NY Solar Summit

Grid Ready Solar

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Con Edison

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Distributed Generation Group
Solar in Con Edison Service Territory (NYC only)

Drivers

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

![Graph showing Total PV Capacity 2014 - NYC Only](image)

![Graph showing Projected Installed Capacity: NYC Solar (MW)](image)
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

Q1 2015 PV
4892 Installs
68.7MW
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

Transmission

Area Substation (voltage stepped down to distribution voltage)

Distribution

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

Connection To Others

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

Feeders

Radial Customers

Gen FERC NYISO Con Edison
Typical Network Grid

- Area Substation
- Substation Breakers
- Network Transformer
- Network Protector
- 120/208 Volt Network Grid
- Primary Feeder (13/27/33 kV)
- PV Customer
- Standard Customer
- Large Customer
- Spot or Isolated Network
Purpose of network protectors: 
*fault isolation*

Area
Substation

120/208 Volt Grid
13 kV Feeder

Substation Breakers
Implications for PV Installations: A Tale of 3 Warehouses

Radial | Network | Spot/Isolated

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

• Typically the Easiest for Export
  – No Network Protectors
  – 2-way Power Flow

• Potential Technical Issues
  – PV Penetration on the Feeder
  – Size of PV vs Service/Transformer
  – Switch or Re-Closer Issues

• Potential Operational Issues
  – Higher Rate of Storm Outages
Typical Con Edison Radial Network

- Primary Feeder (13/27/33 kV)
- Overhead Transformer
- Closed Overhead Switch
- Open Overhead Switch
- Radial Feeder (13/4 kV)
- ‘A’ Unit Substation
- ‘B’ Unit Substation
- Area Substation
- Substation Breakers
- PV Customer
- Standard Customer

120/208 Volt or 120/240 Volt Service

A
B
C
D
E
Network Grid Service

• Service from Manhole or Service Box Connection

• Export Capability Dependent upon Multiple Factors
  – PV Size vs Service Capacity
  – Network Loading (weekend)
  – Nearby Transformer Loading

• Upgrades to Service may require Street Work
  – Customer Cost & Increased Time
Network protector considerations:

*Solar export with Low Network Load*
Isolated/Spot Network

- Typically Served Larger Load Buildings
- Cannot Accept Export without Major Upgrades
  - PV Pilot Program
  - Second Service (EDF)
- Highest Interconnection Costs to Accept Export
- Process would include 60-day CESIR Review
Network protector considerations: spot or isolated networks
Grid Ready Evaluation Concept
200 kW to 2 MW

• Step 1
  – Identify Service Type

• Step 2
  – Load vs PV Potential

• Step 3
  – Evaluate existing Service Capacity for PV Export

• Step 4
  – Identify Local Area Network’s Minimum Load Condition
Grid Ready Opportunity Profiles: High, Medium and Low

• High Opportunity:
  – No grid, service, or interconnection upgrades.

• Medium Opportunity:
  – Possibly an interconnection issue.
  – Need deeper study to determine impacts.

• Low Opportunity:
  – Definitely will require upgrades and deeper study of impacts.
Desired Results

• Customers
  – Understand why project might not be technically feasible.

• Installers
  – Upfront indication of potential interconnection costs.
  – Create business deals with interconnection costs factored in.

• All users
  – Better understanding of Con Edison’s complex electric system.
Thank you!

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