



**Solar**  
Urbana-Champaign

## Solar Power Hour!

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

# *Solar*



## *Urbana-Champaign*



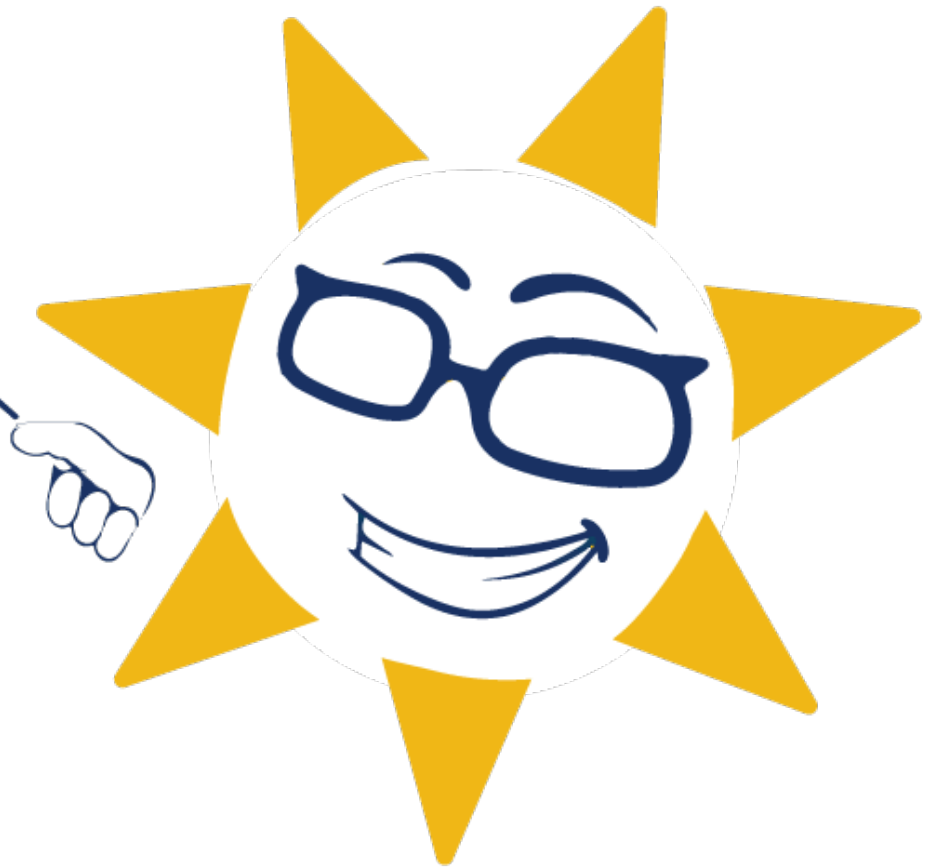


## Today's Agenda

1. What is the Solar Urbana-Champaign 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.

**It's time  
for a  
poll!**





## Why are we here?

There are problems with the way you currently buy electricity.

1. Unpredictable rate increases
2. Not building equity
3. Pollution

POWERED BY







# What is a group buy?

Model for lower prices:

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

**Everyone wins.**

POWERED BY



Springfield

Twain  
Forest

KENTUCKY

WEST  
VIRGINIA

VIRGINIA



## Solar Urbana Champaign

- Educational sessions throughout the summer and fall
- Open to all **Champaign, Piatt, and Vermillion County** residents, businesses, farms, and nonprofits
- Start with a free, no-obligation site assessment
- **Turnkey system:** program Pricing includes design, permitting, components, installation (all-in cost), and warranties
- Financing available; American-made modules



## 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

- New Prairie Solar was established as a division of New Prairie Construction in 2015.
- New Prairie Construction is a 34 year old company.
- New Prairie Solar has designed and installed hundreds of solar systems in central Illinois with a capacity over 1.5 megawatts.
- New Prairie Solar is an employee-owned and operated cooperative.
- We believe in Solar. New Prairie has solar systems on their office and warehouse facilities.

## Expertise:

- North American Board of Energy Practitioners (NABCEP) Certified PV Design and Installation Professionals™ on staff.
- Every employee is OSHA trained and certified.
- FAA licensed drone pilots on staff.
- Licensed electricians perform AC interconnection.
- A+ rated by the Better Business Bureau.



# *How Does Solar Work?*

## *Part 2 of 5*





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



## **KILOWATT HOUR (kWh)**

a unit of energy used or produced. This is what shows up on your bill.



## **KILOWATT (kW)**

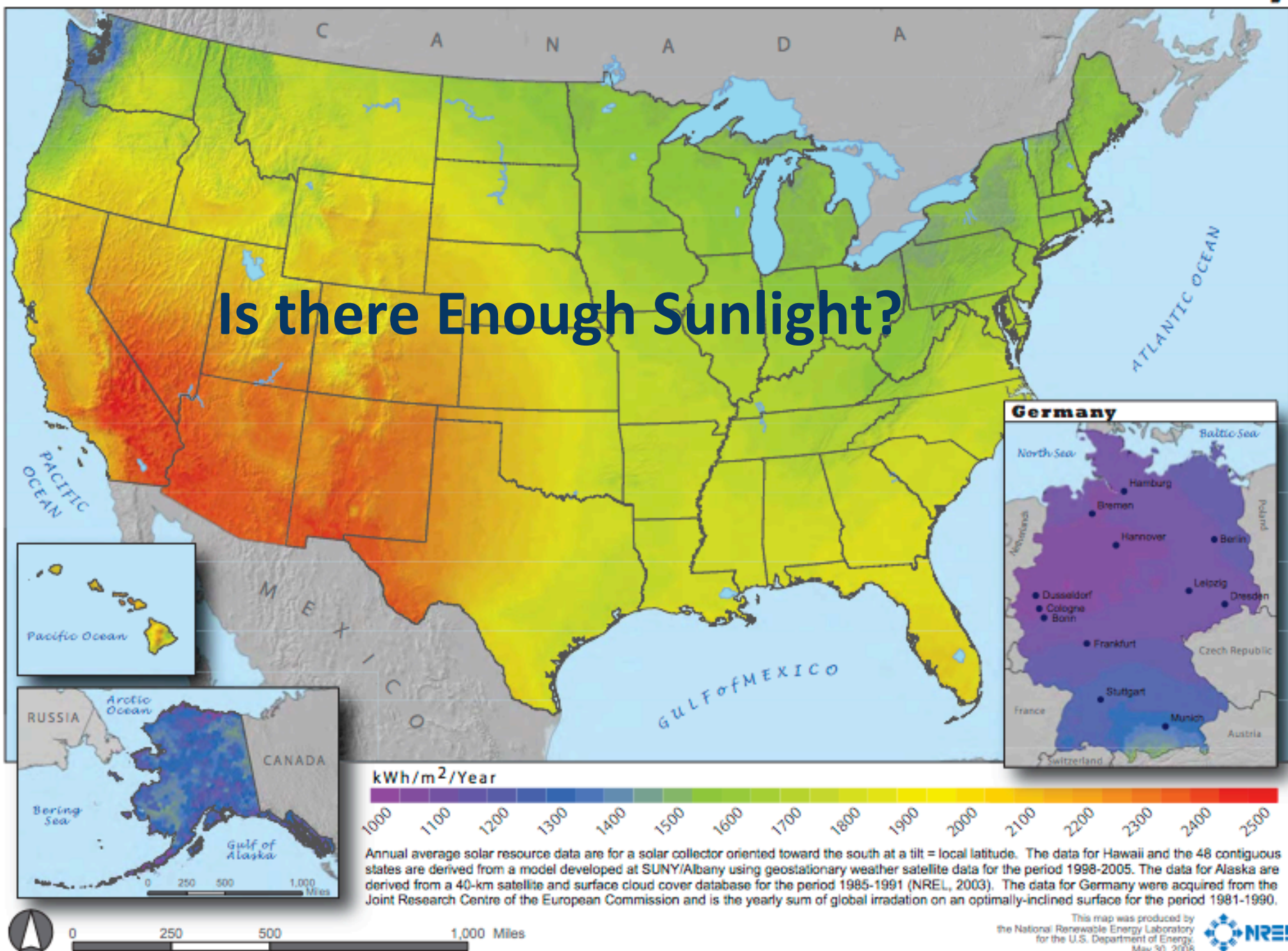
a measurement of capacity: how big your array is.



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

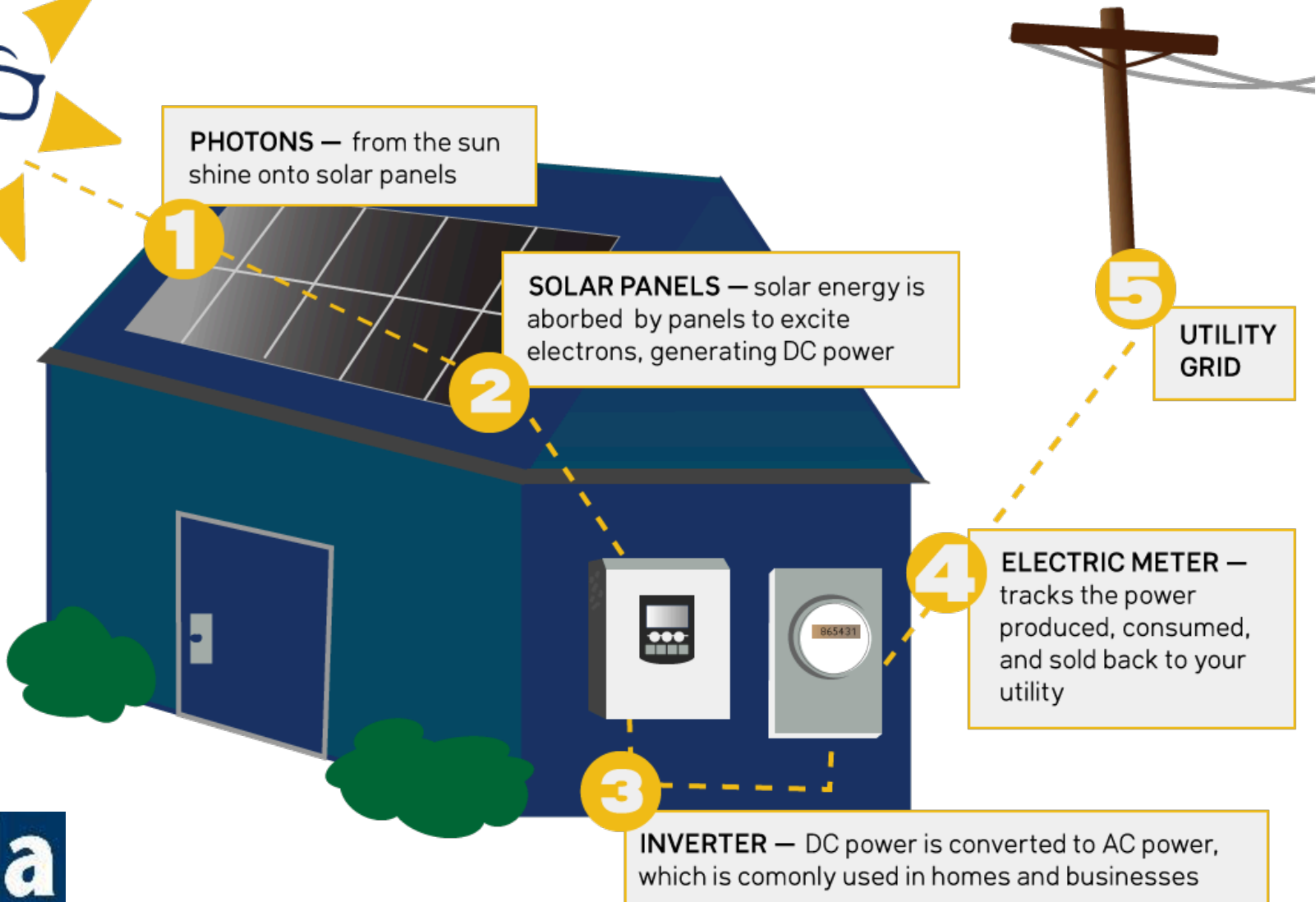
# Photovoltaic Solar Resource : United States and Germany

## Is there Enough Sunlight?

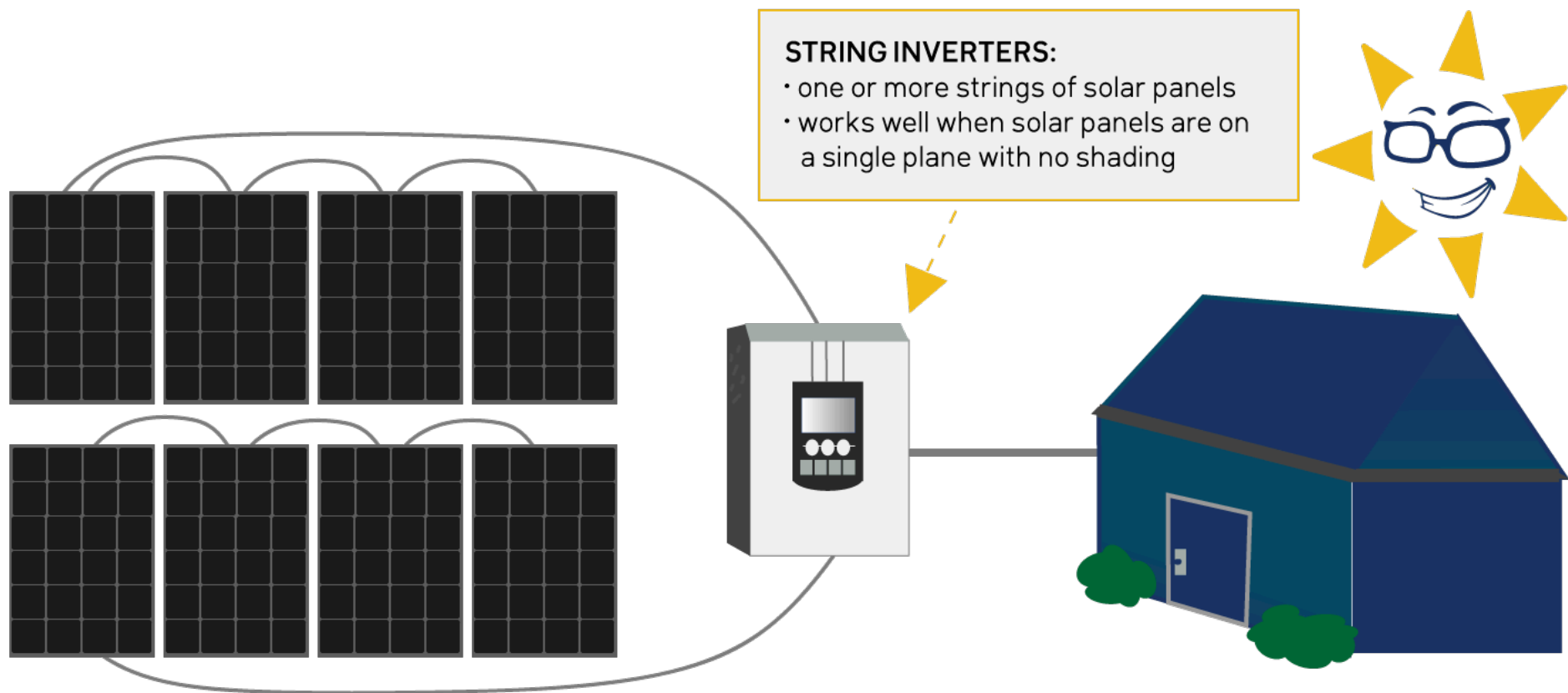




# Configuration: How It Works...



# Inverter, the heart of the array.

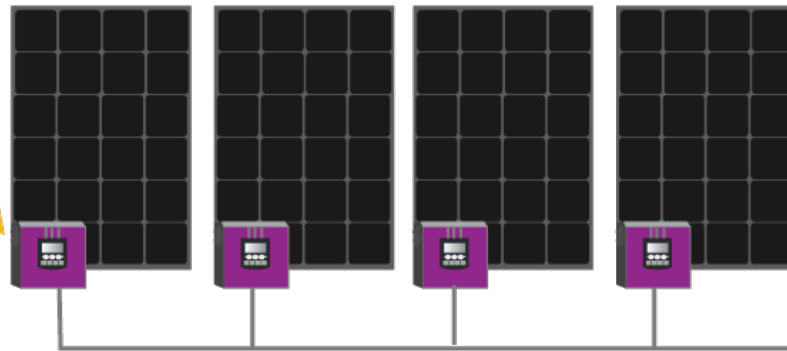




# Inverter, the heart of the array.

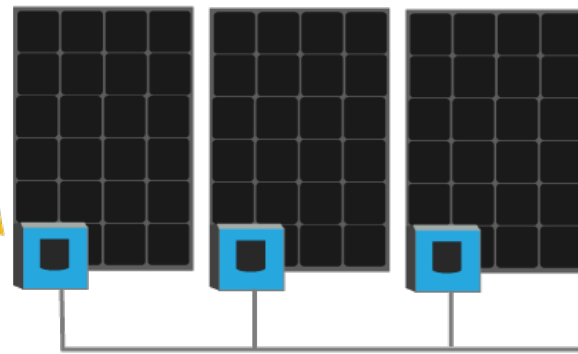
## MICRO INVERTERS:

- one microinverter per panel
- function well on roofs with shade or multiple panel orientations



## POWER OPTIMIZERS:

- one optimizer per panel, plus central string inverter
- function well on roofs with shade or multiple panel orientations



INVERTER

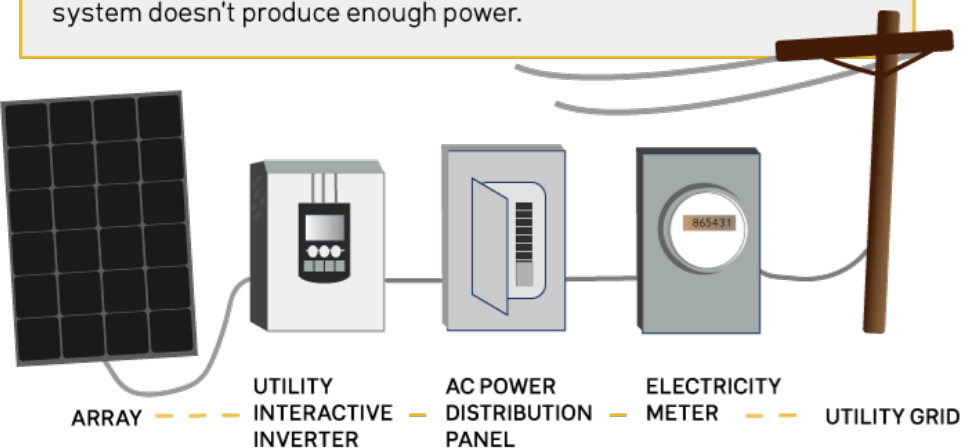


# Grid-Tied vs. Off-Grid

## GRID-TIED DESIGN:

Excess electricity can be delivered to the utility grid, **AND** you can use electricity from the utility grid when your system doesn't produce enough power.

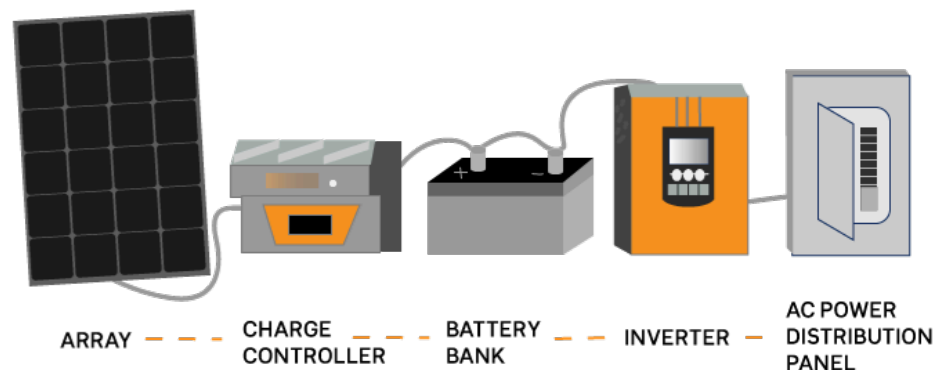
- Least Expensive Option
- Allows for Net Metering
- Grid Off = Solar Off



## OFF-GRID DESIGN:

A stand-alone PV system that operates autonomously and supplies power to electrical loads independent of the utility grid.

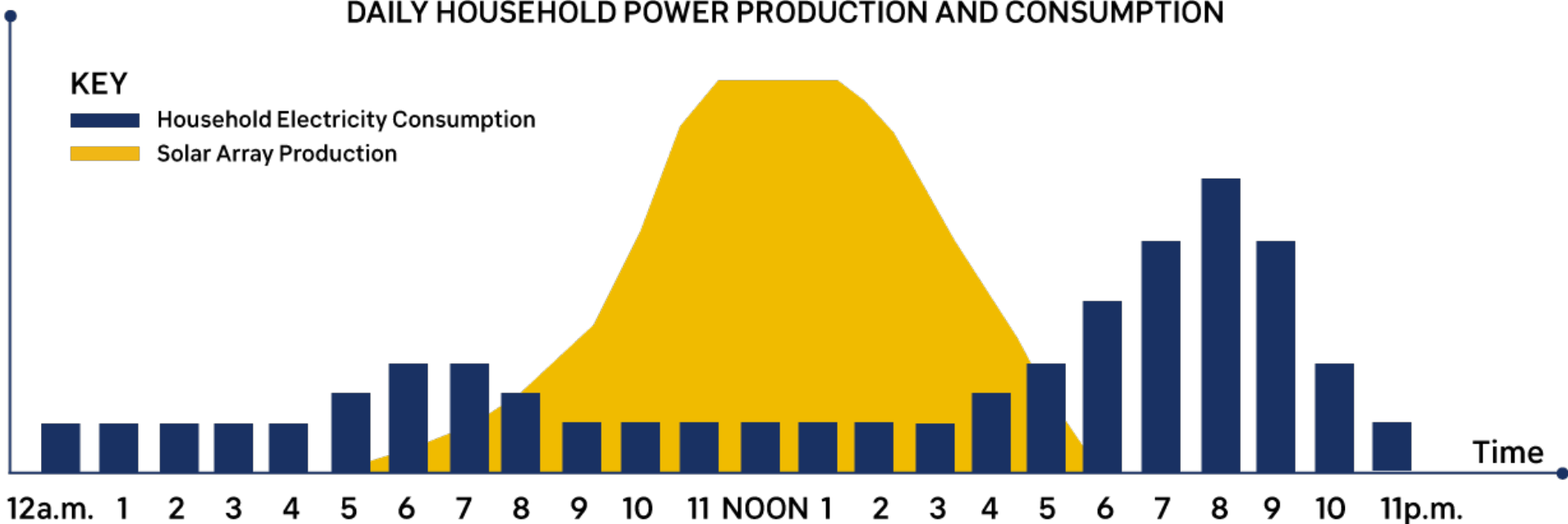
- Requires Batteries & Charge Controller
- Not Connected to the Grid
- Grid Off = Solar On





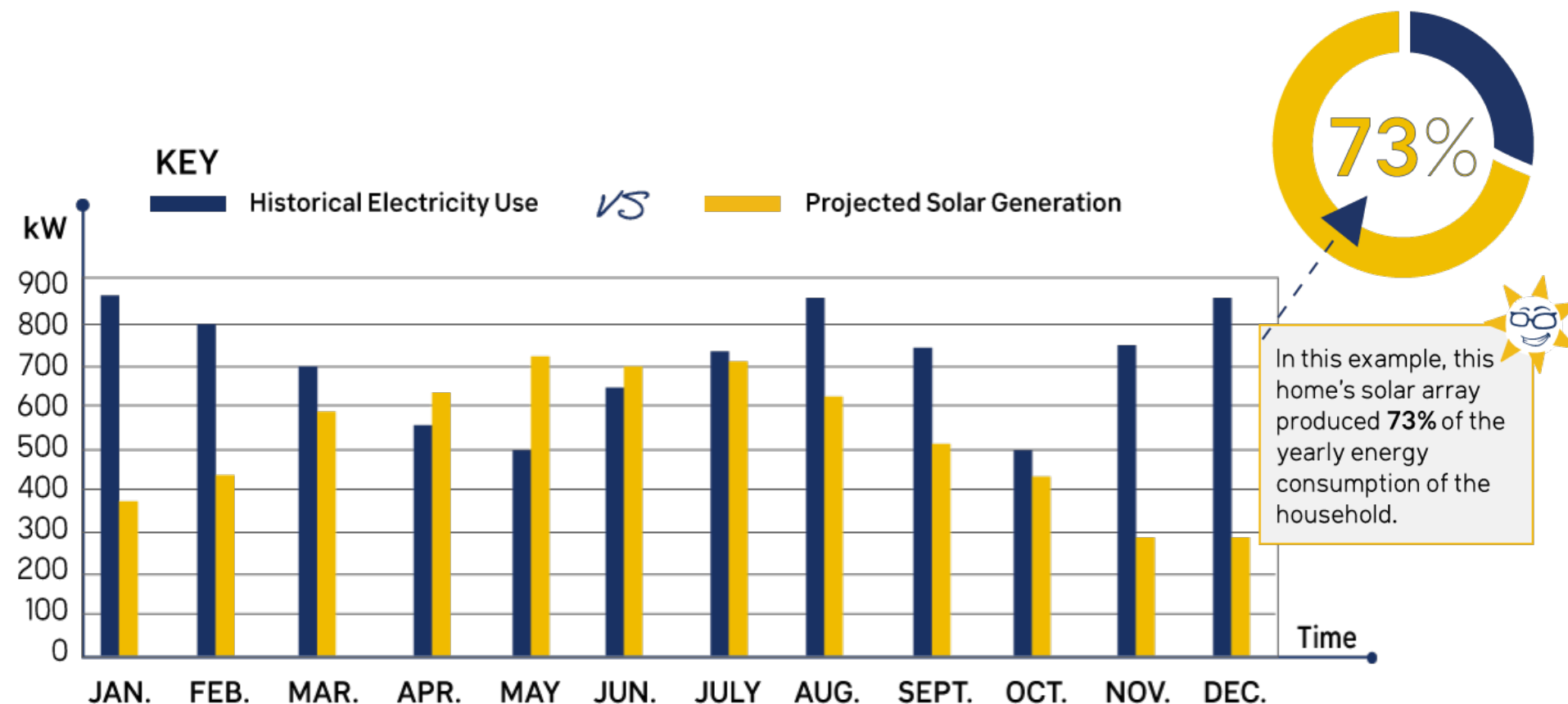
# *“A Day in the Life”* of a Grid-Tied / Net Metered Home

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, poles
- East or West-facing roofs are also workable options





# 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

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# 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

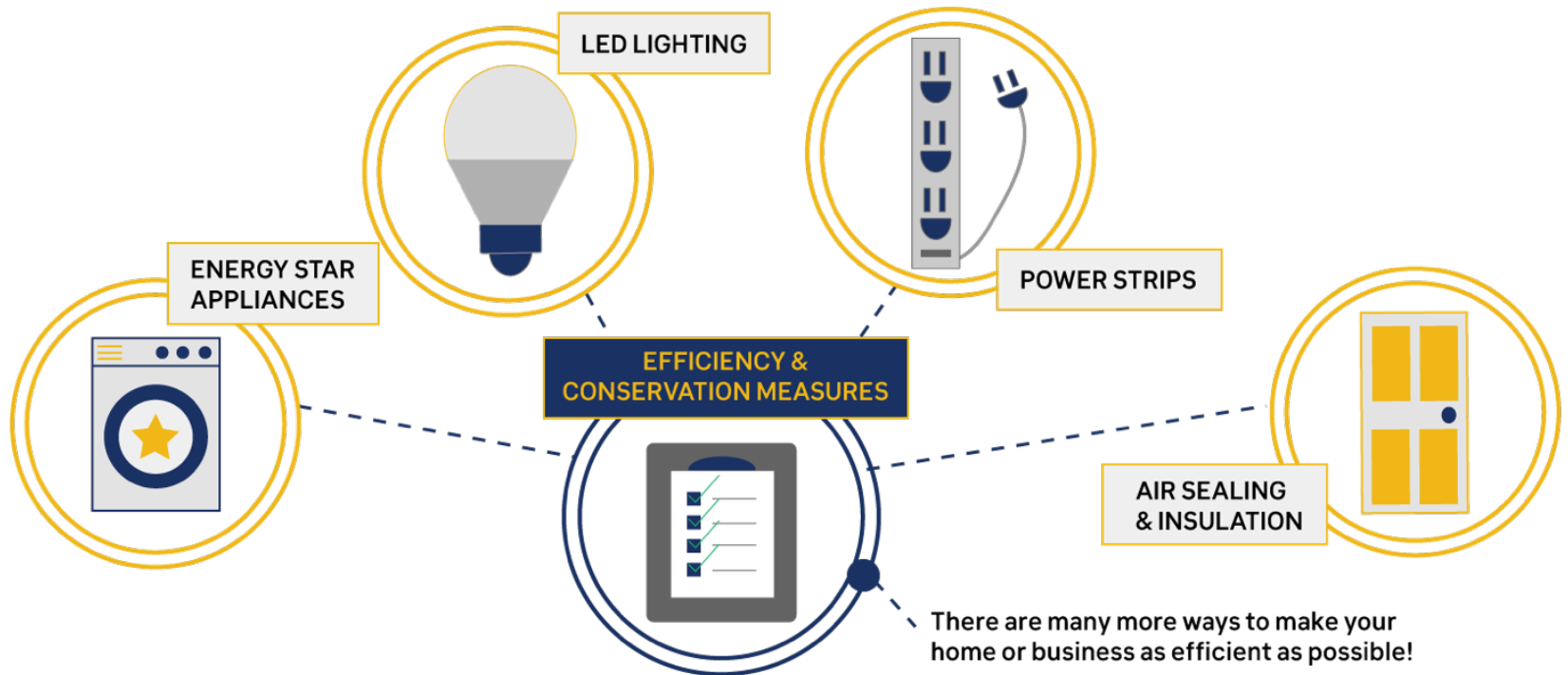


## Considerations

- 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

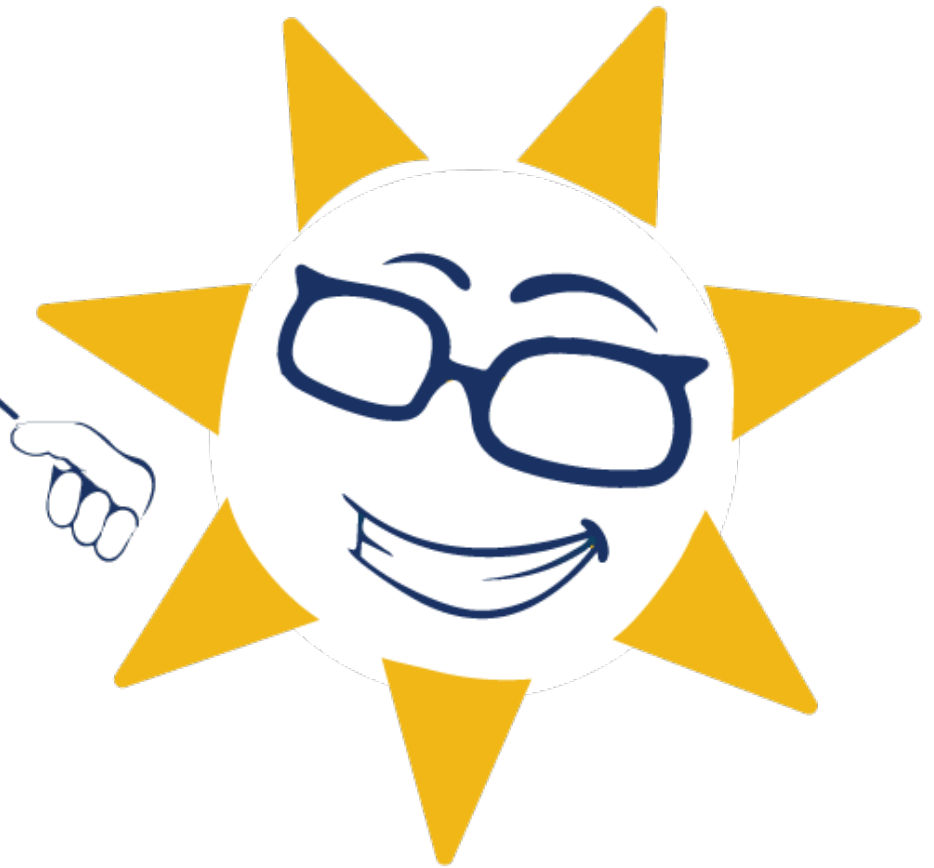
# Energy Efficiency

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





It's time  
for a  
poll!



## 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
- Dual Fuel/Off-Peak Metering
- Inverter Type
- Height and Pitch of Roof
- Complexity of Electrical Interconnection
- Multiple PV Arrays
- Energy Storage
- Transformer & Electric Service Upgrade

# How Group Buys Work

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

Base Price:

**\$3.05/Watt**

Base price is lower than installer's market rate.

## Group Buy Volume Discounts

Collective kW	>50 kW	>150kW	>250kW
Cumulative Discount per watt	\$.05/W	\$.07/W	\$.10/W
Approximate # of Homes	7 homes	19 homes	32 homes



# Typical Installation

## System Details

Year 1 Production	9,955 kWh
Energy Offset	89%
Year 1 Bill Savings	\$1,294



## Estimated Monthly Utility Bill

**\$38**

**With Solar**

**\$146**

**Without Solar**

**Average American home uses 12,000 kWh/Year  
which cost approximately \$1,560 or \$130 per month.**

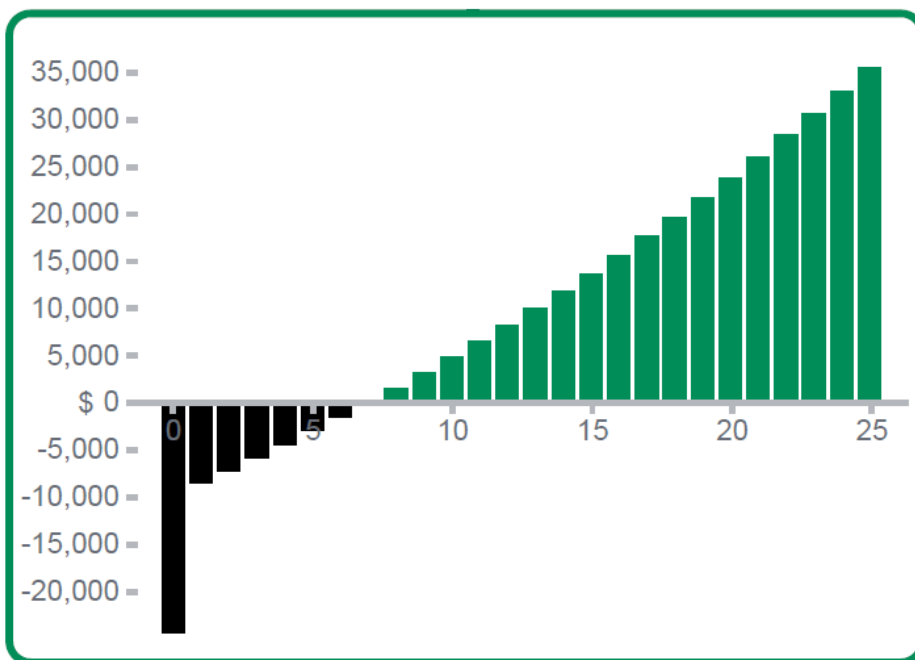


# 7.70 kW Residential System

## Financial Projections

System Cost	\$24,409
Federal Tax Credit	\$6,346
SREC Incentive	\$9,867
Group Buy Rebate*	\$770
Total Incentive Value	\$16,983
Net System Cost	\$7,426
25 Year Savings**	\$45,314

## Estimated Total Value Generated after each Year



## System Components

Solar Panels - Hanwha Q-cells Q.Peak Duo G6+ 350W [22]

Inverter - SMA Solar Technology AG Sunny Boy 7.7-US 240V [1]

**Group Buy Savings \$1,155**

## 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)



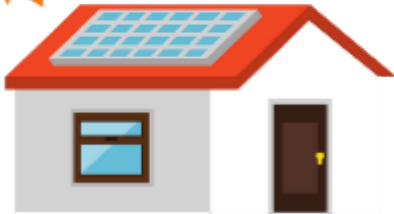
## Illinois Law & SRECs

- **25% Renewable Energy (RE) on the IL grid by 2025**
  - We have about 9% RE now; ~1% is solar.
- **RE Expansion through Solar Renewable Energy Credits (SRECs).**
- **SRECs funding comes from major utility companies through a small fee on customers (NOT A TAX!)**
- **SRECs give you cash payments based on projections of future energy production for your solar project.**

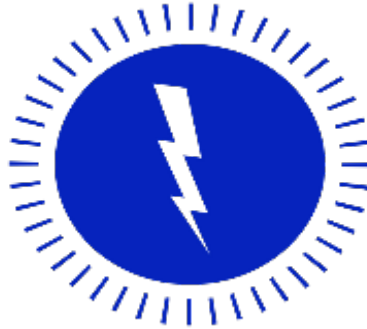




## Example: Solar Renewable Energy Credits SRECS = "Green Value"



**Bob installs  
a  
7.7 KW  
Solar Array**



**Solar Vendor Estimates  
Production = 9,700 KWh/year  
  
9.7 MWhr = 9.7 SRECs**



**Bob sells 15 years  
of SRECS for  
\$72.28\***

**Bob gets  
\$10,517 a few  
months later \***

- ★ \* For <25 kW AC systems in Illinois. Example values. Does not illustrate administrative fees.
- ★ SREC income is taxable

## SREC Status

- New CEJA legislation September '21 allocates more funds
- SREC payment typically arrives 9-18 months after interconnection
- That payment comes from an SREC Aggregator (New Prairie Solar uses Carbon Solutions Group, other providers exist)
- You don't have to sell your SRECs if you don't want to





# *Next Steps*

## *Part 5 of 5*



## 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*



# 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-year fixed rate loan up to the remaining 74% solar electric system cost
- Check with your local lenders for your options!

# Environmental Benefits

Over the life of a 5 kW system, the electricity produced is equivalent to 163 tons of carbon dioxide (CO<sub>2</sub>).

That's the CO<sub>2</sub> 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 to you in the chat AND in a follow-up email right after this webinar.
2. Provide New Prairie with your utility account number or a copy of your bill.
3. New Prairie Solar will schedule a free, no-obligation site assessment to analyze the compatibility of solar on your property.
4. New Prairie Solar will custom design a solar system and email a detailed proposal.
5. New Prairie Solar will schedule a virtual or in-person meeting to answer any questions you may have.
6. Sign contract and pay down payment with New Prairie Solar by October 31, 2021 to participate in Solar Urbana-Champaign.
7. Celebrate and enjoy clean energy! Tell your neighbors and friends to participate!

**[SolarUrbanaChampaign.com](http://SolarUrbanaChampaign.com)**

# **INSTALLATION TIMELINE (approximate)**

<b>Day 1</b>	<b>Sign Contract</b>
<b>Week 1-3</b>	<b>Final design by New Prairie Solar; permit and interconnection applications submitted; materials ordered</b>
<b>Week 4-8</b>	<b>Obtain approval for interconnect and building permit; receive materials</b>
<b>Week 9-10</b>	<b>Installation</b>
<b>Week 11+</b>	<b>Permit inspection &amp; approval and Utility permission to operate</b>
<b>Final Day</b>	<b>System training with customer</b>





# 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!**

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



[www.midwestrenew.org/membership](http://www.midwestrenew.org/membership)



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

### MREA Contacts

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