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May 28, 2020

California Air Resources Board
1000 I Street
Sacramento, CA 95814

RE: Energy Innovation Support for Proposed Advanced Clean Truck Rule

Dear Chair Nichols, Executive Officer Corey, Board Members, and agency staff,

We write to support the proposed rule and thank you for the work that has gone into developing it.

It is a delicate moment in the transition to zero-emissions technologies, such as electric trucks. Important factors are pushing it forward. Most importantly, innovation and plunging battery costs have created compelling economic opportunities as indicated by CARB's analysis of the proposed rule.

Moreover, Chinese policymakers overseeing the world's largest market for new vehicles are committed to the transition to electric vehicles and have adopted a zero-emissions vehicle requirement modeled on California's. This is an outstanding example of California's policy leadership contributing to policy progress in other global venues.

A 2019 accounting found automakers planning over $400 billion in investments over the next five years to develop electric cars equipped with technology that automates much of the task of driving. In addition to technology development, costs include retooling factories, retraining workers, reorganizing supplier networks, and grappling with urban mobility changes. Even as China's broader economy was wracked by the measures to contain the spread of COVID-19, Tesla achieved record sales in March 2020.

Despite growing advantages, the current economic crisis clearly poses new challenges to the transition to electric vehicles. Uncertainty is always a drag on investment, especially for emerging technologies. That's why the proposed rule is needed. The policy will create a strong market signal to support the investments necessary to transition to electric vehicles.

We have been working on an evaluation of the impacts of the proposed rule using a customized version of the California Energy Policy Simulator (EPS), our open-source, system dynamics tool for policy analysis. Our report, which will be released soon, provides an independent confirmation of the regulatory analysis findings performed by staff. Upon reprograming the California EPS with assumptions that align with those developed through regulatory analysis, we find impacts similar to staff estimates, such as emissions reductions of 17.6 MMT of carbon dioxide-equivalent and direct cost savings of about $7 billion through 2040. These compare to emission reductions of 17.3 MMT of carbon dioxide-equivalent and direct cost savings of $6 billion in CARB's evaluation.[1]

In reality, future battery costs are likely to be lower than those underpinning CARB's analysis of economic impacts expected from the proposed rule. CARB's analysis is based on an assumption that future battery costs for electric medium- and heavy-duty vehicles will significantly differ from the cost batteries for passenger electric vehicles. Specifically, the staff analysis assumes the cost for trucks will lag five years behind the trend for passenger vehicles batteries. Yet, the main cost in producing battery packs are the battery cells, which are homogeneous across uses. Moreover, a study from the International Council on Clean Transportation (Lutsey 2019) has indicates that larger batteries offer economies of scale. By 2030, these result in cost savings of more than 10 percent for full size SUVs compared to compact cars, in that the ICCT's estimation.[2] Such a finding suggests that the cost of batteries for trucks could fall faster, not slower, than the cost of batteries for passenger vehicles.

Thus, we provided a second set of results testing a more realistic, two-year lag. When the model is run based on an expectation of the lower future battery prices for trucks implied by a two-year lag, the net economic benefits estimated from the proposed rule increase by $5 billion, to approximately $12 billion.[3]

The magnitude of the economic opportunity and the state's carbon neutrality goals combined with the logic of capital stock turnover would argue for an even stronger rule. As you well know, truck lifetimes may extend to 15 or even 25 years. If there are significant numbers of vehicles reliant on fossil-fuel combustion still being sold in 2030, future policymakers could face the difficult choice of accepting higher than optimal emissions or implementing additional policies to encourage premature retirement of existing emitting vehicles.

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[1] Following the convention of CARB's regulatory analysis, the reported cost impact is the sum of undiscounted costs 2020-2040; for an example from the regulatory record, see, Table IV-8, Appendix C. Note that results cited in this letter are not yet final as they are still undergoing peer review. They are subject to later revision.

[2] Table 2 in Lutsey (2019) shows the cost battery storage for compact cars vs. SUVs as follows

	2018	2030
Compact	177 $/kWh	73 $/kWh
SUV	175 $/kWh	64 $/kWh

[3] These and other economic results given in undiscounted 2018 dollars, following the convention in the regulatory record.

For these reasons, we encourage adoption of the proposed or even a stronger rule. Such actions will be crucial to the timely success of the transportation electrification revolution and they will contribute to public health and quality of life as well as a more robust California economy.

Thanks for your dedicated efforts and for considering our comments.

Sincerely,

Chris Busch
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