

RI Distributed Generation

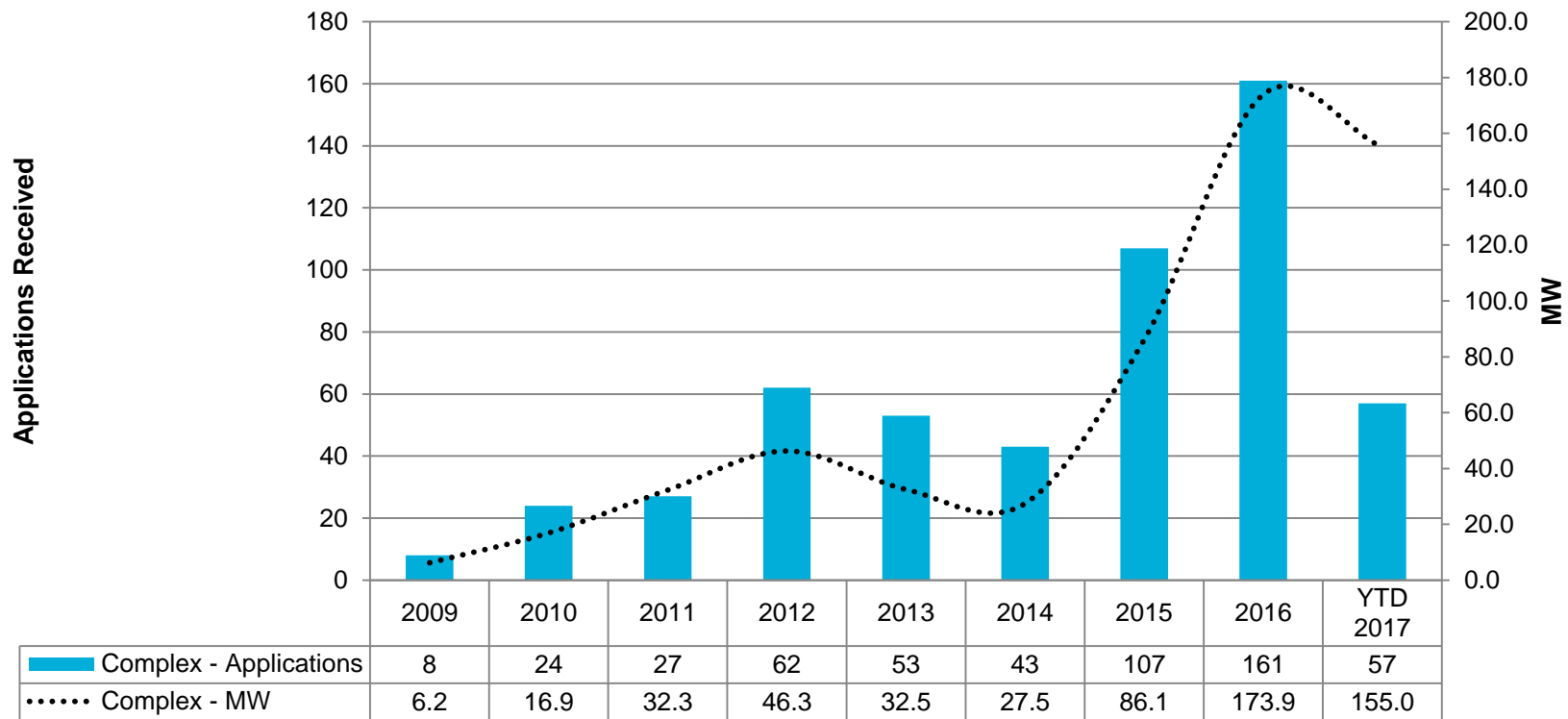
May 25, 2017

TEC RI –TACO



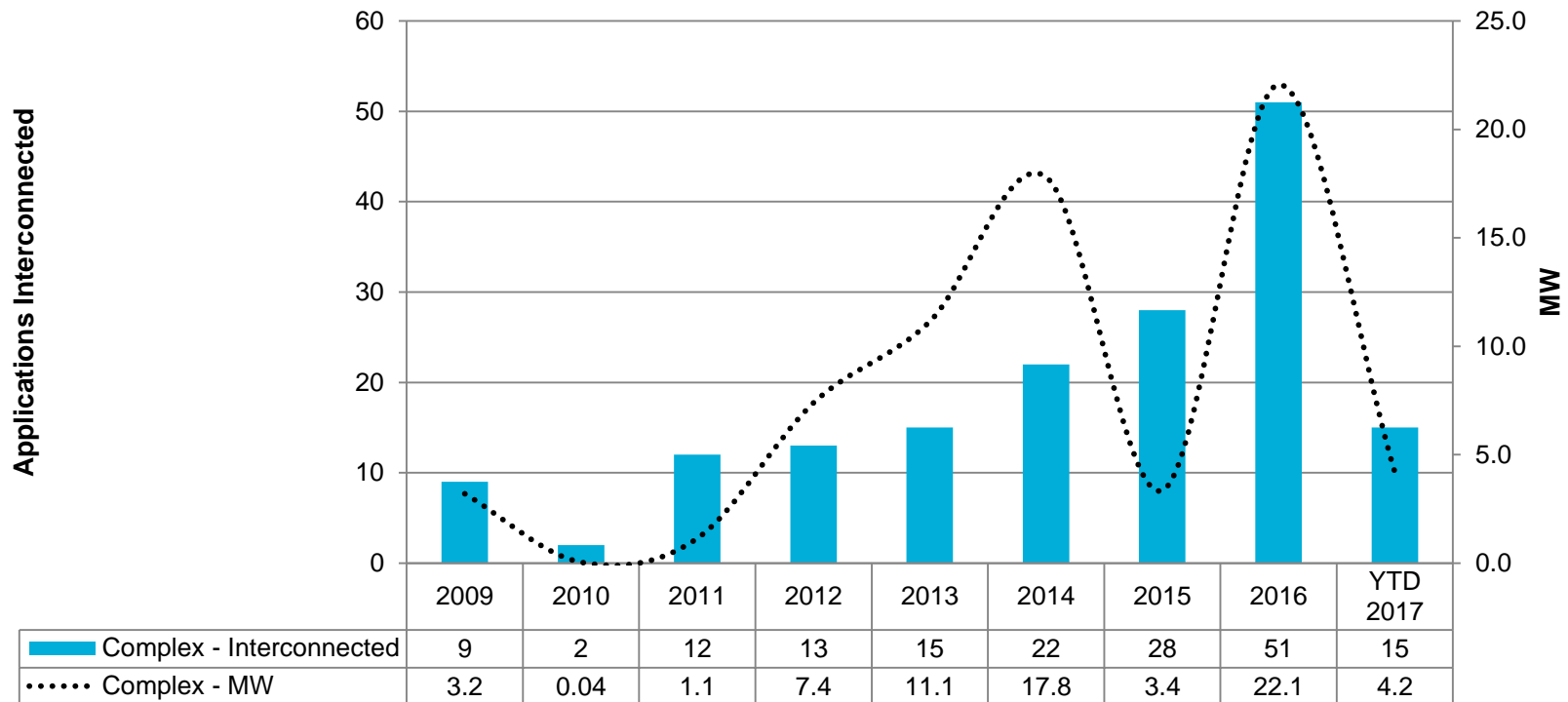
DG Activity Trends - NE

Complex Applications Received



DG Activity Trends - RI

Complex Applications Interconnected



Distributed Generation and the Electric Grid

Two Types of grid-connected DG:

- Behind Meter:
 - DG system partially or fully supplies an on-site load.
 - Unused electricity exported back to the distribution system
- Direct Connect / Stand-alone:
 - DG system does not supply an on-site load
 - Is connected directly to the distribution system



RI PUC Interconnection Tariffs

- The most recent RI PUC Interconnection tariff is titled “RIPUC #2163, Standards for Connecting Distributed Generation”.
 - Includes interconnection standards and renewable energy interconnection process.
 - Current version of “Standards for Connecting Distributed Generation” can be found at:

http://www9.nationalgridus.com/non_html/RI_DG_Interconnection_Tariff.pdf

- The RI PUC recently adopted a revised net metering tariff titled “RIPUC #2169, Net Metering Provision”.
 - Includes Eligible Net Metering Rate Classes and Technologies
 - Current version of the “Net Metering Provision” can be found at:

http://www9.nationalgridus.com/non_html/Net%20Metering%20Tarrif%202169.pdf

Importance of the Interconnection Process

- Safety of utility workers and general public
- No adverse impact to power quality, in terms of:
 - Islanding
 - Transient Voltage Conditions
 - Noise and Harmonics
 - Frequency
 - Voltage Level
 - Machine Reactive Capability
- Per tariff: customers cannot interconnect without an interconnection agreement and approval. You proceed at your own risk if you don't have utility approval
- Billing implications

Interconnection Process Steps

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- Pre-Application
- Simplified and Expedited Application
- Standard Application
- Impact Study and Detailed Study
- Conditional Approval
- Construction
- Witness Test
- Authorization to Interconnect

http://ngridustest/narragansett/home/energyeff/4_interconnection-process.asp

Pre-Application Report

Customer provides:

- Contact and alternative contact Information
- Facility Location (street address with cross streets, including town, and a Google Map still picture and GPS coordinates):
- Generation type, size (AC kW), single or three phase, service configuration:
- Stand-alone (no on-site load, not including parasitic load)?
- If there is existing service at the Proposed Facility site, provide: Interconnecting Customer Account Number
- Site minimum and maximum (if available) current or proposed electric loads:
- Is new service or service upgrade needed?

Utility provides:

- Circuit voltage, circuit number
- Whether single or three phase is available near site; If single phase – distance from three phase service;
- Aggregate of connected Facilities (kW) on circuit;
- Aggregate of not yet connected (kW) on circuit
- Whether the Interconnecting Customer is served by an area network, a spot network, or radial system;
- Identification of feeders within ¼ mile
- Other potential system constraints or critical items

Everything starts with the Application

- **A complete complex application package includes:**
 - Complete application, signed and dated, with generator info
 - Pre-application (optional; required for projects over 500kW)
 - Application Fee (\$3 / kW – \$300 minimum, \$2,500 maximum)
 - Standard Renewable DG: Feasibility fee in lieu of application fee
 - PE-Stamped 1-line diagram preferably showing relay controls
 - Site Diagram showing electric service location, generator location, AC Utility Disconnect, metering, access to metering and disconnect
 - Supplemental Information including tech sheets, inverter islanding info, etc.
 - Schedule B if planning to Net Meter
- Documentation problems “stop the clock” (Reference ESB756 as a guide to avoid customer/contractor holds in the process).
- Electronic documents preferred - however, mail first page of application with application fee

Interconnection Review Paths

- There are three different interconnection review paths a project can follow based on generation type, size, customer load and the characteristics of the grid where the system is to be located.
 - Simplified Review Path
 - Expedited Review Path
 - Standard Review Path
 - Non-Renewable DG
 - Renewable DG



Simplified Review Path

- Less than 15 kW single phase, or less than 25 kW three phase

Review Process	Simplified Process
Acknowledge Receipt of Application	(3 days)
Review Application for Completeness	10 days
Complete Review of All Screens	10 days
Send Executable Agreement (Note 4)	Done
Total Maximum Days	20 days
Notice/ Witness Test	< 1 day with 10 day notice or by mutual agreement

	Simplified Process
Application Fee (covers screens)	0 (Note 1)
Supplemental Review or Additional Review (if applicable)	N/A
Standard Interconnection Initial Review	N/A
Feasibility Study	N/A
Impact Study or ISRDG	N/A
Detailed Study (if required)	N/A
Facility Upgrades	N/A (Note 5)
Witness Test	0

Expedited Review Path

- Greater than 15 kW single phase, or greater than 25 kW three phase
 - Maximum size based on review of screens
 - Does not apply to non-listed inverters or other generators

Review Process	Expedited Process
Acknowledge Receipt of Application	(3 days)
Review Application for Completeness	10 days
Complete Review of All Screens	25 days
Complete Supplemental Review (if needed)	20 days
Send Executable Agreement (Note 3)	10 days
Total Maximum Days	45/65 days (Note 4)
Notice/ Witness Test	1-2 days with 10 day notice or by mutual agreement

	Expedited Process
Application Fee (covers screens)	\$3/kW, minimum \$300, maximum \$2500
Supplemental Review or Additional Review (if applicable)	Up to 10 engineering hours at \$125/hr (\$1,250 maximum) (Note 2)
Standard Interconnection Initial Review	N/A
Feasibility Study	N/A
Impact Study or ISRDG	N/A
Detailed Study (if required)	N/A
Facility Upgrades	Actual Cost
O&M (Note 6)	TBD
Witness Test	Actual cost, up to \$300 + travel time (Note 7)

Standard Review Path

Non-Renewable DG

- Non-listed inverters or other generators (induction, synchronous, asynchronous)
- Most Combined Heat and Power (CHP) systems

Review Process	Standard Process
Acknowledge Receipt of Application	(3 days)
Review Application for Completeness	10 days
Complete Standard Process Initial Review	20 days
Send Follow-on Studies Cost/Agreement	5 days
Complete Impact Study or ISRDG (if requested)	55 days
Complete Detailed Study (if requested)	30 days
Send Executable Agreement (Note 3)	15 days
Total Maximum Days	135/155 days (Note 5)
Notice/ Witness Test	By mutual agreement

	Standard Process
Application Fee (covers screens)	\$3/kW, minimum \$300, maximum \$2500
Supplemental Review or Additional Review (if applicable)	N/A
Standard Interconnection Initial Review	Included in application fee (if applicable)
Feasibility Study	N/A
Impact Study or ISRDG	Actual Cost (Note 3)
Detailed Study (if required)	Actual Cost (Note 3)
Facility Upgrades	Actual Cost
O&M (Note 6)	TBD
Witness Test	Actual Cost

Standard Review Path Renewable DG

- Large-scale PV (500 kW or greater), large-scale wind turbines (500 kW or greater), hydro facilities, anaerobic digestion, etc.

Review Process	Standard Process
Acknowledge Receipt of Application	(3 days)
Review Application for Completeness	10 days
Complete Standard Process Initial Review	20 days if feasibility study not requested
Send Follow-on Studies Cost/Agreements	5 days
Feasibility Study (if requested)	30 calendar days
Complete Impact Study or ISRDG (if requested)	The shorter of 55 days or 90 calendar days
Complete Detailed Study (if requested)	30 days
Send Executable Agreement (Note 3)	15 days
Total Maximum Days	Varies depending on studies done
Notice/ Witness Test	By mutual agreement

	Standard Process
Application Fee (covers screens)	Feasibility Study Fee in lieu of Application Fee
Feasibility Study	Residential: ≤ 25 kW: \$0, > 25 kW: \$50 Non-residential: ≤100 kW: \$100, ≤250 kW: \$300, 250 kW-1MW: \$1,000, > 1MW: \$2,500
Impact Study or ISRDG	Residential: ≤ 25 kW: \$0, > 25 kW: \$100 Non-residential: ≤100 kW: \$500, ≤250 kW: \$1,000, 250 kW-1MW: \$5,000, > 1MW: \$10,000
Detailed Study (if required)	Actual Cost (Note 3)
Facility Upgrades	Actual Cost
O&M (Note 6)	TBD
Witness Test	Actual Cost

Interconnection Process: Summary and Recommendations

- **Submit your interconnection application with National Grid early**, during conception phase before committing to buy no matter how simple or small the DG might be.
- You can always request general utility information about a specific location from your utility by requesting a Pre-application Report
- Large interconnection applications take longer to study
- The Interconnection Tariff is a wealth of information
- Interconnection timeframes do not apply to Electric Power System construction if required.
- Time frames are standard working days and do not include delays due to missing information or force majeure events
- ISO-NE notification not included in time frame.
- Interconnection applications have increased significantly in the past few years – **APPLY EARLY!**

Questions

Questions ?