Solar Opportunities for Businesses and Non-Profits

Starts at 3 pm

COSEIA

COLORADO SOLAR ENERGY INDUSTRIES ASSOCIATION

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October 8, 2017

Today's Agenda

Who, what, where, when, & why solar can help your business.

Define your goals for solar

- Prioritize…
  - Lower operating overhead
  - Increase sales
  - Hedge against rising electric costs
  - Utilization of tax credits and depreciation benefits
  - Additional revenue streams
  - Meet customer demand for sustainability
  - Show environmental leadership in your sector
  - Be "green"

Solar can help achieve
All of the items listed above.

Find partners to develop and finance a project that meets most of your specific goals and needs.

Who has gone solar already?

SOLAR MEANS BUSINESS

Top corporate solar users in the U.S.

Capacity currently installed at nearly 2,000 locations by the Top 25 corporate solar users
1,092 MW

The solar energy installed on U.S. corporations and businesses is enough to power
193,000 homes

Every week,
7.3 million
people, roughly 2% of the U.S. population, visit a solar-powered Walmart

Prologis has installed more solar capacity than
27 different U.S states

91%
of IKEA's stores are powered by the sun

Since 2012, the year Solar Means Business was first released, the top U.S. businesses have increased their solar capacity by
240%

U.S. corporations generate enough solar electricity to offset nearly
1.1 million
metric tons of CO2 emissions

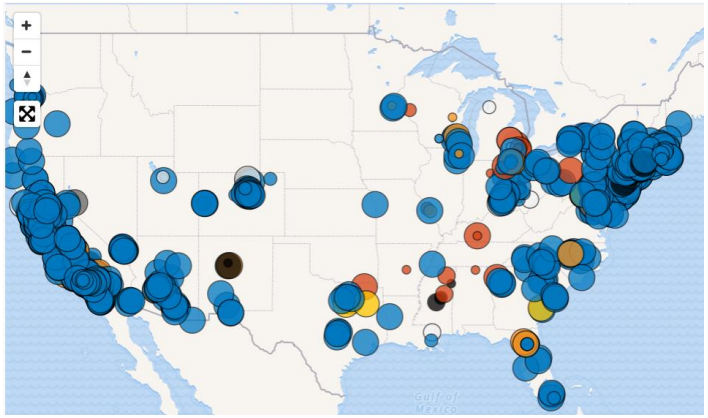
Since 2012, the average price of a commercial PV installation has fallen **58%**

TOP 10 CORPORATE SOLAR USERS

1. Target	147.5 MW	6. Kohl's	50.2 MW
2. Walmart	145.0 MW	7. IKEA	44.0 MW
3. Prologis	107.8 MW	8. Macy's	38.9 MW
4. Apple	93.9 MW	9. General Growth Properties	30.2 MW
5. Costco	50.7 MW	10. Hartz Mountain	22.7 MW

All data from the SEIA 2016 Solar Means Business Report.
Learn more at **SEIA.org/solarmeansbiz**

SEIA Solar Energy Industries Association



What are photovoltaics (PV)?

Simple, Reliable, Proven Technology

Sunlight converted directly into electricity

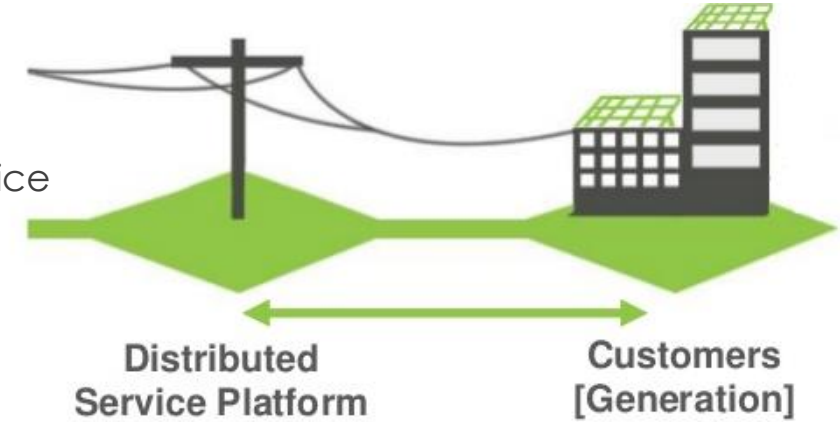
Long lasting warrantied power production

No batteries necessary, works with the grid

2 Main Project Structures

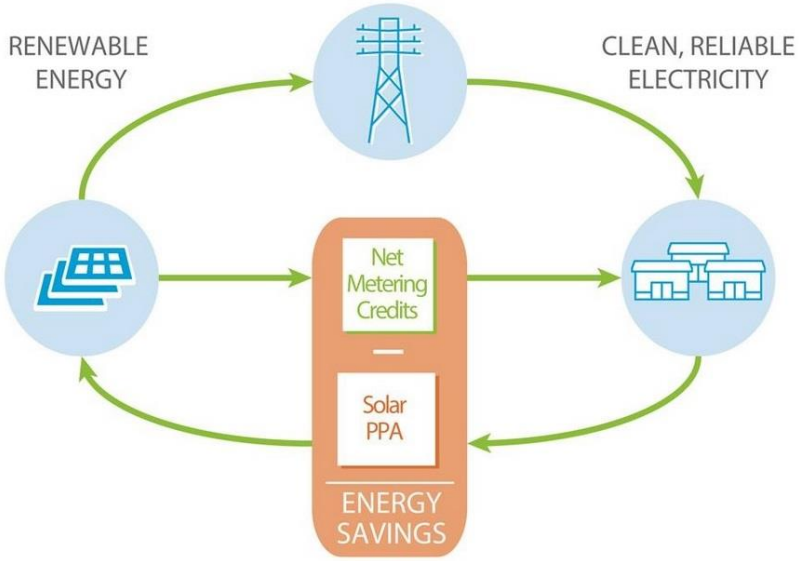
On-Site:

An On-site system produces power intended for on-site use in a home, office building, or other commercial facility.



Off- Site:

An offsite system is a project that generates electricity to be *virtually* consumed by Globus.



Images courtesy of: Soltage RENEWABLE ENERGY PROVIDER

On-Site Solar

Broomfield Detention Center, 100 kW

Modules create DC power

Inverters turn DC into AC power

Net Metering allows power to be used on site or sent to grid

1. Solar Electric Array
2. Inverter/s
3. Existing Electrical Service (Breaker Boxes)
4. Utility Electrical Grid Feeder Line

On-Site Solar

Ground Mounts

Source: Soltage, LLC

Ground-mounted arrays require clear flattish, uninhibited land on same lot as electric user.

Rooftops

Source: Soltage, LLC

Roof-mounted arrays typically require newer roofs. Can be placed on almost any roofing material.

Carports

Source: Standard Solar

Carport canopy arrays typically require relatively flat (<10° grade) parking lot.

Excess system production is automatically fed onto grid. You receive credit for the energy you put onto the grid and you save money when you consume the energy you produce.

Off-Site Solar

LaPorte Solar Farm 1 MW

Remote solar array sends energy to the grid

Solar production is measured

Distribution or transmission "delivers" energy to subscribing consumers

Customer/consumer gets credits on their electric bills

Lafayette Solar Garden 500kW x2

Off-Site Solar

Virtual Net Metering (VNM)

Virtual Net Metering refers to when solar is not used on-site but is instead externally installed and the subscriber receives bill credits from their utility.

Community Solar

Similar to Virtual Net Metering, **Community Solar** helps clients harness clean energy from remote solar assets via utility programs.

Images courtesy of: Soltage RENEWABLE ENERGY PROVIDER

Choose Your Method

	Buying	Lease	Solar PPA
Upfront Capital?	Yes	Little to None	Little to None
Performance Risk?	Yes	Yes	No
System Knowledge Required?	Yes	Generally, Yes	No
Maintenance Required?	Yes	Yes	No
Purchase Required?	Yes	Yes, with option to re-lease	No
Recognize ALL Tax Benefits?	Yes	Depends on Lease	No
Recognize ALL Savings?	Yes	Yes	No
Insurance or Prop Tax Payments?	Yes	Yes	No
Purchase Required?	Yes	Yes, with option to re-lease	No

- Strong partners will offer all options and assist in uncovering the best solutions for you
- Own and realize all benefits
  - Best for most profitable corporations
  - For on-site only
  - Appetite for tax credits and depreciation usually needed to pencil
  - All benefits pass to asset owner (you).
  - Comfort in owning, monitoring, and maintaining equipment (however minimal)
  - Finance options:
    - Cash, Loan, Property Assessed Clean Energy finance ("PACE")
- Third Party Ownership
  - Can be on or off-site
  - Typically best for municipalities and non-profits
  - Also good for very risk averse corporations not wanting to utilize capital
  - Little to zero capital requirement
  - No tax credit or depreciation appetite necessary
  - No monitoring and maintenance requirement
  - Finance options:
    - Power Purchase Agreement ("PPA") a.k.a. Solar Services Agreement ("SSA")
    - Capital Lease (much like a loan)
    - Equipment Lease
  - Realize less benefits than ownership

Incentives to Install

Invest in Your Own Interests

Federal Tax Credit

MACRS with Bonus

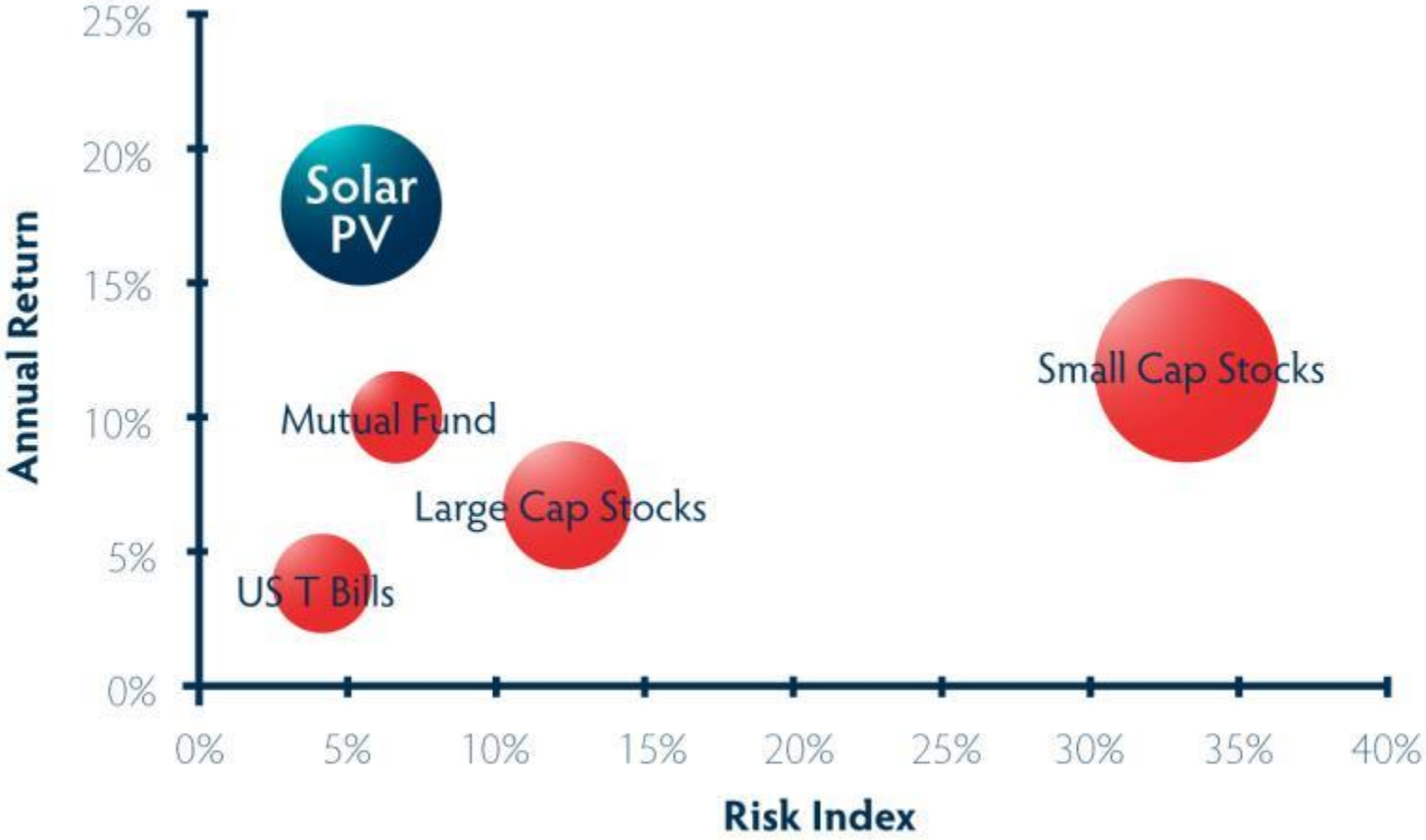
Monthly REC Reward

Avoided Energy Cost

Marketing Benefits

Businesses are taking advantage of multiple incentives to go solar.

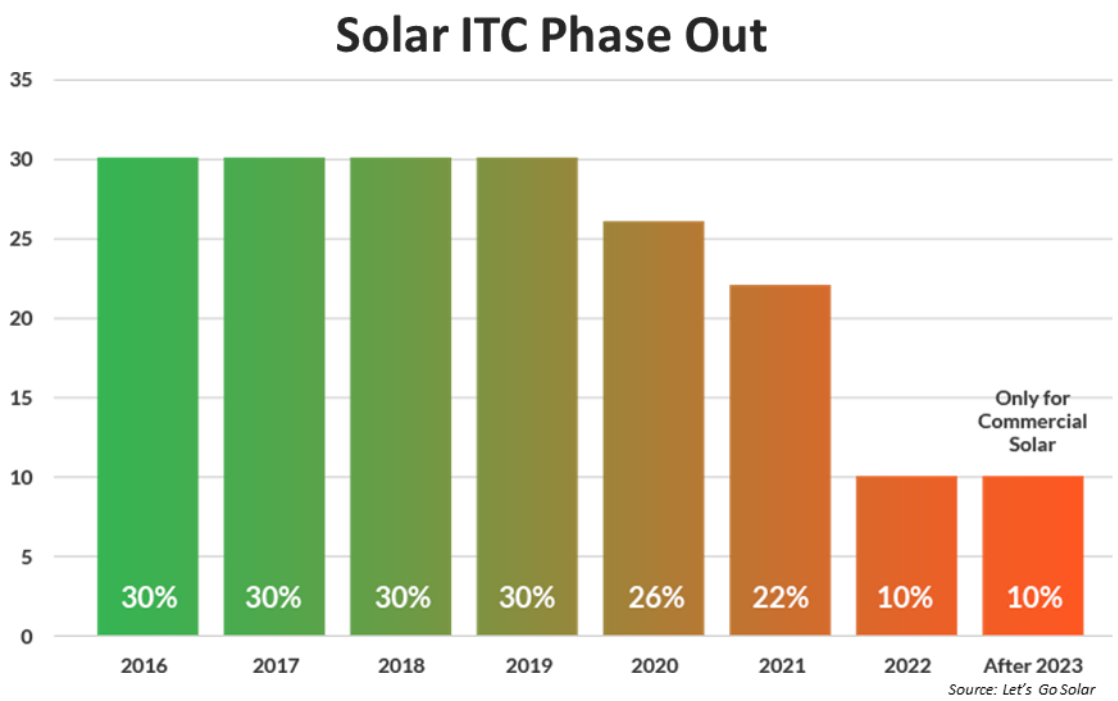
Financial Comparison



Current incentive climate creates excellent investment opportunities.

30% Federal Tax Credit

- Would you like some of your taxes back?
- Carry up to 20 years forward



50% Bonus Depreciation

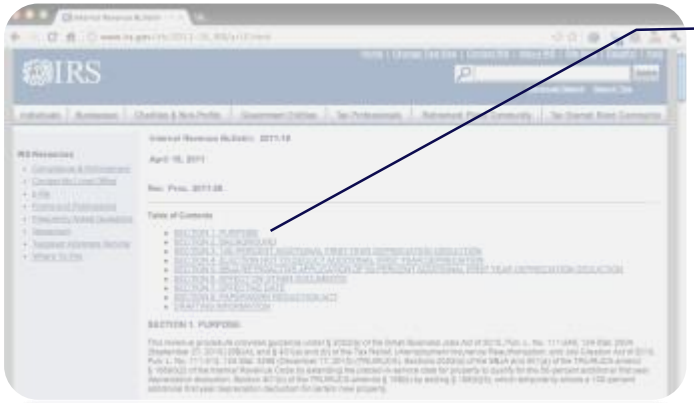
Projects completed before 2018 will receive a year one 50% bonus depreciation

Plus Standard MACRS 5 Year Property Rules

Include Bonus Depreciation							
	Year 1	year 2	Year 3	Year 4	Year 5	Year 6	
Bonus Depreciation *(if applicable)*	$137,067						TOTAL
5 Year MACRS Rate	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%	100.00%
5 Year MACRS Amount	$27,413	$43,862	$26,317	$15,790	$15,790	$7,895	
Total Depreciation	**$164,481**	**$43,862**	**$26,317**	**$15,790**	**$15,790**	**$7,895**	$274,135

This is not tax-advice *- simply SunMath's best guess of how to calculate MACRS*

For precise calculations on how the MACRS depreciation ends up saving business's money, contact SunMath at 855.SUNMATH.



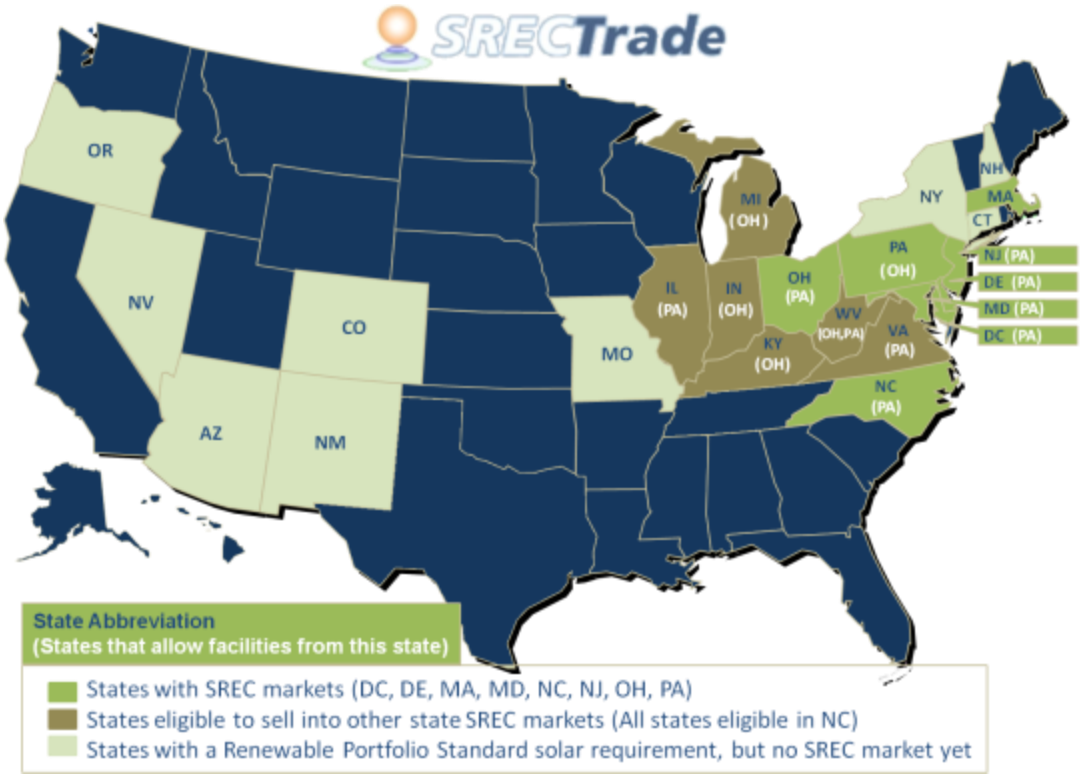
Under these amendments, eligible property placed in service after January 1, 2012 and before January 1, 2018 qualifies for 50% first-year bonus depreciation.

http://www.irs.gov/irb/2011-16_IRB/ar10.html AND http://dsireusa.org/incentives/incentive.cfm?Incentive_Code=US06F

REC (SREC) Sales

(some markets)

- REC/SREC = 1 MWh of solar production
- Open REC markets are growing in popularity
- Pricing varies between $525 to $20/SREC
- Can be worth more than energy savings



SREC Market Prices

Recent SREC Prices

State/Year	Last Sale	Auction
Delaware		
2010	$40.00	July-2012
2011	$45.00	July-2012
2012	$40.00	Sep-2012
Maryland		
2010	$140.00	Dec-2012
2011	$140.00	Dec-2012
2012	$140.00	Dec-2012
Massachusetts		
2012	$206.96	Dec-2012
New Jersey		
2011	$130.00	Aug-2012
2012	$82.00	Dec-2012
2013	$85.00	Dec-2012
Ohio		
2010 In	$180.00	May-2012
2011 In	$120.00	Aug-2012
2012 In	$35.00	Dec-2012
2010 Out	$30.00	Jan-2012
2011 Out	$8.99	Dec-2012
2012 Out	$8.99	Dec-2012
Pennsylvania		
2011	$16.25	Aug-2012
2012	$15.00	Nov-2012
2013	$8.99	Dec-2012
Washington D.C.		
2010	$300.00	Aug-2012
2011	$300.00	Dec-2012
2012	$308.61	Dec-2012

View All SREC Market Prices

Notes: "In" refers to in-state SRECs, "Out" refers to SRECs generated by any eligible facility (can be in-state or out-of-state). Prices listed reflect the last sale price of all SRECs eligible in current energy years.

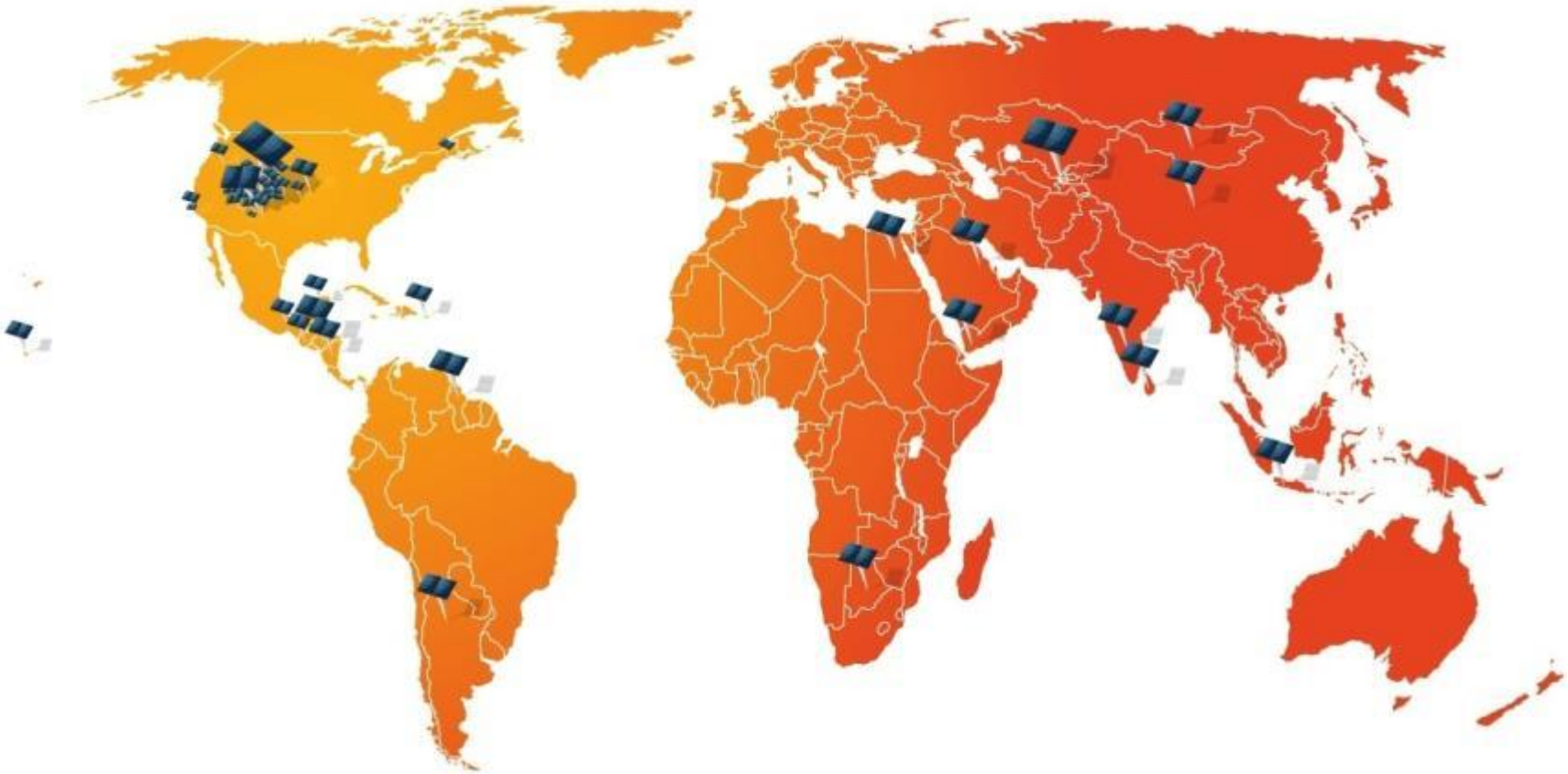
http://www.srectrade.com/background.php

A bit about…

CHOOSING YOUR PARTNERS

To RFP or Not to RFP?

- Request for Proposals ("RFP")
  - May be requirement in large organizations
  - Typical for large projects
  - Adds to customer workload
  - Problematic before design is complete
  - May not be able to compare apples to apples
  - Low bid may not be most qualified
  - Best method is to pay for comprehensive design first
- Request for Qualifications ("RFQ")
  - Small to large projects
  - If going design-build route, only need to generalize project parameters
  - Easier to compare apples to apples
  - Increases likelihood of finding best partner for your chosen "method"
  - May not be the cheapest option
  - Allows for design to evolve for best results



Do you need local, regional, national, or international partners?

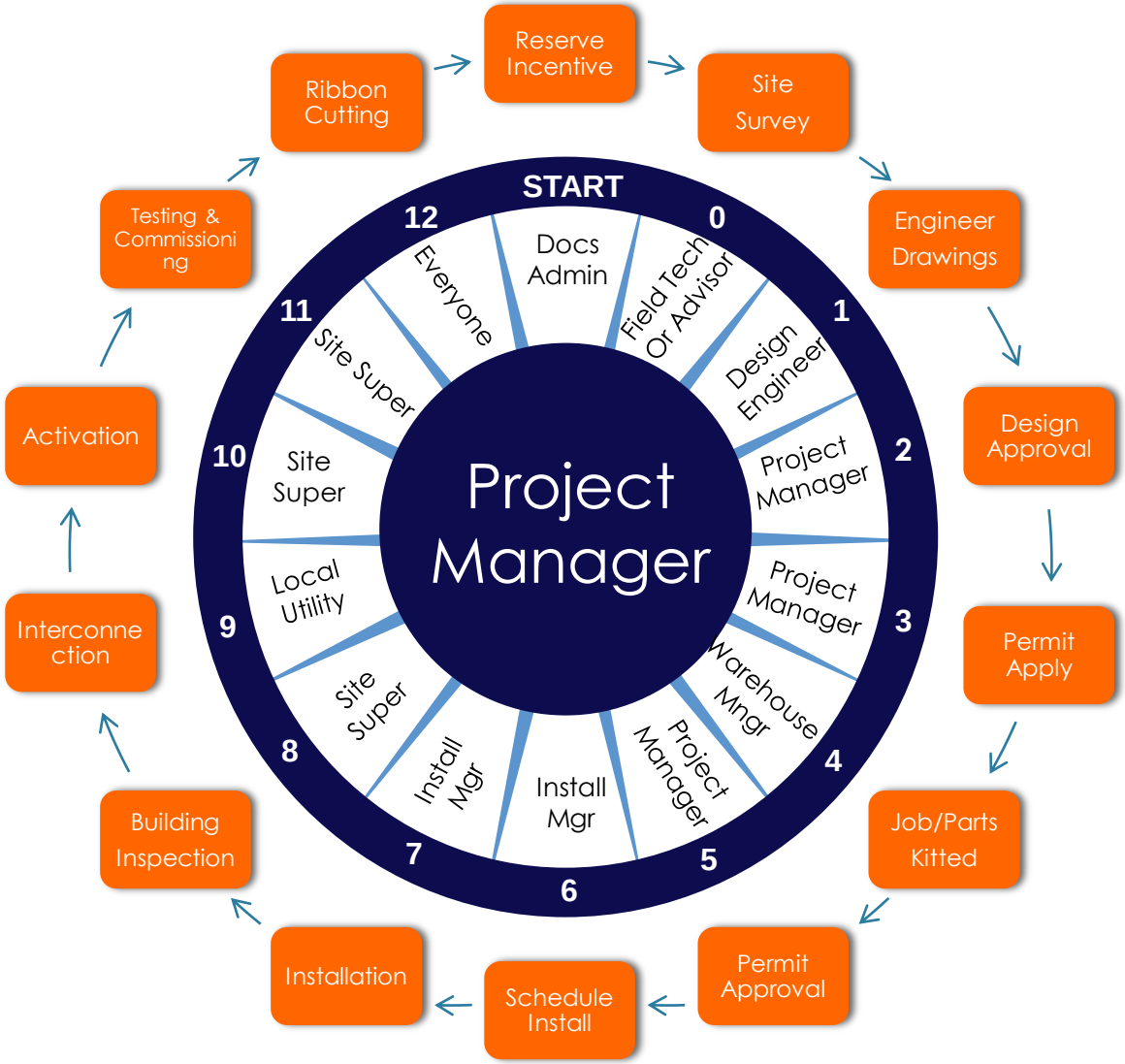
Installers and finance partners cover many varying market segments.

Partners with some history of satisfied customers.

Most solar companies were formed after year 2000.

Partners must know the process for YOUR jurisdiction.

From concept to commissioning, they will manage the process for you and should make going solar easy, <u>BUT it does take teamwork.</u>



Financial and Technical Expertise Required

Extensive financing experience:

Power Purchase Agreements, Leasing, Conventional Loans, PACE, new market tax credits, and many more

Engineering is Critical:

System engineering team with experience in your scale of project is very important

Combined staff experience is irrelevant!

Call on references!

How many similar projects?

Some Additional Points…

COSEIA
COLORADO SOLAR ENERGY INDUSTRIES ASSOCIATION

Installers and finance partners that are members of state trade organization

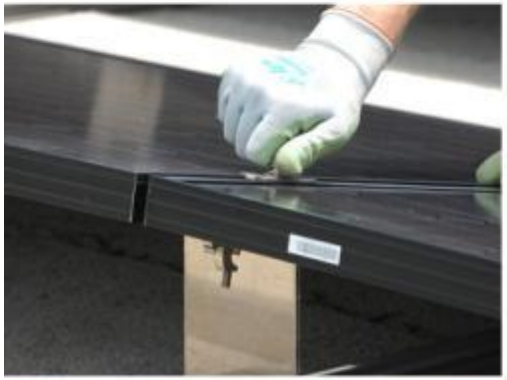
SEIA Solar Energy Industries Association®

Companies that are members of national trade organization

NABCEP™
Raising Standards. Promoting Confidence.

North American Board Certified Energy Practioner ("NABCEP")

TECHNICAL SOLUTIONS



Ballasted Roof Mount Racking

Typically non-penetrating construction does not void roof warranty.
Minimum burden and modular assembly. Meets or exceeds local wind rating.

Ground Mount Racking

Aluminum or galvanized construction. Pile driven, ground screws, or pour in place.
Full stamped structural engineering. Meets or exceeds local wind rating.

Flush Mount Racking

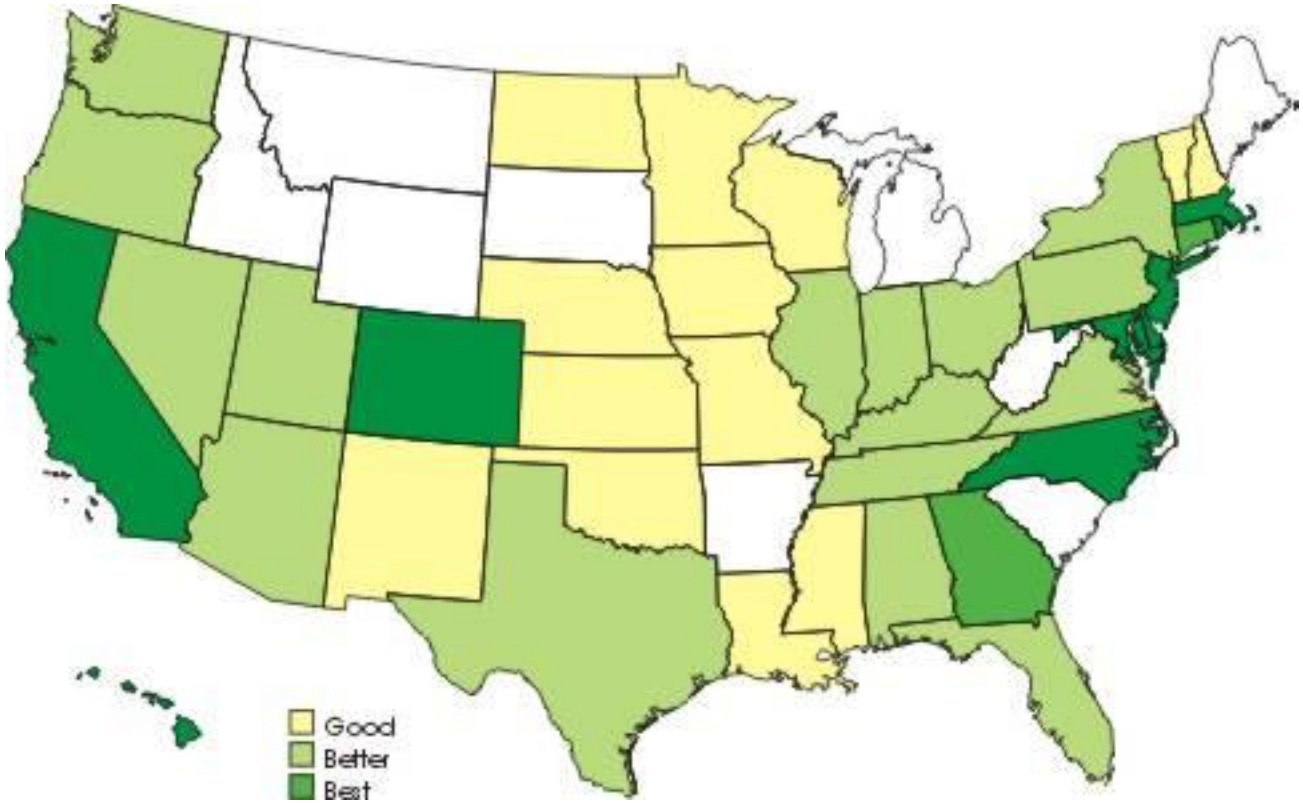
All aluminum construction. Less than 2.5 lbs per square foot installed.
Long manufacturer's warranties.

Production vs. Consumption Monitor

Your IT Department can link/embed display within your website and/or in your lobby helping enhance your sustainable image.

Best States for Commercial or Municipal Solar

(markets change often, don't just pass)



Expanded Solar Campaign?

Identify and qualify maximum benefit locations and implement a National Solar Initiative.

ESTIMATE PROJECT RESULTS

Environmental Benefits (sample)

See your benefits over conservative 30 year System Life

12,355 Trees	15,222 Pounds	5,398,484 Pounds
Equivalent Full Grown Carbon Absorbing Trees	Amount of Smog & Acid Rain Pollutants Prevented	CO_2 Emissions Prevented

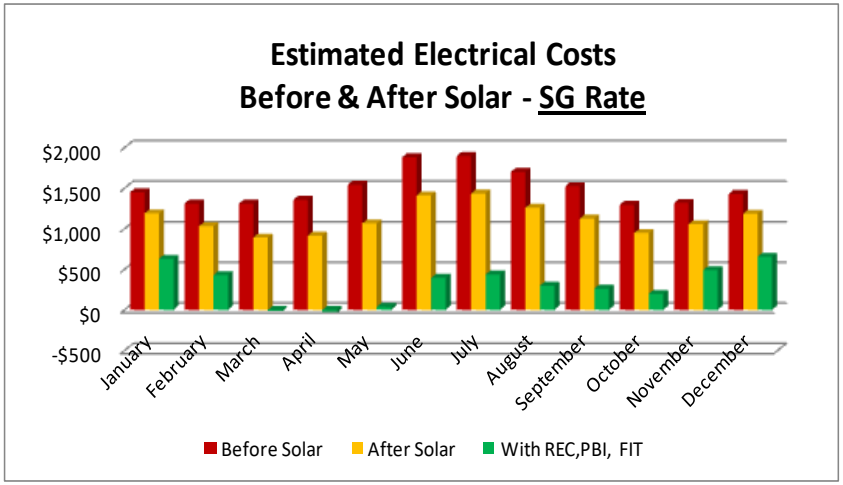
Local Economy Benefits (sample)

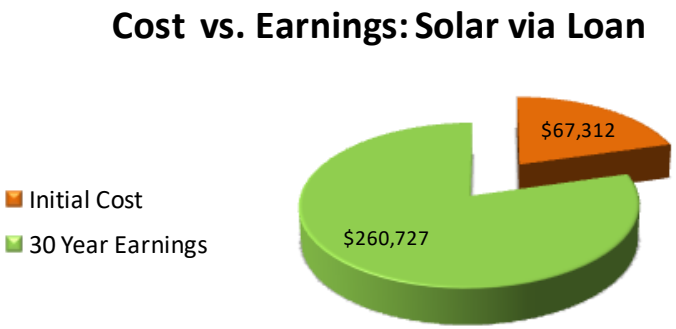
During 20 year standard term

Approx $8,560,000	Approx 3,160 days	Approx 6.5
Contributed to the local Economy	Full Time man days of work during construction	Long term jobs permanently created

Model Energy Cost Savings

Your PV Systems will produce about 97349 kWh per year. This results in first year kWh cost savings of ~$4509 on your current rate, reducing your grid consumption by about 73.9%





Model Rate Comparisons (sample)

Year One Xcel Rate Comparison

Integrity Retail Partners, LLC
1955 28th St., Boulder, CO 80301

Nick Perugini
cell: 303-817-3104 office: 303-665-2100 x248
Nick.Perugini@BellaEnergy.com
500 South Arthur Ave, Louisville, Colorado 80027
www.BellaEnergy.com

vers 10-18-2011

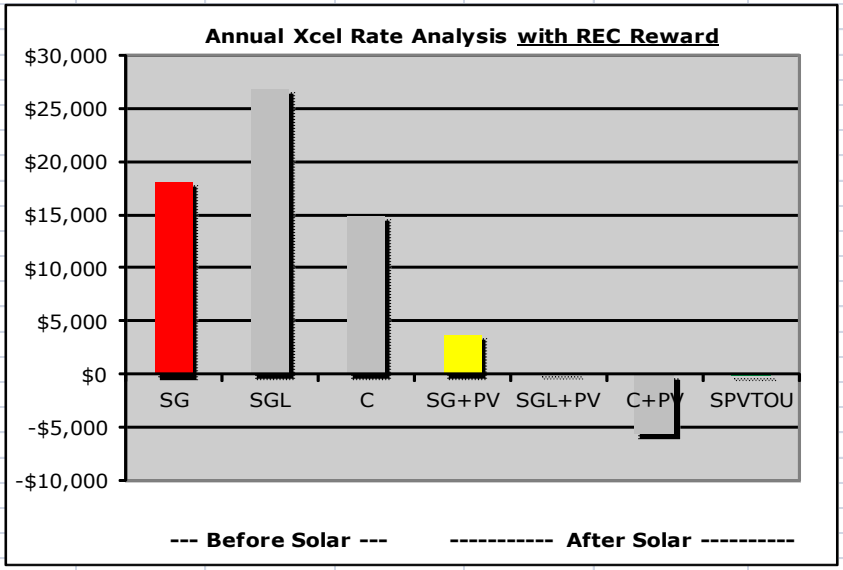
Manual Fill Yellow Fields

Current Consumption

Month	kW	kWh
January	46	11000
February	46	8000
March	46	8000
April	46	9000
May	46	13000
June	46	17000
July	47	16800
August	46	13120
September	46	9280
October	46	7680
November	46	8160
December	46	10560
Annual	553	131,600

Est Monthly PV System Output

Month	kWh
January	5614
February	6027
March	9058
April	9541
May	10291
June	10163
July	9967
August	9595
September	8625
October	7510
November	5665
December	5293
Annual	97,348



System Size DC kW

STC **68.64** DC kW

REC/PBI Reward

$ 0.100 $/kWh

Annual kWh Offset

73.97%

System Tilt

select **15.0** degrees

Avg Month Load Factor

32.6%

>30% OK for SPVTOU

Summer On-Peak **70.0%** estimated

Annual On-Peak **29.9%** percent

Estimated Future Annual Electric Bills

Xcel Rate	SG	SGL	C	SG+PV	SGL+PV	C+PV	SPVTOU
Total Bills	$18,012	$26,893	$14,891	$13,504	$9,768	$4,065	$9,622
REC Reward	N/A	N/A	N/A	$9,735	$9,735	$9,735	$9,735
Net Bills	**$18,012**	$26,893	$14,891	**$3,769**	**$33**	-$5,669	**-$112**
per kW Charge	$20.68	$5.55	$0.00	$20.68	$5.55	$0.00	$10.47
per kWh Charg	$0.0463	$0.1740	$0.1099	$0.0463	$0.1740	$0.1099	$0.0824

(negative number indicates payment to Solar owner)

average annual weighted

average annual weighted

$4,508	$8,245	$13,947	$8,390
Bill Savings	Bill Savings	Bill Savings	Bill Savings
SG+PV	SGL+PV	C+PV	SPVTOU

Note: This spreadsheet does not take into account peak demand changes from peak reduction due to PV because this cannot be guaranteed, therefore it is conservative estimate.
IF overgeneration is present in any month it is estimated as a credit on that months bill at full kWh value in this analysis, like "Continious Roll Over". Annual over production designs will skew analysis.
SPVTOU Rates assume an input % of consumed On Peak and remainder consumed Off Peak (Peak time is Mon-Fri 12pm to 8pm in June thru Sep ONLY)

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Model Cash Flows (sample)

Solar Levered Cashflow

Rooftop Solar Client
123 Solar Street, Denver, CO

PRELIMINARY - FUNDED via LOAN

INDEPENDENT POWER SYSTEMS

Nick Perugini
303-817-3104
NPerugini@SolarIPS.com
Project & Partner Development
www.SolarIPS.com

Financial Assumptions

System Size	786,300	DC kW
1st Year kWh Solar Production	1,166,083	kWh / year
Turn Key Installation Price	$ 1,236,457	1.57 per Watt
ITC Ineligible Costs (if any)	$ 15,726	
Federal Investment Tax Credit (ITC)	$ 366,219	30% of eligible Cost
Other Incentive	$ -	if any
Marginal Tax Rate	38.01%	*estimated Fed + State*
Discount & Interest Rate	4.50%	*estimated*

Current kWh Rate	$0.0427	kWh
Estimated Annual Consumption	1,245,188	kWh
Annual Electric Cost Escalation	4.00%	per year
Standard Inflation Rate	2.50%	per year
Estimated Personal Property Tax	$17.48	Typical $17.48/kW/Yr
Estimated Insurance	0.14%	of System - Roof
Annual Change in RCNLD	4.47%	
Annual Module Degredation	-0.50%	

Monthly Loan Payment	$6,407.22	
Loan Term in Years	10	
Loan Amount	$ 618,228	50%
Weighted average REC Reward	$0.030	per kWh
RE Reward Inflator	0%	per year
REC Term	20	years
Optional Operations & Maintenance	$7.00	per kW per year
Potential 15yr Inverter Replacement	$58,972.50	at .75 of today

Percent of kWh Offset by Solar	93.6%	
Estimated Roof Array Area	95,188	*Sq. Ft. estimated*

Year	Installation Cost and O & M	Estimated Loan Amount	30% Federal Tax Credit	Other Incentive	Depreciation Tax Shield MACRS Value	Estimated kWh Solar Production	On-Site Avoided kWh Cost	REC, PBI, FIT Reward	Estimated IF Property Taxes (Some Exempt)	Estimated Insurance	Tax on Income Less Expenses	Loan Payments	Loan Interest Tax Deduction Value	Annual Effective Cash Flow	Cumulative Cash Flow
0	-$1,236,457	$618,228	$366,219	$0		1,166,083	$49,836	$35,221	-$13,745	-$1,731	$0	-$76,887	$10,574	-$248,740	-$248,740
1	-$5,504				$239,685	1,160,252	$51,571	$35,045	-$13,458	-$1,695	-$5,469	-$76,887	$9,517	$232,805	-$15,934
2	-$5,642				$63,916	1,154,451	$53,365	$34,870	-$13,177	-$1,660	-$5,470	-$76,887	$8,459	$57,775	$41,841
3	-$5,783				$38,350	1,148,679	$55,222	$34,696	-$12,902	-$1,625	-$5,468	-$76,887	$7,402	$33,005	$74,846
4	-$5,927				$23,010	1,142,936	$57,144	$34,522	-$12,633	-$1,591	-$5,462	-$76,887	$6,345	$18,520	$93,366
5	-$6,075				$23,010	1,137,221	$59,133	$34,349	-$12,370	-$1,558	-$5,453	-$76,887	$5,287	$19,436	$112,803
6	-$6,227				$11,505	1,131,535	$61,190	$34,178	-$12,112	-$1,525	-$5,440	-$76,887	$4,230	$8,911	$121,714
7	-$6,383					1,125,877	$63,320	$34,007	-$11,859	-$1,494	-$5,424	-$76,887	$3,172	-$1,548	$120,166
8	-$6,543					1,120,248	$65,523	$33,837	-$11,612	-$1,462	-$5,405	-$76,887	$2,115	-$433	$119,732
9	-$6,706					1,114,646	$67,804	$33,668	-$11,370	-$1,432	-$5,382	-$76,887	$1,057	$752	$120,485
10	-$6,874					1,109,073	$70,163	$33,499	-$11,133	-$1,402	-$5,356	$0	$0	$78,898	$199,383
11	-$7,046					1,103,528	$72,605	$33,332	-$10,900	-$1,373	-$5,326	$0	$0	$81,291	$280,674
12	-$7,222					1,098,010	$75,132	$33,165	-$10,673	-$1,344	-$5,293	$0	$0	$83,764	$364,438
13	-$7,402					1,092,520	$77,746	$32,999	-$10,451	-$1,316	-$5,257	$0	$0	$86,320	$450,758
14	-$7,587					1,087,058	$80,452	$32,834	-$10,233	-$1,289	-$5,217	$0	$0	$88,960	$539,718
15	-$66,750					1,081,622	$83,251	$32,670	-$10,019	-$1,262	$0	$0	$0	$37,891	$577,609
16	-$7,972					1,076,214	$86,149	$32,507	-$9,810	-$1,236	-$5,127	$0	$0	$94,511	$672,120
17	-$8,171					1,070,833	$89,147	$32,344	-$9,606	-$1,210	-$5,077	$0	$0	$97,427	$769,547
18	-$8,375					1,065,479	$92,249	$32,183	-$9,405	-$1,185	-$5,024	$0	$0	$100,442	$869,989
19	-$8,585					1,060,152	$95,459	$32,022	-$9,209	-$1,160	-$4,967	$0	$0	$103,560	$973,549
20	-$8,799					1,054,851	$98,781	$0	-$9,017	-$1,136	$0	$0	$0	$79,829	$1,053,379
21	-$9,019					1,049,577	$102,219	$0	-$8,829	-$1,112	$0	$0	$0	$83,259	$1,136,637
22	-$9,245					1,044,329	$105,776	$0	-$8,645	-$1,089	$0	$0	$0	$86,798	$1,223,435
23	-$9,476					1,039,107	$109,457	$0	-$8,465	-$1,066	$0	$0	$0	$90,450	$1,313,885
24	-$9,713					1,033,911	$113,266	$0	-$8,288	-$1,044	$0	$0	$0	$94,221	$1,408,106
25	-$9,955					1,028,742	$117,208	$0	-$8,115	-$1,022	$0	$0	$0	$98,115	$1,506,221
26	-$10,204					1,023,598	$121,286	$0	-$7,946	-$1,001	$0	$0	$0	$102,135	$1,608,357
27	-$10,459					1,018,480	$125,507	$0	-$7,780	-$980	$0	$0	$0	$106,288	$1,714,644
28	-$10,721					1,013,388	$129,875	$0	-$7,618	-$959	$0	$0	$0	$110,576	$1,825,221
29	-$10,989					1,008,321	$134,394	$0	-$7,459	-$939	$0	$0	$0	$115,007	$1,940,228
30	-$11,264					1,003,279	$139,071	$0	-$7,304	-$920	$0	$0	$0	$119,584	$2,059,812
20 Yr Total	-$1,427,230	$618,228	$366,219	$0	$399,475	22,246,418	$1,406,460	$671,948	-$226,677	-$28,549	-$95,618	-$768,866	$58,159	$973,549	$973,549
30 Yr Total	-$1,525,810	$618,228	$366,219	$0	$399,475	32,560,721	$2,564,229	$671,948	-$308,840	-$38,896	-$95,618	-$768,866	$58,159	$1,940,228	$1,940,228

All figures are presented to the best of our ability and knowledge of facts and forecasts. We are not financial advisors. Verification with an independent third party financial analysis expert is recommended.
*REC, Rebates, and PPA electric payments are considered taxable income
This document may contain statements concerning taxation. These statements or any other estimated amounts are provided for standard illustrative purposes. They are not intended to constitute tax advice, and are not intended to be used or relied upon, to avoid penalties. Consult your tax advisor for verification on your specific circumstance.

On site surveys must be performed to verify existing conditions and exact final price.

Some Questions for You?

- What hurdles do you see for your business?
- Why wouldn't you go solar?

Your Future Install Here ???? kW

Next Steps…

- ☑ Choose Your Method and Partners
- ☐ Letters of Intent or Term Sheets
- ☐ Interconnection/Incentive Applications
- ☐ Final Agreements and Contracts
- ☐ Approvals, Engineering, & Construction
- ☐ Reap the benefits of Going Solar!

☐ Must Attend to Learn More:

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www.CleanEnergyMeansBusiness.com

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