NYSERDA Thermal Biomass
Regulatory and Roadmap Update

bioenergy2020+

NYSERDA EMEP Conference
November 7, 2013
Albany, New York
Regulatory Pathway

ICI
Residential
Regulations - ICI

- What is ICI?
  - Industrial – manufacturing operations that require steam/hot water
  - Commercial – retail establishments, hotels, restaurants
  - Institutional – government buildings, hospitals and schools

- Regulations that apply
  - New Source Performance Standards
  - Area Source Rule
  - State permits
Size Thresholds for State Permitting lb/MMBtu heat input

CT  MA  ME  NH  NJ  NY  PA  RI  VT  EPA Area  NSPS
ICI Boiler Regulations - Emission Thresholds

![Graph showing emission thresholds for different states and EPA areas. Each state is represented by a vertical bar, with NY having the highest threshold.]
Federal Regulations
NSPS for Residential Wood Heaters

- Current regulation
  - adopted in 1988
  - NSPS should be reviewed and revised on 8 yr schedule
  - Only regulates indoor wood stoves

- Revision drafted
  - Submitted to Office of Management and Budget (OMB)
  - Anticipate publishing proposal winter 2014
  - States have filed suit with EPA
EPA’s Proposal

- Draft subject to change based on OMB review
- Submitted draft
  - Expanded devices regulated: wood Stoves (and single-burn-rate stoves and pellet stoves); hydronic heaters (aka indoor and outdoor wood boilers); forced-air furnaces; masonry heaters
  - Potential revisions to test methods – short term emissions, test fuel
  - Emission levels – two/three phased approach
What is the Roadmap?
Project Description

NESCAUM and its project partners are developing a Biomass Heating Roadmap for New York State. The Roadmap will evaluate:

- Environmental impacts
- Public health concerns
- Fuel feed stocks
- Economic consequences
- Policy strategies

Identify critical actions to create a pathway that can:

- Stimulate the necessary research, investments and policies to build appropriate capacity
- Maintain feedstock supplies
- Ensure public health and environmental protection
What is the project examining

Equipment
- Residential devices
  - Woodstoves
  - Boilers certain
- Industrial, Commercial, and Institutional (ICI) thermal heating devices
  - Boilers
  - District heating
  - Combined Heat and Power (CHP)

Feedstocks
- Wood
  - cordwood
  - wood chip
  - wood pellet
  - forest residues
  - industry by-products
- Agricultural by-products
- Dedicated energy crops
  - Miscanthus
  - Switch grass
  - Willow
New York has Existing Biomass Thermal Users at Community and Industrial Scale

Much of Existing Use Concentrated at Forest Industries
Emissions

PM2.5 Emissions by Source Sector in New York in 2005

<table>
<thead>
<tr>
<th>Source Sector</th>
<th>Total Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Dust</td>
<td>14,569</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>13,737</td>
</tr>
<tr>
<td>Residential Wood Combustion</td>
<td>12,773</td>
</tr>
<tr>
<td>Electricity Generation</td>
<td>11,871</td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>11,412</td>
</tr>
<tr>
<td>Non Road Equipment</td>
<td>8,622</td>
</tr>
<tr>
<td>Fossil Fuel Combustion</td>
<td>8,469</td>
</tr>
<tr>
<td>Waste Disposal</td>
<td>8,021</td>
</tr>
<tr>
<td>On Road Vehicles</td>
<td>4,980</td>
</tr>
<tr>
<td>Solvent Use</td>
<td>41</td>
</tr>
</tbody>
</table>

Source: NYSERDA
Residential wood combustion by county (tons) in 2011
Residential wood combustion per capita in 2011
Business-As-Usual Fuel Use Trends in NY

Source: Annual Energy Outlook 2012.
Fine Particulate Emissions (Output) for Residential Boilers by Fuel Type

ULS #2 home heating oil, 11 ppm sulfur, 85% efficiency
LS #2 home heating oil, 322 ppm sulfur, 85% efficiency
#2 home heating oil, 1520 ppm sulfur, 85% efficiency

* Commercial Boiler, 70% efficiency (estimated)
^Average of Top 25% Performers
Components of the Air Modeling Analysis

Local Impacts

Regional Impacts
Receptor Grid

- Denser receptor grid near source
- Sparser receptor grid away from source
- Residential, up to 0.5 km
- ICI, up to 5 km
## Comparison of different technology standards for residential central heating

<table>
<thead>
<tr>
<th>Device Type</th>
<th>Business as usual</th>
<th>Best Available Technology (BAT)</th>
<th>next Best Available Technology (nBAT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Boiler</td>
<td>Ph2 log boiler</td>
<td>Ph 2 pellet boiler</td>
<td>pellet boiler</td>
</tr>
<tr>
<td>Efficiency</td>
<td>87</td>
<td>73.8</td>
<td>77.8</td>
</tr>
<tr>
<td>PM Emissions</td>
<td>.000068</td>
<td>0.23</td>
<td>0.13</td>
</tr>
<tr>
<td>(lb/MMBtu)</td>
<td></td>
<td></td>
<td>0.0272</td>
</tr>
</tbody>
</table>
Economic Analysis: Thermal Biomass Spreadsheet (TBS) Tool

- The TBS Tool has two primary objectives:
  1) Develop state- and sector-level estimates of possible market penetration of thermal biomass, “Business as Usual” (BAU), “Best Available Technologies” (BATs) and emerging “Best Available Technologies” (nBATs);
  2) Generate quantitative estimates of changes associated with greater market penetration of thermal biomass BATs in New York;
    - Fuel Use
    - Emissions
    - Economic performance
    - Efficiency
Please Contact Us

- Judy Jarnefeld, NYSERDA, jj1@nyserda.org
- Lisa Rector, NESCAUM, lrector@nescaum.org
- Eric Kingsley, Innovative Natural Resource Solutions llc, kingsley@inrsllc.com
- Tom Butcher, Brookhaven National Laboratory, butcher@bnl.gov