

Considerations for Municipal Solar Projects

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Topic Areas

- Benefits of going green / solar
- Actions local governments can take
- Programs and incentives
- Implementation process

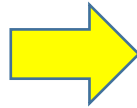
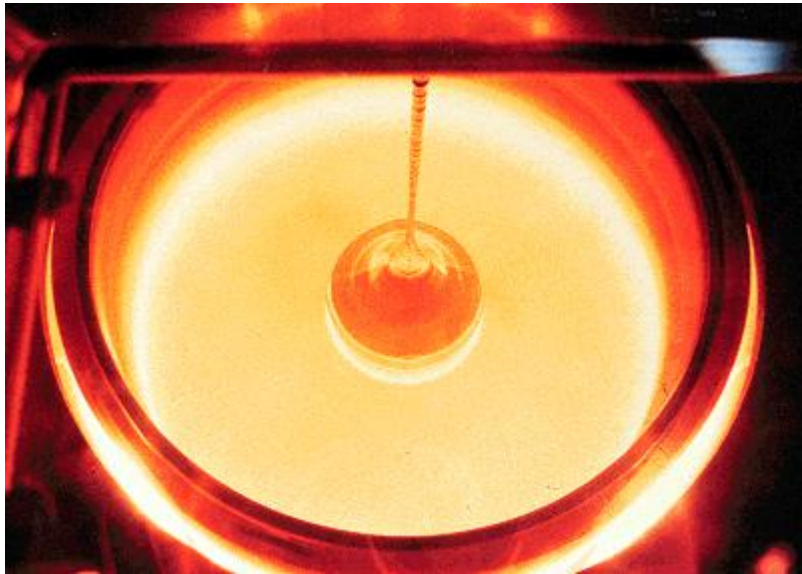
Solar Overview

- Solar photovoltaic systems capture energy in sunlight and convert it to electricity.
- How does that work?



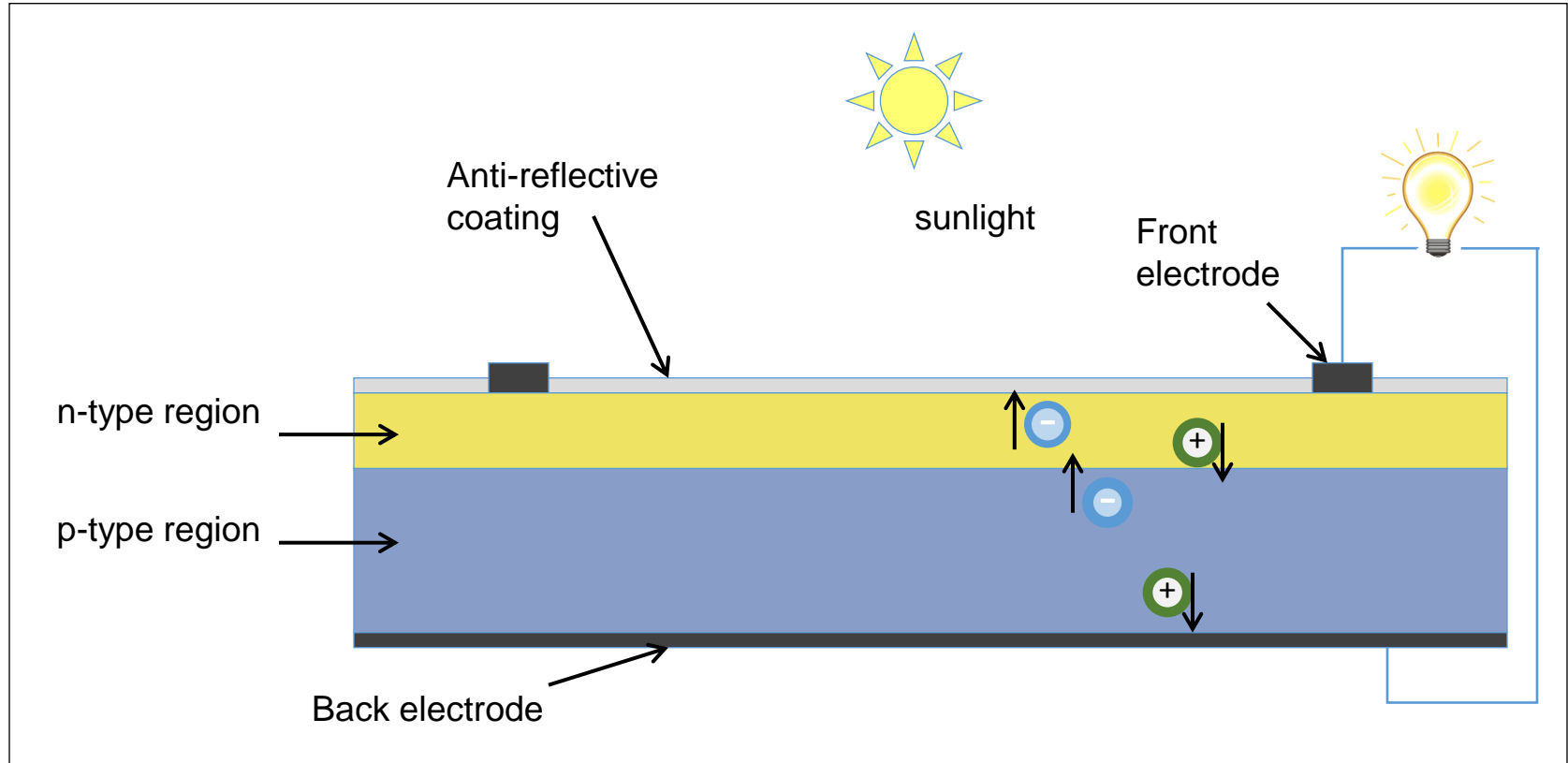
Solar Overview

- Silicon is processed into solar cells
- Solar cells are assembled into panels or modules



Solar Overview

- The photovoltaic effect...



Solar Overview

- Modules are then installed along with racking, conductor assemblies, combiner boxes, inverters, and other equipment into working systems.
- These system are then connected to the electricity grid.



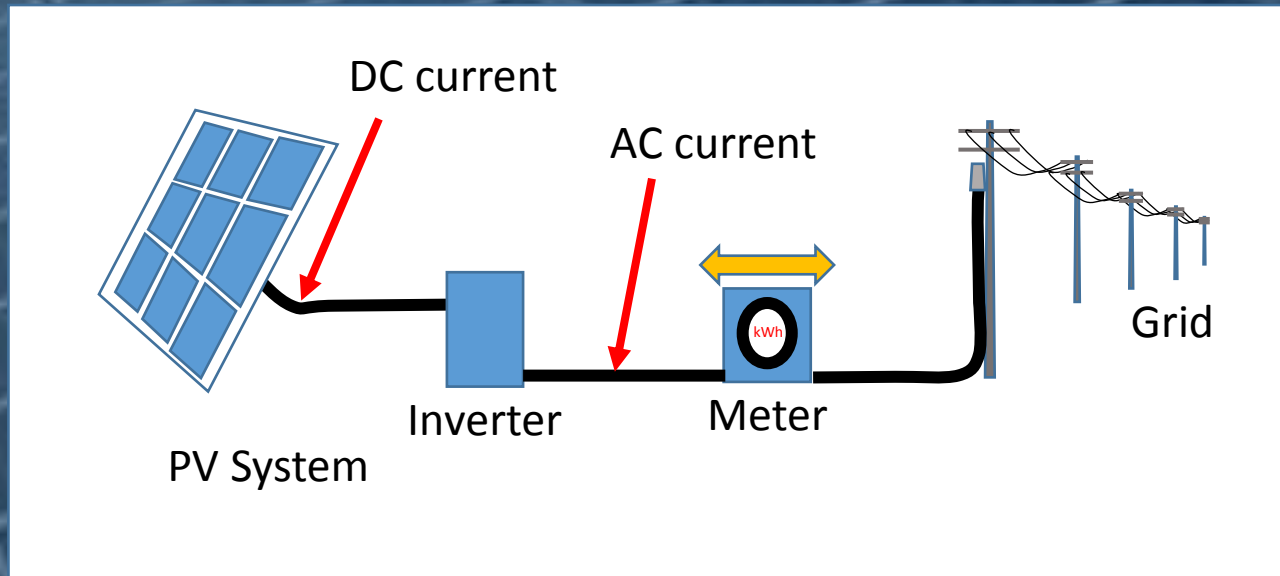
Solar Overview

- Module characteristics

PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

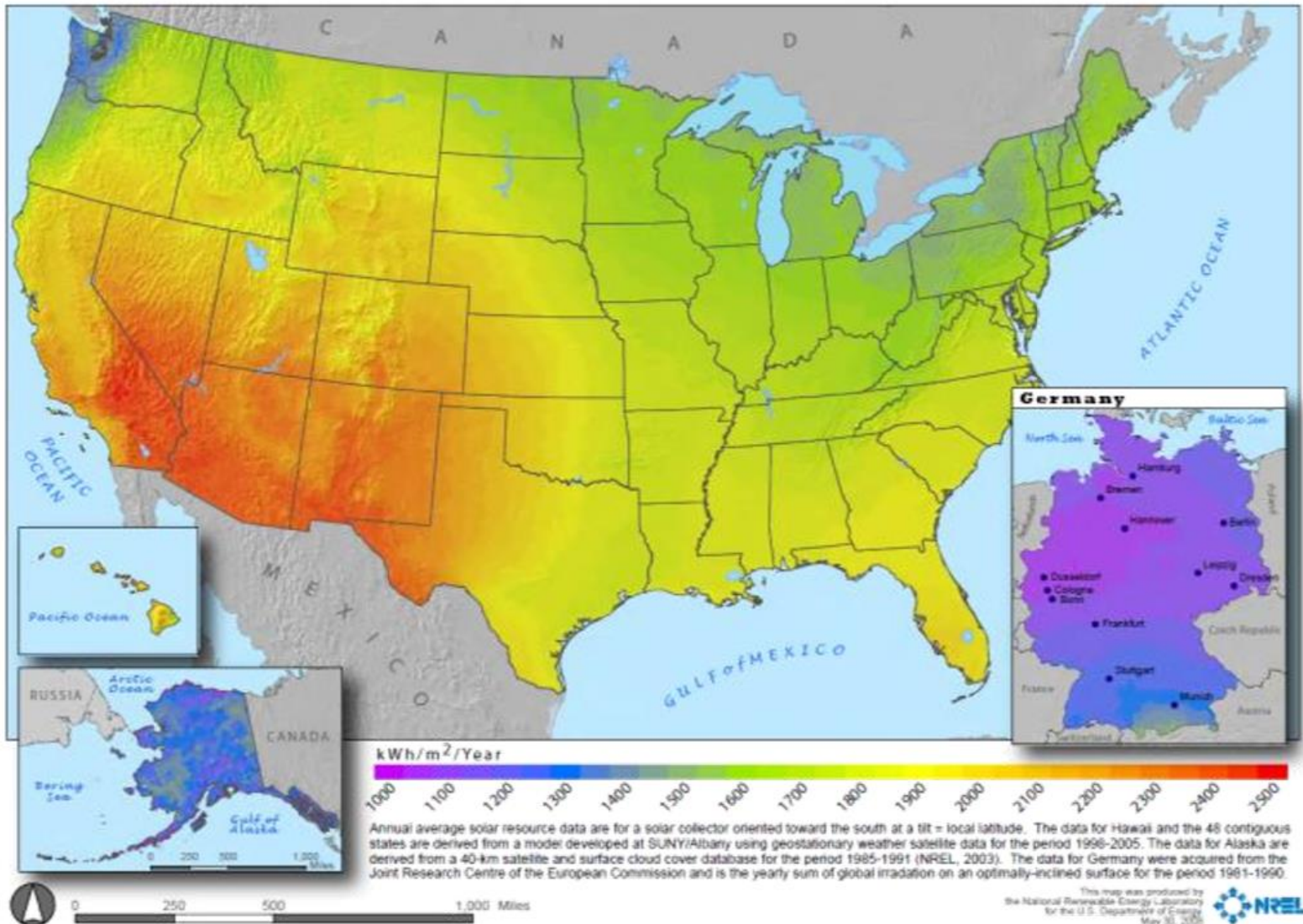
		SW 285
Maximum power	P_{\max}	285 Wp
Open circuit voltage	V_{oc}	39.7 V
Maximum power point voltage	V_{mpp}	31.3 V
Short circuit current	I_{sc}	9.84 A
Maximum power point current	I_{mpp}	9.20 A
Module efficiency	η_m	17.00 %

System Size Limits



- 5 MW ac limit for interconnection
- 2 MW ac limit for remote net metering

Solar Overview



Source:
NREL

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Benefits

- Reductions in greenhouse gas emissions and carbon footprint
- Advances toward greater levels of resiliency
- Improved public relations within community
- Encourage citizens to make similar commitments

Benefits

- Improved access to additional funding programs.



Benefits

- Potential to save on energy costs.
 - Meter classification
 - Supply and delivery
 - Demand vs. non-demand
 - Third party supply and consolidated billing



nationalgrid

SERVICE FOR BILLING PERIOD Mar 21, 2014 to Apr 22, 2014 PAGE 2 of 4

ACCOUNT NUMBER PLEASE PAY BY May 18, 2014 AMOUNT DUE \$ 50.16

DETAIL OF CURRENT CHARGES

Delivery Services

Type of Service	Current Reading	Previous Reading	Difference	Meter Multiplier	Total Usage
Energy	2609 Actual	2448 Actual	161	1	161 kWh
Total Energy Usage					161 kWh
Billed Energy Usage					161 kWh

METER NUMBER NEXT SCHEDULED READ DATE May 27
SERVICE PERIOD Mar 21 - Apr 22 NUMBER OF DAYS IN PERIOD 32
RATE Electric SC2 T&D VOLTAGE DELIVERY LEVEL 0 - 2.2 kv

Customer					21.02
Delivery	0.05378813	x 161 kWh			8.66
Consolidated Billing Credit					-1.24
SBC/RPS	0.007911	x 161 kWh			1.28
Incr State Assessment	0.00403	x 161 kWh			0.65
Legacy Transition Chrg	0.00175	x 161 kWh			0.28
Transmission Rev Adj	0.00131	x 161 kWh			0.21
Total Delivery Services					\$ 30.86

Supply Services

SUPPLIER American Power & Gas, LLC
303 Main Street
Dunedin, FL 34698
PHONE 727-733-8700 ACCOUNT NO 0003344909

Electricity Supply	0.11986479	x 161 kWh			19.30
Total Supply Services					\$ 19.30

Benefits

- Savings for members of the community



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Local Government Actions

- Energy use planning



Local Government Actions

- Implement solar to offset municipal consumption

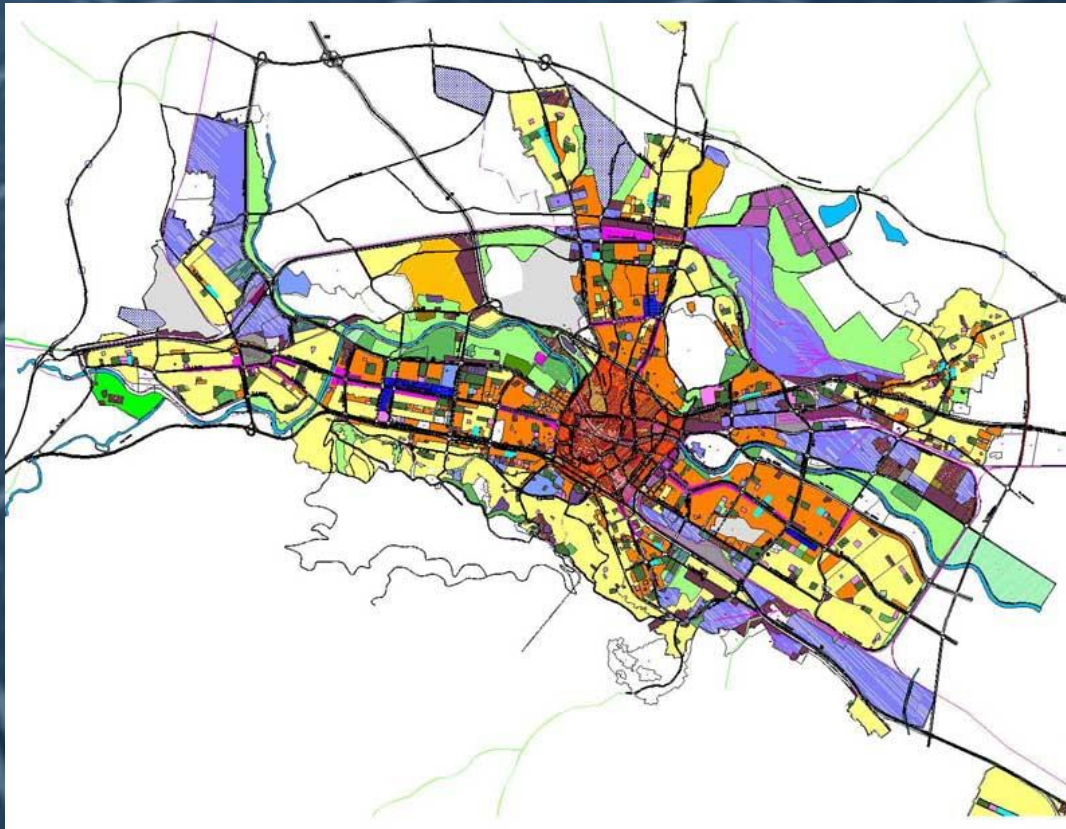


Local Government Actions

- Implement solar to offset municipal consumption
 - Ownership
 - Lease arrangement
 - Power purchase agreement

Local Government Actions

- Update zoning to address solar



Local Government Actions

- Adopt unified solar permit

Appendix A. Unified Residential Solar PV Permit Application

PERMIT APPLICATION

NY State Unified Solar Permit

Unified solar permitting is available statewide for eligible solar photovoltaic (PV) installations. Municipal authorities that adopt the unified permit streamline their process while providing consistent and thorough review of solar PV permitting applications and installations. Upon approval of this application and supporting documentation, the authority having jurisdiction (AHJ) will issue a building and/or electrical permit for the solar PV installation described herein.

PROJECT ELIGIBILITY FOR UNIFIED PERMITTING PROCESS

By submitting this application, the applicant attests that the proposed project meets the established eligibility criteria for the unified permitting process (subject to verification by the AHJ). The proposed solar PV system installation:

- | | | |
|------------------------------|-----------------------------|---|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 1. Has a rated DC capacity of 25 kW or less. |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 2. Is not subject to review by an Architectural or Historical Review Board. (If review has already been issued answer YES and attach a copy) |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 3. Does not need a zoning variance or special use permit.
(If variance or permit has already been issued answer YES and attach a copy) |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 4. Is mounted on a permitted roof structure, on a legal accessory structure, or ground mounted on the applicant's property. If on a legal accessory structure, a diagram showing existing electrical connection to structure is attached. |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 5. The Solar Installation Contractor complies with all licensing and other requirements of the jurisdiction and the State. |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | 6. If the structure is a sloped roof, solar panels are mounted parallel to the roof surface. |

Source:

NY-Sun Solar
Guidebook for Local
Governments in New
York State

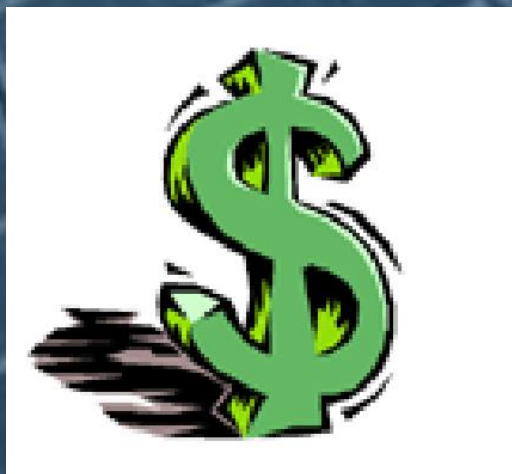
Local Government Actions

- Pursue solarize program



Local Government Actions

- Engage in state incentive programs to position for future opportunities.



High Impact Action Items

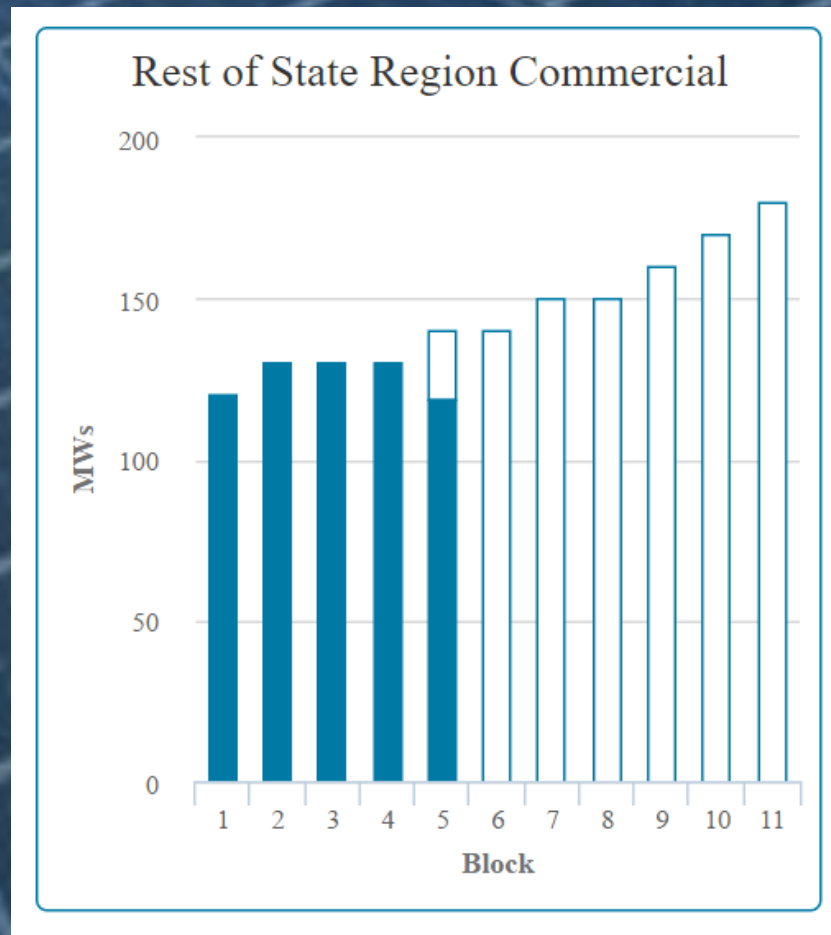
- ▶ Benchmarking - Adopt a policy to report the energy use of buildings
- ▶ Clean Energy Upgrades - Achieve 10% reduction in greenhouse gas emissions from buildings
- ▶ LED Street Lights - Convert street lights to energy efficient LED technology
- ▶ Clean Fleets - Install electric vehicle charging stations or deploy alternative fuel vehicles
- ▶ Solarize - Undertake a local solarize campaign to increase the number of solar rooftops
- ▶ Unified Solar Permit - Streamline the approvals process for solar
- ▶ Energy Code Enforcement Training - Train compliance officers in energy code best practices
- ▶ Climate Smart Communities Certification - Get certified by the NYS Department of Environmental Conservation
- ▶ Community Choice Aggregation - Put energy supply choices in your community's hands
- ▶ Energize New York Finance - Offer energy upgrade financing to businesses and non-profits

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Programs and Incentives

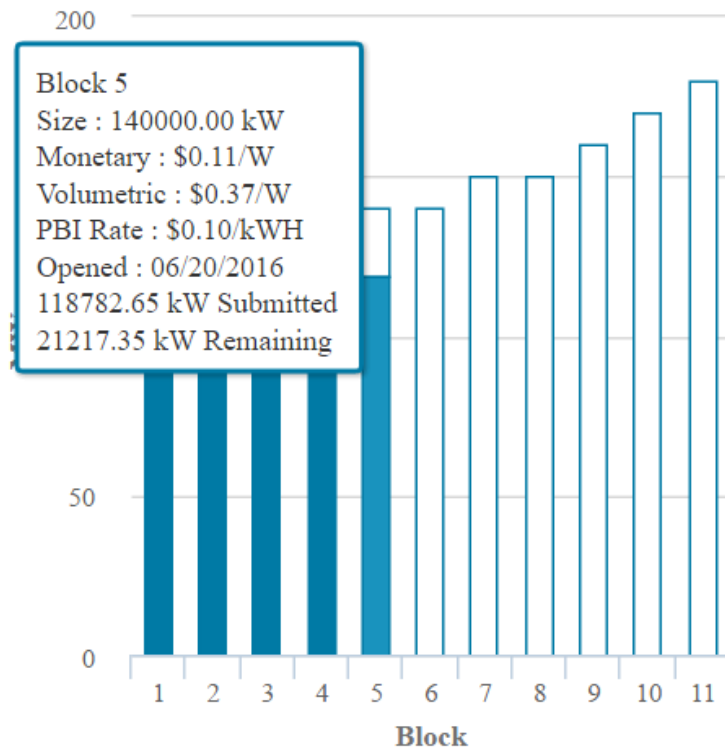
- NY-Sun Megawatt Block program



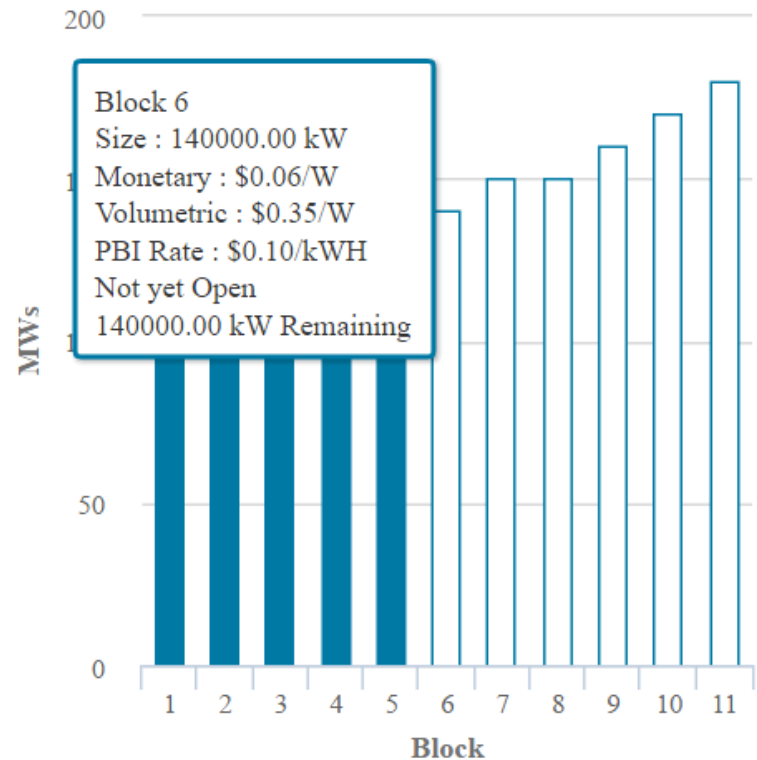
Programs and Incentives

- NY-Sun Megawatt Block program

Rest of State Region Commercial

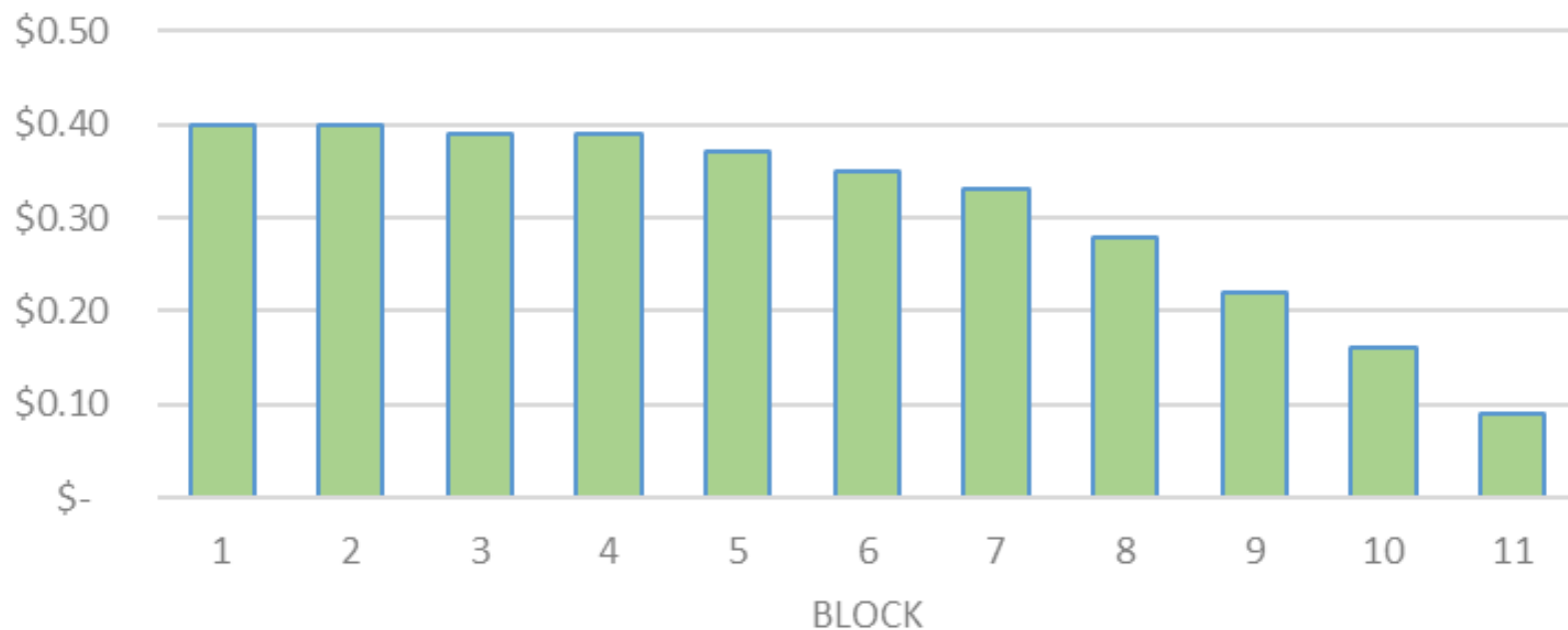


Rest of State Region Commercial



Megawatt Block Grant Value

C&I Megawatt Block Incentive
Volumetric Crediting
\$/W



Programs and Incentives

- Renewable Energy Certificates/Credits (RECs)
 - Pending (PSC Case 15-E-0302)

Programs and Incentives

- Federal Investment Tax Credit (ITC)



Programs and Incentives

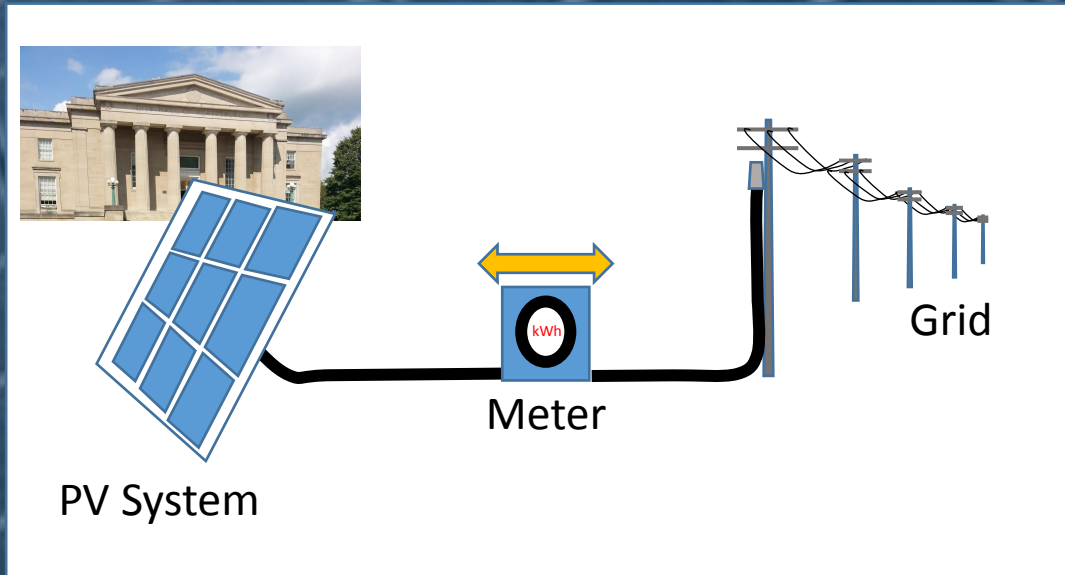
- Depreciation
 - Solar PV systems can be completely depreciated using an accelerated depreciation schedule
 - Basis (85% of eligible project costs –reduced by $\frac{1}{2}$ of ITC) viewed as a loss over 5 to 6 years
 - Dependent on owner tax rate but value can be an additional 30% of project cost

Programs and Incentives

- Net metering
- Remote net metering (RNM)
- Community Distributed Generation (CDG)

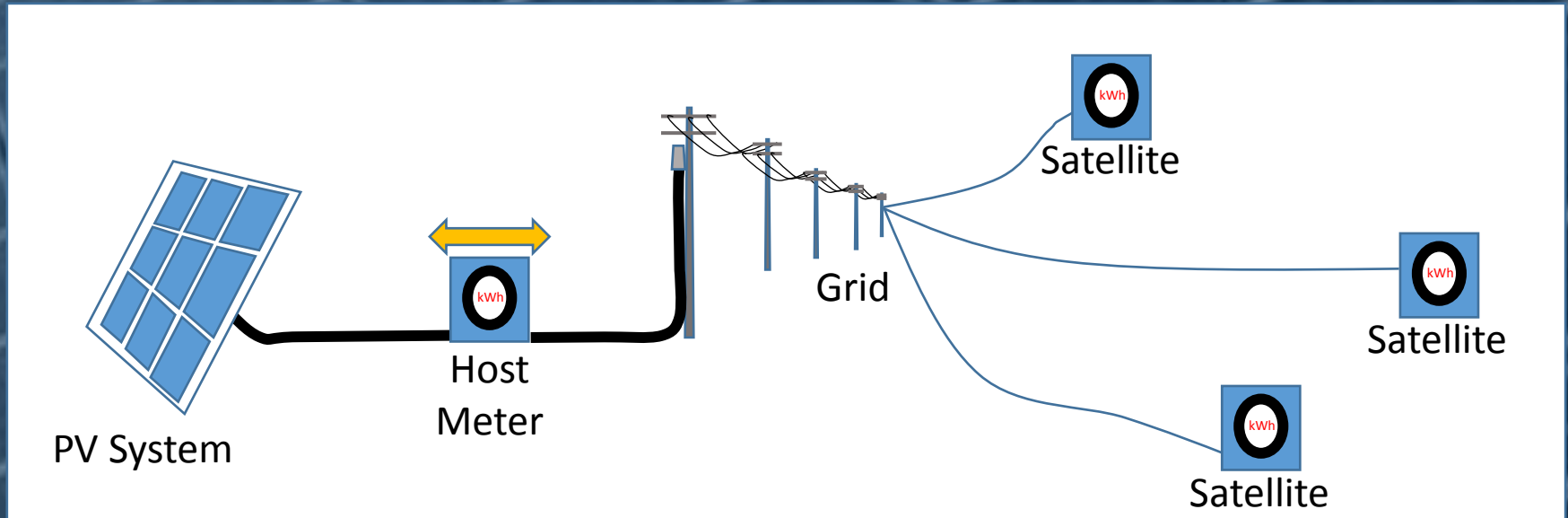
Programs and Incentives

- Net metering



Programs and Incentives

- Remote net metering (RNM)



Host and Satellite meters required to be in the same name

Programs and Incentives

- Net metering and remote net metering video

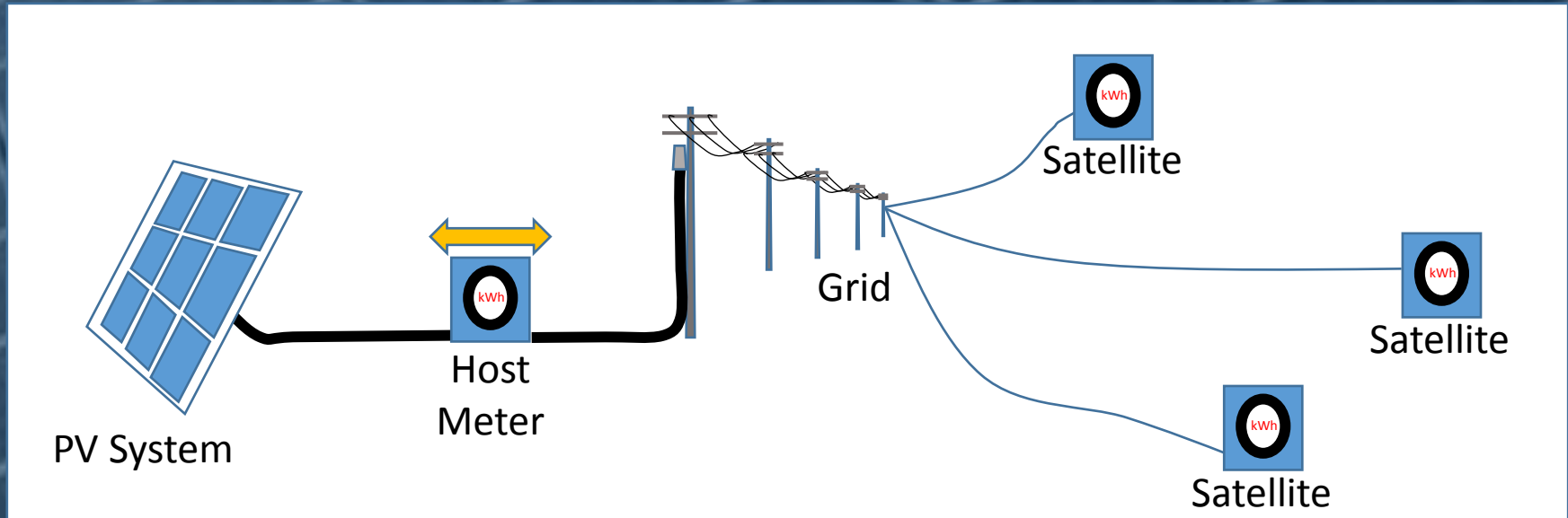
<https://www.youtube.com/watch?v=p8giMFEN3bY>



Source:
The City University of New York with
NYSERDA's PV Trainer Network

Programs and Incentives

- Community Distributed Generation (CDG)

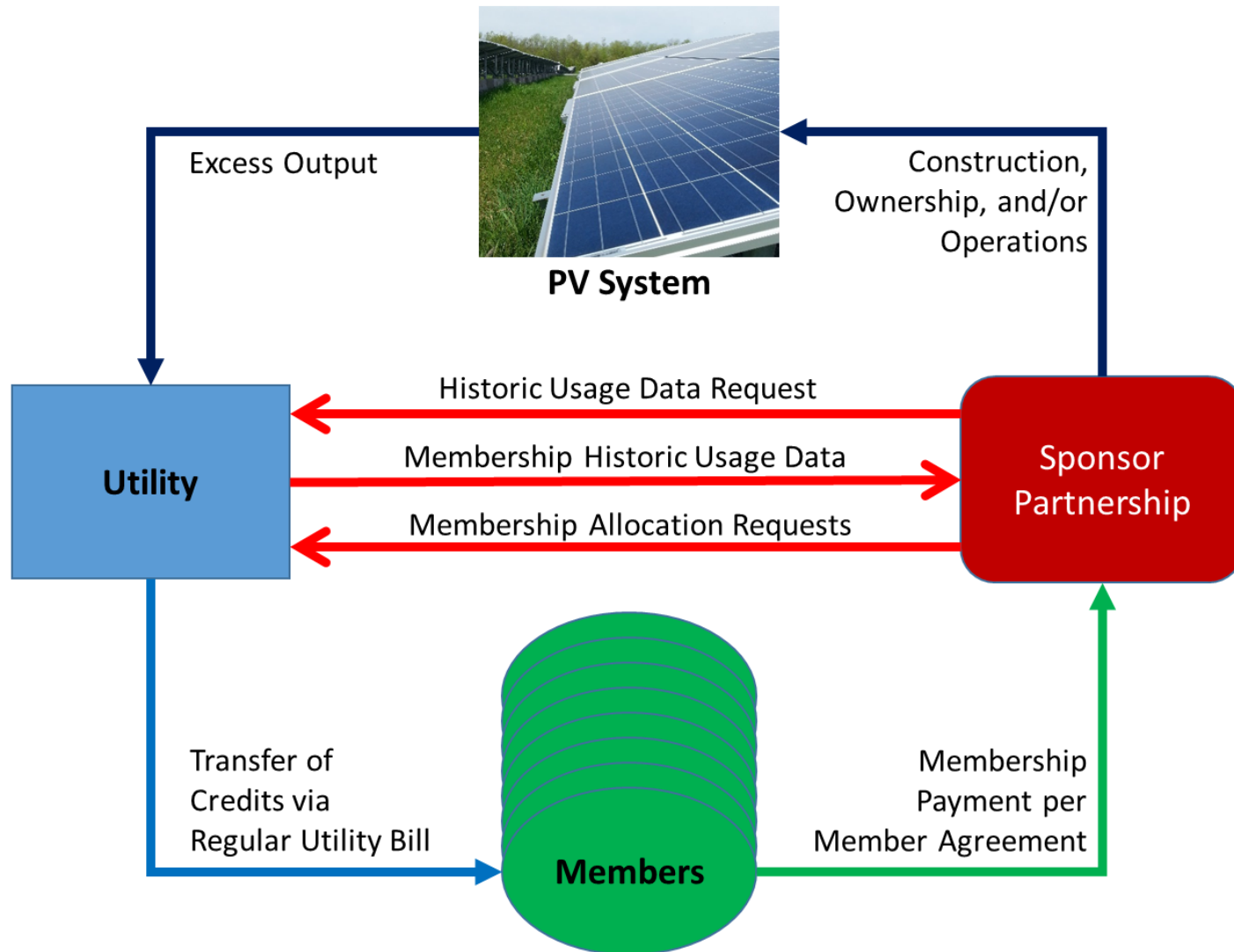


Host and Satellite meters not required
to be in the same name

More on CDG

- Minimum of 10 members (satellites accounts)
- Each satellite must be allocated a minimum of 1000kWh annually
- No more than 40% of the excess generation may serve members with an average monthly peak demand of 25kW or more

More on CDG



More on CDG

- Practical considerations
 - Investor concerns about creditworthiness of the members
 - Need for anchor members with allocations that provide a backstop strategy
 - Billing and membership management effort represents additional project O&M cost

Solarize

- Aggregate electricity customers to get better solar pricing
- NYSERDA provides grant funds, technical assistance and other resources

Community Solar NY:
2017 Resource Guide for
Solarize Campaign Success

The New York State Energy Research and Development Authority (NYSERDA) works with community leaders, local governments, schools, and organizations to rollout "Solarize" campaigns, where groups of solar customers come together to lower the costs of solar installations through group pricing discounts. Solarize campaigns team up with competitively chosen solar electric (also known as photovoltaic or PV) installers to make residential and small commercial solar energy more accessible and affordable for residents and businesses across New York State.



Supported by
**Community
Solar NY**

Other notable programs

- Community Choice Aggregation
- Clean Energy Communities

High Impact Action Items

- ▶ Benchmarking - Adopt a policy to report the energy use of buildings
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Going Solar - Overview of Process

- Stakeholder engagement and goal setting



Going Solar - Overview of Process

- Planning to
 - Determine system size
 - Identify potential sites ... or not
 - Project to serve municipality only
 - Or CDG with municipality as anchor

Going Solar - Overview of Process

- Competitive process to select a developer
 - Develop and issue RFP

Provide:	
Site Description	Aerial Photos
Historic Energy Usage Data	Evaluation Criteria
Price Proposal Template/Requirements	Model PPA

Request
Developer Experience and References
System Design Information and Production Estimates
Proof of Funding Capacity
Timeline for Project Development and Construction
Price / Escalator

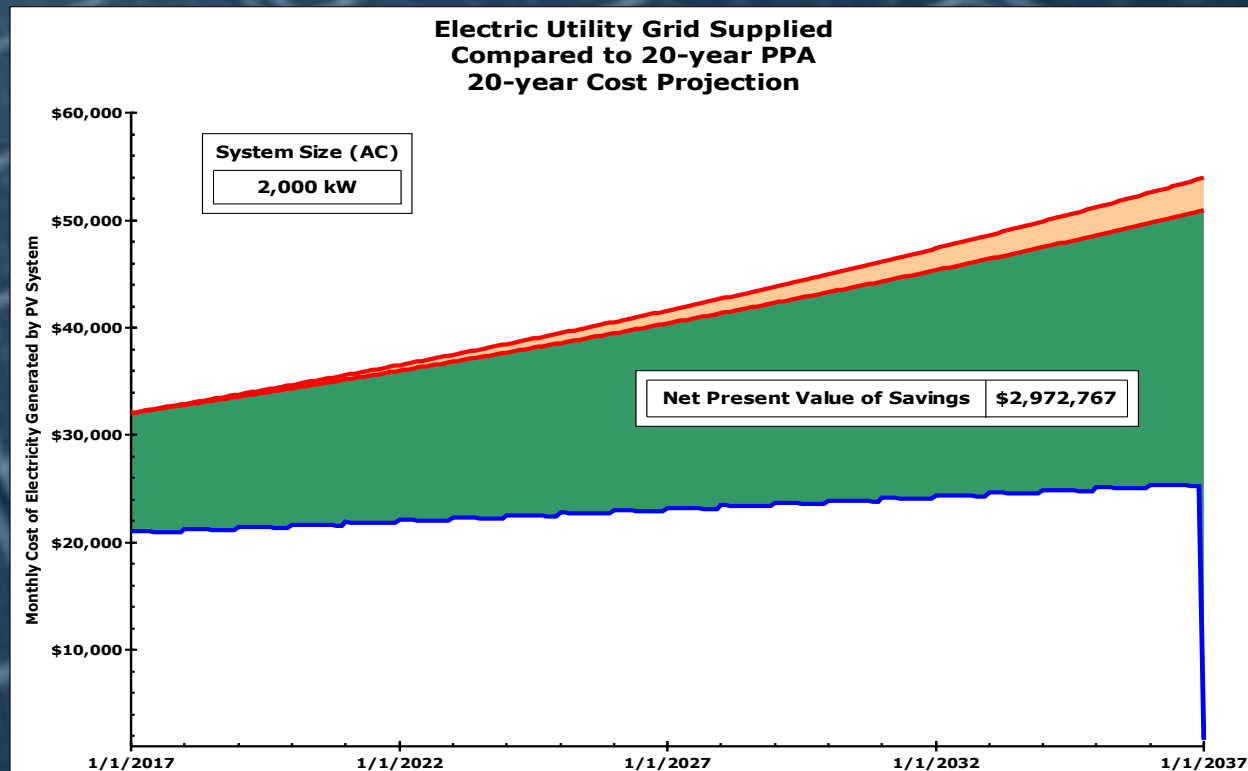
Going Solar - Overview of Process

- Competitive process to select a developer
 - Develop and publish RFP

	NY-Sun C&I Program					
	Block 6		Block 7		Block 8	
Interconnection Cost	PPA \$/kWh	Esc %	PPA \$/kWh	Esc %	PPA \$/kWh	Esc %
\$ 200,000						
\$ 300,000						
\$ 400,000						
\$ 500,000						
\$ 600,000						
\$ 700,000						
\$ 800,000						
\$ 900,000						
\$ 1,000,000						

Going Solar - Overview of Process

- Competitive process to select a developer
 - Develop and publish RFP
 - Review bids and select a developer



Going Solar - Overview of Process

- Competitive process to select a developer
 - Develop and publish RFP
 - Review bids and select a developer
 - Negotiate contract

Going Solar - Overview of Process

- Monitor developer activities
 - Preliminary/supplementary interconnection screening
 - Submit payment for CESIR and obtain acknowledgement
 - NY-Sun incentive application
 - Coordinated Electric Service Interconnection Review (CESIR)

Going Solar - Overview of Process

- Monitor developer activities
 - Submit payment for interconnection
 - Complete SEQRA process
 - Finalize system design
 - Address zoning issues if needed

Going Solar - Overview of Process

- Monitor developer activities
 - Acquire building permit
 - Construction
 - Remote net metering application
 - Interconnection and commissioning

Going Solar - Overview of Process

- Realize credits on bills
- Pay for energy generated – ongoing for term of PPA

Other Resources

- NY-Sun Program web site
nyserda.ny.gov/All-Programs/Programs/NY-Sun
- PV Trainers Network
training.ny-sun.ny.gov/
- Solarize
nyserda.ny.gov/All-Programs/Programs/NY-Sun/Communities/Solarize
- Solar Procurement Guidelines for Local Governments in New York State