



**NYSERDA**

# **NYSERDA Programs & Interconnection R&D Projects**

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Locust Grove, Poughkeepsie NY  
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# Clean Energy Fund (CEF)

The Clean Energy Fund is central to Reforming the Energy Vision (REV)

- Accelerate the use of clean energy and energy innovation
- Drive economic development
- Reduce ratepayer collections

Individual investment chapters including:

- Grid Modernization
- Energy Storage
- Smart Buildings
- Renewable Energy Optimization
- Clean Transportation

# Grid Modernization Program Guiding Principles

*Accelerating adoption of an advanced, digitally enhanced and dynamically managed electric grid*



Clean

Integrate clean sources, deliver renewable energy, reduce losses



Reliable

Avoid outages, restore faster, reduce impacts of severe weather



Affordable

Apply innovation to get better results at lower costs

# Grid Modernization Program

Commitment Budget	2017	2018	2019	2020	2021	2022	Total
DER Integration	\$3 M	--	--	--	--	--	<b>\$6 M</b>
High Performing Grid	\$18 M	\$16 M	\$16 M	\$16 M	\$16 M	\$16 M	<b>\$110 M</b>

- Note: DER Integration rolls into High Performing Grid in 2018
- Grid Modernization Investment Chapter: <https://www.nyserda.ny.gov/About/Clean-Energy-Fund>

# Grid Modernization Program – Recent Solicitations

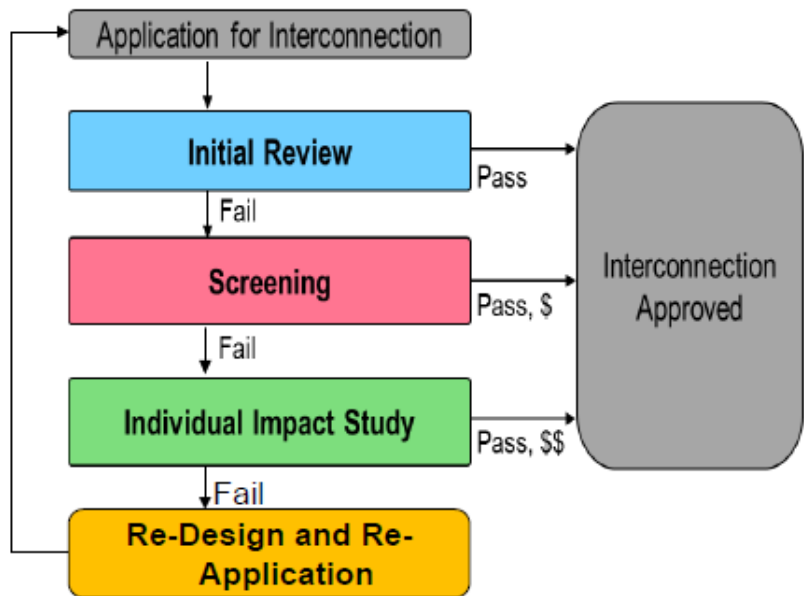
## PON 3404 DER Integration

- 11 proposals selected for award
- Approximately \$2.5M in total
- Awards focused on overcoming specific interconnection issues
  - Neutral voltage shift (3V0)
  - Islanding
  - Active variable curtailment
  - Automation of interconnection studies

## PON 3770 High Performing Grid

- High Performing Grid
- Concept papers accepted on a rolling basis
- Broad grid focus areas like:
  - Advanced Monitoring, Measurement & Controls
  - T&D Automation / Management
  - Distributed Energy Resources Integration
  - Advanced Power Electronics, Smart Inverters
  - Advanced Materials, Cabling, Conductors
  - Advanced System Modeling, Applications, Algorithms
  - Advanced Planning, Operations, Design, Forecasting Tools
  - Advanced Sensors, Devices, Systems
  - Innovative Cybersecurity / Data Analytics
  - Adaptive Protection Systems

# DER Interconnection Process



## Initial or Preliminary Screening for fast track

- 6-10 tests, include both individual and aggregate
- Certification, feeder type, capacity, short circuit, back feed, islanding (15% peak load), effective grounding (GFO), secondary voltage, stiffness.
- Need some feeder and aggregate DER data, pass/fail criteria to measure/test
- Must pass all tests, may consider mitigations?

## Supplemental Screening practices

- Only 3 considerations 1) aggregate <100% min load, 2) power quality, 3) safe/reliable
- Limited criteria, needs load-flow and protection review/analysis, engineering judgement
- Utility judgement if all 3 tests are required

# Interconnection Technology Working Group (ITWG)

## Interconnection Technical Working Group

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### Statewide Interconnection Technical Documents

Interim JU Anti-Islanding Criteria (February 9, 2017)  
 Interim JU Monitoring and Control Criteria (September 1, 2017)  
 JU Standardized CESIR Template (August 2018)  
 JU Standardized Preliminary Screening Template (January 2019)  
 JU Technical Guidance Matrix (January 2019)

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### ITWG Meeting Information and Materials

2019 Calendar of Meetings

Source: <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/DEF2BF0A236B946F85257F71006AC98E?OpenDocument>

## Sample Topics of Discussion:

- ESS – Appendix K submission & related information discussion
- ESS Monitoring & Control / UL 1741 California Lessons Learned
- Flicker Screening / Calculation discussion
- Metering Configurations for ESS Integration
- Effective Grounding

# Sample Projects Addressing DER Challenges

Project	Category
Islanding Protection	Integration & Interconnection
Solution Methods for Increasing Hosting Capacity	Integration & Interconnection
Overvoltage Protection (3Vo)	Integration & Interconnection
Computer Aided Unintentional Islanding Screening	Modelling & Software
Dynamic Voltage Restorer for Risk of Islanding Mitigation, Single Phase Open & Voltage Variability Reduction	Hardware & Devices
Automated Engineering of Interconnection Requests & Mitigation Options	Modelling & Software
Alternative Mitigation & Design Options for 3 Vo Requirements	Integration & Interconnection
Low Cost Islanding Detection for DER Smart Inverters	Hardware & Devices
Cloud Based Active Network Management for DER Integration	Modelling & Software



# Progress on Key Outcomes in NY state

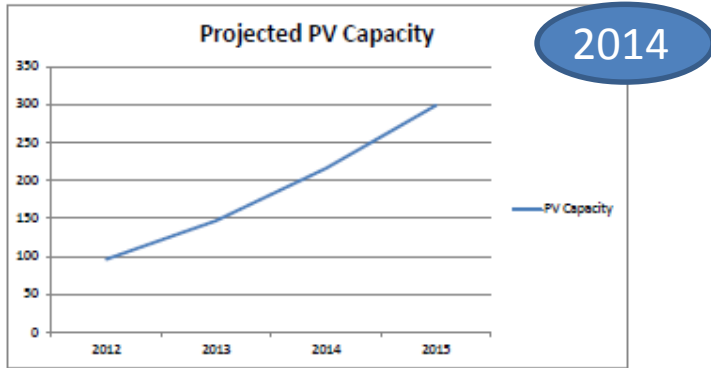


Figure 4-1  
Projected Trends In Installed PV Capacity for One Northeastern Investor-Owned Utility

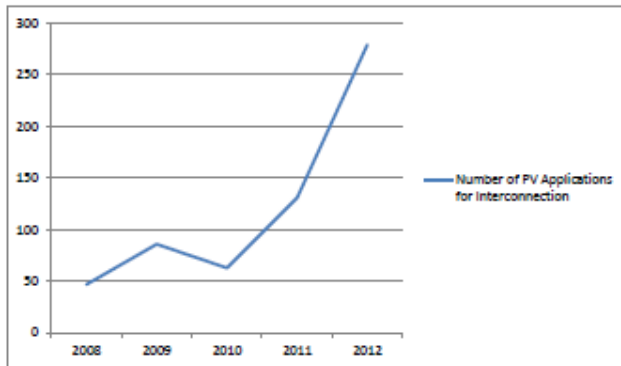
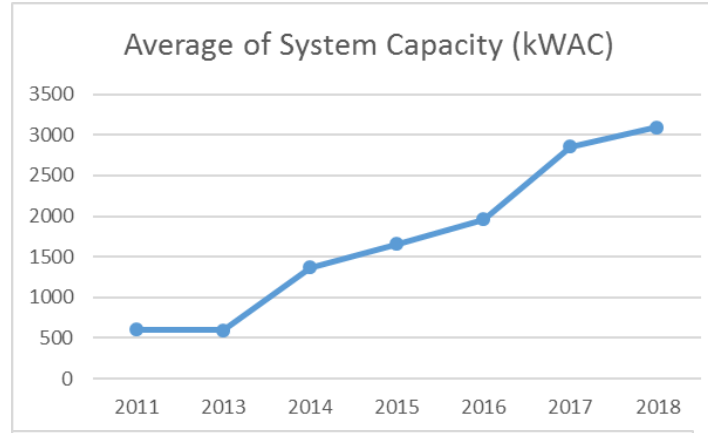
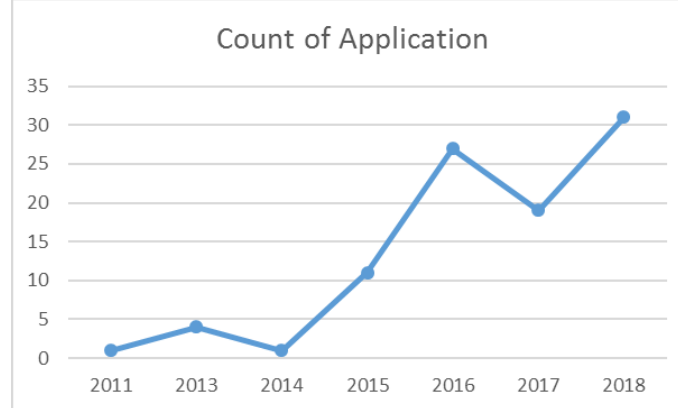


Figure 4-2  
Trends In the Numbers of Applications for PV Interconnection at One Northeastern Utility

Source: Coddington and Smith 2014



**2018**  
Data from  
applications  
>500kW



# Questions?



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