



State of New Hampshire  
Public Utilities Commission  
21 S. Fruit Street, Suite 10, Concord, NH 03301-2429



**DRAFT REVISED 6-16-16**

APPLICATION FORM FOR

**RENEWABLE ENERGY SOURCE ELIGIBILITY FOR  
CLASS I THERMAL SOURCES WITH RENEWABLE THERMAL ENERGY CAPACITY GREATER THAN  
200,000 BTU/HR**

*Pursuant to New Hampshire Administrative Code [PUC 2500](#) Rules*

- Please submit one (1) original and two (2) paper copies of the completed application and cover letter\* to:

Debra A. Howland  
Executive Director  
New Hampshire Public Utilities Commission  
21 South Fruit Street, Suite 10  
Concord, NH 03301-2429

- Send an electronic version of the completed application and the cover letter electronically to [executive.director@puc.nh.gov](mailto:executive.director@puc.nh.gov).

\* The cover letter must include complete contact information and identify the renewable energy class for which the applicant seeks eligibility. Pursuant to PUC 2505.01, the Commission is required to render a decision on an application within 45 days of receiving a completed application.

If you have any questions please contact Barbara Bernstein at (603) 271-6011 or  
[Barbara.Bernstein@puc.nh.gov](mailto:Barbara.Bernstein@puc.nh.gov).

**Only facilities that began operation after January 1, 2013 are eligible.**

Is this facility part of a Commission approved aggregation?

Yes \_\_\_\_\_ No \_\_\_\_\_

Aggregator's Company Name: \_\_\_\_\_

Aggregator Contact Information: \_\_\_\_\_

## Contents

Part 1. General Application Information.....	3
Part 2. Technology Specific Data.....	4
Part 3. Metering and Measurement of Thermal Energy and REC Calculations .....	5
Part 4. Affidavits.....	8
Application Checklist.....	9
Appendix A. Excerpt from Puc 2500 – Certain Thermal Metering Provisions .....	10

## Attachment Labeling Instructions

**Please label all attachments by Part and Question number to which they apply (e.g. Part 3-7). For electronic submission, name each attachment file using the Owner Name and Part and Question number (e.g. Pearson Part 3-7).**

## Part 1. General Application Information

Please provide the following information:

### Applicant

Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Town/City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Primary Contact: \_\_\_\_\_

Telephone: \_\_\_\_\_ Cell: \_\_\_\_\_

Email Address: \_\_\_\_\_

### Facility

Name: \_\_\_\_\_

Physical Address: \_\_\_\_\_

Town/City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

If the facility does not have a physical address, the Latitude: \_\_\_\_\_ & Longitude \_\_\_\_\_

### Installer

Name: \_\_\_\_\_

Installer License Number: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Town/City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Primary Contact: \_\_\_\_\_

Telephone: \_\_\_\_\_ Cell: \_\_\_\_\_

Email Address: \_\_\_\_\_

If the equipment was installed by the facility owner, check here:

### Facility Operator

If the facility operator is different from the owner, please provide the following:

Name: \_\_\_\_\_

Facility Operator Telephone Number: \_\_\_\_\_

## Independent Monitor

Name: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
Town/City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
Primary Contact: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Cell: \_\_\_\_\_  
Email Address: \_\_\_\_\_

## NEPOOL/GIS Asset ID and Facility Code

***In order to qualify your facility's thermal energy production for RECs, you must register with the NEPOOL – GIS. Contact information for the GIS administrator follows:***

**James Webb**  
**Registry Administrator, APX Environmental Markets**  
224 Airport Parkway, Suite 600, San Jose, CA 95110  
Office: 408.517.2174  
[jwebb@apx.com](mailto:jwebb@apx.com)

Mr. Webb will assist you in obtaining a GIS facility code and an ISO-New England asset ID number.  
GIS Facility Code # \_\_\_\_\_ Asset ID # \_\_\_\_\_

1. Has the facility been certified under another non-federal jurisdiction's renewable portfolio standards?  
Yes  No

If you selected yes, *please provide proof of certification in the form of an attached document as Attachment 1-1.*

2. *Attach any supplementary documentation that will help in classification of the facility as Attachment 1-9*

## Part 2. Technology Specific Data

### All Technologies

Fuel type (solar, geothermal, or biomass): \_\_\_\_\_  
Rated Thermal Capacity (Btu/hr): \_\_\_\_\_  
Date of initial operation using renewable fuels: \_\_\_\_\_

### Biomass

If a thermal biomass facility, provide proof of New Hampshire Department of Environmental Services approval that the facility meets the emissions requirements set forth in Puc 2500, as Attachment 2-1.

### Solar Thermal

If a solar thermal facility, please provide the Solar Rating and Certification Corporation rating based on Mildly Cloudy C (kBtu/day): \_\_\_\_\_

### Geothermal

If a geothermal facility, please provide the following:

The coefficient of performance (COP): \_\_\_\_\_

The energy efficiency ratio of the system: \_\_\_\_\_

## Part 3. Metering and Measurement of Thermal Energy and REC Calculations

This section deals with the thermal metering system including methods for calculation and reporting useful thermal energy. **A copy of PUC 2506.04 of the RPS rules is included as Appendix A.**

Using the table below, identify the thermal metering system or custom components (e.g., heat meters, flow meters, pressure and temperature sensors) used to measure the useful thermal energy and enter the accuracy of measurement for the entire system:

System or Component	Product name	Product Manufacturer	Model No.
Total System Accuracy (Percent)			

*Attach component specification sheets (Accuracy, Operating Ranges) as Attachment 3-1.*

*Attach a simple schematic identifying the location of each sensor that is part of the metering system as Attachment 3-2.*

Check the applicable standard for meter accuracy prescribed in Puc 2506.04 among the six choices below (compliance with Puc 2506.04 shall be certified by a professional engineer licensed by the state of New Hampshire and in good standing):

*If the facility is a large thermal source using a liquid or air based system, check the method that applies:*

- A. Installation and use of heat meters capable of meeting the accuracy provisions of European Standard EN 1434 published by CEN, the European Committee for Standardization. The heat meter shall have the highest Class flow meter that will cover the design flow range at the point of measurement and a temperature sensor pair of Class 5K or lower.
- B. Installation and use of meters that do not comply with European Standard EN 1434, provided that the manufacturers' guaranteed accuracy of the meters is  $\pm 5.0\%$  or better,
- C. Use of an alternative metering method approved pursuant to Puc 2506.06.

*If the facility is a large thermal source using a steam-based system, check the method that applies:*

- D. Installation and use of meters with accuracy of  $\pm 3.0\%$  or better.
- E. Installation and use of meters with system accuracy that do not meet D but are  $\pm 5\%$  or better.
- F. Use of an alternative metering method approved pursuant to Puc 2506.06.

Please summarize the manufacturer's recommended methods and frequency for metering system calibration and provide reference for source document (e.g. owners/operators manual):

REC Calculation Discount factor for meter accuracy (Enter 0 if no discount is required): \_\_\_\_\_ %

If the meters used to measure useful thermal energy comply with the accuracy of the European Standard EN 1434 for liquid systems or use of meters with accuracy of  $\pm 3.0\%$  or better for steam systems enter zero, for all other systems enter the sum total of the manufacturer's guaranteed accuracy of the meters used or the accuracy of the alternative method approved pursuant to Puc 2506.06.

REC Calculation Discount factor for operating energy and thermal energy losses: \_\_\_\_\_ %

*Check the method used for determining the operating energy and thermal loss factor among the choices below:*

**Default Factor**

- For sources using solar thermal technology, the discount factor shall be 3.0% of the useful thermal energy produced;
- For sources using geothermal technology, the discount factor shall be 3.6% of the useful thermal energy produced;
- For sources using thermal biomass renewable energy technology, the discount factor shall be

2.0% of the useful thermal energy produced.

**Actual Metering**

- Include a simple schematic identifying the operating energy and thermal energy losses and placement of the meters.

### Interim Alternative Metering Method

Until such time as the Puc 2500 rule is finalized applicants may utilize an alternative method as described in the draft rule 2505.02(e)(2):

*In lieu of the information required by Puc 2505.02 (d) (11) through (13), a thermal source may submit a detailed explanation of the methodology used to measure and calculate thermal energy and an attestation by a professional engineer that is licensed in New Hampshire and in good standing that the methodology for measuring useful thermal energy and calculating certificates is sound.*

### Application Checklist

Please complete the following table to assist in the review of the application for REC eligibility.

Table 1: Description of the Equipment & Meters [Puc 2505.02 (d)(3)-(5),(10)-(14 ), 2506.04 (b)-(f), (m), & 2506.05]									
		C = Provided in compliance with Puc 2500			NC = Compliance with Puc 2500 not demonstrated			N/A = Not Applicable	
*if applicable	PUC 2500 Rule	Attachment #	Page #	Mass Flow Meter	Steam or Supply Water Temperature Sensor	Steam Pressure Sensor	Condensate or Return Water Temperature Sensor	Condensate Pressure Sensor	Thermal Energy Monitoring System
Product Name	2505.02(d)(3)								
Product Manufacturer*	2505.02(d)(3)								
Model #*	2505.02(d)(3)								
Total System Accuracy	99%	2506.04(e),(f)							
Placement of sensor*	2506.02(d)(3)								
Temperature operating range*	2506.02(d)(3)								
Flow operating range*	2506.02(d)(3)								
Pressure operating range*	2506.02(d)(3)								
Manufacturer's meter calibration recommendations	2506.02(d)(4)								
Manufacturer's guaranteed accuracy	2506.05(d)(10)								
Useful thermal energy methodology & calculation	2506.04(m)								
Meter accuracy discount factors*	2505.02(d)(13)								
Discount factor for operating energy & thermal losses*	2505.02(d)(14)								
Thermal energy data read hourly	2506.04(c)								
Thermal energy totaled every 24 hours	2506.04(c)								
Thermal energy totaled monthly	2506.04(c)								
Thermal energy totaled quarterly	2506.04(c)								
Manufacturer's specifications for heat meters followed	2506.04(d)								
Rated thermal heating capacity	<i>Btu/hr</i>			<i>MW</i>		<i>calculation</i>			
	2,000,000			0.586142		2,000,000/3,412.142 = 586.14207 kW			

## Part 4. Affidavits

### Owners Affidavit

The following affidavit must be completed by the owner attesting to the accuracy of the contents of the application pursuant to PUC 2505.02 (b) (14).

#### AFFIDAVIT

I, \_\_\_\_\_ have reviewed the contents of this application and attest that it is accurate and is signed under the pains and penalties of perjury.

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_

Applicant's Printed Name \_\_\_\_\_

Subscribed and sworn before me this \_\_\_\_\_ Day of \_\_\_\_\_ (month) in the year \_\_\_\_\_

County of \_\_\_\_\_ State of \_\_\_\_\_

\_\_\_\_\_  
Notary Public/Justice of the Peace Seal

My Commission Expires \_\_\_\_\_

### NH Professional Engineer Affidavit

#### AFFIDAVIT

I, \_\_\_\_\_ attest that this facility meets the requirements of the thermal REC eligibility requirements of Puc 2500, including the thermal metering and measurement methodologies and standards and REC calculation methodologies.

Professional Engineer's Signature \_\_\_\_\_ Date \_\_\_\_\_

Professional Engineer's Printed Name \_\_\_\_\_

NH Professional Engineer License Number \_\_\_\_\_

PE Stamp

Application Checklist				
Application Section		Item Description	Attachment Required	Check box
Part 1-1		Applicant Information		<input type="checkbox"/>
Part 1-2		Facility Location Information		<input type="checkbox"/>
Part 1-3		Installer Contact Information		<input type="checkbox"/>
Part 1-4		Equipment Seller Information		<input type="checkbox"/>
Part 1-5		Facility Monitor Information		<input type="checkbox"/>
Part 1-6		Regulatory Approvals for REC Requirements	Yes	<input type="checkbox"/>
Part 1-7		Other REC Certifications		<input type="checkbox"/>
Part 1-8		Facility Output Information		<input type="checkbox"/>
Part 1-9		Facility Operator Information		<input type="checkbox"/>
Part 1-10		Additional Facility Classification Information		<input type="checkbox"/>
Part 1-11		Attestation that Building Codes are Met		<input type="checkbox"/>
Part 2-1		Rated Thermal Capacity		<input type="checkbox"/>
Part 2-2a		Thermal Biomass Facility, 3-99 MMBTu/hour Output		<input type="checkbox"/>
Part 2-2b		Thermal Biomass Facility, 100+ MMBTu/hour Output		<input type="checkbox"/>
Part 2-3		Solar Thermal Facility Solar Rating and Certification Corporation Rating		<input type="checkbox"/>
Part 2-4a		Geothermal Facility Coefficient of Performance		<input type="checkbox"/>
Part 2-4b		Geothermal Facility Energy Efficiency Ratio		<input type="checkbox"/>
Part 3-1		Equipment and Meter Description		<input type="checkbox"/>
Part 3-2		Recommended Methods for Meter Calibration		<input type="checkbox"/>
Part 3-3		Attestation that Meters meet PUC 2506 Requirements		<input type="checkbox"/>
Part 3-4		Guaranteed Accuracy of Meters		<input type="checkbox"/>
Part 3-5a		Small Thermal Source- Calculating Useful Thermal Out		<input type="checkbox"/>
Part 3-5b		Large Thermal Source- Calculating Useful Thermal Out		<input type="checkbox"/>
Part 3-6		Meter Accuracy Discount Factor		<input type="checkbox"/>
Part 3-7a		PUC 2506 Operating Energy and Thermal Loss Discount Factor		<input type="checkbox"/>
Part 3-7b		Determining Operating Energy and Thermal Loss Discount Factor		<input type="checkbox"/>
Part 4-1		Owner Affidavit		<input type="checkbox"/>
Part 4-2		Professional Engineer Affidavit		<input type="checkbox"/>

## Appendix A. Excerpt from Puc 2500 – Certain Thermal Metering Provisions

For complete rules and requirements related to the RPS and REC eligibility, please refer to [Puc 2500](#).

### Puc 2506.04 Metering of Sources that Produce Useful Thermal Energy

(a) Sources producing useful thermal energy shall comply with this part in metering production of useful thermal energy.

(b) Sources shall retain an independent monitor to verify the useful thermal energy produced.

(c) Sources shall take data readings for the measurement of useful thermal energy at least every hour. The useful thermal energy produced shall be totaled for each 24 hour period, each monthly period, and each quarter.

(d) Sources shall install meters to measure thermal energy output in compliance with the manufacturer's recommendations and as noted in this part.

(e) Large thermal sources using a liquid or air based system shall measure the useful thermal energy produced using one of the following methods:

(1) Installation and use of heat meters with an accuracy that complies with European Standard EN 1434 published by CEN, the European Committee for Standardization, and that complies with paragraph (k), (l) or (m). The heat meter shall have the highest Class flow meter that will cover the design flow range at the point of measurement and a temperature sensor pair of Class 5K or lower. Compliance shall be certified by a professional engineer licensed by the state of New Hampshire and in good standing;

(2) Installation and use of meters that do not comply with subparagraph (e) (1), provided that the manufacturers' guaranteed accuracy of the meters is  $\pm 5.0\%$  or better, and provided that a professional engineer licensed by the state of New Hampshire and in good standing certifies that the meters were installed and operate according to the manufacturers' specifications and in accordance with paragraph (k), (l) or (m); or

(3) Use of an alternative metering method approved pursuant to Puc 2506.06, provided that the accuracy of any such method is  $\pm 5.0\%$  or better, and provided that a professional engineer licensed by the state of New Hampshire and in good standing certifies that the source implemented the alternative method as approved by the commission and certifies that the alternative method achieves the stated accuracy of  $\pm 5.0\%$  or better.

(f) Large thermal sources using a steam-based system shall measure the useful thermal energy produced using one of the following methods:

(1) Installation and use of meters with accuracy of  $\pm 3.0\%$  or better, which compliance shall be certified by a professional engineer licensed by the state of New Hampshire and in good standing and in accordance with paragraph (m);

(2) Installation and use of meters that do not comply with the accuracy of subparagraph (f) (1), provided that the manufacturer's guaranteed accuracy of the meters is  $\pm 5.0\%$  or better, and provided that a professional engineer licensed by the state of New Hampshire and in good standing certifies that the meters were installed and operate according to the manufacturer's specifications and in accordance with paragraph (m); or

(3) Use of an alternative metering method approved pursuant to this section, provided that the accuracy of any such method is  $\pm 5.0\%$  or better, and provided that a professional engineer licensed by the state of New Hampshire and in good standing certifies that the source implemented the alternative method as approved by the commission and certifies that the alternative method achieves the stated accuracy of  $\pm 5.0\%$  or better.

(g) Small thermal sources shall measure useful thermal energy produced using one of the following methods:

(1) For any small thermal sources, the methods described in paragraphs (e) or (f);

(2) For small thermal sources using solar thermal technologies, the method described in paragraph (h);

(3) For small thermal sources using geothermal technologies, the method described in paragraph (i); or

(4) For small thermal sources using thermal biomass technologies, the method described in paragraph (j).

(h) Calculation of useful thermal energy produced by small thermal sources using solar technologies.

(1) "Q" means thermal energy generated, stated in Btu's.

(2) "R" means the Solar Rating and Certification Corporation (SRCC) OG100 rating on Mildly Cloudy C Conditions, stated in thousands of Btu's per day.

(3) "L" means the orientation and shading losses calculated based on solar models such as Solar Pathfinder, T-sol, Solmetric, or another model approved by the Commission, converted from a percentage to the equivalent number less than 1.

(4) "t" means the total operating run time of the circulating pump as metered, stated in hours.

(5) "h" means 11 hours per day to convert the SRCC OG100 rating to an hourly basis (conversion factor).

(6) To calculate Q, the useful thermal energy produced by small thermal sources using solar technologies, the source shall compute the product of R, t and the result of 1 minus L, and divide the result by the product of h and 1,000, as in the formula below:

$$Q = [R * t * (1 - L)] / (h * 1,000)$$

(i) Calculation of useful thermal energy produced by small thermal sources using geothermal technologies.

- (1) “Q” means thermal energy generated, stated in Btu’s.
- (2) “HC” means the Air Conditioning, Heating and Refrigeration Institute (AHRI) certified heating capacity at part load, stated in Btu’s per hour.
- (3) “COP” means the AHRI Certified Coefficient of Performance.
- (4) “t” means total operating run time of the pump when the entering water temperature is greater than the leaving water temperature, stated in hours.
- (5) Small thermal sources using geothermal technologies may calculate Q, the useful thermal energy produced, by multiplying HC by the difference between COP and 1, multiplying the result by t, and dividing the result by COP, as in the formula below:

$$Q = [HC * (COP - 1) * t] / COP$$

(j) Calculation of useful thermal energy produced by small thermal sources using thermal biomass renewable energy technologies.

- (1) “Q” means the thermal energy generated, stated in Btu’s.
- (2) “D” means the default pellet density, which shall be 0.0231 pounds per cubic inch.
- (3) “R” means the auger revolutions per hour.
- (4) “V” means auger feed volume, stated in cubic inches per auger revolution. Small thermal sources shall assume that V equals one of the following:
  - a. 5 cubic inches per revolution for augers with a 2” inside diameter;
  - b. 20 cubic inches per revolution for augers with a 3” inside diameter;
  - c. 50 cubic inches per revolution for augers with a 4” inside diameter;
  - d. 95 cubic inches per revolution for augers with a 5” inside diameter; or
  - e. 150 cubic inches per revolution for augers with a 6” inside diameter.
- (5) “EC” means the default energy content of pellet fuel, which shall be 7870 Btu per pound.
- (6) “ASE” means the default thermal efficiency expressed as a percentage based on the manufacturer’s warranty of average seasonal thermal efficiency, or based on a default thermal efficiency of 65%.
- (7) “t” means the total auger run time in hours as metered.

(8) The estimated amount of fuel burned (the product of D, R, V and t) shall be verified by the fuel purchase records and fuel inventory.

(9) Small thermal sources using thermal biomass renewable energy technologies with wood pellets as the fuel source may calculate Q, the useful thermal energy produced, by computing the product of D, R, V, EC, ASE and t, as in the formula below:

$$Q = (D * R * V * EC * ASE * t)$$

(k) Thermal sources using solar thermal technologies.

(1) “ $Q_g$ ” means the heat generated in the collector loop, stated in Btu’s.

(2) “ $dm/dt$ ” means the mass flow of the collector working fluid measured near the inlet to the solar storage tank, stated in pounds per hour.

(3) “ $c_p$ ” means the specific heat of the collector fluid, stated in Btu’s per pound (mass), degrees Fahrenheit (BTU/lbm-°F).

(4) “ $T_i$ ” means the collector loop inlet temperature measured near the outlet of the solar storage tank, stated in degrees Fahrenheit.

(5) “ $T_o$ ” means the collector loop outlet temperature measured near the inlet to the solar storage tank, stated in degrees Fahrenheit.

(6) “ $t$ ” means the frequency at which data readings are recorded, stated in hours.

(7) Meter sensors shall be installed on the collector loop as close to the water storage tank as practical and in accordance with the meter manufacturer’s guidance.

(8) Thermal sources using solar thermal technologies shall calculate Q, the useful thermal energy produced, by calculating the product of  $dm/dt$ ,  $c_p$ , the difference between  $T_o$  and  $T_i$ , and t, as stated in the formula below:

$$Q_g = (dm/dt) * c_p * (T_o - T_i) * t$$

(l) Thermal sources using geothermal technologies.

(1) “ $Q_g$ ” means heat generated in the ground loop, stated in BTU’s.

(2) “ $dm/dt$ ” means mass flow measured near the outlet of the ground loop, stated in pounds per hour.

(3) “ $c_p$ ” means specific heat of the working fluid, stated in BTU/lbm-°F.

(4) “ $t$ ” means the frequency at which data readings are recorded, stated in hours.

(5) “ $T_i$ ” means ground loop inlet temperature measured at the inlet to the ground loop, stated in degrees Fahrenheit.

(6) “To” means ground loop outlet temperature measured at the outlet from the ground loop, stated in degrees Fahrenheit.

(7) Bleed points, supplemental boilers and cooling towers shall be excluded from the calculation.

(8) Meter sensors shall be installed on the ground loop as close to the ground loop inlet and outlet as practical and in accordance with the manufacturer’s recommendation.

(9) Thermal sources using geothermal technologies shall calculate Q, the useful thermal energy produced, by calculating the product of dm/dt, c<sub>p</sub>, the difference between To and Ti, and t, as stated in the formula below:

$$Q_g = (dm/dt) * c_p * (T_o - T_i) * t$$

(m) Thermal sources using thermal biomass renewable energy technologies.

(1) “Q<sub>g</sub>” means the thermal energy generated from biomass, stated in Btu.

(2) “dm<sub>out</sub>/dt” means mass flow metered upstream of distribution and downstream of parasitic loads, stated in pounds per hour.

(3) “h<sub>out</sub>” means the specific enthalpy at the metering point determined by temperature data and, for superheated steam, by pressure data, stated in Btu’s per pound.

(4) “dm<sub>in</sub>/dt” means mass flow of water into the feedwater or condensate pumps, stated in pounds per hour.

(5) “h<sub>in</sub>” means the specific enthalpy at the metering point which will be a function of the enthalpy of incoming condensate and make-up water prior to the first condensate or feedwater pumps, stated in Btu’s per pound.

(6) “t” means the frequency at which data readings are recorded, stated in hours.

(7) All metering systems shall measure boiler feedwater flow, pressure and temperature as close to the first feedwater pump inlet as possible, thereby excluding the deaerator.

(8) Metering for systems that produce hot water shall include sensors for temperature and hot water mass flow placed as close as possible to the boiler hot water distribution header inlet.

(9) Metering for systems that produce steam shall include sensors for temperature, pressure and steam flow placed as close as possible to the steam distribution header inlet and thereby prior to distribution to process loads.

(10) For saturated steam systems, pressure and temperature shall be measured to verify the absence of superheat at the measurement point.

(11) For superheated systems, both pressure and temperature measurements shall be required.

(12) Regardless of phase, the enthalpy under the measured conditions shall either be calculated using International Association for the Properties of Water and Steam (IAPWS) Industrial Formulation 1997 (IF97) formulas or taken from IAPWS or derivative steam tables.

(13) Thermal sources using thermal biomass renewable energy technologies shall calculate  $Q_g$ , the useful thermal energy produced, by calculating the product of  $dm_{out}/dt$ ,  $(h_{out})$ , and  $t$ , and subtract from that number the product of  $dm_{in}/dt$ ,  $h_{in}$  and  $t$ , as stated in the formula below:

$$Q_g = [dm_{out}/dt * (h_{out}) * t] - [dm_{in}/dt * (h_{in}) * t]$$

Puc 2506.05 Calculation of Certificates for Production of Useful Thermal Energy

(a) Sources producing useful thermal energy, the independent monitor or the designated representative shall report to GIS the useful thermal energy produced and the amount of RECs calculated pursuant to this part, as verified by the source's independent monitor.

(b) Useful thermal energy shall be expressed and reported in megawatt-hours where each 3,412,000 Btu's of useful thermal energy is equivalent to one megawatt-hour.

(c) Small thermal sources shall receive certificates based on the useful thermal energy produced as metered pursuant to Puc 2506.04(e) or (f) and discounted, as applicable, by the discount for meter accuracy pursuant to paragraph (e) or as calculated pursuant to Puc 2506.04(h), (i), or (j).

(d) Large thermal sources shall receive certificates based on the useful thermal energy calculated pursuant to Puc 2506.04(e) or (f), discounted by the sum of the percentage discount for meter accuracy pursuant to paragraph (e) and the percentage discount for operating energy and thermal storage losses, or parasitic load, pursuant to paragraph (f).

(e) The discount factor for meter accuracy referenced in paragraphs (c) and (d) shall be one of the following:

(1) If the meters used to measure useful thermal energy output comply with the accuracy of the European Standard EN 1434 as provided in Puc 2506.04(e)(1) or the accuracy pursuant to Puc 2506.04(f)(1), there shall be no meter accuracy discount; or

(2) If the meters used to measure useful thermal energy output do not comply with the accuracy of the European Standard EN 1434 as provided in Puc 2506.04(e)(1) or the accuracy pursuant to Puc 2506.04(f)(1), the applicable meter discount shall be the manufacturer's guaranteed accuracy of the meters used or the accuracy of the alternative method approved pursuant to Puc 2506.06.

(f) The discount factor for large thermal sources for parasitic load referenced in paragraph (d) shall be one of the following:

(1) For sources using solar thermal technology, the discount factor shall be 3.0% of the useful thermal energy produced as measured pursuant to Puc 2506.04;

(2) For sources using geothermal technology, the discount factor shall be 3.6% of the useful thermal energy produced as measured pursuant to Puc 2506.04;

(3) For sources using thermal biomass renewable energy technology, the discount factor shall be 2.0% of the useful thermal energy produced as measured pursuant to Puc 2506.04; or

(4) The discount factor shall be the source's actual metering of the parasitic load.

Puc 2506.06 Request for Alternative Method for Measuring Thermal Energy

(a) A source shall not use an alternative metering method until that alternative method is approved by the commission.

(b) A source seeking approval of an alternative method shall submit an application to the commission that includes the following information:

(1) The name, mailing address, daytime telephone number, and e-mail address of the person requesting approval for the alternative method;

(2) The name and location of the source at which the alternative method will be implemented;

(3) A description of the metering method otherwise required by these rules and the reasons it cannot be used with the applicant's facility;

(4) A description of the proposed alternative method;

(5) Technical data and information demonstrating that the accuracy of the method otherwise required by these rules will be substantially achieved by the proposed alternative method (such data and information may include third party data such as product test results from independent test laboratories, performance data based on nationally recognized product test/certification programs, published resource data for use in calculations, and examples of the use of the method by other organizations for similar purposes); and

(6) Certification by a professional engineer licensed by the state of New Hampshire and in good standing of the meter accuracy rate that will be achieved by the alternative metering method and that the proposed alternative method is technologically sound.

(a) Electricity generation in megawatt-hours and useful thermal energy expressed in megawatt-hours shall be measured and verified in accordance with ISO-NE and GIS operating rules and this Part.

(c) The commission shall approve an alternative metering method that satisfies the requirements of paragraph (b).