

Midwest Renewable Energy Association Solar Power Hour









Why Are We Here?

Learn how solar energy works

Review solar ownership economics

MREA Group Buy saves money for all

How to participate

Start today!





Who is the MREA?

Mission we are a 501(c)(3) nonprofit dedicated to promote renewable energy, energy efficiency, and sustainable living through education and demonstration

Host the Annual Energy Fair in Custer, Wisconsin

Offices located in Custer and Milwaukee, Wisconsin and Minneapolis, Minnesota









Who is Ted?





- Architect and Urban Planner
- Partner with paleBLUEdot LLC, Maplewood (<u>www.paleBLUEdot.llc</u>)
 - Sustainability
 - Climate Action Planning
 - Renewable Energy Planning (supporting local communities and the US DOE)



Twin Cities Cool Solar Stuff



US Solar Installations

64.2 GW of installed capacity

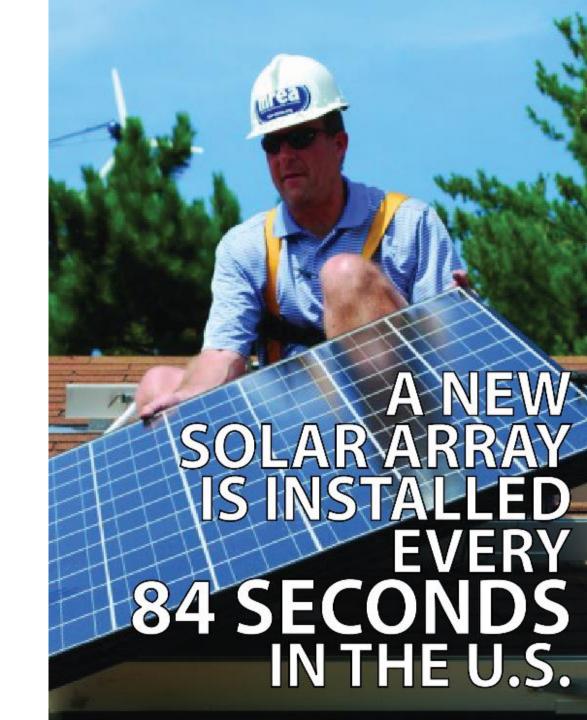
12.3 Million homes in US

4.2 GW in US Q4 2018

MN #5 in US Q3 2018

14% expected growth in 2019

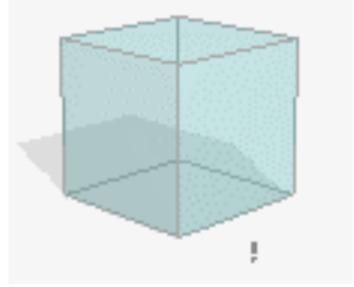




Environmental Benefits of Solar

Over its lifespan, every Solar PV module installed saves:

- 10,600 lbs of greenhouse gases
- Equivalent to 94,000
 Cubic Feet of Manmade
 Atmosphere





Environmental Benefits of Solar

Over its lifespan, every Solar PV module installed saves:

69,650 Gallons of water













Solair What is a Watt, kW, & kWh?

Watt (W) = unit of instantaneous Power This is the unit of base pricing of solar

Kilowatt (kW) = a measure of 1,000 W

This is how a solar array size is described







Solar What is a Watt, kW, & kWh?

Kilowatt-hour (kWh) = unit of Energy equal to 1,000 W x 1 hour







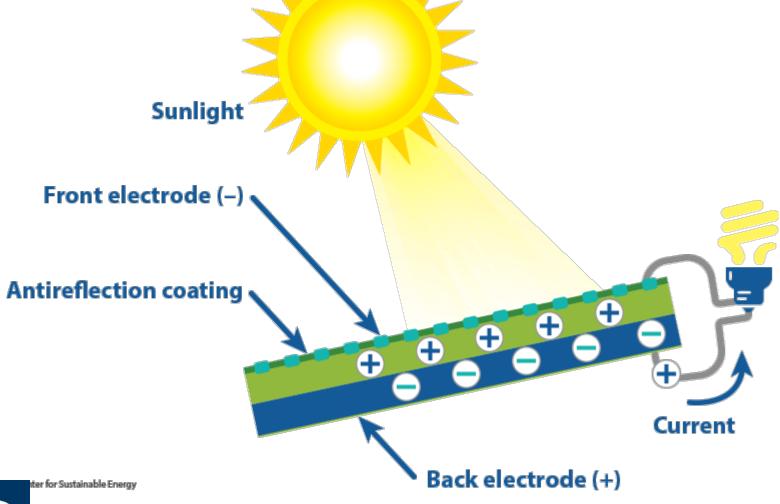
It is the use of Power over time

This is how electric utilities bill us.





How Does Solar Work?









Roof Mounted

Most common design

Good sun access

Considerations

- Roof condition
- Wind load
- Proper installation



Ground Mounted

Good for larger arrays

Large un-shaded areas

Easy snow and dust removal

Axis tracking available







Solar Interconnection - How's it Work?





Monitoring & Reporting



Solar Diffe Street Stre

Converts DC to AC

Complete system reporting & diagnostic data

Logs array production over time

Monitors real-time using phone or computer



Source: ww.solaredge.com





Utility Connected Solar Systems

Most systems are **net metered**Utility supplies balance of power
Less expensive than batteries
Off during power outages

Energy storage is available



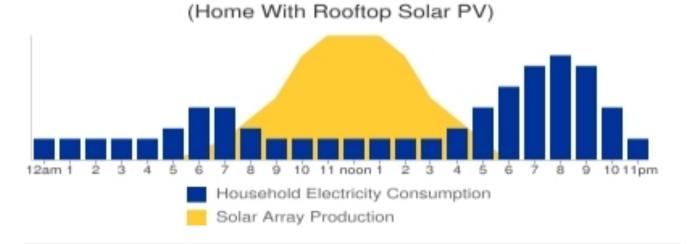


Net Metering

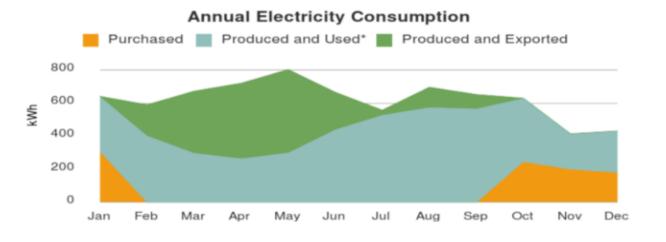
Energy value parity

Sell price **equals** buy price

Utility bills reconcile value



Daily Household Power Production and Consumption







MREA Group Buy





What is a MREA Group Buy?



It's a Win-Win scenario for all!

Competitive contractor selection

Community-led outreach

Strong consumer education

Significant cost savings

Limited-time offering





Solar MREA Solar Twin Cities 2.0 "The Basics"

Homeowners, businesses or nonprofits

No-cost site assessment and proposal

Proper design and installation

Financing & American-made products available

Reduced costs for everyone

May 15 through September 30, 2019







MREA Solar Twin Cities 2.0 Value Proposition

Reduced costs for everyone

Base cost: \$3.17 /watt

Progressive cost reductions for quantity of signups:

>50kw: Reduced to \$3.10

>150kw: Reduced to \$3.03

>250kw: Reduced to \$2.96

>350kw: Reduced to \$2.89







MREA Group Buy Programs

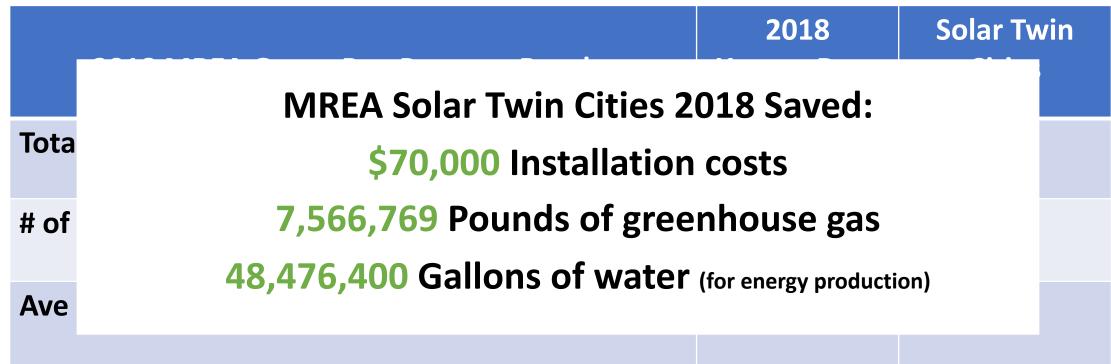
2018 MREA Group Buy Program Results	2018 Year to Date	Solar Twin Cities
Total Installed kW	3,815	232
# of Households/Businesses	482	35
Ave System Size (kW)	7.9	7.5



In all 1,041 homes & businesses in WI, IL, IA, and now MN have installed solar PV since 2013!



MREA Group Buy Programs





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Contractor Selection

MREA Advisory Committee

Solicited proposals from qualified local solar installers

Criteria

Experience, capacity, product selection, warranties, and cost







Licensed master electricians, NABCEP-certified installers, and degreed engineers will ensure your satisfaction!

No-cost solar site assessment & proposal

Meet customer to **review** proposal

Design your solar energy system

Submit all required permits

Assist with utility incentives

Build and interconnect your solar energy system



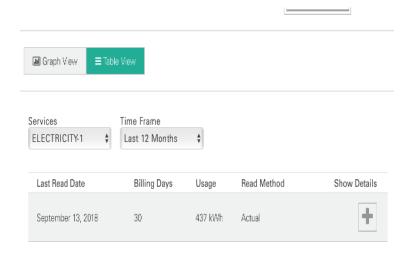
First Things First – Utility Data Twing

TruNorth Solar requires 12 months of utility history

Contact Xcel Energy at 800-895-4999

Log into myaccount.xcelenergy.com

Go to "My Usage" Table View – Last 12 Months







Economics





Solar Home Value

Lawrence Berkeley National Laboratory

- Studied home prices in 6 states
- Buyers willing to pay a premium for solar homes

NREL (National Renewable Energy Laboratory)

- Solar homes sold 20% faster
- Solar home value is 17% more than non-solar





Incentives

FEDERAL INVESTMENT TAX CREDIT	2019 INCENTIVE
Residential or Business	30% of system costs

NOTE: Steps down to 26% January 1, 2020 for both residential and business.

SOLAR*REWARDS – XCEL ENERGY	2019 INCENTIVE
Residential	\$.07/kWh for 10 years
Business, Nonprofits, Multi-Family	\$.06/kWh for 10 years

System Size: Up to 40kW

Non-profit & Multi-Family: income restricted





7.5kW Solar PV System Proposal

System Cost

\$3.17/W x 7475W (Base Price) **\$ 23,695**

Incentives

Federal ITC (30%) \$ 7,108

Solar*Rewards (\$.07/kWh) \$ 6,224

STC 2.0 Rebate (Max - \$.28/W). \$ 2,100

Net Cost \$ 8,263

Energy Production (Before/With Solar)

First Year Output 8,900 kWh

Annual Energy Cost (Before) \$ 1,483

Annual Energy Cost (with Solar) \$ 281

Components

23 Hanwha Q-Cell – 325W

23 SolarEdge P320 DC Optimizers

1 SolarEdge SE7600H Inverter





Simple Payback: 8.8 yrs



Solar MREA Group Buy Rebate Multiplier

Typical Home 9,200 kWh/Annually

Typical Solar Array 7.5 kW Array 23 solar panel 8,900 kWh/Annual output



60kW



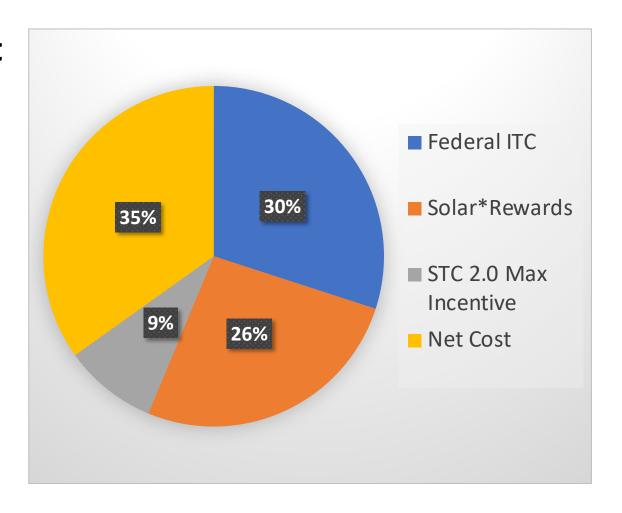
MREA Group Buy Value Proposition

Group Buy Pricing – Base \$3.17/Watt

- Milestones: > 50kW, 150kW, 250kW and 350kW
- Each Step Lowers Price \$.07 per Watt

Program Goal

- > 350kW Max Milestone
- Everyone Saves \$.28 per Watt





Financing Options

Residential Homeowners

Center for Energy and Environment (CEE) – multiple loan options

CU Green (MN Credit Union Network) – home equity loan

MFHA – Fix Up Loan Program - secured & unsecured loans

Commercial Businesses & Nonprofits

St Paul Port Authority - (MinnPACE) – positive cashflow in year one of assessment





Twin Cities How to Participate in Group Buy





Act Before September 30, 2019

STEP 1 – Signup at <u>www.solartwincities.org</u>

STEP 2 - Connect to discuss utility bills (within 2-3 days)

STEP 3 - TNS bill review & **no-cost** site assessment (7 -10 days)

STEP 4 - Meet to **review** proposal (within days of completion)

STEP 5 – You decide to act

STEP 6 – TNS schedules, **installs** and interconnects system







Ways to Join MREA

Sign up online at www.midwestrenew.org

Call MREA's Custer, WI office at 715-592-6595

Contact Development Director **Gina Miresse** at ginam@midwestrenew.org

Member support allows us to continue offering free educational sessions like this one. Let's grow solar!









Sign Up: www.SolarTwinCities.org

TruNorth Solar: 612-888-9599

Questions: Eric Rehm, MREA Solar Finance Manager: ericr@midwestrenew.org



