Renewable Thermal in RPS

March 10, 2014

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About CESA

Clean Energy States Alliance (CESA) is a national nonprofit organization working to implement smart clean energy policies, programs, technology innovation, and financing tools, primarily at the state level. At its core, CESA is a national network of public agencies that are individually and collectively working to advance clean energy.
State-Federal RPS Collaborative

• With funding from the Energy Foundation and the US Department of Energy, CESA facilitates the Collaborative.

• Includes state RPS administrators, federal agency representatives, and other stakeholders.

• Advances dialogue and learning about RPS programs by examining the challenges and potential solutions for successful implementation of state RPS programs, including identification of best practices.

• To sign up for the Collaborative listserv to get the monthly newsletter and announcements of upcoming events, see: www.cleanenergystates.org/projects/state-federal-rps-collaborative
Background

- The only US organization solely dedicated to the protection and promotion of the REC markets
- Representing all renewable energy sectors
  - Utilities
  - Marketers
  - Developers
  - Manufacturers
  - Consumers
  - Non-profits

“If you want your voice to be heard while the future of the renewable industry is decided, you need to join REMA.”

– Jay Carlis, Community Energy
Dedicated to protecting and promoting the voluntary and compliance REC markets
Today’s Guest Speakers

Elizabeth Nixon, Energy Analyst, New Hampshire Public Utilities Commission

Kyle Haas, Energy Policy Manager for Clean Energy Policy, Maryland Energy Administration
Thank you for attending our webinar

Warren Leon
RPS Project Director, CESA Executive Director
wleon@cleanegroup.org

Visit our website to learn more about the State-Federal RPS Collaborative and to sign up for our e-newsletter:
http://www.cleanenergystates.org/projects/state-federal-rps-collaborative/

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NEW HAMPSHIRE
RENEWABLE PORTFOLIO STANDARD
THERMAL ENERGY PROVISIONS

Elizabeth Nixon
NH Public Utilities Commission
March 10, 2014
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.
• 0.2% of Class I REC requirement to be met with thermal resources beginning 2013; delayed by an Order of the Commission to January 1, 2014 at 0.4%.
• SB 148 and HB542 in 2013 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
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 - % Obligation

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>Total Requirement</th>
<th>Total Class I</th>
<th>Thermal Class I</th>
<th>Class II</th>
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## Key Provisions – Est. MWH RECs

<table>
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<th>Calendar Year</th>
<th>Total Retail Sales to Retail Customers (MWh)*</th>
<th>Total Class I</th>
<th>Thermal Class I</th>
<th>Class II</th>
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<th>Total Obligation</th>
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<td>1,035,452</td>
<td>194,147</td>
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</table>

*2008 - 2012 figures are based on MWH Sales reported on the E2500 RPS Compliance Reports. 2013 is based on estimates provided by the distribution utilities. 2014 to 2025 figures assume 1.5 percent annual growth in sales based on ISO New England’s 2011 Regional System Plan.
Eligible Technologies

- Solar Thermal
- Geothermal - Ground Source Heat Pumps
- Thermal Biomass Renewable Energy Technologies
- Biomass Combined Heat and Power Facilities
- Biomass facilities must meet emission requirements:
  - PM: 0.1 lb/MMBtu for 3-30 MMBtu/hr; 0.02 lb/MMBtu >30 MMBtu/hr
  - NOx: 0.075 lb/MMBtu ≥ 100 MMBtu/hr
  - Best Management Practices (annual tune-ups; combustion efficiency) <100 MMBtu/hr
- To be REC eligible, systems must begin operation after January 1, 2013.
Program Development Process

- Worked with NEPOOL GIS – Incorporated into GIS by July 2013.
- Challenge to develop rules for metering and measurement.
- Hired Antares Group to assist Summer 2013.
- Antares issued draft report on metering and measurement in September 2013.
- Antares provided preliminary draft rule language to PUC in late 2013.
- Based on stakeholder comments, needed to simplify methodology.
Measuring and Metering Thermal Energy

Proposed Approaches

- Boundary for thermal measurement – before delivery to distribution
- Measuring thermal energy:
  - Air/Water Systems: based on flow, temperature, and specific heat
  - Steam systems: based on flow and specific enthalpy (temp. & pressure)
- Metering
  - Must meet accuracy of EN1434 standard; or
  - Must meet accuracy \( \leq \pm 5\% \); RECs discounted; or
  - Alternative methodology
- Parametric monitoring for small sources allowed:
  - 100 kW or 350,000 Btu/hr
  - Solar Thermal: operating hours of pump and SRCC rating taking into account shading/orientation losses
  - Geothermal: operating hours of pump and HC and COP
  - Thermal Biomass: operating hours and auger feed rate
Proposed REC Calculation

- Measure thermal output
- Discount for meter accuracy if meter does not meet standard
- Discount for operating energy and thermal energy storage losses
- RECs reported to NEPOOL GIS in mWh (1 mWh = 3.412 MMBtu)
Proposed REC Calculation—
Meter Accuracy Discount Factor

- Upper and lower boundary for metering system accuracy (±5%)
- REC is discounted by accuracy of metering
- Example:
  - Meter accuracy = ±4%
  - Measured thermal output = 100,000 mWh
  - REC = 100,000 mWh \times (1 - 0.04) = 96,000 mWh of RECs
Proposed REC Calculation—Parasitic Energy Discount Factors

- Solar thermal: 3.0%
- Geothermal: 3.6%
- Thermal biomass: 2.0%
- Actual Metering of Parasitic Load
- Only for large sources
Verifying and Reporting Thermal Energy

- Professional Engineer must attest to the thermal energy metering/measurement methodology
- Independent monitor must inspect facility initially
- Independent monitor must verify and report thermal output to NEPOOL GIS
- RECs retroactive to January 1, 2014 if source certified to be eligible to create RECs
Schedule

• Draft Rule
• Public Hearing
• Comments Due
• Final Rule

• Send Liz an e-mail if would like to be on service list
Contact info

- **Liz Nixon:** [elizabeth.nixon@puc.nh.gov](mailto:elizabeth.nixon@puc.nh.gov)
  603-271-6018
- **Jack Ruderman:** [jack.ruderman@puc.nh.gov](mailto:jack.ruderman@puc.nh.gov)
  603-271-6012
- **Mike Sheehan:** [michael.sheehan@puc.nh.gov](mailto:michael.sheehan@puc.nh.gov)
  603-271-6028
Thermal Energy Task Force Brief
Clean Energy States Alliance

Kyle Haas 3/10/2014
Background

- MD RPS had no unified means of awarding RECs for thermal renewable energy
- Legislative action in subsequent years incorporated SWH, geothermal and poultry biomass thermal systems
  - Each treated differently
- SB797/HB1084 was initially written to offer electricity RECs to woody biomass
- As written, it had errors, potential pitfalls
- Modified the bill to establish a task force
  - MEA; MD Senate; MD House; Solar; Geo; Wood industry; Sustainable forestry; Enviro; DNR; MDE; Agriculture; PSC
Members of the Task Force had a variety of perspectives, opinions and recommendations.

I will cover the highlights, but we do not have the time to cover each member of the Task Force’s perspectives.

More detail can be found in the report itself.
The Report:

Rec 1: Thermal Tiers

Move new, non-solar Tier 1 technologies, including geothermal heating and cooling, animal manure-based biomass, and qualifying biomass technologies, into a primary thermal tier.
Rec 2: ACP Limitation

- Limit Alternative Compliance Payments ("ACP") to the extent that the market has supplied Thermal Renewable Energy Credits ("TRECs").

- Electricity suppliers should be required to purchase available TRECs, but should not need to make ACP payments for thermal obligations that were not delivered to the market.
Rec 3: Market Creation

- The Thermal 1 tier should gradually ramp up to 2% of electricity sales in 2024.

- Thermal 1 ACP:
  - Start at $30 in 2015
  - Decline to $20 by 2019

- Thermal 2 ACP:
  - Start at $0.25 in 2015
  - Decline to $0.05 in 2019

- Maximum cost:
  - $0.03/month in 2015
  - $0.15/month in 2024
### Rec 3: Market Creation

**Thermal TREC Per Unit**

<table>
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<tr>
<th>Year</th>
<th>Geothermal</th>
<th>Ind Boiler</th>
<th>Com Boiler</th>
<th>Res Stove</th>
<th>Total TREC</th>
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**Total TRECs**

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<th>Ind Boiler</th>
<th>Com Boiler</th>
<th>Res Stove</th>
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Rec 3: Market Creation

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Rec 4: Efficiency Requirement

- Thermal biomass systems should have a 65% minimum efficiency requirement.
- Thermal biomass systems should be limited to:
  - Clean and untreated wood
  - Agricultural crops
  - Biogas; and
  - Liquid biofuels.
- Should also exclude materials derived in whole or in part from construction and demolition debris.
Rec 5: Displacement

- Thermal energy should be required to displace electricity or a non-renewable fuel in an application in which electricity or a non-renewable fuel would have otherwise been used for a useful thermal application.
Rec 6: Grandfathering

- Existing thermal-only systems will remain in their current status.

- Alternatively, they may choose to re-register as a Thermal 1 system.
Thank you!

- A big thank you to the Task Force Members!