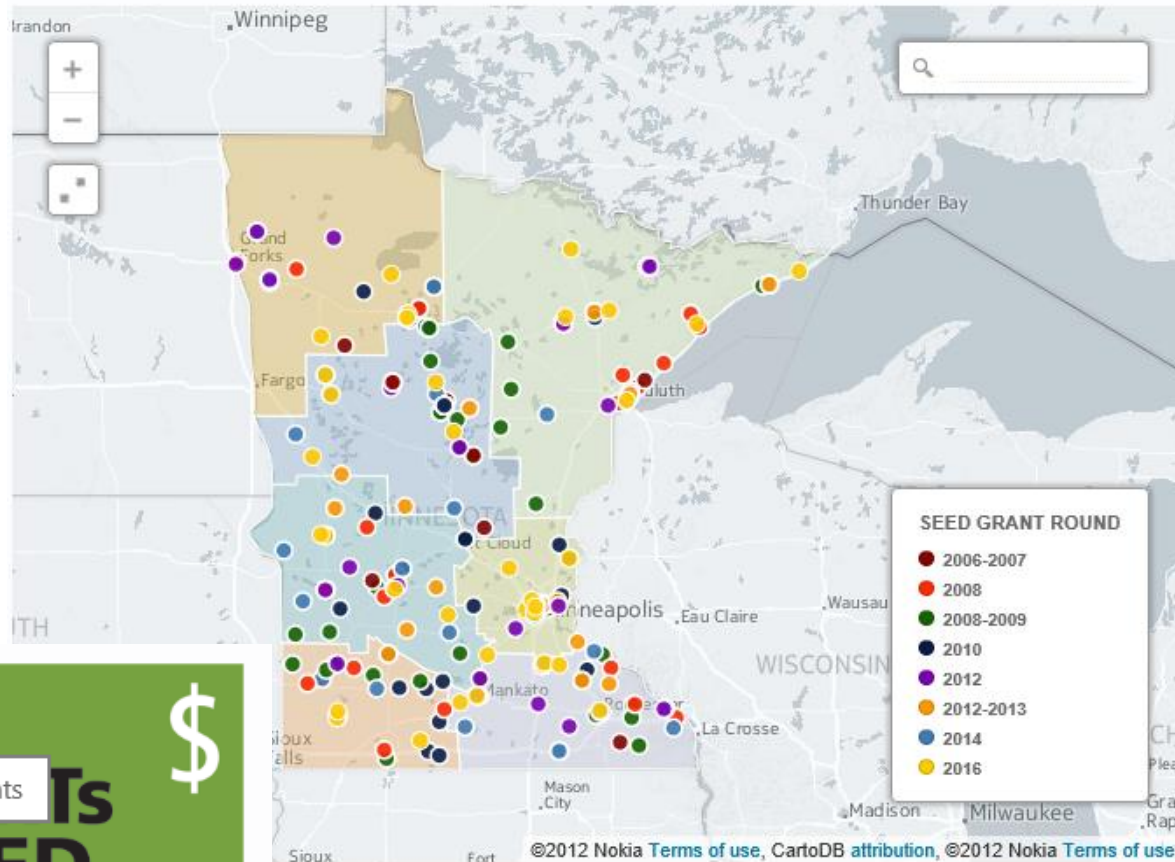


For over half a century, Otten Bros. Garden Center and Landscaping has been harnessing the power of the sun to grow plants and create beautiful spaces. With this history, it seemed like a natural step to use sunlight to power their business, and PACE helped them pay for it.

[Learn about their efforts >>](#)

<http://www.cleanenergyresourceteams.org/pace>

Seed Grants



<http://www.cleanenergyresourceteams.org/projects>

CERTs: Minnesotans Building a Clean Energy Future



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