

Industry Perspective: Heating Oil

Presented by
The New England Fuel Institute
at the
U.S. EIA Heating Oil & Propane Workshop
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Meet the New
Chairman: Sean Cota
of Cota & Cota, Inc.

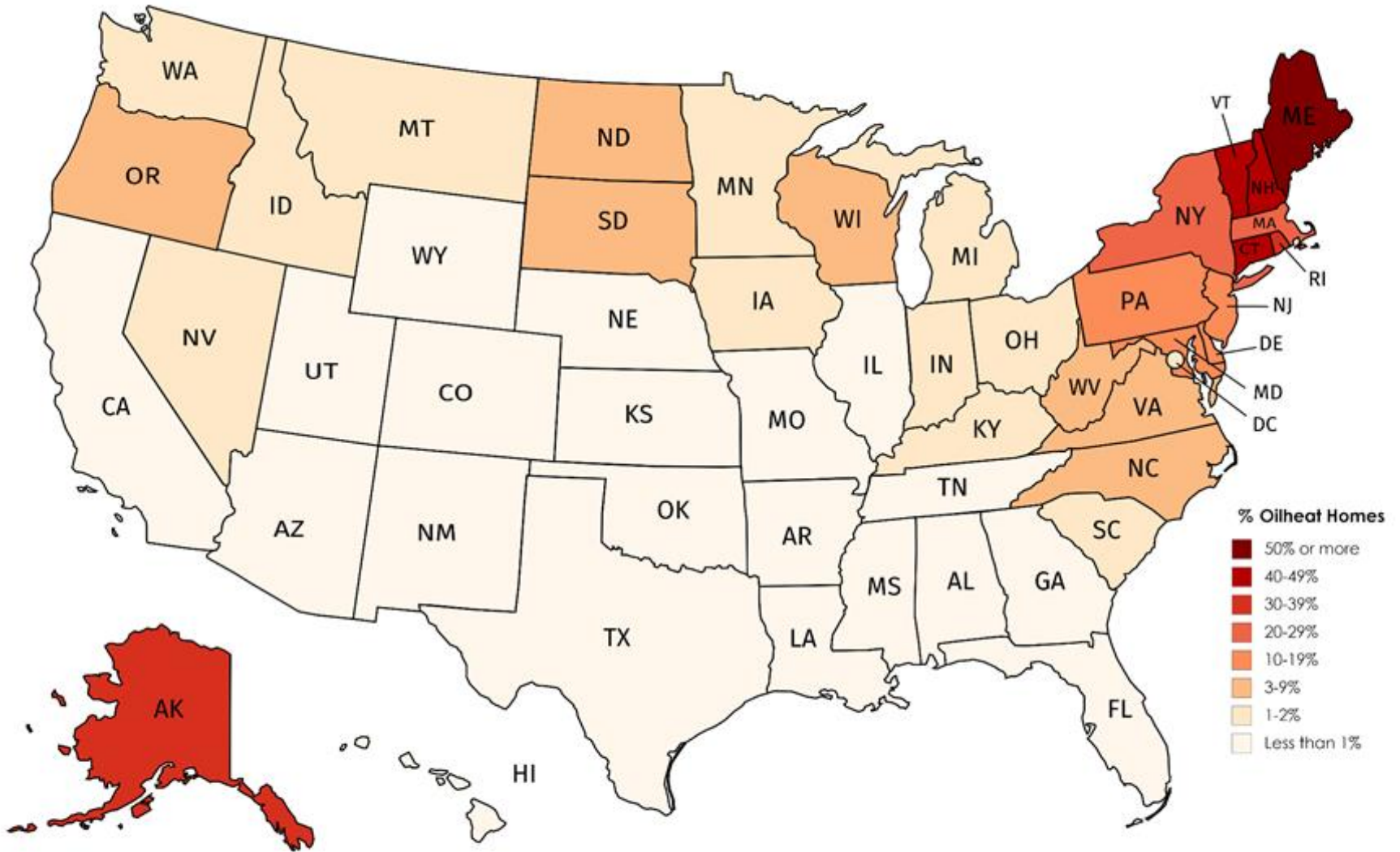
Cota & Cota of Bellows Falls, VT



Today's Heating Oil

- Provides warmth & comfort to more than **six million homes** across America.
- Delivered by **Main Street businesses**, not big oil companies or large utilities.
- Is now **ultra-low sulfur**, a cleaner-burning and more efficient fuel.
- Is delivering **renewable fuel** that utilizes existing heating systems & infrastructure.
- Helps provide **energy security and reliability**, especially in the Northeast.

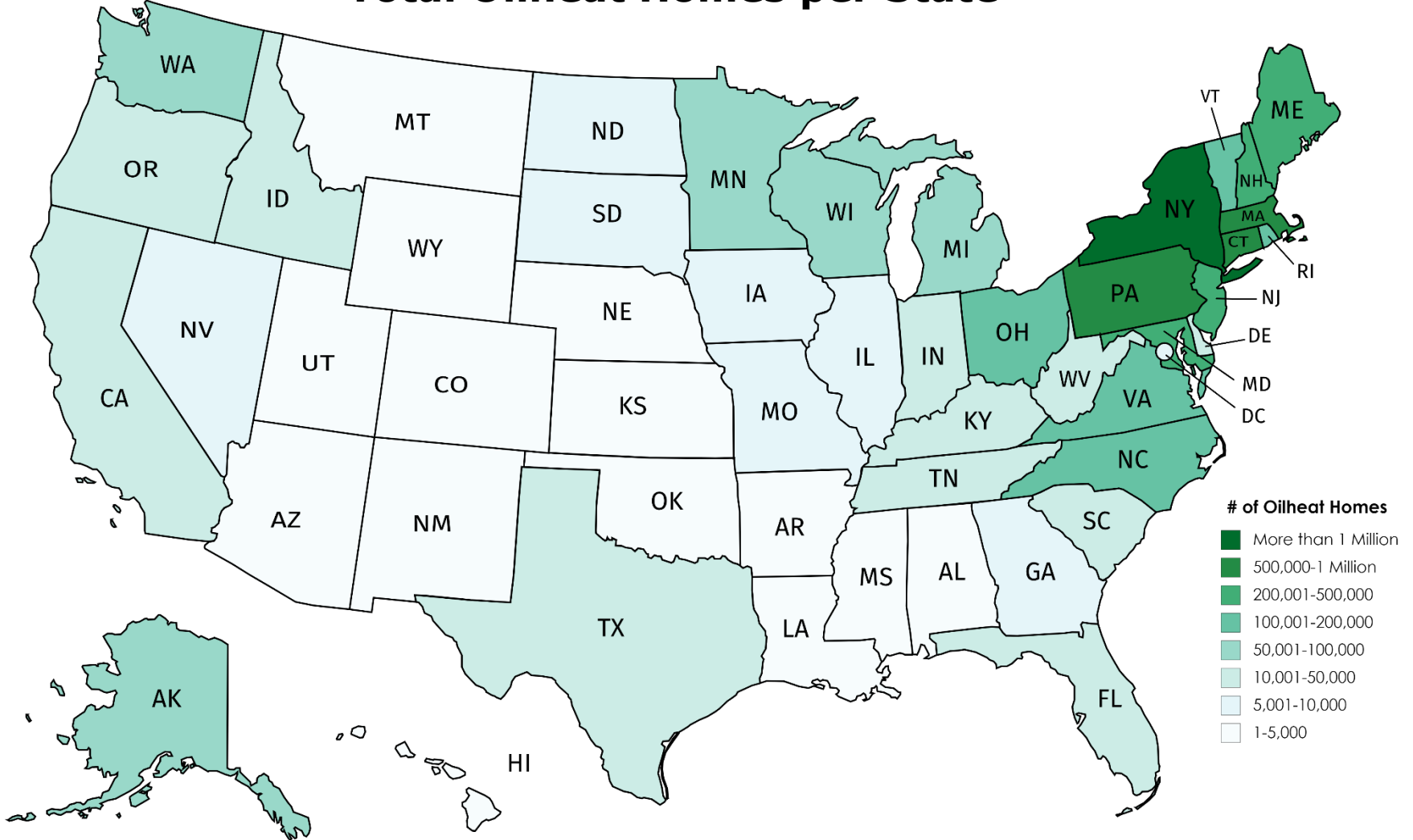
Oilheat Share of State Residential Markets



87% of U.S. homes with Oilheat are in the NE/MA region



Total Oilheat Homes per State



Many other states have localized home heating oil use, mainly in the Great Lakes region, Pacific Northwest and parts of the South.



State	Oilheat Homes	% of Market
Connecticut	581,000	43%
Maine	351,000	64%
Massachusetts	723,000	28%
New Hampshire	237,000	45%
Rhode Island	132,000	32%
Vermont	112,000	43%
New England Total	2.1 million	38%
New Jersey	315,000	10%
New York	1.7 million	24%
Pennsylvania	865,000	17%
Northeast Total	5 Million	24%



Other Notable States & Locales	Oilheat Homes	% of Market
Delaware	47,000	14%
District of Columbia	5,000	19%
Maryland	208,000	10%
Virginia	162,000	5%
West Virginia	21,000	3%
Mid-Atlantic Total	443,000	7%
NE/MA Total	5.5 million	20%
Alaska (statewide)	74,000	30%
<i>King County, Washington</i>	<i>29,000</i>	<i>4%</i>
<i>Yancey County, N. Carolina</i>	<i>2,500</i>	<i>33%</i>
<i>Presidio County, Texas</i>	<i>700</i>	<i>27%</i>
<i>Siskiyou County, California</i>	<i>5,000</i>	<i>26%</i>



Challenges for Average HO Dealer

- **Competition** with other heating oil dealers.
- Homeowner **fuel-switching** to:
 - Other “deliverable” fuels (propane, wood, etc)
 - Utility-provided fuels (natural gas, electricity)
- **Market volatility**, especially price spikes.
- Federal, state and local **regulations**.
- Ability to hire and retain qualified **HAZMAT drivers** and other employees.
- Need to correct **myths** that today’s heating oil is inefficient or harmful to environment.

**DESPITE THESE CHALLENGES,
WE CONTINUE TO REMIND OUR
MEMBERS...**



YOU MATTER...

**UNLESS YOU MULTIPLY YOURSELF BY THE SPEED OF
LIGHT SQUARED. THEN YOU ENERGY.**

memes.com



Heating Oil Matters to...

**Future generations
of these family-run businesses.**

(Also, their employees and *their* families and future careers.)



The Average HO Dealer:

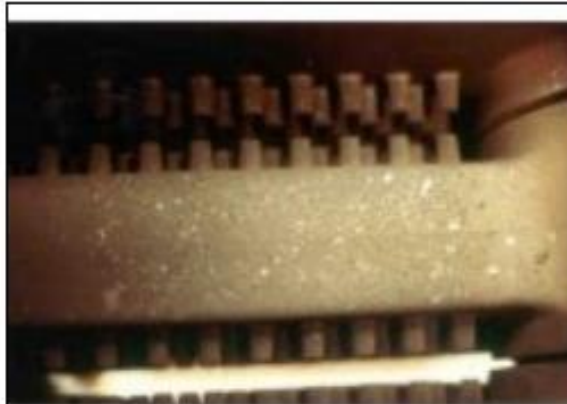
- Is a small, third-generation family business.
- Supports 28 good-paying jobs, including six full-time equivalent delivery drivers.
- Personally delivers around 1.7 million gallons annually to 2,000-3,000 residential accounts.
- Does not benefit from high prices... margins are in cents-per-gallon, not a percentage.
- Offers budgeting plans (90%), fixed-price plans (58%) and/or price-caps (49%).
- Is increasingly diverse... HVAC-R/PE services, energy audits, propane, etc.

Heating Oil Matters to...

The Environment.

Ultra-low Sulfur Heating Oil

- **New York** led the move to ultra-low sulfur heating oil (ULSHO) in 2012.
- **Delaware & New Jersey** transitioned in in 2016, and all six **New England** states will transition to ULSHO on **July 1, 2018**.
- Improves heating system reliability and longevity and reduces service calls... in other words, **saves consumers money!**
- **Reduced emissions:** sulfur dioxide (SO₂), nitrogen oxides (NO_x) and particulates
- Blended with sustainable biodiesel to make **Bioheat[®] Fuel** and reduce GHG emissions.



No. 2 heating fuel, 0.04% sulfur



No. 2 heating fuel, 0.18% sulfur



No. 2 heating fuel, 0.34% sulfur



No. 2 heating fuel, 1.08% sulfur

HO Boiler Deposition for Varying Fuel Sulfur Contents

Clock-wise from upper-left, 400ppm, 1,800ppm, 3,400ppm and 10,800ppm

Courtesy of Brookhaven National Laboratory

Historic Efficiency Gains

- Since 2000, oilheat efficiency has improved about 30% per home, down to as low as 500-700 gallons per year.
- **This amounts to \$600 in average annual savings per consumer.**
- ULSHO will allow the introduction of lower-cost, compact and ultra-efficient condensing units into the U.S. market.
- **These systems offer AFUE ratings that exceed 90-percent.**

A Renewable Future

- Bioheat blends of between five and seven percent (B5-B7) are in **widespread use** through the industry.
- Blends at this level have been shown to have **lower GHG emissions** than natural gas based on a 20-year atmospheric lifecycle.
- Some dealers are offering 20% (B20) Bioheat blends or higher, showing good results.
- **Safe for existing systems.** Little to no modifications are necessary.
- Biodiesel for use in Bioheat can come from **diverse feedstocks**, including soy, waste oils and cellulosic feedstocks such as wood.

Bioheat blends are required in Rhode Island (statewide) and New York (downstate region) at 5%. New York City will require 10% in 2025, 15% in 2030, and 20% in 2034.

LOW SULFUR & BIODIESEL BLENDING REQUIREMENTS IN THE NORTHEAST/MID-ATLANTIC							
All data is listed for No. 2 Fuel Oil only. Compliance dates are July 1st of that year unless otherwise specified. Cities are listed in <i>italics</i> .							
	Previous Sulfur	2012	2014	2015	2016	2017	2018+
New York State (Sulfur)	2,500-5,000ppm	15ppm					
New York State (Bioheat)							5% Bio
<i>New York City (Bioheat)</i>		2% Bio				5% Bio*	
<i>Philadelphia, PA (Sulfur)</i>	2,000ppm			15ppm			
Delaware	3,000-10,000ppm				15ppm		
New Jersey	2,000-3,000ppm		500ppm		15ppm		
Maryland	3,000ppm		2,000ppm		500ppm		
Pennsylvania	2,000-5,000ppm				500ppm		
Massachusetts	3,000ppm		500ppm				15ppm
Rhode Island (Sulfur)	5,000ppm		500ppm				15ppm
Rhode Island (Bioheat)			2% Bio	3% Bio	4% Bio	5% Bio	
Vermont	20,000ppm		500ppm				15ppm
Connecticut	3,000ppm		500ppm				15ppm
Maine	3,000-5,000ppm						15ppm
New Hampshire	4,000ppm						15ppm
<i>Washington, DC (Sulfur)</i>	10,000ppm				500ppm		15ppm

*New York City will require 5% blends on October 1, 2017 and after a study and report, 10% in 2025, 15% in 2030 and 20% in 2034.



Bioheat Emissions Reductions by Blend

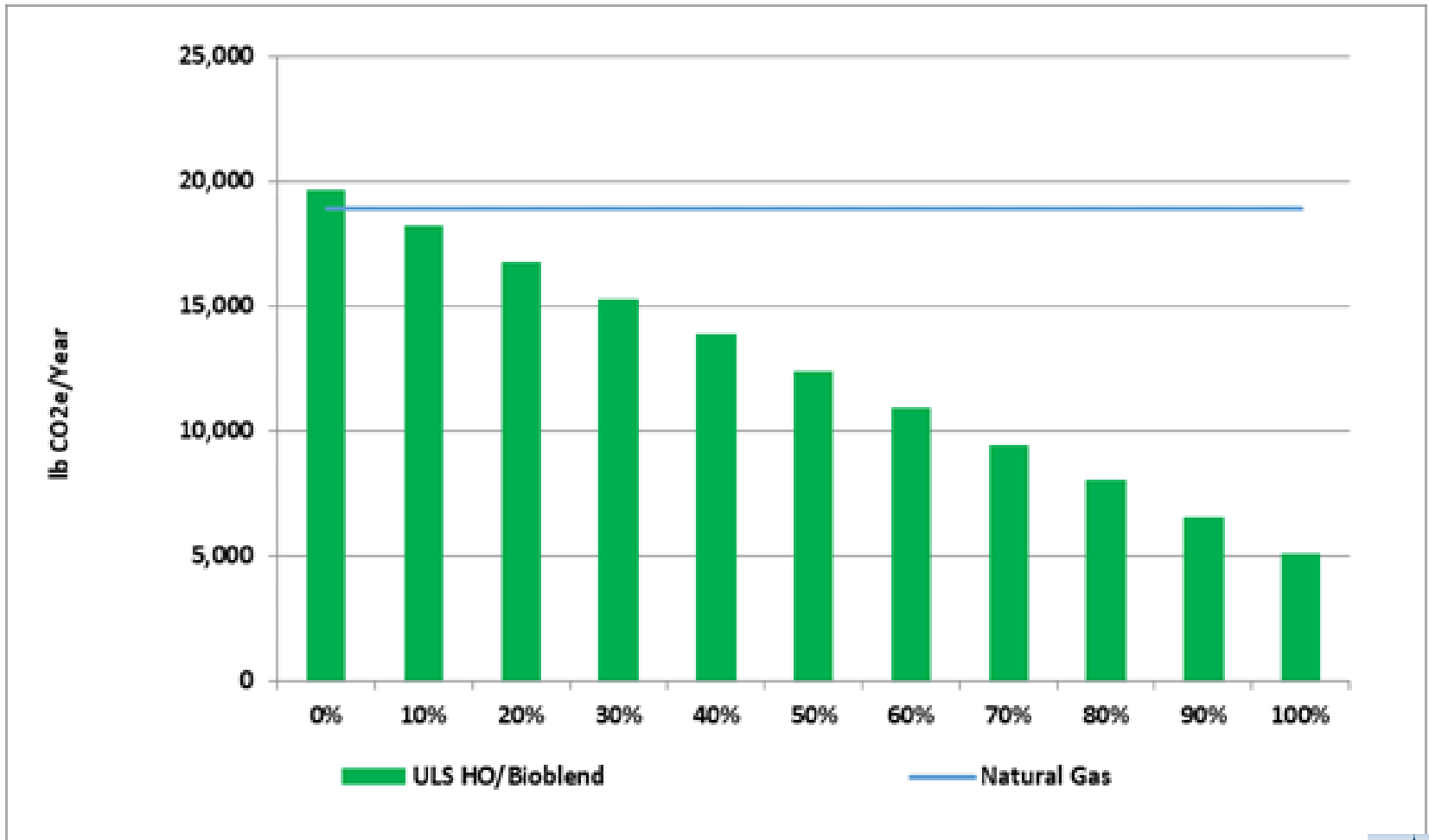
Emissions	B5	B10	B20	B100
Carbon Dioxide (CO ₂)	4%	8%	16%	81%
Nitrogen Oxides (NO _x)	≥ 5%	Varies	≤ 8%	≤ 35%
Sulfur Oxides (SOX)*	5%	10%	20%	100%
Particulate Matter (PM2.5)	≥ 3%	≥ 6%	12-16%	≥ 47%
Carbon Monoxide (CO)	≥ 3%	≥ 5%	≥ 9%	16-40%
Hydrocarbons	5%	10%	20%	100%

*New York currently requires use of ultra-low (15ppm) sulfur heating oil state-wide and all six New England states will require its use effective July 1, 2018.

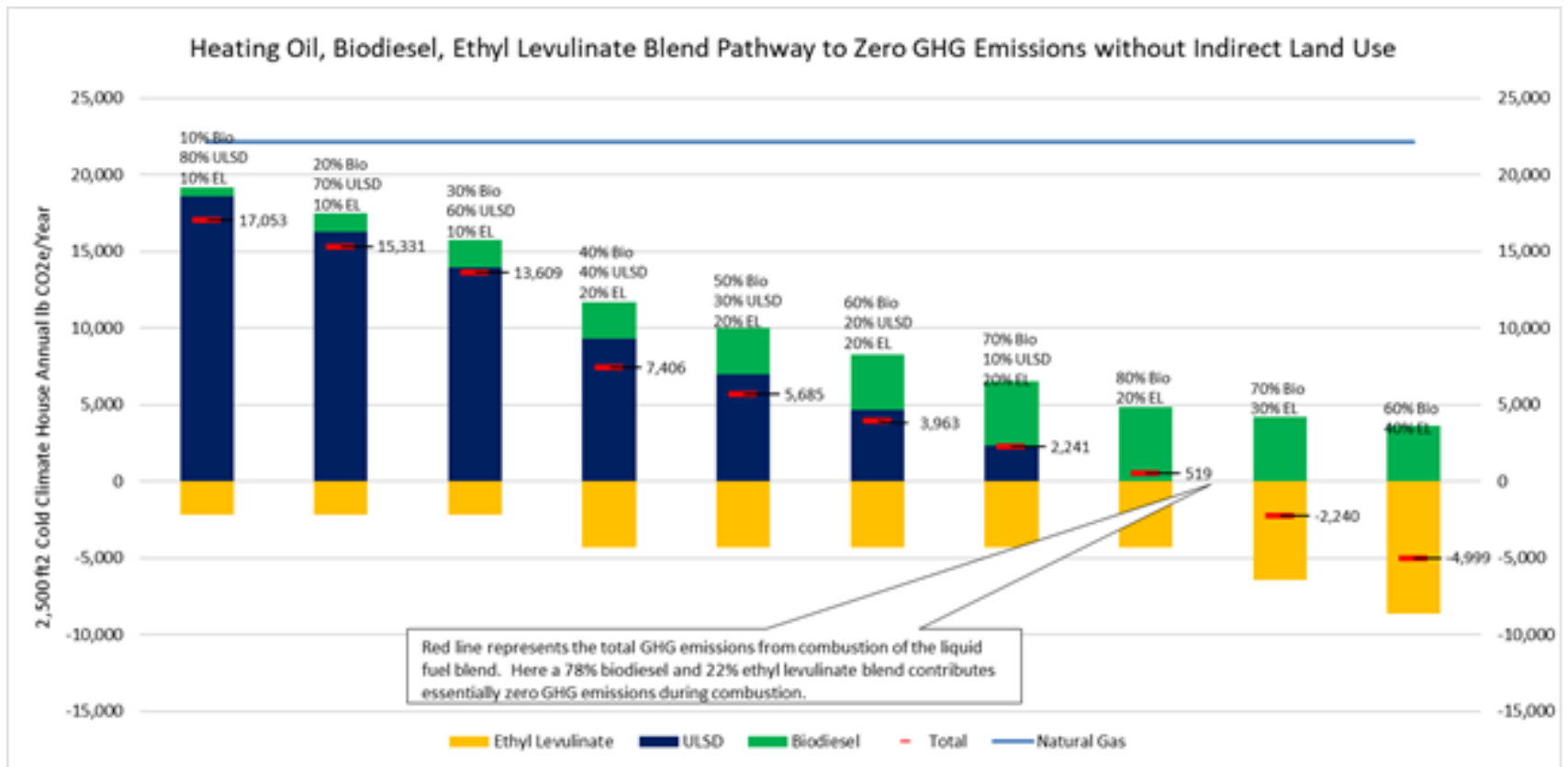
**5% Blend Regionwide in New England & New York
= 300,000 Cars Removed from Road Annually**



Carbon dioxide reductions with a 20-year atmospheric lifecycle using natural gas as a baseline.



Impact of Advanced Biofuels in Heating Oil: Pathway to Zero Emission Heating Fuel



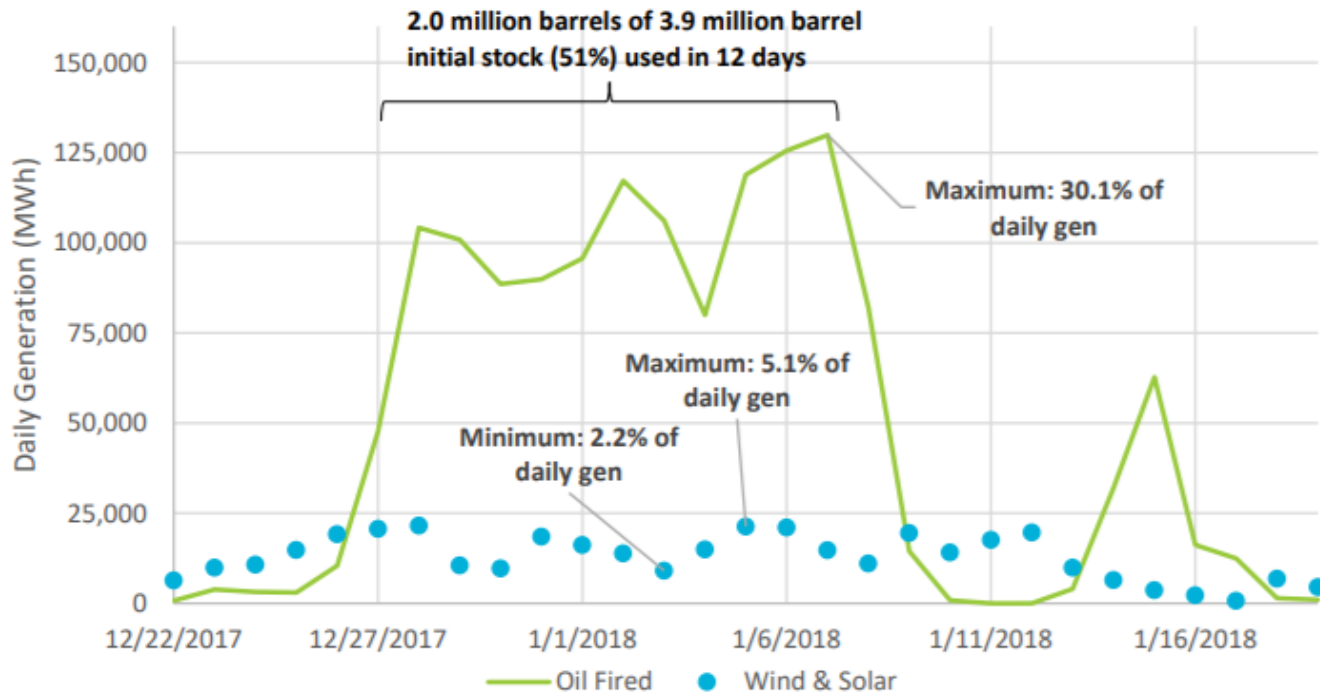
Heating Oil Matters to...

Power Companies

(No, really, its true... especially in the Northeast)

In twelve days this winter (Dec. 27 - Jan. 7), New England power companies used nearly 2 million barrels or about 80 million gallons of fuel oil, representing more than 50% of the capacity available under the ISO's Winter Reliability Program and equal to all the fuel used by Vermont homes in a typical year. Some days, fuel oil accounted for nearly 40% of peak power output.

Fuel oil resilience and renewable output, ISO-NE, Dec 22, 2017–Jan 18, 2018



Average of 166,000 barrels per day consumed during cold period, 1.06 trillion Btus per day

Source: U.S. Department of Energy, National Energy Technology Laboratory, 2018



Thank you for listening!



Sean Cota, NEFI President & CEO

sean.cota@nefi.com

Cell (802) 380-1571

Sources:

U.S. Census Bureau, American Community Survey, Primary Heating Fuel by Occupied Housing Unit, "Fuel Oil, Kerosene, etc.", Five-year average (2012-2016).

*Gray, Gray & Gray 2018 Heating Oil Dealer Survey, Published May 22, 2018. Available at:
<https://www.gggcpas.com/practice-areas/energy-petroleum>*

Efficiency and Biodiesel Performance data provided by the National Oilheat Research Alliance (NORA)

Bioheat is a registered trademark of the National Biodiesel Board



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