

July 5, 2016

The California Freight Advisory Committee
Submitted electronically

IN RE: Comments on California Sustainable Freight Strategy

On behalf of the Diesel Technology Forum, we submit these comments to the draft Sustainable Freight Action Plan (“The Draft Action Plan”) for California. Our comments offer the perspectives regarding the importance of diesel technology to California’s freight system and the current and future role of diesel power; impacts of new technology diesel engines; California’s experience with the adoption of new technology; and the importance of incentive programs to increase the share of these technologies on the road and in the field to generate immediate-term air quality and climate benefits.

By way of background, the Diesel Technology Forum represents the manufacturers of diesel engines, vehicles and equipment including passenger vehicles and pickups to large commercial vehicles and even larger pieces of off-road equipment, locomotives, stationary engines and agricultural equipment. The Forum serves as a not-for-profit educational and advocacy organization raising awareness of the clean air and economic benefits of cleaner diesel fuel including biodiesel and renewable diesel, engines, vehicles and equipment.

I. Diesel Technology is the prime mover of California’s freight system.

Diesel engines are the lifeblood of our transportation network and national economy. A diesel engine is critical to over half of all economic sectors. Our construction, agricultural, mining, forestry, freight transportation, and public transportation systems depend on diesel. Manufacturers, retailers, and farmers depend on diesel trucks, trains, vessels and barges to deliver products to store shelves and factory floors here in the U.S. and fulfill orders overseas. In 2009, diesel technology was responsible for generating \$275 billion in economic activity and supporting 1.2 million jobs.

Diesel engines are the prime mover in California’s goods movement system. From ocean going vessels to railroad freight locomotives to medium and heavy duty trucks, diesel engines power the overwhelming majority of commercial vehicles in California found delivering freight across the state and destinations beyond California’s borders. Diesel engines will power almost the entirety of large construction equipment that will be vital to complete infrastructure projects necessary to realize the goals of the Draft Action Plan.

II. Environmental policies in California have transformed diesel engines to near zero emissions in all modes of freight transport.

Thanks to decades of innovation, investment and collaboration between industry and the regulatory community, the diesel engine of today has been transformed to provide substantial air

quality benefits while enhancing the already impressive fuel savings capabilities. One of the benefits of the diesel platform remains its continuous improvement.

Manufacturers are hard at work enhancing these benefits while many engines on the road and at worksites today may operate on blends of high quality biofuels, including biodiesel and renewable diesel, that further enhance the air quality and fuel savings benefits of clean diesel technology. California's experience adopting the latest technology to meet the latest emissions requirements for commercial vehicles may provide valuable insights into future adoption rates for emerging technologies as outlined in the Draft Action Plan. While the latest clean diesel innovations are now found in construction equipment, existing voluntary incentive programs, most notably the Carl Moyer Program, may need to keep up with the times to encourage equipment owners to repower or replace equipment to provide clean air benefits to communities located near transportation infrastructure improvement projects.

III. Clean diesel technology is a centerpiece of the Draft Action Plan

In the Draft Action Plan, Governor Edmund G. Brown in Executive Order B-32-15, outlines nine objectives. Clean diesel technology is a key strategy in achieving many of these objectives as follows:

- **Preserving and enhancing freight infrastructure.** Sustaining roadways and bridge systems as well as rail and port infrastructure relies on heavy duty diesel powered construction equipment, of which the new generation of clean diesel technology achieves near-zero emissions. Technology deployed since 2014 to meet the near-zero "Tier 4" emissions standards, established by the U.S. Environmental Protection Agency, results in more than a 90 percent reduction in NOx and PM emissions, depending on the horsepower range of specific equipment. Much like commercial vehicles, a diesel engine powers the majority of this equipment and will continue to do so into the future.

Manufacturers couple fuel savings and productivity enhancing technology along with emission reduction capabilities in the latest Tier 4 compliant equipment. Next generation hybrid, energy storage, GPS enabled telematics and even aerial drone technologies make the most of these expensive assets by saving fuel and maximizing operating time while delivering near-zero emissions and air quality benefits for communities near worksites.

Agencies are recognizing the recent clean air and fuel savings advancements in the latest clean diesel innovations that power Tier 4 construction equipment. The California High Speed Rail Authority announced that Tier 4 compliant equipment, where available, will be required at all job sites associated with the large public works project. Tier 4 compliant equipment is expected to deliver substantial air quality benefits for communities near worksites while saving fuel costs for contractors and delivering savings to the State of California.

- **Reducing exposure to air toxics:** According to the most recent reports from the Health Effects Institute Advanced Collaborative Emissions Study (ACES) of which CARB was a co-sponsor, emissions from new technology diesel engines that meet the model year

2007 standard for near-zero levels of particulate matter and model year 2010 standard for near zero levels of oxides of nitrogen, were not correlated with adverse health outcomes during animal assays. Accelerated replacement of older technology with new diesel technology would play a key role in risk reduction outlined by the Draft Action Plan.

- **More protective air quality standards:** New technology clean diesel engines have near zero- emissions for both particulates (PM) and oxides of nitrogen (NOx). Today, diesel engines that meet the latest emissions milestone provide substantial clean air benefits and fuel savings. Diesel engines that power commercial vehicles that meet the latest emissions standards established by the U.S. Environmental Protection Agency beginning with model year 2007 for near-zero levels of PM emissions and the model year 2010 standard for near-zero levels of NOx emissions result in a 98 percent reduction in these emissions relative to a commercial vehicle manufactured in 1988. Since 2010, in California, these model year 2010 compliant commercial vehicles have eliminated:
 - 700,000 tons of NOx
 - 20,700 tons of PM

According to research commissioned by the Diesel Technology Forum, additional significant air quality improvements can be delivered immediately if more of these model year 2010 compliant diesel commercial vehicles enter the California fleet. For example, and additional 30,000 tons of NOx could be eliminated if the share of model year 2010 compliant diesel commercial vehicles increased by 7 percent to reach the national average of 26 percent of all vehicles in the commercial vehicle fleet.

- **Climate change goals:** Use of new technology clean diesel engines is already helping the state achieve its climate goals to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030. For example, a single Class 8 line haul tractor powered by a model year 2010 compliant clean diesel engine will eliminate 9 tons of CO₂, 1 ton of NOx while saving 21 barrels of crude oil each year.

Substantial climate change benefits accrue to California by the fleet of these model year 2010 compliant diesel commercial vehicles. According to data compiled by IHS Insight for the Diesel Technology Forum, a diesel engine powers 907,235 Class 3-8 commercial vehicles in California. Of these, 165,466 are powered by a model year 2010 compliant engine. This compares with just 15,193 natural gas powered commercial vehicles. While providing air quality benefits outlined above, the roughly 18 percent of diesel commercial vehicles that meet the model year 2010 standard have saved or eliminated:

- 5.8 million barrels of crude oil
- 2.5million tons of CO₂

Substantial additional greenhouse gas reduction goals are achievable under a modest increase in the share of these model year 2010 compliant commercial vehicles. For example, over a million tons of CO₂ each year may be eliminated if the share of these clean diesel commercial vehicles increased to just 26 percent, the national average.

Another 2 million tons of CO₂ may be eliminated if the share of these clean diesel commercial vehicles increased to 46 percent of the fleet, the share of the clean diesel commercial vehicles in Indiana, the top state for the adoption of the latest emissions milestone. In addition, substantial reductions in black carbon emissions are achievable through greater adoption of model year 2007 and 2010 diesel commercial vehicles. Black carbon is classified as a short lived climate pollutant that contributes to warming polar ice. Clean diesel technology capable of reducing emissions of black carbon to near zero levels will greatly help reduce transportation related sources of black carbon emissions reduce the pace of rapidly warming polar ice.

IV. New technology clean diesel engines achieve CARB and USEPA standards by a wide margin

Recent research suggests that clean diesel commercial vehicles actually demonstrate air quality benefits in excess of the standard. According to the Phase 2 Advanced Collaborative Emissions Study conducted by the Coordinating Research Council, in collaboration with the U.S. Environmental Protection Agency, the Air Resources Board and others, diesel engines that meet the model year 2010 standard generate NO_x and PM benefits that beat the regulatory standard.¹ The research project examined three model year 2011 heavy-duty diesel engines that typically power a large Class 8 line haul tractor by subjecting these engines to over 16 hours of testing including the test procedures used for emissions compliance. The research determined that these engines resulted in NO_x emissions 60 percent below the standard and PM emissions almost 90 percent below the standard established for model year 2010.

V. California is among the bottom 5 states for the adoption of the latest technologies

California's environmental leadership cannot be questioned. The State is a leader for encouraging the latest clean air and fuel saving technologies. However, when it comes to commercial vehicles, California can learn a lot from its commercial vehicle fleet. Nationwide, almost 26 percent of the diesel commercial vehicle fleet is powered by an engine that meets the model year 2010 standard. Yet, California comes in at #48 of all 50 states for the adoption of the latest emissions standards for commercial vehicles with just over 18 percent of the fleet deployed with a model year 2010 diesel engine. California only beats Kentucky and Hawaii for the adoption of the latest technology.

VI. Significant benefits are at hand from greater adoption of clean diesel

While California may be among the bottom five states for the adoption of commercial vehicles that meet the most recent emissions standards, enormous immediate term air quality and fuel savings benefits are at hand if a greater share of the commercial vehicle fleet meets these standards. According to the South Coast Air Quality Management District (SCAQMD), an additional 80 tons of NO_x emissions each day may be eliminated in the South Coast air basin if

¹http://www.crao.org/reports/recentstudies2013/ACES%20Ph2/03-17124_CRC%20ACES%20Phase2-%20FINAL%20Report_Khalek-R6-SwRI.pdf

all commercial vehicles came with an engine that meets the model year 2010 standard – a standard that is now six years old.²

Benefits also accrue throughout the state if a growing share of the commercial vehicle fleet came with an engine that meets the model year 2010 standard. Between 2010 and 2015, about 700,000 tons of NO_x have been eliminated by the 18 percent of commercial vehicles that meet the model year 2010 standard. If the fleet of clean diesel commercial vehicles in California met the U.S. average at 26%, an additional 30,000 tons of NO_x could be eliminated. If the share of these vehicles in California's fleet met the top state for the adoption of the latest standard – Indiana, 46% - an additional 95,000 tons of NO_x per year could be eliminated. As noted earlier, additional fuel savings and CO₂ benefits accrue under these scenarios.

VII. The Draft Action Plan as currently constructed sacrifices proven near term reductions in nitrogen oxides, particulate emissions and CO₂

The Draft Action Plan would move California to invest in zero and ultra-low emission technologies for freight applications. While applications of these technologies are available today, they are not widely available beyond niche applications including airport shuttle buses, port yard equipment and smaller urban delivery buses. Programs to encourage the greater adoption of existing near-zero technologies that meet the latest emissions standards can deliver significant air quality, fuel savings and greenhouse gas reduction benefits.

VIII. Existing policies could be amended to encourage the adoption of the latest new technology today.

The durability and proven performance of diesel engines is well documented and highly valued by shippers, carriers and other users. These attributes result in lengthy turn over to new or newer technology. Since 1998, California has provided about \$60 million a year in voluntary incentive funding to owners of older equipment through the Carl Moyer Program. Today, the program helps owners of older on- and off-road equipment retrofit, repower or replace vehicles and equipment.

While the Carl Moyer Program has been hailed as a success, its goal of incentivizing the latest clean equipment in use on California's worksites has trailed off owing in large part to its statute. The program may only incentivize the introduction of technology that exceeds regulatory emissions requirements. In years past, the program was successful in introducing engines and other technologies in advance of engine emissions milestones. However, as new engines and equipment rolling off assembly lines meeting the latest Tier 4 standard, the program may not help fund the purchase of equipment that meets the latest emissions standard. Without access to "Moyer" incentive funds, construction equipment owners may decide to simply maintain older in-use equipment until required to upgrade by law. Revising the Carl Moyer Program's requirement to allow for the purchase of technology that, at a minimum, meets the latest emissions

²<http://www.aqmd.gov/docs/default-source/Agendas/aqmp/white-paper-working-groups/preliminary-draft-goods-movement-white-paper---060515.pdf?sfvrsn=2>

requirements may go a long way to accelerate the introduction new clean diesel equipment in the field and help communities near worksites achieve clean air faster.

X. Expanded penetration of low-carbon liquid biofuels in diesel engines is delivering proven climate and clean air benefits.

One of the benefits of the diesel platform is its demonstration of continuous improvement. Advanced engine components, emission control technologies, hybridization and energy storage have helped deliver significant air quality and fuel savings benefits from the diesel platform. Advances in biofuels, including biodiesel and renewable diesel fuel, have the potential to contribute to these clean air and fuel savings benefits. Clean diesel engines may operate on high quality blends of these fuels that are considered advanced biofuels by the U.S. Environmental Protection Agency, that are capable of delivering at least a fifty percent reduction in CO₂ emissions. The California Air Resources Board has also identified additional NO_x reduction capabilities associated with blends of renewable diesel fuel. While these bio-based fuels add to the many benefits of the latest clean diesel vehicles and equipment, these fuels may also provide air quality and CO₂ reductions from older diesel engines still in use.

Many public agencies, large municipalities and businesses have taken notice of the benefits of these fuels. Just this year, the City of San Francisco announced that all diesel vehicles and equipment in the City's fleet will operate exclusively on renewable diesel fuel. On the heels of this announcement, the Cities of Oakland, Walnut Creek and others announced similar policies to use renewable diesel fuel. UPS, one of the largest package delivery services, recently announced goals to consume more than 46 million gallons of the fuel while Google, Disneyland and others use the fuel in large fleets of shuttle buses.

Xi. Conclusions

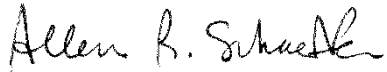
We appreciate the opportunity to provide information about the importance of clean diesel technology that will help realize the many goals included in the Draft Action Plan to provide air quality benefits and greenhouse gas reductions and fuel savings from the movement of freight.

Today, diesel powers the majority of commercial vehicles and off-road equipment and will continue to do so into the future. Near zero emissions clean diesel technology is now widely available in the market. Technology developed to meet the latest tailpipe emissions standard for commercial vehicles established for model years 2007 and 2010, has contributed to California's goal of improving air quality while reducing greenhouse gas emissions and petroleum use. However, California is among the bottom 5 states for the adoption of these clean technologies that meet the latest emissions standards. Even greater air quality benefits and greenhouse gas and petroleum reduction are immediately at hand if the share of these near zero emissions vehicles increase in modest numbers. As California considers adopting rules to encourage emerging zero and ultra-low emission technologies, we hope that California's experience adopting the latest clean air technologies in commercial vehicles may provide further insight concerning potential benefits provided by these emerging technologies. Equally impressive advances have been made in achieving near-zero emission reductions from clean diesel technologies that power construction equipment that will be essential to complete transportation infrastructure projects outlined in the draft action plan. While the Carl Moyer Program has been a success in years past,

small changes to the program to allow interested equipment owners to purchase the latest clean technologies may provide greater air quality benefits.

Please feel free to reach me at (301) 668-7230 with any questions or concerns.

Very truly yours,

A handwritten signature in black ink that reads "Allen R. Schaeffer". The signature is written in a cursive style with a large, prominent initial 'A'.

Allen R. Schaeffer

Executive Director