



December 4, 2020

Comments: Alternative Energy Portfolio Standard  
Department of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston, MA 02114  
Attention: Samantha Meserve

The Massachusetts Energy Marketers Association (MEMA) thanks the Massachusetts Department of Energy Resources (MA DOER) for the opportunity to provide comments on 225 CMR 16:00 – Alternative Energy Portfolio Standard (APS), the related Daymark Energy Advisors Report and a series of questions issued to APS stakeholders by MA DOER.

MEMA, established in 1955, is the state trade association representing over 300 companies in all sectors of the heating oil industry including retail distributors of heating oil, renewable liquid biofuel, and propane; wholesale suppliers of heating oil and biofuel with large fuel storage and distribution operations statewide; and producers of B100 – 100% liquid biofuel.

MEMA is a member of the National Energy & Fuels Institute (NEFI), and the National Oilheat Research Alliance (NORA). MEMA also partners with the National Biodiesel Board (NBB) on many initiatives to promote and increase the use of liquid biofuel in heating oil and diesel fuel nationwide.

For clarity purposes in this document, APS eligible liquid biofuel is also referred to as biodiesel and Bioheat® fuel within the heating oil industry.

- **Executive Summary**

Bioheat® fuel is the only home energy source that is currently having an immediate impact on reducing greenhouse gas (GHG) emissions in Massachusetts and other key heating oil states. Bioheat® fuel is a drop-in, turn-key fuel that is currently being delivered at blends as high as 50% (B50). This renewable fuel is not exhibiting any operational issues with heating oil customers, it requires no heating system modifications and can be as economical as traditional heating oil.

The heating oil industry in Massachusetts and the U.S. is committed to liquid biofuel as a pathway to net-zero carbon emissions by 2050. The APS program has been highly successful in helping to incentivize biofuel blends in heating oil.

Over a two-year period, following the implementation of 225 CMR 16:00 in January 2018, the APS program has seen retail distributor participation grow from a handful of companies to 76 companies today across the Commonwealth.

MEMA is hopeful that by submitting comments to MA DOER and offering our support to comments submitted by our colleagues from Diversified Energy Specialists and NBB, that MA DOER will make the following improvements to the APS program, capitalize on other opportunities to further assist the heating oil industry in attaining its decarbonization objectives, and help the Commonwealth fulfill the requirements of the 2008 Global Warming Solutions Act. MEMA recommends that MA DOER:

1. Increase the cap on available Alternative Energy Certificates (AECs) in 2022 for eligible liquid biofuels in the APS program from 20% to 30%.
2. Raise the 2022 annual minimum standard for the APS to 7% -- 1.5% higher than the current regulations which allows for 5.5 % in 2022 -- and then continue with the current increment of 0.25% per year in 2023.
3. Eventually phase out Combined Heat & Power (CHP) from the list of eligible technologies in the APS to further incentivize and expand the use of liquid biofuel and other thermal technologies.
4. Expand the feedstock eligibility within the APS in 2022 to include soy-based biofuel and other feedstocks designated as advanced biofuels under the federal Renewable Fuel Standard (RFS).
5. Fully implement the 2008 Clean Energy Biofuels Act for both heating oil and on-road diesel fuel by July 1, 2022.

▪ **Profile of the Heating Oil Industry**

On a national basis, there are 22 heating oil states represented by NORA. The industry has a well-established supply, storage, distribution and delivery system that has historically operated smoothly and efficiently. The industry's largest footprint is in the northeast and mid-Atlantic regions with about 3000 retail operations serving 5.5 million homes. The regions account for over 4 billion gallons of heating oil in annual volume. Nationally, the industry serves 6 million homes and thousands of commercial operations.

Massachusetts is the third largest heating oil state by volume in the U.S. Over 800 million gallons of heating oil is delivered annually to more than 700,000 homes and businesses in Massachusetts for space heating and domestic hot water production.

The average full-service heating oil retailer in Massachusetts employs over 25 highly skilled workers including heating equipment technicians, fuel delivery drivers, customer service and sales representatives.

- **The Transition to Renewable Liquid Fuel: Bioheat®**

Through the efforts of NORA, which was authorized by the U.S. Congress in 2000, the heating oil industry has a laudable track record of accomplishments to improve the efficiency of equipment and provide a cleaner liquid fuel. NORA is funded by a government sanctioned “check-off” program by which \$0.002 is collected at the wholesale level on every gallon of heating oil sold in the U.S.

Over the past 20 years, NORA has provided ongoing industry education, worked with equipment manufacturers to develop state-of-the art heating systems to improve energy efficiency, and funded Brookhaven National Laboratory for extensive research on liquid fuels. Improving the basic liquid fuel is NORA’s highest priority and the organization’s substantial work has resulted in the development of Bioheat® fuel – ultra-low sulfur heating oil blended with renewable biofuel at various percentages.

In 2015, the U.S. Congress required that NORA conduct research and report on the utilization rate and analysis of the use of biofuels in heating oil equipment. The report found that the transition to ultra-low sulfur heating oil and biodiesel blends “improves efficiency and reduces pollution from heating systems.”<sup>1</sup> The report also found that, “Biodiesel blends at 20% (B20) with ultra-low sulfur heating oil are lower in Greenhouse Gas Emissions (GHG) than natural gas when evaluated over 100 years, while blends of 2% (B2) or more are lower in GHG than natural gas when evaluated over twenty years.”<sup>2</sup>

Because of NORA’s continued leadership and guidance from NBB, the heating oil industry has proactively pursued all legislative and regulatory opportunities to transition to renewable fuel blends. The industry has supported the enactment of biofuel mandates for heating oil in New York City (B5 increasing to B20 in 2034), Rhode Island (B5), for diesel fuel in Pennsylvania (B2), and the 2008 Clean Energy Biofuels Act in Massachusetts that was never implemented by MA DOER.

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<sup>1</sup> Developing a Renewable Biofuel Option for the Home Heating Sector, National Oilheat Research Alliance, May 2015

<sup>2</sup> Developing a Renewable Biofuel Option for the Home Heating Sector, National Oilheat Research Alliance, May 2015

## **Heating Oil Industry Resolution**

In order to expand the use of renewable biofuel to assist in climate change mitigation, the heating oil industry in September of 2019 committed to reduce GHG emissions, based on 1990 levels, by 15% by 2023, 40% by 2030 and net-zero carbon emissions by 2050 through the accelerated use of higher blends of renewable biofuel blended with ultra-low sulfur heating oil.

Two independent studies on the feasibility of accomplishing these goals were conducted by Kearney Consulting and IHS Markit in 2020. Both studies, which are included with these comments, validated the industry's ability to reach net-zero carbon emissions by 2050 with renewable biofuel.

## **Recommendations for Improving the APS Program & Response to Specific MA DOER Stakeholder Questions**

### ***How could the APS program be improved to better influence residential or commercial purchasing behaviors?***

As previously stated, renewable liquid biofuel is fit-for-use today in every home and business in Massachusetts using heating oil. Kearney Consulting found that “the liquid heating fuel industry has the renewable fuel product today to drive immediate carbon reductions faster than alternative electric or gas options.”<sup>3</sup>

Biofuel has been rigorously tested by NORA at various blend rates<sup>4</sup> and there is substantial research from many leading authorities, including the U.S. Environmental Protection Agency (U.S. EPA), that advanced biofuels significantly reduce carbon emissions when blended with traditional petroleum. Furthermore, through the APS program, heating oil distributors have demonstrated that liquid biofuel is a drop-in fuel that does not cause any major operational issues with heating oil equipment, requires no heating system modifications and is efficient and economical.

Daymark Energy Advisors found that, “Given that liquid biofuel can be used in a customer's existing boiler with no upfront investment, liquid biofuels could serve as a bridge to a low carbon future.”<sup>5</sup>

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<sup>3</sup> Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI, October 2020

<sup>4</sup> National Oilheat Research Alliance & Brookhaven National Laboratory: B20 to B100 Blends in Heating Fuels, November 2018.

<sup>5</sup> Daymark Energy Advisors, Alternative Energy Portfolio Standard Review, October 30, 2020

Because of these factors, MA DOER should do everything within its regulatory authority to improve the APS program in order to increase retail distributor participation and provide more residential and commercial customers greater opportunities to take advantage of the benefits of liquid biofuel.

MA DOER should increase the cap on available Alternative Energy Certificates (AECs) in 2022 for eligible liquid biofuels in the APS program from 20% to 30%. In doing so, this will greatly expand the use of the fuel in homes and businesses across the state. Additionally, unless the biofuel cap increases and the price of AECs increases, there is a chance that current retail distributor participation in the program will decline and companies that are currently participating may choose not to.

In order to improve supply and demand of AECs for all current thermal technologies in the APS, and improve the economic value of the certificates, MA DOER should raise the 2022 annual minimum standard for the APS to 7% -- 1.5% higher than the current regulation which allows for 5.5% -- and then continue with the current increase of 0.25% per year increment for 2023.

And as cited in the Daymark Energy Advisors report, Combined Heat & Power (CHP) systems currently produce the largest number of AECs in the APS program. Daymark maintains that CHP systems do “not require APS incentives to be economic and that natural gas fueled CHP does not provide GHG emissions reductions.”<sup>6</sup>

Hence, MA DOER should consider the eventual phase out of CHP as an eligible technology in the APS program.

To further strengthen Daymark’s finding that liquid biofuels are a bridge to a “low carbon future”<sup>7</sup> for Massachusetts, MA DOER should expand the feedstock eligibility within the APS in 2022 to include soy-based biofuel and other feedstocks designated as advanced biofuels in the federal RFS.

MA DOER already relies on the RFS for the definition of Eligible Liquid Biofuel Supplier List in 225 CMR 16:00 and should endeavor to adopt the following RFS definition for feedstocks:

"Feedstock" shall mean soybean oil, canola oil, oil from annual cover crops, algal oil, biogenic waste oils, fats and greases, camelina sativa oil, distillers corn oil, distillers sorghum oil, and commingled distillers corn and sorghum oil, provided that the commissioner may, by rules and regulations, modify the definition of feedstock based on the vegetable oils, animal fats or cellulosic biomass listed in table 1 of 40 C.F.R § 80.1426.”<sup>8</sup>

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<sup>6</sup> Daymark Energy Advisors, Alternative Energy Portfolio Standard Review, October 30, 2020

<sup>7</sup> Daymark Energy Advisors, Alternative Energy Portfolio Standard Review, October 30, 2020

<sup>8</sup> Title 40, Code of Federal Regulations, U.S. Environmental Protection Agency

To further enhance the sustainability criteria of the APS, MA DOER should not only require that the eligible biofuel be produced from feedstocks listed on Table 40 C.F.R. § 80.1426, MA DOER should also require that fuel sold into the Commonwealth also generate a Renewable Identification Number (RIN) as defined under the federal program.

This additional requirement should not be a burden to well-intentioned biofuel producers who would already be generating a RIN in the normal course of business. However, a requirement to generate a RIN, or at least be registered with the U.S. EPA, would make it more difficult for unscrupulous producers to sell unsustainable product into Massachusetts.

In establishing the RFS, the U.S. EPA determined that soy-based biodiesel along with other advanced biofuels, reduces particulate emissions by as much as 50% and carbon emissions up to 86 percent.<sup>9</sup>

Further, a study conducted in 2018 by Argonne National Laboratory found that, “Relative to the conventional petroleum diesel, soy biodiesel could achieve 76% reduction in GHG emissions without considering induced land use change (ILUC), or 66-72% reduction in overall GHG emissions when various ILUC cases were considered.”<sup>10</sup>

Expanding feedstock eligibility in the APS program will also help ensure that supplies of liquid biofuel are sufficient to meet the needs of the program and the expanding demand for biofuel. In California, for example, a Low Carbon Fuel Standard is attracting east coast and mid-west biofuel supplies.

In 2020, the Massachusetts APS program is expected to utilize 28 million gallons of B100 eligible biofuel that comes primarily from used cooking oil (UCO) feedstocks. UCO feedstocks have been able to meet the demand for the program thus far despite shortages due to the shutdown of restaurants – a main source for UCO – this past year because of the pandemic. Expanding feedstock eligibility will be a buffer against this or other supply and demand factors.

And in order to accomplish MA DOER’s stated goal of finding pathways to achieving the “Commonwealth’s clean energy goals by increasing energy efficiency and reducing the need for conventional fossil fuel-based power generation,”<sup>11</sup> MA DOER should fully implement the 2008 Clean Energy Biofuels law<sup>12</sup> or both heating oil and on-road diesel fuel by July 1, 2022.

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<sup>9</sup> Biodiesel: The Northeast’s Carbon Solution, National Biodiesel Board

<sup>10</sup> Biosource Technology, Argonne National Laboratory, Life Cycle Energy and Greenhouse Gas Emission Effects of Biodiesel in the United States with Indirect Land Use Impacts, 2018

<sup>11</sup> Alternative Portfolio Standard: Massachusetts Department of Energy Resources Website

<sup>12</sup> An Act Relative to Clean Energy Biofuels, M.G.L Chapter 206, 2008

In doing so, MA DOER can assist the heating oil industry in Massachusetts in achieving the industry-wide goals of net-zero carbon emissions, help meet the objectives of the forthcoming Massachusetts 2050 roadmap to decarbonization plan and provide another program that supports compliance with the requirements of the Massachusetts Global Warming Solutions Act.

The Clean Energy Biofuels mandate requires that all #2 distillate fuel used in diesel for transportation and heating purposes contain at least 2 per cent “eligible petroleum distillate substitute fuel” by July 1, 2010; 3 per cent by July 1, 2011; 4 per cent by July 1, 2012; and 5 per cent by July 1, 2013.

If reinstated today, a B5 mandate would ensure that every retail heating oil company in Massachusetts is selling renewable liquid fuel and it would begin the process of reducing carbon emissions in the on-road diesel transportation sector.

On June 30, 2010 MA DOER suspended the implementation of the mandate stating that the mandate was *“not feasible on the basis of unreasonable cost and will instead move forward with a voluntary program to encourage the use of biofuels that meet the standards of the Clean Energy Biofuels Act.”*<sup>13</sup>

MA DOER further stated, *“Lessons learned from this voluntary program will provide valuable learning for expanding the program in the future. In this way, DOER will continue to work toward full implementation of the biofuel mandate at an appropriate time in the future.”*<sup>14</sup>

MEMA believes that now is the appropriate time. Combined with the excellent results from the APS program since its roll-out, and greater success in the long term as the program is improved, the mandate will contribute greatly to reducing carbon emissions statewide at a time when Massachusetts is seeking pathways for net-zero carbon emissions by 2050.

***Is there enough supply of biodiesel to meet the demands of an expanded APS program and a statewide biofuel mandate?***

According to the U.S. Energy Information Agency (U.S. EIA), annual sales of #2 distillate fuel in Massachusetts total 1.5 billion gallons. Sales include residential, commercial and industrial heating; and on-road and off-road diesel. Hence, a reinstated B5 biofuel mandate in Massachusetts would require an additional 75 million gallons of biofuel per year.

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<sup>13</sup> Massachusetts Advanced Biofuels Program Announcement, Massachusetts Department of Energy Resources, June 30, 2010

<sup>14</sup> Massachusetts Advanced Biofuels Program Announcement, Massachusetts Department of Energy Resources, June 30, 2010

Data from NBB indicates that today's market for biodiesel has reached 2.8 billion gallons with more than 3 billion gallons of domestic production capacity online today. Capacity of planned U.S. expansions will grow to 5.5 billion gallons by 2023. This biodiesel is produced using various feedstocks designated as advanced biofuels under the federal RFS. These feedstocks include used cooking oil, soybean oil and canola.

Historically, ratable demand and growth for biodiesel has occurred when policies help develop markets. As cited, there is high demand for biodiesel in California where a Low Carbon Fuel Standard is in place.

Mandates send a clear market signal to wholesale terminal operators and producers of biodiesel that demand will be consistent which strengthens the supply and distribution chain.

Based on supply information provided by Kearney Consulting, IHS Markit and NBB; along with the success of biofuel mandates in New York, Rhode Island and Pennsylvania; and the two years of data from the APS program regarding biofuel supply and market dynamics; reinstating the Clean Energy Biofuels law is sound energy policy.

***What are the benefits of the APS program to ratepayers, including but not limited to economic, environmental, and societal benefits?***

The benefits of the APS program are economic value; and environmental stewardship for the heating oil industry, end-users of biofuel blends; and society at-large in Massachusetts.

In the first 6 months of 2020, 14.65 million gallons of APS eligible biofuel was delivered to end users in Massachusetts, generating GHG emissions savings of 287,068,220 lbs. of CO<sub>2</sub>e vs. the alternative – traditional ultra-low sulfur heating oil.<sup>15</sup>

And the benefits of the APS program are further illustrated by the following 2020 profiles of two Massachusetts retail distributors in the program.

Distributor #1 used 847,943 gallons of B100 with average blend levels per month between January and June of B18 – B31. This retailer generated GHG emissions savings of 16,618,370 lbs. CO<sub>2</sub>e vs. the alternative (heating oil) in the first half of 2020.<sup>16</sup>

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<sup>15</sup> Diversified Energy Specialists APS Program Research, December 2020

<sup>16</sup> Diversified Energy Specialists APS Program Research, December 2020

Distributor #2 used 678,805 gallons of B100 with all heating oil blended at B20. This retailer generated GHG emissions savings of 13,303,527 lbs. CO<sub>2</sub>e vs. the alternative (heating oil) in the first half of 2020.<sup>17</sup>

In just six months, these two heating oil retailers displaced nearly 1.5 million gallons of heating oil with eligible biofuel from UCO and provided an 80% reduction in GHG emissions compared to traditional heating oil. By year-end 2020, these two distributors, will displace over 3 million gallons of heating oil. This will be accomplished at no significant cost increase to the end user and no modifications to heating equipment.<sup>18</sup>

The APS program is clearly providing significant environmental and societal benefits.

***Do you believe the APS program should prioritize technologies which provide the most benefits, such as greatest greenhouse gas emissions reductions?***

MEMA believes that liquid biofuels should be prioritized over air source heat pump (ASHP) technology in the APS program. On the basis of installation cost, cold weather performance and the lack of demonstrable contributions to climate change, MEMA does not agree with Daymark's recommendation to expanded APS support for ASHP technology.

Daymark writes, "While the APS allows for ASHP retrofits, these systems must supply 90 percent of a home's heating needs in order to be eligible. This means that customers who want to add ASHP(s) to their home but do not meet the 90% requirement are not eligible to receive AECs. Expanding the eligibility to incorporate small ASHP systems could drive program participation by supplemental systems which replace a smaller amount of heating load."<sup>19</sup>

Kearney Consulting's research indicated that, "Proponents of electrification tout air-source heat pumps as a low carbon solution for the home energy sector. However, while air-source heat pumps (using an average electricity mix) release lower CO<sub>2</sub> per unit of heat delivered to the household (only 57 kg of CO<sub>2</sub>), almost all of this (56 kg) consists of abiogenic (non-renewable) emissions that in fact contribute to climate change."<sup>20</sup>

Kearney also found that "By comparison, biodiesel made from soybean oil has double the total carbon emissions, at 122 kg of CO<sub>2</sub>, but about two thirds (81 kg) of that is renewable carbon that comes from soybeans. Only 41 kg is non-renewable – 15 kg less than air-source heat pumps."<sup>21</sup>

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<sup>17</sup> Diversified Energy Specialists APS Research, December 2020

<sup>18</sup> Diversified Energy Specialists APS Research, December 2020

<sup>19</sup> Daymark Energy Advisors, Alternative Energy Portfolio Standard Review, October 30, 2020

<sup>20</sup> Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI, October 2020

<sup>21</sup> Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI, October 2020

Kearney also reported that “Another downside of heat pumps is their reliance on grid-electricity generated at peak usage times. Current renewable electricity inputs to the grid such as wind and solar, or other low-carbon generators like nuclear, cannot provide the extra electricity required to meet peak demand because their output cannot vary quickly.”<sup>22</sup>

In a study conducted in 2019<sup>23</sup> from data collected by the Massachusetts Clean Energy Center (MA CEC) from 2014-2019, the average cost of converting a 1500 square foot home to an electric air-source heat pump system in Massachusetts was \$20,428.

The study also found that in addition to the high cost of conversion to air-source heat pumps, most installers recommend retaining a supplemental source of heat due to the heat pump system’s inability to sufficiently heat residences during the winter season. MA CEC data revealed that 92.8% of the homes that installed ASHP retained their primary heating equipment.

And this year, the following information was published on the MA CEC website.<sup>24</sup>

“Before incentives, a single-head ductless heat pump costs around \$5,000, including installation. Whole-home replacement systems will start at \$15,000 and can range up to \$25,000 or more, depending on the home.”

“Costs increase depending on the size of the home and the degree of ductwork modification required. Ductwork modifications can increase the project costs significantly.”

“Homes that have less than 200-amp electrical service will likely incur additional costs for upgrading the electrical service to accommodate an air-source heat pump system.”

***Has the APS incentive had an impact on the decision of system owners to invest in APS eligible technologies? Why or why not.***

Apart from the significant and quantifiable environmental benefits provided by eligible biofuel in the APS, the program has sparked millions of dollars of investment in biofuel production, storage and distribution; the development of technology to help with the accurate blending of APS eligible biofuel with heating oil; and provided retail APS distributors opportunities to install thousands of new home heating systems and storage tanks. The APS program has:

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<sup>22</sup> Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI, October 2020

<sup>23</sup> Massachusetts Air-Source Heat Pump Installations 2014-2019, Diversified Energy Specialists, November 2019

<sup>24</sup> Massachusetts Clean Energy Center Website 2020

- Prompted four of the state’s leading wholesale distributors of heating oil to invest in new terminal assets and equipment to distribute APS eligible biofuel at terminals in Revere, Braintree and Springfield.
- Increased the production of B100 eligible biofuel from biofuel producers located in Boston, on Cape Cod, in Rhode Island, Connecticut, Iowa and Pennsylvania.
- Allowed three leading retail APS distributors to build new, on-site state-of-the-art biofuel storage tanks at their company headquarters in Haverhill, Natick and Newburyport.
- Encouraged a Braintree-based petroleum equipment supplier to design and build a new liquid fuel control panel that accurately blends APS eligible biofuel with heating oil. Our association provided some funding for the research and development of this device using NORA dollars earmarked for Massachusetts.
- Successfully enabled APS retail distributors to replace older heating systems and fuel storage tanks in more than 2000 homes across Massachusetts with the help of a NORA funded equipment rebate program operated by MEMA.

***What are the costs to consumers as the heating oil industry moves to higher blends of biofuel?***

Since the APS program was initiated two years ago, retail distributors have been successfully delivering economically priced heating oil blended with eligible biofuel to thousands of customers statewide including those receiving benefits from the Low-Income Heating Assistance Program (LIHEAP).

Heating oil prices in Massachusetts are tracked weekly by MA DOER during the winter season and reported to the U.S. EIA. According to MA DOER, the average price per gallon for heating oil in Massachusetts on December 1, 2020 was \$2.22, compared to \$2.94 per gallon the same time last year.<sup>25</sup> No matter what the cost of heating oil may be, biofuel is not expected to add any additional cost to end users as long as APS incentives remain in place and increase over time.

As the heating oil industry moves to higher blends of biofuel, the fuel will need to be treated with low-cost fuel additives. Kearney Consulting found, “Cold weather performance of blends up to B50 can be managed with additives, which are readily available and affordable (+/- \$0.05 per gallon) and a proven method of improving cold flow properties in colder climates.

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<sup>25</sup> Massachusetts Retail Heating Oil Prices, Massachusetts Department of Energy Resources Website

Additionally, there are only minimal changes required to existing delivery and home heating equipment for blends up to B50. Required changes are similar to routine or periodic heating system maintenance and unlikely to exceed normal and anticipated maintenance costs.”<sup>26</sup>

Furthermore, IHS Markit examined various studies that analyzed the costs of installing a range of heating oil technologies. “These studies show that fully converting an existing home to a heat pump system incurs a substantial cost. On the other hand, moving from heating oil to a higher blend of heating oil and biodiesel has the advantage of requiring little to no additional cost to the end user.”<sup>27</sup>

IHS Markit concluded that, “From the perspective of the overall value proposition, the continued use of heating oil with higher biodiesel blends can reduce CO2 emissions at lower costs per pound of carbon emitted and a lower upfront cost to the consumer.”<sup>28</sup>

Thank you once again for the opportunity to provide comments on the Massachusetts Alternative Energy Portfolio Standard program.

Sincerely,

*Michael Ferrante*

Michael Ferrante

President, Massachusetts Energy Marketers Association

Attachments:

IHS Markit: Heating Oil: Transitioning to BioBlends 2023-2050

Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI

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<sup>26</sup> Roadmap to Success: Achieving a Net-Zero Future by 2050, Kearney Consulting & NEFI, October 2020

<sup>27</sup> IHS Markit: Heating Oil: Transitioning to BioBlends 2023-2050, August 2020

<sup>28</sup> IHS Markit: Heating Oil: Transitioning to BioBlends 2023-2050, August 2020