

Solar Power Hour!

We will begin our presentation shortly, starting with a brief introduction to zoom.























GROW SOLAR GREATER MILWAUKEE



Today's Agenda

- 1. What is the Grow Solar Milwaukee group buy program?
- 2. How does solar power work?
- 3. Solar options & considerations
- 4. Costs and cost-saving incentives
- 5. How to begin your solar journey

GOAL: Simplify a complex topic and make it easier and more affordable to go solar.



Why are we here? There are problems with the way you currently buy electricity.

1. Unpredictable rate increases

2. Not building equity

3. Pollution



ΟΤΑ

Cloud

Minneanolis

IOWA

City

POWERED

BY

Moines

Manitoulin Island Algo

B

PE

Pittsburgh

What is a group buy?

Lower Prices for High Quality using on Volume Purchase

OHIO

Everyone wins.

- 1. Competitive contractor selection
 - 2. Community-led outreach
- 3. Limited time offering
- 4. Strong customer education
- 5. Economy of scale

Cincinnati

Lexinaton

Peoria

ILLINC

N Green Bay

Ailm-

Nuke

Mark Twain

Louisville

INDIANA

ndianapol

BL

Evansville

WEST VIRGINIA

How it works

Grow Solar Greater Milwaukee Group Buy

- Educational sessions throughout the summer
- Installer selected April 2021
- Open to all Milwaukee County property owners, businesses, farms, and nonprofits
- Turnkey system: program Pricing includes design, permitting, components, installation (all-in cost), and warranties (5 years on labor and 10-25 years on equipment)
- Financing and American-made modules are available







Who is the MREA?

- Founded in 1990 with the first Energy Fair
- Promote renewable energy through educational courses in solar PV, solar thermal and small wind
- 42 Solar group buys, 1,946 properties, 14,000 kW of solar

INSTALLER PROFILE - Arch Electric Inc

Arch Electric has been installing Solar in Wisconsin since 2003 Growing from a team of less than 20 in 2017 to over 100 professionals in 2020 This is Arch Electric's 8th Group Buy in the Milwaukee Area Arch's Residential Solar Team, from design to installation, is entirely based in Wisconsin and only installs in Wisconsin. Arch has installed over 50MW of Solar Energy



Training Scholarships

- MREA recently provided training scholarships to ten trainees at Walnut Way in Lindsay Heights
- Interns trained by the MREA will work with Arch electric on installations through this program
- Help support more trainings like this by donating to the scholarship fund
- Walnut Way is also receiving a solar installation on their new Wellness Commons at 16th and North courtesy of Hammond Climate Solutions, Solar for Good, and Grow Solar Greater Milwaukee.



How Does Solar Work? Part 2 of 5







What's a Kilowatt Hour (kWh) and a Kilowatt (kW)?



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KILOWATT HOUR (kWh) a unit of energy used or produced. This is what shows up on your bill. KILOWATT (kW) a measurement of capacity: how big your array is.

Every home's system size and energy use is different.







Configuration: How It Works...





Inverter, the heart of the array.









Inverter, the heart of the array.





Racking



- Martine and



Grid-Tied VS.

Off-Grid







How Net Metering Works







" "A Day in the Life" of a Grid-Tied / Net Metered Home

DAILY HOUSEHOLD POWER PRODUCTION AND CONSUMPTION





Net Metering is generally calculated on a monthly basis
 Net Metering policies vary based on utility





"A Year in the Life" of a Grid-Tied / Net Metered Home







Options & Considerations Part 3 of 5







Location and Siting

- South-facing with 9am-3pm sun exposure is ideal
- Avoid shading: trees, buildings, or poles
- East or west-facing roofs are also workable options



Google Project Sunroof

Mounting: Roof Mounted Solar

- Roof is most common
- Need good solar window
 - South is ideal, but E/W only reduce ~20%
 - Trees can partially shade





Mounting: Ground Mount

- Good for larger arrays and for properties where house roof is shaded
- Require large un-shaded area
- Take advantage of best solar window
- Anchor to ground mounts
- Easy to remove snow, dust
- Static, but may have a summer/winter adjustment





Considerations

- System size and design •
- Module type
- Inverter type
- Slope, height of roof
- Complexity of electrical interconnection
- Age & type of roof
- Multiple PV arrays

Need good solar "window"

- South is ideal, but East + West only reduces production ~20%
- Environment
 - Shading
 - Snow / Hail
 - Wind Loading
 - Squirrels



Energy Efficiency

The cheapest kWh is the one that's never used.











Is my home well-suited for solar?

- Do I have a south facing roof?
- □ Are there shade issues?
- □ When do I anticipate re-roofing?
 - Is my roof structurally sound?
- □ Is my home energy efficient?



Solar Costs Part 4 of 5







Every Home Is Different

Your PV system will be tailor-made to fit your needs.



Pricing Varies by Site and Needs:

- System Design and Size
- Age and Type of Roof
- Panel Type

- Inverter Type
- Height and Pitch of Roof
- Complexity of Electrical
 Interconnection

- Multiple PV Arrays
- Energy Storage
- Transformer & Electric
 Service Upgrade



Focus on Energy Rebate (WI only)

Solar Electric (PV) System	Incentive
Residential Single Family Homes	\$500 per installation
Business Up to 5 kW	\$200 per kW, up to \$1,000
Business 5 - 10 kW	\$1,000 + \$150 per kW above 5 kW, up to \$1,750
Business 10 - 100 kW	\$1750 + \$125 per kW above 10 kW, up to \$13,000

 Additional eligibility requirements and status of remaining funds can be tracked at <u>https://focusonenergy.com/residential/renewable-energy</u>

Residential & Commercial Renewable Energy Tax Credit (Federal)

- Tax credit of 26% on qualified expenditures
 - Includes labor costs, system installation, interconnection wiring
 - Does not include new roof unless roof reinforcement is necessary to support the solar panels
- No maximum credit
- Res: The home must be owned by the taxpayer but does not have to serve as the principal residence
- Goes away for residential in 2024 (remains at 10% for commercial)







How Group Buys Work

The more properties that go solar, the lower the price:

Base Price:

\$3.03/Watt

Base price is lower than installer's market rate.

Group Buy Volume Discounts

Collective kW	>50 kW	>150 kW	>250kW	>350kW
Cumulative Discount per watt	\$.01/W	\$.05/W	\$.08/W	\$.20/W
Cumulative Discount per kilowatt	\$10/kW	\$50/kW	\$80/kW	\$200/kW
Approx. # of Homes	7-10 homes	21-30 homes	35-50 homes	50-70 homes



6.6 KW Residential System

Grow Solar Price		Market Price	
<u>6.6 kW Milwaukee County Residential Roof</u> <u>Array</u>		6.6 KW Market Price Residential Roof <u>Array</u>	
Base Cost (\$3.03/watt)	\$19,998	Base Cost (\$3.15/ Watt)	\$20,790
Estimated Adders	\$208	Estimated Adders	\$208
Focus on Energy	- \$500	Focus on Energy	- \$500
26% Federal Tax Credit (Post-Focus rebate)	-\$5,254	26% Federal Tax Credit (Post-Focus rebate)	-\$5,459
Max group buy savings (.20/watt)	-\$1,320	Group buy savings	\$0
Net Cost	\$13,132	Net Cost	\$15,039

Home Values

Zillow has released a report stating that homes with solar panels sell for 4.1% more than their generation-naked counterparts. *Zillow Economic Research*

A study by the National Renewable Energy Laboratory found that homes with solar sold faster and for more than equivalent non-solar homes.

NREL (National Renewable Energy Laboratory)

In a study across six states, Berkeley National Lab found that home buyers will pay a premium for solar homes. Lawrence Berkeley National Laboratory





Historic Properties in the City of Milwaukee

- Special considerations are required for placement of solar installations on historic properties
- The City of Milwaukee's Historic Preservation Office requires a Certificate of Appropriateness (COA) for solar installations



lioing with history





Historic Properties in the City of Milwaukee

- The COA is issued by City Staff, in line with Milwaukee's solar zoning ordinance and Wisconsin Statute 66.0401
- Questions? Contact the Historic Preservation Office at 414.286.5712



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Next Steps Part 5 of 5







City of Milwaukee Solar Loan

- Summit Credit Union Partnership
- Low interest rate loans
- Up to \$20,000 up to 15 years
- No upfront costs, no penalties
- 4.5% to 5.25% interest rate
- Not required for the solar group buy program
- Can be used to replace your roof if you are adding solar at the same time











Financing Solar

Clean Energy Credit Union

- 100% clean energy loans first of its kind launched
 2017
- Not for profit
- Choose one or both of these loan types:
 - 12-18 month loan for 26% of system cost (covers the 26% Federal Tax Credit)
 - 12, 15, or 20-year fixed rate loan up to the remaining 74% solar electric system cost





414-604-6450 www.GreenHomeownersUnited.com

Green Mortgages

- Multiple banks are now offering "green mortgages", where homebuyers and those refinancing can add in an extra 15% of the value of the home into the mortgage for "energy efficiency" improvements, including solar & insulation/air sealing, water efficiency upgrades, and more
- Approximately the same interest rate as conventional home loan. Offered by Fannie Mae, Freddie Mac, VA & FHA. For every \$1 the mortgage lender puts in, utility bills slated to decrease by <u>at</u> <u>least</u> \$1, making it effective <u>no-cost</u> to cut emissions at home!
- If you are buying a home or have a mortgage interest rate over 3% then contact Green Homeowners United to get a no-cost Home Energy Score assessment and to be guided through the upgrade process.
 - 414-604-6450 www.GreenHomeownersUnited.com Kevin@greenhomeownersunited.com





From Associated Bank website, 4.9.2021

Product	Rate	
10 Year Fixed	2.125%	
15 Year Fixed	2.375%	
20 Year Fixed	3.000%	
30 Year Fixed	3.125%	



Environmental Benefits

Over the life of a 5 kW system, the electricity produced is equivalent to 163 tons of carbon dioxide (CO_2) .

That's the CO₂ equivalent of any one of these:



Planting 3,798 trees.



Driving reduced by 326,000 auto miles, or 16,626 gallons of gasoline.

Recycling 515 tons of waste instead of sending it to landfill.



158,831 pounds (79.4 tons) of coal burned.





and you will help avoid the use of up to 3,975,500 gallons of water by Thermoelectric Powerplants.



Next Steps

- 1. Fill out the form we're sending you in the chat (we'll also send it in a follow-up email right after this webinar)
- Arch Electric will follow up in the next few days to get started on a free, no obligation quote. Please collect 12 months of electricity usage.
- **1. Request a site assessment**. Arch Electric will verify your quote and provide you documentation and your contract.
- 1. Sign contract and pay down payment with Arch Electric before September 30 to lock in Grow Solar Milwaukee pricing.
- 1. Celebrate, share your story, enjoy clean energy every time the sun shines!



INSTALLATION TIMELINE (approximate)

	Day 1	Sign Contract
	Week 1-2	Engineered design by Arch Electric submitted for permitting and interconnection applications
	Week 3-7	Getting approval for interconnect application from Utility Company
	Week 8-9	Construction
POWER	Week 10- 14+	Waiting for inspection/approval and Utility Company Permission to Operate
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Become a member of MREA!



Your support as a member makes a long lasting impact.

You help sustain and grow our many programs, including:

- Grow Solar Group Buy Program
- Solar on Schools Initiative
- Solar Professional Training
- Solar Ready Wisconsin Workforce Development Project
- Solar Corps Internship Program
- Rise Up Midwest, and more!





www.midwestrenew.org/membership

Everyone who goes solar through the program gets a FREE Basic Family Membership!

When there's a huge solar energy spill, it's just called a "really nice day."

<u>MREA</u>



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