NY Solar Summit

Interconnection and NYC Grid Ready Solar

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Con Edison

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Distributed Generation Group
## Con Edison

<table>
<thead>
<tr>
<th></th>
<th>Customers</th>
<th>Infrastructure</th>
<th>Service Territory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric</strong></td>
<td>3.3 million (2.4 Network)</td>
<td>90,000 miles of UG cable in network grid</td>
<td>All 5 boroughs and Westchester County</td>
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<tr>
<td><strong>Gas</strong></td>
<td>1.1 million</td>
<td>6,600 miles of gas mains and services</td>
<td>3 out of the 5 boroughs and Westchester County</td>
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<tr>
<td><strong>Steam</strong></td>
<td>1,760</td>
<td>World’s largest district steam system</td>
<td>Manhattan below 96th Street</td>
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### Interruptions per 1,000 Customers per Year

- National (USA): 1,250
- New York State (w/o Con Edison): 880
- Con Edison (Overhead): 420
- Con Edison (Network): 17
- Con Edison (Overall): 130
Con Edison’s Role in PV Interconnections

- Review to maintain grid safety and reliability for all customers
- Installation of net meter and subsequent billing
- Integration of DERs into area planning and forecasts
Solar in Con Edison Service Territory (NYC only)

Drivers
- PV System Cost
- NY-Sun funding
- Third-party financing
- Pre-ITC rush
- ITC Extension
- Balance of System Cost Reductions

NYC Solar Customers YTD = 6,100

2016 YTD - NYC Only
Total Solar Capacity = 75MW
Con Edison Electric Distribution System

Generating Station
(electricity generated at 13.8 to 22.0 kV)

Transformers
(voltage stepped up to transmission voltage)

Transmission Substation

Area Substation
(voltage stepped down to distribution voltage)

Distribution

Transformers
(voltage stepped down to 480, 208, or 120 V)

Feeders

Network Customers
(residential, commercial, industrial, hospitals, schools, and street and traffic lights)

Connection To Others

Gen

FERC  NYISO  Con Edison

Radial Customers
Implications for PV Installations: *A Tale of 3 Warehouses*

- **Radial**
- **Network**
- **Spot/Isolated**
Typical Con Edison Radial Network

Area
Substation

Substation

Breakers

Overhead Transformer

Closed Overhead
Switch

Radial Feeder
(13/4 kV)

Open Overhead
Switch

‘A’ Unit
Substation

‘B’ Unit
Substation

Primary Feeder
(13/27/33 kV)

Overhead Transformer

Substation

Breakers

PV Customer

Standard Customer

120/208 Volt or
120/240 Volt Service

Primary Feeder
(13/27/33 kV)
Typical Network Grid

Area Substation

Substation Breakers

Network Transformer

Network Protector

120/208 Volt Network Grid Primary Feeder (13/27/33 kV)

PV Customer

Large Customer

Spot or Isolated Network
Typical Isolated/Spot Network

• Serve Larger Load Buildings with a Dedicated Service

• Cannot Accept Export without Major Upgrades
  – PV Pilot Program
  – Second Service (EDF)

• Highest Interconnection Costs to Accept Export

• Process often includes 60-day CESIR Review
Con Edison and Grid Ready

Goals

• Provide a Better Experience to Customers who Choose Solar
• Manage Installer Expectations
• Transparency into the Con Edison Technical Reviews
• Insight into the Complexity of the Con Edison Electric System

2016 PV YTD
Residential – 89%
Commercial – 10%
Public Bldg. – 1%
111MW Total
Grid Ready Evaluation Concept
200 kW to 2 MW

• Step 1
  – Identify Service Type

• Step 2
  – Evaluate existing Service Capacity for PV Export

• Step 3
  – Identify Local Area Network’s Minimum Load Condition
Summary

This building is on a spot or isolated network. In order to install the PV system size analyzed in Grid Ready, grid upgrades may be required to accommodate potential solar export.

Please review the NYC Grid Ready Fact Sheet for more information on spot networks and average costs incurred by the customer/developer to install a PV system.

Solar Potential Analyzed
275 kW
Additional Features to NYC Solar Map

• Customers
  – Understand relative ease/challenge to install a potential PV project.

• Installers
  – Upfront indication of potential interconnection issues.

• All users
  – Better understanding of Con Edison’s complex electric system.
Ongoing Efforts for our Customers

• Innovative solutions for PV export at network transformers.
• Annual NYC Installer training at our Learning Center.
• 2015 Award-winning net metering video for customers.
• 2015 “Investor-Owned Utility of the Year”
• Fast Track Solar
  – Same-day approvals for most residential PV.
• Solar Progress Partnership
  – Joint filing between New York State utilities and three major solar companies proposing net metering successor tariffs.
• Clean Virtual Power Plant REV Demo Project
Thank you!

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