

R.I.P.U.C. No. 2098
Canceling R.I.P.U.C. No. 2074
Sheet 8

Schedule A

THE NARRAGANSETT ELECTRIC COMPANY
QUALIFYING FACILITY POWER PURCHASE AGREEMENT

The Agreement is between _____, a Qualifying Facility ("QF") and The Narragansett Electric Company (the "Company") for energy purchases by the Company from the QF's facility located at _____, Rhode Island.

Agreement to Purchase under the Qualifying Facilities Power Purchase Rate Tariff

Effective as of _____, the Company agrees to purchase electricity from the QF and QF agrees to sell electricity to the Company under the terms and conditions of the Company's Qualifying Facilities Power Purchase Rate Tariff as currently in effect or amended by the Company in the Company's sole discretion. The QF agrees to comply with the terms and conditions of the Qualifying Facilities Power Purchase Rate Tariff, the Company's Standards for Connecting Distributed Generation, as currently in effect or as amended from time to time, and associated policies of the Company that are on file with the Rhode Island Public Utilities Commission as currently in effect or as modified, amended, or revised by the Company, and to pay any metering and interconnection costs required under such tariff and policies.

Payments for Energy

The Company will pay the QF at the rates in effect at the time of delivery as provided for in the Qualifying Facilities Power Purchase Rate Tariff.

Notice

The Company or QF may terminate this agreement on thirty (30) days written notice which includes a statement of reasons for such termination.

Agreed and Accepted

Date

The Narragansett Electric Company Date

La Capra Associates



PUBLIC UTILITY REGULATORY POLICIES ACT (PURPA) COMPLIANCE METHODS

Presented by: *John Athas & Mary Neal*
La Capra Associates, Inc.

Presented to: **Green Mountain Power**

February 19, 2015

EXJ-A2

000281

Topics Covered

- I. Introduction to PURPA**
- II. FERC Response to Issues Regarding PURPA & Market Access**
- III. New England State Rules**
- IV. Other RTO Regions**

I. INTRODUCTION TO PURPA

- ☐ **PURPA Goals**
- ☐ **PURPA Requirements**
- ☐ **Energy Policy Act of 2005**

Source: Carolyn Elefant, "A Survey of Avoided Cost Ratemaking Methodologies Under the Public Utilities Regulatory Policies Act (PURPA)", March 2014,
<http://www.narucmeetings.org/Presentations/25%20PURPA%20Avoided%20Cost%20Calculation%20Differences%20Across%20States-Carolyn%20Elefant.pdf>

PURPA Goals

- **Encourage alternative energy/distributed generation development in order to conserve energy and increase utility efficiency**
- **Grant qualified facility (QF) status to eligible cogeneration and small renewable generating facilities**
 - **Utilities obligated to purchase power from facilities with QF status**
- **Maintain equitable rates for consumers**
 - **Electric rates unaffected by QF purchase**

PURPA Requirements

- Utilities must purchase power from QFs at avoided cost based rates
- FERC defines avoided cost as “the incremental cost to the electric utility of electric energy or capacity or both which, but for the purchase from the QF or QFs, such utility would generate itself or purchase from another source.”
§CFR 292.101(b)(6)
- Legal standards
 - Just, reasonable and in the public interest
 - Non-discrimination among co-generators or small power producers

Source: 18 CFR S292.304(a)(i) and S292.301(b)

Energy Policy Act of 2005 amends PURPA's must purchase obligation and avoided cost

- **Utilities may terminate (with FERC permission) mandatory purchase obligation if QFs have non-discriminatory access to competitive markets**
- **FERC Order 688 determined that:**
 - **ISO-NE, NYISO, PJM, and MISO meet statutory criteria for competitive markets**
 - **QFs of more than 20 MW assumed to have non-discriminatory access to at least one of these competitive markets**
- **For QFs still entitled to sell power at avoided cost in places with Day 2 Markets, the avoided costs are most often based on market prices**

II. FERC RESPONSE TO ISSUES REGARDING PURPA & MARKET ACCESS

- ☐ **Small QFs**
- ☐ **Congestion Issues**
- ☐ **Treatment of RECs**

FERC protects QF status for facilities under 20 MW

- **FERC has shown reluctance to eliminate mandatory purchase obligation from QFs smaller than 20 MW, even in Day 2 Market Environments**
 - **FERC granted BED relief from this requirement in the case of Winooski One (there may also be one additional recent case) – these exemptions are rare and on a case by case basis.**
- **In 2010, FERC denied PSNH's request to eliminate the mandatory purchase obligation for QFs between 5 and 20 MW**
- **In 2013, FERC denied PPL Electric's request to eliminate the mandatory purchase obligation for the planned 18.1 MW Souderton cogeneration plant**
 - **FERC stated PPL Electric's application lacked a necessary QF-specific analysis demonstrating the QF has non-discriminatory market access**

FERC considers congestion for QF status termination

- **Some utilities have also been denied request to terminate mandatory purchase obligation due to market congestion**
- **As an example, in 2008, Southwestern Public Service (SPS) Company was denied its request to eliminate mandatory purchase obligation for QFs larger than 20 MW**
 - **SPS is a member of SPP**
 - **JD Wind, a QF owner, provided evidence of curtailment due to transmission constraints and the lack of ability to secure a third-party purchase agreement for its JD Wind No. 4 project**
 - **Only one QF in SPS had an OASIS reservation and only for a small fraction of its output**

FERC excludes RECs from PURPA statute

- **FERC has stated that contracts for the sale of QF energy and capacity pursuant to PURPA do not automatically include RECs**
- **RECs may be transferred to the utility from the QFs per a separate contractual provision or through state law, but not PURPA**
- **REC policies vary by state**

III. NEW ENGLAND STATE RULES

- ☐ New Hampshire
- ☐ Connecticut
- ☐ Rhode Island
- ☐ Maine
- ☐ Massachusetts

Summary of New England States

Common Elements

- All states except Vermont use short term ISO-NE marginal energy prices (spot prices and not forward prices)
 - Allco Renewable Energy petitioned FERC for enforcement action against MA DPU for only allowing short term avoided cost rates and not long-term contract rates; FERC did not bring such an enforcement action
- Most States pay FCM value as well as energy
- States allow long term contracting at negotiated rates
- All States adjust for losses
- Most states try to have some connection between their QF rate and net metering rate design
- Most states have tiers by size of QF giving slight differences in rate structure

Distinctions among States

- Varies among states on Nodal versus Zonal and Day Ahead or Real time markets
- NH and Maine adjust their payments to QFs to account for administrative costs

Summary of New England States (cont.)

	MA	CT	ME	RI	NH	VT
Mechanism	Statute	Utility Tariff	PUC Rules	Utility Tariff	Utility Tariff	PSB-Approved Rates Statewide
Energy Price	Equal to payments received by utility from ISO-NE	RT LMP at generator node or Zone	RT LMP at generator node or negotiated between utility and QF	Standard Offer Price or Hourly clearing prices – RT or DA not specified	Zonal RT LMP or contract	Based on long-term forecast from consultant
Capacity Price	Included if recognized by NEPOOL or ISO-NE	Included in long-term contract	Negotiated between utility and QF	Included if recognized by NEPOOL or ISO-NE	FCM Price less PER	Based on long-term forecast from consultant
Losses	Each company files line loss factors with DPU	No adjustments if 69kV or more; fixed peak and off-peak % for <69kV	Commission may consider losses	No line loss adjustment specified in tariff	Line losses wholesale to retail meter point	Adjusted for Local T & D
RECs	REC transfer not covered by statute	Included if long-term contract under tariff or if contract includes it	Retained by QF	REC transfer not specified in tariff	Retained by QF	Retained by QF
Frequency of price updates	Short-term Prices	Short-term Prices	Filed by QF annually	Short-term prices; annual reconciliation	Short-term Prices	Annually per Rule 4.100
Length of contract	N/A	No specified contract length	No specified contract length	N/A	One 20-year contract; could be others	5, 10, 15, 20, or 30-year options

IV. Other RTO Regions

- ☐ **NYISO**
 - ☐ **Niagara Mohawk**
 - ☐ **Con Ed**
- ☐ **PJM**
 - ☐ **Public Service Electric & Gas**
 - ☐ **Virginia Electric and Power**
 - ☐ **Baltimore Gas and Electric**
- ☐ **MISO**
 - ☐ **Entergy**

Summary of Other RTO Regions

Common Elements

- All states used short term marginal energy prices, varying between RT and DA
- Most States pay capacity value as well as energy
- States allow long term contracting at negotiated rates
- All States adjust for losses
- Some states adjust their payments to QF to account for administrative costs
- Most states have tiers by size of QF giving slight differences in rate structure

Distinctions from New England

- Con Ed has QFs over 1MW provide schedule of output for Day Ahead Market
- Most states do not have a direct connection between their QF rate and net metering rate design

Summary of Other RTO Regions

	NY	NJ	VA	MD	VT
Mechanism	Utility Tariff	Utility Tariff	Utility Tariff	Utility Tariff	PSB-Approved Rates Statewide
Energy Price	Real-Time LBMPs – floor price of 6.0 cents/kWh	Load weighted average LMP	Day-Ahead LMP	PJM market prices for time period energy is produced	Based on long-term forecast from consultant
Capacity Price	Based on LBMCP using unforced capacity	Based on revenue from PJM (must qualify for PJM auction)	Based on PJM capacity resource clearing prices	PJM market prices	Based on long-term forecast from consultant
Losses	Con Ed has factor of 1.066 for delivery at secondary distribution	N/A	2.8% for line losses	N/A	Adjusted for Local T & D
RECs	REC transfer not covered by statute	N/A	N/A	N/A	Retained by QF
Frequency of price updates	N/A	N/A	N/A	N/A	Annually per Rule 4.100
Length of contract	N/A	N/A	N/A	N/A	5, 10, 15, 20, or 30-year options

End of Presentation



Additional Discussion or Questions ?



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APPENDIX

- ☐ State level detail
 - ☐ New England
 - ☐ Other states
- ☐ Qualifying Facilities in New England

New Hampshire: Limited Electrical Energy Producers Act

- Utilities purchasing power from qualifying facilities “shall pay rates per kilowatt hour to be set from time to time by the commission. Such rates shall be based on the purchasing utility’s avoided costs... either calculated for the time of delivery or calculated for a specified term at the time of qualifying small power producer or qualifying co-generator agrees to be obligated to deliver for the specific term.” NH Statutes Chapter 362-A
- Commission considers any mutually agreed upon contract that differs from the rate or terms that would otherwise be required by the Commission

Effective August 25, 1998

New Hampshire Net Metering: NH Code of Administrative Rules PUC 900

- **Commission annually determines net metering rates consistent with requirements of PURPA published on NH PUC website: <http://www.puc.state.nh.us/electric/electric.htm>**
- **Net metering rates for avoided costs based on short-term avoided energy costs for the New Hampshire load zone**
 - **RT-LMP of electricity plus generation related ancillary service charges, all adjusted for the average line loss in New Hampshire between the wholesale metering point and the retail metering point**
 - **Capacity costs based on applicable FCM price, adjusted to account for any peak energy rent payments made from energy market reducing direct capacity costs charged to load and for average line loss**

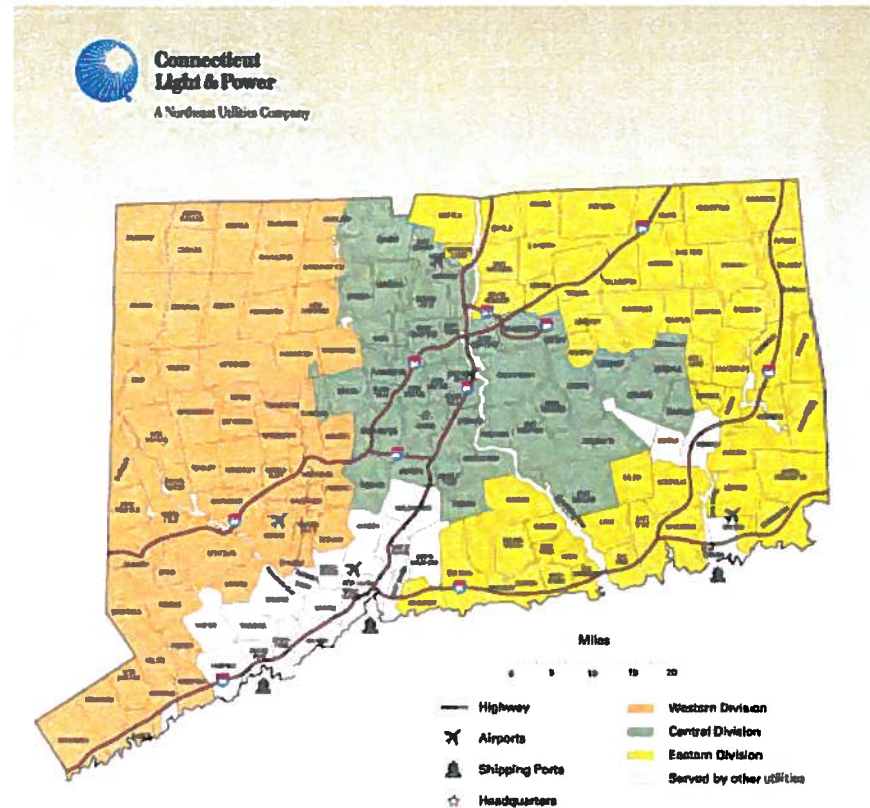
New Hampshire – Public Service New Hampshire (PSNH)

- **FERC granted PSNH request to terminate mandatory purchase obligation for QFs larger than 20 MW (131 FERC ¶ 61,027)**
- **PSNH tariff specifies rates for QF power sales (Section 33 of Electricity Delivery Service Tariff – NHPUC No. 8)**
 - **QF may sell to PSNH or wheel through PSNH (wheeling charges may apply which include distribution) through separate contract or "Short Term Avoided Cost Rate"**
 - **"Short Term Avoided Cost Rate" is based on revenues from PSNH's resale to ISO-NE market, adjusted for "line losses, wheeling costs, and administrative costs"**
 - **Net Metering available to renewable facilities less than 1,000 kW**
- **QF maintains rights to RECs**
- **PSNH signed 20-year contract for Berlin biomass facility**

Sources: http://elibrary.ferc.gov/idmws/file_list.asp?document_id=13808630;
<https://www.psnh.com/downloads/Electric%20Delivery%20Service%20Tariff.pdf?id=4294988540&dl=t>
<http://www.puc.state.nh.us/electric/electric.htm>; <http://www.puc.state.nh.us/Regulatory/Orders/2011orders/25213e.pdf>

Connecticut – Connecticut Light and Power (CL&P)

- **CL&P maintains Rate 980 for Non-Firm Power Purchases from “any self-generation facility”**
- **CL&P maintains Rider N for Non-Class 1 Renewable and QF Self-Generator Net Energy Billing Service**
 - Available to QFs under 50 kW for customers taking service under certain rates
 - If energy sold to CL&P exceeds energy purchases, the net sales will be credited per Rate 980



https://www.cl-p.com/Home/AboutCLP/Service_Territory_Map/?MenuID=4294985160

Sources: <http://www.cl-p.com/downloads/rate980.pdf?id=4294986720&dl=t>
https://www.cl-p.com/downloads/RiderN_NonClass.pdf?id=4294986717&dl=t

Connecticut – Connecticut Light and Power (CL&P)

■ Rate 980 Energy

- If the facility has a time-differentiated meter, then power is purchased at ISO-NE hourly RT-LMP clearing price, either at the generator node—if it exists—or the Connecticut Zone price
- With no time-differentiated meter, energy is purchased at the average RT-LMP over the billing period

■ Rate 980 Capacity

- CL&P retains capacity rights without any capacity payment if the generation unit was subsidized by ratepayers through certain grants
- Customer retains capacity rights if it is an emergency generator or if the customer is not under long-term contract, has a settlement account with ISO-NE and the generating unit entitled to capacity is in excess of that subsidized by ratepayers

Connecticut – Connecticut Light and Power (CL&P)

■ Rate 980 RECs

- CL&P retains RECs if power purchase was made through long-term contract which uses Rate 980 as pricing mechanism or if the contract provides it
- DG projects not under long-term contract retain RECs

■ Rate 980 Adjustments to Line Losses

- Purchases made at voltage levels of 69kV or higher are paid the appropriate RT-LMP market clearing price
- Purchases made at levels less than 69 kV:

Purchase Voltage	Alternative A (hourly metering) On Peak	Alternative A (hourly metering) Off Peak	Alternative B (No time differentiated meter)
Bulk Substation	0.5%	0.34%	0.42%
Primary			
Distribution	4.38%	2.89%	3.60%
Secondary			
Distribution	7.13%	4.59%	5.80%

Source: <http://www.cl-p.com/downloads/rate980.pdf?id=4294986720&dl=t>

Rhode Island – Narragansett Electric Company (NEC)

- NEC maintains tariff R.I.P.U.C. No. 2098 specifying QF power purchase rates for QFs less than 20 MW and *not* eligible for net metering:

QF Criteria	Rate
Facilities meeting definition of renewable energy resources (Defined in R.I.G.L. Section 39-26-5)	Standard Offer Service (SOS) rate for the applicable retail delivery rate (based on QF capacity) for each kWh in excess of facility requirements.
All other QFs	Hourly clearing prices at ISO-NE for electricity generated in excess of requirements. QFs may receive payments for capacity and/or reserves-related products if recognized by NEPOOL or ISO-NE.

- Resources meeting net metering eligibility subject to Net Metering Provision, R.I.P.U.C. No. 2075
- NEC entitled to cost recovery for any differences in payments to QFs and actual payments received from ISO-NE through a uniform surcharge embedded in the distribution component from all customers

Sources: http://www.nationalgridus.com/narragansett/non_html/rates_tariff.pdf
<http://webserver.rilin.state.ri.us/Statutes/title39/39-26/39-26-5.HTM>
http://www.nationalgridus.com/non_html/RI_DG_Net_Metering_Tariff.pdf

Maine – Maine PUC Rules Chapter 360

- **Chapter 360 specifies rates for sales of power from small power producers and cogeneration units**
 - **Short-term energy purchases**
 - Each T&D utility that has a QF contract shall file rates annually with the Commission calculated as “the sale prices accepted pursuant to the sale of the rights to the energy component of QF contracts”
 - **Standard rates for energy and capacity (QFs <1000 kW)**
 - Each T&D utility that has QF contract shall file rates annually with the Commission calculated as “the sale prices accepted pursuant to the sale of the rights to the energy and capacity components of QF contracts”
- **Maine statute indicates that rates are negotiated between the utility and the generator and if they are unable to agree they are set by the Commission**

Maine – Maine PUC Rules Chapter 360

- **Net Metering:** Any QF that has an installed capacity of 100 kW or less may opt to sell electricity to an electric utility on a net energy billing basis
 - If QF obtains retail generation service from a competitive electricity provider, net energy shall be purchased at rates agreed upon by the QF and the competitive electricity provider
 - If QF obtains SOS, net energy shall be purchased at rates established pursuant to the existing contract
- **Line Losses:** In determining rates for purchase of energy, the Commission may consider the costs or savings resulting from variations in lines losses from those that would have existed in the absence of purchases from a QF

Maine – Maine PUC Rules Chapter 315

- **Under Chapter 315, eligible generators shall pay the utility's administrative costs pursuant to a rate schedule approved by the Commission**
- **Chapter 315 specifies standard offer provider purchase obligations of power from facilities 5 MW or less**
 - **Price is equal to the ISO-NE RT nodal clearing price at the node which the generator is located as adjusted for administrative costs or another price accepted by the Commission**
 - **Standard Offer Provider has transmission and distribution service territory where the eligible generator is located**
 - **Generator retains rights to GIS certificates**

Massachusetts - MA CMR 220, §. 8.05

- **Net Metering: On-site Generating Facilities (OSGF) less than 60 kW may elect net metering. Generation must serve the load at the same physical location as the QF or OSGF.**
- **Rates are market-based and set as follows:**

QF Capacity	Rate
>= 1 MW	"...equal to payments received by the Distribution Company from the ISO power exchange for such output for the hours in which the Qualifying Facility generated electricity in excess of its requirement." 220 CMR 8.05 (2)(a)
>60 kW and <1 MW	"...equal to the arithmetic average of the Short-run Energy rate in the prior calendar month for the KWH which the Qualifying Facility generated electricity in excess of its requirements." 220 CMW 8.05 (2)(b)
<= 60 kW	Option to have same rates as QFs between 60 kW and 1 MW or to use net metering. 220 CMR 8.05 (2)(c)

Sources: 220 CMR 8.05 (6); 220 CMR 18.0; https://www.nationalgridus.com/masselectric/non_html/rates_tariff.pdf
<http://www.lawlib.state.ma.us/source/mass/cmr/cmrtext/220CMR8.pdf>

Massachusetts - MA CMR 220, §. 8.05

- **Line Losses:** Rates adjusted for line losses. Each Company files its line loss factors with the DPU.
- **Capacity and Reserves:** The Company shall make payments to a QF for capacity and/or reserves-related products if the sale is recognized by NEPOOL. The Company shall pay rates equal to the payments received for the sale of any capacity and/or reserves-related products associated with such QF output to the ISO power exchange.
- **Allco Renewable Energy** petitioned FERC for enforcement action against MA DPU for only allowing short term avoided cost rates and not long-term contract rates; FERC did not bring such an enforcement action

Sources: 220 CMR 8.05 (6); 220 CMR 18.0; https://www.nationalgridus.com/masselectric/non_html/rates_tariff.pdf
<http://www.lawlib.state.ma.us/source/mass/cmr/cmrtext/220CMR8.pdf>; Allco Docket: EL14-84

NYISO-Niagara Mohawk

- **Niagara Mohawk's tariff has Service Classification No. 6 for QFs**
 - **Energy payments based on Real Time LBMPs**
 - **Capacity payments made based on LBMCP paid based on the amount of unforced capacity supplied by the generator per NYISO rules**
 - **Minimum unit rate of no less than 6.0 cents/kWh averaged over the year may apply**
 - **Average LBMP rates may be used if no interval metering is available**
 - **QF may take payment directly from NYISO for ancillary services**
 - **Certain small renewable QFs with less than 5 MW of nameplate capacity may elect to take payment based on a Day Ahead LBMP and avoided ancillary service rate (no capacity payments)**

Sources: <https://www2.dps.ny.gov/ETS/jobs/display/download/5589992.pdf>

NYISO-Con Ed

- **Con Ed's tariff has Service Classification No. 11 for buyback service for QFs**
 - **Customers may elect to sell capacity and energy directly into NYISO market or sell to Con Ed and be paid at NYISO market rates**
 - **For customers selling to Con Ed and are >1 MW, they submit a schedule of electricity export**
 - Scheduled deliveries are paid the Day Ahead price
 - Differences between scheduled and actual deliveries are paid the lower of the Real Time price or Day Ahead price, not to be lower than zero
 - **Customers selling to Con Ed that are less than 1 MW are paid a monthly average real-time price for all deliveries**
 - **Adjustment factor: for customers delivering at secondary distribution (delivery to NYISO or Con Ed), the LMP price will be increased by a factor of adjustment of 1.066 taken to the nearest cent**

NYISO-Others

- **NYSEG has Service Classification No. 10 for QFs**
- **Rochester Gas and Electric has Service Classification No. 5 for Buy-Back Service for QFs**
- **Both provide market-based rates similar to the other utilities in the state**

Sources: <https://www2.dps.ny.gov/ETS/jobs/display/download/5527506.pdf>;
<https://www2.dps.ny.gov/ETS/jobs/display/download/5526916.pdf>

PJM- Public Service Electric & Gas (PSE&G)

- **Distinct rate for Qualifying Facility as defined by PURPA**
- **Rate includes service charge, energy payment, and capacity payment**
 - **Energy payment in an month is based on “avoided energy cost by time period or by hour, as applicable, in that month (defined as the load weighted average Location Marginal Price (LMP) for the Public Service Transmission Zone)”**
 - **Capacity payment applicable when capacity exceeds 100 kw and capacity meets PJM criteria. If applicable, payments are based on revenue received by Public Service for selling such capacity in the final PJM capacity auction prior to delivery, “adjusted for all penalties and other charges assessed for non-performance or unavailability of such capacity”**

Tariff: B.P.U.N.J No. 15 Electric

Source: https://www.pseg.com/family/pseandg/tariffs/electric/pdf/electric_tariff.pdf Original Sheet No. 176

PJM-Virginia Electric and Power

- **Schedule 19 provides for power purchases from QFs up to 20 MW**
- **QFs 10 kW or less may contract to supply energy only**
 - **Payments are based on average PJM market prices and are not time-differentiated**
 - **QFs cannot contract for more than 20,000 kW in capacity if electing for both**
- **Otherwise, QFs contract to supply energy and capacity**
 - **Energy is paid based on the hourly PJM Day Ahead LMP divided by 10 and multiplied by the hourly net generation as recorded by the Company's time differentiated meter, as adjusted for line losses**
 - **Energy purchases are increased by 2.8% to account for line losses. A QF may request that the percentage be calculated from a line loss study at the location of interconnection, but the QF must bear the cost of the study**
 - **Capacity is based on PJM's capacity resource clearing prices in the Dominion zone**

PJM-Baltimore Gas and Electric

- **Schedule X provides for power purchases from qualified cogenerator or small power producer**
- **Energy and capacity payments are paid based on applicable PJM market prices for time period when energy is produced and delivered to the Company, less any ancillary services costs and other related costs**

Source: http://www.bge.com/myaccount/billsrates/ratestariffs/electricservice/electric%20services%20rates%20and%20tariffs/p3_sch_x.pdf

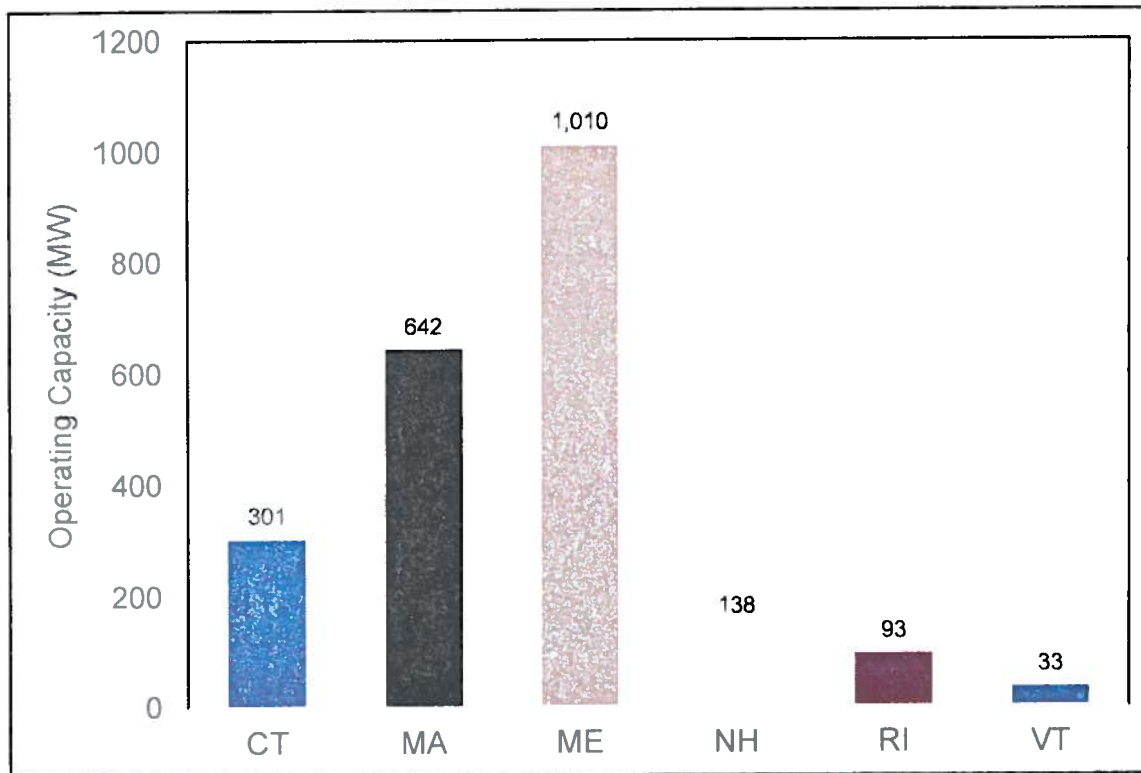
MISO-Entergy

- **Entergy has significant QF capacity in its Louisiana service territory**
- **Entergy joined MISO in December of 2013**
 - **Integrating QF load into the market and paying QFs at market-based rates was part of the value proposition for Entergy to join an RTO**
- **Once Entergy joined MISO, QFs had the choice to either become MISO market participants or continue to put their energy to Entergy at avoided cost rates**
 - **The latter are called Behind the Meter (BTM) QFs**
- **The LPSC approved Entergy's request to pay BTM QFs at market-based rates after joining MISO (Order U-32628-A)**
 - **Prices are primarily based on Real Time LMPs**

Qualifying Facilities in New England

- ☐ **Pre-2000 QF Operating Capacity**
 - ☐ **QF eligible generation Capacity which may not be using PURPA rates**
- ☐ **Post-2000 QF Operating Capacity**
 - ☐ **QF eligible generation Capacity which may not be using PURPA rates**

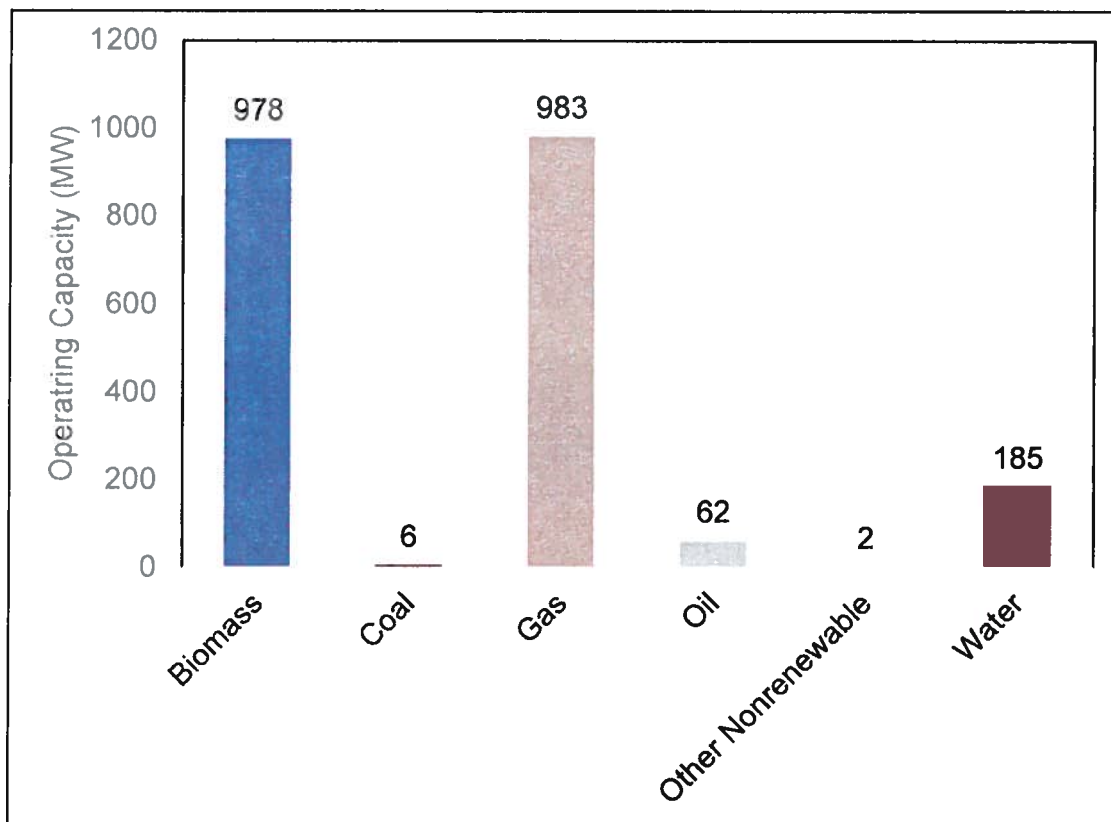
Pre-2000 QF Operating Capacity in New England



State	Total QF Operating Capacity (MW)
CT	301
MA	642
ME	1,010
NH	138
RI	93
VT	33
Grand Total	2,216

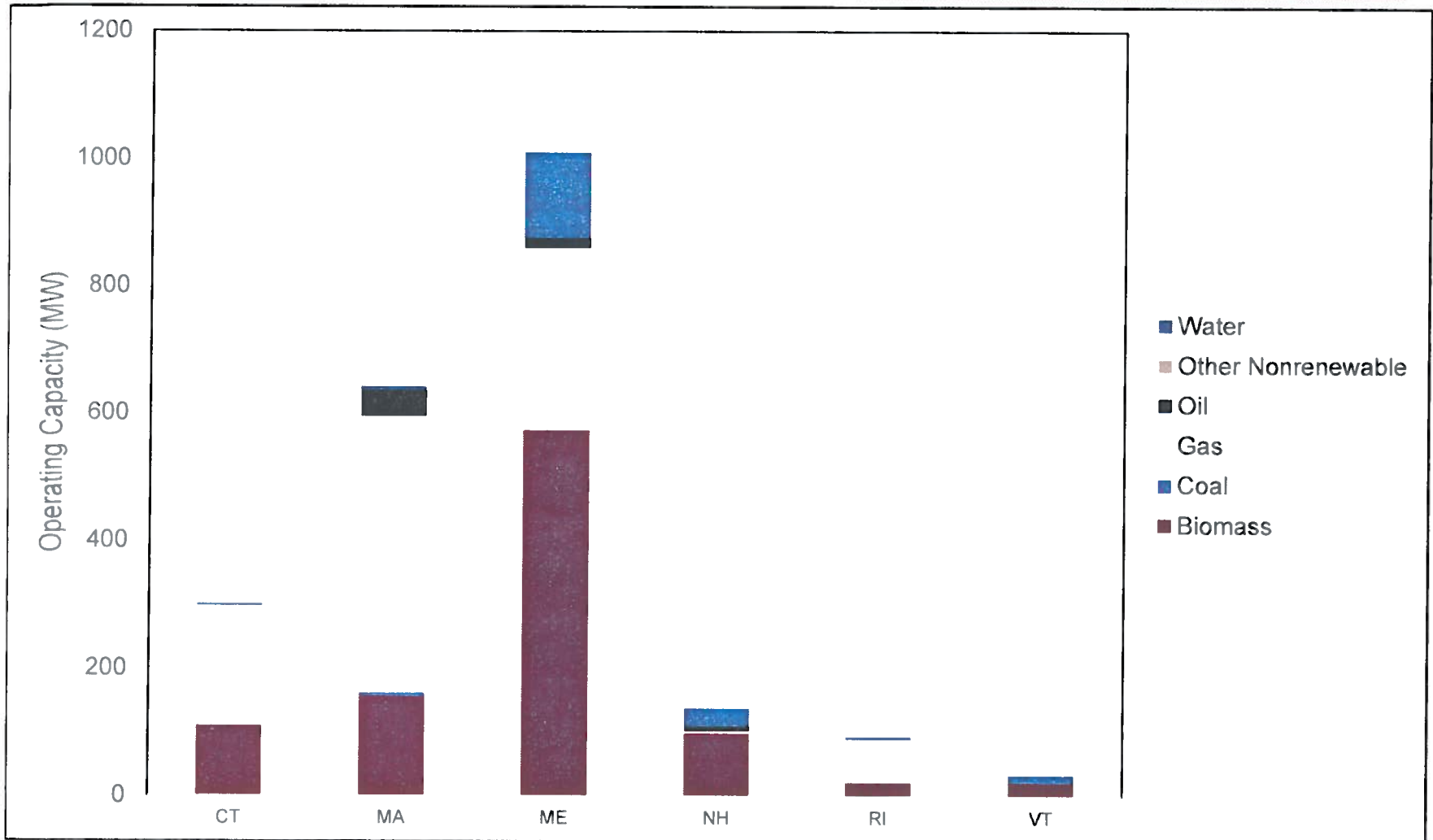
Source: Data retrieved using SNL

Pre-2000 QF Operating Capacity by Fuel in New England



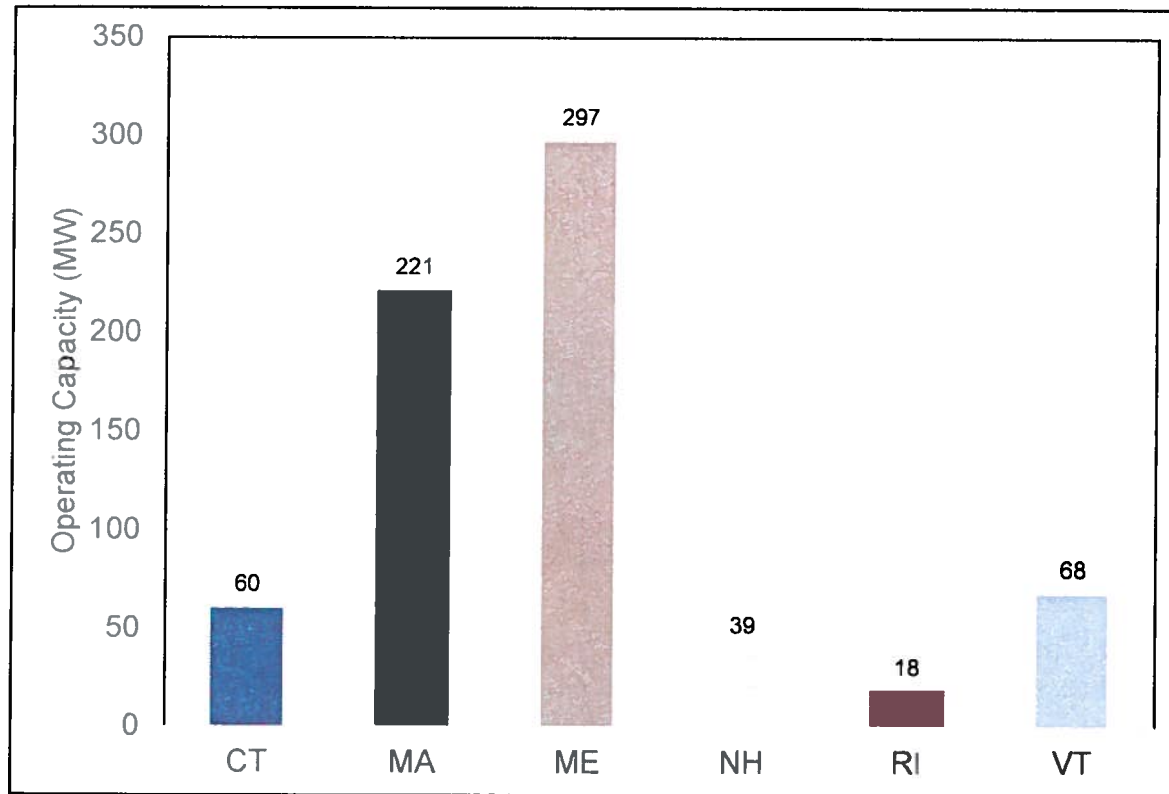
Fuel Type	Total QF Operating Capacity (MW)
Biomass	978
Coal	6
Gas	983
Oil	62
Other Nonrenewable	2
Water	185
Grand Total	2,216

Pre-2000 QF Operating Capacity by State and Fuel



Source: Data retrieved using SNL

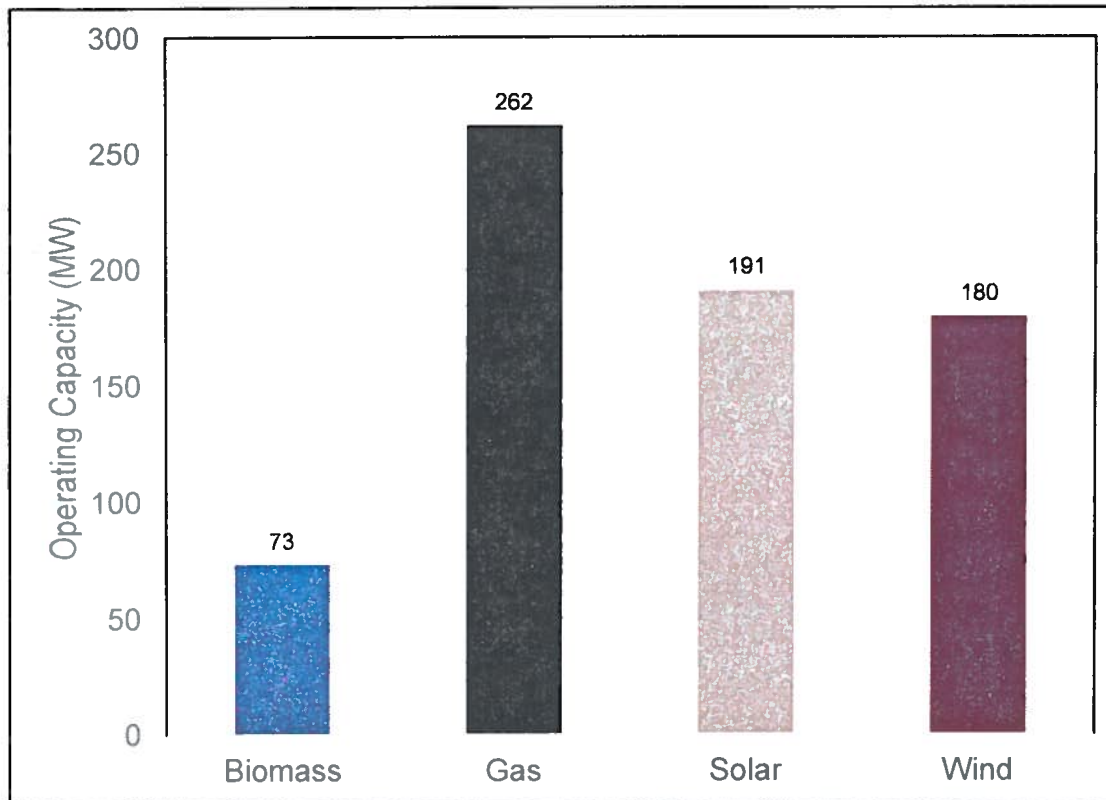
Post-2000 QF Operating Capacity in New England



State	Total QF Operating Capacity (MW)
CT	60
MA	221
ME	297
NH	39
RI	18
VT	68
Grand Total	705

Source: Data retrieved using SNL

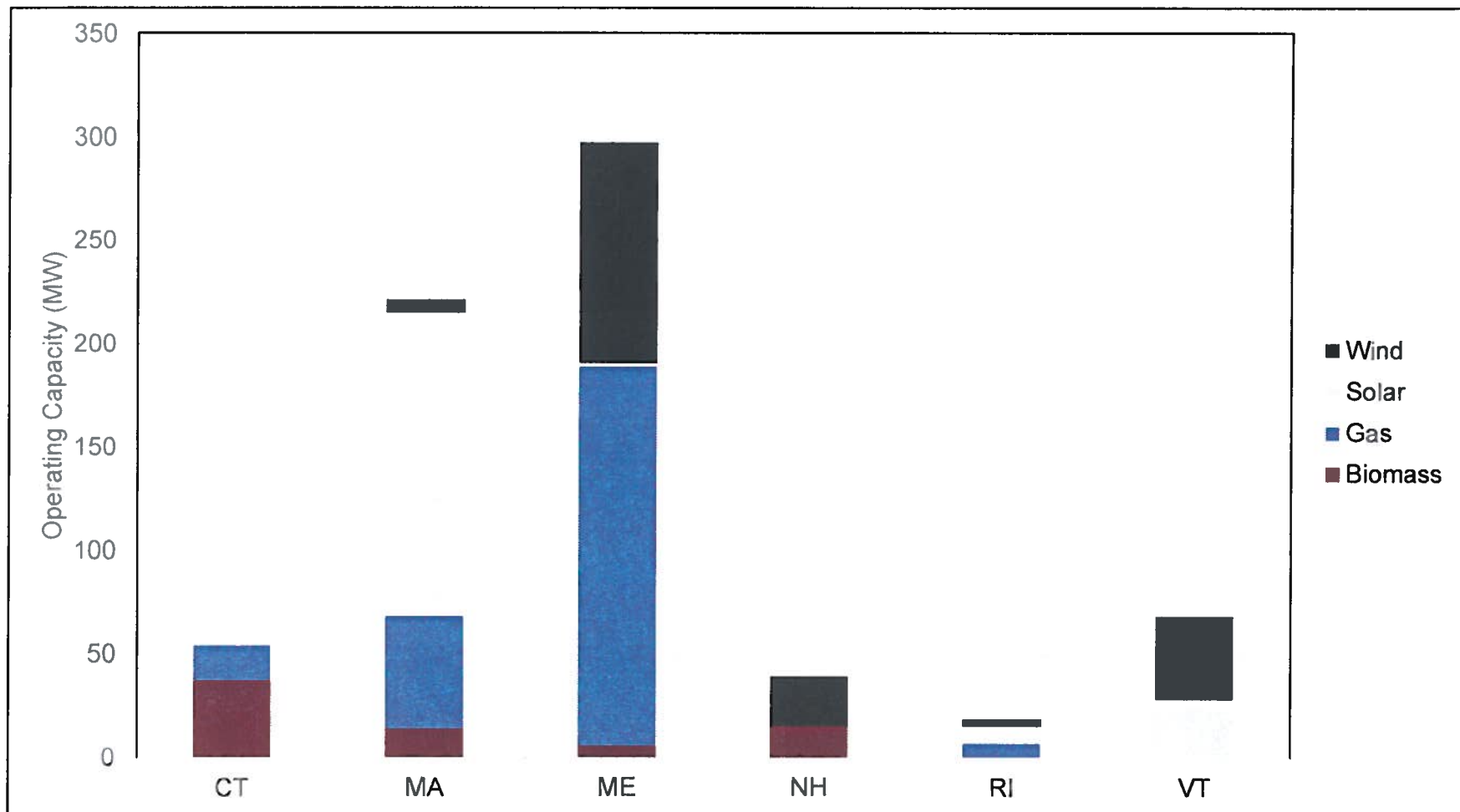
Post-2000 QF Operating Capacity by Fuel in New England



Fuel Type	Total QF Operating Capacity (MW)
Biomass	73
Gas	262
Solar	191
Wind	180
Grand Total	705

Source: Data retrieved using SNL

Post-2000 QF Operating Capacity by State and Fuel



Source: Data retrieved using SNL

N.H.P.U.C. No. 19 - ELECTRICITY

LIBERTY UTILITIES (GRANITE STATE ELECTRIC) CORP. D/B/A

LIBERTY UTILITIES

SUPERSEDING N.H.P.U.C. No. 18

TARIFF

for

RETAIL DELIVERY SERVICE

Applicable

in

Twenty-three towns in New Hampshire

served in whole or in part.

(For detailed description, see Service Area)

Dated: April 1, 2014
Effective: April 1, 2014

Authorized by Order No. 25,638 Issued March 17, 2014 in Docket No. DE 13-063

Issued by _____
Richard Leehr
Title: President
000325

N.H.P.U.C. No. 19 – ELECTRICITY
LIBERTY UTILITIES

Energy Transactions with Qualifying Facilities

ENERGY TRANSACTIONS WITH QUALIFYING FACILITIES

AVAILABILITY

The Company will purchase electric energy from any small power producer, cogenerator, or limited electric energy producer (collectively referred to as a qualifying facility, or QF) in its service territory (i) under the Limited Electrical Energy Producers Act (LEEPA, NH RSA Chapter 362-A) or (ii) under Section 210 of the Public Utility Regulatory Policies Act of 1978 (PURPA, 16 U.S.C. 824a-3) that meet the criteria specified by the Federal Energy Regulatory Commission (FERC) in 18 C.F.R. §§292.203 (a) and (b). Such purchases will be in excess of the facility's requirements.

TERMS AND CONDITIONS

Any QF that plans to sell its electric output to the Company from a facility sized up to 100 kVA or 100 kW must comply with the Company's interconnection requirements as set forth in Granite State Interconnection Standards Provisions For Inverters Sized Up To 100 kVA as found on Page 76 of this Tariff.

For all other QFs, the Company must be notified in writing at least 120 days prior to interconnecting the QF with the Company's facilities. Such notification shall, at a minimum, include the following information:

- a. The name, address and contact information of the applicant and location of the QF.
- b. A brief description of the QF, including a statement indicating whether such facility is a small power production facility or a cogeneration facility.
- c. The primary energy source used or to be used by the QF.
- d. The power production capacity of the QF and the maximum net energy to be delivered to the utility's facilities at any clock hour.
- e. The owners of the QF including the percentage of ownership by any electric utility or by any public utility holding company, or by any entity owned by either.
- f. The expected date of installation and the anticipated on-line date.
- g. The anticipated method of delivering power to the Company.
- h. A description of any power conditioning equipment to be located between the QF and the Company's system.
- i. A description of the type of generator used in the installation of the QF (synchronous, induction, photovoltaic, etc.).

Such notification shall be sent to:

Director of Engineering
Distribution Engineering Department
Liberty Energy Utilities (New Hampshire) Corp.
11 Northeastern Blvd
Salem NH 03079
Fax: 603-896-6175

The Company will respond to the notification within 30 days and either request additional information regarding the QF or provide site specific interconnection requirements. The Company and the QF shall execute the standard purchase power agreement setting forth the terms of the sale, a form of which is attached in Schedule A of this tariff.

Dated: April 1, 2014
Effective: April 1, 2014

Authorized by Order No. 25,638 Issued March 17, 2014 in Docket No. DE 13-063

Issued by: /s/Richard Lee
Richard Lee
Title: President

**N.H.P.U.C. No. 19 – ELECTRICITY
LIBERTY UTILITIES****Energy Transactions with Qualifying Facilities****PURCHASE OPTIONS**

QFs with a peak generating capacity of 1,000 kW and under may choose to utilize Net Energy Metering as specified in NH RSA 362-A:9 and in PUC 900 Net Metering For Customer-Owned Renewable Energy Generation Resources of 1,000 Kilowatt or Less.

QFs not utilizing Net Energy Metering shall have their electric energy output metered and purchased by the Company and then resold into the Real-Time Energy Market administered by ISO New England Inc. ("ISO-NE"). Such purchase will be equal to the payments received by the Company from ISO-NE less all charges imposed by ISO-NE for such sales.

The Company shall not purchase for resale any capacity or other reserve-related products associated with the QF. The Company will not purchase or own any of the generation attributes associated with the QF.

PAYMENT

For QFs not utilizing Net Energy Metering, within 30 days after the end of a month, the Company will provide the QF with a calculation showing the quantity of electric energy sold into the New England electric wholesale market, the payments received by the Company, and any charges imposed by ISO-NE on the Company for such sales. If the QF agrees with the Company's calculation, the QF will then issue an invoice to the Company for payment of such net electric energy sales. The Company reserves the right to require the QF to pay any administrative or service fees as may be assessed by the Company.

METERING

QFs selling to the Company shall install metering as specified by the Company that either (i) satisfy ISO-NE requirements or (ii) Net Energy Metering requirements, as both may change from time to time. QFs shall be charged a standard monthly service fee for metering service as approved by the appropriate regulatory agency.

INDEMNIFICATION

The QF shall defend, indemnify and hold the Company harmless from and against all claims for damage to the equipment of the QF, or Company, as the case may be, or damage or injury to any person or property arising out of the QF's use of generating equipment in parallel with the Company's own system; provided that nothing in this paragraph shall relieve the Company from liability for damages or injury caused by its own willful default or willful neglect.

Dated: April 1, 2014
Effective: April 1, 2014

Issued by: /s/Richard Leehr
Richard Leehr
Title: President

Authorized by Order No. 25,638 Issued March 17, 2014 in Docket No. DE 13-063

000327

EXJ-A 48

N.H.P.U.C. No. 19 – ELECTRICITY
LIBERTY UTILITIES

Energy Transactions with Qualifying Facilities

SCHEDULE A
GRANITE STATE ELECTRIC COMPANY
QUALIFYING FACILITY POWER PURCHASE AGREEMENT

The Agreement is between _____, a Qualifying Facility ("QF") and GRANITE STATE ELECTRIC COMPANY (the "Company") for electric energy purchases by the Company from the QF's facility located at _____, New Hampshire.

AGREEMENT TO PURCHASE

Effective as of _____, the Company agrees to purchase electricity from the QF and QF agrees to sell electricity to the Company under the terms and conditions of the Company's tariff for Energy Transactions with Qualifying Facilities ("QF Tariff") as currently in effect or amended by the Company in the Company's sole discretion and as approved by the New Hampshire Public Utilities Commission. The QF agrees to comply with the terms and conditions of the QF Tariff and associated policies of the Company that are on file with the New Hampshire Public Utilities Commission as currently in effect or as modified, amended, or revised by the Company, and to pay any metering and interconnection costs required under such tariff and policies.

PAYMENTS FOR ENERGY

The Company will pay the QF at rates equal to the payments received by the Company for electric energy sales from the QF's facility in the Real-Time Energy Market administered by ISO New England Inc. ("ISO-NE") net of all charges imposed by the ISO-NE for such sales, as provided for in the QF Tariff. The Company reserves the right to require the QF to pay any administrative or service fees as may be assessed by the Company.

NOTICE

The Company or QF may terminate this Agreement on thirty (30) days written notice which includes a statement of reasons for such termination.

AGREED AND ACCEPTED

Date:

Date:

Granite State Electric Company

Dated: April 1, 2014
Effective: April 1, 2014

Issued by: /s/Richard Leehr
Richard Leehr
Title: President

Authorized by Order No. 25,638 Issued March 17, 2014 in Docket No. DE 13-063

000328

EXJ-A 49

NHPUC No. 3 - ELECTRICITY DELIVERY

Unitil Energy Systems, Inc.

SUPPLEMENT NO. 2

TARIFF FOR

ELECTRIC DELIVERY SERVICE

IN THE STATE OF NEW HAMPSHIRE

(Authorized by NHPUC Order No. 25,124 in Docket No. DE 10-055 dated June 29, 2010)

Issued: June 29, 2010
Effective: July 1, 2010

Issued by: Mark H. Collin
Treasurer

NHPUC No. 3 – Electricity Delivery
Unitil Energy Systems, Inc.

Original Page 76

**RATES APPLICABLE TO QUALIFYING FACILITIES
SCHEDULE QF**

AVAILABILITY

The Company will purchase electricity from and provide certain service to any small power producer, cogenerator, or limited electrical energy producers (collectively referred to as a "Qualifying Facility" or, "QF") in its service territory as required by the New Hampshire Limited Electrical Energy Producer Act, N.H. RSA 362-A (LEEPA), or the Federal Public Utility Regulatory Policies Act Section 210 (PURPA).

PURCHASE RATES

Rates for Qualifying Facilities 1 MW or Greater

Qualifying Facilities that have a design capacity of 1 MW or greater shall have their output metered and purchased at rates equal to the payments received by the Company from the ISO-NE, net of all charges imposed by the ISO-NE for such output, for the hours in which the Qualifying Facility generated electricity in excess of its requirements.

Rates for Qualifying Facilities Less Than 1 MW

Qualifying Facilities with a design capacity less than 1 MW, shall have their output metered and purchased at rates equal to the arithmetic average of the Short-Run Energy rate in the calendar month, net of all charges imposed by the ISO-NE for such output, for the KWH which the Qualifying Facility generated electricity in excess of its requirements. The Short-Run Energy rate is the hourly market-clearing price for energy as determined by the ISO-NE and its successors.

Net Metering - Rates for Qualifying Facilities 25 kW or Less

Projects 25 kilowatts and under using solar, wind and/or hydro generation shall have the option of being served under Net Energy Metering as specified by NH RSA 362-A:9 and NHPUC Rules Chapter Puc 900, Net Metering For Customer-Owned Renewable Energy Generation Resources of 25 Kilowatts or Less.

Issued: October 20, 2006
Effective: November 1, 2006

Issued By: Mark H. Collin
Treasurer

000330

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NHPUC No. 3 – Electricity Delivery
Unitil Energy Systems, Inc.

Original Page 77

**RATES APPLICABLE TO QUALIFYING FACILITIES
SCHEDULE QF (continued)**

Rates for Capacity and Reserves-Related Products

The Company shall make payments to a Qualifying Facility for capacity and/or reserves-related products if the sale is recognized by ISO-NE as a capacity and/or reserves-related product sale. The Company shall pay rates equal to the payments received for the sale of any capacity and/or reserves-related products associated with such Qualifying Facility output to the ISO-NE, net of all charges imposed by the ISO-NE.

Line Losses

Energy for purchases shall be adjusted to reflect the costs or savings in line losses that result from purchases from the Qualifying Facility. Because the appropriate line loss factor and adjustment may be unique to each interconnection, the Company will adjust the line loss factor on a case by case basis.

PAYMENT

Payment by Company for Power Supplied

A Qualifying Facility selling power to the Company may choose to receive a check from the Company as payment for power supplied or may have payment credited towards its bill from the Company.

Payment by Customer for Interconnection Costs

These payment provisions shall apply to new Qualifying Facilities who are taking service under this schedule. The Qualifying Facility shall pay all incremental interconnection costs that are a direct result of connecting the Customer's power production equipment to the Company's distribution system, including the cost of engineering studies that will be used to provide a more accurate assessment of interconnection costs. The Company's procedures for interconnection studies and cost estimates are set forth in Section V of Unitil Interconnection Requirements for Customer Owned Generation. The incremental cost of interconnection, including the cost of engineering studies, shall be paid in advance of any work undertaken by the Company.

The incremental cost of interconnection includes the costs of installation, equipment, operations and maintenance expense, property taxes, insurance, and all incremental modifications

Issued: October 20, 2006
Effective: November 1, 2006

Issued By: Mark H. Collin
Treasurer

000331

EXJ-A 52

**RATES APPLICABLE TO QUALIFYING FACILITIES
SCHEDULE QF (continued)**

to the distribution and transmission system to the extent such incremental modifications are for the sole benefit of the customer-generator and are necessary to incorporate the Customer's generation into the Company's distribution system. Costs of system improvements and equipment installed to provide retail service to the Customer consistent with the Company's Terms and Conditions for Distribution Service shall be excluded from the incremental cost of interconnection.

INTERCONNECTION STANDARDS

The Company's interconnection standards for Qualifying Facilities located within its service territory are set forth in Unitil Interconnection Requirements for Customer Owned Generation. These standards for interconnection shall apply to all new Qualifying Facilities taking service under this Schedule. Wholesale transactions shall follow the interconnection requirements or standards set forth by the ISO-NE and the Federal Energy Regulatory Commission (FERC).

RATE FOR OTHER ELECTRICAL SERVICES

The Company shall, upon request by a Qualifying Facility, supply to a Qualifying Facility supplementary, back-up, maintenance, and interruptible power under the rate schedules applicable to all customers for such service, regardless of whether they generate their own power. Where it is possible for a Qualifying Facility to receive this service under the applicability clauses of more than one rate schedule, the Qualifying Facility may choose the rate schedule under which it will be served.

INDEMNIFICATION

The Qualifying Facility shall defend, indemnify and hold the Company harmless from and against all claims for damage to the Qualifying Facility's equipment or damage or injury to any person or property arising out of the Qualifying Facility's use of generating equipment in parallel with the Company's own system; provided that nothing in this paragraph shall relieve the Company from liability for damages or injury caused by its own willful default or willful neglect.

TARIFF PROVISIONS

The Company's complete Tariff where not inconsistent with any specific provisions hereof, is part of this Schedule.

N.H.P.U.C. NO. 21 ELECTRICITY

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NEW HAMPSHIRE ELECTRIC COOPERATIVE, INC

Rate QF

RATES AND TERMS FOR PURCHASES FROM QUALIFYING FACILITIES

Rates per kilowatt-hour of Energy delivered to be paid by the Cooperative under its short-term rate policy for purchases of energy and capacity from Qualifying Facilities ("QF's") under PURPA.

For QF's directly connected with NHEC's facilities and QF deliveries to the NEPOOL Pool Transmission Facilities ("PTF") for sale to NHEC, the energy rate for each month shall be the monthly average clearing price (arithmetic average of the month's hourly energy clearing prices) for the NEPOOL Real-Time Energy Market as finally determined by ISO-New England.

1. Short-term purchases shall be subject to written agreement between NHEC and the Qualifying Facility. NHEC requires a minimum 10-business days notice for initiation of purchases.
2. Rates per kilowatt-hour delivered shall be for Energy plus all NEPOOL market products to the extent provided in conjunction with such Energy.
3. Short-term purchases shall be for all-hours for single or multiple full calendar month periods.
4. The QF shall be responsible for transmission service and transmission losses to the NEPOOL PTF.

Issued: October 1, 2004

Effective: October 1, 2004

Issued by: Heather Kaufman
Title: Power Resources/Financial Consulting Manager

Authorized by NHPUC Order No. 23,449 in Docket No. 00-039 issued May 1, 2000

000333

EXJ-A 54

STATE OF NEW HAMPSHIRE

PUBLIC UTILITIES COMMISSION

May 27, 2015 - 1:04 p.m.
Concord, New Hampshire

NHPUC JUN15'15 PM 1:05

RE: IR 14-338
ELECTRIC UTILITIES:
Review of Default Service Procurement
Processes for Electric Distribution
Utilities.

PRESENT: Chairman Martin P. Honigberg, Presiding
Commissioner Robert R. Scott

Sandy Deno, Clerk

APPEARANCES: Reptg. Public Service of New Hampshire
d/b/a Eversource Energy:
Matthew J. Fossum, Esq.

Reptg. Liberty Utilities (Granite State
Electric) Corp.:
Sarah B. Knowlton, Esq.

Reptg. Unitil Energy Systems:
Gary Epler, Esq.

Reptg. NextEra Energy Power Marketing:
Susan S. Geiger, Esq. (Orr & Reno)

Reptg. Briar Hydro Associates:
Andrew Locke
Richard Normand

Court Reporter: Steven E. Patnaude, LCR No. 52

ORIGINAL

APPEARANCES: (C o n t i n u e d)

Reptg. Constellation Energy/Exelon:

Daniel Allegretti

Patricia Martin, *pro se*

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Meredith Hatfield, Esq., Director

Molly Connors

Reptg. Residential Ratepayers:

Susan Chamberlin, Esq., Consumer Advocate

Pradip Chattopadhyay

Office of Consumer Advocate

Reptg. PUC Staff:

Suzanne G. Amidon, Esq.

Leszek Stachow, Asst. Director/Electric Div.

Amanda Noonan, Director/Consumer Affairs Div.

Grant Siwinski, Electric Division

{IR 14-338} {05-27-15}

1 MR. ALLEGRETTI: Thank you, Mr.
2 Chairman. We're not supportive of the Briar Hydro
3 proposal. And, I want to try again giving you the
4 perspective of a wholesale supplier of default service.
5 We see this issue come up all the time in connection with
6 net metering programs. And, there is a tendency to
7 confound two fundamentally different products in the
8 marketplace. One is wholesale energy and the other is
9 retail electric service. When we bid to provide a default
10 service, we are offering to provide what is fundamentally
11 retail electric service down to the customer meter. And,
12 this includes a lot of things. It includes energy,
13 ancillary services, line losses, but it also includes a
14 bid component, which is managing the variable load risk.
15 Electricity is a completely unique product, in that it has
16 to be manufactured and delivered in the same instant that
17 it is consumed, without anyone telling you in advance how
18 much they're going to buy. That's a very tricky thing to
19 provide. And, it requires a large amount of portfolio
20 management. We have to put together a portfolio of
21 hedges, manage weather risk, bid the load into the
22 day-ahead market, we have to look at outage risks, we have
23 to look at gas prices. We do all of this from our trading
24 floor with a lot of people and a lot of effort. And, the

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1 cost of providing all of that service is bundled down into
2 a single number, a cents per kilowatt-hour. That is the
3 number we bid in a default service solicitation. It
4 includes all of these components, all of this service that
5 comes around the basic concept of energy.

6 By contrast, there is a wholesale price
7 of energy. If you happen to have some, you'd like to sell
8 it, there's a wholesale spot price, there's a day-ahead
9 price and a real-time price. And, we've been implementing
10 PURPA in this state and across the region in reliance on
11 this, this wholesale market, with either the day-ahead or
12 the spot price representing the avoided cost. Because
13 that's really the value of wholesale energy, that comes
14 without being scheduled well in advance, without coming in
15 a known schedule.

16 If we were to try and manage with
17 variable load risk on a portfolio of constantly changing
18 demand, and we add to that an unknown variability in the
19 supply coming out of a facility like Briar Hydro, it
20 actually creates more of a variable load risk, this
21 variable risk. It makes it more expensive and difficult
22 to manage that portfolio.

23 So, the idea that the value of the
24 energy coming out of Briar Hydro is comparable to the

{IR 14-338} {05-27-15}

1 retail electric price of default service is simply
2 confounding the two different products. And, we don't
3 believe that the proposal would result in lower costs to
4 the consumers. We think it would actually have the
5 opposite effects. That in states struggling with net
6 metering programs have discovered, the math ends up not
7 adding up. And, the EDCs end up having to sell the energy
8 back into the wholesale market, and then recover the
9 difference through reconciliation charges to customers.

10 So, there is a subsidy here. If you
11 want to subsidize hydroelectric generation, that's a
12 matter of state policy. There are more efficient ways to
13 do it than creating more variable load risk for default
14 service. So, we would strongly argue against adopting the
15 Briar Hydro proposal.

16 CHAIRMAN HONIGBERG: Does anyone on the
17 other side of the room want to comment on anything that
18 was just said by either Mr. Allegretti or Mr. Locke?
19 Looks like the answer to be "yes". Mr. Warshaw.

20 MR. WARSHAW: I do concur with Mr.
21 Allegretti's comments. And, you know, Briar Hydro has to,
22 you know, has to define "well, who is their competition?"
23 They're not a retail provider, they're a wholesale
24 generator. The other competition in that arena is other

{IR 14-338} {05-27-15}

Q-PSNH-18. Do any of the GSHA's QFs provide any ancillary services? If yes, please identify each resource, which services they provide, and how much did they provide in each year from 2012 through 2014.

Original Objection: GSHA objects based upon relevance and materiality. Whether a QF provides any ancillary service has absolutely no bearing on the determination of the correct avoided cost definition in this docket. GSHA also objects because it does not require, maintain or collect the specific member information requested in this data request.

Supplemental response: Mr. Norman is unaware of QFs providing ancillary services.