To: CARB Staff

Re: Public Availability of Modified Text and Availability of Additional Documents and Information on the Advanced Clean Trucks Rule

Viatec Inc supports CARB's Advanced Clean Trucks Rule, however feels the rule could be strengthened even more in order to enhance California's measures to meet emissions targets, protect the environment, and preserve air quality for all. Viatec support's the CARB Board's direction to staff seen in the 30 day notice revisions, and have feedback specifically in regards to the Board's instructions to staff to "extend near-zero emission vehicle credit, and accelerate emissions benefits in disadvantaged communities"

Viatec Inc has developed and deployed a product called SmartPTO, a fully electric system that is added to utility work trucks to electrify the boom device and the HVAC system. These work functions are the key work of the vehicle, and by enabling the operator to turn off the engine and use electric power our product can fully eliminate emissions associated with the idling engine typically used to power the work functions.

The emissions and fuel used in idling is a huge problem for the industry, but it is a harder problem to solve than in passenger cars as work functions of medium and heavy duty truck applications can vary widely and the work functions they perform are key for maintaining essential industries. "Each year, U.S. passenger vehicles, light trucks, medium-duty trucks, and heavy-duty vehicles consume more than 6 billion gallons of diesel fuel and gasoline combined—without even moving. Roughly half of that fuel is wasted by passenger vehicles (cars and light trucks); the remaining half by medium- and heavy-duty vehicles.[1]"

While the goal of fully electric vehicles is one in which idling usage would not cause any emissions, the current state of the market for medium and heavy duty all-electric vehicles has been centered on applications which are primarily used for traveling vehicle miles, not for performing work functions. Transit buses, shuttle buses, school buses, and last mile delivery trucks all share similar usage characteristics, in that the key role of a powertrain in such a vehicle is to provide motor power to move a vehicle. These vehicles can and should be electrified. This rule will help move the market for electrification in those segments. However when looking at the proposal's hybrid approach, the measurement of what is credit eligible for a Near Zero Emission Vehicle (NZEV) is based upon the number of All-Electric Miles the vehicle can travel.

Technologies which can reduce emissions from vehicles when they're not moving, would not receive the same support from a credit system as technologies focused on propulsion. Work trucks which primarily are used as stationary platforms for work are not limited by the range of an electric powertrain as much as they are limited by the ability of that powertrain to power

[1] "Energy Systems Division: Idle Reduction Research" Argonne National Laboratory. https://www.anl.gov/es/idle-reduction-research

auxiliary functions which are key to their work. An auxiliary boom with a heavy-duty hydraulic system uses most of its power to run the hydraulic system. That idling engine produces onsite emissions often times disproportionately hurting workers, and communities in which the trucks operate. The stationary energy needs are the primary needs. An electric powertrain allowing the truck to get to the work site but not powering auxiliary functions would still need a diesel generator or a specifically designed Auxiliary Power Unit (APU) to power their work. However diesel trucks can also use APUs or Electric Power Take-Off (ePTOs) to reduce their primary emissions hybridizing the work function while not altering their driving emissions.

If CARB wishes to reduce all emissions for the vehicles across a range of use cases, we urge CARB to evaluate the value of hybridization solutions not just for driving the vehicle, but also for electrifying the primary work function even if it is not conducted during the drive cycle, but rather while parked on site. If CARB modifies the near-zero emission vehicle credits (NZEV), so such credits focusing on all-electric operation in either hours or miles, it would enable work functions based on usage not just driving. Expanding NZEV credits to incentivize OEMS to design the types of platforms best able to serve all work functions, and to integrate technologies to reduce operational emissions beyond the current standards.

Staff has wisely modified the credit system since the draft released last winter, and in the current draft the targets will better accelerate emissions benefits in disadvantaged communities by expanding the credits for heavier applications which often operate in disadvantaged communities. We support this modification and urge staff to build upon that work by modifying the NZEV credit system.

As staff assesses the value of NZEV applications, staff should also recognize that redundancy in hybrid system provides a key element of resiliency for uniquely Californian challenges such as Public Safety Power Shutoffs. In the event of a power outage, trucks using Viatec's SmartPTO are able to use all the electric power on board to run a full day on the electric power, but when the battery is fully discharged the operator can turn on the engine and resume operation. This is a key need for utility fleets who must be able to operate their service trucks when the grid is down. But it is also important for many other businesses to maintain mobile operations. NZEV trucks that can be more resilient and clean than current technologies offer a unique advantage to further improve upon the business as usual scenario by hybridizing a larger portion of vehicles covered under the rule.

Viatec believe that CARB should consider equivalent credits for NZEV applications in idle dominant work as well as driving. Argonne National Laboratory and Oak Ridge National Laboratory have done assessments with the US Department of Energy to measure the specific loads and found the following: (see chart below) in Bucket Trucks which don't have load idling uses .9 gal/h and when loaded use 1.5 gal/h. Converting these fuel usages to the equivalent miles per gallon savings when thinking of credits will ensure whether a medium or heavy duty truck is primarily used to drive or primarily for idling work functions – there is an incentive for OEMs to work with new technology providers to cut emissions, ultimately helping reduce fuel usage, emissions, and improving air quality and helping CA meet emissions targets.

Vehicle Type	Class	Fuel Type	Size Indicator		Idling Fuel Use (gal/h)		Source
			Engine Size (l)	GVWR (lb)	No load	With load	
Passenger Car (Ford Focus)	1	G	2	–	0.16	0.29	ANL 1
Passenger Car (Volkswagen Jetta)	1	D	2	–	0.17	0.39	ANL 1
Passenger Car (Ford Crown Victoria)	1	G	4.6	–	0.39	0.59	ANL 1 & 2
Medium Heavy Truck	6	G	5–7	19,700–26,000	0.84	–	WVU
Delivery Truck	5	D	–	19,500	0.84	1.1[1]	NREL
Tow Truck	6	D	–	26,000	0.59	1.14[2]	ORNL
Medium Heavy Truck	6–7	D	6–10	23,000–33,000	0.44	–	WVU
Transit Bus	7	D	–	30,000	0.97	–	ORNL
Combination Truck	7	D	–	32,000	0.49	–	ORNL
Bucket Truck	8	D	–	37,000	0.90	1.50[2]	ORNL
Tractor-Semitrailer	8	D	–	80,000	0.64	1.15[3,1]	TMC

D = diesel. G = gasoline. Gal = gallon(s). GVWR = gross vehicle weight rating. h = hour(s). l = liter(s). lb = pound(s). PTO = power take-off.
[1] High idle.
[2] PTO on.
[3] Air conditioning on.

Viatec is proud that our all-electric SmartPTO helps fleets cut engine use, emissions, and improves air quality and worker safety. We hope to expand into many applications and hope that large OEMs will begin to integrate technologies like ours into the initial build process to allow for safer, cleaner, and quieter workplaces using ZEV technology. We applaud CARB for strengthening the rule and urge staff to continue to strengthen it to optimize outcomes for all Californians.

Respectfully,

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[2] "Idling Reduction Savings Calculator" Argonne National Laboratory & Clean Cities. https://www.anl.gov/sites/www/files/2018-02/idling_worksheet.pdf