NEW HAMPSHIRE’S THERMAL RENEWABLE PORTFOLIO STANDARD PROVISIONS Geothermal

Barbara Bernstein and Elizabeth Nixon
NH Public Utilities Commission
Renewable Portfolio Standard (RPS) Legislation

  - Established requirement for 4 classes
- Thermal Sub-Class created through SB 218, effective June 2012.
  - Required 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.)
# New Hampshire’s RPS Obligations

<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>
<th>Class III</th>
<th>Class IV</th>
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<td>2025 and thereafter</td>
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<td>0.30%</td>
<td>8.00%</td>
<td>1.50%</td>
</tr>
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Measuring and Metering Geothermal Energy

• Boundary for thermal measurement:
  • Before delivery to distribution

• Measuring thermal energy:
  • Large Systems: based on flow, temperature, and specific heat
  • Small Systems: based on operating hours and HC & COP

• Metering Options:
  • Must meet accuracy of:
    • EN1434 standard for water systems; or
    • ±5% or better; RECs discounted; or
  • Alternative methodology

• Small/Large Threshold - 200,000 Btu/hr of heat input
T-REC Calculation

- Measure thermal output
- Discount for operating energy and thermal energy storage losses for large sources
  - Geothermal: 3.6% or
  - Actual Metering of Parasitic Load
- Convert MMBtu to MWh:
  - 1 MWh = 3.412 MMBtu
- RECs reported to NEPOOL GIS in MWh
Verifying and Reporting Geothermal Energy

- Professional Engineer must attest to the thermal energy metering/measurement methodology
- Independent Monitor (IM) qualifications:
  - Professional Engineer, or
  - IGSHPA Accredited Geothermal Installer
- IM must inspect facility initially
- IM verifies and reports thermal output to NEPOOL GIS
# Summary of Geothermal Facilities

*(as of December 31, 2016)*

<table>
<thead>
<tr>
<th>REC #</th>
<th>Facility Name</th>
<th>Approval Date</th>
<th>BTU/hr.</th>
<th>MW equ.</th>
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<tr>
<td>15-056</td>
<td>Krinsky</td>
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<td>Mack</td>
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<td>15-481</td>
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<td>11/13/2015</td>
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<td>16-222</td>
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<tr>
<td>16-691</td>
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<tr>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>1,134,300</strong></td>
<td><strong>0.33</strong></td>
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</table>
Benefits of Renewable Geothermal Program

- Provides fuel diversity and displaces fossil fuels
- Use of local renewable fuels and resources
- Keeps energy and investment dollars in the State
- Provides an additional revenue stream for participants
- Increased efficiency from newer, renewable technology
Lessons Learned/Next Steps

• **Lessons Learned:**
  - RPS programs CAN include renewable thermal
  - Administration, metering, measurement and verification can be complex

• **Next Steps**
  - Develop more streamlined methods to accurately measure and verify while maintaining integrity
  - Modify thermal application to assist review and approval
  - Explore the inclusion of geothermal cooling as a renewable thermal resource
Contact info

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