Solar For Rural Water Facilities

IL Rural Water Association Annual Conference
2/20/25

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Today's Agenda

- Why Solar?
- Planning a Solar Project
- Mounting Options
- Solar Incentives
- Solar Cost Example & Financing
- Case Study – EJ Water
- Q&A

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The #1 Reason to Go Solar

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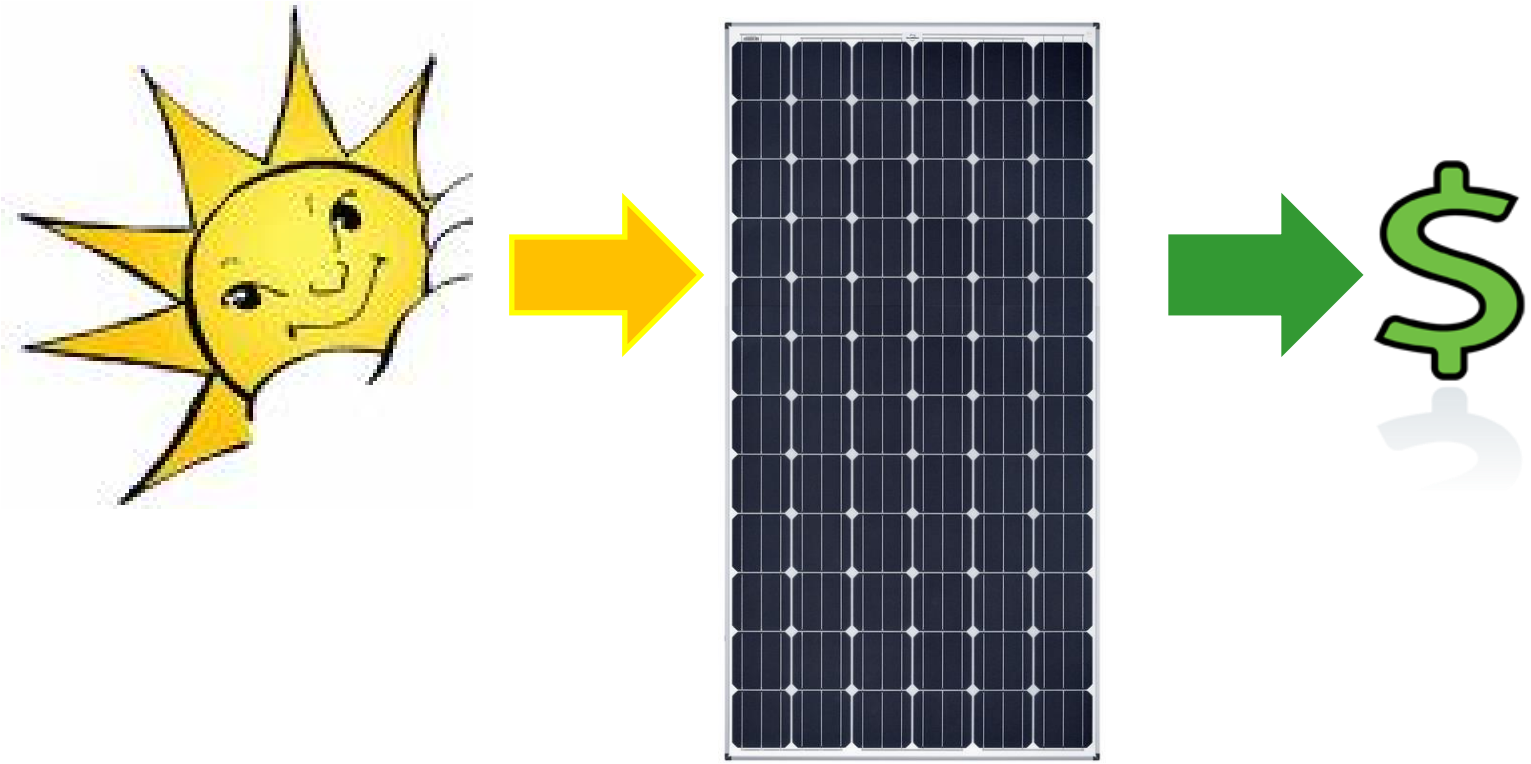
PRODUCE Electricity
&
Turn Sunshine Into Cashflow℠



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Other Reasons

- REDUCE a major operating cost (electricity)
- Easy / Proven Technology
- Great Solar Incentives
- Easy to finance
- Strong Return on Investment

- OTHER?

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Electric Cost Volatility

Count On higher rates

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Pressure to Shut Down Baseload Central Generation

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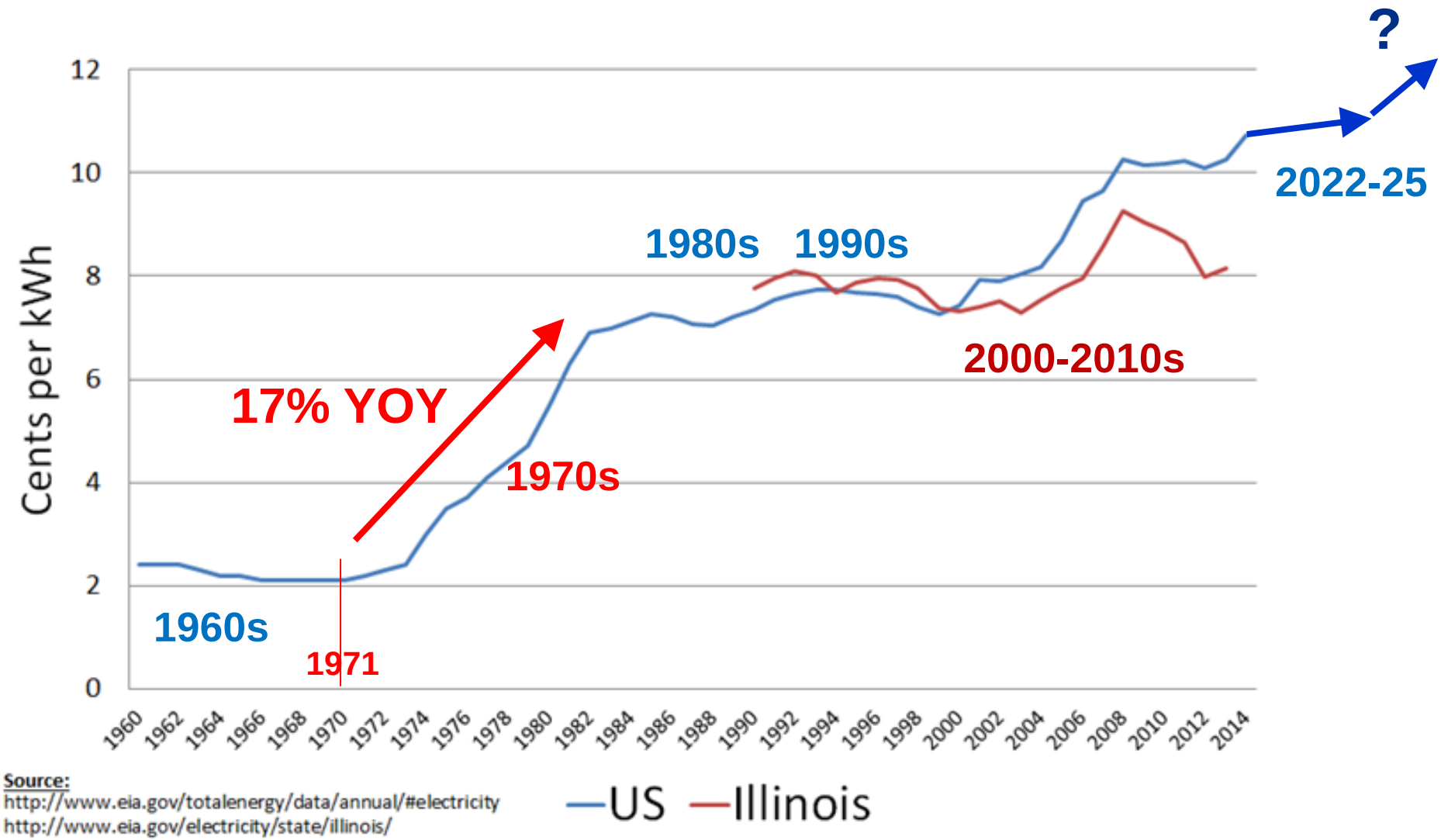
Avg Commercial Electricity Price History



Source:
http://www.eia.gov/totalenergy/data/annual/#electricity
http://www.eia.gov/electricity/state/illinois/

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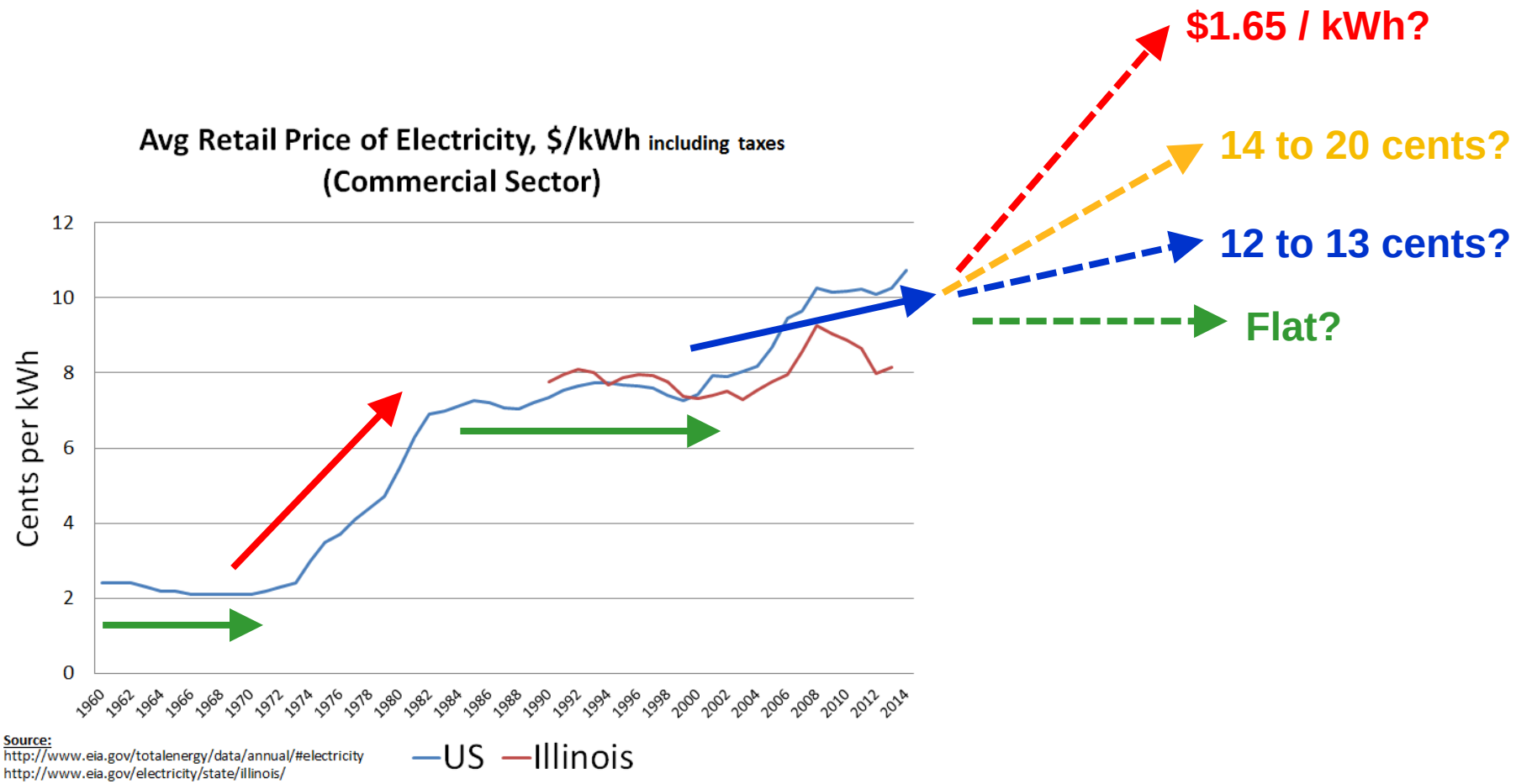
What a Decade of HIGH Inflation Could Look Like



Source:
http://www.eia.gov/totalenergy/data/annual/#electricity
http://www.eia.gov/electricity/state/illinois/

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A Great Hedge:

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Let's Plan a Solar Project

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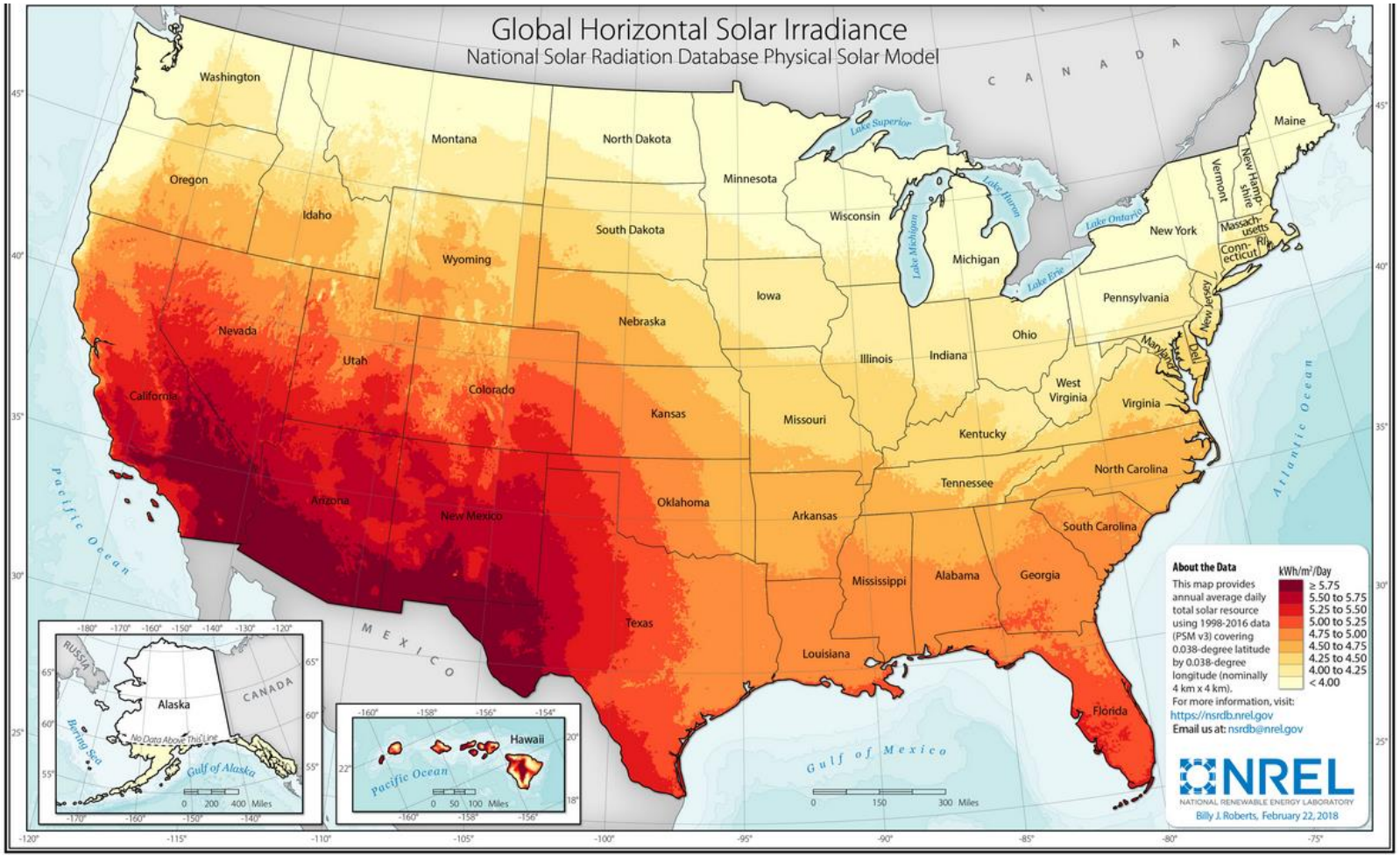
Irradiance Map



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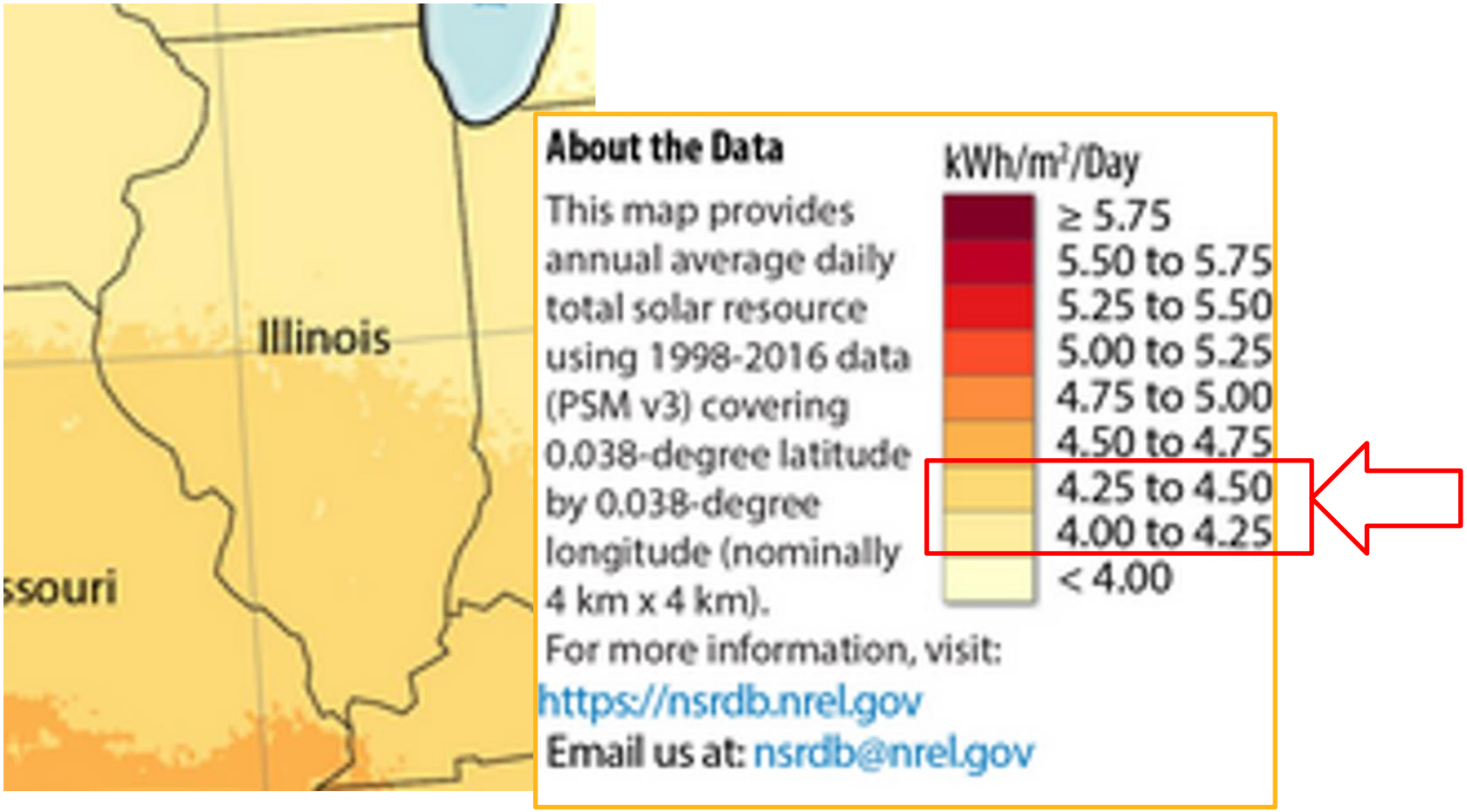
4.0 to 4.5 kWh / m^2 / day



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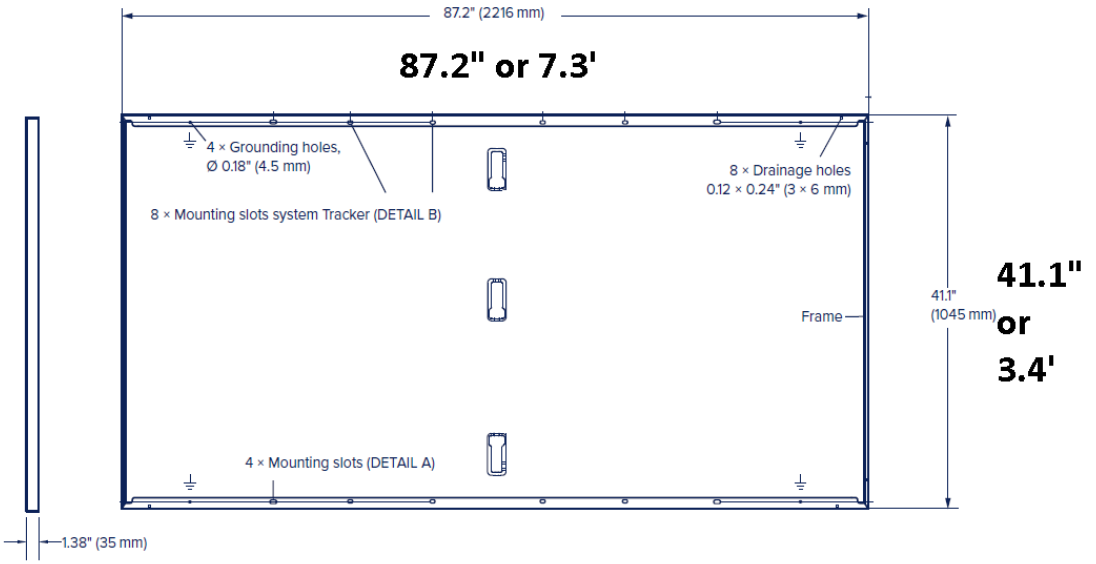
490 Watt Panel (7.3’ x 3.4’)



24.8 square feet (sqft²)

Or

2.3 square meters (m²)

Source: https://us.qcells.com/q-peak-duo-xl-g10-bfg/

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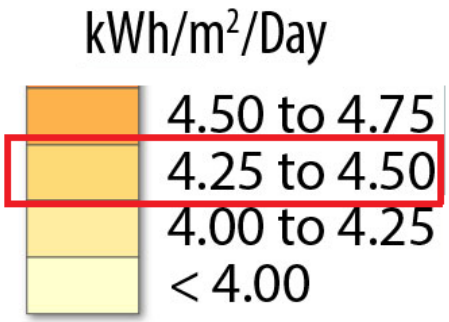
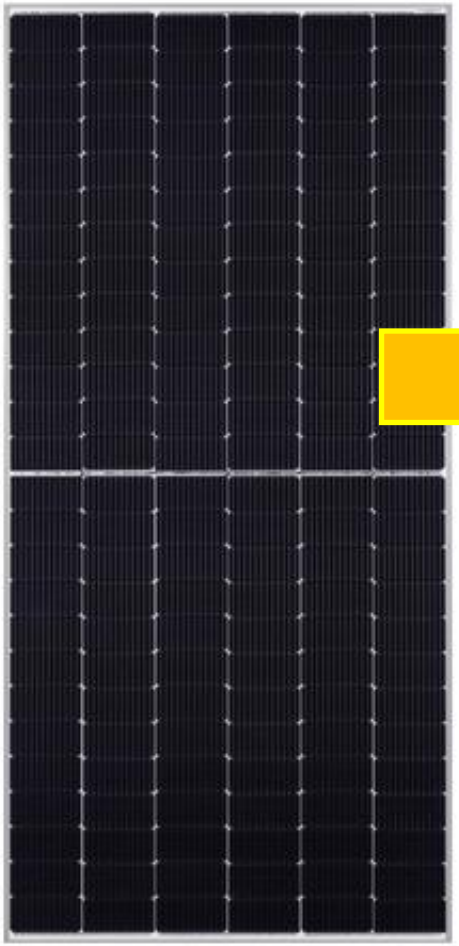
490 Watt Panel
(Flat / 0 Degree tilt)



X

2.3 square meters (m^2)



9.8 kWh
Per Day (kWh/day) on Average

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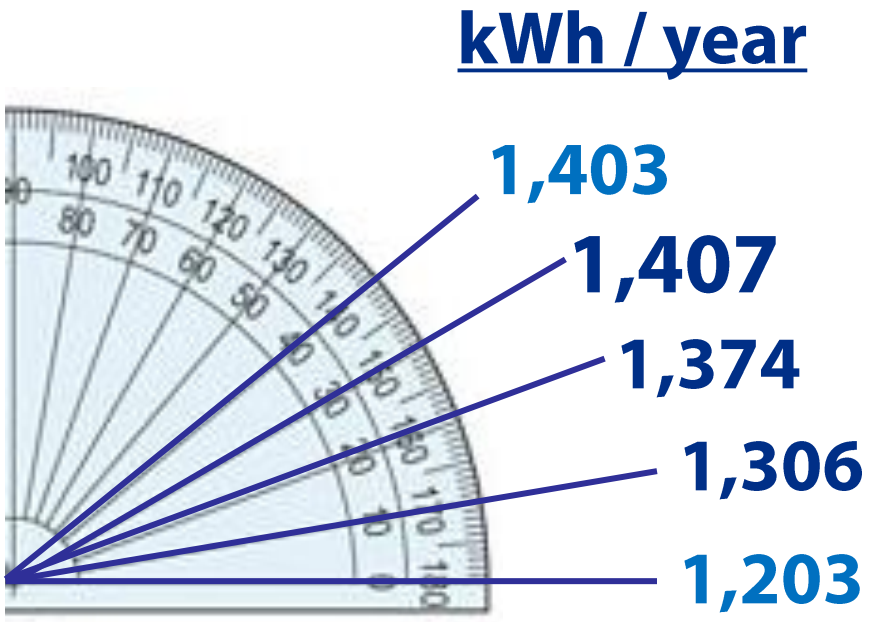
Tilt Angle & Energy Production with Full Sun / no Shade 2 Panels / 980 Watts



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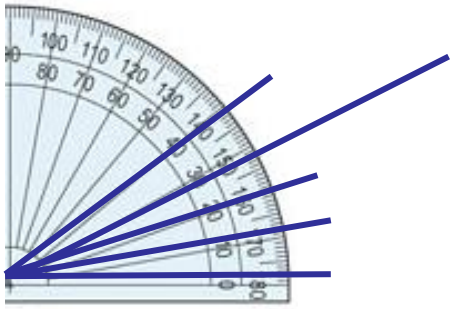
Energy Yield (kWh) per kW
(at 30-degree tilt)



kWh per kW per year

1,407 (at 30-degree tilt)

# Panels	Panel Area (Sqft)*	kW (DC)	kW (AC)	kWh/year
2	50	0.98	0.82	1,407
100	2,489	49.0	40.8	70,350
500	12,444	245.0	204.2	351,750
1,000	24,888	490.0	408.3	703,500
2,000	49,777	980.0	816.7	1,407,000
3,000	74,665	1,470.0	1,225.0	2,110,500

*** Does not factor interow shading and other offsetting allowances**

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How Much Room Do You Need For Solar Panels?

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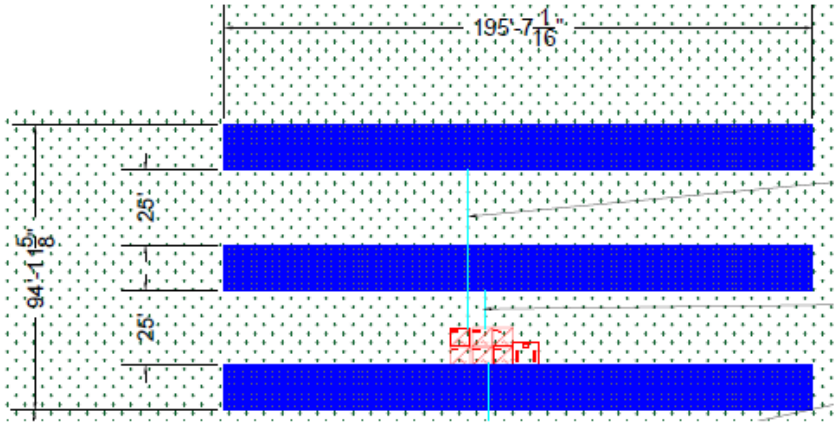
EXAMPLE:
Ground Mount – 167 kW (DC)



196' x 95'

18,620 sqft

9 Watts per Sqft (W/ft²)

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Q: How Much Space Required to Generate 100,000 kWh per Year?

A: Approximately 3,600 sqft

(for ground mount 30 deg tilt, central IL irradiance)

# Panels	Panel Area (Sqft)*	kW (DC)	kW (AC)	kWh/year
2	50	0.98	0.82	1,407
100	2,489	49.0	40.8	70,350
145	3,610	71.1	59.2	100,000
500	12,444	245.0	204.2	351,750
1,000	24,888	490.0	408.3	703,500

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Bifacial Panels

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Other Common Mounting Options

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Flat Roof – Ballasted Rack

Metal Standing Seam

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Metal Standing Seam

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Metal – Panel Type

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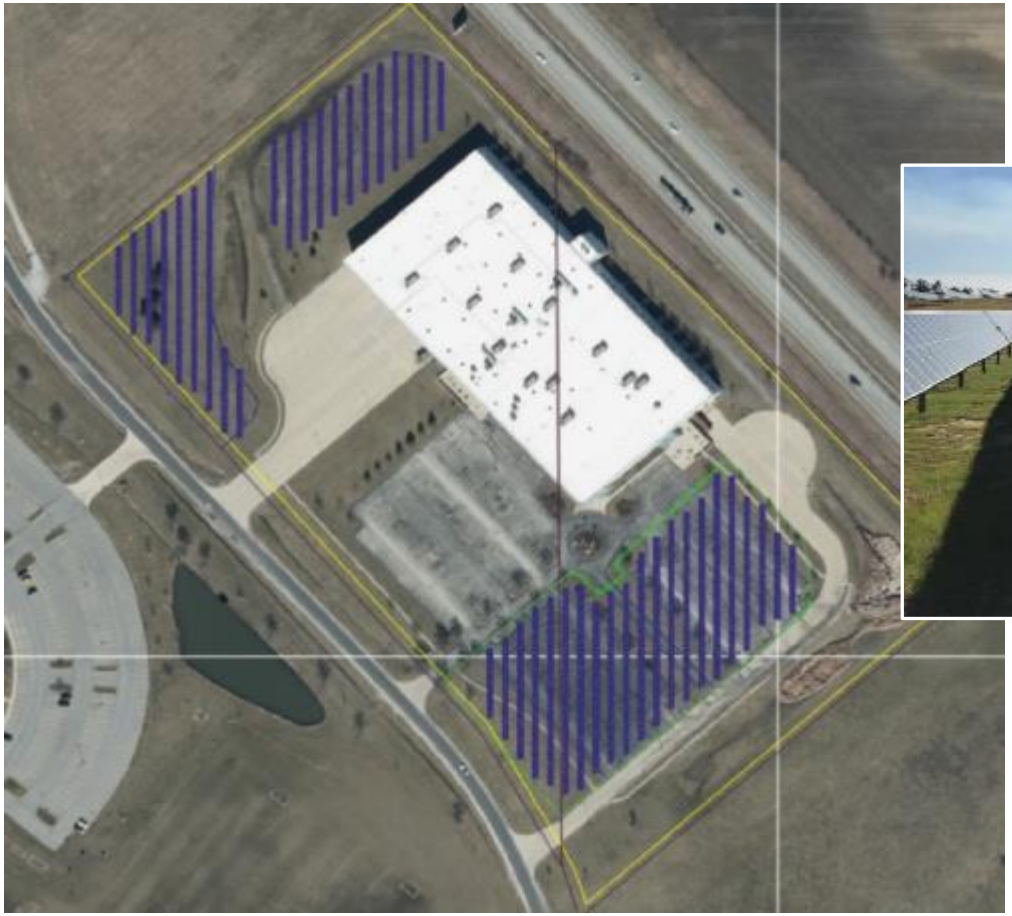
1-Axis Tracker



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2-Axis Tracker

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Electricity Rates & Demand / Generation Considerations

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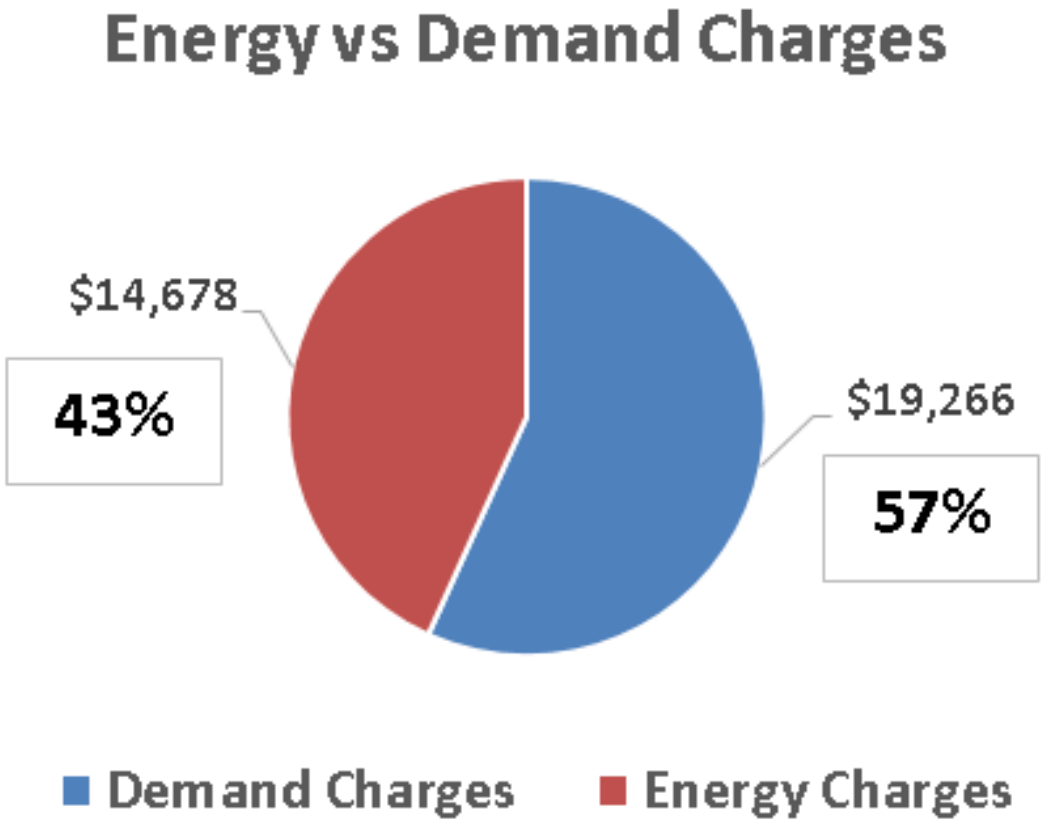
Electricity Rate Considerations



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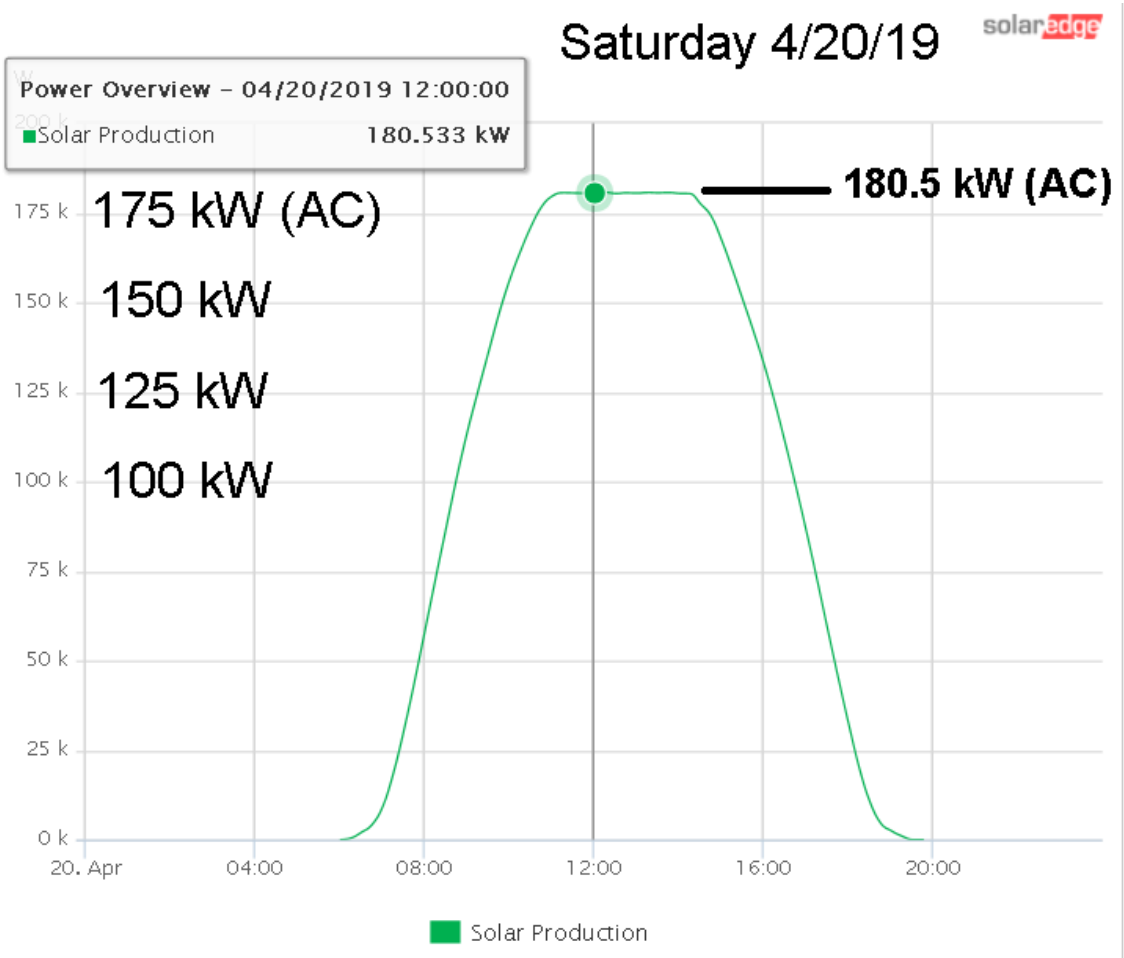
Example: 200 kW (DC) /180 kW (AC) Sunny Day



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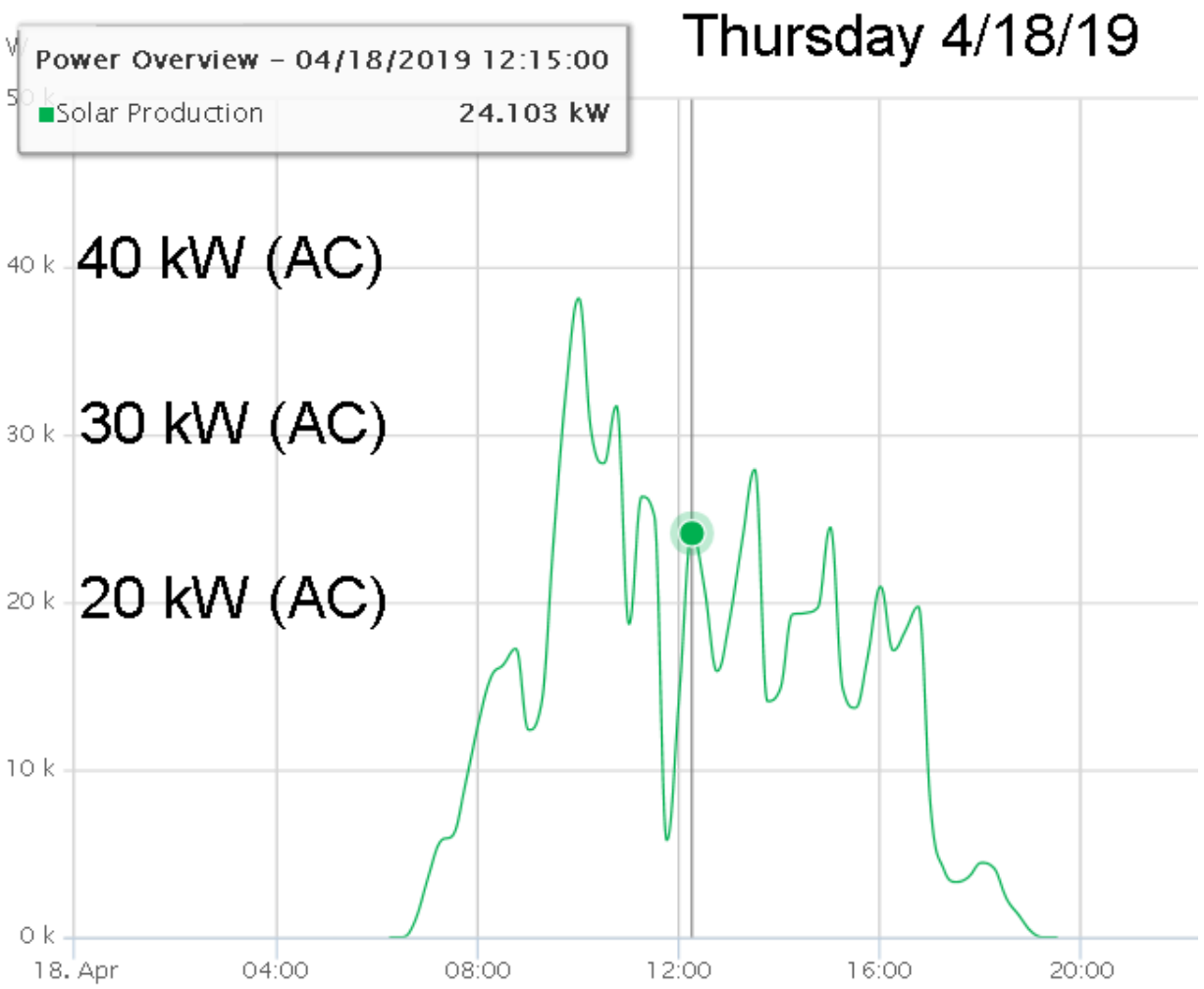
Cloudy Day



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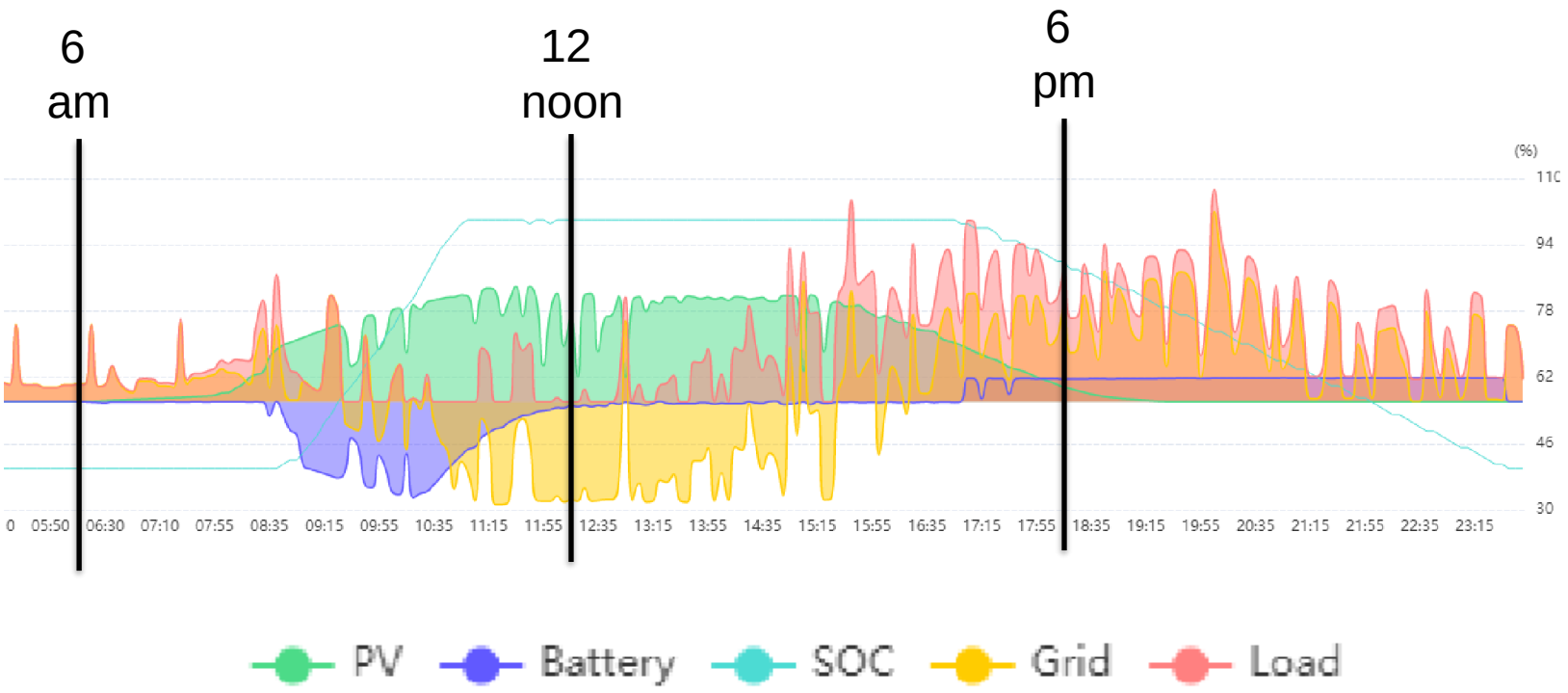
Excess Energy



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Summary of Incentives

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Federal Tax Credit

30%

$1 for $1 offset of tax liability.

NON-PROFITS NOW QUALIFY!

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Federal Tax Credit

BONUS ADDERS!

- 10% for Energy Community
- 10% for Domestic Content (>45% in 2025)

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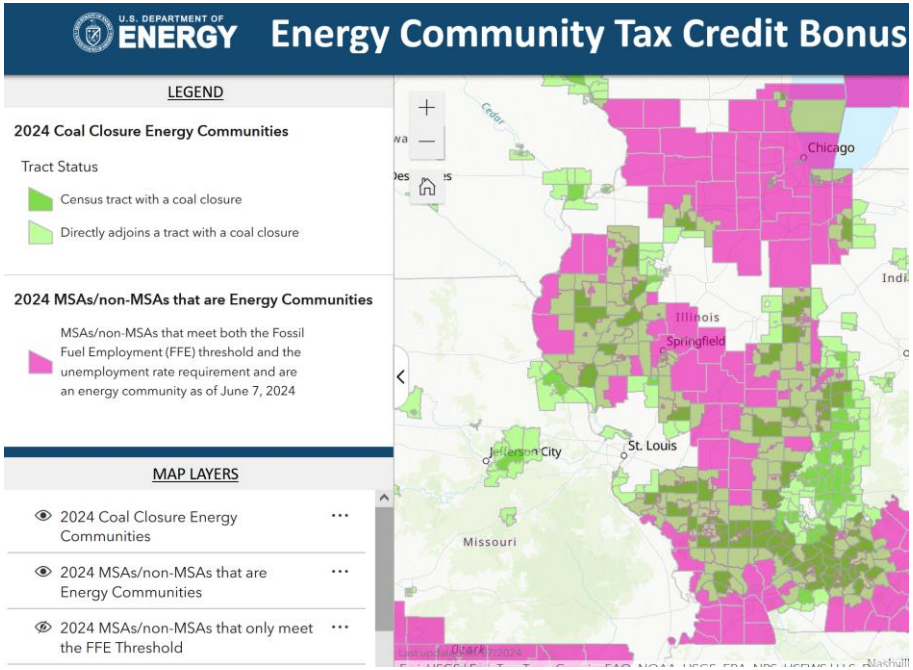
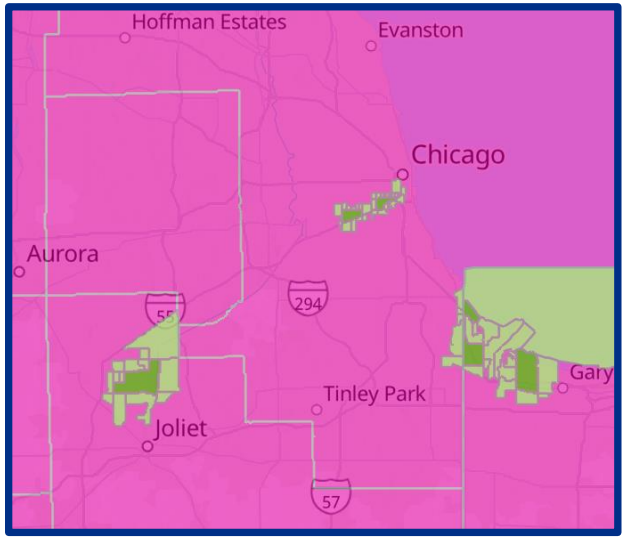
Energy Community





https://arcgis.netl.doe.gov/portal/apps/experiencebuilder/experience/?id=a2ce47d4721a477a8701bd0e08495e1d

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Accelerated Depreciation (For For-Profit Businesses)

Solar Qualifies as 5-Year Property by The IRS

May be eligible for Section 179 Bonus Depreciation

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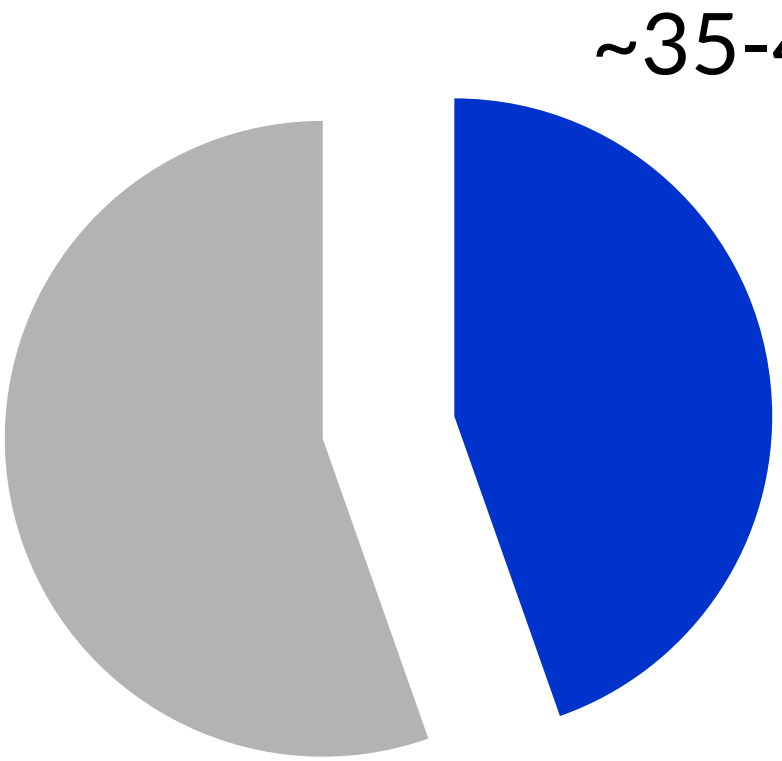
State of Illinois SREC Incentive

(Solar Renewable Energy Credit)



Value is approx. 35% to 45% of total project cost.

Paid over 7 years
1,000 kWh = 1 SREC

15 Year Contract

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Smart Inverter Rebate (Ameren & Comed Only)

Value is approx. 10 to 15% of total project cost.

$250 per kW (DC)

PAID approximately 3 to 5 months After system energized

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The TOTAL Pie

- Federal Tax Credit
- SREC
- Smart Inverter Rebate
- Depreciation
- Your Net Cost

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Financial Examples

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TYPICAL COSTS & FINANCING

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Example – 250 kW Ground Mount

		Medium Ground Mount	
Power Rating, kW (DC):		**250 kW**	
Typical Purchase Price:		**$ 521,700**	
30% Federal Tax Credit:		$ 156,510	
10% Tax Credit Bonus Adder:		$ 52,170	for elgible locations
Illinois SREC Incentive:		$ 290,000	
Smart Inverter Rebate **(Ameren only)**:		$ -	***worth $62,600***
Potential Incentives:		**$ 498,680**	
Typical Cost AFTER Incentives:		**$ 23,020**	
Est. Electricity Value 15 Years:		**$ 547,000**	factoring inflation & panel degradation
Est Electricity Year 1 Savings:		**$ 26,700**	
Potential Return on Investment	**(approx)**	**13 to 19%**	**Based on Site Specifics**

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Financing Options

- Bank Solar Loan:
  - Loan 1: 18-month term
  - Loan 2: 10 to 15-year term

- Capital Lease
- Operating Lease
- PPA

Let incentives and energy savings pay off most if not all of your solar loan!

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Case Study
EJ Water, Gila IL, Water Plant

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EJ Water (Gila, IL) Water Plant

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Gila Water Plant – Main Stats

291 kW (DC) 240 kW (AC)

Existing 600A Service & maximize backfeed was 240 kW (AC)

Approx 21,000 sqft / 0.5 acres

544 Watt Solar Panels
(JA Solar 535 Watt)

Four (4) Solectria 60 kW Inverters

Location served by
Norris Electric Rural Coop

EJ WATER COOPERATIVE, INC.®

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Construction

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Electricity Stats – FORECAST p1

	kW (AC)	
Solar System PEAK Output	240	
12-Month Plant Max kW Demand	148	
Size Ratio:	**162%**	
Est. Solar Generation, kWh/year:	**423,609**	
Est. Portion Direct Use by Plant:	284,479	67.2%
Est. Portion Sold to Norris Electric:	139,130	32.8%
		100.0%

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Electricity Stats – FORECAST p2

Historical Electricity Cost:	$60,702
Est. Solar Savings:	$27,310
% Bill Reduction Due to Solar:	**45.0%**
Historical Plant kWh/year:	584,714
Est. After-Solar Purchased kWh:	300,235
% kWh Reduction Due to Solar:	**48.7%**

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Incentives / Savings Summary

INCENTIVES:			
	Federal Investment Tax Credit (ITC):	$	(260,399)
	Estimated Solar Renewable Energy Credit (SREC) Value:	$	(271,696)
	NET / AFTER-INCENTIVE:	**$**	**156,487**
			Over 10 Years
OPERATIONAL SAVINGS:	Value of Solar Electricity:		$332,103
	Estimated Ops & Maintenance:		($38,635)
	EST. OPERATIONAL SAVINGS (First 10 Years):		**$293,468**
RETURN ON INVESTMENT	**IRR =**		**12.7%**

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Will Your Plant be the Next Case Study?

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Give Us A Call
We're Here to Help
THANK YOU!

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