

INTEGRATING ETHANOL INTO EPA’S PHASE 3 GHG PROPOSAL¹

The Problem:

Every day, more than 4 million heavy-duty, Class 8 trucks move goods on America’s highways and roads. Our economy depends on these trucks to deliver the goods we want, when we want them. Unfortunately, almost all of today’s trucks currently use diesel or other fossil fuels. Medium- and heavy-duty trucks operating on diesel fuel emit 26% of our transportation-related greenhouse gas emissions.

These trucks also emit high levels of toxic particulate matter and smog-forming nitrogen oxides that are linked to increased asthma, bronchitis, cancer, and thousands of premature deaths every year. These emissions disproportionately impact our nation’s low-income communities and communities of color, because these communities are more likely to be near our highways, ports, and railyards.

The problem is not the efficient, powerful, durable, and reliable diesel engine that these trucks use to deliver their goods. The problem is the high-carbon, toxic petroleum diesel fuel that powers these engines. EPA’s certification process for new engines continues to assume that most of our future trucks will continue to run on diesel, gasoline, or natural gas—and provides no opportunity for engines that are dedicated to the use of cleaner, sustainable liquid fuels like ethanol. Such engines can harness the efficiency, durability, and other attributes of diesel power without the harmful emissions of diesel fuel.

The Solution:

The Biden Administration’s recent [U.S. National Blueprint for Transportation Decarbonization](#) (the “Decarbonization Blueprint”) pointed out that we need to deploy a range of solutions to meet our climate goals, including sustainable biofuels and e-fuels, clean electricity, and clean hydrogen. In the long haul truck sector, the Decarbonization Blueprint concluded that biofuels and other Sustainable Liquid Fuels (SLFs) are a “large, long-term” opportunity that is even greater than the market opportunity for battery-electric vehicles.²

Ethanol is a SLF that can play an important role in decarbonizing our nation’s long-haul trucks at scale, this decade, especially for market segments that will not electrify in the foreseeable future. Ethanol has a lower carbon intensity than diesel, emits far lower levels of toxic particulate matter or nitrogen oxides when used, and is 100% fossil-free. The fuel is available at scale now, and using it provides jobs and economic opportunities in our farm and rural communities. [ClearFlame Engine Technologies](#) is an example of an innovative company that is demonstrating how a long haul truck designed to run exclusively on ethanol can cost-effectively operate with 22% lower lifecycle greenhouse gas emissions than a comparable battery-electric truck that is charged on the U.S. grid—with no loss of power, torque, or efficiency.

EPA’s upcoming proposal to reduce greenhouse gas emissions from the nation’s new trucks and buses (the “Proposal”)³ provides a unique opportunity for EPA and the Biden administration to update EPA’s certification process for new engines to enable and encourage heavy-duty diesel engines that operate exclusively on ethanol, especially in long haul trucking segments that will not electrify in the foreseeable

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² Decarbonization Blueprint, Figure 5, page 5.

³ U.S. Environmental Protection Agency, “Greenhouse Gas Emissions Standards for Heavy-Duty Engines and Vehicles – Phase 3,” OIRA RIN 2060-AV50.

future. Taking this step would encourage innovators and investors to develop technologies that can harness the decarbonization and economic benefits of ethanol to the efficiency, reliability, and durability benefits of future diesel (technically, compression-ignition) engines. It would also allow valuable innovation to continue in the on-road sector, to create new solutions that can be adapted to off-road applications in the future.

Our Specific Request:

We ask that the Proposal requests comment on ways to integrate ethanol into the certification process for new heavy-duty truck engines. EPA's request for comment should be designed to enable EPA to (a) consider any proposed approaches for how best to do so during the rulemaking process, including but not limited to the approach summarized below; and (b) finalize a rule that includes the best possible approach, without requiring an additional Notice of Proposed Rule Making or other procedural step.

Updating EPA's Greenhouse Gas Emissions Model ("GEM") is key to selecting the best possible approach to integrating ethanol. As part of an engine's certification application, engine makers use GEM to demonstrate the anticipated GHG emissions of their engines. Currently, GEM is designed to certify engines that operate on diesel, gasoline, or natural gas only. Computer models like GEM often include conversion or correction factors that allow the model to be used if a different fuel is used. However, EPA's certification process does not include a conversion or correction factor (or any other mechanism) to enable an engine maker to certify a diesel engine that is designed to operate exclusively on ethanol.

The Proposal should include a GEM conversion factor, correction factor, or other mechanism to properly account for the different combustion properties and lifecycle decarbonization benefits of a diesel engine that has been designed to run exclusively on ethanol. This would ensure that fuel/vehicle systems are accurately measured on their true environmental impact compared to a diesel baseline.

Adding such a mechanism to GEM would enable EPA to correctly estimate that actual, real world greenhouse gas benefits of switching from diesel to ethanol. For example, we estimate a truck operating solely on E98 ethanol (i.e., 98% ethanol) should receive a 32% conversion factor, which would account for the two greenhouse gas advantages of ethanol, i.e., its lower heating value and significantly lower carbon intensity.⁴

Conclusion:

We applaud the Biden Administration for its leadership on climate issues, including the adoption of last year's Infrastructure Investment and Jobs Act and the Inflation Reduction Act, in addition to this year's Decarbonization Blueprint.

To send the right market signal to the innovators who are developing the next generation of decarbonized truck engines and to fulfill the "large, long-term opportunity" of sustainable biofuels to decarbonize the nation's long haul trucking that was highlighted in the Decarbonization Blueprint, EPA should seek comment on conversion or correction factors or other mechanisms that would properly account for the different fuel properties and full lifecycle GHG emissions benefits of trucks that are designed to operate exclusively on ethanol in its Proposal.

⁴Argonne National Laboratory, The Greenhouse gases, Regulated Emissions, and Energy use in Technologies Model ("GREET"), accessible at <https://greet.es.anl.gov/>.