



Connecting to the Grid, Long-Term Contracts, And Net Metering

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National Grid – Interconnection

Distributed Generation

Environmental Business Council - NE
Rhode Island Chapter Program
Renewable Energy at Closed Landfills

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national**grid**



Agenda

- **Net Metering**
- **DG Contracting**
- **Interconnection**

Net Metering in Rhode Island

- December 2011 Net Metering Provision Tariff
 - **“Eligible Net Metering Resource”** shall mean eligible renewable energy resource as defined in R.I.G.L. Chapter 39-26-5 including biogas created as a result of anaerobic digestion, but, specifically excluding all other listed eligible biomass fuels.
 - **“Eligible Net Metering System”** shall mean a facility generating electricity using an Eligible Net Metering Resource that is reasonably designed and sized to annually produce electricity in an amount that is equal to or less than the Renewable Self-generator’s usage at the Eligible Net Metering System Site measured by the three (3) year average annual consumption of energy over the previous three (3) years at the electric distribution account(s) located at the Eligible Net Metering System Site.

Net Metering in Rhode Island

- **“Eligible Net Metering System Site”** shall mean the site where the Eligible Net Metering System is located or is part of the same campus or complex of sites contiguous to one another and the site where the Eligible Net Metering System is located or a farm in which the Eligible Net Metering System is located.
 - Except for an Eligible Net Metering System owned by or operated on behalf of a municipality or multi-municipal collaborative through a municipal net metering financing arrangement, the purpose of this definition is to reasonably assure that energy generated by the Eligible Net Metering System is consumed by net metered electric delivery service account(s) that are actually located in the same geographical location as the Eligible Net Metering System.
 - Except for an Eligible Net Metering System owned by or operated on behalf of a municipality or Multi-municipal Collaborative through a Municipal Net Metering Financing Arrangement, all of the Net Metered Accounts at the Eligible Net Metering System Site must be the accounts of the same customer of record and customers are not permitted to enter into agreements or arrangements to change the name on accounts for the purpose of artificially expanding the Eligible Net Metering System Site to contiguous sites in an attempt to avoid this restriction. However, a property owner may change the nature of the metered service at the delivery service accounts at the site to be master metered (as allowed by applicable state law) in the owner’s name, or become the customer of record for each of the delivery service accounts, provided that the owner becoming the customer of record actually owns the property at which the delivery service account is located.
 - As long as the Net Metered Accounts meet the requirements set forth in this definition, there is no limit on the number of delivery service accounts that may be net metered within the Eligible Net Metering System Site.

Net Metering Credits

- Energy use is “netted” over the billing month
 - If there is net energy use – utility will bill customer for net use
 - If net energy export – export kWh * the following
 - Renewable installations will be credited at near retail rate for excess kWh (minus conservation and renewable energy charges).
- Tariff allows credits to be allocated (with limitations)
- Customer still responsible for customer charges and demand charges

			Credit the following charges			
min	max	Type	Default Service	Distribution	Transmission	Transition
0	5,000 KW	Renewable	X	X	X	X

Net Metering Credits

- If there is excess at the end of the year
 - **“Excess Renewable Net Metering Credit”** shall mean a credit that applies to an Eligible Net Metering System for that portion of the Renewable Self-generator’s production of electricity beyond one hundred percent (100%) and no greater than one hundred twenty-five (125%) of the Renewable Self-generator’s own consumption at the eligible net metering system site during the applicable billing period. Such Excess Renewable Net Metering Credit shall be equal to the Company’s avoided cost rate, defined for this purpose as the Standard Offer Service kilowatt-hour (kWh) charge for the rate class and time-of-use billing period, if applicable, applicable to the delivery service account(s) at the Eligible Net Metering System Site.
- Customer must fill out Schedule B in the net-metering tariff to apply
 - https://www.nationalgridus.com/narragansett/home/energyeff/4_net-mtr.asp

THE NARRAGANSETT ELECTRIC COMPANY
NET METERING PROVISION

Schedule B

INFORMATION REQUIRED FOR APPLICATION OF RENEWABLE NET METERING
AND EXCESS RENEWABLE NET METERING CREDITS

Date: [REDACTED]

Net Metering Customer ("NMC"): [REDACTED]

NMC Address:

[REDACTED]
[REDACTED]
[REDACTED]

Estimated annual generation in kWhs of Eligible Net-Metering System:

[REDACTED]

Net Metered Account(s)

The following information must be provided for each individual Net Metered Account:

Name: [REDACTED] (Except in the case of a municipal or Multi-municipal Collaborative, the customer of record must be the same as the NMC)

Service Address: [REDACTED]

National Grid Account Number: [REDACTED]

Three (3) years average kWh usage for this account: [REDACTED]

Total three (3) years average kWh usage for all accounts listed: [REDACTED]

Net Metering Summary

- If planning to Net Meter, submit Schedule B with interconnection application
- Correctly fill out Schedule B
 - Name must match electric account of Host Customer
 - Must be signed by Host Customer
- Submit 3 year average usage history.
- If allocating, verify name/address/account info of customer(s) – or will need to submit corrected form

RI DG Standard Contracts

- Long-term standard contracts for the purchase of energy, capacity and RECs for 15 year terms from eligible DG facilities
- Three “enrollments” per year for a total of 40 MW nameplate over 4 years
 - By December 30, 2011: 5 MW (nameplate)
 - By December 30, 2012: an aggregate of 20 MW
 - Note: the 3rd enrollment period of 2012 was cancelled upon request of OER. The PUC approved this request . 16.2MW awarded in 2012, remaining 3.8MW rolled over to 2013.
 - By December 30, 2013: an aggregate of 30 MW
 - By December 30, 2014: an aggregate of 40 MW
- Two week open enrollment
 - Submit conforming application
 - Submit completed feasibility study or impact study with application
- Eligible Projects
 - “Newly Developed Renewable Energy Resource”¹
 - Located in the Narragansett Electric Company ISO-NE load zone
 - Connected to the electric distribution company’s power system
 - Revised technology classes, ceiling prices, and allocations are pending OER’s recommendations and PUC approval.
 - Projects must be built within 18 months of contract execution

¹As defined under R.I.G.L. § 39-26-5 and Section 5 of the Rules and Regulations governing the Implementation of a Renewable Energy Standard, effective July 25, 2007

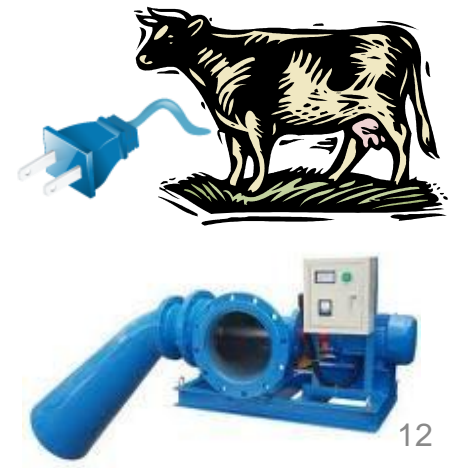
Compensation if not Net Metered or under a DG contract

- If the customer will never export power – no concern, but still must follow interconnection tariff if connected in parallel with utility
- If customer will export power – they can sell their exported power to the market through a registered market participant.
 - If customer has a Qualifying Facility (QF) certificate from FERC for the generator, they can “sell” to local utility (Power Purchase Schedule).
 - Customer can work with any registered market participants to sell power
 - Customer must pay for all power they use.

FERC QF page: <http://www.ferc.gov/industries/electric/gen-info/qual-fac.asp>

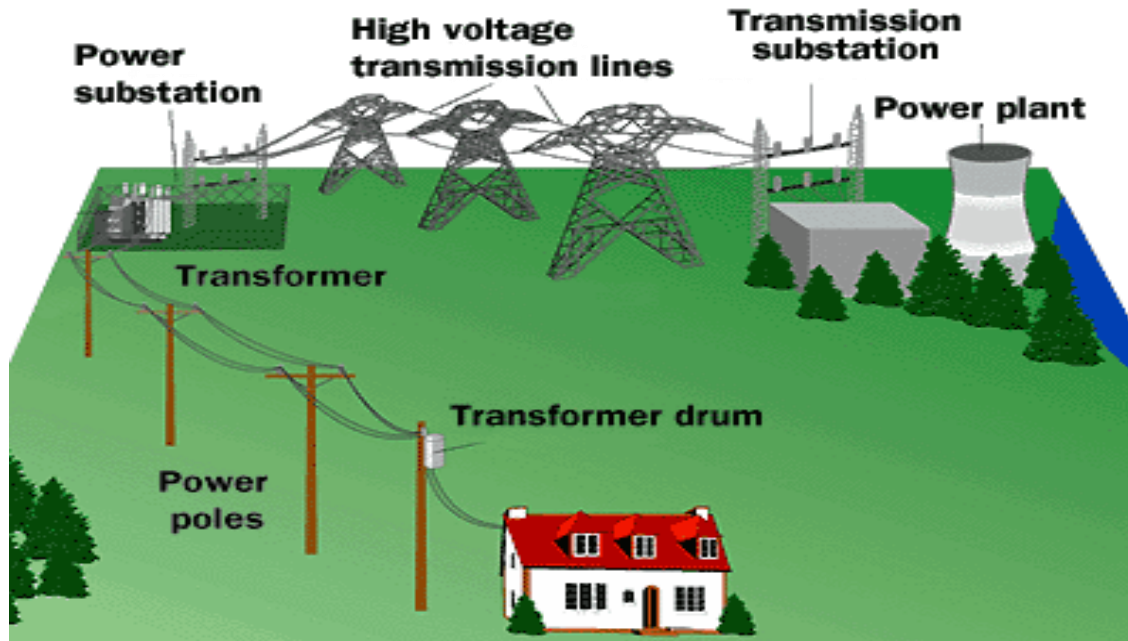
Interconnection Tariffs

- The RI PUC adopted a revised tariff titled, “RIPUC #2078, Standards for Connecting Distributed Generation”, on November 30, 2011.
- - Includes interconnection standards and renewable energy interconnection process.
 - Current version of “Standards for Interconnecting Distributed Generation” is can be found at:
https://www.nationalgridus.com/narragansett/home/energyeff/4_interconnect.asp
- The RI PUC adopted a revised tariff titled “RIPUC #2075, Net Metering Provision”
 - Includes Eligible Net Metering Rate Classes and Technologies
 - Current version of “Net Metering Provision” can be found at:
https://www.nationalgridus.com/narragansett/home/energyeff/4_net-mtr.asp



How Does the Electric Grid Work?

- **Generators (Power Plants):** Produce electricity (usually large and centralized – nuclear, coal, natural gas)
- **Transmission System:** Transmits electricity at high voltage from generators to distribution systems (where the power is needed)
- **Distribution System:** Distributes electricity to customers via lower voltage wires
- **Substations and Transformers:** Used to “step-down” voltage to the appropriate task



Interconnection 101: The Basics

1. The customer starts the review process by requesting, filling out and submitting an application package to the local utility
2. The utility begins review to determine appropriate application path
3. If approved, the applicant will be required to sign an interconnection agreement with the utility. The system must be installed within 12 months of the agreement, or else a new application is required.
4. If there is a dispute over an application, the interconnection standards released by the RI Public Utilities Commission (PUC) include a dispute resolution process.
5. At first glance, the interconnection process seems simple, but there is a significant amount of information needed by the utility to successfully process the application. **Delays are common due to missing information, so it is important that the system design engineer help with the application process.**
6. Contact National Grid, RI PUC or RI OER assistance or with queries even **before** the system design process. **Everything Starts with the Application!**

Everything starts with the Application

- A complete complex application package includes:
 - All appropriate sections of 4-page application completely filled out. Customer will likely need assistance from vendor/engineer.
 - **Application fee** \$3/KW (\$300 minimum and \$2,500 maximum). This fee covers the initial review. Note: if Renewable DG, Feasibility Study fee applies in lieu of Application fee.
 - **Stamped electric one-line diagram**, preferably showing relay controls (one copy) (Stamped by Rhode Island Electrical PE)
 - **Site diagram** (one copy)
 - One copy of any **supplemental information** (if electronic – single copy acceptable)
 - Identify electric customer and owner of proposed generation
 - **Schedule B** if planning to Net Meter
- Errors or problems with application will slow down the process and “*stop the clock*”
- Send **Electronic copy** of all documents **preferred** if possible – Easier to distribute, saves paper, and is faster. However, submit 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	Expedited	Standard
For PV and other inverter based technologies served by radial systems, 10k W or less 1-Phase or up to 25k W 3-Phase [Note: Simplified Spot Network path is 30-90 days]	For inverter-based systems greater than 10 kW 1-Phase or greater than 25 kW 3-Phase and other systems of all sizes that are served by radial systems and meet other requirements.	All projects not eligible for simplified or expedited review, including all systems on networks
Typical Projects: small PV, demonstrations or homeowner wind	Typical Projects: certified large renewables, cogeneration, and other turbine or engines of any size	Typical Projects: uncertified large projects, unusually complex projects or projects of any size located on networks
Total Maximum Days: 15*	Total Maximum Days: 40 – 60*	Total Maximum Days: 125-150*

* Without delays

Responsibility of Costs

- **Interconnecting customer responsible for:**
 - Application Fee
 - Simplified Process: Fee Waived (except for Simplified spot network)
 - Expedited and Standard: \$3/kW (\$300 min and \$2,500 max)
 - Renewable DG: Feasibility Study Fee is required in lieu of Application Fee
 - Costs of impact and detailed studies if required
 - Grid modification requirements – can include ongoing charges
 - Witness Test Fee
 - Costs associated with design, construction and installation of the facility and all associated interconnection equipment on the customer's side of the meter
 - Most smaller projects will not require impact or detailed studies or distribution system upgrades
 - **See Fee Schedule for details**

Interconnection Process Fee Schedule

	Simplified	Expedited	Standard		Simplified Spot Network
	Listed Small Inverter	Listed DG	Any DG including Renewable DG not requesting a Feasibility Study or ISRDG	Renewable DG requesting a Feasibility Study or ISRDG	Listed Inverter ≤ 15 kW
Application Fee (covers Screens)	0 (Note 1)	\$3/kW, minimum \$300, maximum \$2,500	\$3/kW, minimum \$300, maximum \$2,500	N/A	≤\$3/kW \$100, >3 kW \$300
Supplemental Review or Additional Review (if applicable)	N/A	Up to 10 engineering hours at \$125/hr (\$1,250 maximum) (Note2)	N/A	N/A	N/A
Standard Interconnection Initial Review	N/A	N/A	Included in application fee (if applicable)	N/A	N/A
Feasibility Study	N/A	N/A	N/A	Residential : ≤25kW: \$0 >25kW: \$50 Non-residential: ≤100kW: \$100 ≤250kW: \$300 250kW–1MW: \$1,000 >1MW: \$2,500	N/A
Impact Study or ISRDG	N/A	N/A	Actual cost (Note 3)	Residential : ≤25kW: \$0 >25kW: \$100 Non-residential: ≤100kW: \$500 ≤250kW: \$1,000 250kW–1MW: \$5,000 >1MW: \$10,000 (Note 4)	N/A
Detailed Study (if required)	N/A	N/A	Actual cost (Note 3)	Actual cost (Note 3)	N/A
Facility Upgrades	N/A (Note 5)	Actual cost	Actual cost	Actual cost	N/A
O&M (Note 6)	N/A	TBD	TBD	TBD	N/A
Witness Test	0	Actual cost, up to \$300 + travel time (Note 7)	Actual Cost	Actual Cost	0 (Note 8)

Many Stakeholders Involved

Utility

- Application analyst – processes application and contracts
- Lead Engineer for reviews/studies
- Relay Engineering
- Distribution Planning
- Distribution Dispatch
- Distribution Design Engineering
- Meter Operations
- Meter Engineering
- Meter Data Services
- Relay Telecom Operations
- Inspection team
- Customer Service / Billing
- Legal...

Interconnecting Customer

- Customer
- Equipment vendor
- Lead contractor
- Electrician
- Electrical Engineer (PE)
- Relay Engineer
- Relay testing firm
- Legal

ISO-NE
(If necessary)

Upgrades and Modifications

- If **aggregate generation** on a feeder is over 7.5% of peak feeder load, there may be special reviews required.
- **Feeder voltage** may impact the size of generator that can be safely and reliably interconnected at the distribution level. (e.g. 4.1KV, 23KV, 69KV)
 - Intermittent sources (solar, wind) can cause unacceptable voltage changes from cloud cover for solar or high wind cut-off from wind.
- If the generator will **sell on market** and has to apply through ISO-NE, the process may take longer than the standard time frames.
- Generators over 10 KW are most likely going to require three-phase. Make sure the customer has three-phase service available. If a line extension is required, it is at the customer's expense.

Interconnection 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
- Large interconnection applications take longer to study
- Stand alone (no load behind the meter) interconnection application take longer to study
- Interconnection timeframes do not apply to distribution system modifications or construction if required.

Summary and Recommendations

(continued)

- The Interconnection Standard is a wealth of information – get to know it
- Time frames are standard working days and do not include delays due to missing information
- Interconnection expenses such as application fees, required studies, potential system modifications and witness tests should be budgeted into each project
- Hire an engineer to help with application process
- ISO-NE notification not included in time frame
- Interconnection applications have increased significantly in the past few years – **APPLY EARLY!!!**

Interconnection Contacts & Tariff Links

National Grid – RI

- Email: distributed.generation@us.ngrid.com
- Phone: John Kennedy | 401-784-7221
- Tariff Link:
https://www.nationalgridus.com/narragansett/home/energyeff/4_interconnect.asp

UsefulLinks (available on our website)

[Electric System Bulletin \(ESB\) 756](#) For contractors and customers looking for technical information on parallel generation with the National Grid electric power system

[Rhode Island Office of Energy Resources](#) Promoting energy efficiency and renewable energy in Rhode Island

[Rhode Island Economic Development Corporation](#) Managing the Rhode Island Renewable Energy Fund

[Energy Efficiency Services](#) National Grid can help you manage your energy usage through our energy efficiency services and incentives.

[Procurements](#) Procurements for the National Grid Distribution Companies to meet their energy supply service requirements

[Solar Energy Business Association of New England](#) Lists many of the local contractor resources for solar energy

[Northeast Sustainable Energy Association](#) A leading Northeast organization of professionals who promote sustainable energy and clean technology

[Department of Energy](#) U.S. DOE Federal site for Energy Efficiency and Renewable Energy

Check out National Grid's 5 MW [Solar Project](#). This link provides real time solar generation information.