NORA/ OEM Bioheat

Codes

Bob O'Brien

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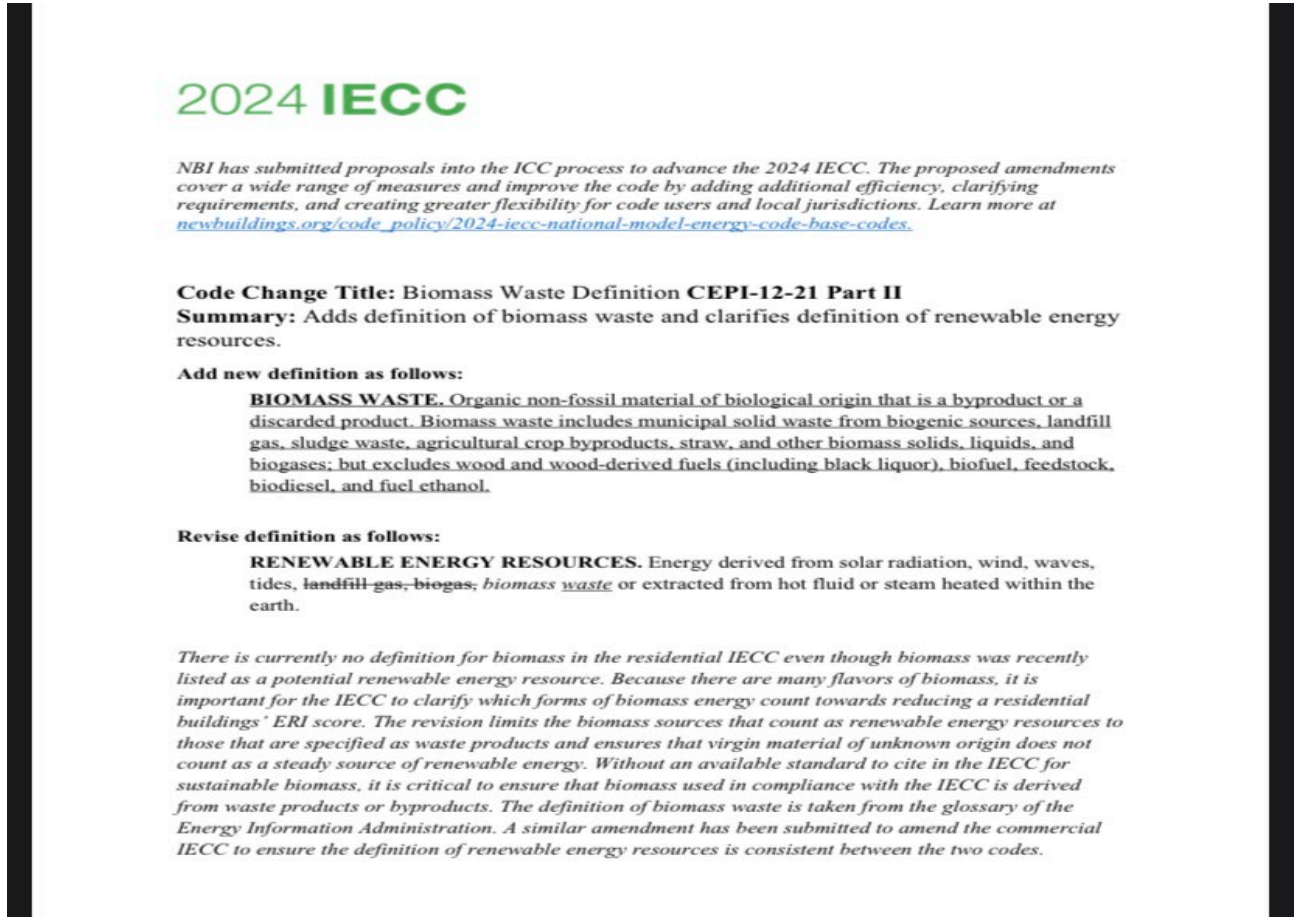
NORA Team: Ryan Kerr, Neehad Islam, Bob O'Brien, John Levey, Michael Persch (Intern), Tom Butcher

IECC Code Changes 2024



2024 **IECC**

NBI has submitted proposals into the ICC process to advance the 2024 IECC. The proposed amendments cover a wide range of measures and improve the code by adding additional efficiency, clarifying requirements, and creating greater flexibility for code users and local jurisdictions. Learn more at newbuildings.org/code_policy/2024-iecc-national-model-energy-code-base-codes.

Code Change Title: Biomass Waste Definition **CEPI-12-21 Part II**
Summary: Adds definition of biomass waste and clarifies definition of renewable energy resources.

Add new definition as follows:

BIOMASS WASTE. Organic non-fossil material of biological origin that is a byproduct or a discarded product. Biomass waste includes municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural crop byproducts, straw, and other biomass solids, liquids, and biogases; but excludes wood and wood-derived fuels (including black liquor), biofuel, feedstock, biodiesel, and fuel ethanol.

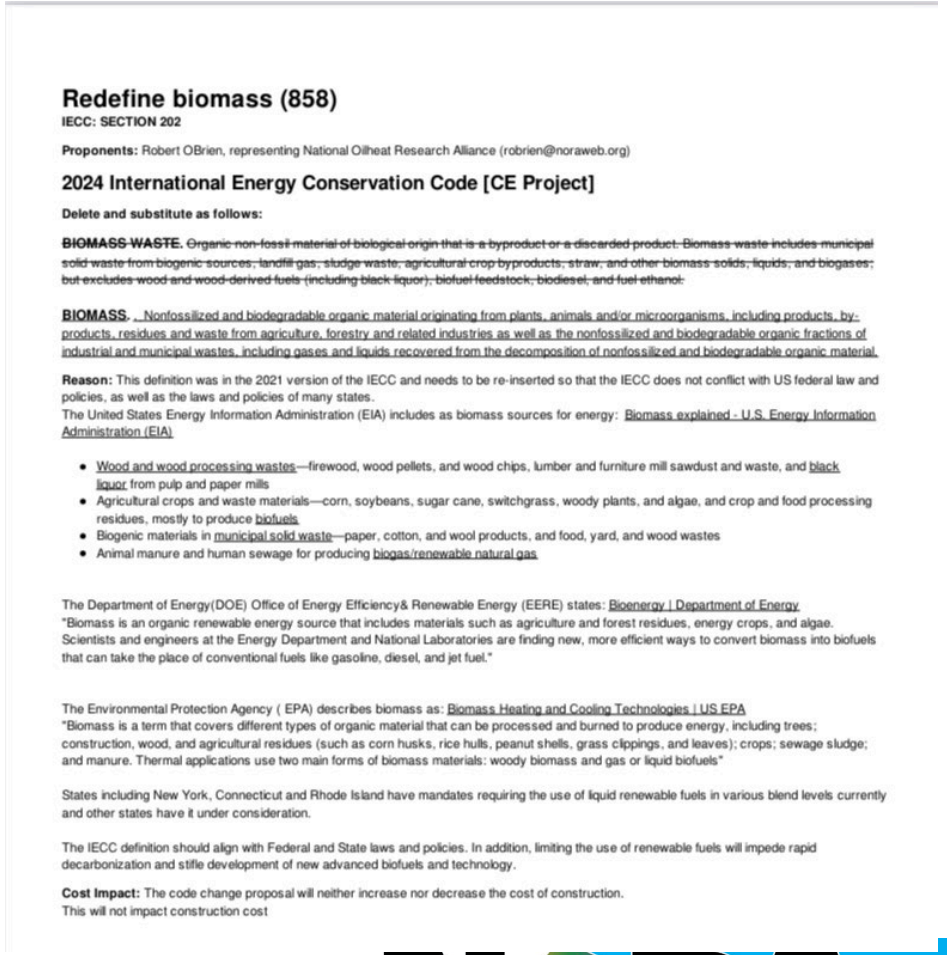
Revise definition as follows:

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, ~~landfill gas, biogas,~~ *biomass waste* or extracted from hot fluid or steam heated within the earth.

There is currently no definition for biomass in the residential IECC even though biomass was recently listed as a potential renewable energy resource. Because there are many flavors of biomass, it is important for the IECC to clarify which forms of biomass energy count towards reducing a residential buildings' ERI score. The revision limits the biomass sources that count as renewable energy resources to those that are specified as waste products and ensures that virgin material of unknown origin does not count as a steady source of renewable energy. Without an available standard to cite in the IECC for sustainable biomass, it is critical to ensure that biomass used in compliance with the IECC is derived from waste products or byproducts. The definition of biomass waste is taken from the glossary of the Energy Information Administration. A similar amendment has been submitted to amend the commercial IECC to ensure the definition of renewable energy resources is consistent between the two codes.

Biomass to Biomass waste

- A definition was adopted by commercial consensus committee to redefine biomass to exclude fuels made from virgin feedstocks and biodiesel from any feedstock
- NORA/CFAA submitted an actionable proposal during comment period to revert to the previous definition



Redefine biomass (858)

IECC: SECTION 202

Proponents: Robert OBrien, representing National Oilheat Research Alliance (robrien@noraweb.org)

2024 International Energy Conservation Code [CE Project]

Delete and substitute as follows:

~~**BIOMASS WASTE.** Organic non-fossil material of biological origin that is a byproduct or a discarded product. Biomass waste includes municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural crop byproducts, straw, and other biomass solids, liquids, and biogases; but excludes wood and wood-derived fuels (including black liquor), biofuel feedstock, biodiesel, and fuel ethanol.~~

BIOMASS. , Nonfossilized and biodegradable organic material originating from plants, animals and/or microorganisms, including products, by-products, residues and waste from agriculture, forestry and related industries as well as the nonfossilized and biodegradable organic fractions of industrial and municipal wastes, including gases and liquids recovered from the decomposition of nonfossilized and biodegradable organic material.

Reason: This definition was in the 2021 version of the IECC and needs to be re-inserted so that the IECC does not conflict with US federal law and policies, as well as the laws and policies of many states.
The United States Energy Information Administration (EIA) includes as biomass sources for energy: Biomass explained - U.S. Energy Information Administration (EIA)

- Wood and wood processing wastes—firewood, wood pellets, and wood chips, lumber and furniture mill sawdust and waste, and black liquor from pulp and paper mills
- Agricultural crops and waste materials—corn, soybeans, sugar cane, switchgrass, woody plants, and algae, and crop and food processing residues, mostly to produce biofuels
- Biogenic materials in municipal solid waste—paper, cotton, and wool products, and food, yard, and wood wastes
- Animal manure and human sewage for producing biogas/renewable natural gas

The Department of Energy(DOE) Office of Energy Efficiency& Renewable Energy (EERE) states: Bioenergy | Department of Energy
"Biomass is an organic renewable energy source that includes materials such as agriculture and forest residues, energy crops, and algae. Scientists and engineers at the Energy Department and National Laboratories are finding new, more efficient ways to convert biomass into biofuels that can take the place of conventional fuels like gasoline, diesel, and jet fuel."

The Environmental Protection Agency (EPA) describes biomass as: Biomass Heating and Cooling Technologies | US EPA
"Biomass is a term that covers different types of organic material that can be processed and burned to produce energy, including trees; construction, wood, and agricultural residues (such as corn husks, rice hulls, peanut shells, grass clippings, and leaves); crops; sewage sludge; and manure. Thermal applications use two main forms of biomass materials: woody biomass and gas or liquid biofuels"

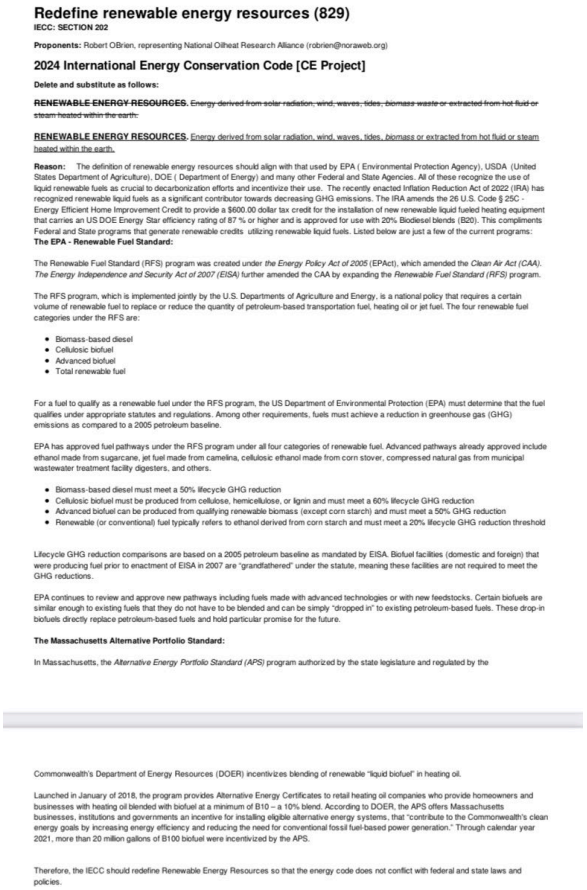
States including New York, Connecticut and Rhode Island have mandates requiring the use of liquid renewable fuels in various blend levels currently and other states have it under consideration.

The IECC definition should align with Federal and State laws and policies. In addition, limiting the use of renewable fuels will impede rapid decarbonization and stifle development of new advanced biofuels and technology.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction.
This will not impact construction cost

Renewable Energy Resources

- A proposal was accepted to redefine renewable energy resources to one excluding all fuels not meeting the definition of biomass waste
- NORA/CFAA submitted an actionable proposal to revert to previously accepted definition



Redefine renewable energy resources (829)

IECC: SECTION 202

Proponents: Robert OBrien, representing National Oilheat Research Alliance (robrien@noraweb.org)

2024 International Energy Conservation Code [CE Project]

Delete and substitute as follows:

~~**RENEWABLE ENERGY RESOURCES.** Energy derived from solar radiation, wind, waves, tides, biomass waste or extracted from hot fluid or steam heated within the earth.~~

RENEWABLE ENERGY RESOURCES. Energy derived from solar radiation, wind, waves, tides, biomass or extracted from hot fluid or steam heated within the earth.

Reason: The definition of renewable energy resources should align with that used by EPA (Environmental Protection Agency), USDA (United States Department of Agriculture), DOE (Department of Energy) and many other Federal and State Agencies. All of these recognize the use of liquid renewable fuels as crucial to decarbonization efforts and incentivize their use. The recently enacted Inflation Reduction Act of 2022 (IRA) has recognized renewable liquid fuels as a significant contributor towards decreasing GHG emissions. The IRA amends the 26 U.S. Code § 25C - Energy Efficient Home Improvement Credit to provide a $600.00 dollar tax credit for the installation of new renewable liquid fueled heating equipment that carries an US DOE Energy Star efficiency rating of 87 % or higher and is approved for use with 20% Biodiesel blends (B20). This compliments Federal and State programs that generate renewable credits utilizing renewable liquid fuels. Listed below are just a few of the current programs:
The EPA - Renewable Fuel Standard:

The Renewable Fuel Standard (RFS) program was created under *the Energy Policy Act of 2005* (EPAct), which amended the *Clean Air Act (CAA). The Energy Independence and Security Act of 2007 (EISA)* further amended the CAA by expanding the *Renewable Fuel Standard (RFS)* program.

The RFS program, which is implemented jointly by the U.S. Departments of Agriculture and Energy, is a national policy that requires a certain volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil or jet fuel. The four renewable fuel categories under the RFS are:

- Biomass-based diesel
- Cellulosic biofuel
- Advanced biofuel
- Total renewable fuel

For a fuel to qualify as a renewable fuel under the RFS program, the US Department of Environmental Protection (EPA) must determine that the fuel qualifies under appropriate statutes and regulations. Among other requirements, fuels must achieve a reduction in greenhouse gas (GHG) emissions as compared to a 2005 petroleum baseline.

EPA has approved fuel pathways under the RFS program under all four categories of renewable fuel. Advanced pathways already approved include ethanol made from sugarcane, jet fuel made from camelina, cellulosic ethanol made from corn stover, compressed natural gas from municipal wastewater treatment facility digesters, and others.

- Biomass-based diesel must meet a 50% lifecycle GHG reduction
- Cellulosic biofuel must be produced from cellulose, hemicellulose, or lignin and must meet a 60% lifecycle GHG reduction
- Advanced biofuel can be produced from qualifying renewable biomass (except corn starch) and must meet a 50% GHG reduction
- Renewable (or conventional) fuel typically refers to ethanol derived from corn starch and must meet a 20% lifecycle GHG reduction threshold

Lifecycle GHG reduction comparisons are based on a 2005 petroleum baseline as mandated by EISA. Biofuel facilities (domestic and foreign) that were producing fuel prior to enactment of EISA in 2007 are "grandfathered" under the statute, meaning these facilities are not required to meet the GHG reductions.

EPA continues to review and approve new pathways including fuels made with advanced technologies or with new feedstocks. Certain biofuels are similar enough to existing fuels that they do not have to be blended and can be simply "dropped in" to existing petroleum-based fuels. These drop-in biofuels directly replace petroleum-based fuels and hold particular promise for the future.

The Massachusetts Alternative Portfolio Standard:

In Massachusetts, the *Alternative Energy Portfolio Standard (APS)* program authorized by the state legislature and regulated by the

Commonwealth's Department of Energy Resources (DOER) incentivizes blending of renewable "liquid biofuel" in heating oil.

Launched in January of 2018, the program provides Alternative Energy Certificates to retail heating oil companies who provide homeowners and businesses with heating oil blended with biofuel at a minimum of B10 – a 10% blend. According to DOER, the APS offers Massachusetts businesses, institutions and governments an incentive for installing eligible alternative energy systems, that "contribute to the Commonwealth's clean energy goals by increasing energy efficiency and reducing the need for conventional fossil fuel-based power generation." Through calendar year 2021, more than 20 million gallons of B100 biofuel were incentivized by the APS.

Therefore, the IECC should redefine Renewable Energy Resources so that the energy code does not conflict with federal and state laws and policies.

Next Steps

- Industry support for proposals
- Form TBD
- Committee Membership
- HVAC / Renewable Subcommittees
- Residential comment period ends 12/19/22
- Heat Pump Infrastructure in appendix

NYS CLCPA

Staff Recommendations

State Codes for New Construction

> Update text to note the enactment of the NYS Advanced Building Codes, Appliance and Equipment Efficiency Standards Act of 2022 and of NYC Local Law 154.

> **Strategy B1:** Revise text to read: "Adopt State codes **that prohibit building systems or equipment used for the combustion of fossil fuels in new construction"** statewide **by 2025** [~~2024~~] for single-family and multifamily residential buildings having three stories or less and by **2028** [~~2027~~] for new construction of multifamily buildings having more than three stories and commercial buildings.

Zero-Emission Equipment Standards

> **Strategy B2:** Revise date to **2025** [~~2024~~] to prohibit utilities from providing new gas service to existing buildings

> **Strategy B2**: By 2030/2035 [dependent on building size], revise text to read: "Adopt zero-emission standards that prohibit replacements (at end of useful life) of gas/oil **combustion equipment** for heating, cooling, and hot water"

- Add description that emission standards for building equipment to be sold in NYS will be developed and proposed through a full public engagement and regulatory process. Such standards shall ensure that compliance will not disproportionately burden Disadvantaged Communities. As part of the emissions standards development process, the following shall be considered: consumer costs and benefits; technical, industry, and grid-readiness; and building-level resilience and potential for future connection to clean thermal energy networks.

Benchmarking and Disclosure

> **Strategy B3:** Revise date to **2024** [~~2023~~] to commence a statewide energy benchmarking and disclosure program.

Summary Themes

Support for the adoption of State Codes that require new construction to be highly efficient, zero-emission, and resilient – with clear dates

- Many commenters supported the dates in the draft Plan; some urged earlier dates, e.g., for mid-rise buildings.
- Proposed variant to B1: Focus on removing on-site fossil fuel combustion in new buildings rather than requiring to be all-electric, to allow for new low-/zero-emission solutions.

Support for setting State zero-emission standards that prohibit replacement of gas/oil HVAC and hot water equipment and appliances (at end of useful life) – with clear dates allowing the market to adjust

- Commenters in favor of these standards also supported market transformation incentives, pairing electrification and thermal efficiency, and dedicated assistance for LMI/DACs.
- Proposed variants to B2: (1) Establish emissions and energy efficiency standards where not preempted; (2) Apply standards in the short-to-mid-term to primary space heating equipment; longer-term, validate grid reliability before requiring 100% of supplemental heater sales to be electric/zero-emission.

Avoid regulation/mandates and instead pursue incentives and market transformation to increase market demand for low-emission technologies

- Commenters with this view emphasized consumer choice and tended to express support for electric heat pumps, dual-fuel heating, and low-carbon fuels as heating options.
- Hospitality industry requested that commercial kitchen equipment be exempted from all-electric codes/requirements.

Attention to rural and upstate community needs

- Some commenters believed the needs of rural/upstate communities were not adequately considered, citing that rural households depend on gas or delivered fuels due to their reliability (vs. above-ground electric infrastructure).
- Some questioned the reliability of heat pumps in very cold temperatures.
- Commenters divided on wood burning, either supporting wood burning as option in rural areas or expressing concern about the associated public health impacts.

Summary Themes

Rapid and just transition away from gas use

> The most common comments were to rapidly and completely move away from gas heating, including a ban on new gas hookups, ban of new investments into the gas system, and zero emissions standards for appliances to phase out the use of fossil fuel appliances.

> Support for a statewide plan for the transition away from use of gas that preserves safety, reliability and affordability.

> Need for a just transition plan for gas utility workers, including thermal energy networks.

> Some commenters expressed concerns with emissions impacts and costs of alternative fuels.

Allow consumer choice and support for alternative fuels

> Concern with the elimination of energy choices that could increase costs related to home heating needs.

> Support for an "all of the above" approach that includes use of hybrid heating systems, electric heat pumps, and low carbon fuels such as RNG, hydrogen, and biofuels in buildings.

System safety and reliability

> Support CLCPA, but strong concerns that relying on only the electric system for everything is too risky when there is a need for overall energy system reliability, resilience, and recovery from more frequent and severe weather events.

> Concerns with reliability of the electric grid as a result of increased electrification and the need for coordinated planning of the gas system transition with the build out of the electric grid.

CLCPA Response

- Under development
- Multiple paths
- Voluntary decarbonization ASAP

Tax Credits/Rebates

- $600 tax credit for 87% AFUE & B20 rated- 2023-2027
- Moves to 90% AFUE & B50 rated- 2028-2032
- Can be combined with NORA Efficiency Rebates

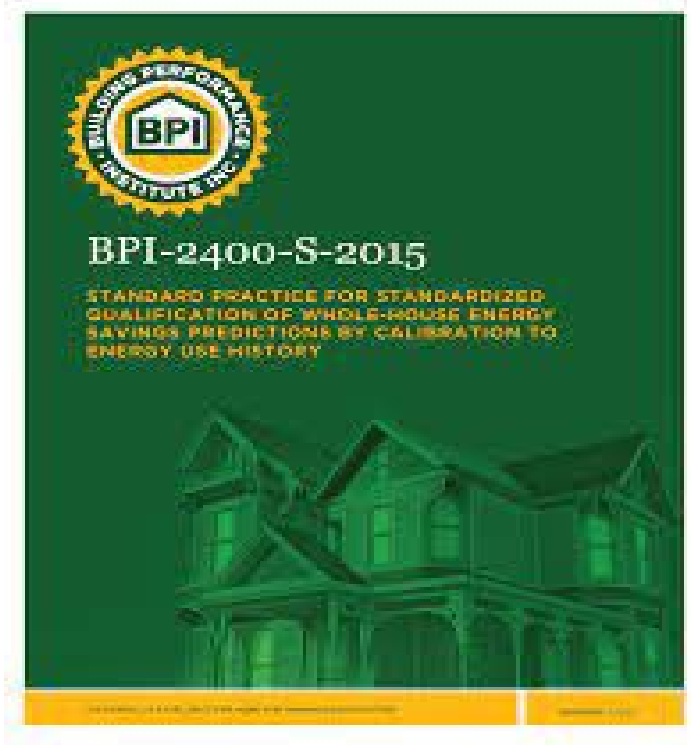
Upgrade & Save
NYC&LI Energy Efficiency and Safety Rebate Program

IRA of 2022 - HOMES

- Homeowner Managed Energy Savings
- $2K greater than 20% but less than 35%
- $4K greater than 35%
- Doubled for low income
- State administered rebate
- Performance based model, no fuel exclusions

BPI 2400

- Modeling to predict energy savings for various upgrades
- Sec of DOE can authorize alternate methods to quantify potential savings
- QA required
- HPwES requires both BPI building analyst & heating specialist certification



NORA Silver = BPI Heating Specialist

NORA/BPI

- Incorporating BPI BA training & testing
- Anyone can challenge test, no training required
- Both written and field test are mandatory
- BPI Standards Technical Committee – JL & RO
- Heating oil to liquid fuel- reduce CO limit

Conclusions

- Many Challenges but Many Opportunities
- Multi-front battle
- Industry cooperation