

BEST FOR *You*
And Your Customers

Our Product, Our Future



Rethinking the future

Situation

- State and Federal policies aimed at phasing out carbon-based fuels is underway challenging the entire petroleum supply chain's sustainability.
- Market consolidation, aging population, reduction in consumer choice.

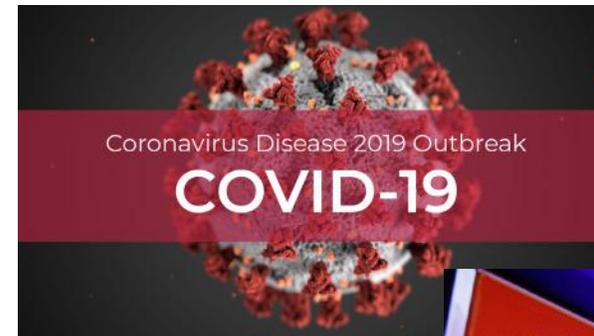
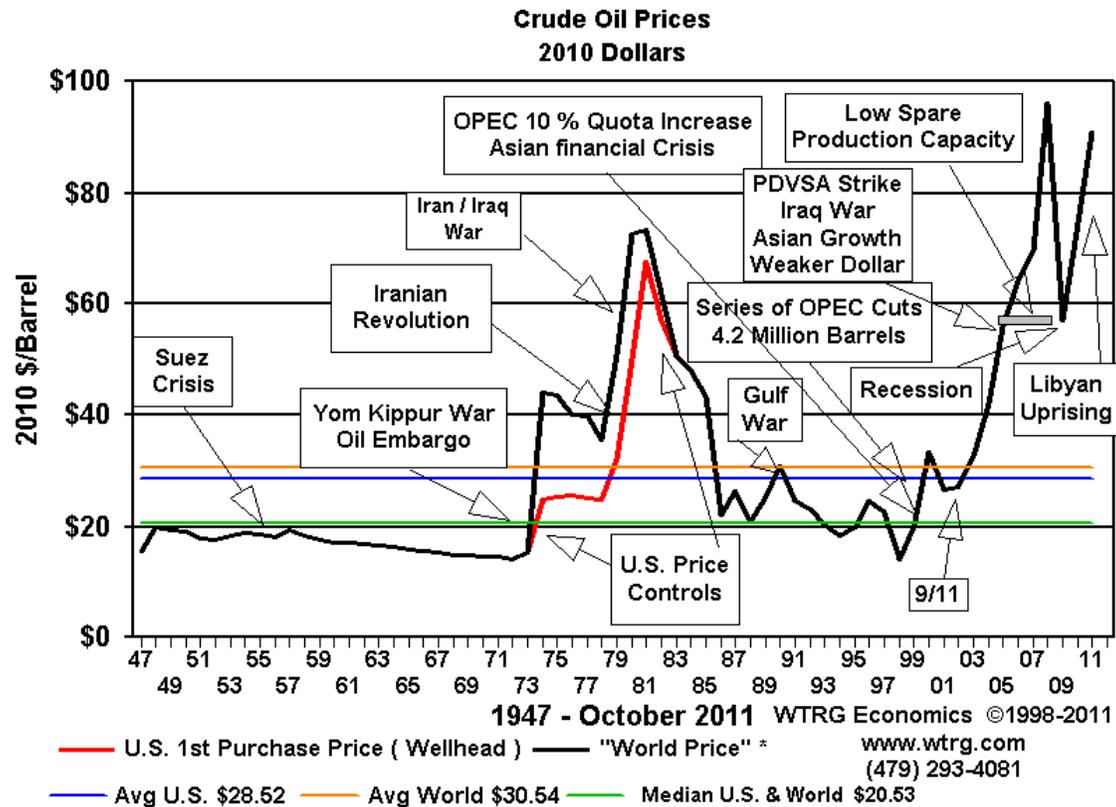
Solution

- Low Carbon Renewable Fuels, Biodiesel, Bioheat®.
- Integrate low carbon renewable liquids like biodiesel and renewable diesel throughout distillate pool.
- Upgrade fuels through treatment technologies.

Strategy

- Work Together, Win Together
- Be vigilant to monitoring fuels, upgrading where required.
- Commit to routine communication with the downstream.
- Invest in ourselves.

Anticipate Uncertainty



Our Industry's Renaissance



Heating Oil, What People Are Saying

- » Hasn't Evolved In Decades
- » It's Carbon Intensive Even At 15 ppm
- » Policymakers Dislike It
- » Poor Merchantability
- » Market Contraction Will Accelerate
- » Our People Are Our Biggest Asset



**Your community works...
because they do.**

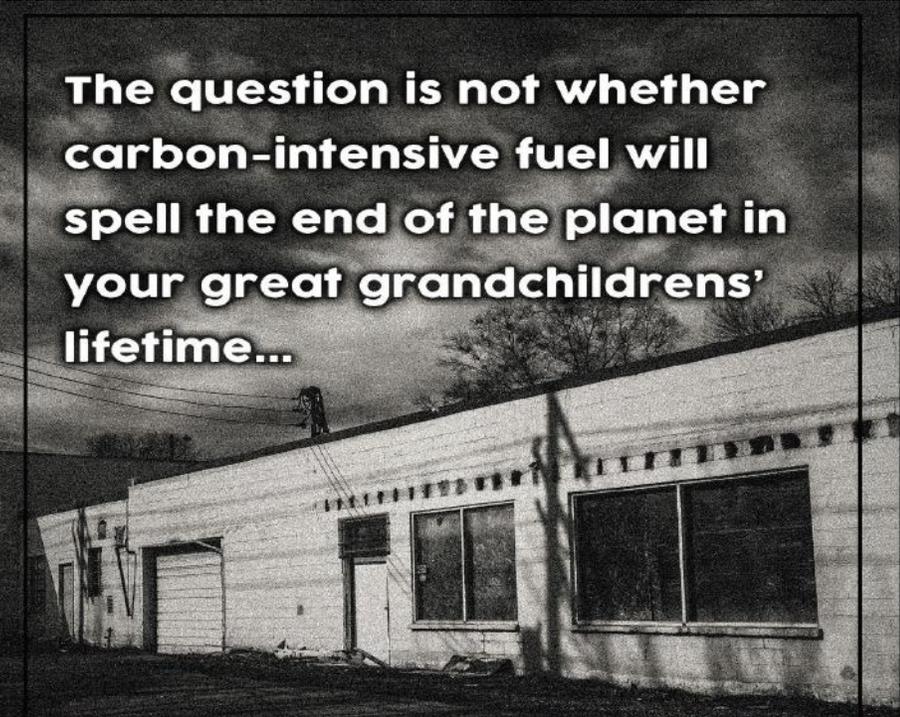
The Community Fuel Dealer
*Bringing warmth, safety,
peace-of-mind and*

BIOHEAT.
THE EVOLUTION OF OILHEAT

Look into becoming a registered Bioheat® dealer

Carbon Reduction Targets, The Providence Resolution

2023/15%, 2030/40%, 2050/80%



The question is not whether carbon-intensive fuel will spell the end of the planet in your great grandchildren's lifetime...

but if it will spell the end of your business in yours.

THE SITUATION

Your company has survived past **threats** from supply, price and utility competition, but now faces an unparalleled and organized threat from government. Unlike the other threats, this one has the power to assess harmful carbon taxes, offer financial incentives to convert away from oil and **legislate you out of business.**

THE SOLUTION

Bioheat[®], made from America's advanced biofuel, biodiesel, blended with varying amounts of heating oil will reduce atmospheric carbon emissions. Blending at 20% provide a 16% reduction, **increasing the blend to 50% will reduce carbon emissions by 40%.**

BEST FOR *You*

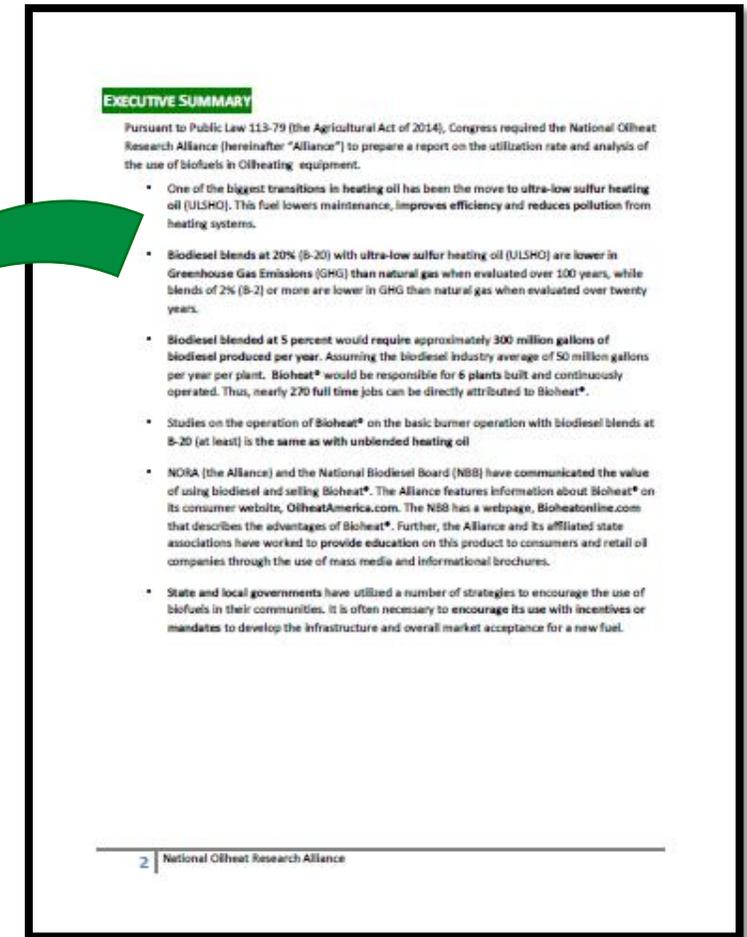
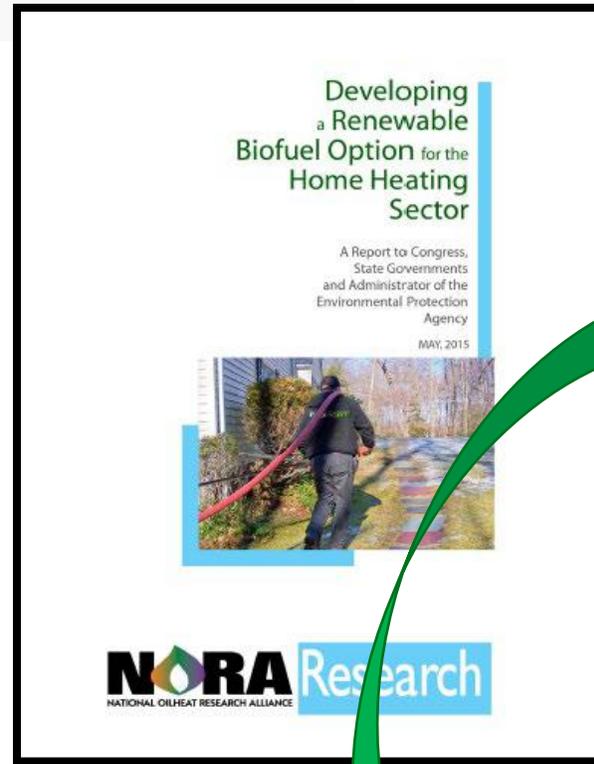
BIOHEAT® TRADEMARKS

- » Bioheat®, Min 2% - 5% Max
- » Bioheat Plus™, 6-20%
- » Bioheat Super Plus™ 21-100%



Biodiesel/ULSHO, A Cleaner Choice

- » Renewable
- » Biodegradable
- » High cetane
- » Increased lubricity
- » Safer flash point
- » No nitrogen or aromatics
- » Virtually sulfur free
- » Contains 11% oxygen by weight
- » Enhances fireside performance
- » Helps reduce brush & vacuum intervals
- » Creates a positive consumer impression about heating oil
- » Our sole pathway forward



Biodiesel blends at 20% (B-20) with ULSHO are lower in Greenhouse Gas emissions than natural gas when evaluated over 100 years, while blends of 2% (B-2) or more are lower in GHG than natural gas when evaluated over twenty years.

BEST FOR You

Bioheat Fuel, “Works Like #2 Oil”, Only Cleaner.....

- Pump Seal Material Evaluation
- Evaluation of Oil Burner Pumps Under Operating Conditions
- Exposure of “Yellow Metals” at Low Temperature
- Exposure of Yellow Metals at High Temperatures
- Managing <B20, >B20 for pour point operability.
- Sedimentation
- Blending



B20 to B100 Blends as Heating Fuels

Dr. Thomas A. Butcher and Rebecca Trojanowski

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submitted to the:
**New York State Energy Research Development Authority
National Biodiesel Board
and
National Oilheat Research Alliance**

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The Facts are The Facts!

However, the biggest challenge we as an industry face in 2019 and going forward is the "electrification of everything."



The short synopsis on HB 725 – FN is that this proposal if adopted would drive the cost of fossil fuels so high that the end users would be forced to seek alternative sources of energy as opposed to what they use today. This proposal would cost you jobs, market share and potentially your company



January 16, 2019

TO: FMA Members
FROM: Eric DeGesero
RE: **The Future of Your Business**

As 2019 begins there are a number of priorities for FMA. Among the priorities are continuing to try and find a way to resolve the ongoing subrogation suits by homeowner insurers against oil dealers and establishing relationships with new members of Congress from New Jersey (look for an upcoming announcement but mark your calendars for a Washington D.C. trip May 9-10).

However, the biggest challenge we as an industry face in 2019 and going forward is the "electrification of everything."

There is a strong push in the Northeast to eliminate all fossil fuels in:

- the building sector by converting everyone to heat pumps.
- the transportation sector by pushing electric cars.

This is not simply a U.S. matter. The province of Quebec, Canada, has **banned** new installations of heating oil systems in 2023 that are not operating on bio or renewable fuel and by 2028 all existing non bio or renewable fuel heating systems will need to be either **removed or replaced** with bio or renewable fuels units. The City of Montreal is considering advancing these deadlines.

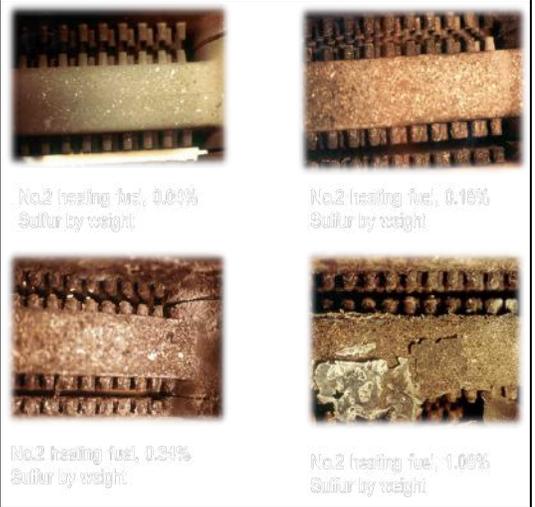
NORA is working on developing a fuel and equipment that will allow for liquid fuels to be part of the heating mix in the future. [This article](#) is an excellent synopsis. The author Rich Sweetser, along with NORA Chairman Charlie Uglietto, Cubby Oil, Somerville, MA, NORA President John Huber and Dr. Tom Butcher, who heads NORA's research lab will present an in depth analysis of all that NORA is doing to ensure your company's future as the [EEE 2019 keynote in Hershey, PA.](#)

BEST FOR You

BTU Content Comparison

BTU Content		Generic Heating Oil	B2 Blend	B5 Blend	B20 Blend
120,000	BTU Biodiesel		2,400	6,000	24,000
138,000	BTU Oil heat	138,000	135,240	131,100	110,400
	Total BTU's	138,000	137,640	137,100	134,400

Similar



Perceived Challenge	Recommended Solution
Fuel Shelf Life	Biodiesel Has Same Recommend Storage Life Additive Solution Provides Protection
Material Compatibility	Elastomers/Yellow Metals/Additive Solution
Combustion	#2 Fuel Oil Requires 20% More Air (B100 ~10% Oxygen By Weight), Optimized w/system adjustment
Cloud Point	Cold Temperature Performance (No ASTM Spec and Variation with Feedstock), Managed by feedstock & blend percentage
Pour Point	Fuel Flow/Treatable With Pour Point Depressants
BTU/Gal	Firing Rate/Increased Fuel Use/Same as #1 or better
Combustion Luminescence	Flame Sensor/Higher Blends/Air Adjustable
Sticking Residues	Pump Failure/Storage Tank Residues Impact
Viscosity	Proper Atomization

BEST FOR *You*

Bioheat®

Multiple legislative items currently under discussion in Northeast to consider biodiesel mandates in heating oil

No specifications past B20 and limited equipment manufacturer support

Technical Considerations for B21-B100 in Heating Oil

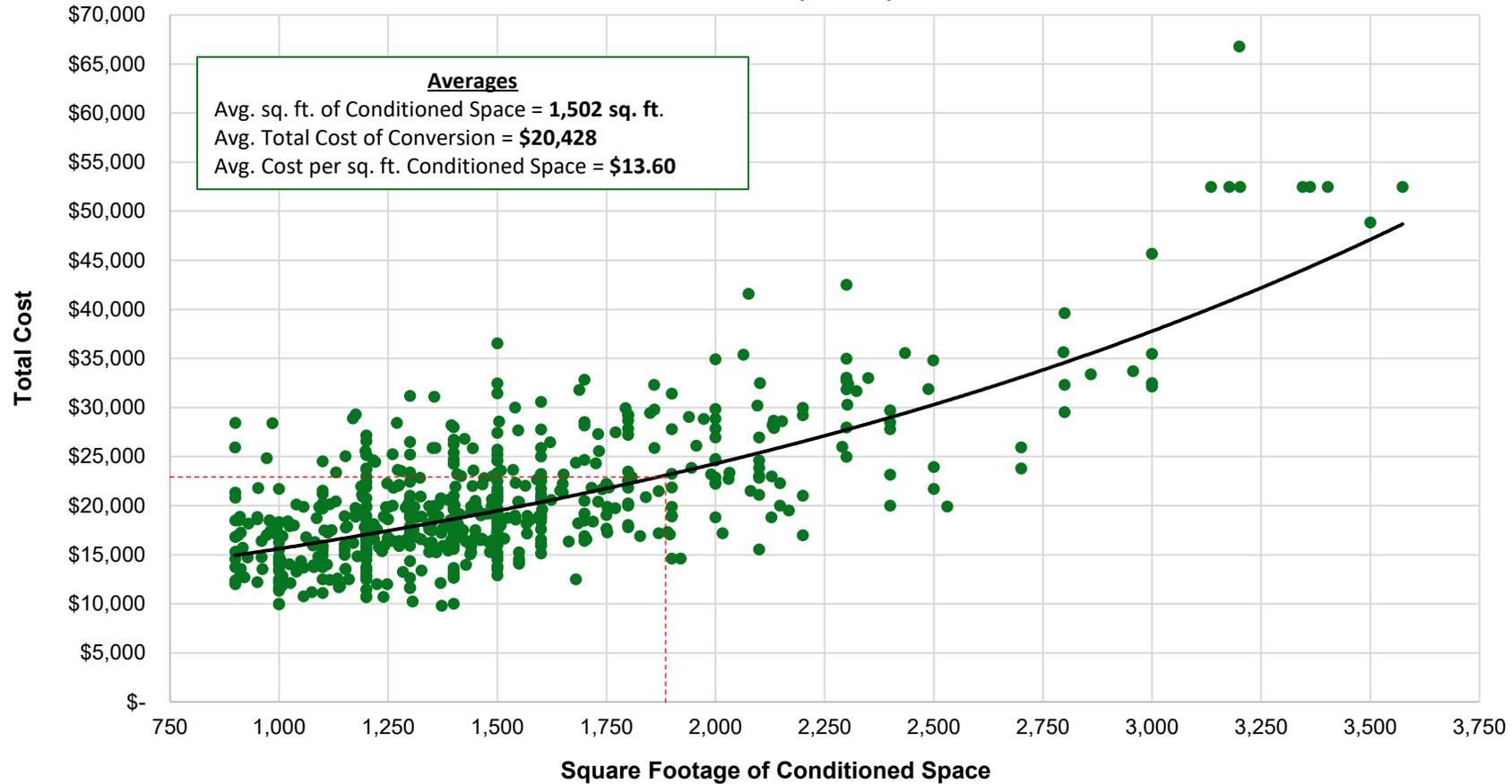
RW Beckett only supports B5 in existing equipment but now offering new B20 burner

UL recently approved protocols for testing and approving B20 heating oil systems

Heat Pumps: Cost

The cost of converting to an electric air-source heat pump system in Massachusetts over the last few years is expensive for homeowners

**Massachusetts Heat Pump Conversion Cost
2014-2019 (n=622)**

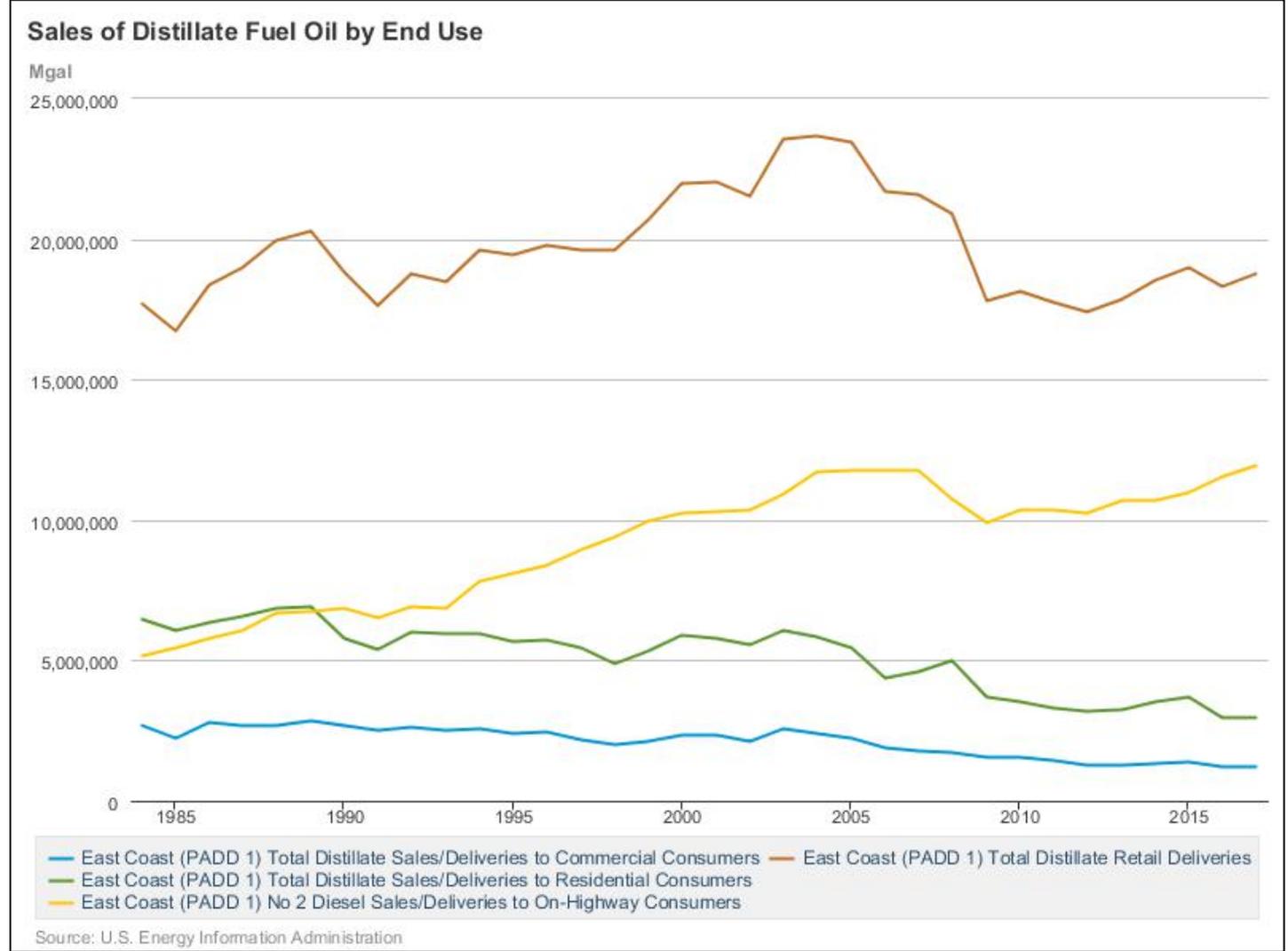


Source: Diversified Energy Specialists Research & Analysis; MassCEC; MA DOER

Median Size of Residence in MA = 1,912 sq. ft.
Median Residence Conversion Cost = \$21,572

PADD I, Includes A&B

- Total: 18,767 BGY
- Residential: 2,958 BGY
- Commercial: 1,217 BGY
- Industrial: 455 MGY
- On-Highway: 11,941 BGY





Min 2% - 5% Max



6-20%



21-100%

More Is Better

TRADEMARK USAGE AGREEMENT

THIS AGREEMENT is entered into this ___ day of _____, 2016 ("Execution Date"), by and between National Biodiesel Board, a non-profit organization organized in the state of Iowa, with offices located at 605 Clark Avenue, Jefferson City, Missouri 65101 ("NBB"), and _____, ("Distributor") (NBB and Distributor being collectively referred to as the "Parties").

WITNESSETH:

WHEREAS, NBB owns the trademarks "BIOHEAT," "THE EVOLUTION OF OILHEAT," "BIOHEAT DESIGN MARK," attached hereto as Exhibit "A," and the "THE EVOLUTION OF OILHEAT DESIGN MARK" attached hereto as Exhibit "B" as used in association with at least fuel oil (collectively the "Marks");

WHEREAS, Distributor provides educational materials (the "Materials") for consumers or persons in the sale, servicing, distribution, and/or use of heating oil or biodiesel identifying ASTM D6751 compliant B100 biodiesel or blends of B100 biodiesel mixed with ASTM D396 compliant heating oil (the "Blended Fuel") in the United States (the "Territory");

WHEREAS, Distributor desires to use the Marks in connection with the distribution of the Materials in the Territory; and

WHEREAS, NBB is willing to permit such use of the Marks under the terms and conditions set forth below.

NOW, THEREFORE, in consideration of the promises and agreements set forth herein, the Parties, each intending to be legally bound hereby, do promise and agree as follows.

1. LICENSE GRANT. NBB hereby grants to Distributor a non-exclusive, non-sublicensable, nontransferable, license to use the Marks in connection with creating and distributing the Materials solely to promote and/or market the Blended Fuel in the Territory in accordance with this Agreement. This license is granted only for use of the Marks in association with the Materials and does not extend to any other mark, product or service. NBB grants to Distributor the right to use the Marks on the Materials. NBB hereby reserves all rights not explicitly granted under this Agreement, including NBB's right to authorize or license use of the Marks, to any third party for use in connection with any goods and services.

2. TERM OF THE AGREEMENT. This Agreement and the provisions hereof, except as otherwise provided, shall be in full force and effect for ten (10) years commencing on the Execution Date. This Agreement may be terminated in accordance with the provisions of Section 10 below.



THE EVOLUTION OF OILHEAT



BEST FOR *You*

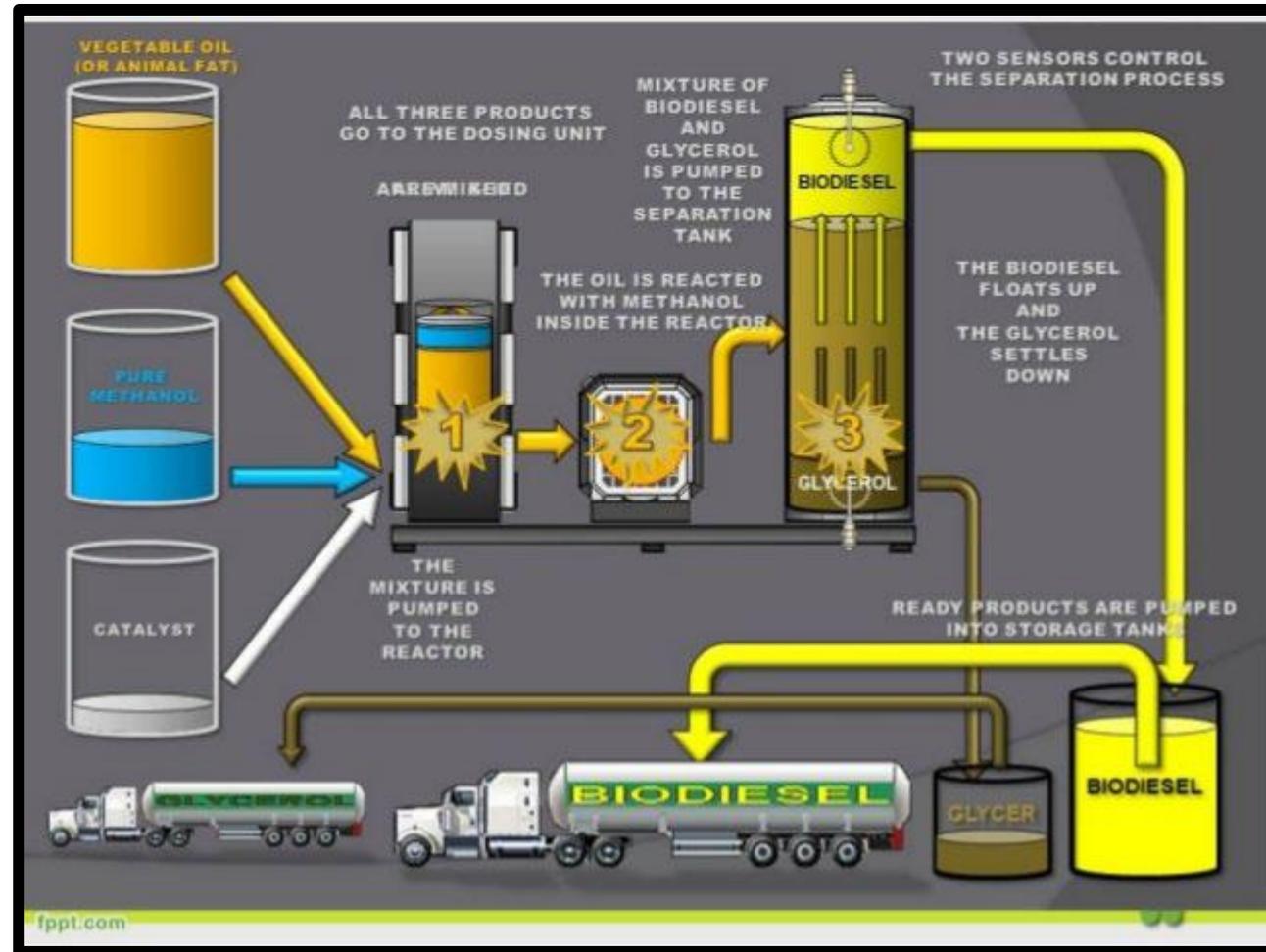


U.S. Biodiesel Production

- The U.S. has approximately 100 Biodiesel Plants
- Current U.S. production is 2.5 BGY gallons on a capacity of 4 BGY gallons
- Current domestic feedstocks support a production capacity of 6 BGY gallons

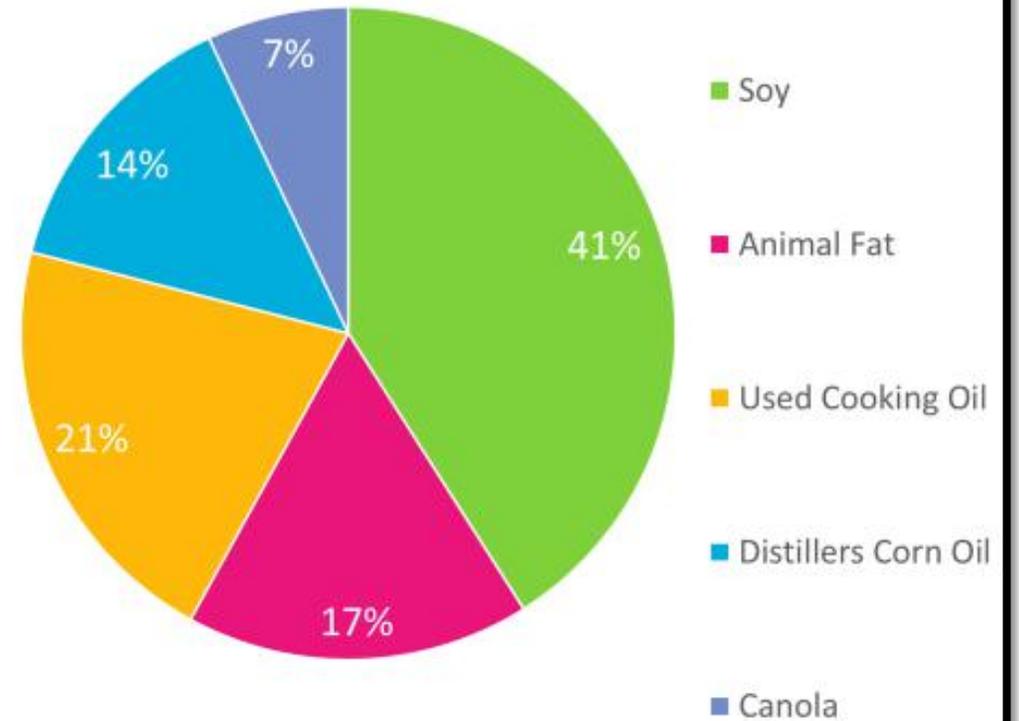
What is Biodiesel?

- A domestic, sustainable, renewable fuel for blending into diesel and heating oil made from fats and oils, such as soybean oil and used cooking oil
- EPA designates biodiesel as a high-quality Advanced Biofuel, because it helps reduce GHG emissions between 57% - 86%
- Made through a chemical reaction called transesterification, raw vegetable oil, recycled cooking oil, RHD/Renewable Diesel are not biodiesel



2019 Biomass Based Diesel Feedstocks

Biomass-based Diesel Feedstocks 2019





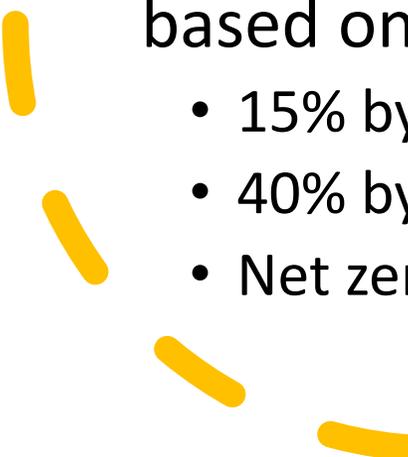
Biodiesel makes heating oil better, while helping states meet its GHG goals

- Biodiesel is currently blended at a minimum of 5% in the Downstate NY, with 20% in statute for NY City
- Retail home energy marketers are delivering up to 20% based on the Clean Heating Fuels Tax Credit
- At least two Massachusetts has retail energy companies selling 40% and 50% biodiesel to their customers with no operability issues; and service maintenance has decreased
- Field use and laboratory tests show no operability issues at 50% and higher
- Oil Equipment Manufacturers are developing technology for 100% biodiesel
- Price tracking in NY Harbor since 2012 show no increase in the cost of heating oil at retail to consumers where biodiesel has been in use



The Providence Resolution

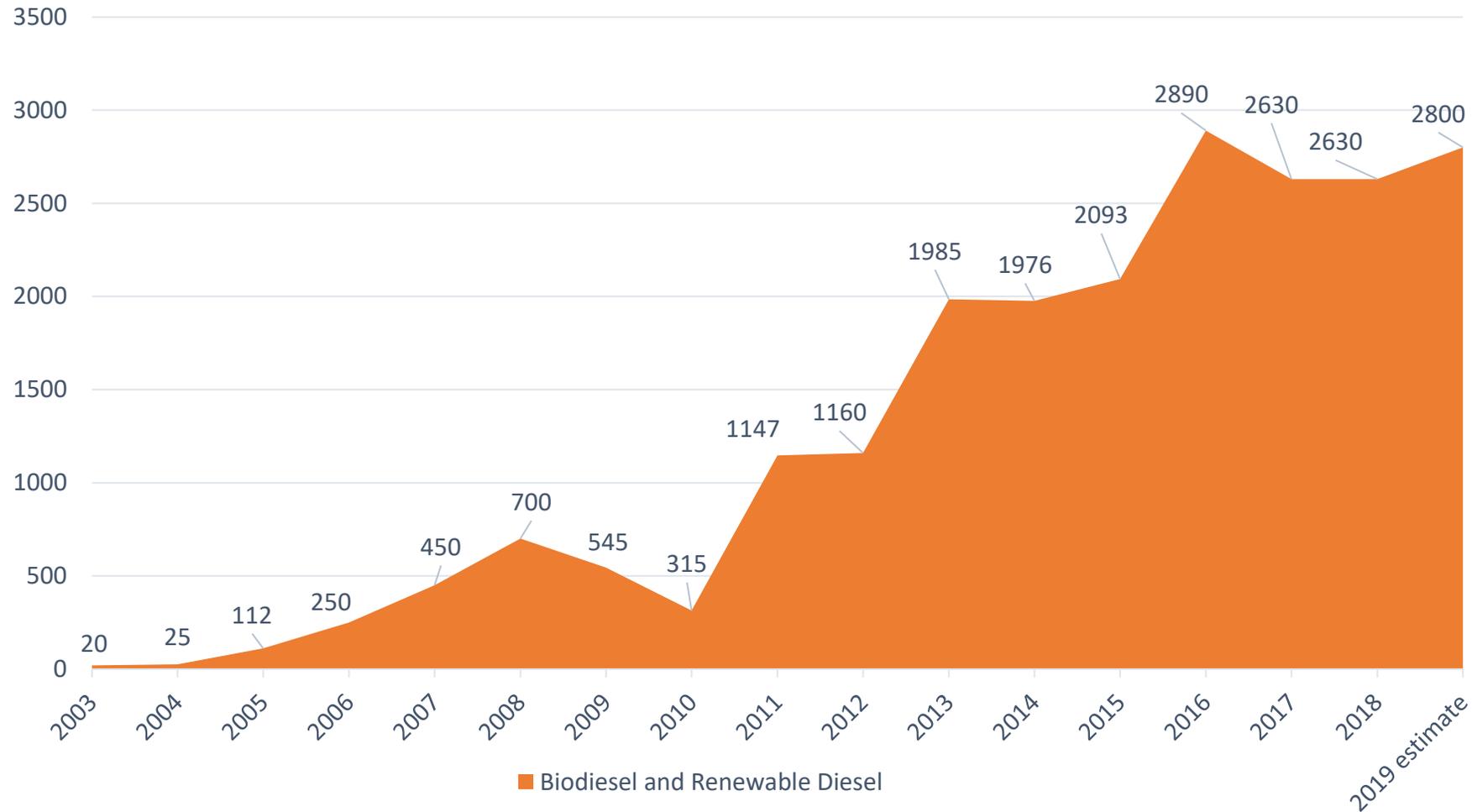
September 16th, 2019

- Industry leaders from the New England States and New York gathered for the 1st Northeast Industry Summit
 - Out of this meeting the Providence Resolution was developed which said;
 - The industry resolved that it would reduce greenhouse gas emissions, based on 1990 levels, as follows:
 - 15% by 2023
 - 40% by 2030
 - Net zero by 2050
- 

U.S. Biodiesel & Renewable Diesel Market

(millions of gallons)

Source: EPA EMTS*

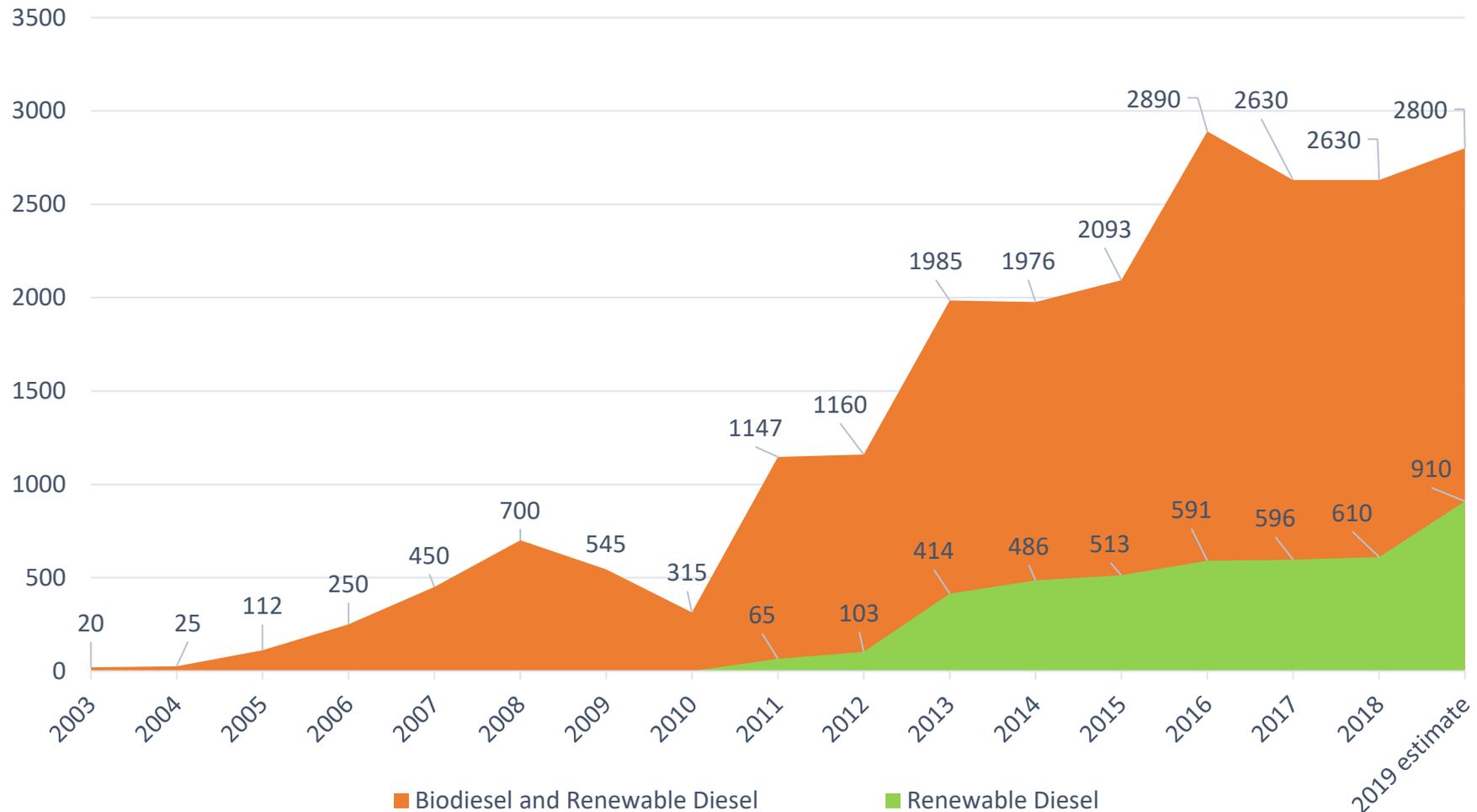


*Volumes reported under the RFS in the D4, D5, and D6 categories.

U.S. Biodiesel & Renewable Diesel Market

(millions of gallons)

Source: EPA EMTS*

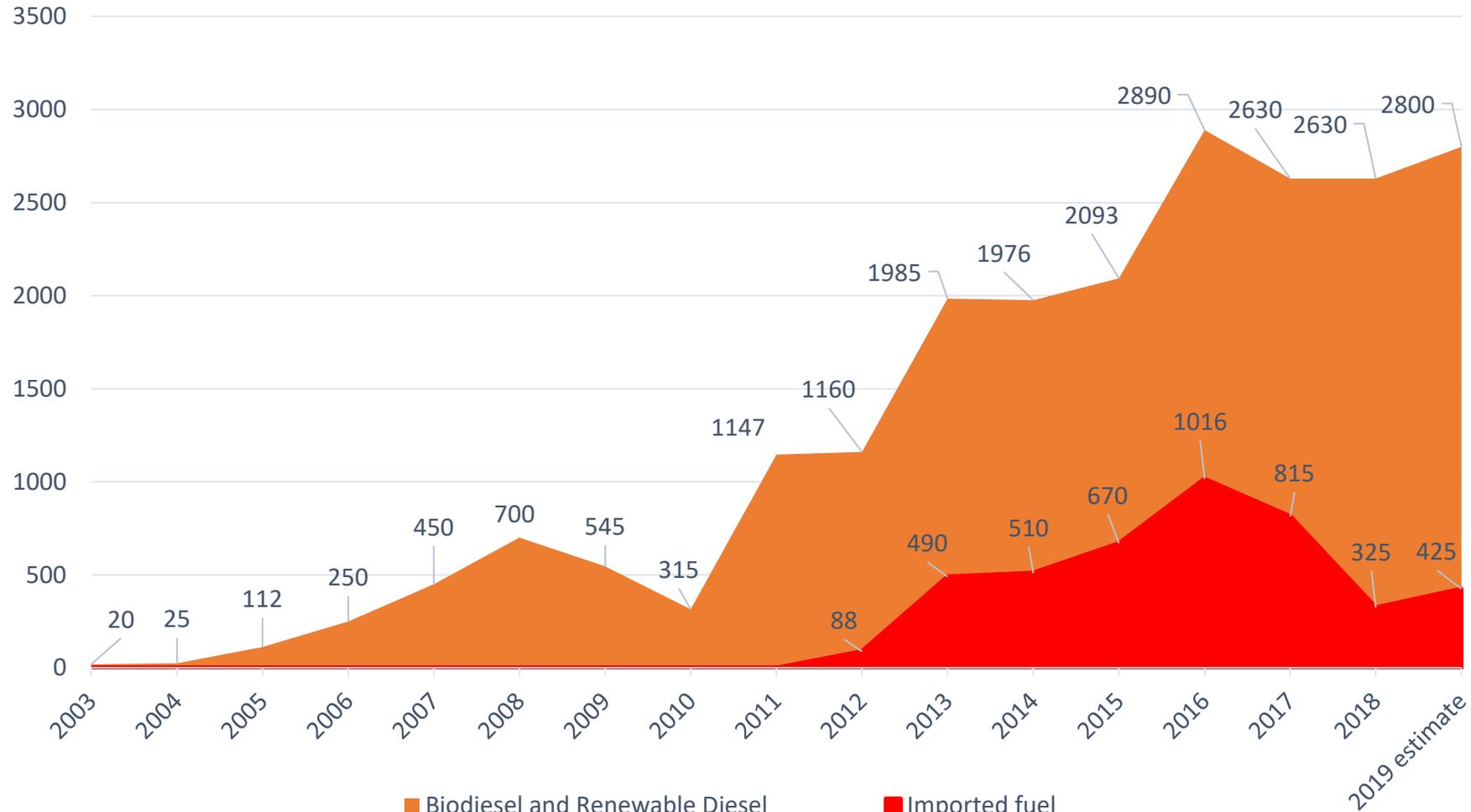


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U.S. Biodiesel & Renewable Diesel Market

(millions of gallons)

Source: EPA EMTS*

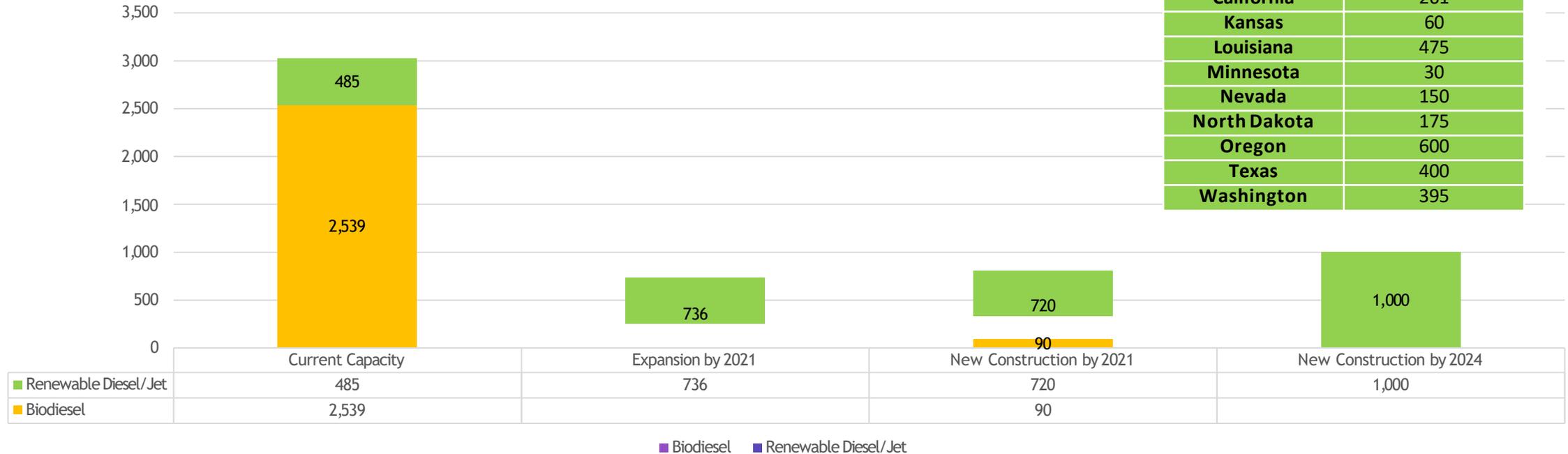


■ Biodiesel and Renewable Diesel ■ Imported fuel

*Volumes reported under the RFS in the D4, D5, and D6 categories.

U.S. BIOMASS-BASED DIESEL INDUSTRY CAN MEET INCREASED VOLUMES

Biomass-Based Diesel Plant Capacity, through 2024



State	Capacity (million gallons)
California	261
Kansas	60
Louisiana	475
Minnesota	30
Nevada	150
North Dakota	175
Oregon	600
Texas	400
Washington	395

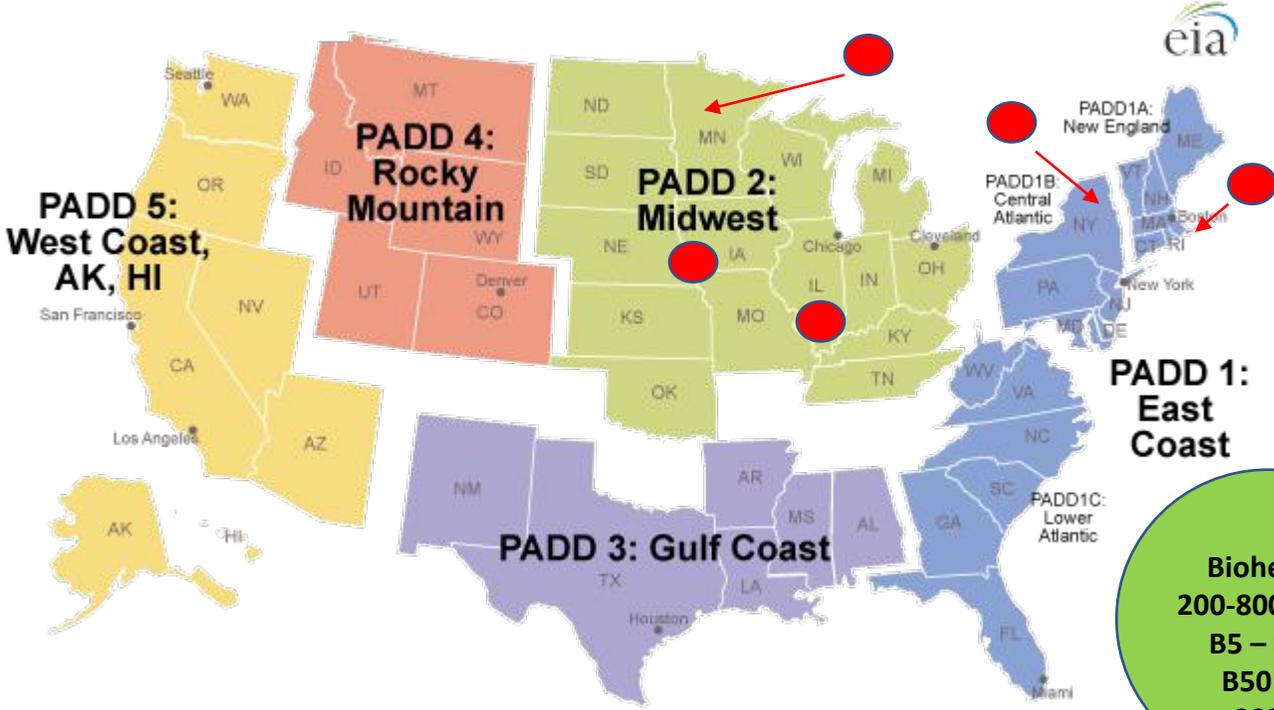
- The United States has more than 3 billion gallons of operating biodiesel and renewable diesel capacity
 - Overall, there is 4.2 billion gallons of registered capacity, according to EPA.
 - There are additional announced plans to build or expand 2.5 billion gallons.
- In 2018, U.S. biomass-based diesel production increased by more than 300 million gallons, according to EPA.

Biodiesel Meeting Demand, Mandates/Incentives

Arbitrage Discretionary Blending Driving Alternative Markets

CARB LCFS
800 MGY
B20

Concentration of Biodiesel Production, PADD 2

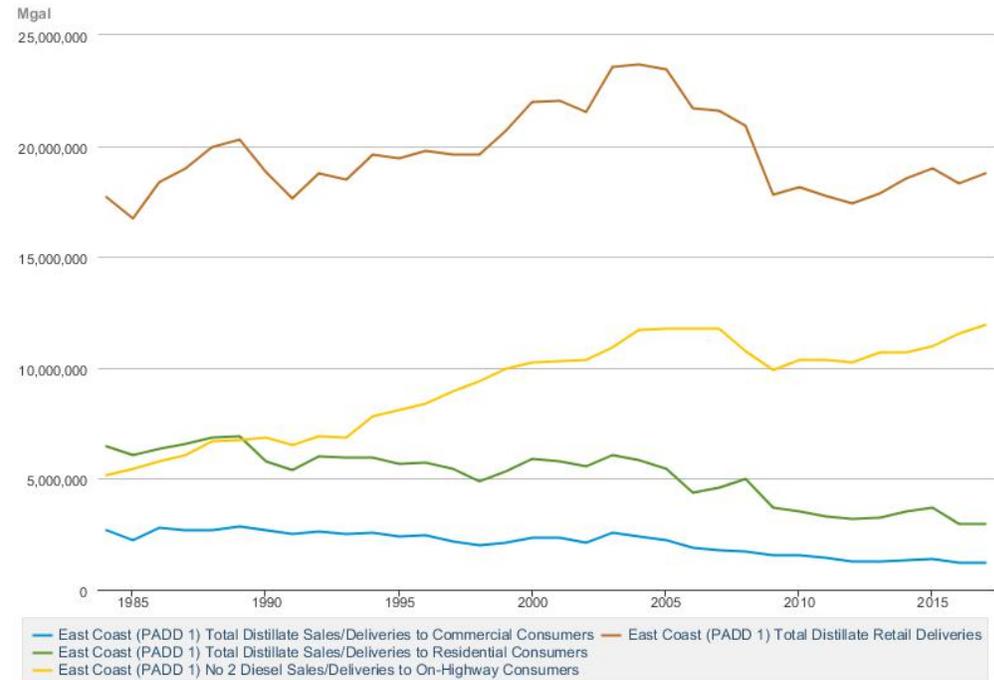


Bioheat®
200-800 MGY
B5 – B20
B50 by
2030

PADD I, Includes A&B

- Total: 18,767 BGY
- Residential: 2,958 BGY
- Commercial: 1,217 BGY
- Industrial: 455 MGY
- On-Highway: 11,941 BGY

Sales of Distillate Fuel Oil by End Use



Source: U.S. Energy Information Administration

Total, 18.0 BGY, Residential, 2.9 BGY, Commercial, 1.2 BGY, Industrial, On-Road Diesel, 11.9 BGY

EIA

	2013	2014	2015	2016	2017	2018	
Total	471,586	477,772	538,300	524,079	633,925	525,319	1984-2018
Residential	183,295	185,628	233,930	227,438	237,595	234,928	1984-2018
Commercial	59,384	71,829	62,925	60,829	64,587	63,903	1984-2018
Industrial	3,826	4,008	9,844	5,952	5,672	6,116	1984-2018
Oil Company	0	0	0	0	0	0	1984-2018
Farm	7,006	5,687	5,872	5,771	6,059	5,970	1984-2018
Electric Power	157	131	2,057	110	7,643	1,595	1984-2018
Railroad	2,504	5,116	5,955	6,026	3,950	3,956	1984-2018
Vessel Bunkering	5,195	7,412	10,031	9,045	8,889	10,070	1984-2018
On-Highway	195,642	180,732	192,224	193,232	283,549	181,796	1984-2018
Military	1,058	2,482	2,341	2,090	1,163	256	1984-2018
Off-Highway	13,518	14,748	13,122	13,586	14,817	16,730	1984-2018

How Much Low Carbon Liquid Fuel Will Maine Require



200+ MGY

Total Demand
Neat
Biodiesel



47 MGY

B20 Blend



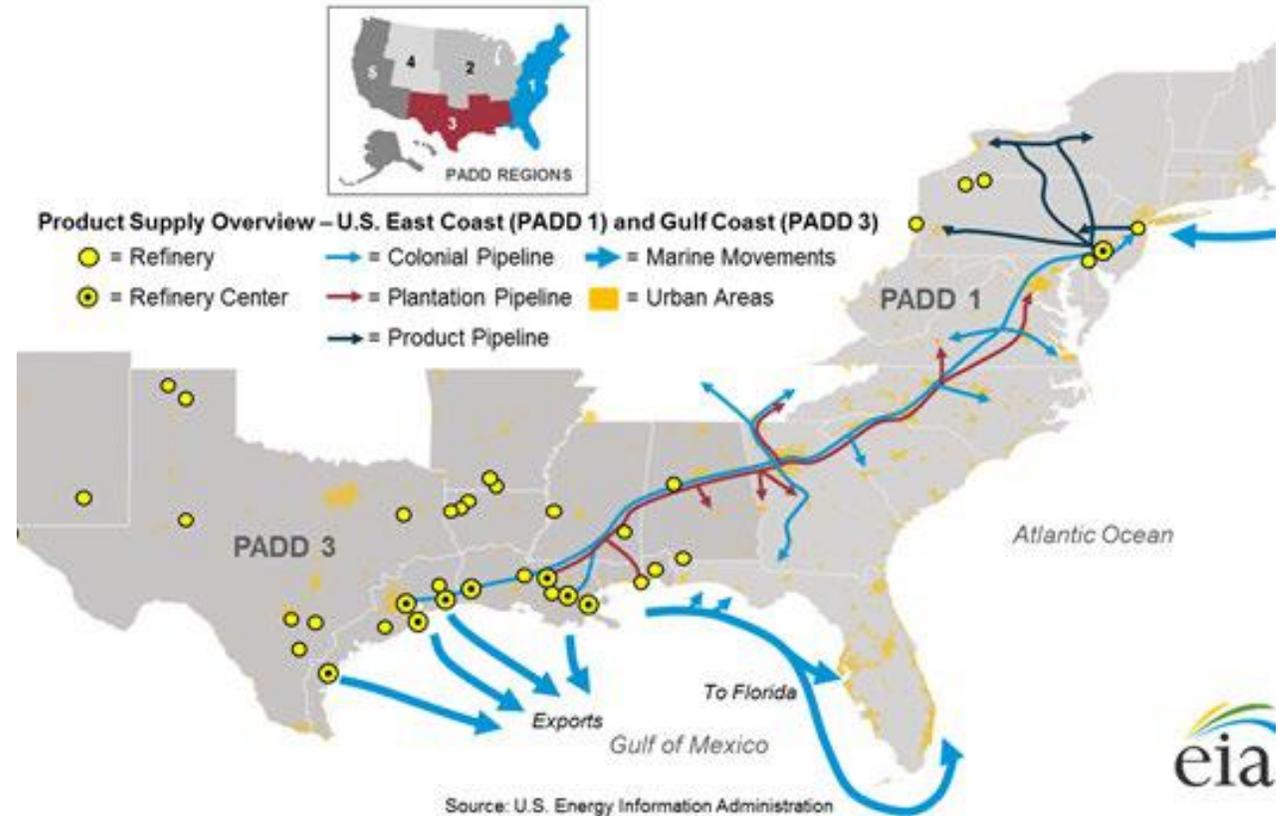
117 MGY

B50 Blend

Navigating The New England Supply Chain

- Feedstocks located in PADD II & III, as is production
- Approximately 180 MGY of production in PADD I
- Rail, Barge, Pipeline, Truck
- Optimize efficiencies to secure reliable and competitive low carbon liquid fuels
- California navigated similar challenges, moving from 25 MGY - >600 MGY

3. U.S. East Coast (PADD 1) and Gulf Coast (PADD 3) transportation fuels product flows



Massachusetts

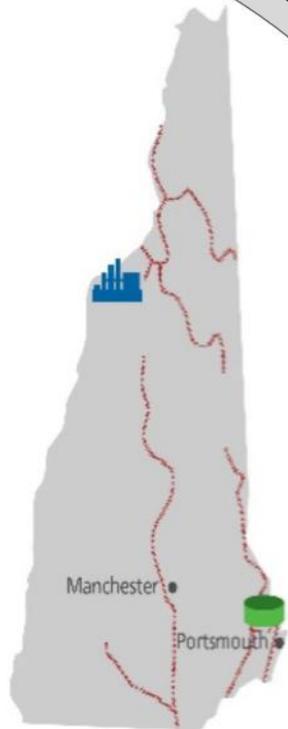


Maine



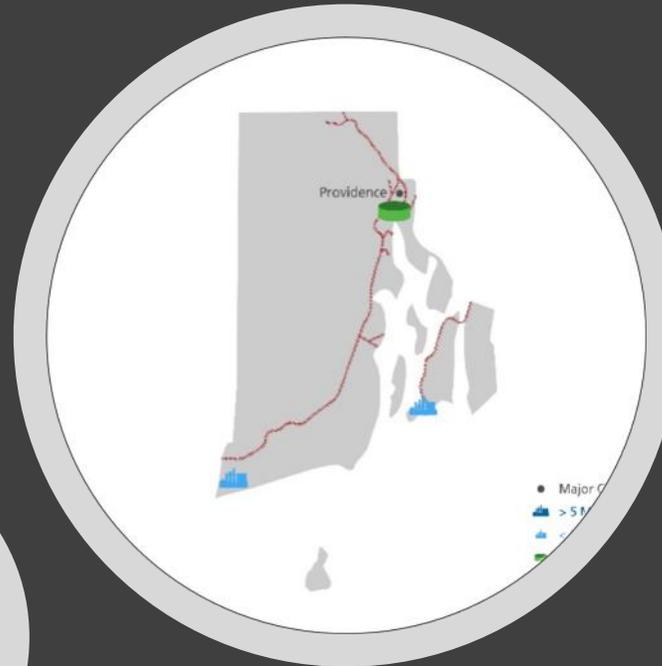
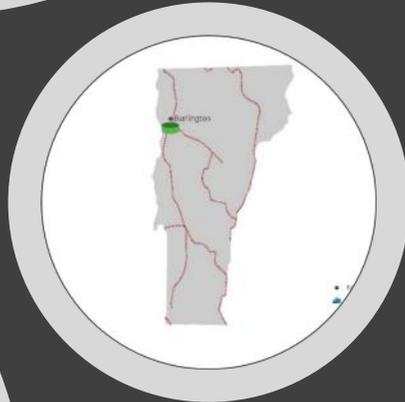
- Major Cities
- ▲ > 5 MMGY Biorefinery
- ▲ < 5 MMGY Biorefinery
- Terminals
- ≡ Railroads
- Pipelines

New Hampshire



- Major Cities
- ▲ > 5 MMGY Biorefinery
- ▲ < 5 MMGY Biorefinery
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N.E. Analysis/Production/Consumption

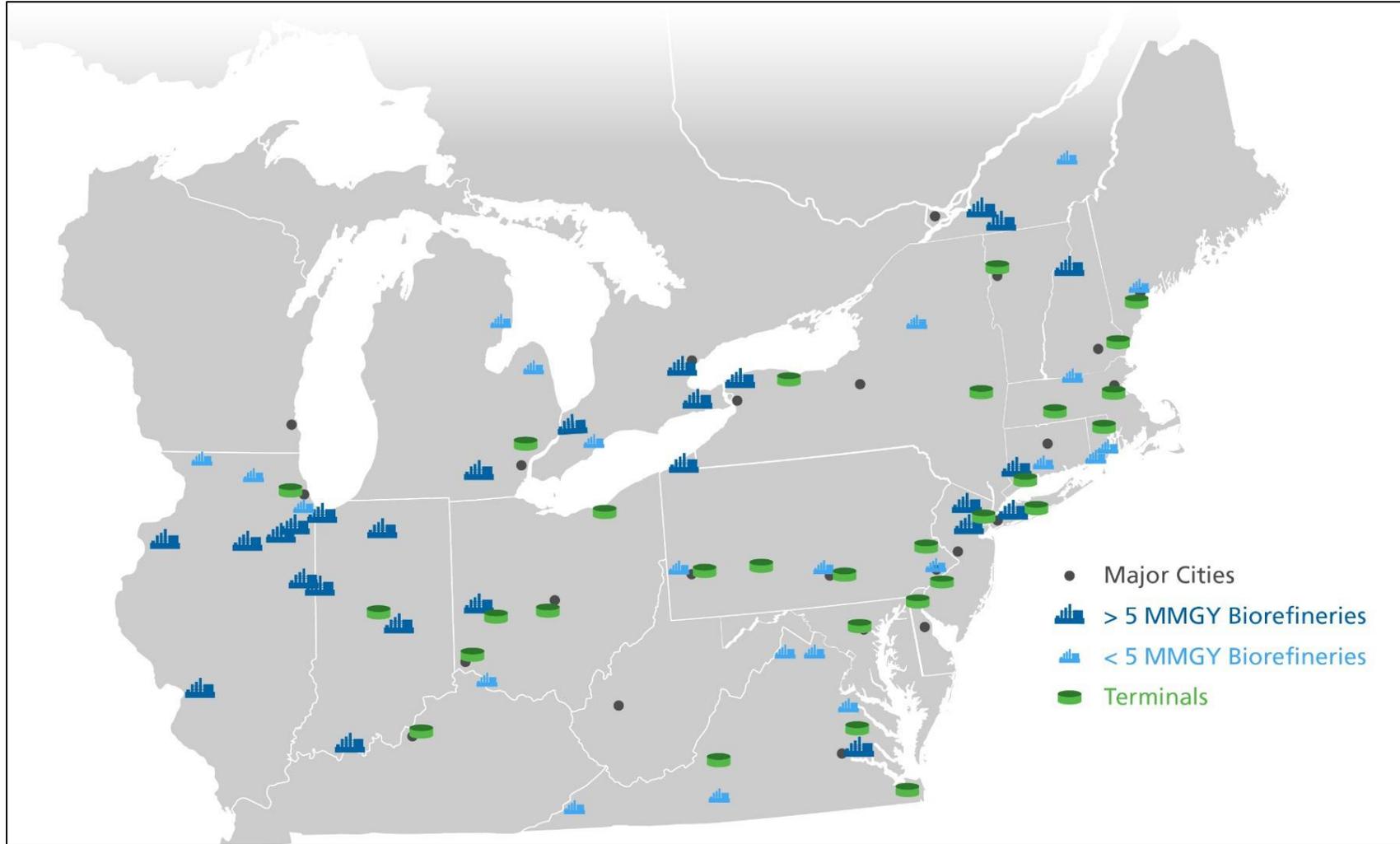


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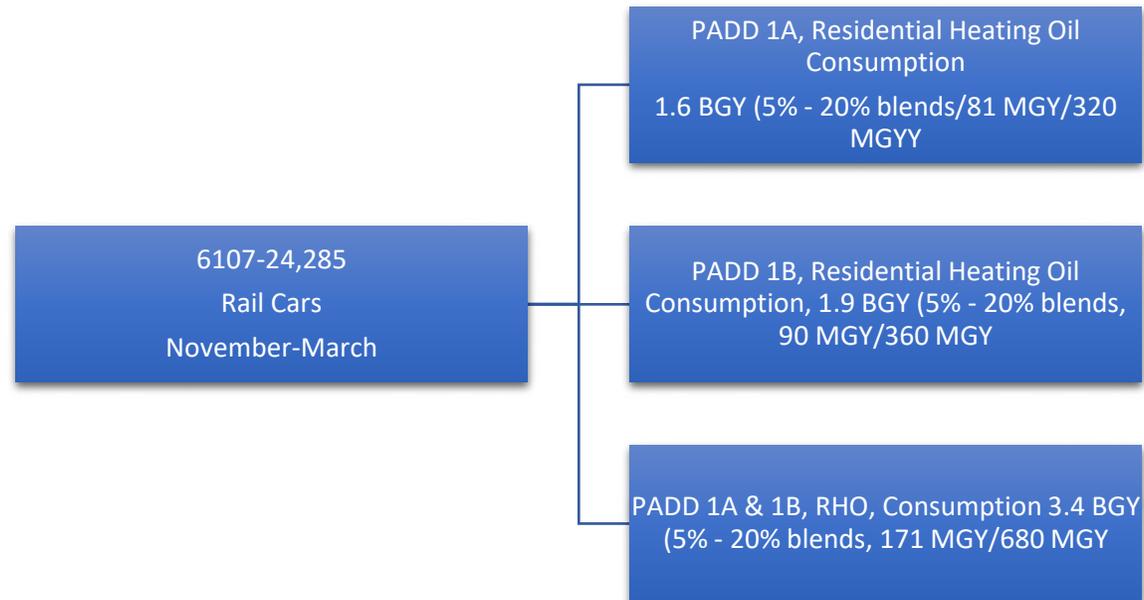


- Major Cities
- ▲ > 5 MMGY Biorefinery
- ▲ < 5 MMGY Biorefinery
- Terminals
- ≡ Railroads
- Pipelines

Biodiesel Production/Terminal Positions

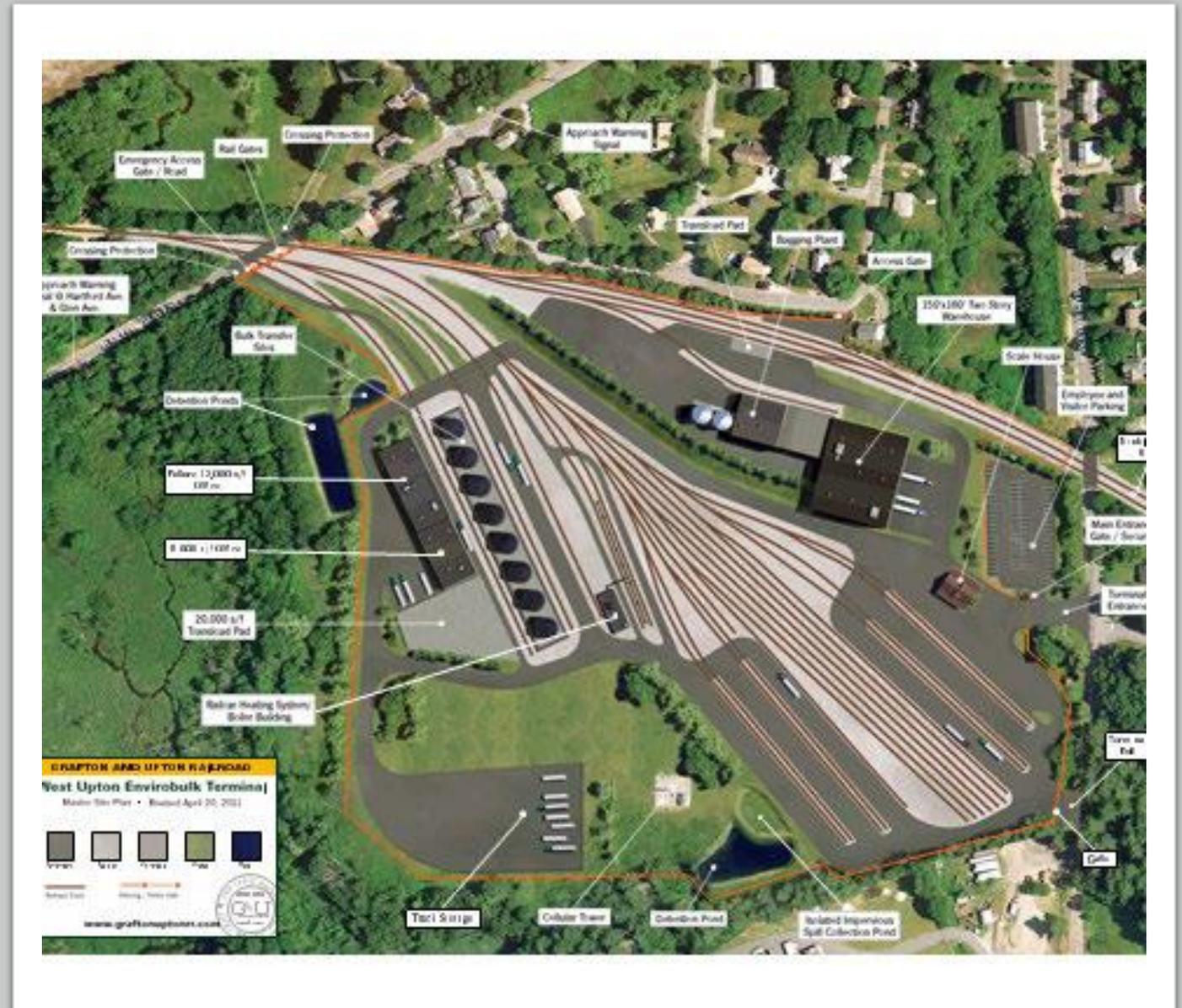


Preparing For Domestic Supply



Optimizing The Rail

- How Many Rail Sidings In PADD I
- Transloading Capability
- Heat
- Storage
- Deployment To Regional Terminals



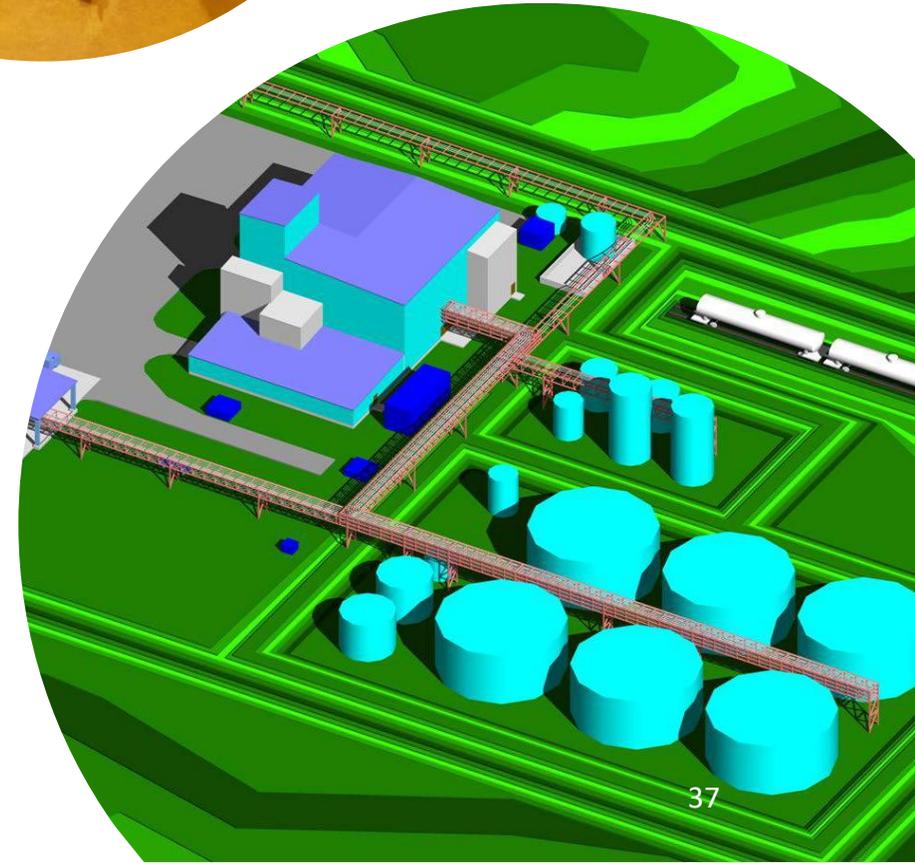
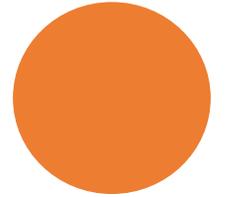
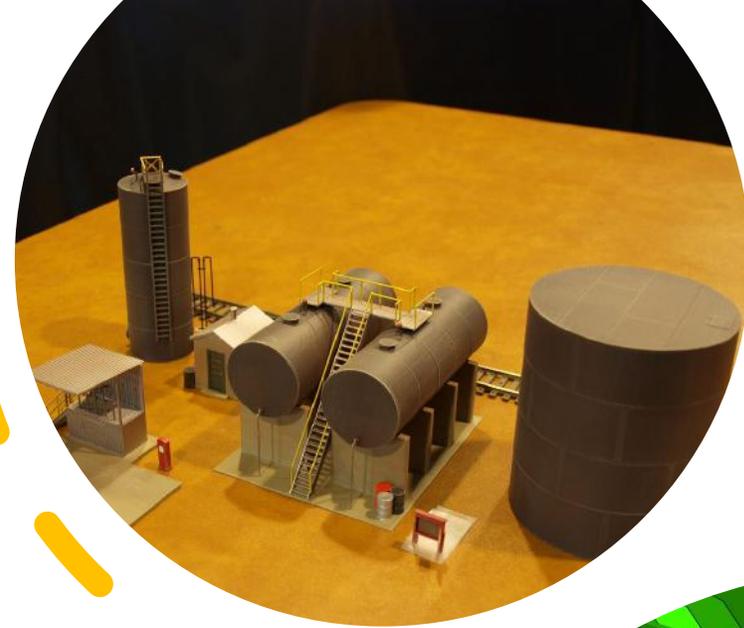
Rail to Transloading

- Efficiency
- Economics
- Quality
- Dependability
- Seasonal Demand Challenge



Preparing To Store, Blend & Distribute

- Proceeding to market analysis to determine infrastructure requirements for higher blends.
- Demand will dictate the size of the tank and handling equipment required.
- Early adoption blends of 20% will require less infrastructure investment dollars than B50 and above.



Bringing it all together

- Site selection
- Permits
- Concrete
- Electrical
- Crane
- Safety
- SPCC Plans
- Maintenance
- Inspections





Preparing To Blend

Automated Accuracy

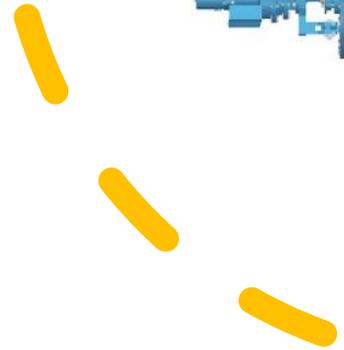
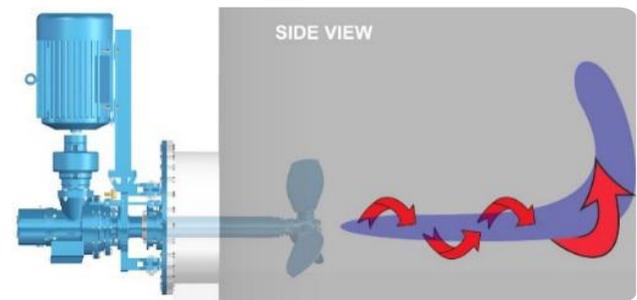
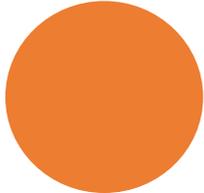
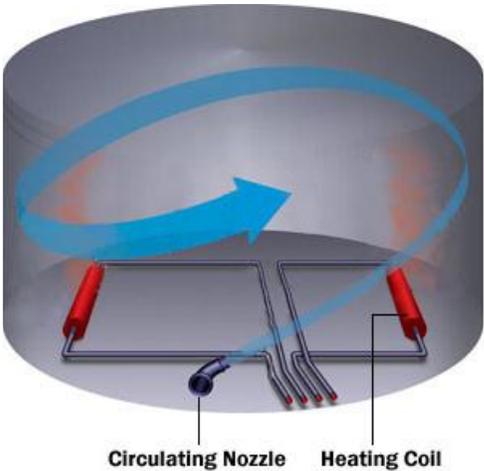
- At the point of loading the utilization of computerized systems program the actual blend.
- The drive can input whatever blend they wish to load, safely, accurately and economically.
- Without automation verification of the actual blend remains reliant upon the terminal owner to keep records of exactly what they tank blended.





Blending Options, In Tank/Inline

- Biodiesel and diesel fuel can be loaded separately, or at the same time through different incoming sources, but at high speeds which sufficiently mix without the need for additional mixing, recirculation or agitation.



What is the Higher Blends Infrastructure Incentive Program?

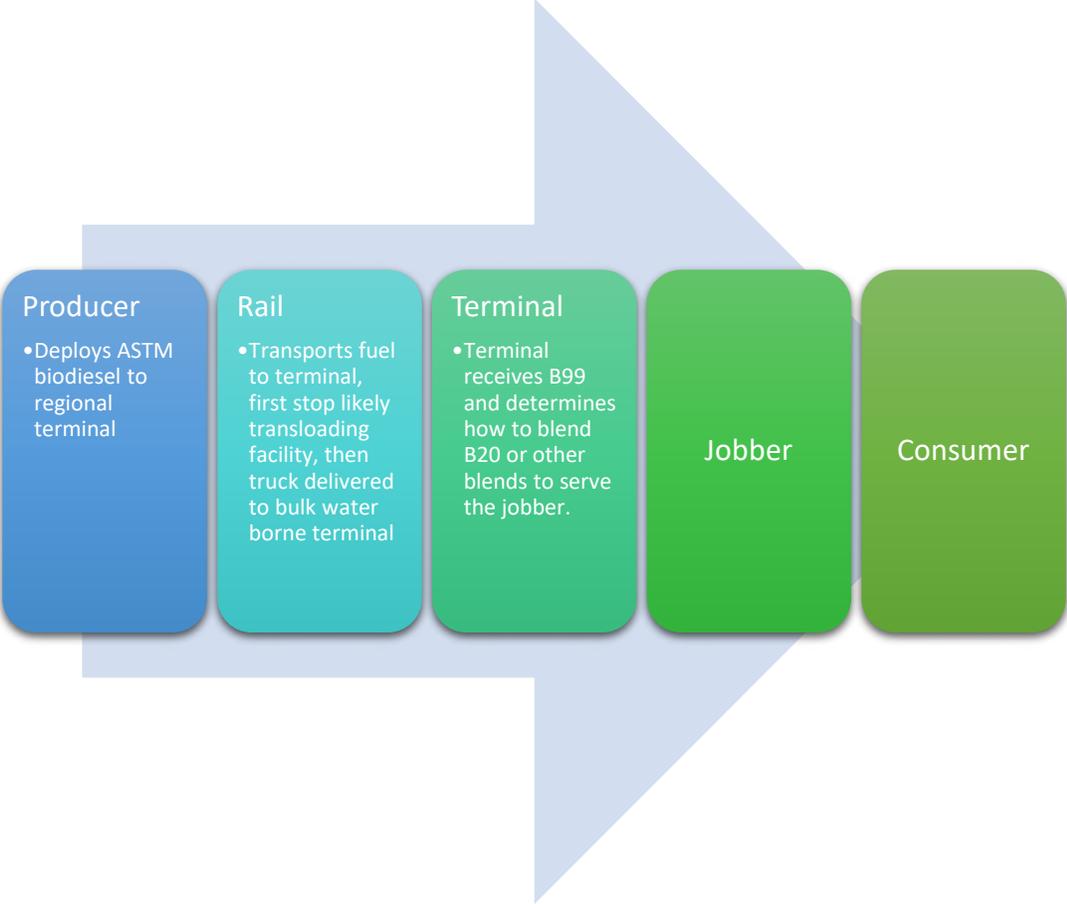
The Higher Blends Infrastructure Incentive Program is a new program that will expand the availability of domestic ethanol and biodiesel by incentivizing the expansion of sales of renewable fuels.

Agriculture Secretary Sonny Perdue announced on February 28, 2020 that the U.S. Department of Agriculture (USDA) intends to make available up to \$100 million in competitive grants for activities designed to expand the sale and use of renewable fuels.

The Department plans to publish application deadlines and other program information in the Federal Register this spring.



The Flow of Product



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BIOHEAT.
THE EVOLUTION OF OILHEAT

Bioheat® Fuel

Locally delivered in your town.

What Bioheat is. How You Get it. Why you should.

For More Information Contact
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paulsr@yourfuelsolution.com

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