Future of New York Commercial / Industrial & Community Distributed Generation Solar Markets

April 21, 2021
Technical Conference Day 1
Introduction

Presented by David Sandbank
## Technical Conference State Representatives

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<tr>
<th>Department of Public Service</th>
<th>NYSERDA</th>
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<tbody>
<tr>
<td>Marco Padula – Director, Markets and Innovation</td>
<td>David Sandbank – Vice President, DER</td>
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<td>Warren Myers – Director, Regulatory Economics</td>
<td>Carl Mas – Director, Energy and Environmental Analysis</td>
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<td>Zeryai Hagos – Deputy Director, Markets and Innovation</td>
<td>Max Joel – Program Manager, NY-Sun</td>
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<td>David Drexler – Managing Attorney</td>
<td>Luke Forster – Senior Business Analyst, DER</td>
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<td>John Garvey – Utility Supervisor</td>
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Meeting Procedures

> Participation for Members of the Public:
  • Members of the public will be muted upon entry.
  • Questions and comments may be submitted in writing through the Q&A feature at any time during the event. Questions will be answered at the end of the presentation.

> If technical problems arise, please contact Karen.Fusco@nyserda.ny.gov
1. Opening Remarks:
   - Doreen M. Harris – President and CEO, NYSERDA
   - John B. Howard – Chair, Public Service Commission

2. Focus & Scope


4. Project Economics & Use Cases

5. Benefits of Distributed Solar

6. Establishing a Value of Carbon

7. Options for Post-6 GW Commercial Industrial & CDG Project Support

8. Next Steps

9. Q&A
Opening Remarks

Doreen M. Harris – President and CEO, NYSERDA

John B. Howard – Chair, Public Service Commission
Focus & Scope

Presented by David Sandbank
This conference will focus on the distributed solar Commercial/Industrial & CDG markets beyond the 6 GW NY-Sun target.

We are well on track to achieve 6 GW of distributed PV on or before 2025 – no additional NYSERDA incentive funding is needed or requested.

**Focus & Scope**

Progress Towards 6 GW Mandate:

- ConEd Residential
- ConEd Nonresidential
- Upstate Residential
- Upstate Nonresidential
- Long Island
- Upstate Commercial/Industrial (inc. CDG)
- Total

- Completed
- NY-Sun Pipeline
- Not Yet Developed
Focus & Scope

Topics to Explore

> Benefits of distributed solar: emission reductions (climate and health), jobs, grid benefits, customer bill saving, benefits to disadvantaged communities
> Potential scale/scope of NYS’s PV future. How will hosting capacity and transmission impact future development?
> DEC guidance on value of carbon and potential effect on the E value
> Role of distributed PV in the Clean Energy Standard’s 70% renewables by 2030
> How will the disadvantaged community requirements of the Climate Act be included in any potential outcomes?
> Federal tailwinds & funding opportunities
> What state initiatives must be considered for a measured and continued market?
> Goals beyond 6GW with equitable cost allocation

Topics Outside the Scope of this Conference

> Residential Onsite PV
> Large-Scale PV (>5MW ac)
> Non-PV technologies
> Extension of Community Credit
Commercial / Industrial & CDG Solar Market Progress 2014-2020

Presented by David Sandbank
2014 Highlights

> Launch of NY-Sun Initiative: 3 GW by 2023. Residential and non-residential blocks open
> NY-Sun soft cost reduction work begins, gradually expanding to offer technical assistance and resources to consumers, developers, and municipal governments
> Prior to NY-Sun, there were several competitive bid solicitations for Commercial/Industrial PV

This and the following charts show NYSERDA incentive per Watt, NOT the federal tax credit, or tariff-based incentives (MTC or Community Credit).
2015 Highlights

- NY-Sun launches Commercial/Industrial MW Block structure. Incentives are transparently and predictably structured in a declining block format
- CDG Order makes community solar possible in NYS
2016 Highlights

> First two CDG projects completed in NYS
> DPS, Utilities, and PV parties work together to design the Value of Distributed Energy Resource (VDER) tariff
> Many projects on hold due to issues with interconnection queue management and awaiting launch of VDER
2017 Highlights

- After years of development and collaboration, VDER is adopted. It’s one of America’s first time and location-sensitive distributed generation tariffs.

- Queue Management Order addresses gridlock with the interconnection process, paves the way for future development.

- First edition of the New York State Solar Guidebook for Local Governments.

- NYSERDA releases PILOT calculator to help standardize and drive down soft costs.

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**Annual C/I MW Installed, Cost, and Incentive**

<table>
<thead>
<tr>
<th>Year</th>
<th>MW dc Completed Annually</th>
<th>Cost/Watt</th>
<th>Non-CDG MW Built</th>
<th>CDG MW Build</th>
<th>NYSERDA Incentive/Watt</th>
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<tbody>
<tr>
<td>2014</td>
<td>$0.83</td>
<td></td>
<td></td>
<td></td>
<td>$0.50</td>
</tr>
<tr>
<td>2015</td>
<td>$1.00</td>
<td></td>
<td></td>
<td></td>
<td>$0.44</td>
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<tr>
<td>2017</td>
<td>$2.28</td>
<td></td>
<td></td>
<td></td>
<td>$0.50</td>
</tr>
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#4 annual non-res PV completions
2018 Highlights

- NYSERDA redesigns the NY-Sun MW Block structure introducing incentive adders for brownfields, landfills, & affordable housing. Rooftop and parking canopy adders in ConEd
- Maximum project size increases from 2MWac to 5MWac, bringing economy-of-scale cost savings
- First two community solar projects completed in New York City

#2 annual non-res PV completions

Annual C/I MW Installed, Cost, and Incentive

*Note that 2018-2020 completions included new incentive adders for brownfield/landfill projects and those in strategic grid locations.
2019 Highlights

> NYSERDA launches retail energy storage program, spurring PV + Storage development
> VDER improvements adds predictability and financeability
> Community Credit supports a new wave of community solar development
> The Consolidated Billing Order sets net crediting in motion, driving down customer management costs for future projects
> The Climate Act sets ambitious targets for NYS, including 6GW of distributed PV by 2025

#2 annual non-res PV completions

*Note that 2018-2020 completions included new incentive adders for brownfield/landfill projects and those in strategic grid locations.
2020 Highlights

- Community Adder launches for National Grid, NYSEG, RG&E; Upfront NYSERDA incentive rather than per-kWh tariff-based incentive
- Community Choice Aggregation (CCA) opt-out provides another path to lower customer acquisition/management costs
- NY-Sun expands with a mandate of 6 GW by 2025
  - 1,810 MWdc of new capacity is added to the C/I MW Block structure
  - $135m for benefits for LMI households and disadvantaged communities
- COVID-19 rocks the industry, and construction is halted entirely for several months; NYS rebounds with the record completion numbers for 2020
- 2020 CES Order lays pathway for achieving Climate Act mandates – 70 by 30

#1 annual CDG completions
#2 cumulative CDG completions
#2 annual non-res PV completions

*Note that 2018-2020 completions included new incentive adders for brownfield/landfill projects and those in strategic grid locations.
Decline of Community Solar Incentives

> State/ratepayer support for CDG projects has dropped by **75%** from 2017 (MTC) to 2021 (the final Community Adder tranche)

> Chart shows total support for CDG project including **NY-Sun MW Block incentive and MTC/Community Credit/Community Adder**

Note: the tax credit and Environmental value are not shown in the chart.
The number of full-time PV jobs has grown steadily, fueled by increasing MW deployment.

Full-time jobs from National Solar Jobs Census annual report.

All-inclusive jobs numbers from NYSERDA New York Clean Energy Industry Report.
Characteristics of most recently-developed projects:

> Generally 4-5 MWac project size, sometimes co-located

> Bifacial modules, on single-axis tracker racking when site conditions allow

> National Grid and NYSEG territories

> Community solar
  • Most projects have the Community Credit or Community Adder incentives

> Projects are beginning to pivot towards Remote Creditiing now that Community Credit and Community Adder incentives are fully allocated
  • Flexibility with residential off-taker requirements allows for lower customer acquisition/management costs
Costs vs. Revenue of a typical CDG project

Revenue vs. Cost for Sample 5 MWac National Grid/NYSEG Project

- **CDG Cost Low**
- **CDG Cost High**
- **Remote Crediting Cost Low**
- **Remote Crediting Cost High**
- **Revenue Low**
- **Revenue High**

> High and Low revenue forecasts shown – Low is 3-year historic LBMP/Capacity with 2% growth; High is NYISO/CARIS LBMP forecast (zones A-F) and DPS BCA ICAP forecast

> Revenue includes 26% ITC, **No NY-Sun incentive**, and NPV of Value Stack minus 10% customer savings; Makes no assumption about potential future federal funding; Cost savings from net crediting are included

> Delta between Revenue and Costs is developer profit/loss
Benefits of Distributed Solar

Presented by Carl Mas
Distributed Solar Benefits

> Contributes to the Climate Act’s goals of reaching 70% renewable electric grid by 2030
  • Displaces combustion of fossil fuels - reducing greenhouse gas emissions and improving air quality
> Allows for greater access to clean energy for all New Yorkers
  • Community solar has the potential to serve thousands of low-income households
> **12,000+** New York State Solar Jobs
  • Largest percent of renewable energy jobs in State
> Adds resource and geographic diversity to New York’s renewable energy portfolio
  • Puts clean energy generation in the ground now (nearly all solar built in the state thus far is from distributed solar)
  • Smaller projects are easier to site and offer community benefits
> Locates zero-emission electric generation closer to load where larger projects would be challenged
  • Provides local capacity value
> Continuation of successful cost reduction trajectory will expand market adoption without incentive
Progress to 70% Renewable by 2030

Remaining ~31 million annual megawatt hours (MWh) to be procured.

Future deployment of distributed solar resources will continue to make significant contributions to the achievement of 70x30.

Distributed solar provides meaningful contributions to operating renewables today.
Establishing a Value of Carbon

Presented by Carl Mas
Establishing a Value of Carbon

Guidelines For Use By State Agencies

The Climate Act directed the Department of Environmental Conservation to consider two approaches for establishing a value of carbon:

- The first approach is based on the **monetary cost of damages** that would result from an incremental increase in emissions as a result of climate change, commonly referred to as the **social cost of carbon (SCC)**.

- The second approach, the **marginal abatement cost (MAC)**, establishes a value of carbon with reference to a specific emissions reduction goal:
  - In other words, what would be the cost to reduce the last ton of emissions by the amount needed to meet a particular emissions target.
Whereas the **damages approach** is intended to establish a value of carbon for all sectors, **marginal abatement costs** are typically estimated with regard to sector-specific technologies, markets, and emission reduction goals:

- The marginal abatement approach requires an analysis of the relevant economic sector of interest, and could result in multiple values of carbon that differ between sectors.
- In New York State today, the **electric power sector is best positioned to apply marginal abatement approaches**, due to available cost information and its history of effective emissions reductions policies.
Options for Post 6 GW
Commercial / Industrial & CDG Solar Support

Presented by Carl Mas
Consider Pricing of Externalities: Monetary Cost of Damages vs Marginal Abatement Cost

- **Monetary Cost of Damages** – A damaged-based approach where an administratively set externality value is equal to the Social Cost of Carbon
- **Marginal Abatement Cost** – A price that society would need to pay to achieve a specific distributed solar goal
  - **How to set the price?** Price could be discovered through a competitive market approach or set through an administrative process
    - A. **Market approach:** Regular competitive solicitations, potentially integrated into the CES Program
    - B. **Administrative approach:** based on modeling of supply curve (price vs quantity) that analyzes future project economics

Pursuant to the DEC Guidelines, explore the Marginal Abatement Cost approach in more detail
Marginal Abatement Cost

A. Market Approach: Externality value (and therefore the incentive) priced through competitive market discovery

> Program design considerations
  - NYSERDA or utility procurements?
  - How do we maintain Value Stack signals (time and location)?
  - What contract type – fixed or index?
  - Regularity of solicitations?
  - Sub-segmentation of technologies and regions?
  - Tenor of contracts?

> Advantages
  - Keeps costs down through competitive pressure, protecting ratepayers
  - Adaptive to market changes

> Challenges
  - Developer uncertainty
  - Higher complexity for administer and developers
Marginal Abatement Cost

B. Administrative Approach:
Administratively set externality value (and therefore the incentive) based on estimates of project economics

- Continuation of administratively set value, now based on Marginal Abatement Cost, to achieve distributed solar goal
  - We would need to arrive at a new deployment goal and analyze the corresponding project economics
  - In addition, need to determine if value should vary by project type or location

> Advantages
  - Less complexity and more certainty for developers
  - Rolling program allows for projects to advance without the timelines of a solicitation

> Challenges
  - Uncertainty in estimating project economics, which vary over time – ie. a set value does not adapt to exogenous changes
Next Steps

Presented by David Sandbank
Next Steps

> This presentation will be posted to **DPS Case 15-E-0751** (VDER)
> Comments on today’s presentation can be informally filed to the Case up until **May 7th**
> Technical Conference #2 will be virtually held on **May 7th**
> Staff will release a Technical Conferences Proceedings document after the second conference (targeting end of May)
> Staff will release a Formal White Paper for SAPA comments (Summer)
Please use the Q&A function in WebEx to ask questions.