Welcome to Our Solar Power Hour!

Solarize Johnson County

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

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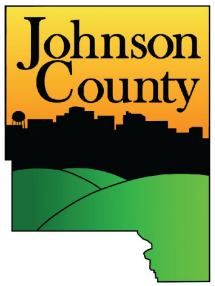
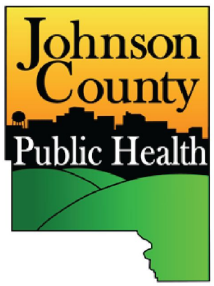
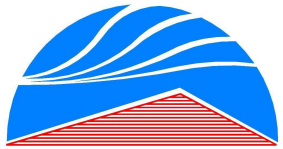
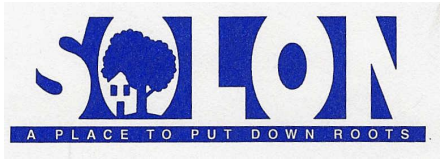






City of Lone Tree



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Johnson County

Johnson County Public Health

Johnson County Conservation

Becky Soglin
Sustainability Coordinator
(and her solar water fountain!)

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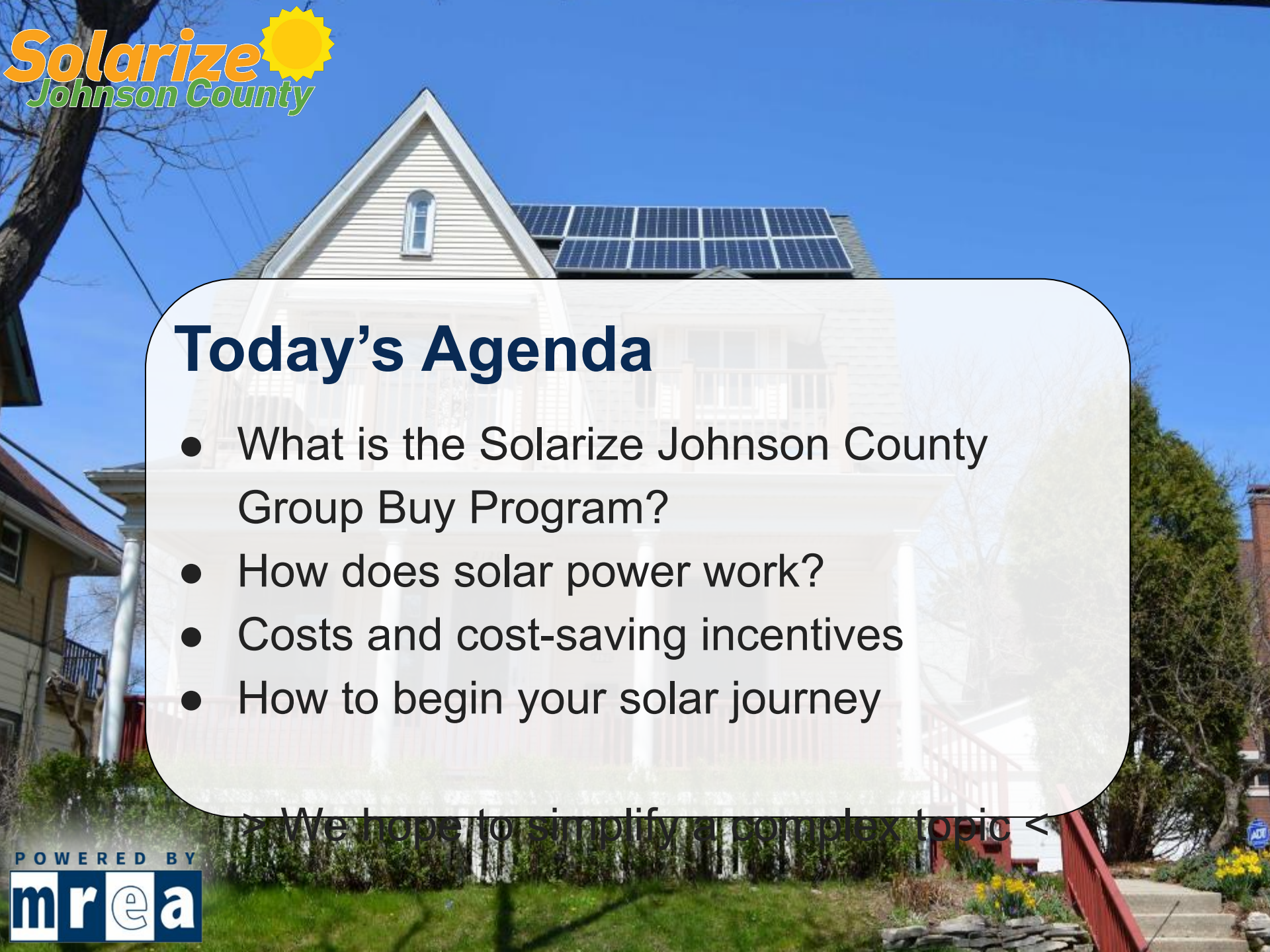

Today's Agenda

- What is the Solarize Johnson 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 <

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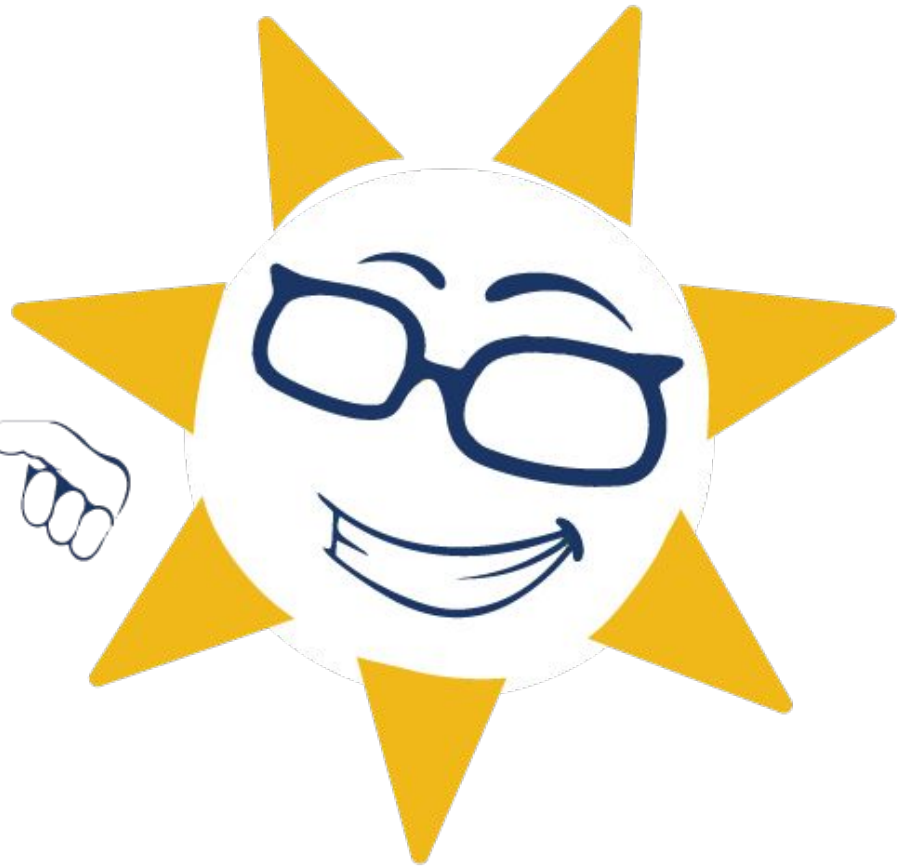
It's time for a poll!



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Why are we here?
To lead in creating more sustainable communities by making solar simple.
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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.
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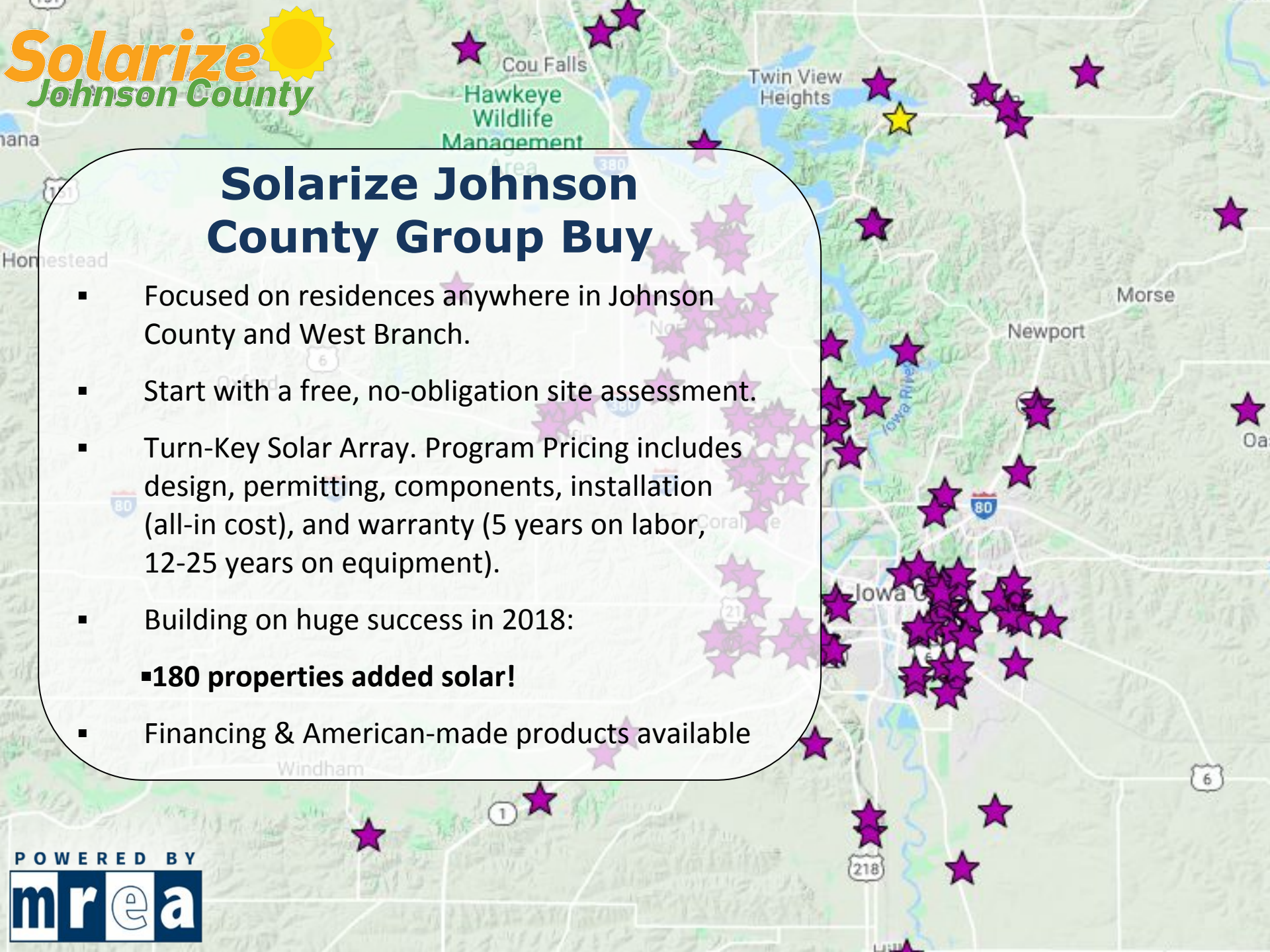

Solarize Johnson County Group Buy

- Focused on residences anywhere in Johnson County and West Branch.
- Start with a free, no-obligation site assessment.
- Turn-Key Solar Array. Program Pricing includes design, permitting, components, installation (all-in cost), and warranty (5 years on labor, 12-25 years on equipment).
- Building on huge success in 2018:
  - **180 properties added solar!**
- Financing & American-made products available

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mrea
midwest renewable energy association

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

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INSTALLER PROFILE

- **Eagle Point Solar** will custom design your solar array based on your last 12 months of kWh consumption on your electric utility bill. Eagle Point Solar will also submit the application to interconnect to the specific utility company.
- Eagle Point Solar and SiteGen Solar will construct your solar array in conjunction with NABCEP certified designers / installers. No subcontractors will be utilized on any projects in this group buy.
- Your solar array will be connected to your home, business, and farm, by Paulson Electric, SiteGen Solar, and Eagle Point Solar's Master Electricians.
- Eagle Point Solar will submit, and track, your state of Iowa tax credit application. (Federal Tax Credit is simpler)
- This process is a turnkey solution for everyone.

Expertise:

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

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How Does Solar Work?

Part 2 of 5

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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.

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Photovoltaic Solar Resource : United States and Germany

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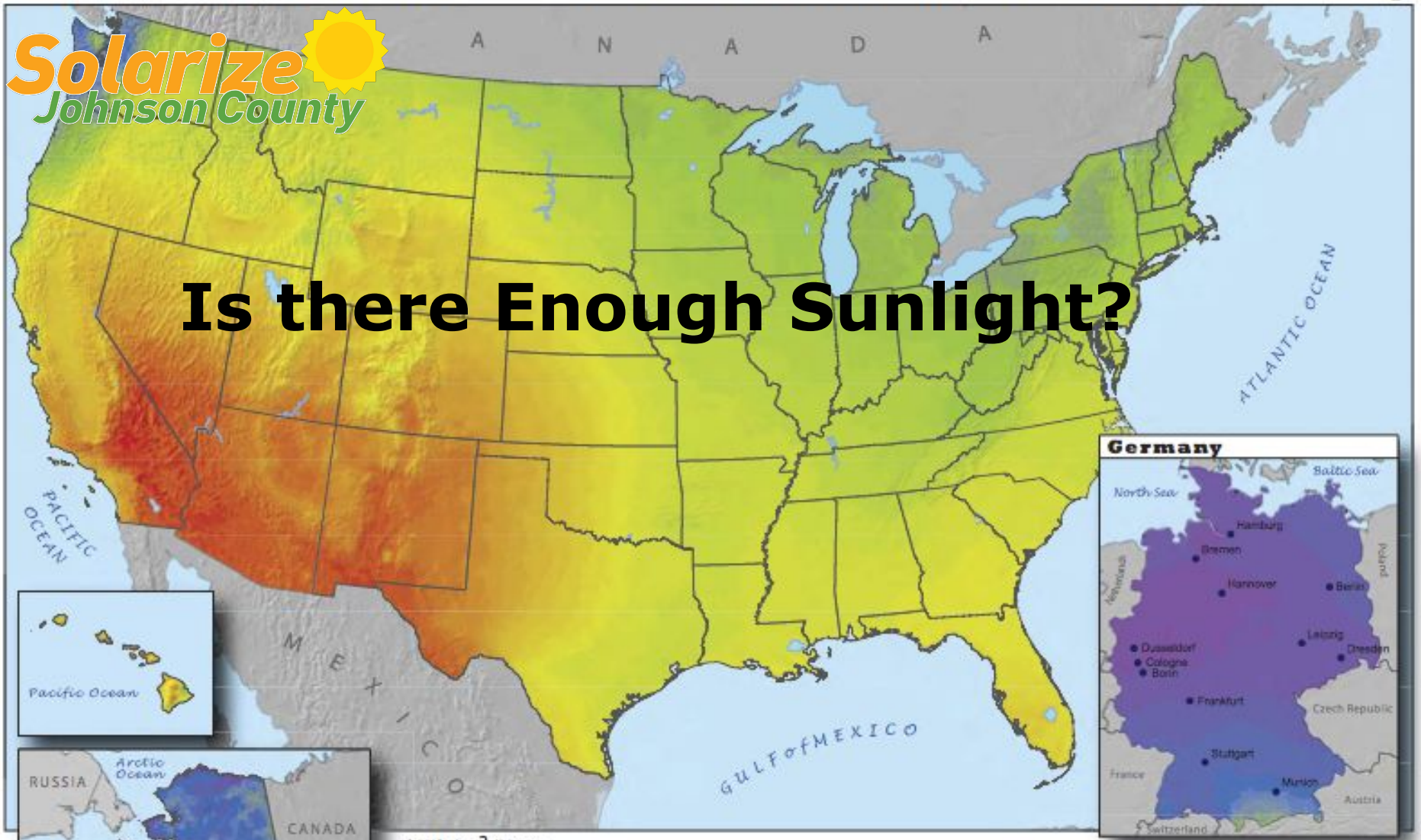
Is there Enough Sunlight?



Annual average solar resource data are for a solar collector oriented toward the south at a tilt = local latitude. The data for Hawaii and the 48 contiguous states are derived from a model developed at SUNY/Albany using geostationary weather satellite data for the period 1998-2005. The data for Alaska are derived from a 40-km satellite and surface cloud cover database for the period 1985-1991 (NREL, 2003). The data for Germany were acquired from the Joint Research Centre of the European Commission and is the yearly sum of global irradiation on an optimally-inclined surface for the period 1981-1990.

0 250 500 1,000 Miles

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy
May 30, 2008
NREL

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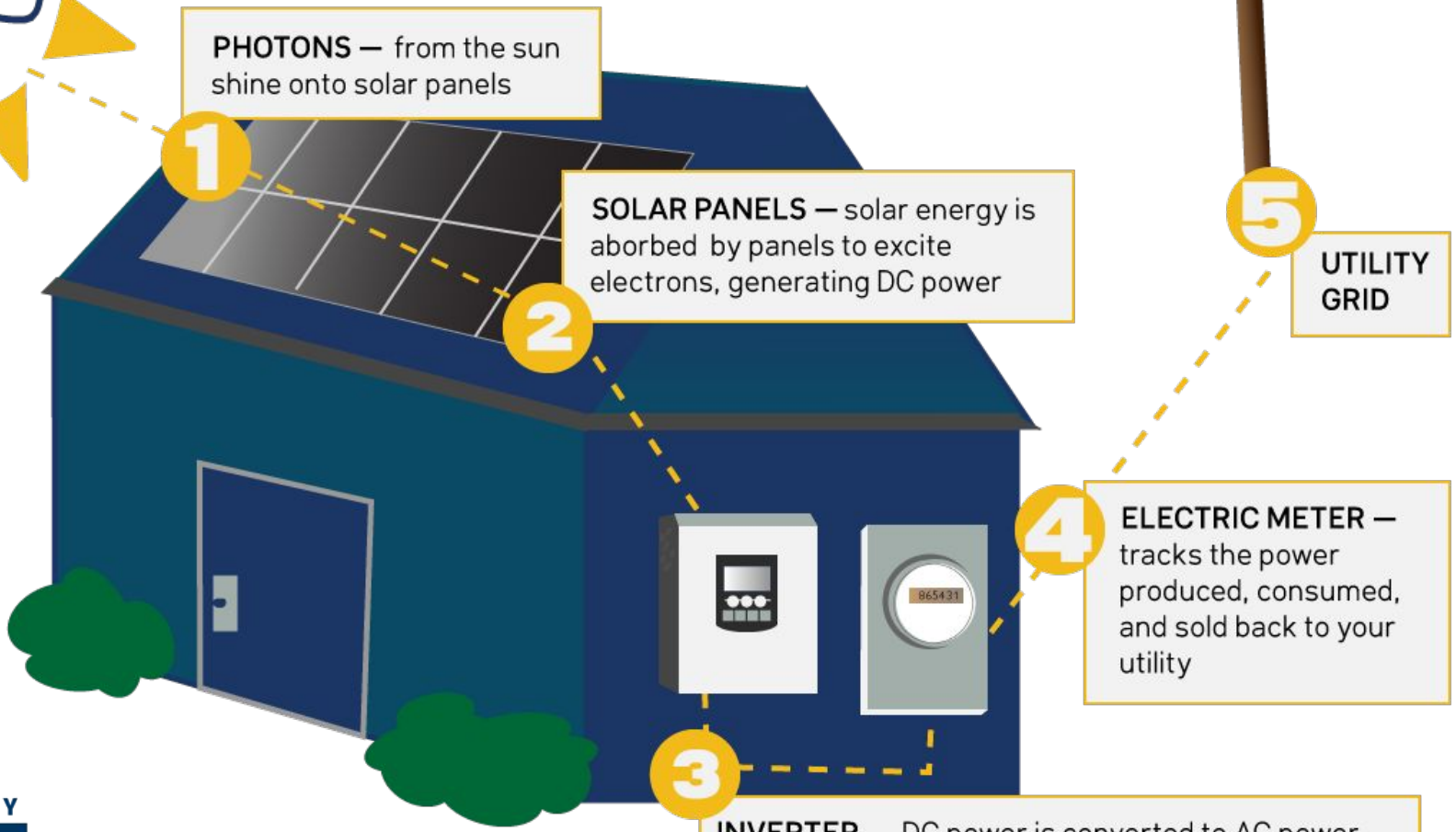
Configuration: How It Works...



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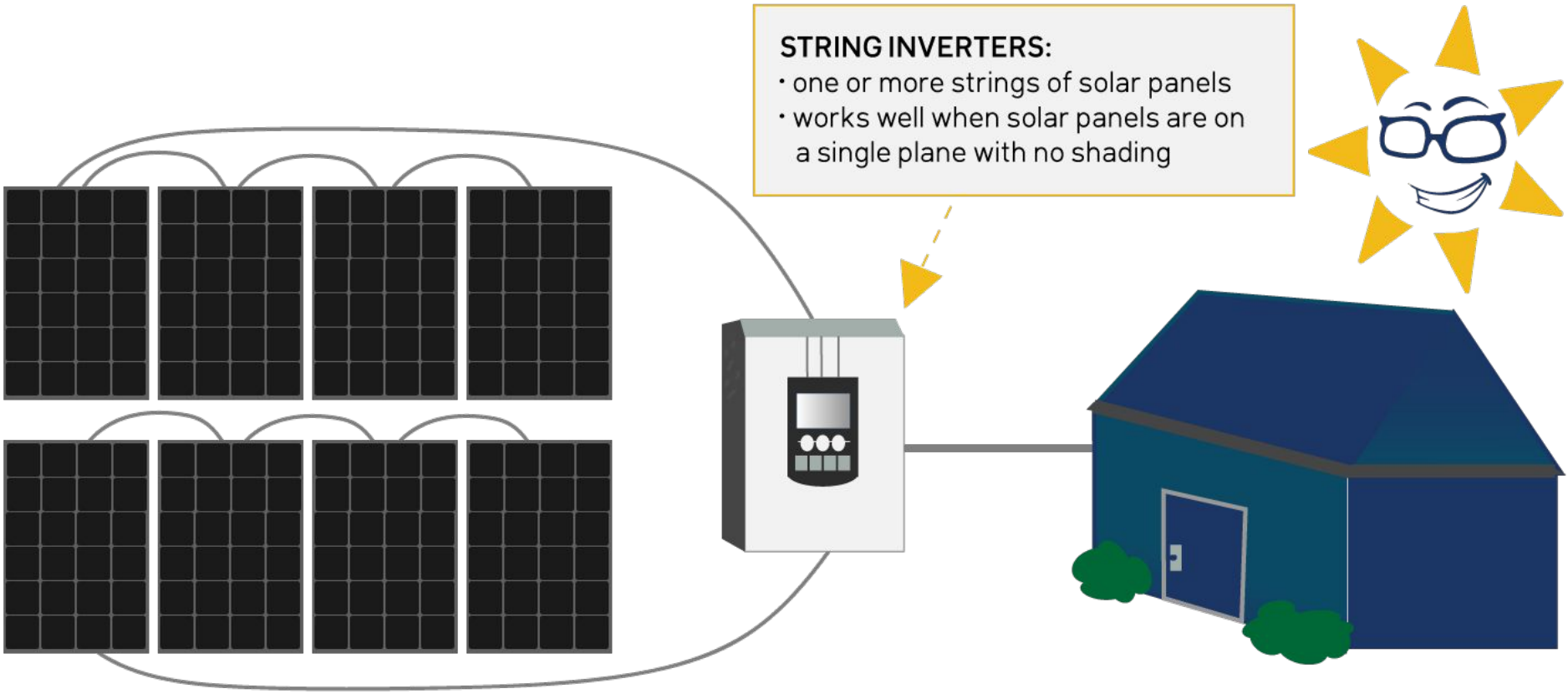
Inverter: The heart of the solar array



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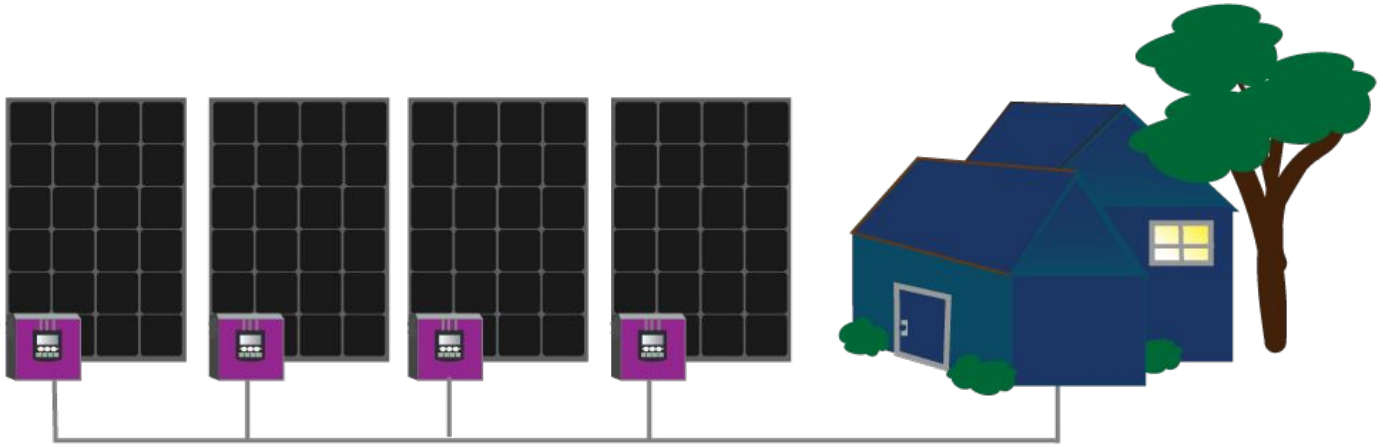
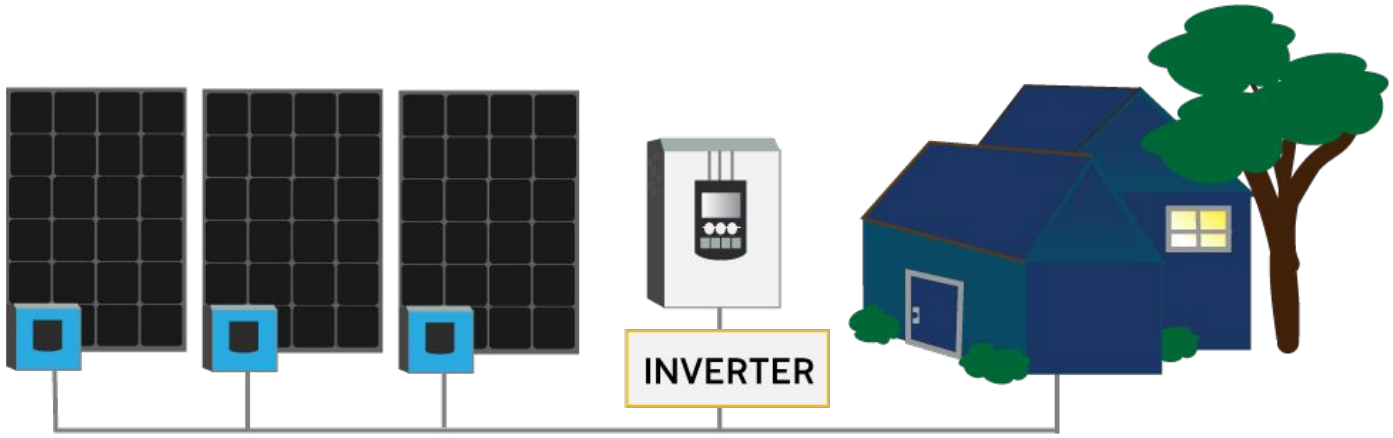
Inverter: The heart of the solar array

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



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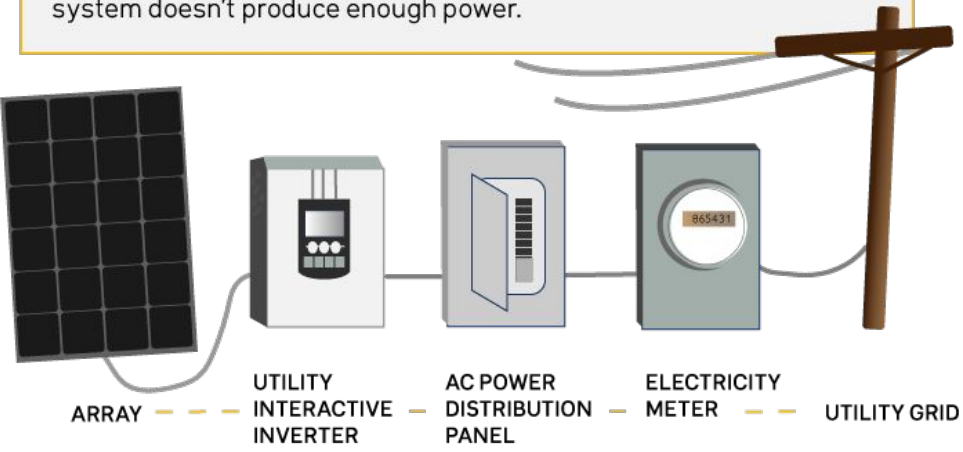
Grid-Tied VS. Off-Grid

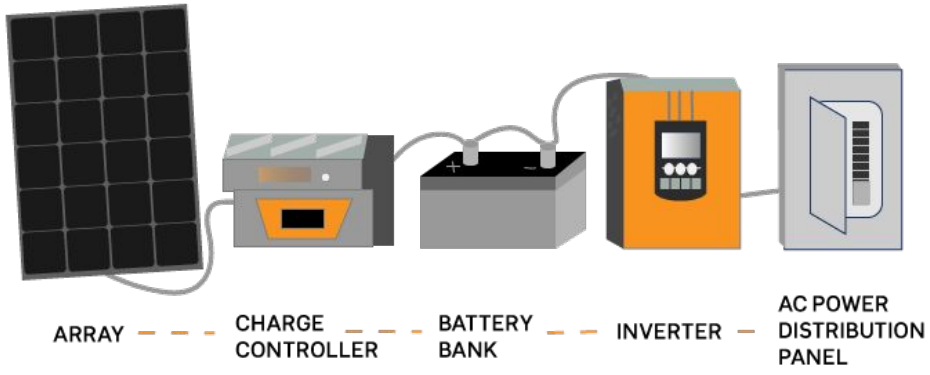
GRID-TIED DESIGN:
Excess electricity can be delivered to the utility grid, **AND** you can use electricity from the utility grid when your system doesn't produce enough power.

- 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 indpendent of the utility grid.

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



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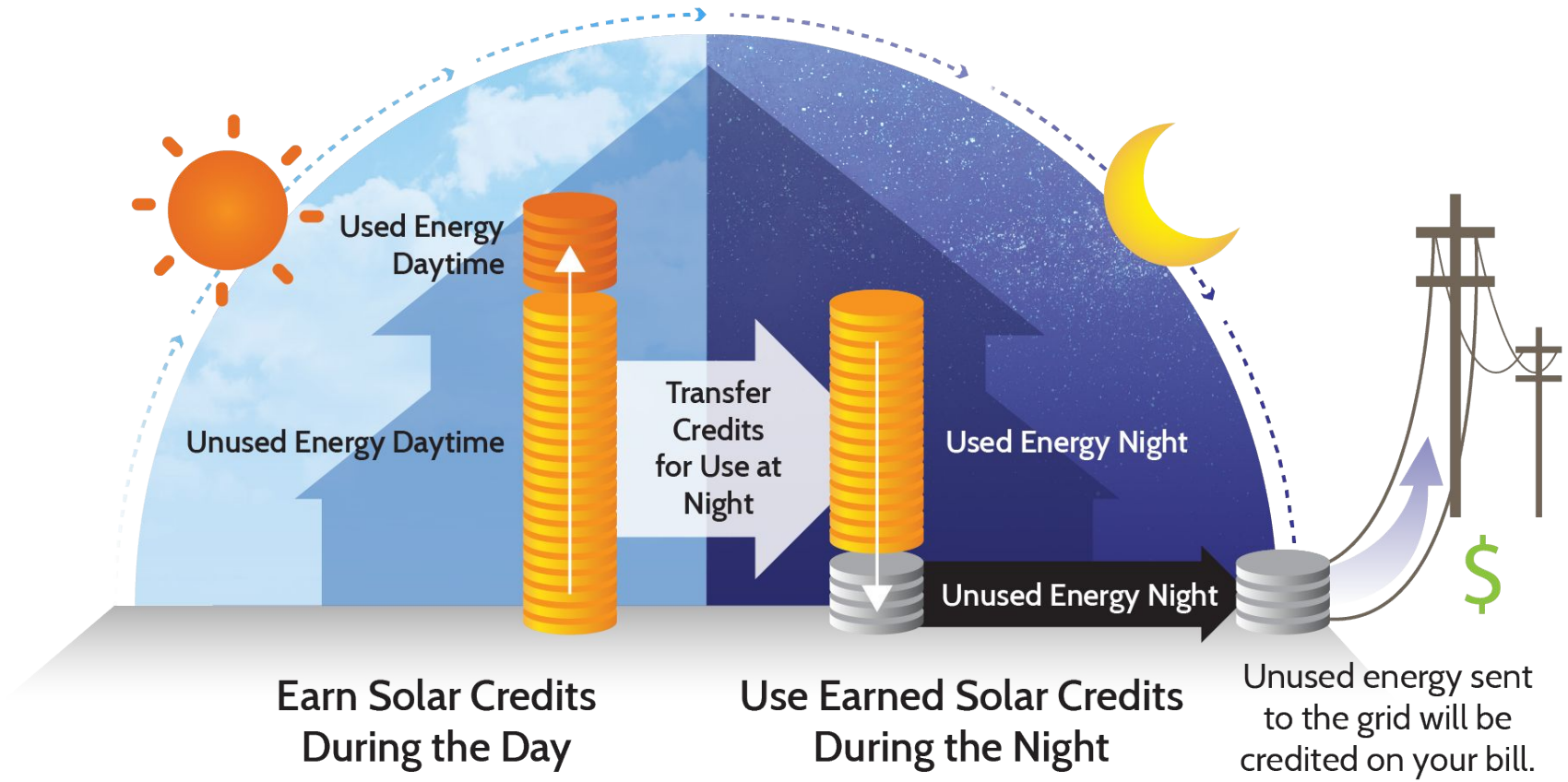
How Net Metering Works



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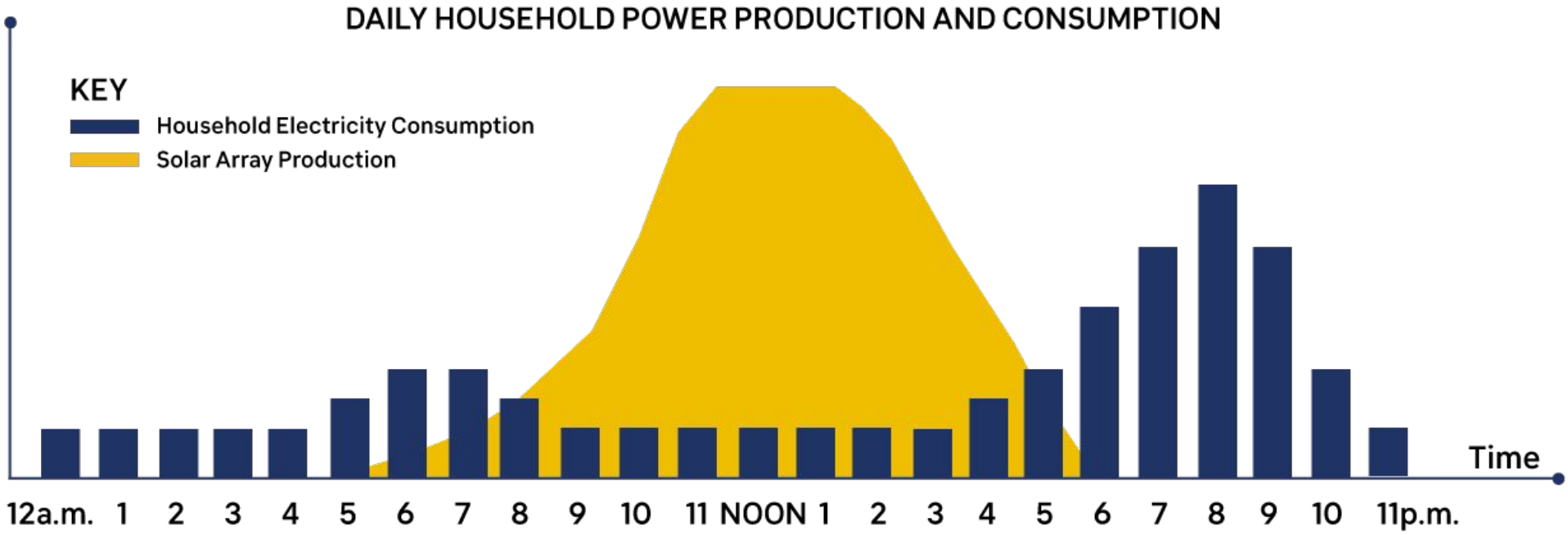
"A Day in the Life" of a Grid-Tied / Net Metered Home



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

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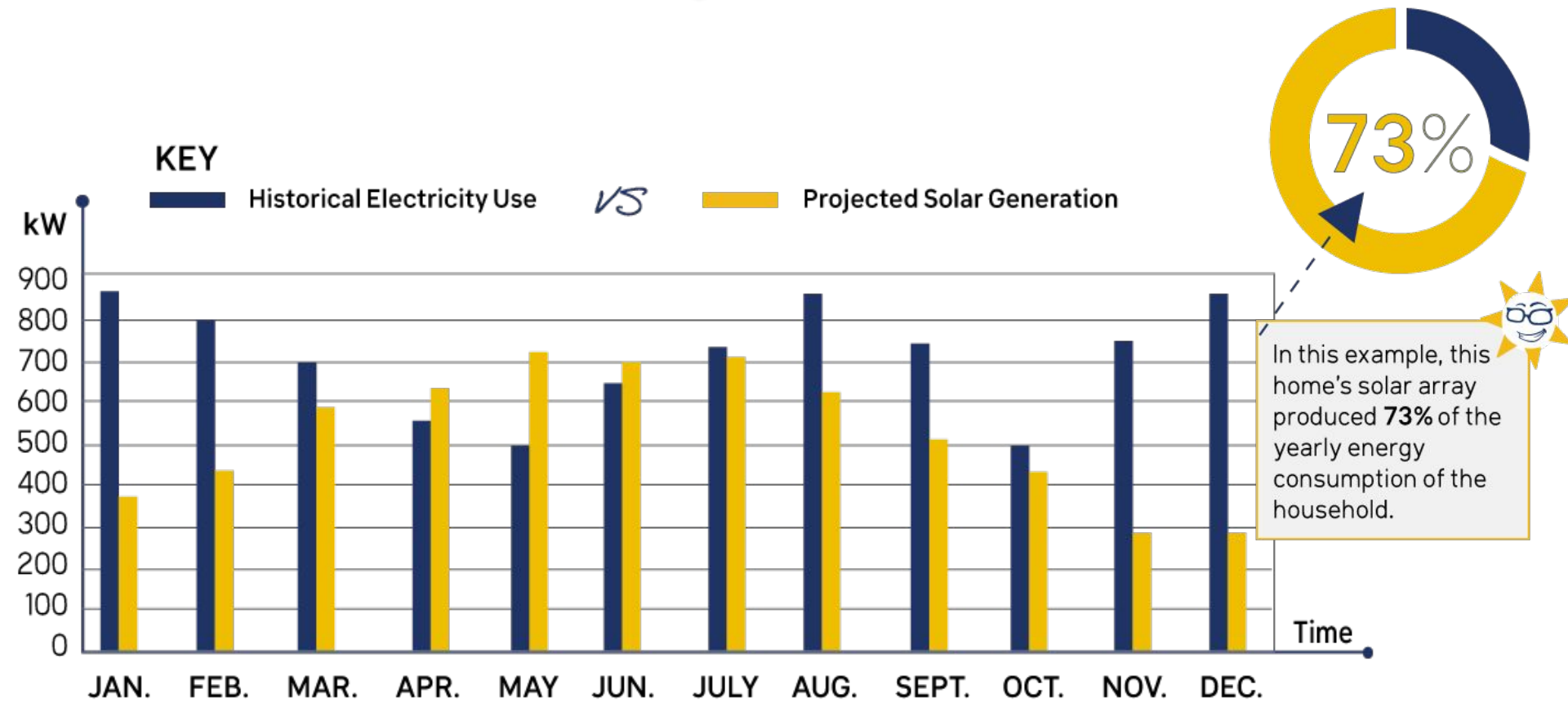
"A Year in the Life" of a **Grid-Tied / Net Metered Home**



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Options & Considerations

Part 3 of 5

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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

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

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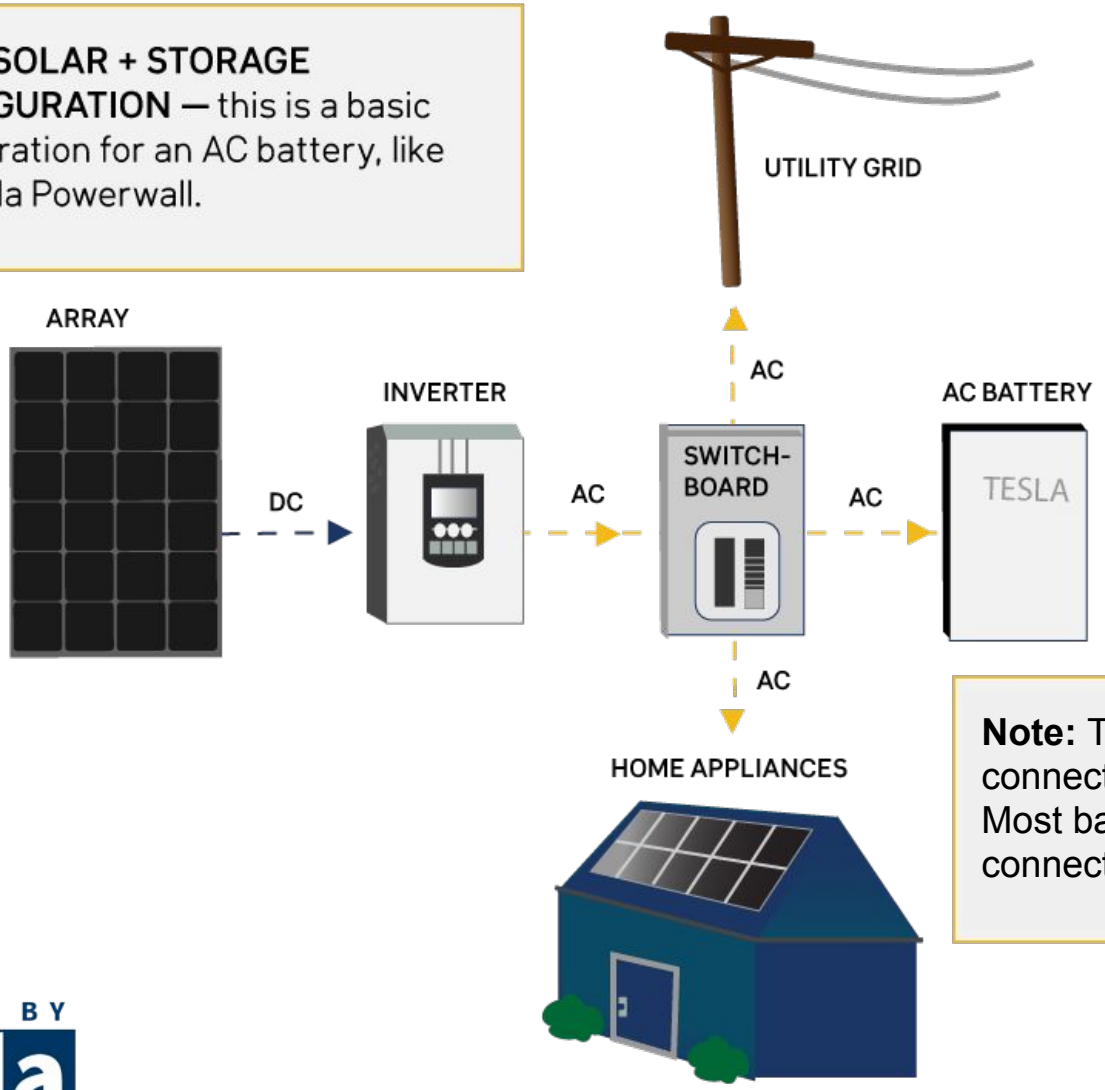
Solar + Storage

BASIC SOLAR + STORAGE CONFIGURATION — this is a basic configuration for an AC battery, like the Tesla Powerwall.



Note: Tesla batteries have an AC connection.
Most batteries would have a DC connection.

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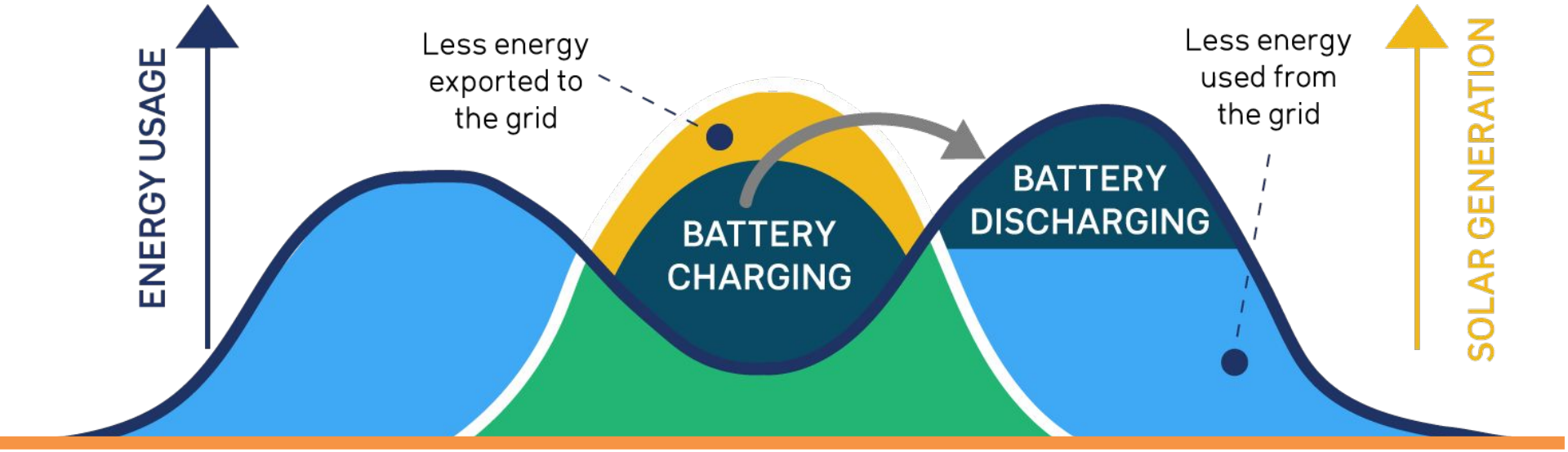
Solar + Storage



FINANCIAL CASES FOR BATTERIES:

- **TIME OF USE (TOU)—** If your utility charges you different rates depending on the time of day that electricity is being used.
- **NET METERING —** If the excess generation from your solar array is credited at avoided cost rates (i.e. wholesale electricity prices).
- **DEMAND CHARGES —** Sometimes utilities have demand charges, meaning your electricity rate varies based on your peak demand, which is the period of time during the billing cycle that you use the greatest amount of electricity (usually calculated in 15 minute increments).

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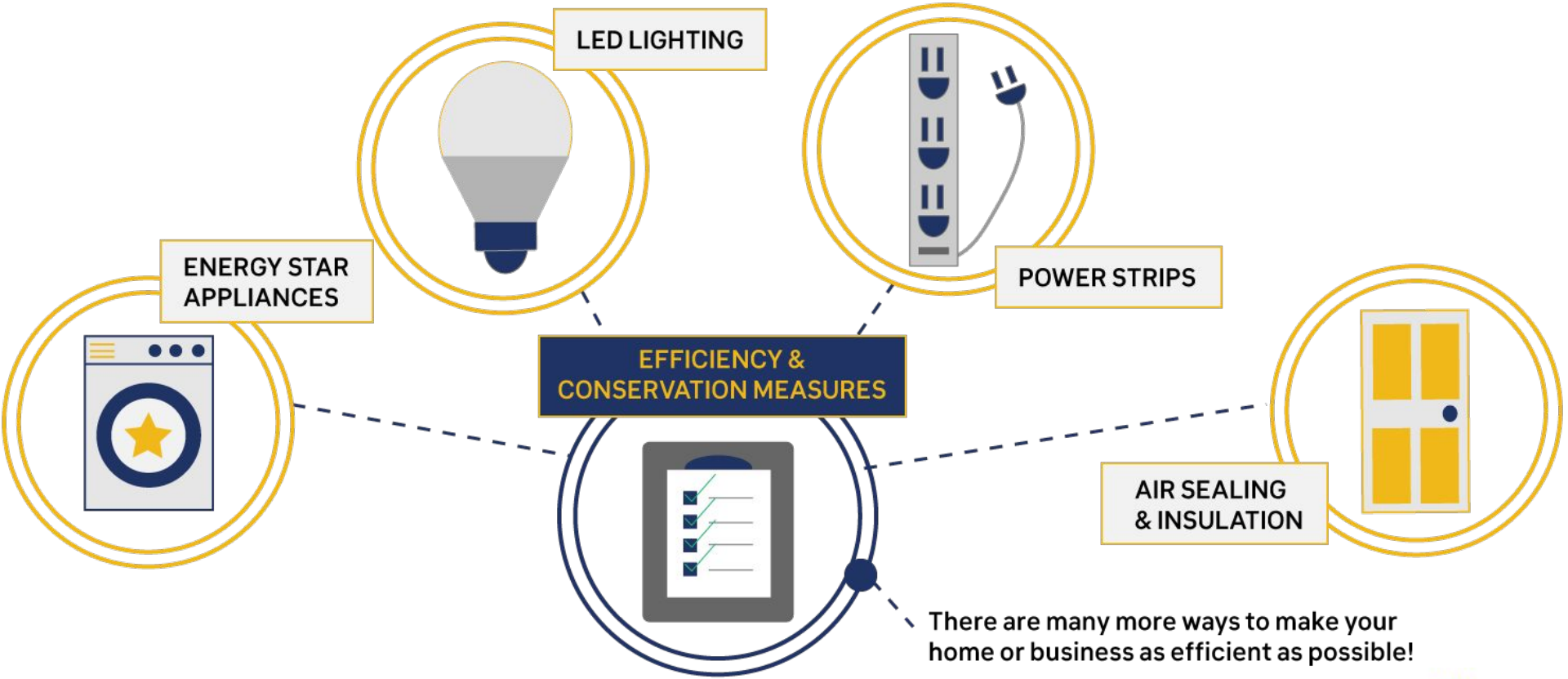
Energy Efficiency



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BPI CERTIFIED PROFESSIONAL

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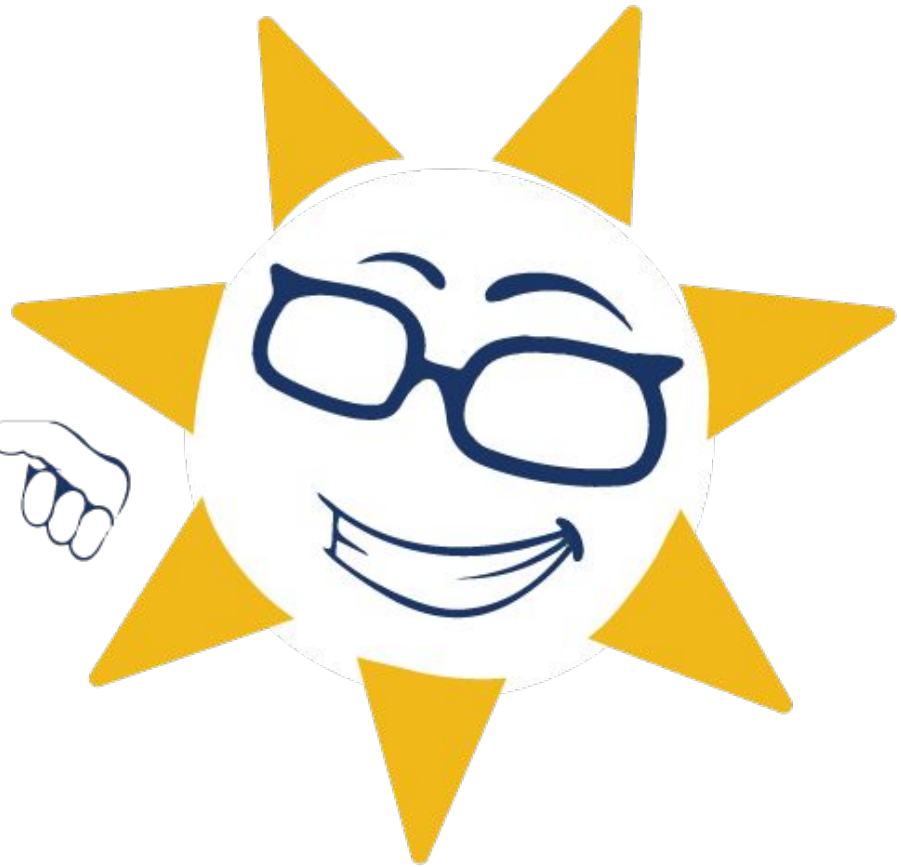
It's time for a poll!



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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

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Group Buy

How It Works

The more people go solar, the lower the price:

Competitive Base Price: $2.12/W

(Base price is lower than Eagle Point's typical price)

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

>50 kW	>150 kW	>300 KW	>500 kW
-$0.03/W	-$0.06/W	-$0.09/W	-$0.13/W
- $30/kW	- $60/kW	-$90/kW	-$130/kW
~8 homes	~25 homes	~50 homes	~83 homes

On a 6 kW array, the maximum *additional* Group Buy price break is $780

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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

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Typical installation

Pictured above is a 22 module, or 7.26 kW DC, solar array.
Estimated annual solar production = **9,253** kWh

Photo Credit: Eagle Point Solar

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7.26 kW Solar Array
22 330W VSUN Modules

7.26 kW DC Residential Roof System	
Starting price:	**$2.12/Watt ($15,392)**
Site-Specific Adders	
- 2 story roof ($.08/W)	**+ $580**
- 7/12 roof pitch ($.05/W)	**+ $363**
Final quoted price ($2.25/W)	**$16,335**
Installed Cost (**$2.25/Watt**)	$16,335
26% Federal Tax Credit	($4,247)
Iowa 13% Tax Credit	($2,124)
Net Cost	**$9,964**

Simple Payback: 9.1 yrs

Estimated Year 1 Solar production = 9,253 kWh
Year 1 utility $/kWh = $.095/kWh
Payback = Net Cost / Year 1 electric bill saving = $880
Cash Gained Over 25 Years = $27,585

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Solar System Price Spectrum

$10,000
One Array <4kW

$20,000
Ground Mount Array, 5-6kW

$30,000
Two Arrays,
One Roof, 7-9kW

$40,000
Two Arrays, Two Roofs, 10+kW

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Incentives & Next Steps

Part 5 of 5

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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, 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.

- **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.

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Home Values

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

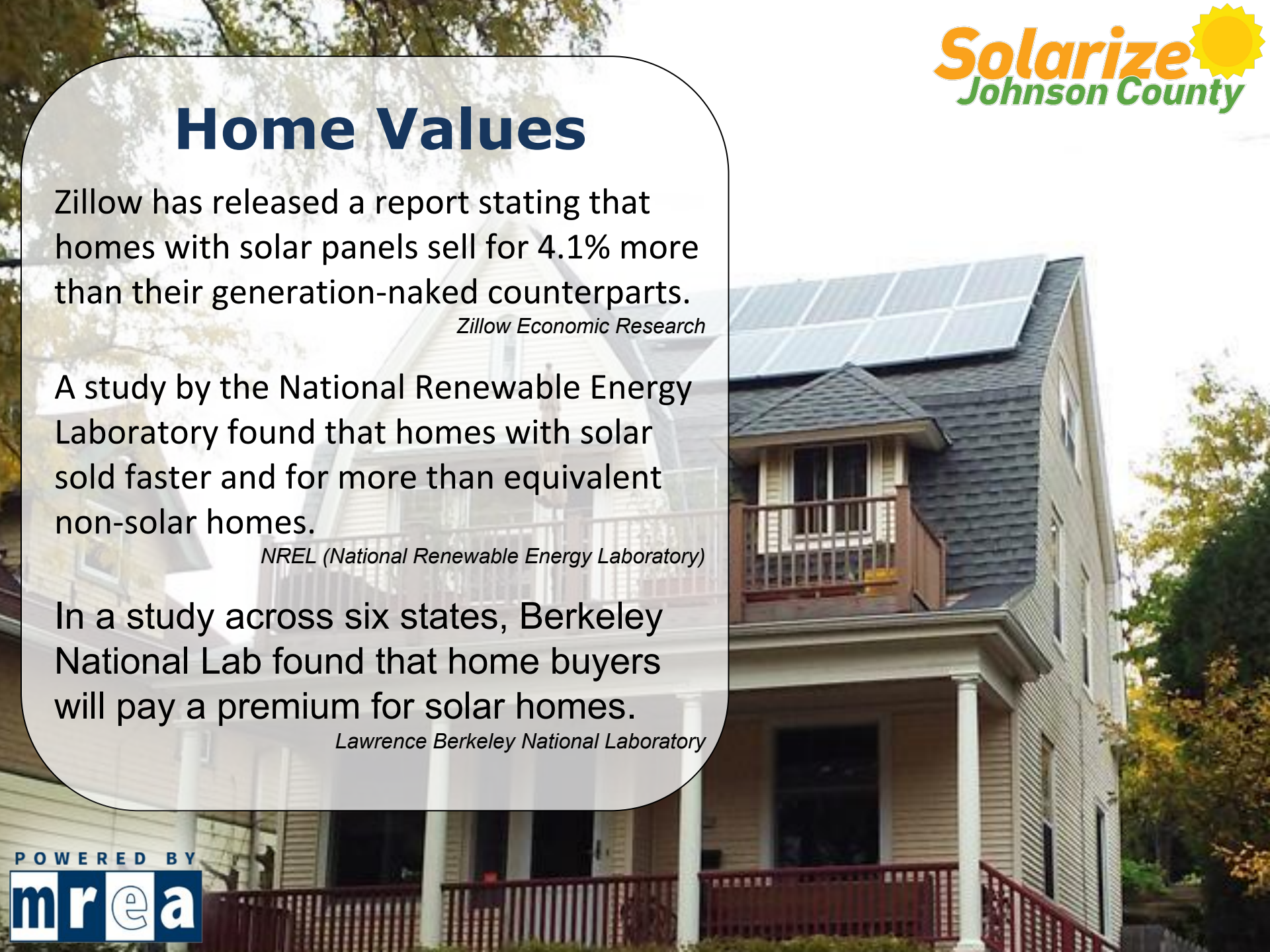
Zillow Economic Research

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



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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 CO_2 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.**

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Financing Solar

Clean Energy Credit Union

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

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INSTALLATION TIMELINE (approximate)

Day 1	Sign Contract
Week 1-2	Engineered design by Eagle Point Solar submitted for permitting and interconnection applications
Week 3-7	Getting approval for interconnect application from Utility Company
Week 8-9	Construction
Week 10-14+	Waiting for inspection/approval and Utility Company Permission to Operate

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Contact: Connie Schuster at Eagle Point Solar
cschuster@eaglepointsolar.com or (563) 582.4044
Presenter: Tom Wieseler - tom.wieseler@gmail.com
Support: Marta Monti - Marta@midwestrenew.org
Solar Program Manager, MREA

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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. Eagle Point Solar will provide you with a free, no obligation preliminary Solar Financial Analysis. This report can be via email or webinar.
4. Request a detailed site assessment. Eagle Point Solar will verify your design, update your quote and give you your contract.
5. Sign contract with Eagle Point Solar by September 30, 2020, to participate in Solarize Johnson County.
6. Celebrate and enjoy clean energy!
7. Tell your neighbors and friends!

Email: Connie Schuster - cschuster@eaglepointsolar.com

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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!**

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