# NYSERDA Thermal Biomass Regulatory and Roadmap Update

bioenergy2020+

Innovative Natural Resource Solutions, LLC

BROOKHAVEN NATIONAL LABORATORY

NESCAUM

**NYSERDA EMEP Conference**

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# Regulatory Pathway

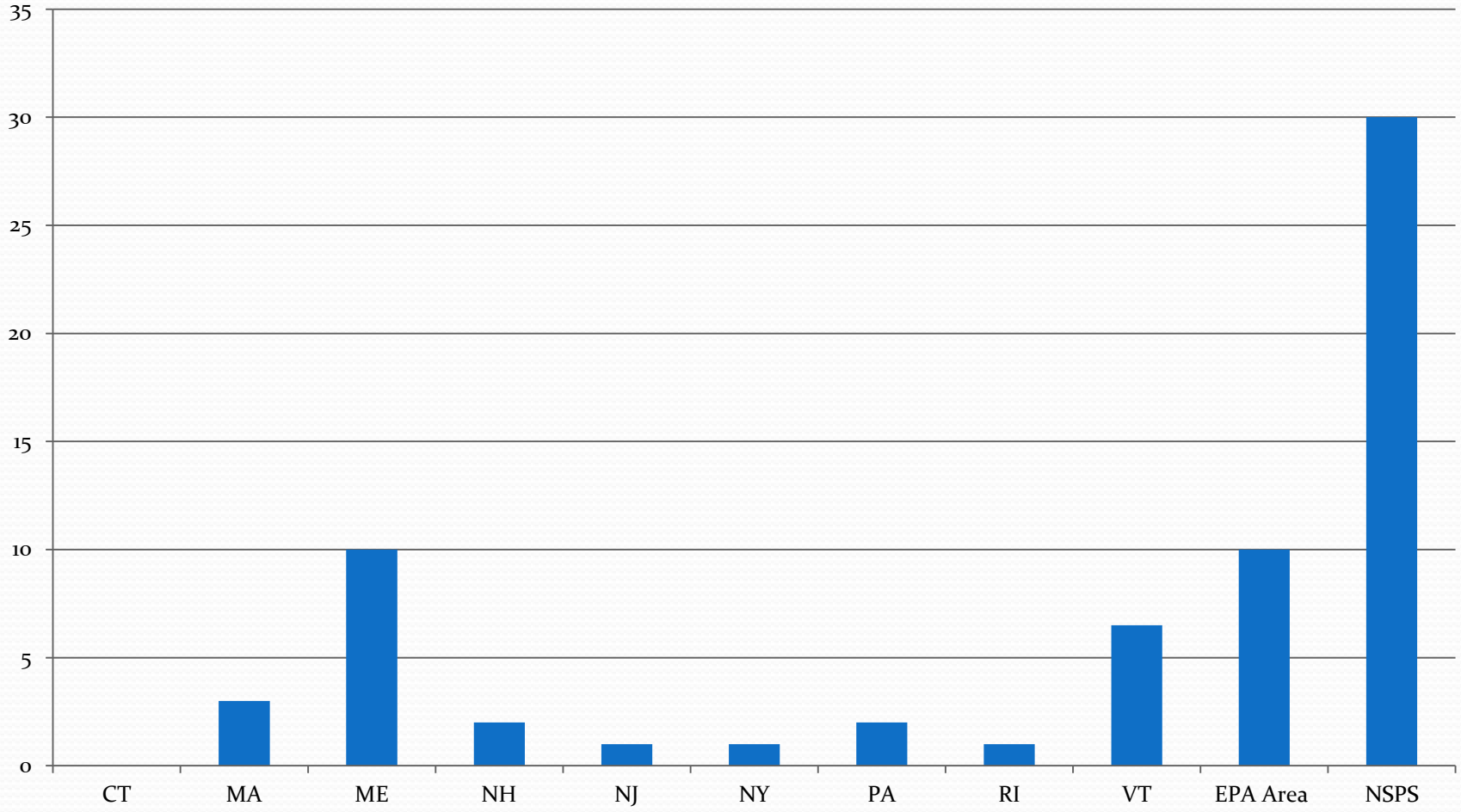
ICI

Residential

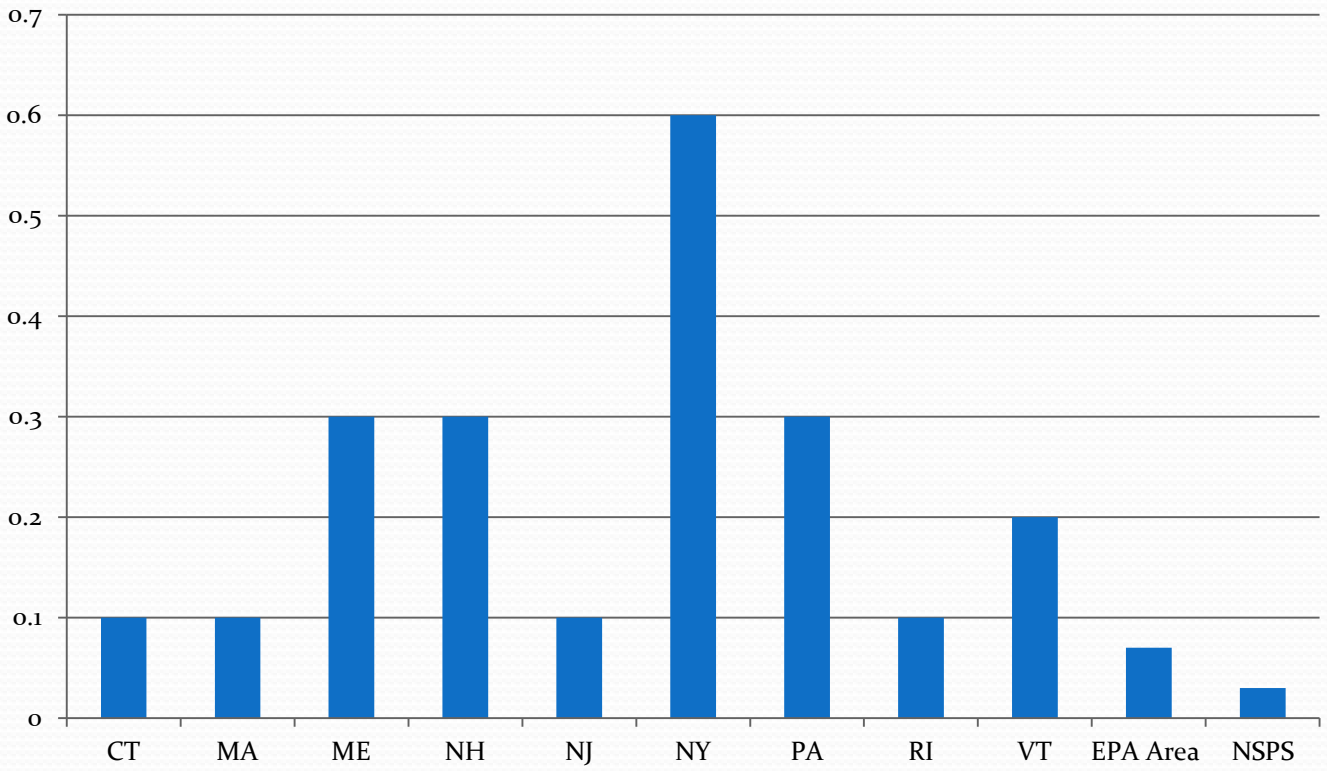
# Regulations - ICI

- 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



# ICI Boiler Regulations - Emission Thresholds



# 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

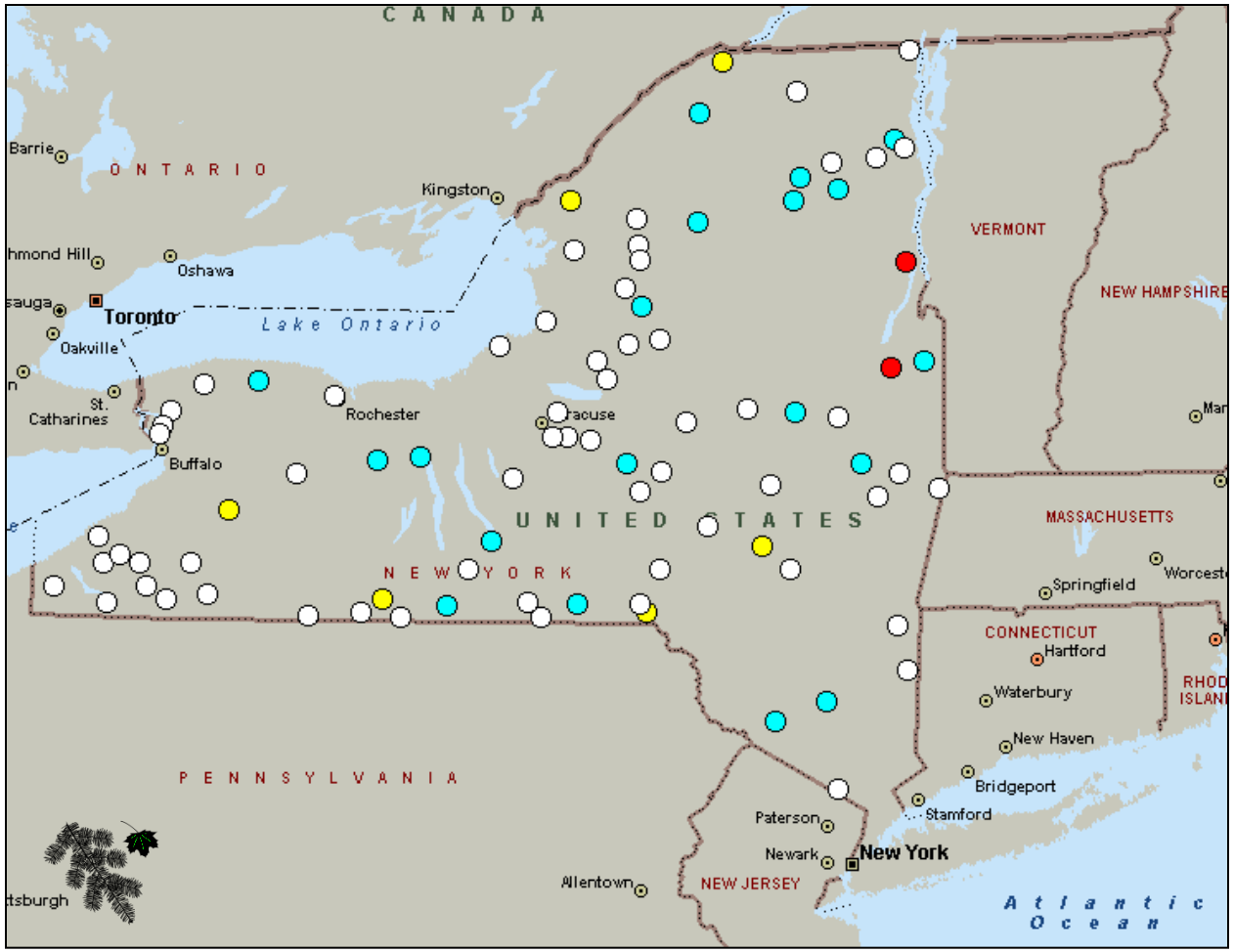
- Residential devices
  - Woodstoves
  - Boilers certain
- Industrial, Commercial, and Institutional (ICI) thermal heating devices
  - Boilers
  - District heating
  - Combined Heat and Power (CHP)

## Feedstocks

- Wood
  - cordwood
  - wood chip
  - wood pellet
  - forest residues
  - industry by-products
- Agricultural by-products
- Dedicated energy crops
  - Miscanthus
  - Switch grass
  - Willow

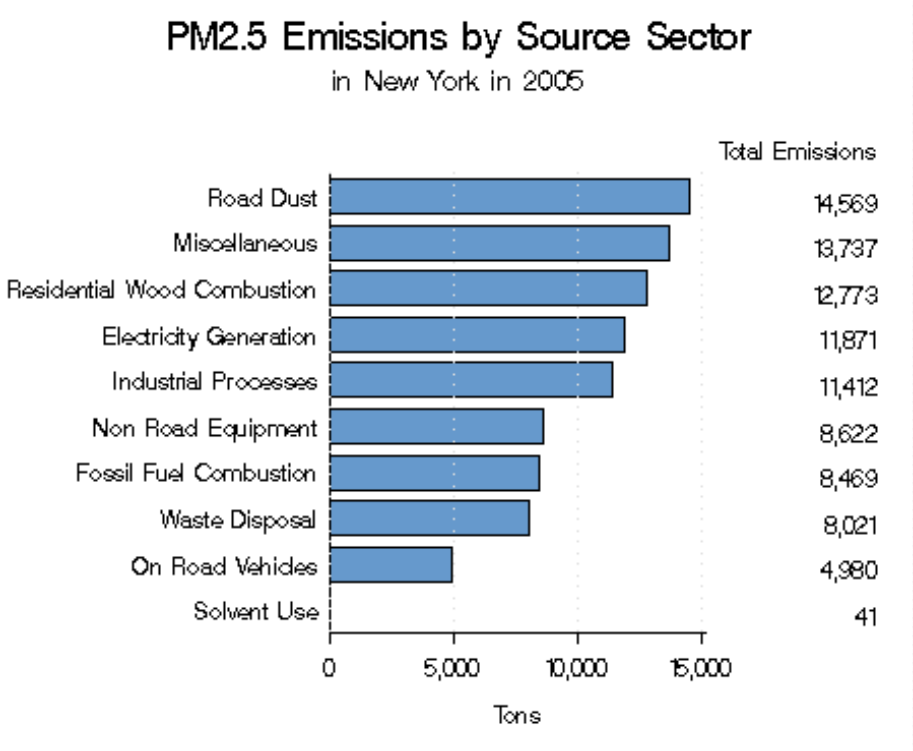
# New York has Existing Biomass Thermal Users at Community and Industrial Scale

Much of Existing Use Concentrated at Forest Industries

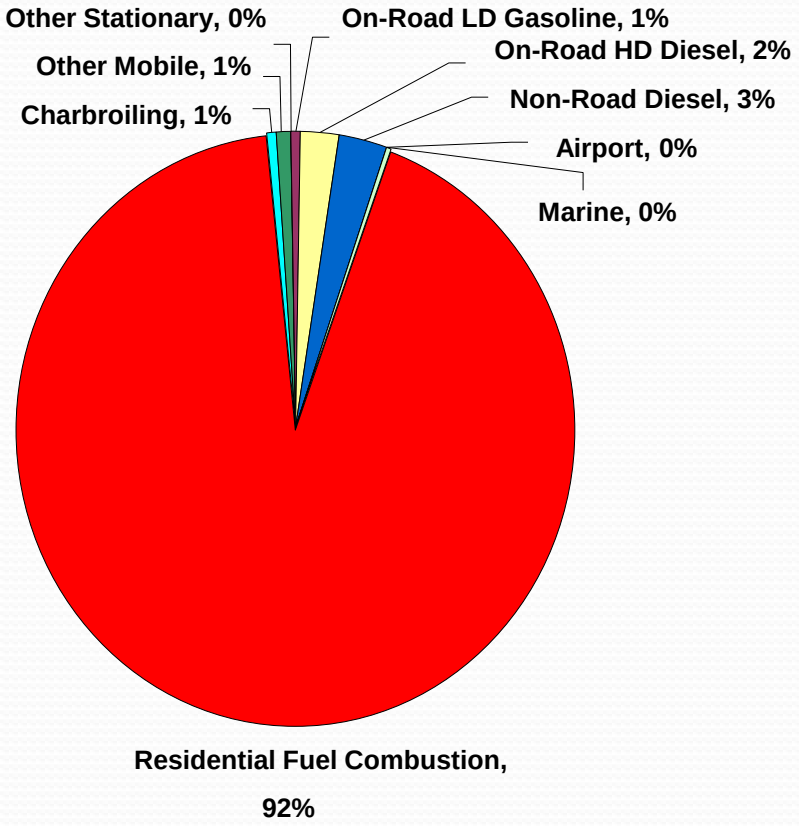



- Forest Industries
- Community Scale
- Pellet Mill
- Paper Mill

# Emissions

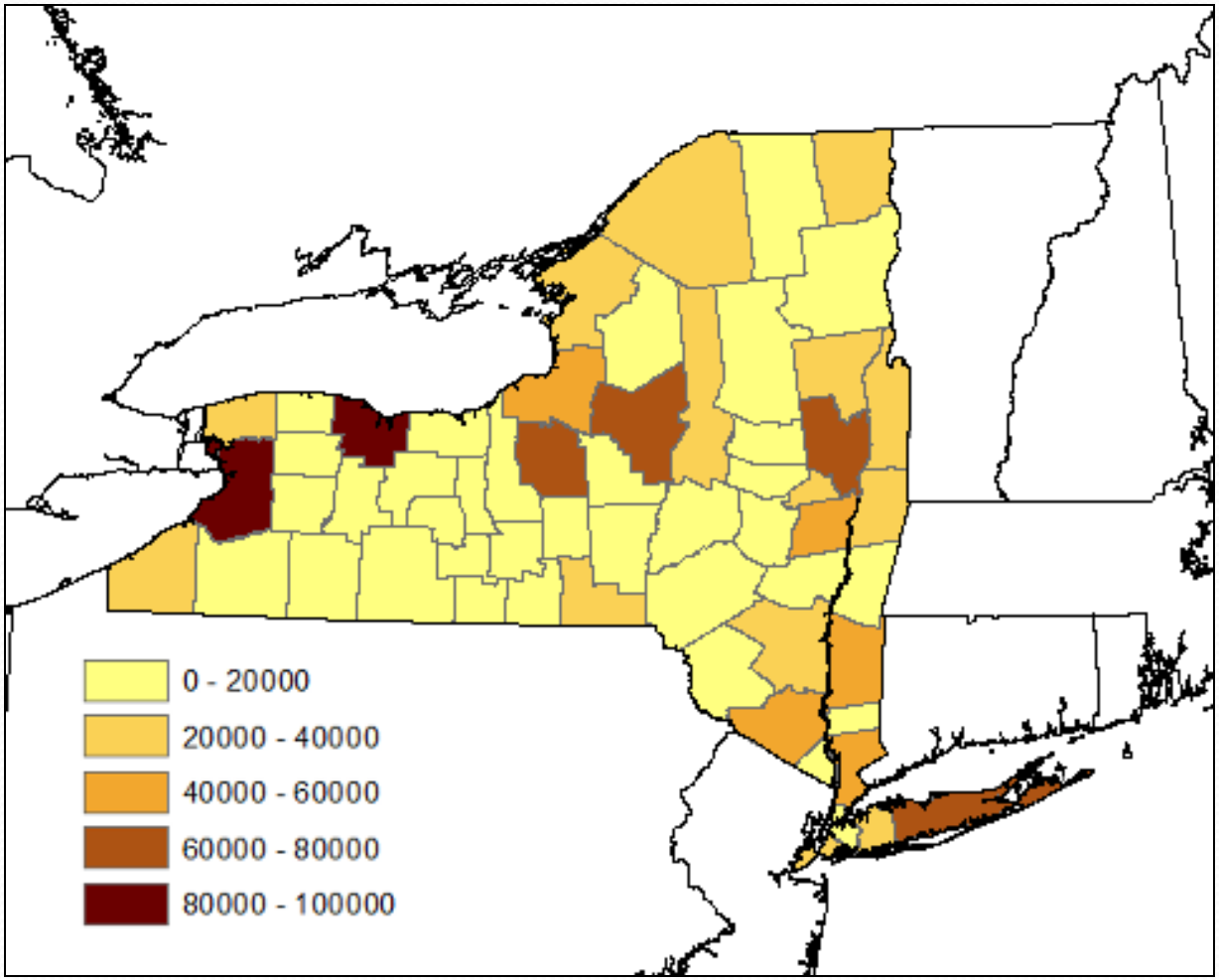



Rural, NY

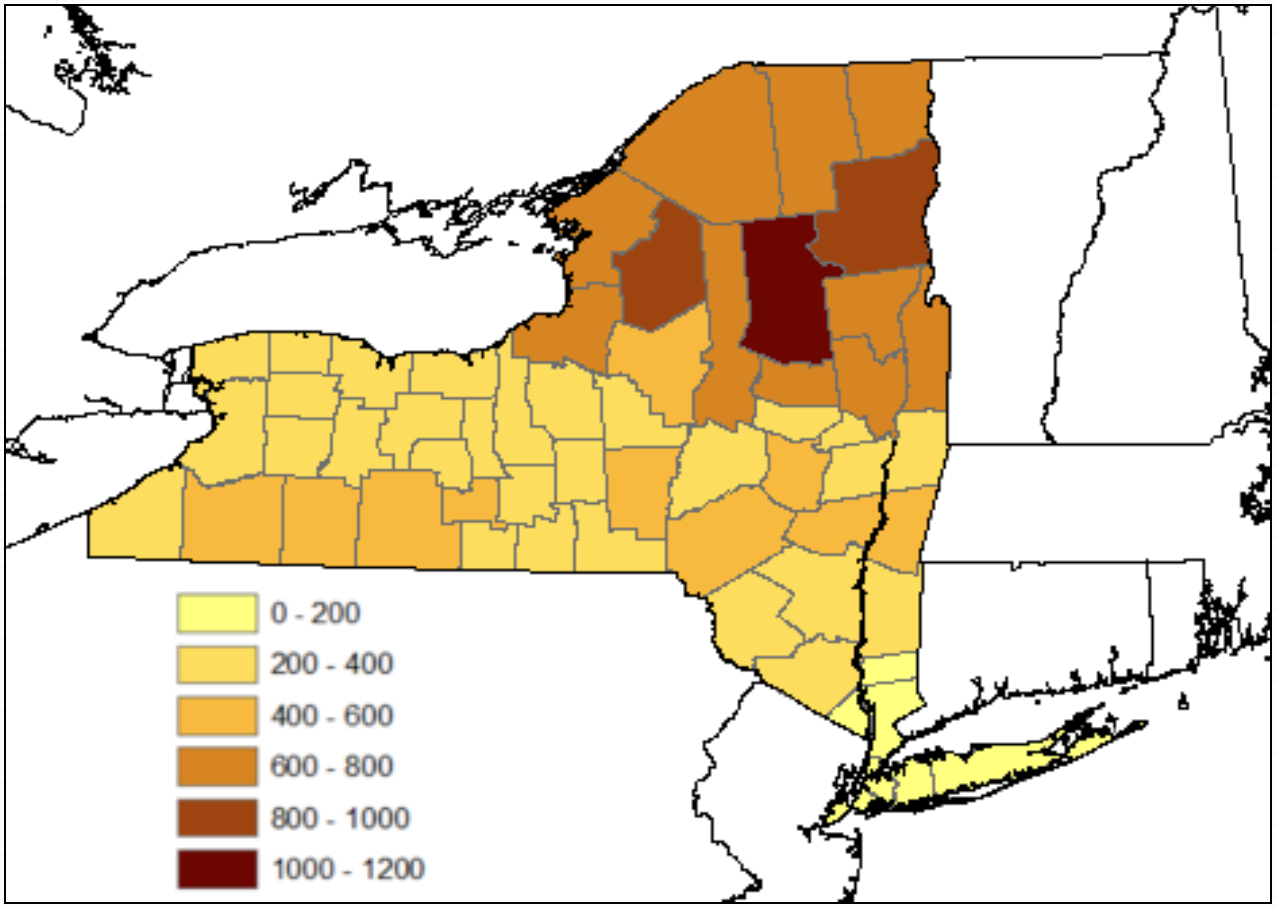



Source: NYSERDA

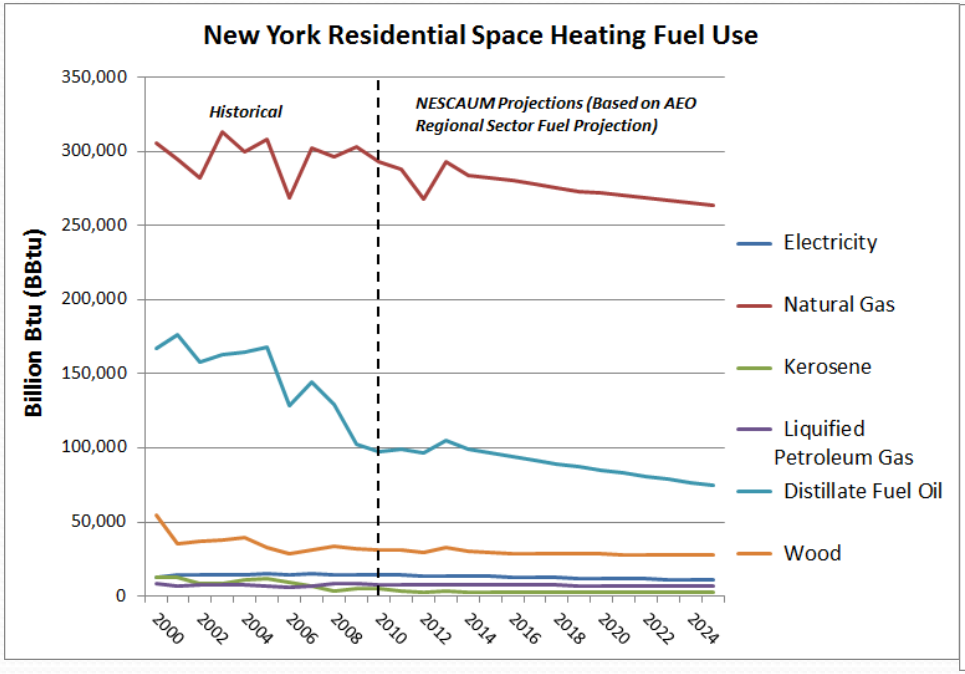
# Residential wood combustion by county (tons) in 2011

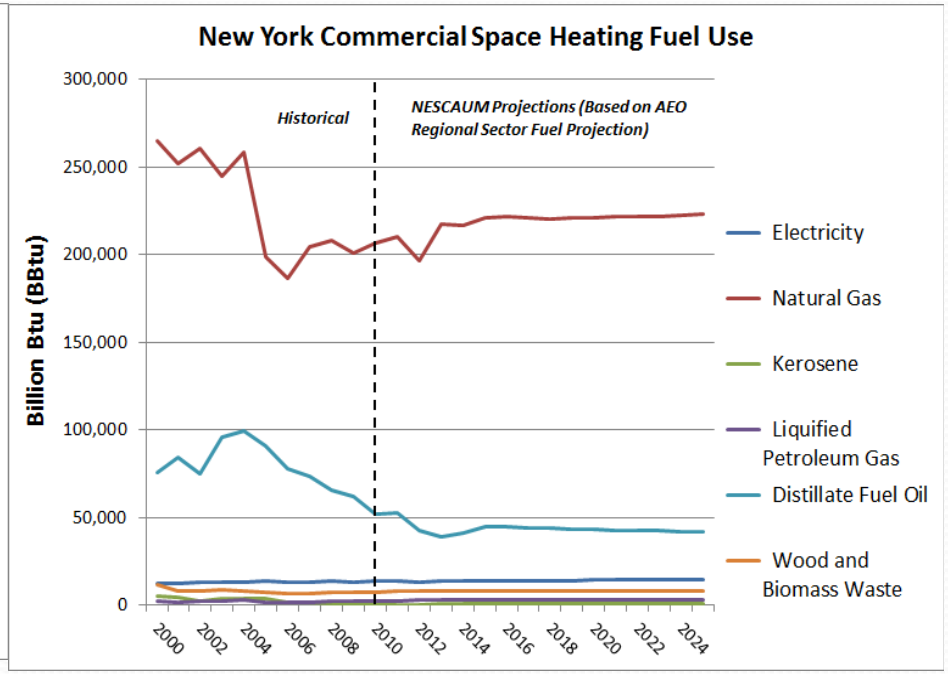


# Residential wood combustion per capita in 2011



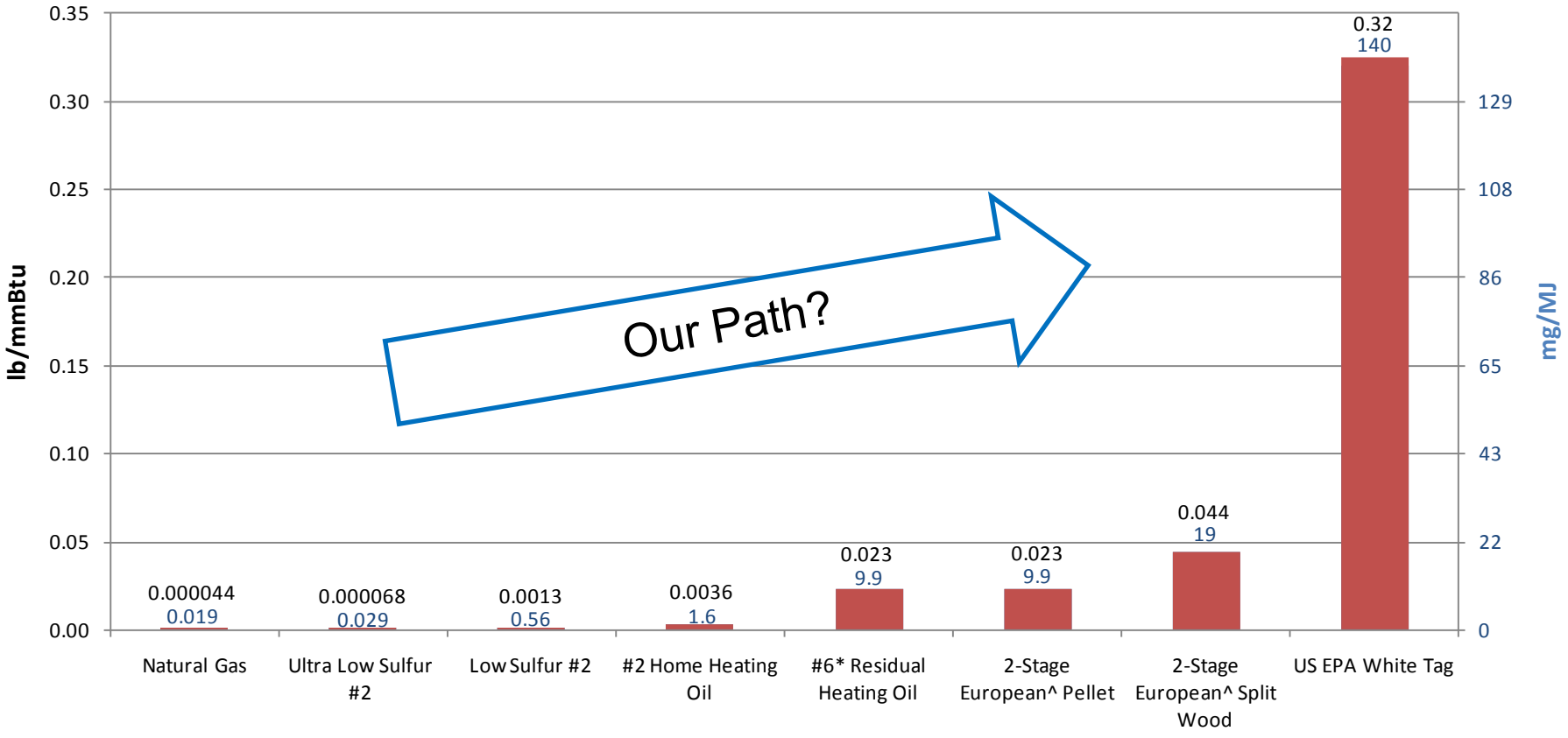
# Business-As-Usual Fuel Use Trends in NY




Source: Annual Energy Outlook 2012.

# Fine Particulate Emissions (Output) for Residential Boilers by Fuel Type

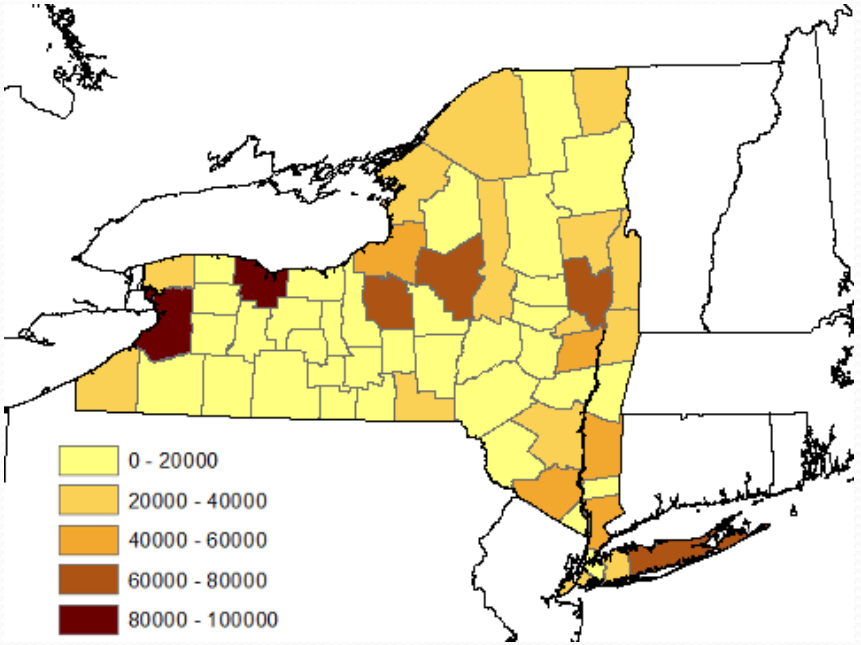



ULS #2 home heating oil, 11 ppm sulfur, 85% efficiency
LS #2 home heating oil, 322 ppm sulfur, 85% efficiency
#2 home heating oil, 1520 ppm sulfur, 85% efficiency

* Commercial Boiler, 70% efficiency (estimated)
^Average of Top 25% Performers

# Components of the Air Modeling Analysis

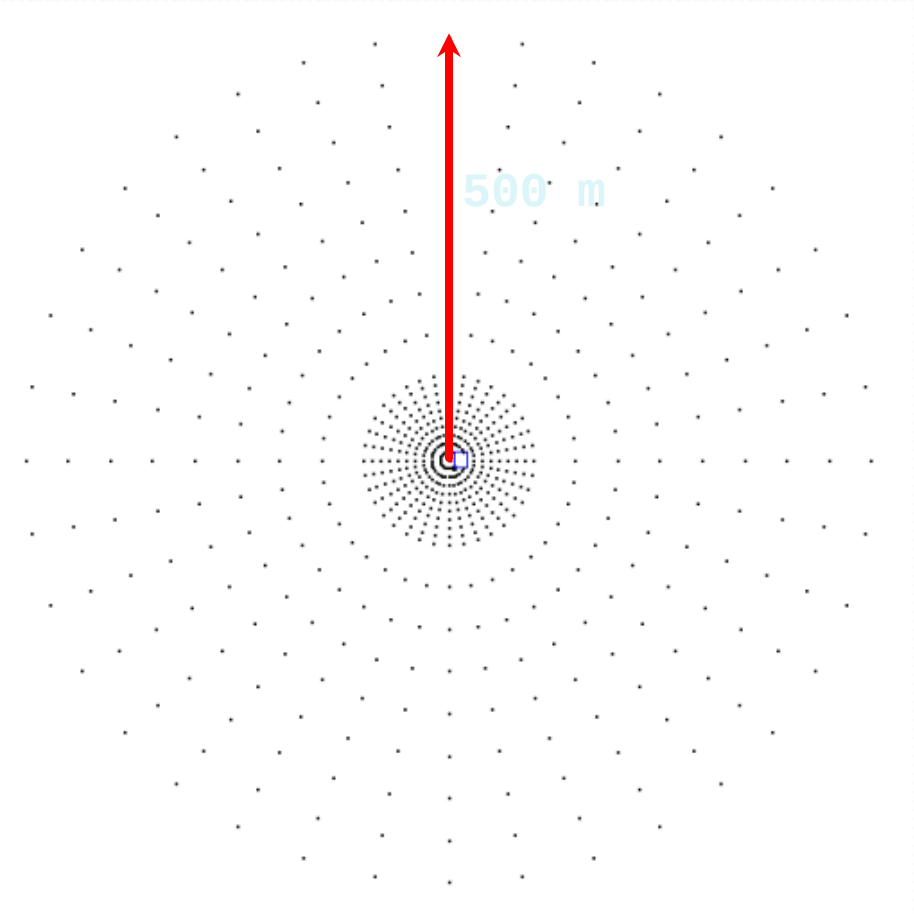
**Local Impacts**




**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

| | Business as usual | | | Best Available Technology (BAT) | next Best Available Technology (nBAT) |
|---|---|---|---|---|---|
| Device Type | Oil Boiler | Ph2 log boiler | Ph 2 pellet boiler | pellet boiler | condensing pellet boiler |
| Efficiency (HHV/max burn) | 87 | 73.8 | 77.8 | 86.4 | 93.5 |
| PM Emissions: (lb/MMBtu) | .000068 | 0.23 | 0.13 | 0.0272 | 0.0272 |

# 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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