



Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
DEPARTMENT OF ENERGY RESOURCES



Executive Order No. 594
LEADING BY EXAMPLE: DECARBONIZING AND MINIMIZING ENVIRONMENTAL IMPACTS OF STATE GOVERNMENT

Section 4D and Section 5D Guideline
Heating Oil and Biodiesel

Guideline Effective Date: February 27, 2023
(Version 2.0)

Background and Purpose

On April 22, 2021 Governor Baker signed [Leading by Example Executive Order 594, Decarbonizing and Minimizing Environmental Impacts of State Government](#) (the “Order”).

The Order sets forth targets and establishes policies, programs, and strategies to substantially reduce greenhouse gas emissions from state government operations at state owned and managed buildings, facilities, and campuses, as well as enhance their resilience. This will be achieved by advancing high performance buildings for new construction; expanding energy efficiency and decarbonizing fuels in existing buildings; acquiring fuel efficient and zero emission vehicles and continuing the deployment of new renewable energy.

This document provides guidance regarding the terms of significance and directives of Sections 4D and 5D of the Order that relate to bio-blend heating oil for existing buildings and biodiesel for the state vehicle fleet. Additional LBE Executive Order 594 guideline documents can be downloaded from the LBE web page at <https://www.mass.gov/info-details/leading-by-example-executive-order-594-decarbonizing-and-minimizing-environmental-impacts-of-state-government>.

Scope

Section 4 of the Order (Existing Buildings), which includes the Section 4D requirements listed herein, states that “all agencies shall take the targets enumerated in this Order into account when planning for, designing, and deploying projects that affect energy use;” this includes the fuel oil reduction targets and minimum biofuel requirements. Section 5D of the Order (Biodiesel) applies to all agencies that purchase and store diesel fuel at their own facilities.

Definitions

- a) **Advanced biofuels** - As defined by the U.S. Department of Environmental Protection Agency, advanced liquid biofuels are those that are generally derived from non-food-based

feedstocks and yield a lifecycle reduction in greenhouse gas emissions of at least 50% compared with fossil fuels.

- b) **Agency** - Although the term agency is used in excerpts of the Order referenced below, the scope of these requirements apply to all those entities listed in the Scope segment of this Guideline.
- c) **ASTM** - Formerly known as American Society for Testing and Materials, an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.
- d) **Biodiesel** - Biodiesel is a clean-burning liquid fuel developed from renewable energy sources like vegetable oils and animal fats, which can be used to power vehicles in place of diesel. For the purposes of this guideline, biodiesel will be used to refer specifically to vehicle fuels.
- e) **Biofuels** - Biofuels are substitutes for liquid petroleum fuels (such as gasoline, diesel, and heating oil) and are derived from renewable organic matter such as corn, soy, switchgrass, agricultural waste, wood, and waste vegetable oil. Biofuel is another term for biodiesel, but typically used to refer to substitutes for gasoline, diesel, and heating oil.

Biofuel for Buildings: Guidance on Requirements of Section 4D of the Order

Heating Oil

All agencies still utilizing heating oil as of July 1, 2021, shall ensure that any heating oil product purchased shall consist of at least 10% biofuels (i.e., B10). Said biofuels must meet the minimum fuel content specifications outlined in LBE guidance.

Agencies shall work with LBE to identify opportunities to increase biofuel consumption to as high a level as is practicable.

Agencies may be exempt from this requirement if biofuels are not readily available or are cost prohibitive, or if a specific performance constraint is identified.

Part I: Minimum Fuel Content Specifications for Heating Biofuel

State entities subject to the Order using #2 heating oil must purchase and use fuel that contains at least 10% liquid biofuel by volume for all facility heating applications starting July 1, 2021. However, in recognition that existing fuel supply agreements may not allow for product substitutions, facilities with supply agreements that need to be amended can delay the biofuel requirement for up to one year, until June 30, 2022. Additionally, facilities wishing to undertake performance testing of biofuels in existing equipment may elect to do so during the winter of 2021-2022, with the full transition to biofuels occurring no later than July 1, 2022, predicated on successful performance assessments.

To be considered eligible, the biofuel portion of fuels purchased must meet the following [Alternative Energy Portfolio Standard](#) (APS) specifications:

1. Fuel suppliers must be certified as advanced biofuel under the U.S. Environmental Protection Agency's [Renewable Fuel Standard](#) (EPA RFS).
2. Eligible liquid biofuels must provide a 50% reduction in lifecycle greenhouse gas (GHG) emissions compared to conventional #2 fuel oil.
 - Fuel qualified under the EPA RFS with a D-Code of 3, 4, 5, or 7 is approved as having met the lifecycle GHG emissions reduction requirement.
3. Only organic waste-derived liquid biofuels will be considered eligible liquid biofuels, which must comply with the latest [ASTM D6751 Standard Specification](#).
 - Please note, not all fuel pathways under the EPA RFS meet this requirement.

If the acquisition of APS eligible biofuel is not feasible for reasons related to availability, cost, or performance as per the language in the Order, state entities shall work with vendors or contractors to acquire alternative biofuels that are EPA RFS certified and that provide at least a 50% reduction in GHG emissions over #2 fuel oil (requirements 1 and 2 above). If the purchase of these non-APS biofuels is not feasible, it is permissible that state entities purchase #2 fuel oil with the intent to transition to biofuels as quickly as possible.

When purchasing non-APS eligible biofuel (whether alternative biofuel or #2 fuel oil), the rationale must be documented by the state entity per the Tracking and Reporting section of this Guideline.

Part II: Higher Biofuel Blends

If higher bio-blends (e.g., B20, B50, B100, etc.) that meet APS eligibility requirements are available, cost-effective, appropriate for current equipment, and suitable for agency needs, agencies should work with their suppliers to identify opportunities to utilize such fuels. If APS-eligible higher bio-blends cannot be procured due to one or more of the above criteria, agencies may work with suppliers to procure biofuels that are EPA RFS certified and that provide at least a 50% reduction in GHG emissions over #2 fuel oil, as long the blend contains at least 10% APS-eligible liquid biofuels by volume.

Part III: Heating Equipment Considerations

Most equipment warranties include the use of bio-blends up to B20 without any additional necessary action. However, it is always advised to verify with the equipment manufacturer regarding any specific equipment adjustments and best practices when considering biofuel blends, including any necessary modifications to maintenance and monitoring. In addition, vendors on statewide contract ENE52: No.2 Heating Fuel and APS Eligible Liquid Biofuel (ENE52) may offer equipment inspection services prior to initial biofuel delivery; contact information for the various delivery zones can be found in the [contract user guide](#).

Part IV: Biofuel Vendors and Procurement

DOER maintains a [Biofuel Suppliers List](#) with retail suppliers that offer these products, but entities should confirm with vendors that fuels are in line with these resource and fuel quality standards. The total percentage of biofuel disclosed to the consumer must include both eligible liquid biofuel and non-eligible liquid biofuel.

The Operational Services Division offers a statewide contract that includes APS-eligible liquid biofuels for heating, [ENE52](#), which is open to all eligible public entities to facilitate the purchase of these fuels. State entities wishing to purchase biofuel content higher than 10% should discuss availability and pricing with the appropriate vendors listed on contract.

Part V: Calculating Emissions Impacts for APS-Eligible Biofuel

The relative emissions impacts associated with APS-eligible biofuel and non-APS biofuel will be accounted for differently. For more information on how biofuel emissions will be tracked and calculated, please see the Executive Order 594 [Section 2 Guideline](#).

Biofuel for Vehicles: Guidance on Requirements of Section 5D of the Order

Biodiesel

All agencies that purchase and store diesel fuel at their own facilities as of July 1, 2021, shall ensure that any diesel fuel purchased for use in motor vehicles owned and operated by Commonwealth agencies shall consist of at least 5% biofuels (i.e., B5). Said biofuels must meet the minimum fuel content specifications outlined in LBE guidance.

Agencies shall work with LBE to identify opportunities to increase the biodiesel portion of vehicle fuel consumed to as high a level as is practicable.

Agencies may be exempt from this requirement if said biodiesel is not readily available or is cost-prohibitive, or if a specific performance constraint is identified.

Agencies shall also strive to utilize biodiesel fuels in other equipment as is appropriate.

Part VII: Minimum Fuel Content Specifications for Biodiesel

State entities that purchase and store diesel fuel in bulk at their own facilities for use in vehicles must purchase and use at least 5% eligible biodiesel by volume (i.e., B5). If available, cost-effective, and suitable for agency needs, higher biofuel blends (e.g., B10 and higher) should be considered.

To be considered eligible, the biofuel component of biodiesel, whether it makes up 5% or more of the fuel, must meet the following specifications:

1. Must provide a 50% reduction in lifecycle GHG emissions compared to conventional diesel oil.

2. Fuel suppliers must be registered in the U.S. Environmental Protection Agency's [Renewable Fuel Standard](#) and must verify that they produce biodiesel from organic waste feedstocks.
3. The B100 portion of the biodiesel must comply with the latest [ASTM D6751 Standard Specification](#).
4. The final blended product must meet the appropriate ASTM specification:
 - B5 biodiesel must meet the latest version of [ASTM D975](#).
 - B6-B20 biodiesel must meet the latest version of [ASTM D7467](#).

The vendors selected by state entities to supply biodiesel may be asked to demonstrate that they employ quality control programs and practices for storage, sampling, testing, blending, distribution, and fuel management.

If the purchase of biodiesel that meets the specifications above meets one or more of the exemption criteria outlined in the Order, the rationale must be documented by the state entity per the Tracking and Reporting section of this guideline.

Part VIII: Biodiesel Procurement

Statewide contract [ENE47: Ultra Low Sulfur Diesel & Biodiesel](#) is open to all eligible public entities to facilitate the purchase of these fuels. It includes a category year-round blend of B5 biodiesel with the ability to purchase other blend percentages B10, B15, B20, etc. Vendors may blend eligible liquid biofuels with non-eligible fuels if the blend contains 5% eligible biodiesel by volume. State entities wishing to purchase higher than 5% biofuel content should discuss availability and pricing with the appropriate vendors listed on contract.

Part IX: Biodiesel Equipment Considerations

It is always advised to verify system-specific biodiesel modifications and best practices with the equipment manufacturer.

Part X: Other Biodiesel Equipment Types

Emergency generators are not included in the Order requirements, but if covered under manufacturer warranty, certain biodiesel blends may be appropriate. Additional examples of types of state-owned and operated assets that may be suitable for biodiesel use include, but are not limited to, off-road equipment, construction and road maintenance vehicles, buses, large trucks, and tractors.

Tracking and Reporting

For both liquid biofuel for heating and vehicle biodiesel, the Order maintains that state entities may be exempt from the requirements when biofuels are not readily available, are cost prohibitive¹, or if a specific performance constraint is identified. State entities that are unable to purchase the specified biofuels for one or more of these reasons must maintain detailed documentation of the rationale as justification for exemption.

Through the applicable statewide contracts and LBE annual progress reporting, the LBE Program will identify and track which state entities are purchasing which types of heating and vehicle fuels. LBE Program staff will work with state partners on an individual basis regarding specific challenges and future biofuel transition plans.

¹ The factors that influence the cost impact of biofuel will vary on a case-by-case basis (e.g., frequency of purchasing, incremental and total fuel costs, impacts of overall fuel cost over time in the context of the specific system or vehicle); the rationale behind cost prohibitive biofuels must be demonstrated through the tracking and reporting process outlined in this Guideline.