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MHD Transportation Electrification Considerations

Please see attached comments by DTNA.

Additional submitted attachment is included below.

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December 23, 2022

Quentin Gee
Advanced Electrification Analysis Branch
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Re: 2022 Integrated Energy Policy Report Update – Updates to the California Energy Demand

Daimler Truck North America (DTNA) submits the following comments in response to the California Energy Commission's IEPR update.

DTNA is the largest producer of medium- and heavy-duty vehicles in North America. DTNA is fully committed to supporting the emerging zero-emission vehicle (ZEV) market; we expect these technologies to play a significant role in the future of commercial transportation, and know they are a vital contributor to lowering NOx and GHG emissions. DTNA is investing heavily in the development of electric vehicles. We currently offer battery electric school buses, walk-in van chassis (Class 5/6), as well as heavy-duty (Class 8) trucks for sale, and we are preparing for the market introduction of an all-electric medium-duty (Class 6/7) truck. DTNA – in partnership with Portland General Electric (PGE) – is proud to have built the first-of-its-kind public charging island for commercial ZEVs in Portland, Oregon. In addition, DTNA's expert eConsulting team is dedicated to supporting fleets with all aspects of the ZEV transition, including site design and interfacing with utilities. Therefore, DTNA is uniquely positioned to offer insights into Medium- and Heavy-duty (MHD) transportation electrification.

Transportation Electrification Principles

DTNA appreciates CEC's careful consideration of transportation electrification. As a critical piece of California's climate policy, utility preparedness is a prerequisite for achieving a successful transition to ZEVs. DTNA recommends additional consideration of the guiding principles below:

- Medium- and heavy- duty (MHD) transportation and its associated load is fundamentally different than light-duty vehicles (LDV), and must be treated as such. Unlike LDV, most MHD vehicles cannot charge using existing AC infrastructure, and require dedicated DC infrastructure, installed at sites designed with MHD vehicles in mind. See Figures 1 and 2 below illustrating the grid to truck energy flow, and the importance of MHD site design.

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Figure 1. Illustration of Grid to Truck Energy Flow. (1) Power is pulled off primary voltage distribution lines, (2) voltage is stepped down over the transformer, (3) the meter measures how much energy is consumed, (4) the switchgear protects and isolates electrical equipment, (5a) the conversion unit (housed independently here) converts AC to DC and can sometimes be housed inside the dispenser, (5b) the dispenser connects to the vehicle via a CSS connector.



Figure 2. Example of medium-duty vehicle attempting to utilize existing EV infrastructure catering only to light-duty passenger vehicles (left), resulting in traffic disruption and operator frustration. Portland's Electric Island (right) shows successful implementation of dual purpose pull-through charging infrastructure able to support all vehicle classes.

- CEC's planning and forecasting must be in lock step with the California Air Resources Board's MHD regulations. CARB's Advanced Clean Trucks regulation and proposed Advanced Clean Fleets regulation generate significant sales and purchase mandates for fleets **as early as 2024**. The required grid capacity to support the projected vehicle volumes must be available **before** these vehicles are delivered to fleets. Lacking supporting infrastructure, fleets and manufacturers will be unable to fulfill their compliance obligations under ACT and ACF, which will likely have far-reaching industry and economic implications and ultimately delay the transition to ZEVs. In addition, stranded ZEVs not engaged in commerce do not serve the ultimate goal of lowering transportation emissions.

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- CEC must consider that MHD vehicles are disproportionately located in concentrated urban areas, creating highly localized grid capacity addition needs in constrained spaces. The charging loads for MHD depots and public en-route charging hubs will not be evenly distributed across a utility's service area.
- DTNA recommends the CEC's IEPR issue both a system-wide transportation electrification electricity forecast and a utility distribution grid capacity requirement forecast to serve these MHD TE loads on a geographic basis, with which DTNA can assist given knowledge gleaned through telematics data from our vehicles.

Medium- and Heavy-Duty Transportation Electrification Demand Forecast

DTNA thanks CEC staff for providing insight into staff's demand forecasting. DTNA has evaluated the available CEC data against our own forecasting, and found some discrepancies between the two sets of analysis.

1. DTNA evaluated a 5-year average of annual new truck registrations in California, and calculated the projected number of Class 2b-8 trucks expected by 2035 based on the required minimum ACT sales percentages. Therefore, DTNA's forecasting does not include the additional volumes forecasted for CARB's ACF rule, whereas CEC's AATE3 scenario includes volumes for both ACT and ACF.
2. DTNA estimated the truck energy use based on the ACT volumes, typical vehicle miles traveled by application, days of operation, and an assumed efficiency for each vehicle class. DTNA's estimate for truck energy use in 2035 is approximately 21,400 GWH, whereas CEC staff is reporting an estimate of 10,526 GWH. It is unclear what vehicle operation assumptions CEC staff is using to calculate the energy usage, but DTNA's forecast is nearly double for a smaller population of vehicles.
3. CEC staff is showing a 642 MW peak load modifier from MHD TE in 2035. DTNA is still developing analysis to inform the shape of the load curve, but has estimated the fully connected load for MHD ACT volumes by 2035 to be approximately 6,800 MW. DTNA believes CEC staff may be underestimating the peak load from the MHD sector.

DTNA believes CEC is using a vehicle count in AATE3 that is well aligned with CARB's vehicle forecasts, but the detailed assumptions on a per vehicle basis informing the load forecasting are unclear. DTNA recommends CEC collaborate with DTNA and other truck manufacturers to ensure the underlying assumptions are well aligned to generate the most accurate MHD demand forecast. DTNA is prepared to share further insights into our transportation electrification work with CEC, and invite CEC staff to provide feedback on parameters helpful for CEC's forecasting in our next phase of modeling work.

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Timing is Critical for Successful Transportation Electrification

DTNA also encourages CEC to consider the importance of timing, and evaluate processes to build out capacity ahead of receiving new service requests and expedite Transportation Electrification (TE) projects. Today, utilities do not begin adding capacity until they receive the request for new service from the fleet. Fleets are unlikely to submit their requests for new service until they have submitted their vehicle orders. New trucks are typically delivered to fleets 6-9 months from the date of order, but in our experience working with California fleets, new utility service times are typically 18-24 months and often longer. This mismatch in truck/refueling timing has led fleets to cancel or delay their ZEV truck orders, and delays emissions-reducing fleet turnover.

DTNA is encouraging our customer fleets to more proactively submit their new service requests ahead of new truck orders. In turn, DTNA asks CEC to consider processes to pull ahead TE projects to meet fleets part way. CEC should consider the 5-10 year outlook and evaluate the time- and cost-effectiveness of adding the needed distribution capacity incrementally on a request-by-request basis vs. in “bulk”, especially in the concentrated freight areas where a variety of CARB rules and programs will rapidly drive the demand for ZEVs. DTNA anticipates the proposed ACF rule, which would take effect in 2024, will drive a spike in urgent demand requests, especially for drayage fleets, when adopted in early 2023.

Collaboration with the California Public Utilities Commission (CPUC)

Transportation electrification requires radical industry transformation. DTNA urges CEC to work closely with the CPUC on aligning their regulatory oversight capacity over California’s investor-owned utilities. This oversight is required for both their TE programs and each individual utility’s System Improvement Plans. The CPUC’s forecasting must be aligned with CEC’s forecasting and CARB’s vehicle projections. The CPUC’s priority to minimize ratepayer risk makes it increasingly difficult for sufficient grid capacity to be installed in an anticipatory manner so that California can meet its emission reduction goals for the transportation sector. DTNA strongly recommends CEC work with the CPUC to encourage pathways for proactive investment ahead of anticipated transportation electrification.

DTNA also believes many fleets will consider solar and on-site storage to go alongside charging infrastructure requests, and policies and practices that favor integrating solar and on-site energy storage will help meet the state’s climate goals. Today, fleets must submit separate requests for new service, solar, and storage, and these three projects are handled by three different departments on three different timelines for separate interconnection studies. This process is arduous and unattractive for fleets.

If CEC is considering solar or on-site storage to offset MHD demand in forecasting, DTNA cautions CEC must work closely with the CPUC to direct utilities to streamline transportation electrification projects, including solar and onsite storage as a single request, instead of

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separate, siloed requests to encourage fleet uptake. DTNA also strongly urges CEC to consider planning for temporary charging solutions for customers who cannot be served at the time their new trucks are slated for delivery, enabling fleets to meet their CARB compliance obligations and ultimately lower transportation emissions.

Conclusion

Because of the high reliance on medium- and heavy- duty vehicles to move over 70% of the nation's freight, electrifying the MHD sector is a critical step in California's climate plan. The variety of vehicle applications and diversity in fleet operations make for a unique challenge in MHD forecasting. DTNA recommends CEC reach out to all truck OEMs, who can provide valuable insights into their customer's transportation electrification needs, and leverage these insights to build out the long-term, necessary capacity to serve the growing MHD ZEV market.

DTNA thanks the CEC for the opportunity to provide feedback on the demand forecasting for transportation electrification, and looks forward to continuing collaboration with the agency to enable widespread transportation electrification.

Sincerely,



Alissa Recker
Engineer, Compliance & Regulatory Affairs