NEW HAMPSHIRE'S THERMAL RENEWABLE PORTFOLIO STANDARD PROVISIONS

Elizabeth Nixon
NH Public Utilities Commission
November 7, 2013

RPS Legislation

- Enacted in July 2007. RSA 362-F.
- Established REC requirement for 4 classes:
  - Class I: New sources (wind, biomass, methane gas, etc.) and new capacity added to existing biomass, LFG, and hydro facilities (Began operation after January 1, 2006)
  - Class II: Photovoltaic systems
  - Class III: Existing biomass < 25 MW and landfill gas facilities
  - Class IV: Existing small hydro facilities < 5 MW

RPS Legislation –Thermal

- SB218 became effective June 19, 2012.
- Created Class I sub-class for useful thermal renewable energy.
- Class I REC requirement of 0.2% to be met with thermal resources beginning 2013; delayed by an Order of the Commission to January 1, 2014 at 0.4%.
- Recent legislation (SB 148 and HB542) revised the % obligation to ramp it up faster
- Requires NHPUC to adopt procedures for the metering, verification, and reporting of useful thermal energy output. RSA 362-F:13 VI-a

Key Provisions - Definition

Useful Thermal Energy means

renewable energy derived from Class I sources that can be metered and is delivered in NH to an end user in the form of direct heat, steam, hot water, or other thermal form that is used for heating, cooling, humidity control, process use or other valid thermal end use requirements and for which fuel or electricity would otherwise be consumed. RSA 362-F:2, XV-a.

Key Provisions - Percent Obligation

Calendar Year	Total Requirement	Total Class I	Thermal Class I	Class II	Class III	Class IV
2008	4.00%	0.00%	0.00%	0.00%	3.50%	0.50%
2009	6.00%	0.50%	0.00%	0.00%	4.50%	1.00%
2010	7.54%	1.00%	0.00%	0.04%	5.50%	1.00%
2011	9.58%	2.00%	0.00%	0.08%	6.50%	1.00%
2012	5.55%	3.00%	0.00%	0.15%	1.40%	1.00%
2013	6.80%	3.80%	0.00%	0.20%	1.50%	1.30%
2014	9.70%	5.00%	0.40%	0.30%	3.00%	1.40%
2015	15.80%	6.00%	0.60%	0.30%	8.00%	1.50%
2016	16.70%	6.90%	1.30%	0.30%	8.00%	1.50%
2017	17.60%	7.80%	1.40%	0.30%	8.00%	1.50%
2018	18.50%	8.70%	1.50%	0.30%	8.00%	1.50%
2019	19.40%	9.60%	1.60%	0.30%	8.00%	1.50%
2020	20.30%	10.50%	1.70%	0.30%	8.00%	1.50%
2021	21.20%	11.40%	1.80%	0.30%	8.00%	1.50%
2022	22.10%	12.30%	1.90%	0.30%	8.00%	1.50%
2023	23.00%	13.20%	2.00%	0.30%	8.00%	1.50%
2024	23.90%	14.10%	2.00%	0.30%	8.00%	1.50%
2025	24.80%	15.00%	2.00%	0.30%	8.00%	1.50%

Key Provisions – Est. MWH RECs

Calendar Year	Total Retail Sales to Retail Customers (MWh)*	Total Class I	Thermal Class I	Class II	Class III	Class IV	Total Obligation
2008	10,550,550	0	0	0	369,269	52,753	422,022
2009	10,202,233	51,011	0	0	459,100	102,022	612,134
2010	10,631,756	106,318	0	4,253	584,747	106,318	801,634
2011	10,610,657	212,213	0	8,489	689,693	106,107	1,016,501
2012	10,681,310	320,439	0	16,022	149,538	106,813	592,813
2013	10,841,530	411,978	0	21,683	162,623	140,940	737,224
2014	11,004,153	550,208	44,017	33,012	330,125	154,058	1,067,403
2015	11,169,215	670,153	67,015	33,508	893,537	167,538	1,764,736
2016	11,336,753	782,236	147,378	34,010	906,940	170,051	1,893,238
2017	11,506,805	897,531	161,095	34,520	920,544	172,602	2,025,198
2018	11,679,407	1,016,108	175,191	35,038	934,353	175,191	2,160,690
2019	11,854,598	1,138,041	189,674	35,564	948,368	177,819	2,299,792
2020	12,032,417	1,263,404	204,551	36,097	962,593	180,486	2,442,581
2021	12,212,903	1,392,271	219,832	36,639	977,032	183,194	2,589,135
2022	12,396,096	1,524,720	235,526	37,188	991,688	185,941	2,739,537
2023	12,582,038	1,660,829	251,641	37,746	1,006,563	188,731	2,893,869
2024	12,770,768	1,800,678	255,415	38,312	1,021,661	191,562	3,052,214
2025	12,962,330	1,944,349	259,247	38,887	1,036,986	194,435	3,214,658

*2008 -2012 figures are based on MWH Sales reported on the E2500 RPS Compliance Reports. 2012 is based on estimates provided by distribution utilities. 2013 to 2025 figures assume 1.5 percent annual growth in sales based on ISO New England's 2011 Regional System Plan.

Eligible Technologies

- Geothermal - Ground Source Heat Pumps
- Solar Thermal
- Thermal Biomass Renewable Energy Technologies (& CHP)
- Biomass facilities must meet emission requirements:
  - PM: 3-30 MMBtu/hr: 0.1 lb/MMBtu;
    >30 MMBtu/hr: 0.02 lb/MMBtu
  - NOx: ≥100 MMBtu/hr: 0.075 lb/MMBtu
    <100 MMBtu/hr: Best Management Practices
- To be REC eligible, systems must begin operation after January 1, 2013.

Program Development Process

- Held stakeholder meetings: Aug. 2012, Jan. 2013, Sept. 2013.
- Incorporated into NEPOOL GIS by July 2013.
- Challenge to develop rules for metering and measurement.
- Issued RFP March 2013 and awarded contract June 2013.
- Antares Group Incorporated issued draft report on metering and measurement.
- Received comments on report by October 4, 2013.
- Antares drafted regulations; PUC reviewing now.
- Hope to begin formal rulemaking process in Nov/Dec.

Measuring and Metering Thermal Energy

- Principles:
  - Consistency among technologies - *boundary* for thermal measurement – delivery to distribution
  - Accuracy – accurate continuous metering
  - Accounting of energy losses and auxiliary energy use
  - Simplicity – transparent and straightforward to implement, not too expensive or onerous
- Standard – ASTM, OIML R75, EN1434
- Refer to Draft Report: *Metering and Measurement of Thermal Energy*

Measuring and Metering Thermal Energy (Cont'd)

- Solar Thermal
  - Continuous metering of collector loop
  - Deductions for collector loop pumping power and solar share of storage losses
- Geothermal Heat Pumps
  - Continuous metering of the ground loop (open or closed)
  - Deductions for ground loop pumping power
- Biomass Thermal
  - Continuous metering of boiler "loop" – feedwater in and steam out
  - Deductions for station energy use and electric REC generation for CHP

Alternative Approach

- Upper and lower boundary for metering system accuracy (say ±10%)
- REC is discounted by accuracy of metering
- Example:
  - Meter accuracy = ±5%
  - Measured thermal output = 100,000 mwh
  - REC = 100,000 mwh*(1-0.05) = 95,000 mwh of RECs
- Another option: Propose an alternative method

Contact info

- Website: http://www.puc.nh.gov/Sustainable%20Energy/Class%20I%20Thermal%20Renewable%20Energy.html
- Liz Nixon
  elizabeth.nixon@puc.nh.gov
  603-271-6018
- Jack Ruderman
  jack.ruderman@puc.nh.gov
  603-271-6012