Solar Panels on Your Home & in Your Community

CUB Webinar

April 21, 2020

Christina Uzzo

CITIZENS UTILITY BOARD

Fighting for Illinois Consumers

Citizens Utility Board (CUB)

- Represents Illinois utility ratepayers & advocates for **cheaper & cleaner energy**
- Has saved consumers more than **$20 billion** by fighting proposed electricity, natural gas, and telephone rate hikes
- Advocated for the Future Energy Jobs Act – which put Illinois at the forefront of renewable energy in the Midwest!
- Operates a consumer hotline to help with utility complaints
- Holds **~500 public education** events per year!

www.CitizensUtilityBoard.org

Solar Benefits

There are now approximately 64GW of solar installed in the U.S.

The U.S. installed 10.6 gigawatts of solar PV capacity in 2018 to reach 64.2 gigawatts of total installed capacity, **enough to power 12.3 million American homes.**

Total installed U.S. PV capacity is **expected to more than double over the next five years** - by 2024, more than 15 GW of PV capacity will be installed annually.

Solar accounted for 29% of all new electric generating capacity additions in 2018, second only to natural gas and the 6th straight year solar has been #1 or #2.

314,600 American homes installed solar in 2018!

A new solar array is installed every 84 seconds in the U.S.

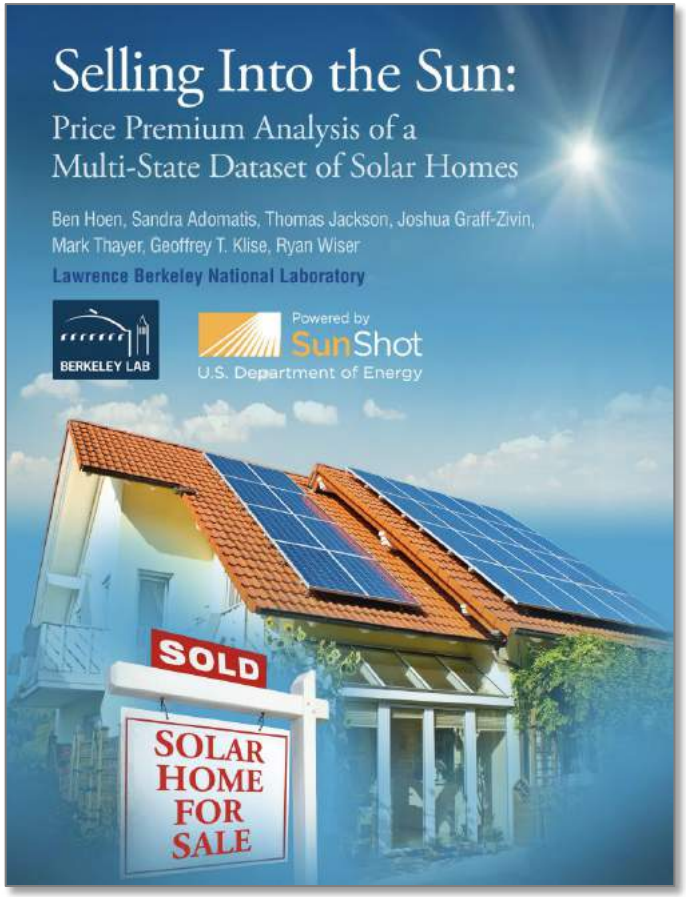
https://www.seia.org/us-solar-market-insight

The real estate market recognizes the value of going solar.

- *Lawrence Berkeley National Laboratory (LBNL)* conducted a report that definitively showed that homes with solar sold for more than houses without it. The study found that each watt of solar added an average of $4 to the home's value in California and an average of $3 per watt elsewhere.

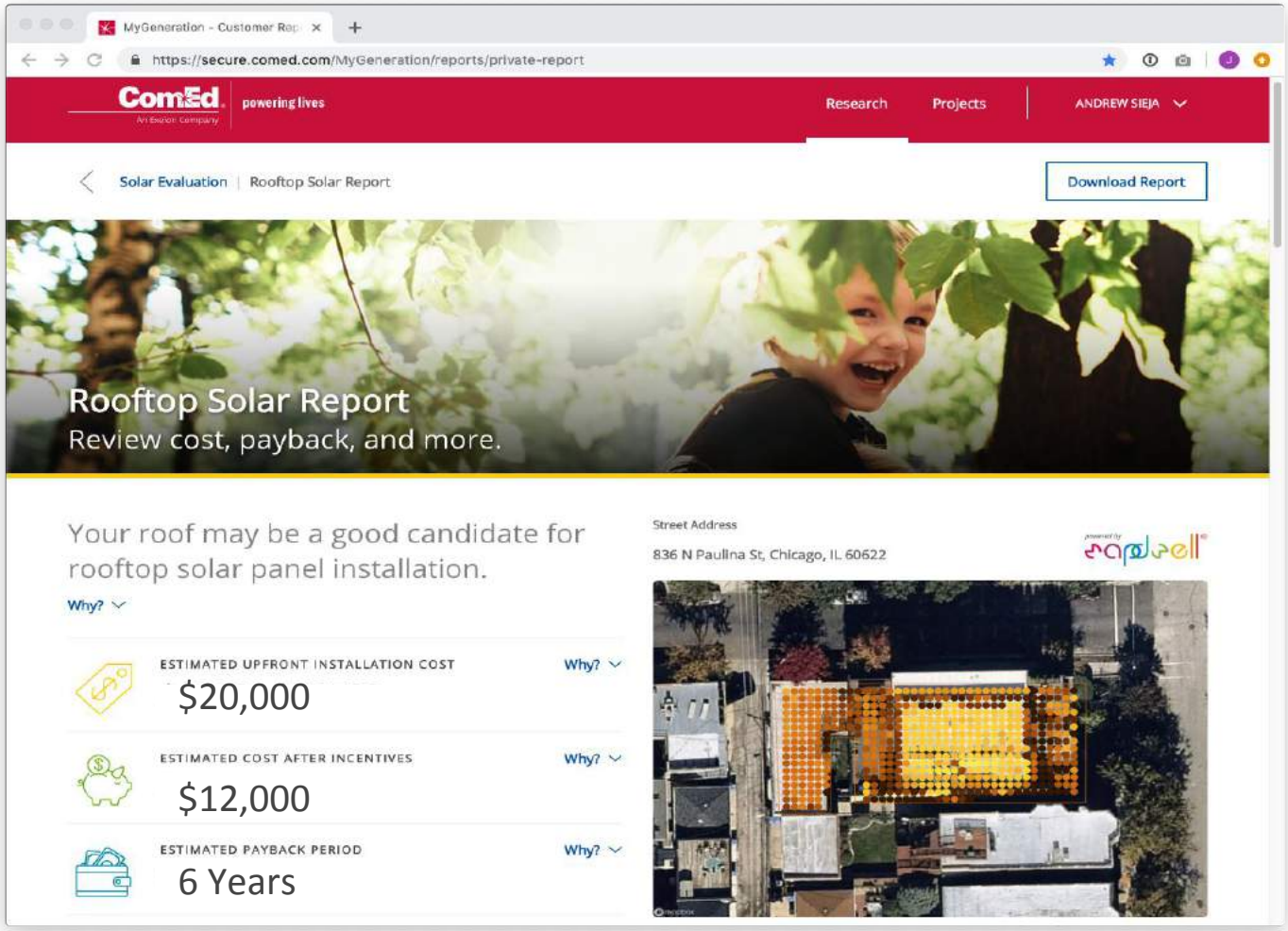
- Zillow found that homes with solar panels sell for 4.1% more than similar, non-solar homes. (*Zillow Economic Research)*

Note: **Solar systems should not increase your property taxes**. Illinois offers a special assessment for solar energy systems, but your assessor may request a completed State of Illinois PTAX-330 property tax form.



https://emp.lbl.gov/sites/default/files/lbnl-6942e.pdf
https://www.zillow.com/research/solar-panels-house-sell-more-23798

Going solar pays for itself!



Solar Calculator Report Payback Period & Electricity Mix – continued

The average system size can offset 260,376 lbs of C02 in 25 years.

287,672 miles driven by an average passenger vehicle

Carbon sequestered by 139 acres of forest

Switching 4,469 incandescent lamps to LED

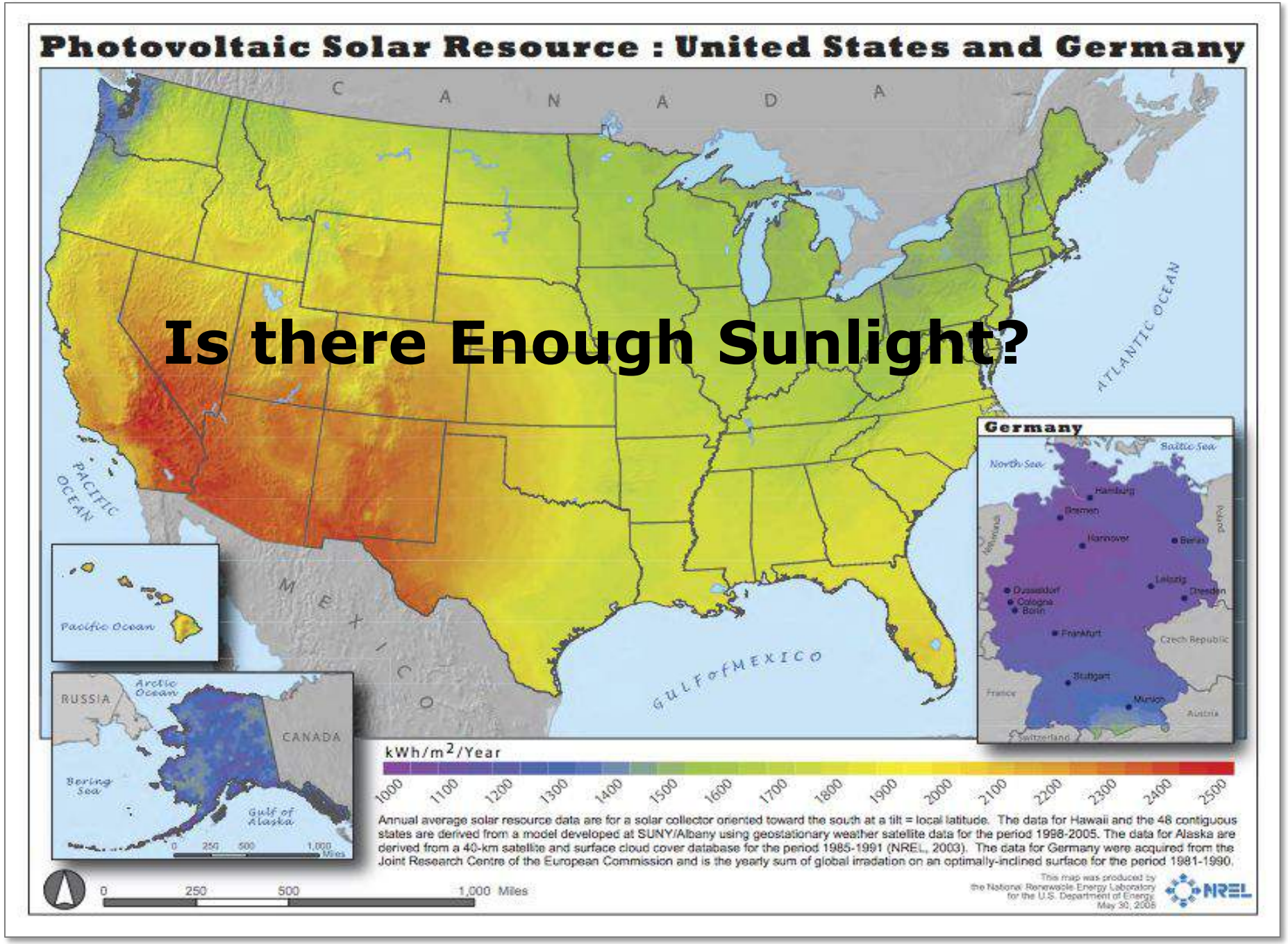
CO2 emissions from burning 129,218 pounds of coal

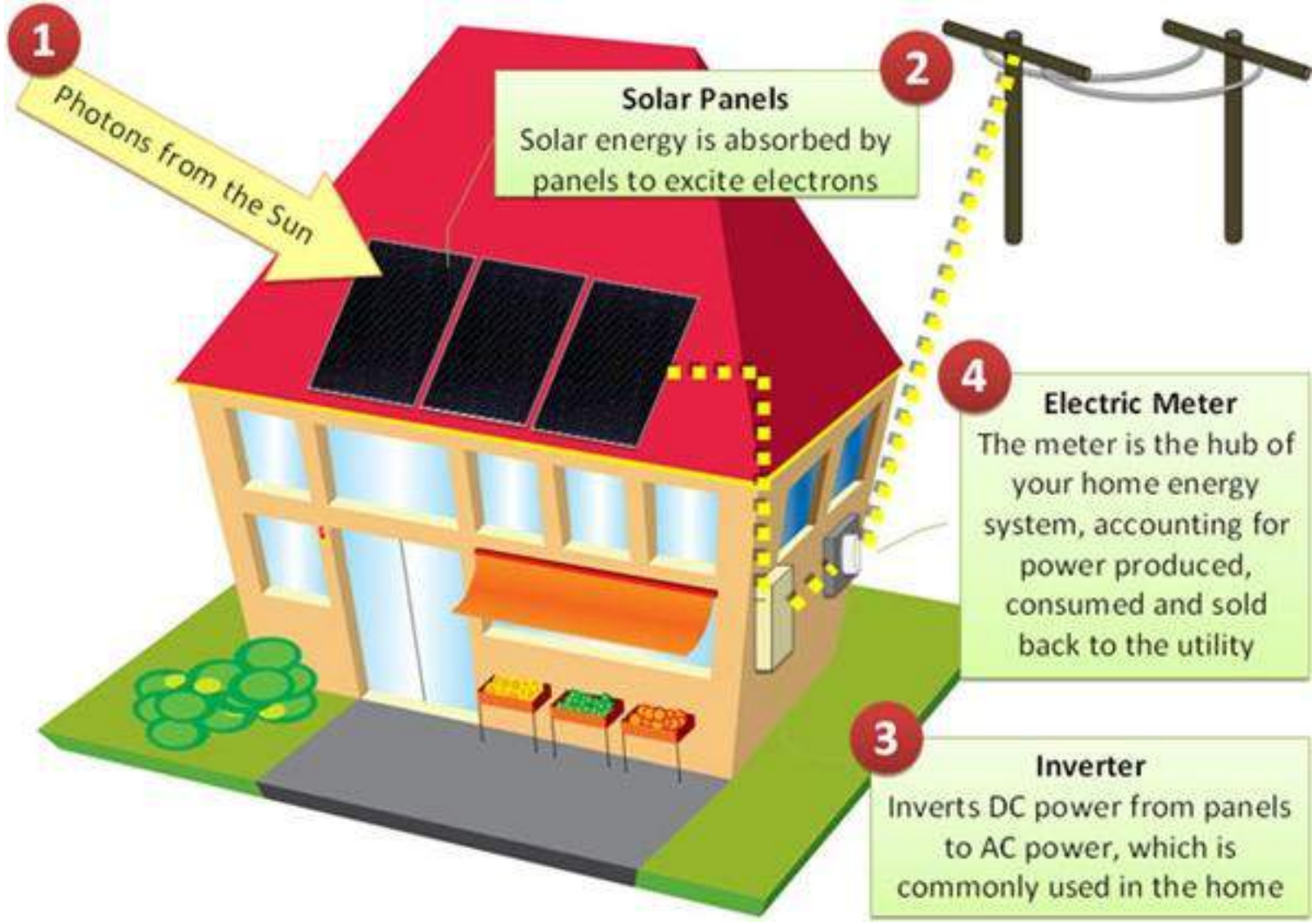
Diverting 41 tons of waste from the landfill

CO2 emissions from 13,239 gallons of gasoline

https://www.epa.gov/energy/greenhouse-gas equivalencies-calculator

Solar Basics


Photovoltaic Solar Resource : United States and Germany
Is there Enough Sunlight?
CANADA
ATLANTIC OCEAN
PACIFIC OCEAN
MEXICO
GULF of MEXICO
Pacific Ocean
RUSSIA
Arctic Ocean
CANADA
Bering Sea
Gulf of Alaska
0 250 500 1,000 Miles
Germany
Baltic Sea
North Sea
Hamburg
Bremen
Hannover
Berlin
Poland
Netherlands
Düsseldorf
Cologne
Bonn
Leipzig
Dresden
Frankfurt
Czech Republic
Stuttgart
Munich
France
Austria
Switzerland
kWh/m2/Year
1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500
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


1
Photons from the Sun
Solar Panels
Solar energy is absorbed by panels to excite electrons
2
4
Electric Meter
The meter is the hub of your home energy system, accounting for power produced, consumed and sold back to the utility
3
Inverter
Inverts DC power from panels to AC power, which is commonly used in the home

Most inverters offer module-level monitoring for real-time feedback.

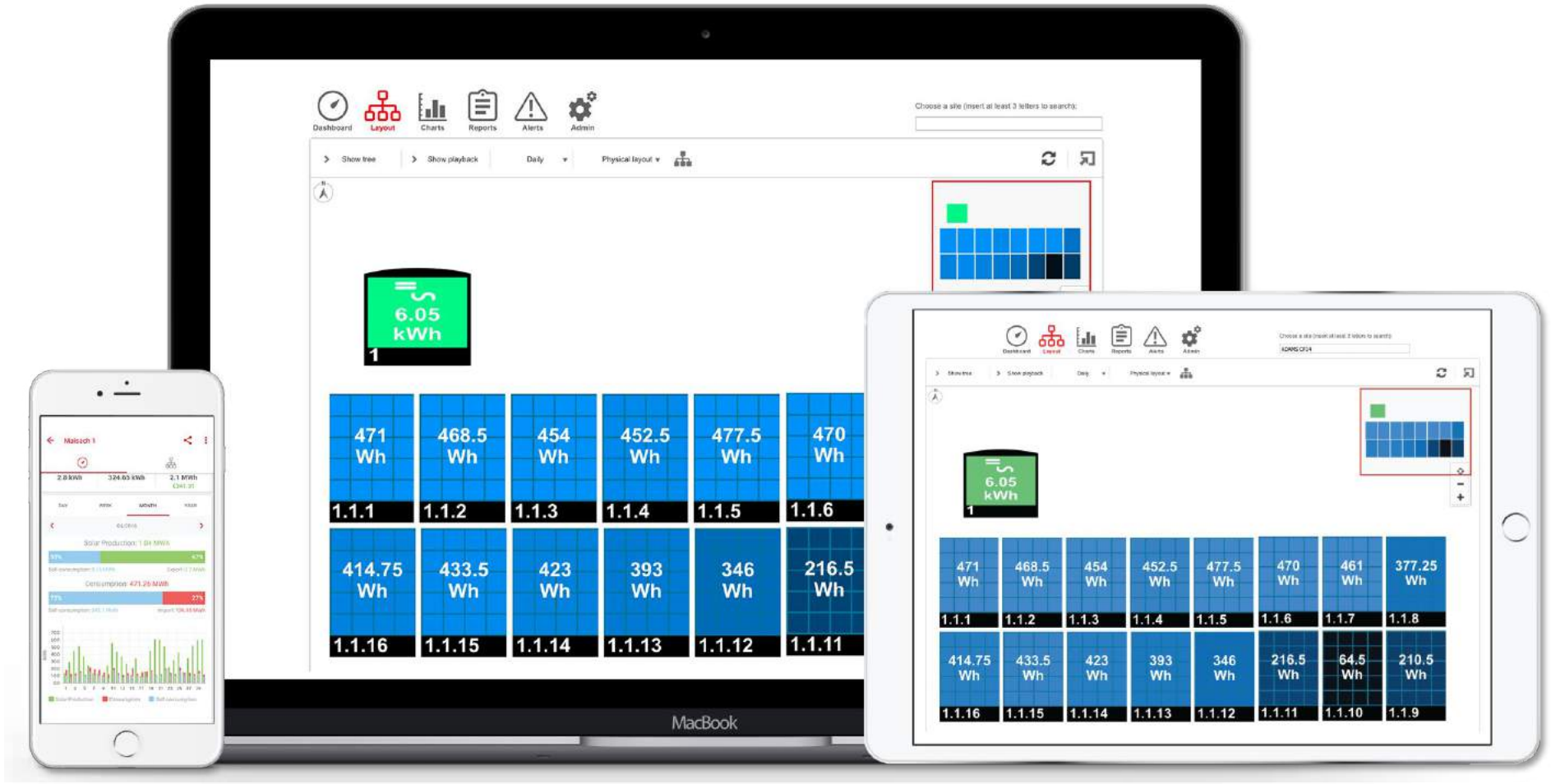
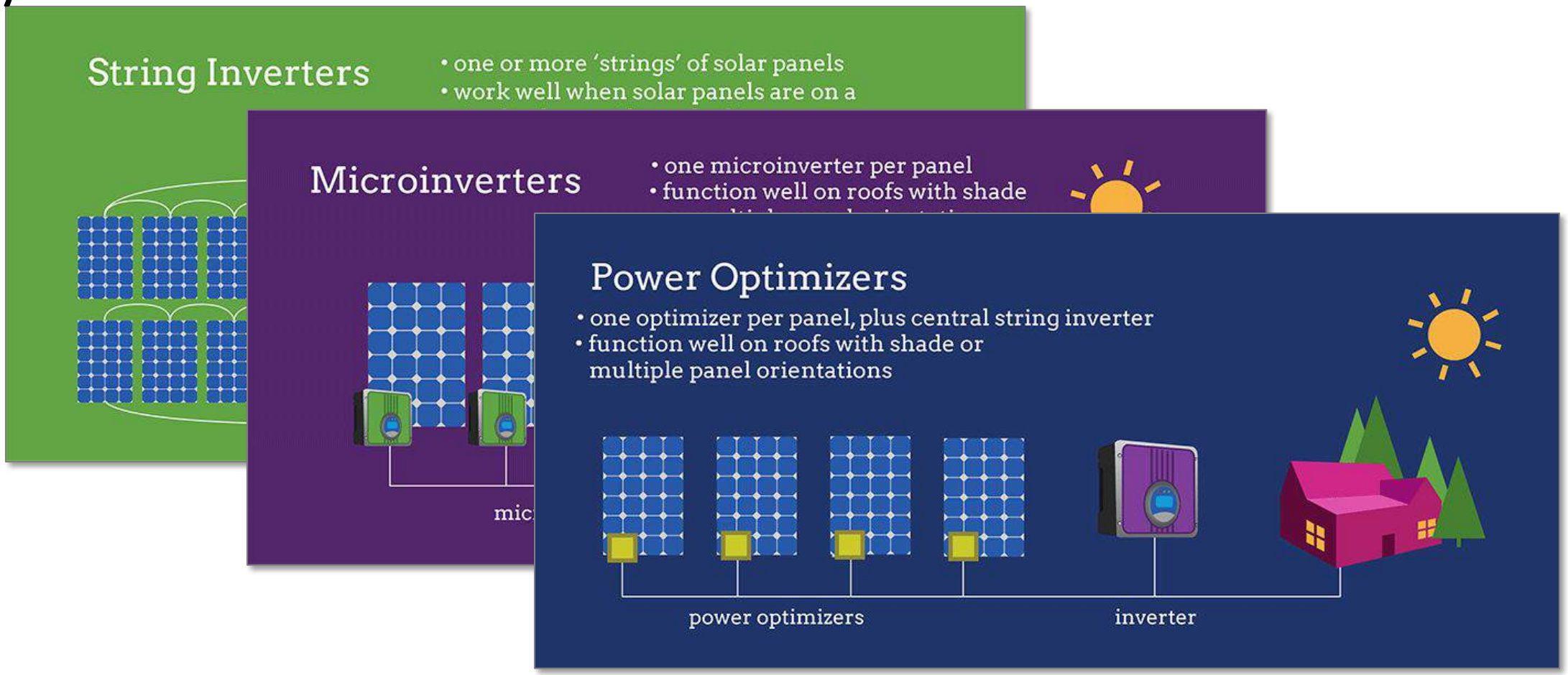


Photo Credit: mysunbank.com.au/energy-management/solaredge-monitoring/monitoring-screens/

Inverter classification: Micro, String, and Power Optimizer systems.



Unshaded, south-facing roofs generate the most electricity.

Most exposure possible between 9am-3pm.

- South-facing sun exposure is ideal.
- East or West-facing roofs are also options, although it can require about 20% more modules.
- Avoid shading: trees, buildings, poles.

Project Sunroof: Mapping Solar Potential.

- Search your home.
- Personalize your solar analysis.
- Compare financing options.

Screenshot of Google's Project Sunroof.

Roof Mounted System: The most common type of installation.

Panels are often installed on sloped rooftops.

- Used for flat or pitched roofs.
- Typically attached via aluminum railing system.
- Roof penetrations require adequate sealing; installers assume responsibility for roof damage, leaks, mold.

Considerations for roof-mounted systems:

- Snow / Hail / Wind Loading
- Roof Condition (age of shingles)
- Squirrels

Installers configuring a roof-mounted system.

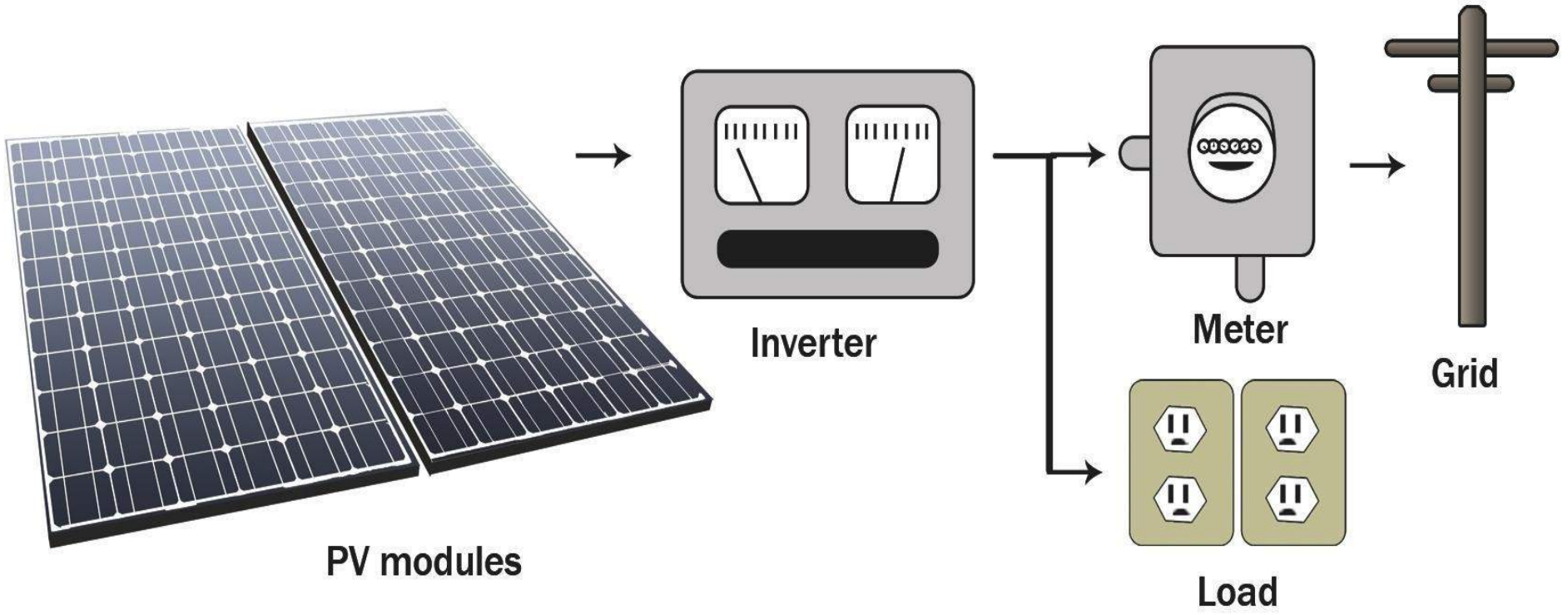
Ground Mounted System: Alternative to roof-mounted systems.

Is Ground-Mount right for me?

- Good for larger arrays and for properties where house roof is shaded or too small.
- Great for open fields or large yards.
- Better air circulation may result in slightly higher energy output.
- Take advantage of best solar window.
- Anchor to ground mounts.
- Easy to remove debris.
- Almost always require excavation for conduit.

Example of a ground-mounted system.

Grid-Direct Systems are required to shut down if utility is offline.



Net Metering: receive credit for energy sent to the grid

- Net metering means that any excess electricity produced by your solar system is exported to the utility grid and you receive credits, reducing your overall electricity costs.
- In ComEd you are credited at the same rate that you purchase electricity –1 to 1 net metering

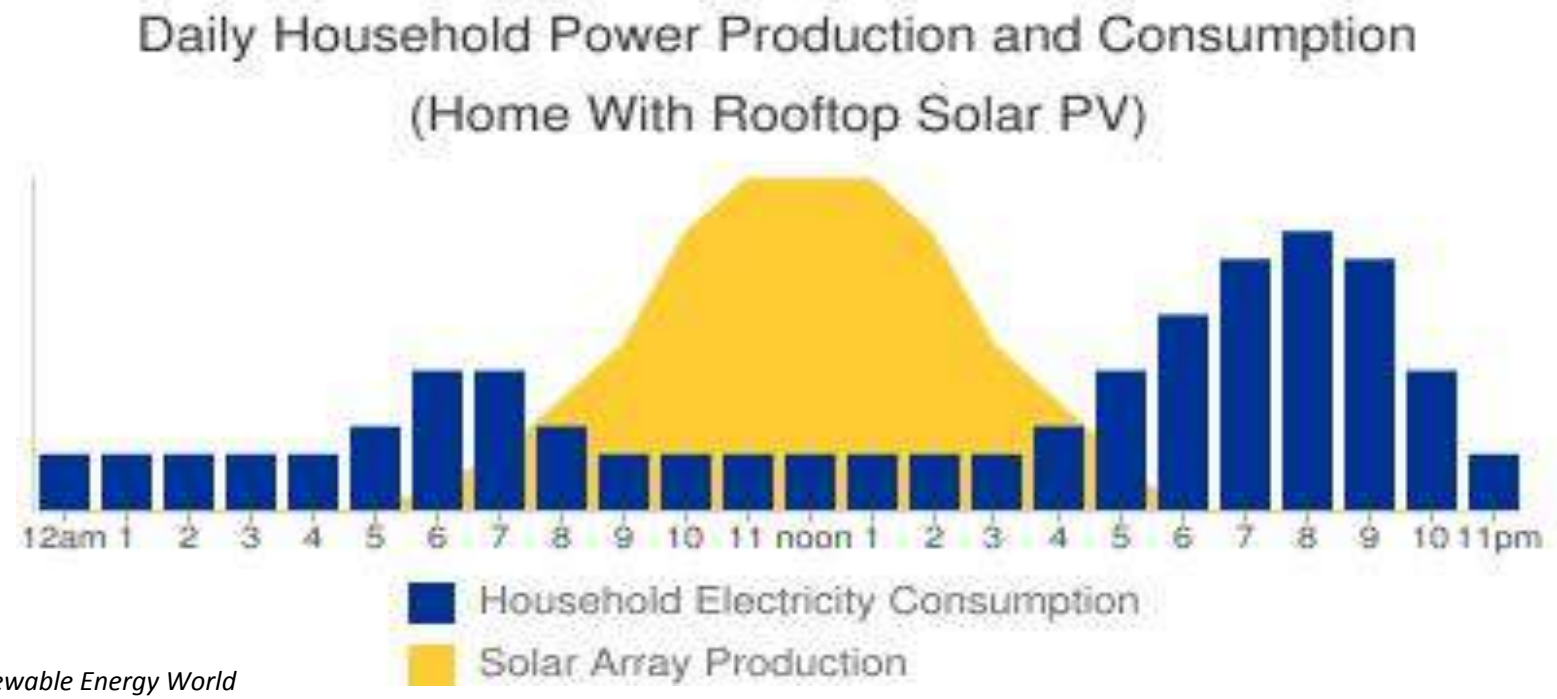


Image courtesy of Renewable Energy World

Net Metering: receive credit for energy sent to the grid

- Net metering will never completely $0 out your bill, or eliminate it
- Credits roll over from month to month , annual true-up with ComEd in April.
- NOTE: You may only interconnect a system sized to produce up to 110% of your electricity demand from the previous 12 months. (ComEd policy)

Image courtesy of Solar Estimate.org

METER INFORMATION

Read Dates	Meter Number	Load Type	Reading Type	Previous	Present	Difference	Multiplier	Usage
2/21-3/22		I/O w/ Flow Thru	kWh From Grid	Actual	Actual			420
2/21-3/22		I/O w/ Flow Thru	kWh To Grid	Actual	Actual			600

CHARGE DETAILS

Residential - Single 2/21/18 - 3/22/18 (29 Days)

SUPPLY -$0.01

Electricity Supply Charge	420 kWh X 0.05844	$24.54
Transmission Services Charge	420 kWh X 0.01351	$5.67
Purchased Electricity Adjustment		-$1.25
Net Metering Credit - Supply	420 kWh X -0.06898	-$28.97

DELIVERY - ComEd $15.51

Customer Charge		$10.87
Standard Metering Charge		$4.64
Distribution Facilities Charge	420 kWh X 0.03181	$13.36
IL Electricity Distribution Charge	420 kWh X 0.00121	$0.51
Net Metering Credit - Delivery	420 kWh X -0.03302	-$13.87

TAXES & FEES $0.08

Environmental Cost Recovery Adj	420 kWh X 0.00048	$0.20
Renewable Portfolio Standard	420 kWh X 0.00189	$0.79
Zero Emission Standard	420 kWh X 0.00195	$0.82
Energy Efficiency Programs	420 kWh X 0.00015	$0.06
Franchise Cost	$14.92 X 0.60600%	$0.09
Net Metering Credit - Other	420 kWh X -0.00447	-$1.88
Service Period Total		$15.58

MISCELLANEOUS $0.00

Net Metering Excess Gen - Rollover 180 kWh

Thank you for your payment of $85.88 on March 12, 2018

Total Amount Due **$15.58**

UPDATES

ComEd

- IT'S A SNAP - GET THE APP! ComEd's free app now offers fingerprint login, account alerts & notifications, and easy pay options on smartphones and tablets. Download the new app today at ComEd.com/App
- ILLINOIS COMMERCE COMMISSION CONSUMER DIVISION: (800-524-0795): The Consumer Services Division is available to help resolve disputes with ComEd. However, customers should contact ComEd before seeking assistance from the ICC.

kWh **From** the Grid

kWh **To** the Grid

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kWh Credits **Remaining**

kWh Credits **Used**

Reducing consumption helps in the long run

- LED lighting
- Energy Star appliances
- Power strips
- Weatherization
- Electricity usage habits
- And more….

Average array size is 6.5kW
annual est. production of 9,000 kWh.

19 Panel system
Photo Credit: GRNE Solar

IL Solar Rights Act: HOA's cannot block or fine solar homeowner's.

Section 1. Short title. This Act may be cited as the Homeowners' Solar Rights Act.

Section 5. Legislative intent. The legislative intent in enacting this Act is to protect the public health, safety, and welfare by encouraging the development and use of solar energy systems in order to conserve and protect the value of land, buildings, and resources by preventing the adoption of measures which will have the ultimate effect, however unintended, of preventing the use of solar energy systems on any home that is subject to a homeowners' association, common interest community association, or condominium unit owners' association.

Section 10. Definitions. In this Act:

"Solar energy" means radiant energy received from the sun at wave lengths suitable for heat transfer, photosynthetic use, or photovoltaic use.

"Solar collector" means:

(1) an assembly, structure, or design, including passive elements, used for gathering, concentrating, or absorbing direct and indirect solar energy, specially designed for holding a substantial amount of useful thermal energy and to transfer that energy to a gas, solid, or liquid or to use that energy directly; or

(2) a mechanism that absorbs solar energy and converts it into electricity; or

(3) a mechanism or process used for gathering solar energy through wind or thermal gradients; or

(4) a component used to transfer thermal energy to a gas, solid, or liquid, or to convert it into electricity.

"Solar storage mechanism" means equipment or elements (such as piping and transfer mechanisms, containers, heat exchangers, or controls thereof, and gases, solids, liquids, or combinations thereof) that are utilized for storing solar energy, gathered by a solar collector, for subsequent use.

"Solar energy system" means:

(1) a complete assembly, structure, or design of solar collector, or a solar storage mechanism, which uses solar energy for generating electricity or for heating or cooling gases, solids, liquids, or other materials; and

(2) the design, materials, or elements of a system and its maintenance, operation, and labor components, and the necessary components, if any, of supplemental conventional energy systems designed or constructed to interface with a solar energy system.

Section 15. Associations; prohibitions. Notwithstanding any provision of this Act or other provision of law, the adoption of a bylaw or exercise of any power by the governing entity of a homeowners' association, common interest community association, or condominium unit owners' association which prohibits or has the effect of prohibiting the installation of a solar energy system is <u>expressly prohibited</u>.

Section 20. Deed restrictions; covenants. No deed restrictions, covenants, or similar binding agreements running with the land shall prohibit or have the effect of prohibiting a solar energy system from being installed on a building erected on a lot or parcel covered by the deed restrictions, covenants, or binding agreements, if the building is subject to a homeowners' association, common interest community association, or condominium unit owners' association. **A property owner <u>may not be denied permission to install a solar energy system</u> by any entity granted the power or right in any deed restriction, covenant, or similar binding agreement to approve, forbid, control, or direct alteration of property.**

However, for purposes of this Act, the entity may determine the specific location where a solar energy system may be installed on the roof within an orientation to the south or within 45 degrees east or west of due south provided that the determination does not impair the effective operation of the solar energy system. Each homeowners' association, common interest community association, or condominium unit owners' association shall adopt an energy policy statement regarding the location, design, and architectural requirements of solar energy systems within 120 days after an association receives a request for a policy statement or an application from an association member. An association shall disclose, upon request, its energy policy statement and shall include the statement in its homeowners' common interest community, or condominium unit owners' association declaration.

Section 25. Standards and requirements. A solar energy system shall meet applicable standards and requirements imposed by State and local permitting authorities.

Section 30. Application for approval. Whenever approval is required for the installation or use of a solar energy system, the application for approval shall be processed by the appropriate approving entity of the association within 90 days after the submission of the application. However, if an application is submitted before an energy policy statement is adopted by an association, the 90 day period shall not begin to run until the date that the policy is adopted.

Section 35. Violations. Any entity, other than a public entity, that willfully violates this Act shall be liable to the applicant for actual damages occasioned thereby and for any other consequential damages. Any entity that complies with the requirements of this Act shall not be liable to any other resident or third party for such compliance.

Section 40. Costs; attorney's fees. In any litigation arising under this Act, the prevailing party shall be entitled to costs and reasonable attorney's fees.

Section 45. Inapplicability. This Act shall not apply to any building which is greater than 30 feet in height

Public Act 096-1436

Questions to answer before speaking with an installer.

- Are there shade issues to consider?
- Which direction is my roof facing (North, South, East, West)?
- When do I anticipate re-roofing?
- Is my roof structurally sound?
- Is my home energy efficient?
- How many total kWh did I use last year?

Solar Costs & Incentives

Current incentives can reduce total costs by up to 60%.

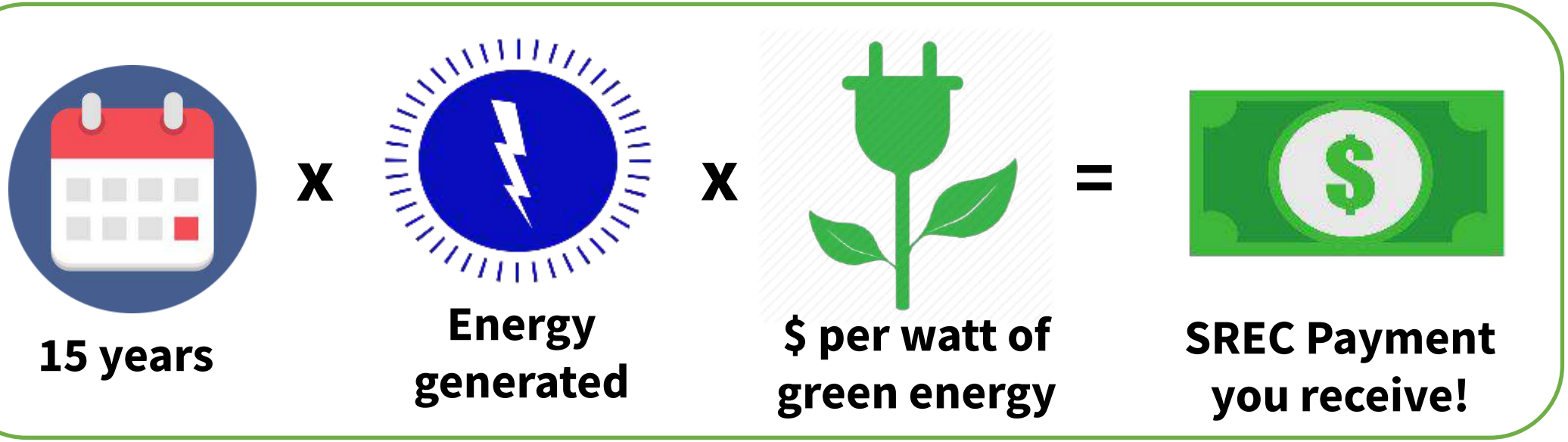
- ~35% State Solar Renewable Energy Credits (SRECs)
- 26% Federal Tax Credit
- Utility Net Metering Credits
- MACRS Depreciation (Businesses Only)

- ***NOTE: The State & Federal Credits are only available for solar purchases, not solar leases***

Going solar never looked this good!

SREC: Get paid to help Illinois meet its renewable energy goals!

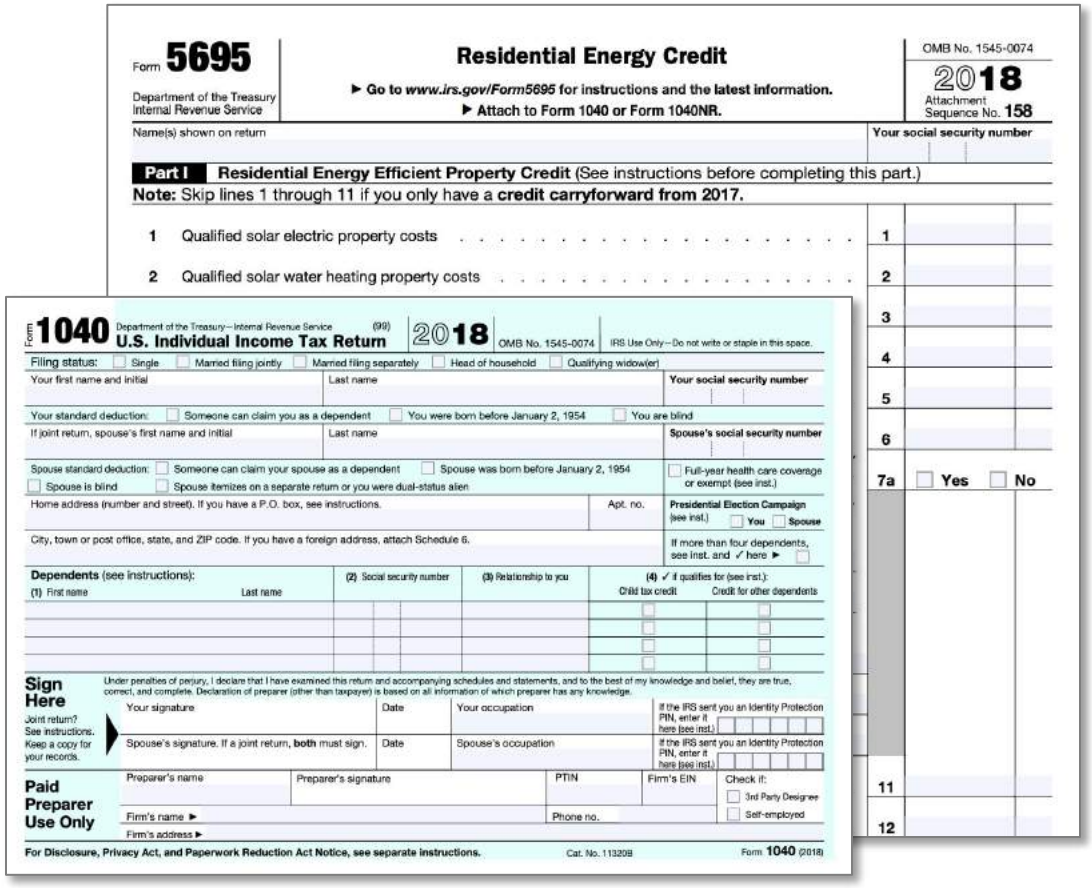
- SREC = Solar Renewable Energy Credit – payment for the **GREEN** energy you put on the grid
- Utilities have state mandated renewable energy goals to meet
- Utility pays you for your green energy, then they count it towards their goal



- 15-Year Contracts Paid In Year 1 for <10 KW;
- Rate-Payer, Not Tax-Payer Funded (But Is Taxable Income To You).

Federal Tax Credit: Covers 26% of Qualified Expenditures.

- Includes labor costs, system installation, interconnection wiring.
- Does not include new roof unless roof reinforcement is necessary to support the solar panels.
- Res: The home must be owned by the taxpayer but does not have to serve as the principal residence.
- If percentage of project cost is greater than total taxes paid, you get the remainder the following year, can roll over for up to 5 years.



Form **5695** — **Residential Energy Credit** — OMB No. 1545-0074 — **2018**

Department of the Treasury, Internal Revenue Service

▶ Go to *www.irs.gov/Form5695* for instructions and the latest information.

▶ Attach to Form 1040 or Form 1040NR.

Attachment Sequence No. **158**

Name(s) shown on return — Your social security number

Part I **Residential Energy Efficient Property Credit** (See instructions before completing this part.)

Note: Skip lines 1 through 11 if you only have a **credit carryforward from 2017.**

1 Qualified solar electric property costs 1

2 Qualified solar water heating property costs 2

3 3

4 4

5 5

6 6

7a . . . . . Yes No

11 11

12 12

Form **1040** Department of the Treasury—Internal Revenue Service (99) **U.S. Individual Income Tax Return** **2018** OMB No. 1545-0074 IRS Use Only—Do not write or staple in this space.

Filing status: Single; Married filing jointly; Married filing separately; Head of household; Qualifying widow(er)

Your first name and initial | Last name | Your social security number

Your standard deduction: Someone can claim you as a dependent; You were born before January 2, 1954; You are blind

If joint return, spouse's first name and initial | Last name | Spouse's social security number

Spouse standard deduction: Someone can claim your spouse as a dependent; Spouse was born before January 2, 1954; Spouse is blind; Spouse itemizes on a separate return or you were dual-status alien

Full-year health care coverage or exempt (see inst.)

Home address (number and street). If you have a P.O. box, see instructions. | Apt. no. | Presidential Election Campaign (see inst.) You Spouse

City, town or post office, state, and ZIP code. If you have a foreign address, attach Schedule 6. | If more than four dependents, see inst. and ✓ here ▶

Dependents (see instructions): (1) First name Last name | (2) Social security number | (3) Relationship to you | (4) ✓ if qualifies for (see inst.): Child tax credit | Credit for other dependents

Sign Here Joint return? See instructions. Keep a copy for your records.

Under penalties of perjury, I declare that I have examined this return and accompanying schedules and statements, and to the best of my knowledge and belief, they are true, correct, and complete. Declaration of preparer (other than taxpayer) is based on all information of which preparer has any knowledge.

Your signature | Date | Your occupation | If the IRS sent you an Identity Protection PIN, enter it here (see inst.)

Spouse's signature. If a joint return, **both** must sign. | Date | Spouse's occupation | If the IRS sent you an Identity Protection PIN, enter it here (see inst.)

Paid Preparer Use Only

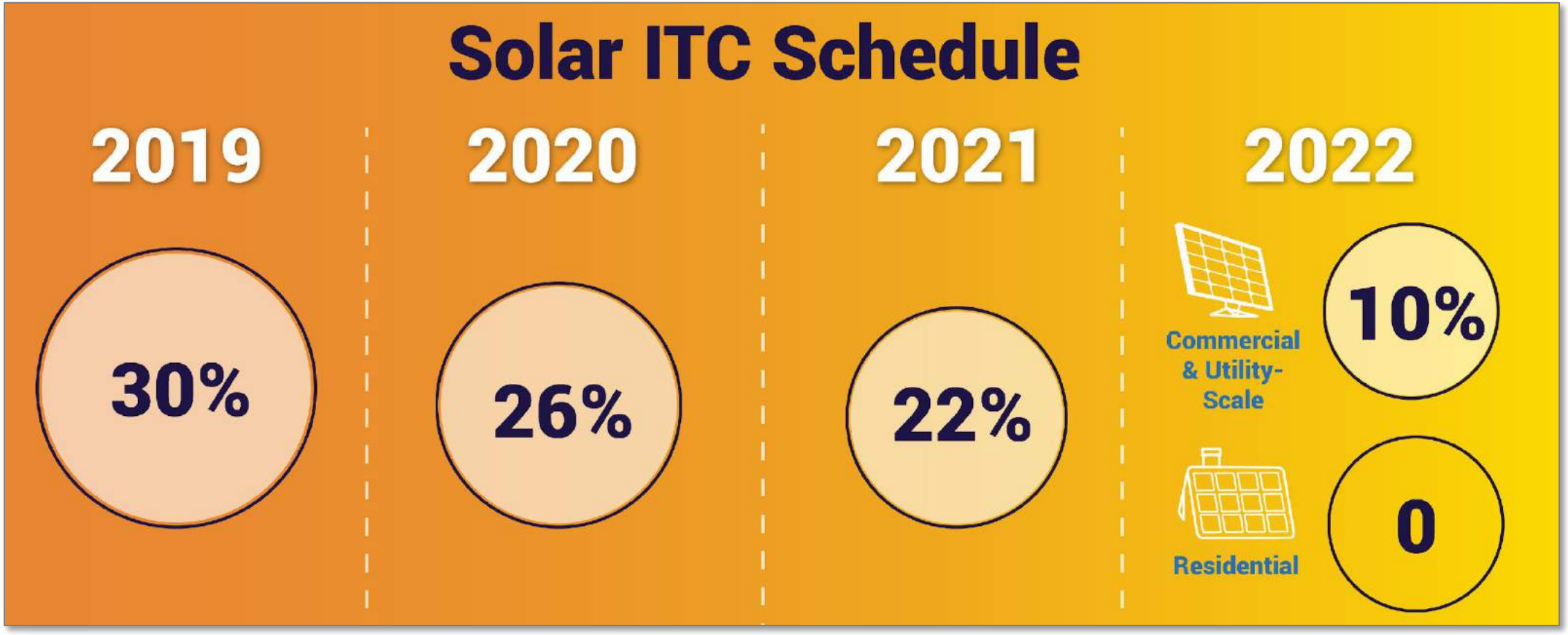
Preparer's name | Preparer's signature | PTIN | Firm's EIN | Check if: 3rd Party Designee; Self-employed

Firm's name ▶ | Phone no.

Firm's address ▶

For Disclosure, Privacy Act, and Paperwork Reduction Act Notice, see separate instructions. Cat. No. 11320B Form **1040** (2018)

Federal Tax Credit: Due to expire in 2022.



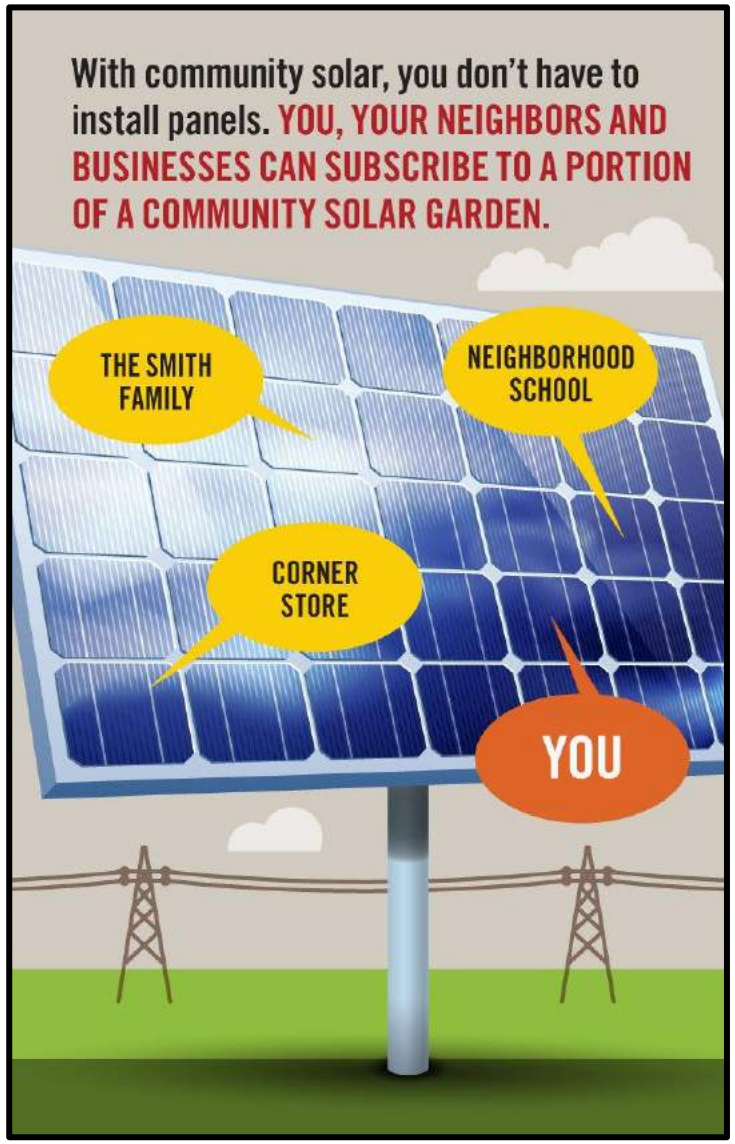
https://www.seia.org/initiatives/solar-investment-tax-credit-itc

The State and Federal Incentives Work Together

6.5 kW Residential Roof System	
Installed Cost ($3 /Watt)	$19,500
Illinois SREC (28% est.)	($5,460)
Tax Credit (26%)	($5,070)
Net Cost	**$8,970**


Community Solar

Community Solar

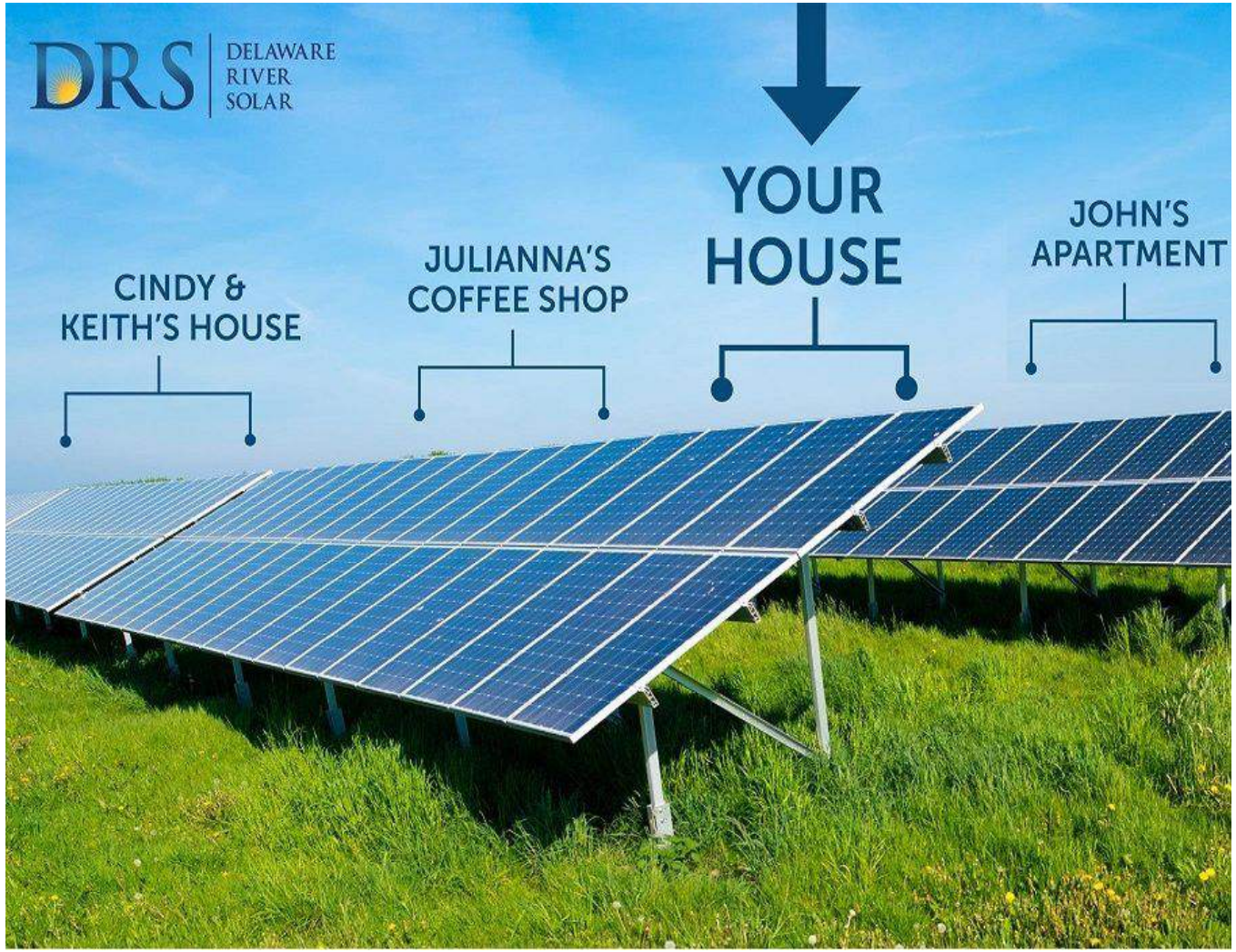


Subscribe to an offsite solar project

& SAVE

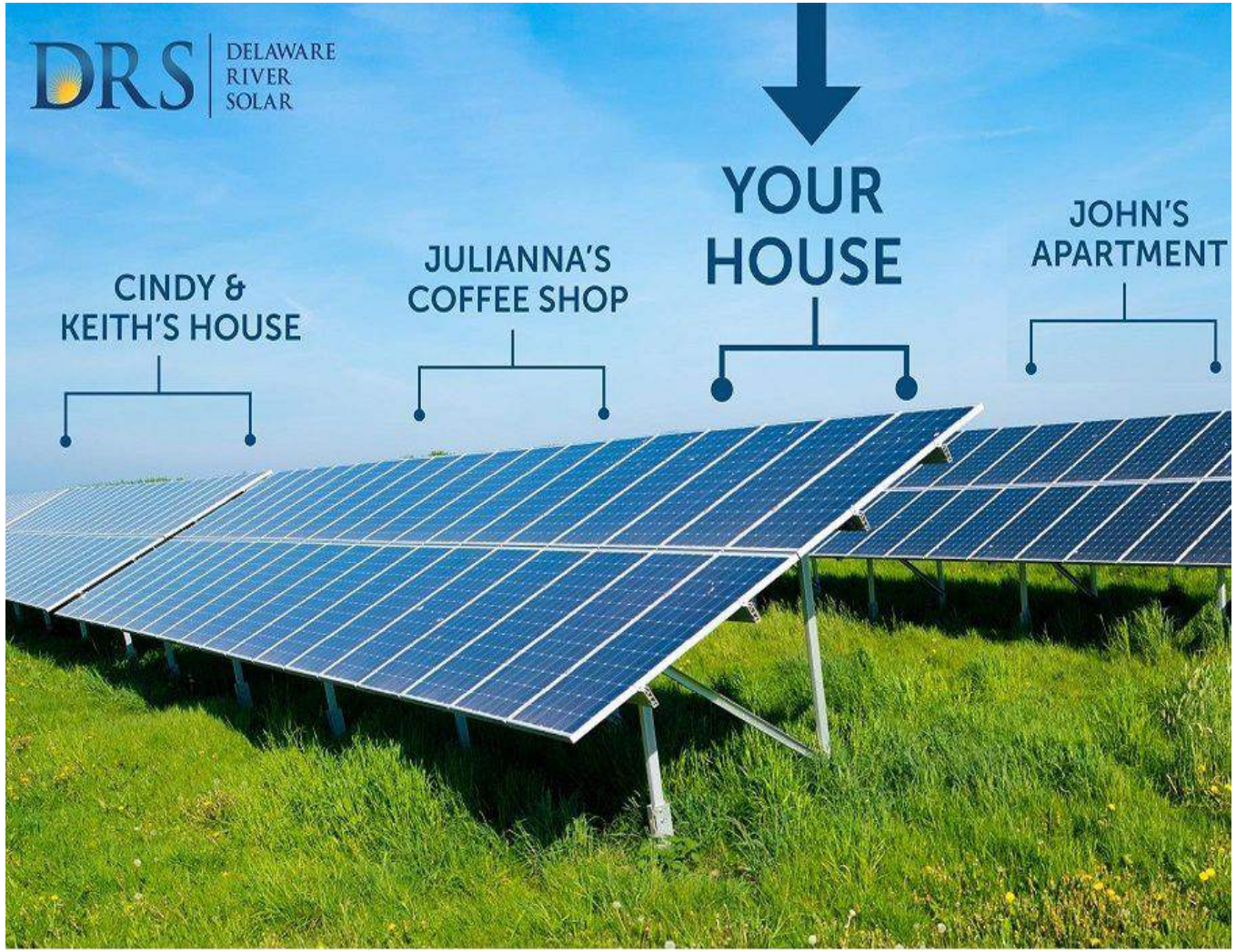
Community Solar

- Makes solar accessible to renters, people with shaded roofs, or people in multi-unit buildings
- No upfront cost to subscribers
- Save on electricity bills every month - based on the output of your portion of the project



How does Community Solar work?

- Instead of 1 electric bill, you will now receive 2 bills:
  - Your regular electric bill
  - A bill to your community solar provider
- Most community solar companies promise savings (more on the next slide)
- Solar energy from your project flows onto the grid, and helps Illinois reach our clean energy targets
- Though it is not flowing to your home, you still receive credit for that energy



Community solar offers

- 20% savings guarantee
- 20 year contract
- Charges exit fee – waived if you move outside of the territory

Clearway

- 20% savings guarantee
- 15 year contract
- No exit fee – requires 90 days notice

nexamp

- At this time is not offering true community solar
- 10% savings
- No contract term
- No exit fee

Arcadia Power

Sign up for our Community Solar newsletter to hear about new offers as they hit the market!


Solar For All

Illinois Solar for All

- Ensures that low income people and people living in environmental justice communities will also see the benefit of solar
- Includes: Community solar, residential rooftop, rooftop for non-profits
- No money down, and guaranteed savings on electricity bills
- Grassroots education

- To qualify you must be below 80% Area Median Income:
  - $63,200 for a family for 4 in the Chicago area – varies by household size and region

- Visit: www.illinoissfa.com to learn more!

Clean Energy Jobs Act (CEJA)

Illinois Clean Jobs Coalition

We're a group of 200+ **environmental organizations, justice and faith-based institutions, consumer watchdogs, public health groups, student activists, clean-technology businesses, and entrepreneurs,** working alongside community and civic leaders to advance clean energy jobs across Illinois.

Clean Energy Jobs Act or "CEJA"

The Four Policy Pillars:

1. Quality jobs and investments in communities across the state
2. Carbon-free electric sector by 2030
3. 100% renewable energy by 2050
4. Increase electric vehicles

HB 3624 // SB 2132 (31 Senate and 53 House Cosponsors so far)

Upcoming webinars:

10 a.m. Thursday, April 30: Home Energy Savings for Ameren and ComEd Customers - we will send link in follow up email.

Check our calendar for more webinars!

To join or learn more visit: CitizensUtilityBoard.org

- Resources for energy efficiency & savings
- Information about new clean energy legislation in Springfield

CUB hosts ~500 events per year.

Thank you.

Questions: Contact Christina Uzzo @ CUB
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