November 30, 2017

BY ELECTRONIC FILING

New Jersey Board of Public Utilities ("NJBPU")
Electric Vehicle Infrastructure Stakeholder Group

Re: Tesla, Inc.'s Comments on the NJBPU Task 2 Questions on EV Infrastructure Goals

Tesla, Inc. ("Tesla"), appreciates the opportunity to submit comments to the New Jersey Board of Public Utilities ("Board") and New Jersey Vehicle Infrastructure Stakeholder Group ("EV Stakeholder Group") regarding its Task 2 questions on goals for EV infrastructure and the role of various stakeholders in addressing EV adoption.

The material presented in these comments builds on the transportation electrification concepts included in Tesla's Task 1 comments, and translates these concepts into tangible recommendations for charging network development in New Jersey. In providing specific recommendations, Tesla provides direction for how the Board can set goals for EV infrastructure development and how stakeholders should be involved in addressing EV adoption.

In summary, Tesla recommends the following:

1. Utilities should develop and implement Level-2 workplace and multi-unit dwelling 'make-ready' EV infrastructure investment programs, similar to those in other states;
2. Utilities should develop a consumer-facing rebate program for electric vehicle supply equipment to support site owners considering EV infrastructure installations;
3. Utilities should consider leveraging utility-owned land for the development of public Level-3 'DC Fast' charging infrastructure;
4. Volumetric residential and commercial charging rates should be developed to encourage off-peak charging and EVSE development;
5. The Board and utilities should consider creating programs that offer electric rate discounts for commercial charging sites that contribute to economic vitality.

Tesla's Task 1 comments focused primarily on EVSE and charging options for light duty vehicles. Since submitting those comments, Tesla unveiled its Semi, an all-electric Class 8 truck with up to 500 miles of range that will begin production in 2019. With the expected significant growth of light duty EVs in New Jersey as well as the opportunity for medium and heavy duty electric vehicles in the State, the Board and EV Stakeholder Group's consideration of charging infrastructure and rate design is timely. Tesla hereby respectfully submits these comments and recommendations to ensure a smooth and successful transition to clean, electric transportation in New Jersey.

I. Utilities should develop and implement Level-2 workplace and multi-unit dwelling charging programs

Approximately 80% of EV charging occurs at home or at work.[1] Therefore, it is critical that current and future EV drivers are comfortable knowing there is accessible charging availability where they and their vehicles spend most of their time. Unfortunately, residents in MUDs, such as apartment and condo complexes, typically do not have access to any charging infrastructure at their residence because MUDs generally do not have sufficient electrical power capacity or the wiring to support EV charging and residents do not have the ability to deploy such infrastructure as they may not own a dedicated parking space. Even in instances where MUD residents can deploy EVSE, the costs of retrofitting a single parking spot, as opposed to a number of spots, can be prohibitive.

Utilities are uniquely suited to help overcome this infrastructure gap given their expertise in electric service connections and upgrades. Moreover, the increased availability of EVSE that would allow for more EVs and thus more managed charging, can help can help put downward pressure on rates for all ratepayers by increasing the load factor of the electric system. Therefore, it is critical for utilities to invest into Level-2 MUD EV infrastructure, particularly to cover a portion of the "make ready" charging infrastructure cost.[2]

Current notable MUD EV infrastructure programs include those being implemented in California. Per Decisions issued in 2016, the California Public Utilities Commission (CPUC) directed Pacific Gas and Electric (PG&E), San Diego Gas and Electric (SDG&E) and Southern California Edison (SCE) to develop pilot programs and spend over $197 million in Level-2 EV infrastructure as outlined in Table 1.[3] Each pilot program is structured differently but in general, they all cover a portion of the "make ready" (non-connector) charging infrastructure cost, which can represent up to approximately 70% of the costs for enabling the installation of an EVSE.[4]

---

[1] Department of Energy, "Charging at Home," *available at* https://energy.gov/eere/electricvehicles/charging-home.

[2] Make ready refers to the 'full circuit' infrastructure (i.e. panels, conduit, wiring) required for EVSE to be connected.

[3] D.16-12-065, available at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M171/K539/171539218.PDF; D.16-01-023 available at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M157/K835/157835660.PDF; D.16-01-045, available at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M158/K241/158241020.PDF

[4] D.16-01-023, p.15, available at http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M157/K835/157835660.PDF

Table 1. *Overview of Level-2 EV Infrastructure Programs Currently Being Administered by California Investor-Owned Utilities.*[5]

	SDG&E	SCE	PG&E
Program Name	Power Your Drive	Charge Ready	EV Charge Network
Scope	3,500 Charging Stations	1,500 Charging Stations	7,500 Charging Stations
Budget	$45m	$22m	$130m
Markets	Multifamily, Workplace	Multifamily, Workplace, Public	Multifamily, Workplace
Disadvantaged Communities ("DACs")	≥10% charging stations in DACs	≥10% charging stations in DACs	≥15% charging stations in DACs
Charger Ownership	SDG&E	Site Host	Site Host. PG&E ownership allowed in multifamily or DAC up to 35%
Cost to Host	Participant Payment	Rebate	Participant Payment or rebate
Rates	Vehicle-grid integration rate to driver or host	Time-of-use rate to host	Time-of-use rate to host
Regulatory Status	Approved Jan 2016 (CPUC D.16-01-045)	Approved Jan 2016 (CPUC D.16-01-023)	Approved Jan 2016 (CPUC D.16-01-065)

California investor-owned utilities have more recently proposed additional investments in transportation electrification totaling $230 million for residential charging infrastructure and more than $779 million for medium and heavy duty EV infrastructure, per Table 2, below.

[5] More info available at http://www.cpuc.ca.gov/zev/.

Table 2. *Light, Medium, and Heavy Duty EV Infrastructure Investment Requests by California Investor-Owned Utilities (SDG&E, SCE & PG&E) in 2017 Transportation Electrification Plans.*[6]

EV Investment Type	Funding Proposed
Medium/Heavy Duty Infrastructure	$779m
Residential Infrastructure (Level-2)	$230m
Public DC Fast Charging Infrastructure (Level 3)	$30m
Others	$24m
TOTAL	**$1,106m**

To overcome the hurdle of making EV charging available for residents of MUDs, Tesla recommends that utility EV charging programs and goals should:

1. Target workplaces and MUDs, and set a goal for the total number charging stations to be installed for the program. The program should determine the total allocated amount based on the cost to convert a standard parking space to an EV space (i.e. include costs of design, construction, fees etc.)

2. Require each site to have the electrical capacity and dedicated breaker space and wiring/conduit to support EV charging stations for MUDs work places. The program should attempt to install as many EV charging stations per site as possible to take advantage of economies of scale, and to track progress the BPU can set goals such as a certain number of charging stations per multi-unit dwelling or workplace.

3. Include considerations for safety standards and certifications, and customer choice for site owners to determine the EVSE of their choosing.

[6] More information available at: http://www.cpuc.ca.gov/sb350te/.

4. Allocate the utility project funds primarily for the make ready infrastructure, i.e., the electrical upgrade and installation of electrical wiring throughout a parking facility, which is the most cost-prohibitive and technically challenging aspect of EV infrastructure build-out, as opposed to using the funds for the EVSE.

Additional recommendations for program parameters include:

- Infrastructure funds qualification should not be tied to a requirement to purchase an EV.
- If a project cost 'match' is required from the site owner, the cost should be no more than 15% the total cost of the project.

II. Utilities should develop a consumer-facing rebate program for electric vehicle supply equipment to support site owners considering EV infrastructure installations

Consumer-facing EV infrastructure rebate programs can help spur customer adoption of EVs by reducing up-front costs associated with the charging equipment necessary for owning EVs. These programs, administered by utilities, also serve as a valuable means to educate consumers on the benefits of electric vehicles. Paired with robust education and outreach, these rebate programs can also address the information costs that consumers may face when contemplating whether or not to purchase an EV.

Any EV rebate program should include an education and outreach plan through which customers will be informed of the available incentives, eligibility requirements, the application process, and information about how charging off-peak can help reduce customer and system costs. Such outreach and education should also seek to leverage the unique relationship utilities have with their customers, including the ability to market the program through bill inserts, informational emails, etc. Several utilities around the country have developed rebate programs and can serve as models if New Jersey utilities are interested in pursuing similar programs. For example, Alliant Energy,[7] San Diego Gas & Electric,[8] and Georgia Power[9] have consumer-facing rebates as well EV infrastructure investment programs. Georgia Power recently provided the Georgia Public Service Commission with a program evaluation report, which found that the residential rebate program had a cost of $0.39 million, but yielded $1.41 million in benefits according the Rate Impact Measure.[10]

[7] Alliant Energy. Electric vehicle chargers and rebates. Available from: https://www.alliantenergy.com/InnovativeEnergySolutions/SmartEnergyProducts/ElectricVehicles/EVHomeChargersandRebates
[8] San Diego Gas and Electric. Power Your Drive. Available from: https://www.sdge.com/clean-energy/electric-vehicles/poweryourdrive
[9] Georgia Power. Residential Electric Vehicle Charger Rebate program. Available from: https://www.georgiapower.com/about-energy/electric-vehicles/pdf/Residential_EV_Rebate_Form.pdf
[10] Georgia Power Company. Filing in Docket 41373 at the Georgia Public Service Commission.

Customer facing rebate programs can take several forms, including rebates for residential customers, workplaces, and fleets. Other example EVSE rebate programs include:

- '**Charge NY'**[11] program that awards EVSE rebates up to $8,000 per port (Level-2), and for DC Fast Charge infrastructure up to $32,000 per pedestal (Level 3).
- '**MassEVIP'**[12] Workplace Charging Program, that provides 50% of the funding (up to $25,000) for hardware costs for employers to acquire Level 2 electric vehicle charging stations that can charge EVs produced by multiple manufacturers.
- '**Charge Ahead Colorado'**[13] program that funds up to 80% of the cost of an EVSE up to the following set maximums: $6,260 for a dual port Level-2 EVSE and $13,000 for a Level-3 EVSE station.

III. Utilities should consider leveraging utility-owned land for the development of public Level-3 'DC Fast' charging infrastructure

Tesla and other charging solution providers are building out DC Fast charging networks across the country. Shared land use of DC Fast charger stations, especially in highly accessible urban areas, provides much needed fast-charging capacity for EV drivers when access to Level 2 charging infrastructure is limited. Utility-owned locations may also have the sufficient power to support a DC Fast charging site. Shared use of utility land enforces the symbiotic relationship of charging providers, utilities, and EV drivers.

IV. Volumetric residential and commercial charging rates should be developed to encourage off-peak charging and EVSE development

Tesla agrees with the Regulatory Assistance Project's ("RAP") conclusion that the importance of rate design, as it relates to EV charging, "should not be underestimated because the right price signal can result in better asset utilization and lower costs to the utility and consumer." As RAP noted, TOU rates, which vary to reflect system costs, can be a useful rate design option for residential and commercial electric vehicle charging as customers are incented to charge during the least expensive hours, thereby increasing a utility's system utilization and efficiency.

An additional rate design consideration is providing rate options and flexibility for commercial customers with on-site charging. RAP notes that demand charges may be an impediment to electric vehicle charging and adoption, as the additional load may "create a new peak demand for the business, raising its demand charge and monthly bill." In response to this concern, Southern California Edison ("SCE"), in conjunction with the ratepayer advocate, Natural Resources Defense

[11] https://grantsgateway.ny.gov/IntelliGrants_NYSGG/module/nysgg/goportal.aspx?NavItem1=2
[12] http://www.mass.gov/eea/docs/dep/air/community/evipwpc-ap.pdf
[13] https://www.colorado.gov/pacific/energyoffice/charge-ahead-colorado

Council, Environmental Defense Fund, Siemens, Sierra Club, and the Coalition of California Utility Employees, filed a joint stipulation as part of SCE's Transportation Electrification application, that establishes a five-year demand charge holiday for commercial customers with EV charging load. That is, for the first five years of service, a customer would be charged on purely a volumetric (dollars per kilowatt-hour) basis. After five years, demand charges will be phased-in for another five years, however at a lower value than current rates.[14] Additionally, the parties agreed to further protect commercial customers from significant demand charge costs during the phase in years (years 5-10), by only assessing demand costs on additional EV load when the monthly EV peak demand exceeds the customer's monthly peak demand. Should EV load exceed a customer's monthly peak demand, the EV demand charge rate would only be applied to the difference, in kilowatts, of the EV monthly peak demand and the customer's monthly peak demand.

The Board should encourage utilities to implement similar optional volumetric TOU rates for residential and commercial customers with EV charging load. If demand charges are assessed on commercial customers with EV charging load, the Board should ensure that such incremental charges are minimized and only assessed on EV load that exceeds a customer's monthly peak load. This can be achieved by consolidating the EV charging load and the host customer load for billing or under an arrangement such as described above in the SCE settlement.[15] These rates incentivize customers to charge during off-peak hours, creating higher system utilization, and keeping charging costs affordable and accessible.

V. The Board and utilities should consider creating programs that offer electric rate discounts for commercial charging sites that contribute to economic vitality

In addition to the significant benefits provided to all ratepayers by transportation electrification, including downward pressure on rates, fuel cost savings, reduced local pollutant and greenhouse gas emissions, charging stations have the potential to increase economic development and employment in the areas where they are located. The duration of charging at work or public sites ranges from 30 minutes to 7 hours. This charging dwell time can help nearby businesses attract customers to their stores and restaurants.

Consistent with how many utilities, including PSEG-Long Island,[16] currently sponsor programs that provide electric rate discounts to customers that meet specified criteria for local economic development, the Board and utilities can consider create an economic development program tailored

[14] Joint Parties Stipulation, A. 17-01-021, before the CPUC, November 2, 2017. Specifically, the parties agreed that during the introductory period (years 1-5) both the peak and grid components of distribution should be recovered through volumetric energy rates, whereas for years 6-10 peak components should be recovered through demand charges. For the demand charges in years 6-10, the parties agreed that the distribution grid component should be the lower percentage of grid-related demand distribution costs, or 60% of design distribution marginal costs. See page 1, Section 1(a).

[15] The preferred approach would depend on factors such as the rate structures applicable to the EV charging load and the host customer load and whether an onsite solar or storage system were involved.

[16] https://www.psegliny.com/page.cfm/Commercial/EconomicDevelopment/programs

to commercial charging sites that offers a competitive electric rate that takes into account the benefit that such stations can provide.

Conclusion

As more electric vehicle models come to market and to fulfill New Jersey's Zero Emission Vehicle compliance requirements adoption increases, customers will require access to convenient charging infrastructure. To help spur the adoption, the Board and stakeholders should seek to develop programs that ensure that charging infrastructure is no longer an impediment to EV adoption, and that all customers have access to charging infrastructure if they choose to go electric. As detailed in these comments, Tesla recommends that the Board, utilities, and stakeholders take on a number of specific initiatives to spur the adoption of EVs including developing utility programs for investment in and rebates for EV infrastructure, as well as developing new rates that could help incent efficient charging of EVs. Tesla appreciates the opportunity to provide these comments to the Board, and is happy to discuss further at the Board's request.

Respectfully submitted,

/s/ Junaid Faruq

Junaid Faruq
Sr Charging Policy Engineer
Tesla Inc.
3055 Clearview Way
San Mateo, CA 94402
Telephone: (410) 292-4487
E-mail: jufaruq@tesla.com