CIR ELECTRIC:

How to empower your business with the sun

DESCRIPTION

A deeper look into photovoltaic solar energy for commerical systems

PRESENTED BY:

Ashley Regan

Director of Business Developement

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What is Solar PV?

When solar cells, also called photovoltaic (PV) cells convert sunlight directly into electricity. PV gets its name from the process of converting light (photons) to electricity (voltage), which is called the PV effect.

As most great inventions, solar was discovered on accident...

Solar Brain Tease

"We are like tenant farmers chapping down the fence around our house for fuel when we should be using Nature's inexhoustible sources of energy—sun, wind an tide. I'd put my maney on the sun and solar energy. Who a source of power! I hape we don't have to woit until or and coal run our befire we tackle that.



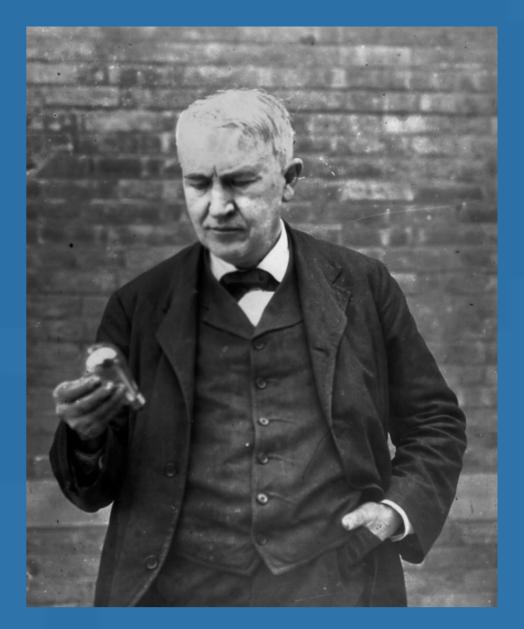
Solar Brain Teaser

"We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy--sun, wind and tide. I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."





- Thomas A. Edison, 1931





Advantages to Solar

- Reduce or eliminate energy bills
- High return on investment
- Excellent incentives slashing costs
- Controllable utility costs
- Reduced dependency on fossil fuels
- Clean, renewable energy
- Global trend with tremendous business opportunity





Lainty





Solar

Misconceptions MYTH: The investment is unrealistic

FACT: In the past 5 years PV system costs dropped 75%, there are also gov't incentives that drop the total system cost >55%

MYTH: The technology is too new and scientifically unproven

FACT: Solar was discovered in the 1800's with its practical application in use since the 1950's

FACT 2: Most modules carry a 25 year warranty, thus complementing their quality and durability

MYTH: We don't get enough sun in Western NY

FACT: WNY gets on average 500 hours more

daylight than Germany



Photovoltaic Solar Resource: United States - Spain - Germa Annual average solar resource data are for a solar collector-oriented toward the south at a tilt = local latitude. The data for Hawwii 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 and Spain 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. States and countries are shown to scale, except for Alaska. Mainland United States · Fart Calife Patria De Mallerra Alaska Germany United States Ollandia Neri te Soulini Hawaii United States Hawaii USA Alaska USA Spain Germany Mainland USA kWh/m²/Year April 12: 2008 Author: Elily J., Poberts National Fernancing Drumpy Laterature for the LB Department of Streets



Components

- Modules (panels)
- Racking
- Inverters
- BOS (balance of system, i.e. conduit, wire, etc.)

Optional components:

- Batteries
- Charge controllers
- Monitoring software





Bausch & Lomb Install photos













State and Federal Tax Incentives

New York State: will provide a 25% income tax credit up to \$5,000 that can be used until fulfilled. Excess credit may be carried forward for five years. *Only for residential

Federal: government will provide a 30% tax credit, uncapped, on any system regardless of size and not exclusive to main residences. This offer expires in 2019 but excess credits may be carried to the following five years after purchase.

can include the cost of batteries

Net Metering

Every time an active solar system produces more energy that a house or business consumes, the owner receives credit fro their utility company. So, on a day when the owner's system produces more than their electrical consumption, the meter on their house or business spins backwards (net metering), and they gain "energy credits." These credits roll-over from month to month and can add up to a decent buck by the end of the year.





oss

*CIR always advises their prospective customers to review the tax incentives with their tax advisor. Gross or net cost methods will vary depending on the customer's tax brackets.



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What happens when the PV system production exceeds consumption?



Energy gets sent back to grid



Bidirectional meter calculates in/out energy transfer



Utility bill reflects consumption less production







NYSERDA

New York State's Energy Research and Development

Authority

Residential and Small Commercial Block Structure
<200kW
Commercial and Industrial
>200kW

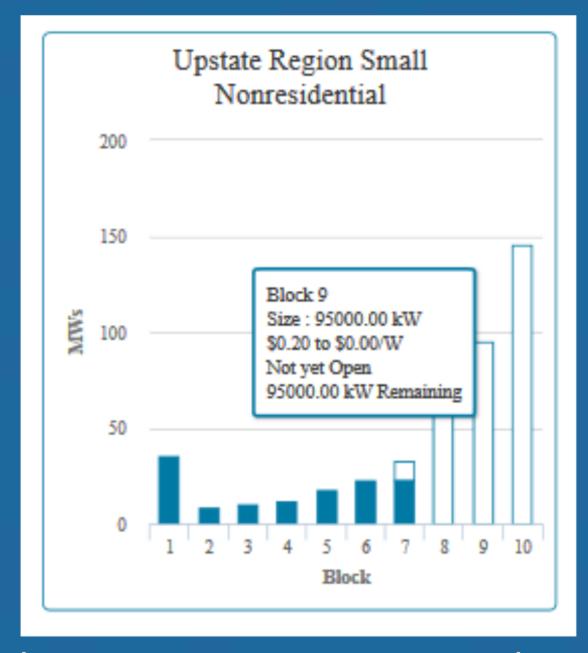
No end date has been verified

NYSERDA's funding is subject to change



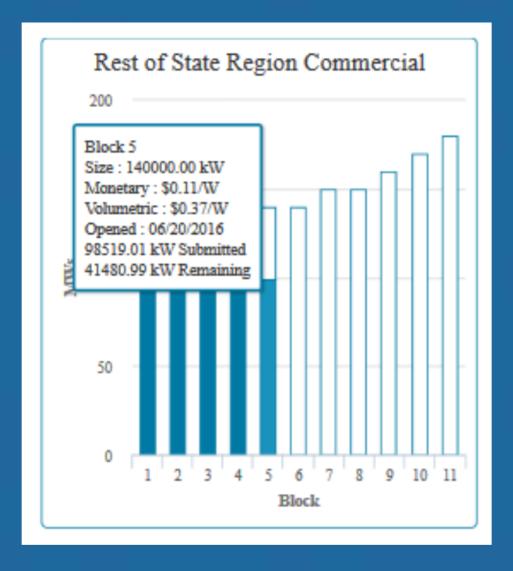






\$0.40 first 50kW then \$0.30 additional 200 kW





*Monetary only applies to Schools, and municipal bodies who had a RFP, RFI, etc. in place prior to June 1st, 2015



Target Markets

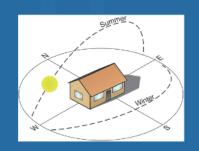
- Residential retrofit
- Residential new build
- Farm/ Winery
- Small to medium sized businesses
- Commercial/industrial buildings
- Municipalities
- Not for profits





What is a good site for Solar?

- South facing roof
- Ground Exposure
- Flat roof
- Little to no shade
- Building/ roof in question to be structurally sound











Poor site for solar.... no problem!

Community Solar

Synonyms: Community Distributed Generation, CDG, Shared Solar, Community DG, Shared Renewables

- One host usually need at least 15-20 acres of land, this is where the solar farm or 'array' will be
- Remote net meter to 'tenants' via the utility company
- Renters and owners both can apply
- Residential, commercial and industrial are eligible to enter
- Villages or towns or any other Municipal body can sponsor the array

Why CDG Works

- Three out of every four residential and commercial rooftops are unsuited for solar in the U.S.
- Tenants can buy-into a PPA, purchase or "pay as you go" model
- Savings are typically seen as 10-30% from your currently utility provider depending on model chosen



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44.95 kW Solar Electric (PV) System

Purchase Price & Net Cost

Financial Ratios

Gross Price: \$132,603

Incentives to Contractor: (\$26,970)

Contract Price: \$105,633

Incentives to Customer: (\$31,690)

Net Purchase Cost: \$73,943

MACRS Depreciation: (\$28,028)

Customer's Profitability Index: 2.5

Cashflow Payback: 5.5 years

Internal Rate of Return (IRR): 17.3%

Modified IRR (MIRR): 10.8%

Net Present Value (NPV): \$113,467

Cash Gained over Life: \$270,961

Assumptions

- 1. NYSERDA at block 7: \$0.40/kW installed
- 2. South facing ballast roof mount
- 3. (145) 310 watt American made panels
- 4. ~\$500-1,000 electric bill
- 5. Paying \$0.12 kWh
- 6. 3% utility inflation rate
- 7. Minimal to no shading
- 8. Structure in question is sound
- 9. ~101% electrical offset
- 10. Tax credits are based of net costs

"All quotes are subject to change upon a site evaluation



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Types of Installations



Roof Mount



Ground Mount



Solar Tracking



Building Integrated





Site Photos













































Complimentary Products

- LED lighting
- Equipment maintenance programs
- Geothermal heating and domestic Hot Water
- Energy audits

Conservation and clean energy production go hand in hand



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