

ACLT Workgroup Meeting Summary

Wednesday, August 30, 2017, 10:00 AM-4:00 PM

Cal/EPA Headquarters, Sacramento, California

Attendees:

Following is the list of workgroup members who participated in the meeting in person or identified themselves via telephone or email during the meeting.

Name	Affiliation
Adam Smith	Southern California Edison
Alison Bird	FedEx
Alyssa Werthman	Ford Motor Company
Amy Lilly	Daimler
Brian Bolton	Hino Motors Manufacturing U.S.A, Inc.
Bud Beebe	California Hydrogen Business Council
Carl McConkie	Isuzu
Chris Franceschi	California Air Resources Board (CARB)
Chris Shimoda	California Trucking Association
Craig Duehring	CARB
Dale Morin	UPS
Dave Kayes	Daimler
Erik Maroney	UC Davis/FedEx
Erin Luke	Peterbilt Motors Company
Hannah Goldsmith	California Electric Transportation Coalition
Inder Atwal	CARB
Jamie Hall	General Motors
Jean-Baptiste Gallo	Efficient Drivetrains, Inc.
Jimmy O'Dea	Union of Concerned Scientists
Jose Paul	Phoenix Motorcars
Joy Alafia	Western Propane Gas Association
Katherine Garrison	CARB
Kaylin Huang	CARB
Ken DeGroot	Fiat Chrysler of America
Linus Farias	Pacific Gas and Electric
Matt Diener	CARB
Matt Psota	Cummins Inc.
Michael Tunnel	American Trucking Association
Paul Arneja	CARB
Paul Cort	EarthJustice
Rebecca Schenker	BYD
Ryan Kenny	Clean Energy
Name	Affiliation
Sean Edgar	Clean Fleets
Shrayas Jatkar	Coalition for Clean Air

Steven Yarosz	Isuzu
Suzanne Seivright	California Construction and Industrial Materials Association
Tim Blubaugh	Truck and Engine Manufacturers Association
Todd Campbell	Clean Energy
Tony Brasil	CARB
Tyson Eckerle	Governor's Office of Business and Economic Development (GO-Biz)
Urvi Nagrani	Motiv Power Systems
Vincent Wiraatmadja	BYD/WAVE/Weideman Group
Wente Yin	CARB
Will Barrett	American Lung Association

This was the second meeting of the Advanced Clean Local Trucks Workgroup. The primary objective of this meeting was to discuss the market status of heavy duty zero emission trucks, potential market opportunities and data needs. The meeting was webcast and recorded. Staff used a presentation format to share information and discussion topics. The agenda, meeting materials, and video recording for this meeting are available at <https://arb.ca.gov/msprog/actruck/actruckmtgs.htm>.

The following were the primary agenda items:

- Program status and key issues
- Early heavy-duty zero-emission vehicle (HD ZEV) market
- Recent HD ZEV Demonstrations
- Notable zero-emission policies
- Future HD ZEV market potential and data needs
- Cost saving opportunities
- Key weight class differences

The following is a brief meeting summary that highlights the major items discussed, comments made, and agreed upon action items.

Program Status and Key Issues

Staff described the status of action items from the last workshop, listed meeting progress with individual stakeholders, and recapped the regulatory proposal to require manufacturers to produce and sell a small percentage of zero emission class 2b-7 trucks and chassis based on their total annual sales in California. Staff also outlined the key issues identified by staff and other key stakeholders including the need to:

- Identify potential self-sustaining markets,
- Match sales requirement with fleet demand,
- Foster innovation,
- Identify the role of Class 8 trucks in the rule,
- Establish a robust maintenance network and supply chain,
- Fill gaps in operational data, cost data, etc.,
- Leverage experience in other ZEV markets for heavy duty space, and
- Address potential overlaps with Phase 2 GHG and low NOx engine standards.

Early Heavy-Duty Zero-Emission Vehicle (HD ZEV) market

In the presentation, staff provided information on the current status of the zero-emission truck and bus market, including a list of current heavy duty ZEV manufacturers. Staff also highlighted recent announcements from truck manufacturers that are entering the zero emission vehicle market or are already demonstrating battery electric and fuel cell electric trucks and buses.

Recent HD ZEV Demonstrations

Staff summarized incentive funding programs and relevant California policies dealing with fueling and infrastructure, and asked what role non-financial incentives could play in developing the market. As a result, the following comments were made or discussion topics raised:

- It would be beneficial to allow zero-emission trucks into the high-occupancy vehicle (HOV) lanes as smaller trucks are not speed-limited and can flow with the traffic. Other suggested dedicated zero-emission freight lanes.
- Incentives are not guaranteed which does not give the certainty that fleets need when investing in a new technology.
- It is possible that electricity rate schedules are going to be unpredictable as more renewables come online.
- Electric Utility Companies should allow for a demand fee “reprieve” for initial years to help ease fleets into the new technology.
- Staff pointed out that Southern California Edison has proposed a rate schedule that eliminates demand fees for EVs in initial years as part of their SB 350 filing.
- In response to questions about whether all manufacturers could provide common diagnostic codes for mechanics, some manufacturers stated that it has been a challenge to provide commonality for OBD diagnostics. Therefore, it is likely be a very difficult task to achieve diagnostic tool commonality.

- There is value in providing incentives to electrified power takeoff (ePTO) and should be considered moving forward in addition to powertrain electrification.
- A fleet representative referred to hydrogen as the “end-game”, offering the same refueling and range as conventional fuels. They stated development is ongoing for both trucks and airport ground support equipment

Notable Zero-Emission Vehicle Policies

Staff summarized key California policy drivers by State agencies, municipalities, and other entities including the San Pedro Bay ports that would create demand for zero-emission trucks and buses in California. Staff also highlighted existing foreign market drivers and government mandates that require the use of zero emission trucks and buses, and provided a brief summary of key California funding programs and deployments. Staff described the Low Carbon Fuel Standard (LCFS) program, and how the new information on the energy efficiency ratio (EER) comparison of battery electric trucks and buses would be considered with the planned updates to the LCFS program. Updates to the program would be considered by the Board in early March and could double the credits that could be earned by zero emission trucks. Staff also provided a brief summary of the status of the SB 350 proceedings that is intended to support widespread electrification of heavy duty vehicles. As a result, the following comments were made or discussion topics raised:

- It was pointed out that, like a three-legged stool, there are three programs that must be balanced and moved forward in harmony to make this effort a success. They are 1. Manufacturer production, 2. Market demand, and 3. Infrastructure availability. All three programs are important and should be addressed simultaneously.
- Adding a fleet purchase requirement may limit funding from several CARB programs. In general, CARB incentives can only be offered to emission reductions above and beyond existing regulations. With the proposed regulation being a manufacturing requirement, ARB is able to offer full incentives for the purchase of the vehicles and avoid the perception and policy prohibition of funding its own regulation.
- A question was raised about the viability of voucher incentives versus pilot projects. Stakeholders suggested pilot projects take longer to set up and may result in less vehicles on the road, but ensure that vehicles, infrastructure, fleet and manufacturer support -- all components of a successful program — are coordinated. Additionally, publicly funded pilots enable public data gathering.
- The available funding from the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) was raised. Funding for this program is currently oversubscribed and it is difficult to rely on for long term planning due to continued funding shortfalls.
- Some parcel delivery companies expressed frustration with perceived lack of manufacturer cooperation in building ZEVs they are interested in buying. In response, truck and chassis manufacturers generally commented that they were not aware there were unmet needs in the ZEV truck market.

- One stakeholder suggested the Governor’s Office of Business and Economic Development (GO-Biz) could mediate communication between fleets and manufacturers about zero-emission trucks to get below the surface issues.
- A comment was made during break that CARB may not need to be a part of the fleet / manufacturer meetings. When the comment was presented to the group, no comments were made either for or against that concept. CARB will move forward with a presence at the meeting and will help facilitate unless group consensus indicates otherwise.
- Regarding questions about utility service for large projects, the California Electric Transportation Coalition (CaETC) responded to a CARB letter relating to how battery electric trucks and buses will affect the grid and possibly aid grid operation, the costs of infrastructure, and what utilities are doing to aid transportation electrification. CARB will add a link to the letter on our ACLT webpage.¹
- It was pointed out that there are other alternatives that staff should be considering to a manufacturer mandate, such as coordinating a group purchase between fleets. The thought was that it might be possible to couple a manufacturer requirement with a purchase requirement on fleets to ensure there is demand for the vehicles produced.
- Fleet owners commented that a purchase requirement may make sense in the future at some point, but currently there are no vehicles to purchase. Additionally, fleets need time to demonstrate vehicles before committing to a large purchase.
- For manufacturers, while in general they would prefer larger orders, if they are losing money on each purchase then higher volume would drive up losses and should be avoided.
- A question was asked on how the LCFS program defines heavy duty. Staff will coordinate with LCFS staff to clarify their distinction between light and heavy duty or residential and commercial.
- A fleet asked whether LCFS applies to electric airport ground support equipment (GSE). Currently, LCFS does not have an airport GSE category.
- Environmental groups expressed concern about pushing back Board date. Staff explained that November date allowed staff enough time to address issues being brought up.
- Recent changes to the California Building Code (CBC) support transportation electrification by requiring new construction projects to plan ahead for EVSE infrastructure.
- A comment was raised that case law that may limit CARB authority to make a purchase requirement– mentioned EMA vs SCAQMD lawsuit. CARB responded that the Federal Clean Air Act gives California the authority to regulate fleets as was done with the Truck and Bus Rule and to set engine standards. Regulatory

¹ California Electric Transportation Coalition, Re: California Air Resources Board Staff Questions for Utilities Regarding Medium- and Heavy-Duty Transportation Electrification (2017), <https://arb.ca.gov/msprog/ict/meeting/mt170626/170626caletcletter.pdf>

authority for local agencies is different than for California. Staff will consult with legal to provide more clarity on the concern.

- There is a potential that limited rare earth metal resources would affect battery price and battery costs may not decline over time, as anticipated.
- CARB has released a draft paper reviewing all available studies on battery costs for heavy-duty vehicles² that is available online.
- Near-zero technologies should be included in this rulemaking's scope. To the extent the comment is about low-NOx engines, CARB has a number of rulemakings underway which are working together to meet our air quality and climate change goals. In a separate rulemaking, CARB is proposing to set a low-NOx engine standard by 2023.

Market Potential and Data Needs

Staff presented an overview of available California vehicle data and data gaps. This showed the population of medium duty and heavy duty trucks from data sources including DMV registrations, four major West Coast Cities, and the entire State of California fleet of vehicles from the California Department of General Services. The data provides potential insight into the potential market for electrification but does not answer questions about whether ZEVs meet the operational needs of fleets or whether the sites have the space or can support electric/hydrogen infrastructure. Staff expressed that comments received about the draft April fleet survey were conflicting, and questions remained with the survey that need to be addressed.

Staff also proposed working with manufacturers to gather information on past sales of vehicles as well as costs of manufacturing for new zero emission vehicle product lines and costs associated with up fitting trucks with electric drive trains rather than conventional drive trains. As a result, the following comments were made or discussion topics raised:

- California Trucking Association will review the survey and provide comments on how to improve it for fleets.
- Reduce survey complexity - fleets may only spend 5 minutes to fill out, too much detail is requested.
- Bins staff identified in the draft survey are not consistent with how fleets keep vehicle information.
- Information from each division or vehicle depot location would be too onerous to gather for large fleets, though smaller fleets may not have an issue with this.
- Limit the need for fleets to contact utilities to gather requested information
- Expand upon questions that ask whether fleets have interest in ZEVs, include focus on which qualities of ZEVs fleets care about or would affect their decision.
- Survey should include hours of operation, urban versus rural.
- Add a question about fleets' sustainability plans.

² California Air Resources Board, *Battery Cost for Heavy-Duty Vehicles Discussion Draft (2016)*, https://www.arb.ca.gov/msprog/bus/battery_cost.pdf

- Fleets may prefer to provide a data dump of their fleet information as an alternative to completing the survey. Staff will follow up with fleets on the type of fleet information they commonly keep and could provide.
- A fleet explicitly stated they would not provide information that could be used for an Indirect Source Regulation.
- Grant program pilot fleets would be a good target to try the survey on first since they have some familiarity with the topic already.
- For some industries, responses from one or two fleets may be representative of the whole industry.
- Staff should recognize that just because a fleet has ideal operation for electrification doesn't mean the fleet will electrify.
- Stakeholders suggested that info gathered from DMV may allow staff to characterize typical operations of target industries.
- Manufacturers offered to give data related to manufacturing costs and sales volumes, but needed more specifics as to the type and format of data needed. Staff will identify more specific data requests and follow up with manufacturers.
- Manufacturers can group data based on GHG Phase 1 categories, which include tractors varying by roof height and vocational vehicles generically, and GHG Phase 2 groupings which are more specific.
- A manufacturer stated that investing in zero-emission vehicles may cost as much as introducing a major product line.
- Stakeholders requested a breakdown of the DMV data by vehicle class. Staff will send to the members of the workgroup and provide it to anyone who asks for it.

Cost Saving Opportunities

Staff summarized preliminary total cost of ownership examples for parcel delivery, yard tractor, passenger vans, and drayage trucks in the presentation. With expected battery price reductions, the total cost of ownership for a battery electric vehicle is likely to be comparable to conventional vehicles by 2023. Total cost of ownership is expected to decline with lower battery costs per kWh, lower infrastructure costs, and from anticipated LCFS program updates. The EER paper was discussed at prior meetings, but is still available for comment. Staff are still gathering information on fuel cell electric vehicle costs. Staff still have data gaps for maintenance costs and mid-life costs for conventional and advanced technologies. The following comments were made:

- Some fleets hold on to vehicles through their life while others sell them after a few years. The secondary market needs to be considered in the cost analyses.
- Financing will be more expensive for zero-emission vehicles due to the larger upfront capital costs.

Key Weight Class Differences

Comments raised at the last meeting and subsequent discussions with manufacturers identified differences between weight class categories and suggestions were made to have different meetings for the tow groups. Staff described the manufacturer identified

differences between class 2B-3 and class 4-7 and asked whether there should be a separate workgroup to deal with unique issues. The following comments were made:

- Class 2B-3 represents a range of only 5,500 lbs. while Class 4-7 is a 19,000 lb. range.
- Class 2B-3 may be able to use light-duty charging infrastructure while class 4-7 vehicles will have more varied charging solutions.
- Stakeholders suggested that there may be a need for some separation, but the perceived need for a separate work group was not clear due to lack of specific topics for discussion. Staff will meet with manufacturers to identify discussion topics and potentially form a separate workgroup if needed.
- Stakeholder suggested that large manufacturers may have already done cost comparison and lifecycle analysis of potential EV markets and invited manufacturers to share that information with staff.
- Class 8 should still be considered for the rulemaking and the feasibility of electrification for Class 8 trucks should be evaluated.

Next Steps

- CARB to publish updated EER paper reflecting relatively minor comments.
- Work with LCFS staff to clarify distinction between light-duty and heavy-duty.
- Staff will update fleet survey and send to workgroup for comments within a few weeks. Meet with fleets individually to address survey issues.
- Coordinate with fleets on receiving data dumps and analyzing information we may receive.
- CARB staff will post CalETC letter describing costs associated with EV infrastructure and benefits to the grid on the ACLT webpage.
- Staff will refine request for manufacturer information and gather data from GHG reporting efforts.
- Staff will contact the Governor's Office (GO-Biz) for them to coordinate a meeting between truck manufacturers, fleet users, and utility companies regarding the development and deployment of zero emission trucks.
- Staff will breakout DMV data by class and provide to workgroup members, and make it available on request.
- Meet individually with 2B-3 stakeholders to identify discussion topics and need for potential separate workgroup.
- Staff will update cost analysis to address secondary resale markets and costs of financing.
- Look into case law referenced by stakeholders- EMA vs SCAQMD to clarify if how it relates to CARB's regulatory authority.
- Contact financing organizations about financing ZEVs.
- CARB will send a revised draft survey for member comment with the meeting summary.