NYC’s Policy Target and Roadmap for Resilient Solar+Storage
Housekeeping

All participants are in “Listen-Only” mode. Select “Use Mic & Speakers” to avoid toll charges and use your computer’s VOIP capabilities. Or select “Use Telephone” and enter your PIN onto your phone key pad.

Submit your questions at any time by typing in the Question Box and hitting Send.

This webinar is being recorded.

You will find a recording of this webinar, as well as previous Resilient Power Project webinars, online at:

www.resilient-power.org
Who We Are

www.cleanegroup.org
www.resilient-power.org
Resilient Power Project

- Increase public/private investment in clean, resilient power systems
- Engage city officials to develop resilient power policies/programs
- Protect low-income and vulnerable communities
- Focus on affordable housing and critical public facilities
- Advocate for state and federal supportive policies and programs
- Technical assistance for pre-development costs to help agencies/project developers get deals done
- See www.resilient-power.org for reports, newsletters, webinar recordings
Today’s Speakers

- **Laurie Reilly**, Director of Communications, Sustainable CUNY
- **Kathryn Wright**, Senior Consultant, Meister Consultants Group
- **Ben Mandel**, Renewable Energy Policy Advisor, NYC Mayor’s Office of Sustainability

Moderator: Seth Mullendore, Project Director, Clean Energy Group
Overview of Resilient Solar Roadmap

April 2017
Sustainable CUNY - An Objective Platform

Solar Infrastructure
- Permitting
- Zoning
- Grid Analysis
- Policy Support
- Installer Roundtable

Mapping the Way
- One stop Portal
- Solar Maps
- Data Analytics
- Roadmaps

Accessing Solar
- Group Purchasing
- Community Shared Solar
- Education
- NY Solar Summit

Resiliency
- Smart DG Hub
- Solar-plus-storage
- Critical Facility Support

Challenge

Build and stabilize an emerging energy sector in changing environments
Hurricane Sandy
October 29, 2012
## Smart DG Hub- Resilient Solar Project

### Resources for the Current Process for Installing Solar+Storage

<table>
<thead>
<tr>
<th>Tool</th>
<th>Economic Factor</th>
<th>Community Engagement</th>
<th>Informational Guide</th>
<th>NYC Solar+Storage Glossary</th>
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<tr>
<td>![Tool Icon]</td>
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<tr>
<td><strong>Resilient Solar PV Systems Hardware Fact Sheet</strong></td>
<td><strong>Economic and Resiliency Impact of PV and Storage on New York Critical Infrastructure</strong></td>
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<td><strong>Solar+Storage and Microgrid Communications Fact Sheet</strong></td>
<td><strong>Solar and Storage Cost Survey</strong></td>
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<td><strong>Solar+Storage Retrofit Guidelines</strong></td>
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**NY SOLAR MAP**

- Going Solar
- Installing Solar
- Financing Solar
- Solar+Storage
- Resources
- NYC Solar
- About
- Help
Sample of the Process Guide for Permitting and Interconnection - VRLA
A Roadmap to Resilient Solar In New York

- Develop a sustainable market through better policy
- Compensate resilient PV for the services it provides to the grid
- Create incentives to value the improved resiliency of sites with resilient PV
- Provide education and outreach about resilient PV systems and their benefits to installers and consumers
Introduction

What is Resilient Solar?

Resilient solar allows buildings and infrastructure to continue to operate when the grid is down. This roadmap focuses on the deployment of solar+storage on critical infrastructure like the fire house depicted below.

- **Back up Power**: Provides critical infrastructure electricity during grid outages
- **Saves Money**: Host sites save on their electric bill by reducing consumption from the grid
- **Grid Support**: Delivers a variety of support services to the grid
- **Fossil Fuel Reduction**: Reduces emissions harmful to our health and environment
Hardware
- Core Components
- AC vs. DC-coupling
- Case Study: Emerging Storage Use Cases
- Case Study: Modeling resilient PV
- Barriers & Solutions
- Practitioner experience

Policy
- Regional activities and opportunities
- Case Study: MA Peak demand reduction
- Case Study: Con Ed/NYSERDA Support for NYC’s Storage Market
- Barriers & Solutions
  - Permitting processes

Software
- Use cases and applications
- Case Study: Interoperability Retrofits
- Barriers & Solutions
- Customer data availability

Economics
- Improving the economics
- Cost survey
- Case Study: Ca/Germany incentives
- Case Study: NYSolar map resiliency calculator
  - Barriers & Solutions
  - High project costs
Barriers & Solutions: Hardware

Barrier – Practitioner Experience

Solutions – Publicize Installation Best Practices

“Online resources concerning the relevant federal, state, and local safety and fire codes and standards should be made available to installers and residents. For example, the County of Santa Clara, CA...”

Implementation Partners
- Manufacturers
- NYC DOB
- Industry Associations
- Municipal Officials
- PV Trainers Network
- Smart DG Hub
Barriers & Solutions: Software

Barrier – Interoperability Challenges

Solution – Finalize and Incorporate Industry Standards

Currently, no standardized open protocols exist. Different industry groups are currently working on creating communication standardizations for system components and grid wide connectivity. Disseminating ongoing protocol developments by MESA, SIWG, the SunSpec Alliance, and NREL will aid energy storage’s ability to communicate with the grid and between system components...

Implementation Partners
- SunSpec Alliance
- MESA
- NREL
- Smart Inverter Working Group (SIWG)
- Industry Associations
- Smart DG Hub
Barriers & Solutions: Economics

Economics

Barrier – Valuing Resiliency

Solution – Quantification of Value

There have been ongoing efforts to quantify the value of resilient power through the Smart DG Hub and the New York Prize program for microgrids. The DG Hub will be working to develop a methodology and/or tool that quantifies the loss avoidance mechanism offered by resilient power projects...

Implementation Partners
- NY Prize
- Smart DG Hub
- City of San Francisco SMP Team
- FEMA
- NYSERDA
- DER Industry
- Insurance Industry
Barriers & Solutions: Policy

Barrier – Permitting Processes

Solution – Streamline Permitting Processes

“Processes for solar+storage should be investigated that expedite review periods, encourage consistency in permitting requirements across the state, and account for projected increases in permitting throughput…”

Implementation Partners

- NYC DOB
- FDNY
- Smart DG Hub
- NYSERDA

- NY-Best
- NYS AHJs
- NYC Solar Partnership
Roadmap Implementation Tracker

In the aftermath of Hurricane Sandy it was determined that while the 672 solar arrays on NYC rooftops at that time sustained little or no damage during the storm, they were unable to supply critically needed power during the subsequent outage. For safety reasons, solar installations without battery backup are wired to automatically shut down during grid outages. Virtually none of NYC’s systems had battery backup power.

The City University of New York formed the Smart Distributed Generation Hub (Smart DG Hub) to develop a strategic pathway to a more resilient distributed energy system, and won Federal and State support for the Smart DG Hub-Resilient Solar Project in 2014. The three-year project will create a roadmap for the integration and tracking of resilient solar systems, conduct analysis for deploying resilient solar electric systems on designated critical infrastructure facilities, and integrate values for resiliency into the solar calculator found on the New York Solar Map.

The DG Hub leveraged a diverse group of stakeholder perspectives, ranging from electric utilities to local non-profits, to develop the barriers and solutions presented in the categories of software, hardware, economics and finance. This website will provide updates on progress toward these activities. The full Roadmap and executive summary are available.

Before you begin:

Why resilient PV?

Introduction and Context

Software  Hardware  Economics  Policy
Smart DG Hub - Resilient Solar Project

Find Your Solar Potential
Enter your address

Which best describes you?
- Residential
- Commercial
- Installer
- Municipal / Non-profit

Available map layers
- NYC Installed Energy Storage Systems...

nysolarmap.com
NYC’s 80x50 Vision for Energy Storage

Check to see if the theme is unique. Here’s an easy way to do this. Swap out the name of your organization with any other organization out there. Does the theme still work? If so, I’m afraid your theme is still too generic.

http://nonprofitmarcommunity.com/nonprofit-event-themes/

Benjamin Mandel
Renewable Energy Policy Advisor
NYC Mayor’s Office of Sustainability

Clean Energy Group
Resilient Power Project Webinar
April 4, 2017
New York City will continue to be the world’s most dynamic urban economy where families, businesses, and neighborhoods thrive. This will require new investments in housing, transportation, and jobs to support a growing population.

New York City will have an inclusive, equitable economy that offers well-paying jobs and opportunity for all to live with dignity and security. Inclusive growth will require actions to raise wages and lift New Yorkers out of poverty, achieve better health outcomes, and ensure economic opportunity for all.

New York City will be the most sustainable big city in the world and a global leader in the fight against climate change. We seek to drastically reduce our greenhouse gas emissions, send far less waste to landfills, and achieve the best air quality of any big city in the country.

New York City’s neighborhoods, economy, and public services will be ready to withstand and emerge stronger from the impacts of climate change and other 21st century threats. This means making investments in our communities and infrastructure to build resiliency in the face of future shocks and stresses.
A new analytical roadmap to achieve 80x50

- First-of-its-kind integrated modeling of the city’s GHG emissions across four sectors: energy, buildings, transportation, and waste
- Analysis of the trends that will drive future GHG emissions
- Understanding that 80x50 will be less of a technical challenge, more of a societal, financial, and institutional challenge
- Opportunity to align 80x50 investments to achieve expanded job access and economic inclusion
NYC’s energy supply will depend increasingly on renewable energy.
NYC’s energy supply will depend increasingly on renewable energy
Other sectors will rely on a clean electricity grid to achieve $80 \times 50$
### Energy storage can help set NYC on low-carbon grid trajectory

<table>
<thead>
<tr>
<th>Energy Supply</th>
<th>Buildings</th>
<th>Transportation</th>
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<td>Energy storage can:</td>
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<tr>
<td>Firm in-city renewable energy resources</td>
<td>Enhance demand management capabilities</td>
<td>Mitigate grid impacts associated with electric vehicle charging</td>
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<tr>
<td>Enhance grid flexibility/stability with increasingly intermittent bulk supply</td>
<td>Provide resiliency for critical loads</td>
<td>Moderate demand charges for fast charger site hosts</td>
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<tr>
<td>Defer/avoid traditional utility upgrades to meet growing load</td>
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**NYC Mayor's Office of Sustainability**
100 MWh by 2020: The nation’s first municipal energy storage target

- Motivated by cross-cutting use cases
- Informed by ESS project pipeline with input from:
  - Con Edison (BQDM, Virtual Power Plant)
  - NYC Dept of Citywide Administrative Services (IDEA Program)
  - NYC Economic Development Corporation (RISE:NYC)
  - CUNY (NYSolar Smart DG Hub)
  - NYSERDA
- Will be facilitated by new FDNY Sustainability Unit
  - Additional engineers and administrative staff
- FDNY and NYC DOB working in partnership with CUNY, DNV-GL, NY-BEST, Cadmus Group on NYSERDA-funded streamlining effort
Next steps

- Staff up!
- Gain experience with real-world applications of various technologies in parallel with testing
- Coordinate with utilities and State entities to create a supportive environment for energy storage

An enclosed lithium-ion battery energy storage system being installed as part of a microgrid at the Marcus Garvey Village in Brownsville, Brooklyn in March 2017 (photo credit: Demand Energy)
Thank you!

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Thank you for attending our webinar

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www.facebook.com/clean.energy.group
@cleanenergygrp on Twitter
@Resilient_Power on Twitter
Upcoming Webinar

Tools for Building More Resilient Communities with Solar+Storage
Thursday, April 6, 1-2:30pm ET

www.cleanegroup.org/webinars