



## **Advanced Diesel, Other Internal Combustion Engines, and Low-Carbon, Renewable Fuels Are Essential to Achieving California's Climate and Clean Air Goals for Trucking**

The Diesel Technology Forum (DTF) issued the following statement with regards to the California Air Resources Board's consideration of the so-called Advanced Clean Fleets rule (ACF), which would require trucking fleets purchase zero emissions vehicles beginning in 2040.

Diesel is the dominant fuel and technology powering California's commercial trucking sector. Today more than 1 million diesel powered commercial trucks are registered and operating in California. About half of all diesel trucks are of the newest generation with near-zero emissions performance.

There is no denying that new zero emissions technologies for the trucking sector are emerging; some of the members of the Diesel Technology Forum are making them.

The future fleet policies that California is considering take a narrow definition of qualified technologies; one that largely excludes the primary technologies powering the industry today such as advanced diesel, natural gas, and other internal combustion engines (ICE).

Advanced diesel and other ICE technologies achieve near-zero emissions while using less fossil fuel and more renewable biofuels. The next chapter for advanced diesel, other ICEs, and the fuels that they might use has not yet been written. We can expect new engine architectures like opposed pistons, improvements to conventional combustion and emissions control, integration of hybrid, and electrified power systems. On the fuels side, expanded use of renewable fuels, new feedstocks as well as the potential for with new liquid e-fuels and other fuels like hydrogen are just a few examples of innovations showing significant potential for carbon and criteria emissions reductions from ICE.

The potential for achieving net-zero carbon emissions using advanced internal combustion engines more rapidly or at lower cost, deserves greater consideration.

In a recent study undertaken by Stillwater Associates for the Diesel Technology Forum (full study follows this comment), researchers evaluated environmental benefits attainable with new technology diesel engines in commercial fleet vehicles fueled with biofuels and comparable medium and heavy-duty electric vehicles (EV) from 2022 to 2032. This study found that fueling the diesel vehicles with 100% renewable diesel (RD) fuel resulted in six times larger cumulative greenhouse gas (GHG) reductions by 2032 than the EV scenarios, while B20 – a 20% blend of biodiesel with 80% petroleum diesel – provided a 30% greater cumulative GHG reduction.

New technology medium and heavy-duty diesel vehicles replacing older models provide greater reductions in particulate matter than replacing those older model diesel vehicles with medium and heavy-duty electric vehicles. Furthermore, when using 100% renewable diesel, diesels (all model-years), vehicles provide up to six times more GHG emissions reductions than medium and heavy-duty electric vehicles powered with U.S. grid average electricity.

The carbon reductions we're achieving today from renewable fuels, particularly biodiesel and renewable diesel fuel, provide important progress in addressing climate change, while zero emissions vehicle technologies and the infrastructure to support them continue to develop and scale.

As a drop-in fuel requiring no additional investment in infrastructure, renewable diesel has delivered 28% of the greenhouse gas reductions from alternative fuels over the life of California's Low Carbon Fuel Standard (LCFS). There is a continued role for renewable fuels in ICE in California because, until the state exceeds the statutory goals set by Senate Bill (SB) 100 of at least 60% renewable retail electricity on a continuous and reliable basis by 2030, renewable diesel fueled Class 8 trucks will continue to provide superior GHG benefits.

Due to its power density, portability, energy efficiency and low-emissions, advanced diesel and other ICE technology will continue to be the primary powerplants for trucking and many sectors of the global economy for decades to come. Further advancement in renewable and other liquid fuels for ICEs, and new gaseous ones like hydrogen, open up important new chapters for internal combustion engines.

Climate change is one of the most complex challenges we have ever faced. Trucking and other sectors need all available tools and strategies to deliver results in the near term, and long term; this includes zero emission vehicles, advanced internal combustion engines, and renewable fuels.

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