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September 21, 2021

Anna Wong - Staff Air Pollution Specialist, Advanced Clean Cars Branch
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comments on August 11th, 2021 Advanced Clean Cars (ACC) II Workshop

Dear Ms. Wong:

Nissan North America, Inc., on behalf of itself and its parent company, Nissan Motor Company (collectively "Nissan") appreciates the opportunity to offer comments on the recent CARB Advanced Clean Cars 2 (ACC2) rulemaking workshop. The comments contained herein are intended to provide Nissan's perspective on vehicle electrification, consumer charging expectations and specific considerations regarding standardization of the DC Fast Charge (DCFC) interface across the light duty segment.

As California is scaling up its transportation electrification effort to meet the state's long-term carbon reduction goal, a significantly large number of consumers will need to purchase ZEVs of all types. For consumers to adopt BEVs in large numbers they will expect minimum disruption to their daily lives. This translates to ownership experiences similar to their current gasoline vehicles. Consumers will want BEVs with long driving range and short refueling times. Vehicle manufacturers recognize these desires and are developing EV models with large batteries capacities capable of 300+ mile range. But larger batteries enabling longer driving range between recharges will not work for consumers when that translates to charge times of 45 minutes or greater and adding an additional 35 minutes or more of time compared to the average ICE refueling time. Therefore a faster charge solution must be developed which will facilitate quicker charging without compromising safety. To limit the DCFC charge interfaces at this time eliminates the opportunity to develop better charging solutions which will be necessary as EV adoption grows rapidly over the next few years and queues at EV charging stations grow ever longer.

Slightly less than 10% of the California vehicle population are electric vehicles. Recent data indicates that approximately one-half of these are pure battery electric vehicles and the remainder are PHEVs with no fast charge requirements.

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With only 5% of the total vehicle population requiring fast charging it is easy to conclude that we are early in the transition from internal combustion engines to pure electric vehicles.

At this early stage it seems premature to limit the market to a single charge interface standard or require adapters which leave an even greater impression of an immature EV market. Nissan therefore believes it is prudent to provide additional time for the market to develop and realize the full needs and expectations of consumers, and allow time for appropriate DCFC charge interfaces to be developed and introduced into the market. Requiring the currently available CCS or adapted to CCS DCFC charge interfaces may not serve future mass consumers and would be counter-productive to achieving California's electrification goal.

Background

Nissan is a global automobile manufacturer offering a full line of light-duty vehicles in the United States and throughout the world, with U.S. sales of nearly 900,000 vehicles in CY2020 and CA sales of nearly 92,000 vehicles. Nissan currently has four manufacturing facilities in the United States and other facilities, including Nissan North American Corporate Headquarters in Franklin, Tennessee and research centers, regional sales offices and training centers, and financial service offices throughout the United States. Nissan directly employs more than 19,000 employees including 14,000 manufacturing jobs and creates tens of thousands of additional jobs at Nissan/Infiniti dealerships in the U.S. As part of its corporate sustainability efforts Nissan is fully committed to the electrification of our fleet and long-term reductions of GHG from vehicles we produce. Nissan has proven to be a global leader in EV technology and has sold nearly 500,000 units of pure EV LEAF worldwide. Nissan announced the upcoming launch of another exciting battery EV project, the Nissan ARIYA SUV. Our commitment goes far beyond vehicle sales, and Nissan has been actively investing in fostering the EV charging infrastructure and market to support transformational change in the U.S. light-duty vehicle fleet. As an industry leader and early developer of EV technology, Nissan has a direct and distinct interest in Agency's pending rulemaking effort.

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Consumer Convenience and Relation to Charge Expectations:

It is primarily consumers with dedicated private parking who will have the convenience of charging overnight on a daily basis at their residence. The over 45% of California residents in multi-unit dwellings or rentals will be dependent on publically available chargers for the foreseeable future. This will be the case until most residential parking whether it's street, private or multi-unit have charging capabilities; which is something Nissan does not believe will broadly occur until well past the 2035 goal of 100% new ZEV sales. It is therefore likely that these charge constrained consumers will purchase EVs with larger batteries to afford less frequent charging sessions and prefer to recharge quickly a couple of times a week which is in line with their current gas fueling practices. This will require large numbers of high rate DC fast charge stations in convenient locations with greater than current maximum fast charge capabilities already at the limit of CCS design standards. Additionally, with increased EV adoption a more diverse set of consumers will require charging capabilities that are also more varied than existing refueling models. The expectation for fast DCFC charging available at highway/freeway rest stops or collocated with street side parking meters will become normal. Consumers will come to expect ubiquitous, convenient, inexpensive and safe EV recharging options wherever they travel.

ZEV vehicles have unique challenges related to infrastructure and successful electrification of the light-duty vehicle (LDV) and truck/SUV sectors requires addressing not just vehicle and charge station availability but most critically consumer expectations. What are consumer expectations of convenience? It is believed that for consumer adoption of EVs to approach the required ZEV penetration targets consumers will expect to refuel at or near the rates they currently enjoy with gasoline vehicles. But, if utilizing available DC fast chargers requires waiting in long queues because several vehicles ahead require 25-45 minute recharges the luster of electric vehicles will quickly wear off and EV adoption will falter.

No current DCFC standard currently being considered in North America equals current consumer experience for gasoline refueling wait times. All current standards fall short of any reasonable miles/minute of charge-refueling rate which consumers will expect for ZEV penetration to reach critical mass.

Nissan expects that broad consumer acceptance of BEVs will be predicated on consumer convenience defined by fast, reliable and convenient charging along

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routes they travel daily. Therefore, wide penetration of BEVs will require significant deployment of high capacity charger technology. But neither the auto industry or any academic institution or regulatory body has any certainty about what future EV market charging demands will be or the appropriate technology to supply them and support consumer confidence in the process.

What we do know is that consumers have rarely required less performance of a replacement technology than they currently have. It is therefore premature to narrow consumer choice to a single standard when options which better meet their need for greater charging capacity have yet to be developed and implemented.

V2X

Any charge interface consideration must be able to accommodate current and future requirements for V2X and specifically V2G capability, furthermore several charging service companies and charger manufacturers have already launched projects to commercialize V2H and V2B utilizing a non CCS standard. Additionally, global standardization of V2X is working toward global metrics whereas CCS is not a global standard. Furthermore the definition of VGI as adopted by the CPUC does not mention or address mobility of the vehicle. The likely result of this will be Utilities will not focus on mobility or passing dynamic electricity rates to the drivers which will complicate a driver's efforts to charge their vehicles at the lowest available pricing. It is therefore premature for one state agency to require a single charger interface standard when another state agency required to define a specific V2X metrics has not included necessary mobile pricing communications considerations.

CONCLUSION

The large and increasing number of consumers that are needed to buy battery powered LD passenger and pickup vehicles will overwhelm even the best case scenarios of expected available public chargers of all types. Many of these consumers will not have access to overnight charging and will be dependent on quick DC fast chargers for multiple weekly charge sessions. The current and next iteration of CCS DCFC charge rate will not be sufficient to meet broad consumer expectations for recharging times. As consumers transition away from ICEs to electric transportation it will be necessary to meet the various needs and expectations of customers such as V2X capabilities, convenience, cost and other

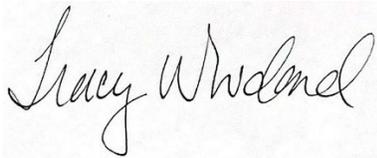
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issues not clearly understood at this early stage. It is therefore unwise to standardize to a single DCFC charger interface or depend on a charge adapter before we realize the full needs and expectations of consumers. Given a still developing understanding of consumer EV charging expectations it is prudent to provide additional time for the market to develop before standardizing the charge interface.

The implementation of a single DCFC standard in ACC2 for 2026 and beyond is not warranted given the unique and uncertain challenges of future EV market in the United States. It is too early to choose a single standard with too many unknowns in the market and a remaining lack of clarity about viability of V2X within the CCS standard. Therefore, we respectfully urge the staff to delete this particular item from ACC2 rulemaking consideration.

Sincerely,

A handwritten signature in black ink that reads "Tracy Woodard". The signature is written in a cursive style and is positioned above the typed name and title.

Tracy Woodard
Director
Government Affairs