

**Welcome to Our Solar Power Hour!**



**GROW SOLAR**

WARREN COUNTY

We will begin our presentation shortly and start with a brief introduction to Zoom

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# GROW SOLAR

WARREN COUNTY



INDIANOLA  
SUSTAINABILITY  
COMMITTEE



# Today's Agenda

- What is the Grow Solar Warren County Group Buy Program?
- How does solar power work?
- Costs and cost-saving incentives
- How to begin your solar journey

> We hope to simplify a complex topic <



# Amenities





# Events



# Beautification

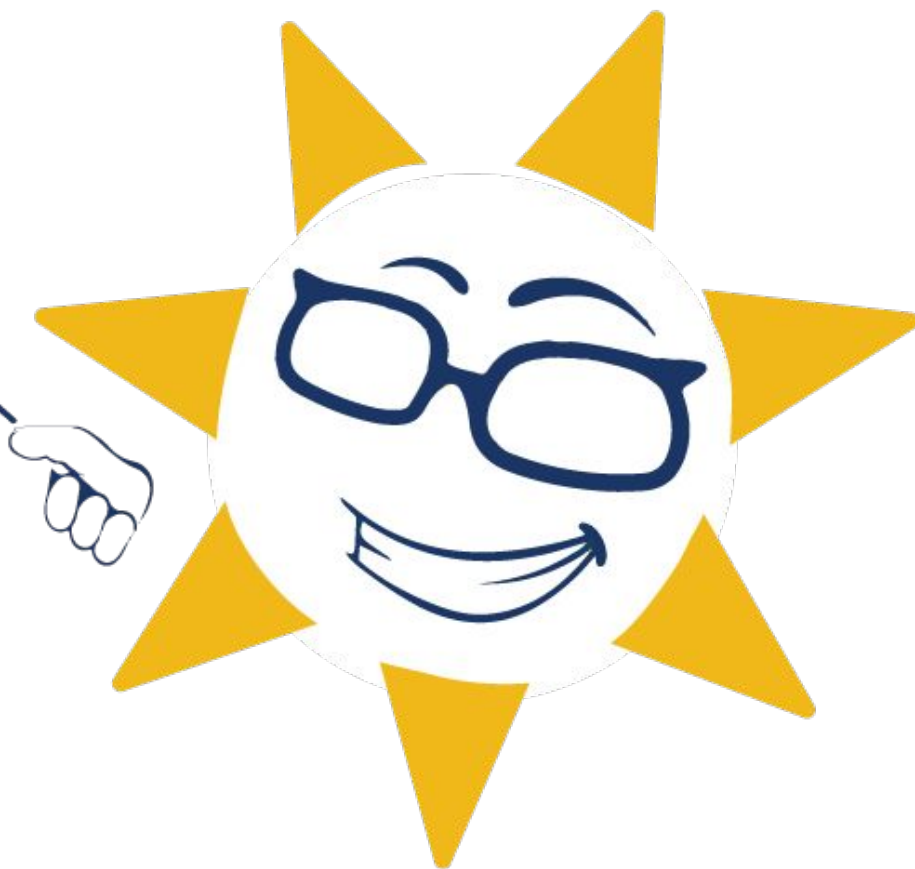




# Beautification



It's time  
for a  
poll!





# Why are we here?

To lead in creating more sustainable communities by making solar simple.





# What is a group buy?

## Lower Prices through:

1. Competitive Contractor Selection
2. Community-Led Outreach
3. Limited-time Offering
4. Strong Customer Education
5. Economy of Scale

**Everyone wins.**



## Grow Solar Warren County Group Buy

- Focused on residences and businesses anywhere in Warren County.
- Start with a free, no-obligation site assessment.
- Turn-Key Solar Array. Program Pricing includes design, permitting, components, installation (all-in cost), and warranty (10 years on labor, 12-25 years on equipment).
- Financing & American-made products 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
- 34 Solar group buys, 1,600 properties, 12,000 kW of solar





## 1 Source Solar will:

- Custom design your solar array based on your last 12 months of kWh consumption on your electric bill.
- Submit appropriate permits and the application to interconnect to your utility company.
- Construct your solar array in conjunction with NABCEP certified designers / installers.
- Connect your solar array to your home, business, or farm using our Master Electrician.
- Submit and track your state of Iowa tax credit application. (Federal Tax Credit is simpler)

This process is a turn-key solution for everyone.

No subcontractors will be utilized on any projects in this group buy.

## Expertise:

- North American Board of Energy Practitioners (NABCEP) Certified PV Design and Installation Professionals™
- Master Electrician on staff



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Photo Credits: 1 Source Solar



# The Right Time to go Solar

77.7 gigawatts of total installed capacity in the US, **enough to power 14.5 million American homes.**

Solar accounted for **40% of all new electric generating capacity additions in 2019**, more than any other energy source!

A new solar array is installed every **84 seconds** in the US.

Solar **benefits both rural and urban Iowa** with projects in all 99 counties.

Nearly **1,000 Iowans** working in solar industry.





# 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*



# 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.**



# ***How Does Solar Work? Part 2 of 5***



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



## **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.

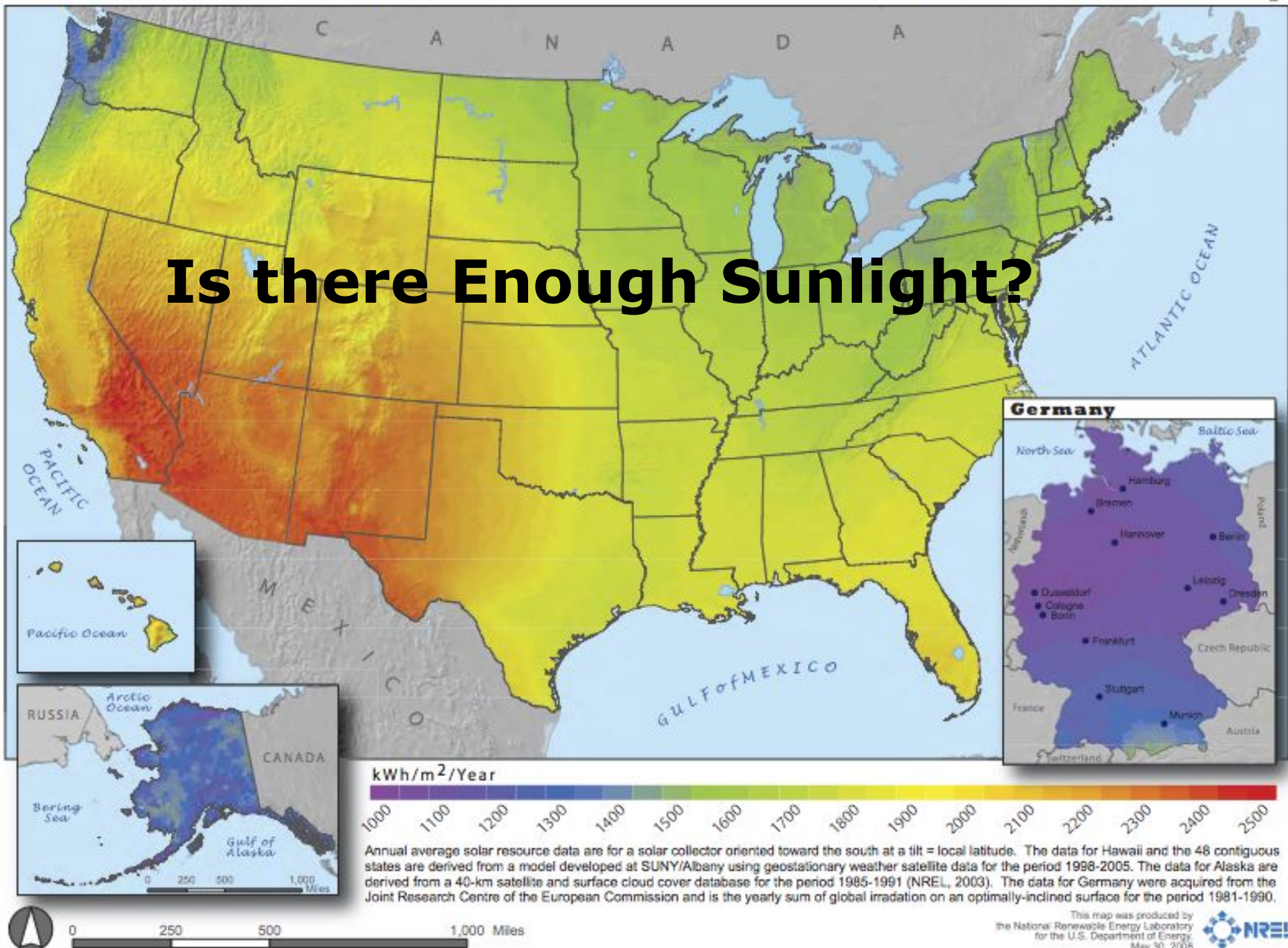


Every home's system size and energy use is different.

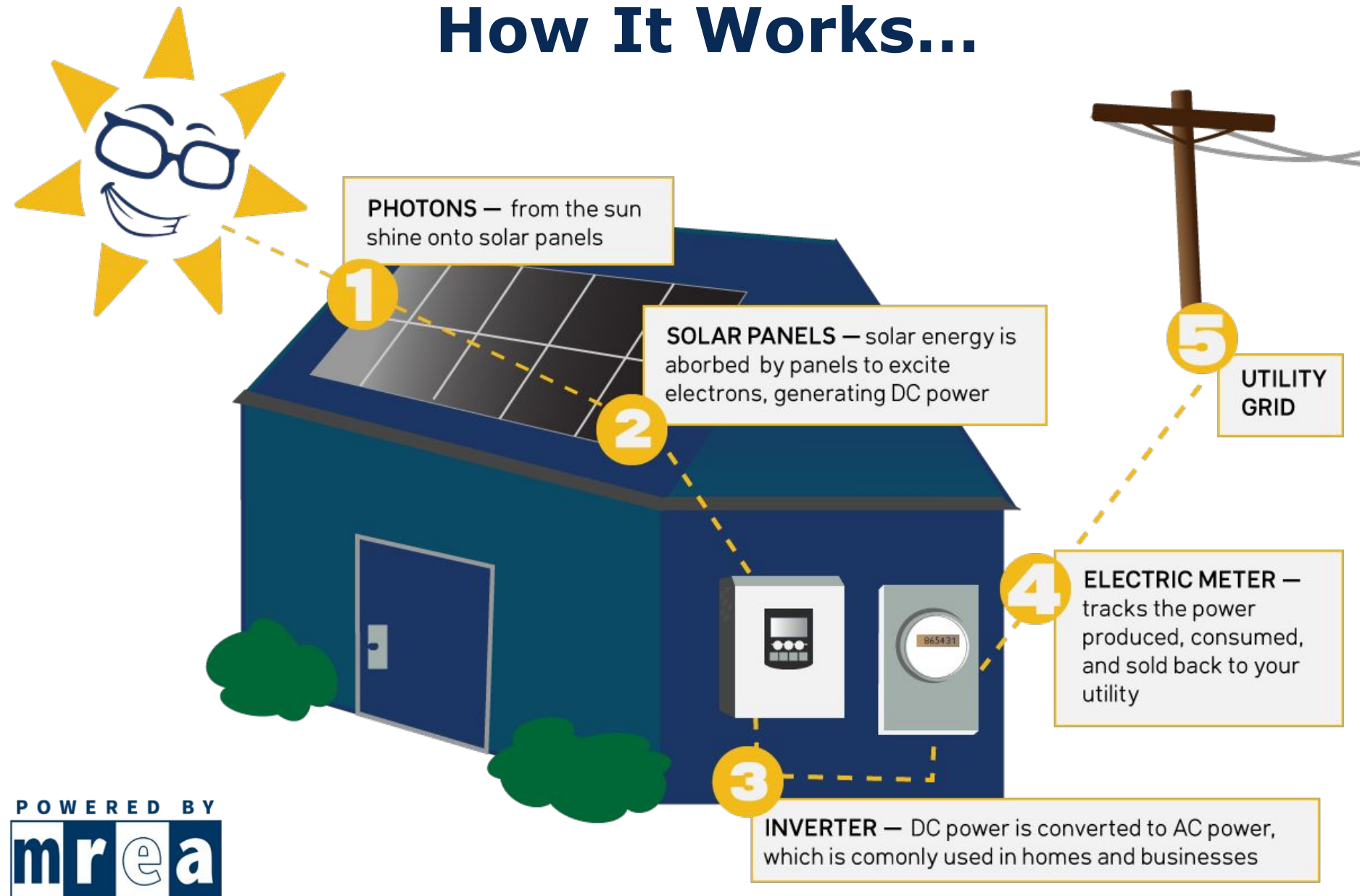


# Photovoltaic Solar Resource : United States and Germany

## Is there Enough Sunlight?

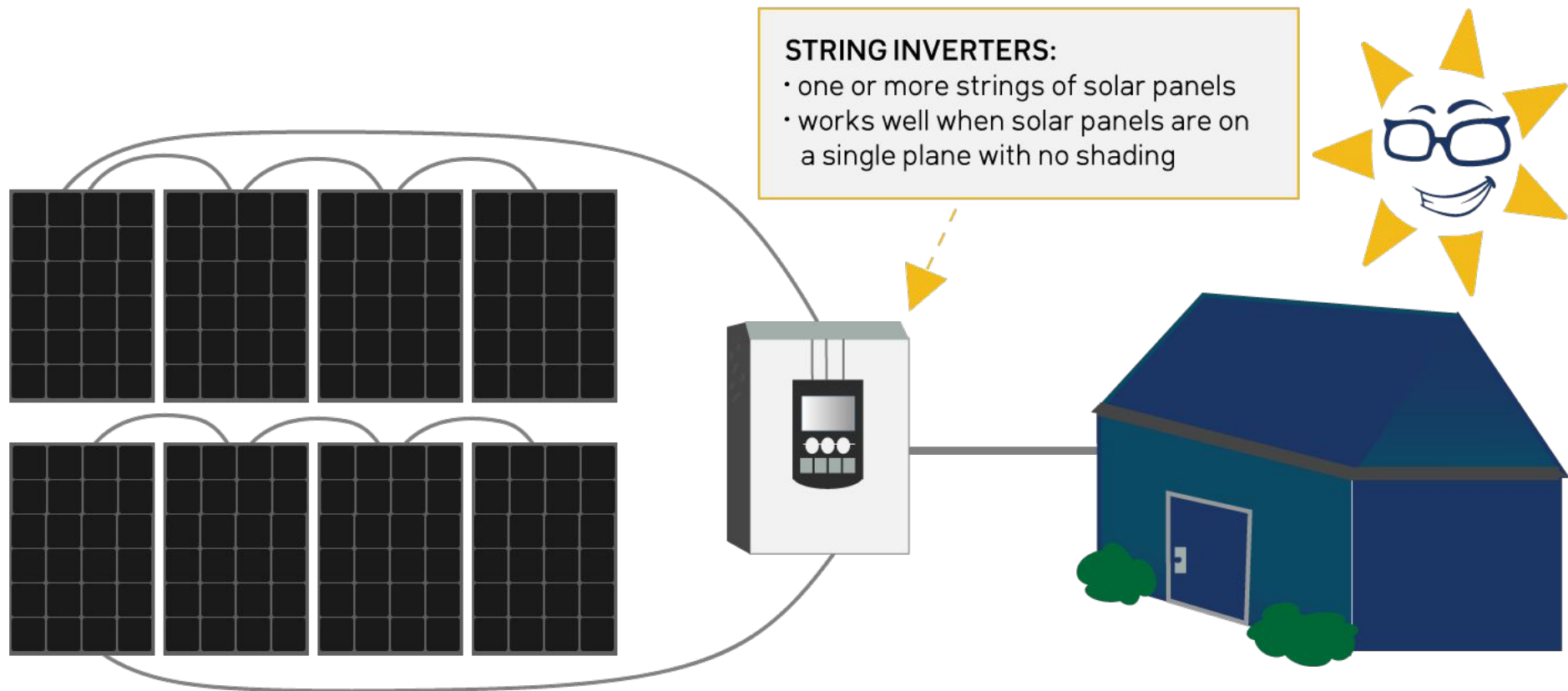


# Configuration: How It Works...





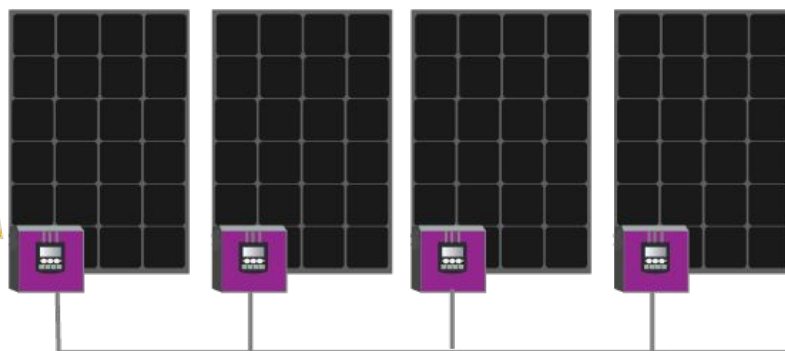
# Inverter: The heart of the solar array



# Inverter: The heart of the solar array

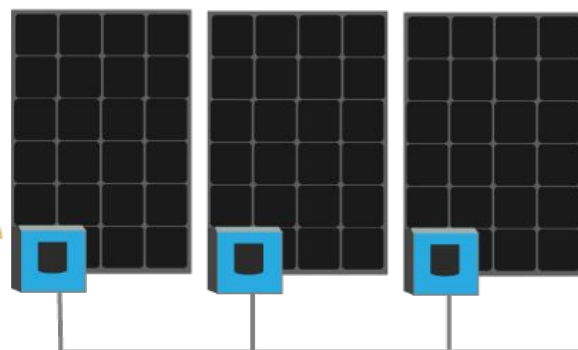
## MICRO INVERTERS:

- 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

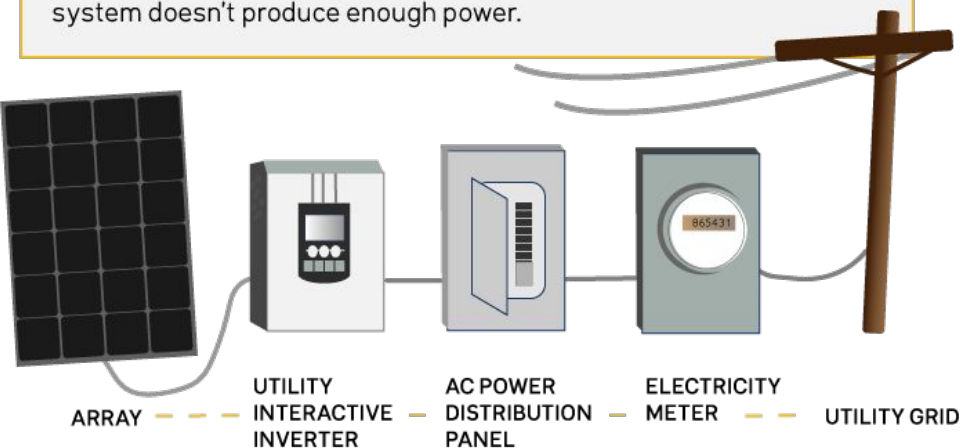


# Off-Grid

## 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.

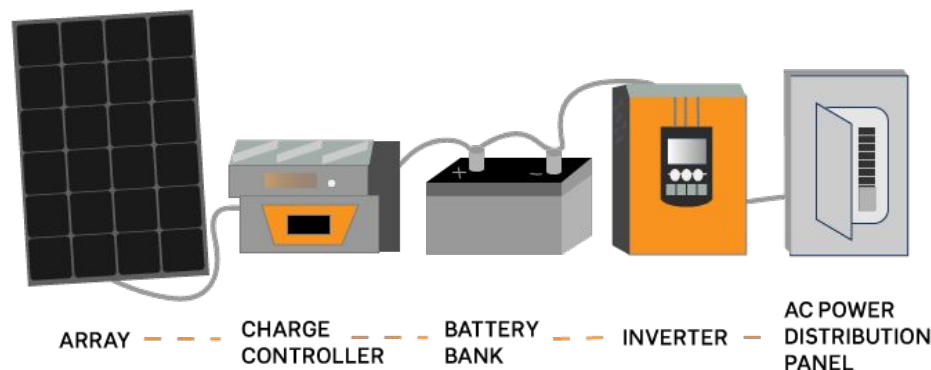
- Least Expensive Option
- Allows for Net Metering
- Grid Off = Solar Off



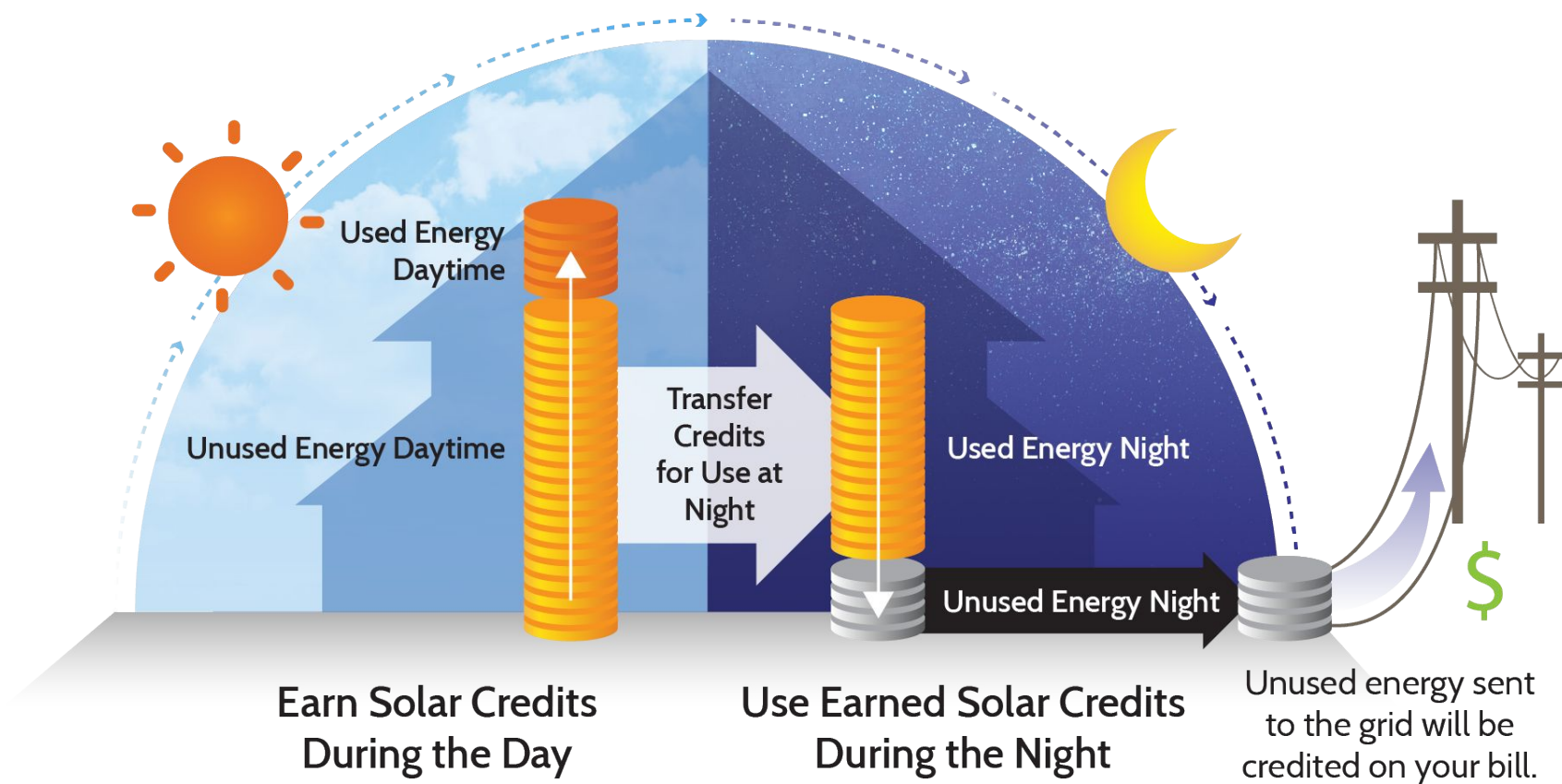
## OFF-GRID DESIGN:

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



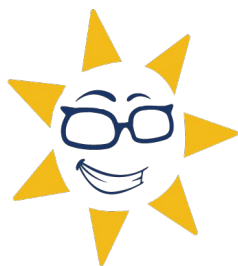
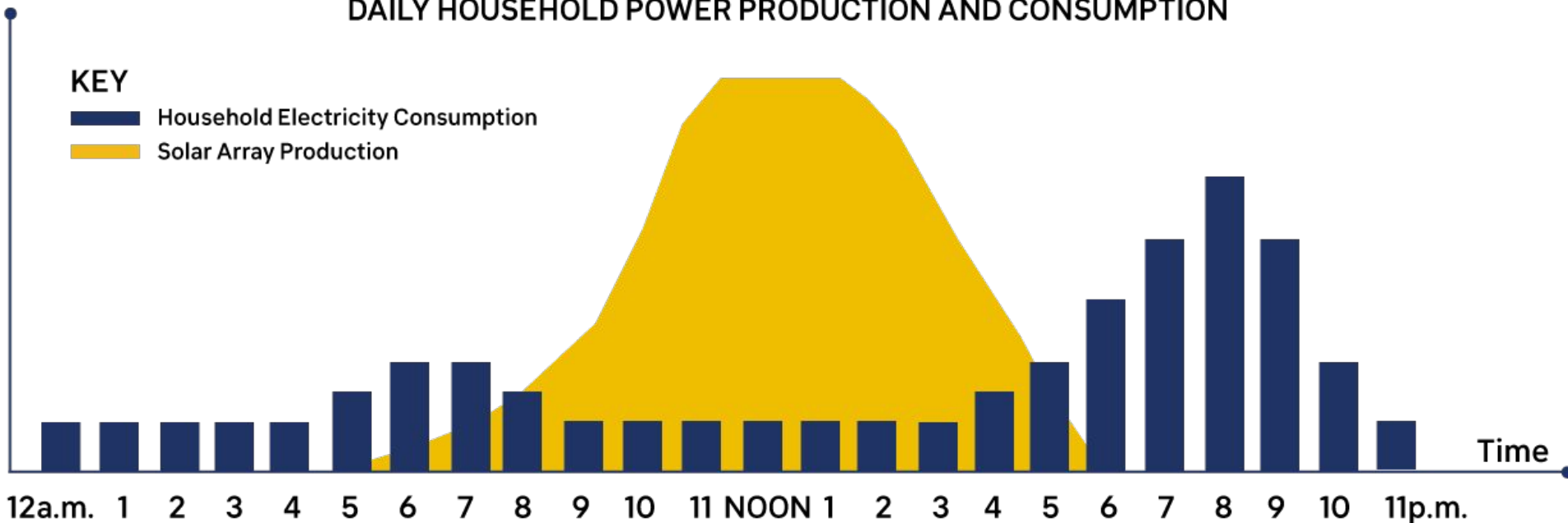
# How Net Metering Works





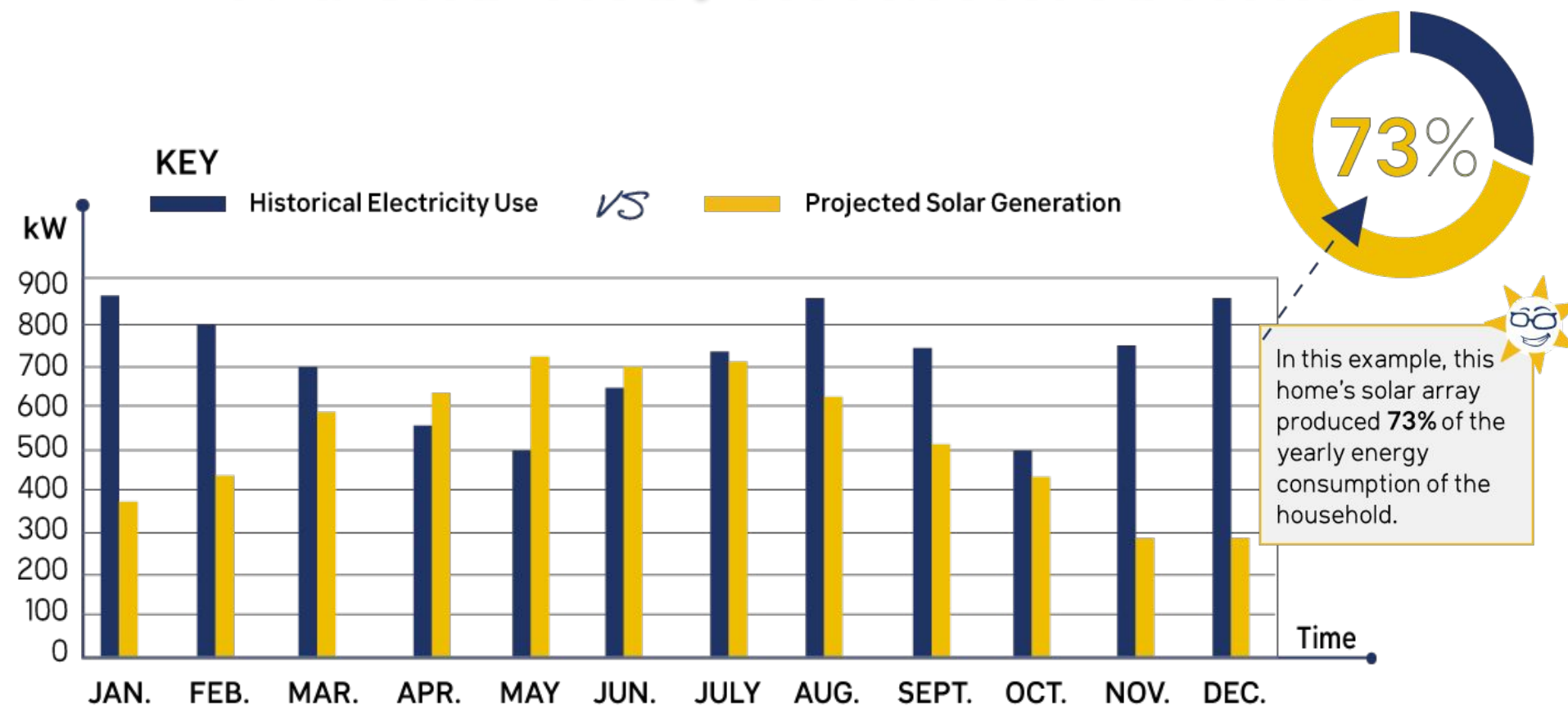
# “A Day in the Life” of a Grid-Tied / Net Metered Home

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



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Shade

Sun



# Roof Mount

- Roof is most common
- Mounted flush to roof using existing pitch and position to the sun
- South-facing pitch is ideal, but East/West-facing are appropriate
- Considerations
  - Hail / snow
  - Shading from trees or nearby obstructions.
  - Wind Loading
  - Roof Condition (age of shingles)



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# 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
- Solar modules anchored to new structure
- Easy to remove snow and dust (if near farm field)



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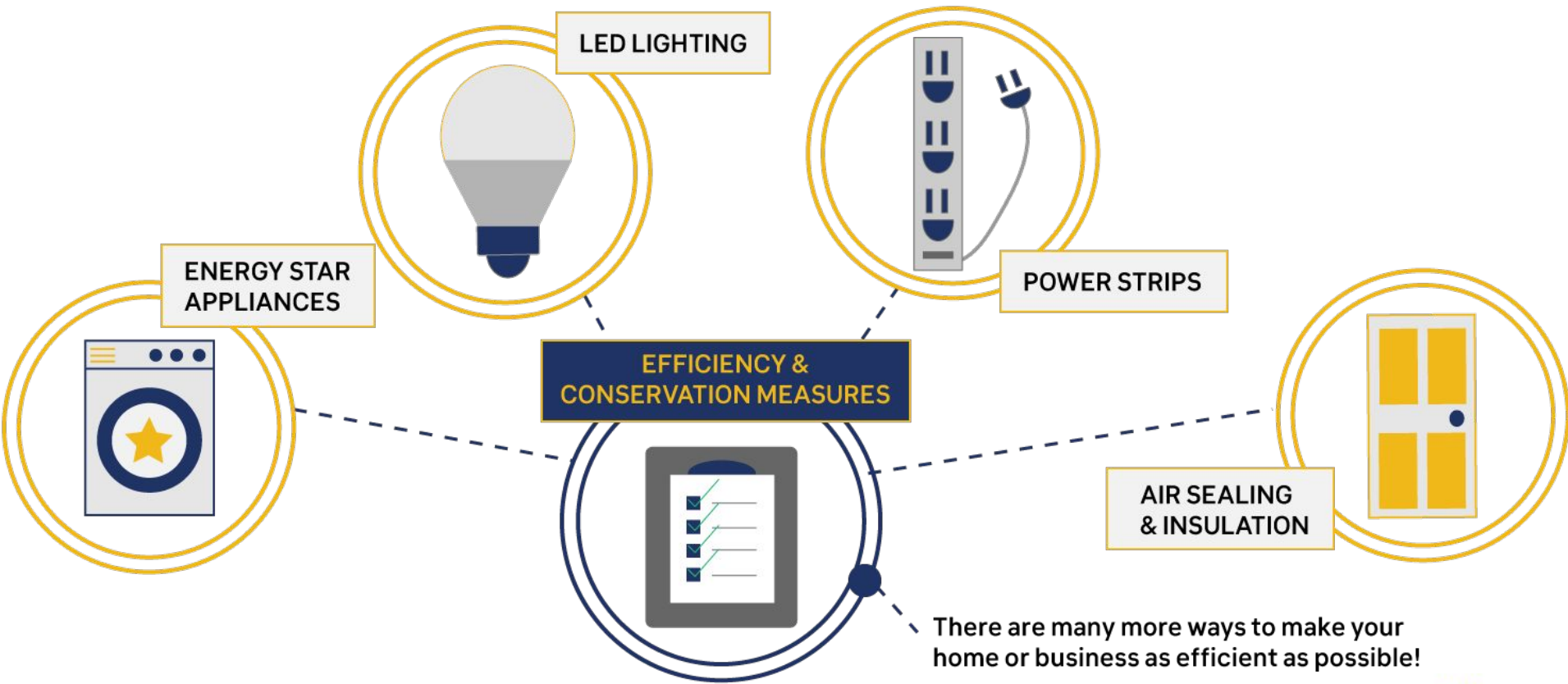




# Considerations

- 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

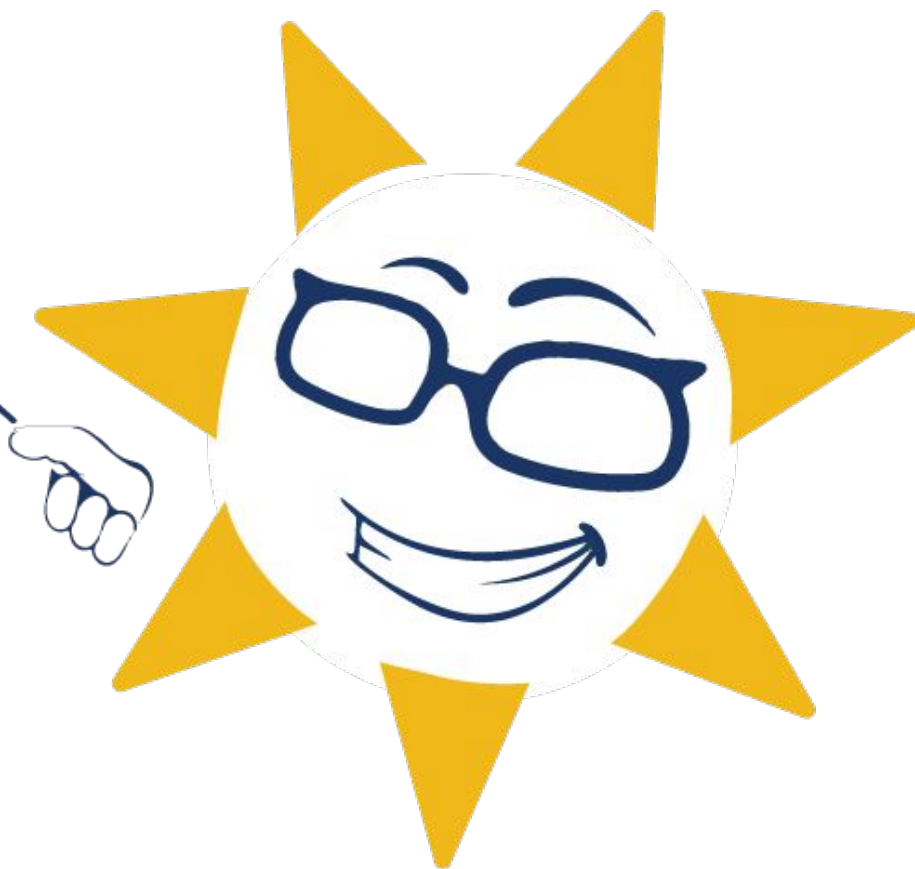
# Energy Efficiency



CERTIFIED  
PROFESSIONAL



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?

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# ***Solar Costs***

## ***Part 4 of 5***



# Group Buy

## How It Works

**The more people go solar, the lower the price:**

**Competitive Base Price: \$2.38/W**

(Base price is lower than 1 Source Solar's typical price)

**With Additional Discounts** (assumes avg solar array = 6kW):

>50 kW	>100 kW	>200 KW	>300 kW
-\$0.02/W	-\$0.05/W	-\$0.08/W	-\$0.10/W
- \$20/kW	- \$50/kW	-\$80/kW	-\$100/kW
~8 homes	~25 homes	~50 homes	~83 homes

**On a 6 kW array, the maximum *additional*  
Group Buy price break is \$600**

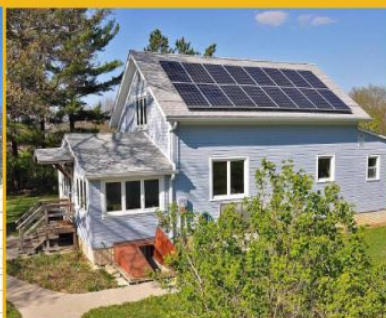
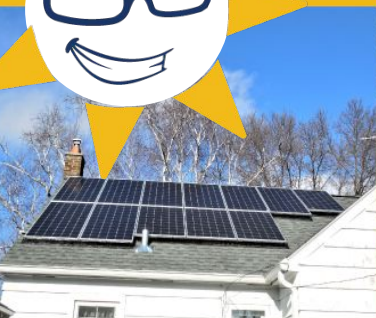
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# Every Home Is Different

## Your PV System Is 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
- Slope and Height of Roof
- Complexity of Electrical Interconnection
- Multiple PV Arrays
- Energy Storage

# Typical installation



Pictured above is a 24 module, or 7.44 kW DC, solar array.

Estimated annual solar production = **9,345 kWh**



# 7.44 kW Solar Array 24 310W VSUN Modules

## 7.44 kW DC Residential Roof System

**Starting price:** \$2.38/Watt (\$17,707)

**Site-Specific Adders**

- 2 story roof (\$.05/W) + \$372
- 2-section array (\$.08/W) + \$595

**Final quoted price (\$2.51/W)** \$18,674

**Installed Cost (\$2.51/Watt)** \$18,674

**26% Federal Tax Credit** (\$4,855)

**13% Iowa Tax Credit** (\$2,428)

**Net Cost** \$11,391



**Sample Payback: 11 yrs**

**Estimated Year 1 Solar production = 9,750 kWh**

**Year 1 utility \$/kWh = \$.105/kWh**

**Payback = Net Cost / Year 1 electric bill saving = \$1,024**

**Money Saved Over 25 Years = \$20,226**

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Installed Cost ( <b>\$2.51/Watt</b> )	\$18,674
26% Federal Tax Credit	(\$4,855)
<del>13% Iowa Tax Credit</del>	<del>(\$2,428)</del>
Max Group Buy Discount (\$.08/W)	(\$595)
<b>Net Cost</b>	<b>\$13,224</b>



**Simple Payback: 12.9 yrs**

**Est. Year 1 Solar production = 9,750 kWh**

**Year 1 utility \$/kWh = \$.105/kWh**

**Payback = Net Cost / Year 1 bill saving [\$1,024]**

**Money Saved Over 25 Years = \$20,226**



# Solar System Price Spectrum



*\$4,500 after incentives  
\$65/month 12-yr loan*



*\$11,500 after incentives  
\$185/month 12-yr loan*

**\$20,000**

Ground Mount Array, 5-6kW

**\$40,000**

Two Arrays, Two Roofs, 10+kW

**\$10,000**

One Array <4kW

**\$30,000**

Two Arrays,  
One Roof, 7-9kW



*\$8,000 after incentives  
\$125/month 12-yr loan*



*\$14,000 after incentives  
\$245/month 12-yr loan*

# *Incentives & Next Steps*

## *Part 5 of 5*





# 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
  - Steps down to **22% in 2021**, and goes away entirely for residential solar in 2022
- No maximum credit
- Res: The home must be owned by the taxpayer but does not have to serve as the principal residence
- Ask your tax professional for further details

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# Iowa's State-Level Incentives

- **State Tax Credit**

PROJECT TYPE	INCENTIVE	PROJECT LIMIT
RESIDENTIAL	50% of Federal Tax Credit	\$ 5,000
BUSINESS	50% of Federal Tax Credit	\$ 20,000

- Statewide incentive is capped at \$5 million per year
- **As of now, the 2020 \$5 million has been exhausted.** You can submit your application for the tax credit and the Iowa Department of Revenue will review it and put you on the waitlist for receiving the credit in 2021.
- **No Sales Tax** - Solar energy equipment is exempt from the state sales tax.
- **5 Year Property Tax Exemption** - In Iowa, the market value added to a property by a solar energy system is exempt from the state's property tax for 5 full assessment years.



# Iowa's State-Level Incentives

- State Tax Credit

PROJECT TYPE	INCENTIVE	PROJECT LIMIT
RESIDENTIAL	50% of Federal Tax Credit	\$ 5,000
BUSINESS	50% of Federal Tax Credit	\$ 20,000

- Statewide incentive is capped at \$5 million per year
- As of now, 2020 the \$5 million has been exhausted.** You can submit your application for the tax credit and the Iowa Department of Revenue will review it and put you on the waitlist for receiving the credit in 2021. **However, due to demand, it is likely that the 2021 waitlist already exhausts available tax credits for 2021 as well. Unless legislative action is taken, newly contracted solar will not receive the Iowa State Tax Credit.**
- No Sales Tax** - Solar energy equipment is exempt from the state sales tax.
- 5 Year Property Tax Exemption** - In Iowa, the market value added to a property by a solar energy system is exempt from the state's property tax for 5 full assessment years.

# 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



# **INSTALLATION TIMELINE (approximate)**

<b>Day 1</b>	<b>Sign Contract</b>
<b>Week 1-2</b>	<b>Engineered design by 1 Source Solar submitted for permitting and interconnection applications</b>
<b>Week 3-5</b>	<b>Getting approval for interconnect application from Utility Company</b>
<b>Week 6-8</b>	<b>Construction</b>
<b>Week 7-12+</b>	<b>Waiting for inspection/approval and Utility Company Permission to Operate</b>

# Next Steps

1. Fill out the site assessment form. We'll send you link to the form in the chat AND in a follow-up email.
2. Once the site assessment form is submitted, prepare to supply a copy of one of your recent utility bills along with the last 12-months of your electric usage data.
3. 1 Source Solar will provide you with a free, no obligation preliminary Solar Estimate and Production Analysis. This report can be via email or webinar.
4. Request a detailed site assessment. 1 Source Solar will verify your design, update your quote and give you your contract.
5. Sign contract with 1 Source Solar by September 30, 2020, to participate in Grow Solar Warren County.
6. Celebrate and enjoy clean energy!
7. Tell your neighbors and friends!

**Email:** Fred Maharry - [fred@1sourcesolar.com](mailto:fred@1sourcesolar.com)




# Stay Informed: Become a Member of the MREA!



**Promoting renewable energy, energy efficiency,  
and sustainable living through education and demonstration.**

- \$20 Off All Courses
- Invite to Virtual Membership Meeting
- Access to Clean Energy Credit Union
- Subscription to Newsletter
- Free Online Tutorials
- Free Rise Up! Publication Mailed to You

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”

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