REBUTTAL TESTIMONY OF WILLIAM EHRLICH ON BEHALF OF TESLA, INC IN THE MATTER OF PETITION OF ATLANTIC CITY ELECTRIC COMPANY APPROVAL OF A VOLUNTARY PROGRAM FOR PLUG-IN VEHICLE CHARGING

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I. INTRODUCTION

Q. PLEASE STATE FOR THE RECORD YOUR NAME, POSITION, BUSINESS ADDRESS, AND ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING.

A. My name is William Ehrlich. I am Senior Policy Advisor for EV Charging Policy and Rates at Tesla, Inc. ("Tesla"). My business address is 3500 Deer Creek Rd, Palo Alto, CA 94304. I am testifying on behalf of Tesla.

Q. ARE YOU THE SAME WILLIAM EHRLICH THAT SUBMITTED TESTIMONY ON SEPTEMBER 18, 2020 IN THIS PROCEEDING?

A. Yes I am.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY

A. The purpose of my rebuttal testimony is to offer support for the appropriate application of cost-causation ratemaking principles to EV charging tariffs and highlight lack of opposition to direct current fast charging ("DCFC") make-ready in the context of ACE PIV Program Offering 9. I also provide feedback related to managed charging in the context of public DCFC stations.

II. OFFERING 9: EV CHARGING TARIFF BEST PRACTICES AND MAKE-READY

Q. DID ACE PERFORM A COST OF SERVICE STUDY OR ANY COST-BASED ANALYSIS TO JUSTIFY THEIR OFFERING 9 SET-POINT?

A. No, no such study or analysis was performed or provided.

Q. HOW DID ACE ARRIVE AT THEIR OFFERING 9 SET-POINT VALUE FOR NON-UTILITY OWNED PUBLIC DCFC?

A. According to ACE, the set-point value is based on two market analogs "a) equivalent cost with gasoline, and b) current DCFC benchmarks in New Jersey."[1]

Q. ARE EITHER OF THESE MARKET ANALOGS RELATED TO THE UTILITY'S COSTS?

A. No.

Q. HOW WOULD YOU CHARACTERIZE THESE MARKET ANALOGS THAT ACE CITES THAT ARE NOT RELATED TO THE UTILITY'S COSTS?

A. Both of these factors are related to the value of electric service to the commercial EV charging customer or to the EV drivers that use a DCFC station, not to the utility's cost of service.

Q. IS A SET-POINT BASED ON THE VALUE TO END USE CUSTOMERS IN ALIGNMENT WITH THE COST CAUSATION PRINCIPLE IN UTILTY RATEMAKING?

A. No.

[1] ACE's Discovery Response to CP-ACE-22

Q. IS THERE ANY EVIDENCE THAT EV CHARGING STATIONS ARE CAUSING COSTS ON THE UTILITY SYSTEM COMMENSURATE WITH THE COSTS THEY ARE PAYING ABOVE OTHER COMMERCIAL CUSTOMERS?

A. None has been offered.

Q. IS THERE ANY EVIDENCE THAT ELECTRIC VEHICLES AND EV CHARGING STATIONS ARE CREATING BENEFITS FOR ALL RATEPAYERS?

A. Yes. In the testimony of Kathleen Harris on behalf of the environmental groups,[2] she highlights how EV investments can put downward pressure on rates for all utility customers.[3] She cites a study by Synapse Energy Economics which uses real world data and concludes "In total, EV drivers contributed an estimated $806 million more than the associated costs."[4]

Q. WHAT ACCOUNTS FOR THESE ADDITIONAL BENEFITS OF ELECTRIC VEHICLES TO ALL RATEPAYERS?

A. The primary reason there are benefits to all ratepayers associated with EV adoption is that electric vehicles represent additional incremental load on the utility system which allows

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[2] Natural Resources Defense Council, Environment New Jersey, Sierra Club, Tri-State Transportation Campaign, New Jersey Work Environment Council, Greenfaith, and Isles.
[3] Kathleen Harris Testimony p.10 Line 15
[4] Frost et al., Synapse Energy Economics, Electric Vehicles are Driving Electric Rates Down, at 1 (June 2020), available at: https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf

for costs to be spread over more kWh therefore putting downward pressure on rates for all ratepayers.

Q. WHAT COSTS ARE MOST APPROPRIATE TO BE RECOVERED FROM ADDITIONAL INCREMENTAL LOADS FROM EV CHARGING?

A. Since EV charging represents additional, incremental load it is most appropriate that EV charging rates, at least initially, only recover marginal distribution costs. "Embedded costs reflect the historical expenditures already made to construct the existing grid that are slowly depreciated over time, while marginal costs are the incremental costs associated with serving additional load."[5]

Q. IS THERE ANY PRECEDENT FOR THIS COST TREATMENT IN OTHER ELECTRICITY JURISDICTIONS?

A. Yes. In 2019 the California Public Utilities Commission (CPUC) approved a commercial EV rate for Pacific Gas & Electric (PG&E) in Decision No. 19-10-055[6] and stated "any revenue collected from the new class [of CEV loads] beyond the marginal cost to serve them is an overcollection."[7] San Diego Gas and Electric (SDG&E) has also asked the CPUC to approve a settlement[8] in its commercial EV rate proceeding which would

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[5] M. Whited *et. al.*, Best Practices for Commercial and Industrial EV Rates*,* Synapse Energy Economics, Inc. (Jul. 13 2020), *available at*: https://www.synapse-energy.com/sites/default/files/Best_Practices_for_Commercial_and_Industrial_EV_Rates_18-122.pdf

[6] https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M318/K552/318552527.PDF

[7] Ibid, p. 44.

[8] *Joint Motion Of Settling Parties For Commission Adoption Of Settlement Agreement* (filed June 30, 2020 in CPUC Application 19-07-006). https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M342/K864/342864901.PDF

initially only recover marginal distribution costs. SDG&E's EV charging rate gradually reintroduces embedded distribution costs over a schedule of 10 years.

Q. ARE THERE ADDITIONAL UTILITY REVENUES ASSOCIATED WITH THIS INCREMENTAL LOAD FROM ELECTRIC VEHICLES?

A. Yes. "All else being equal, the increased adoption of EVs will lead to increases in kWh sales which will undoubtedly lead to greater utility revenues, and, in turn, greater profits for utility shareholders."[9]

Q. DOES ADDITIONAL UTILITY REVENUE ASSOCIATED WITH INCREASED EV ADOPTION ACCRUE IN MULTIPLE RATE CLASSES?

A. Yes. Electric vehicles are a unique technology from a utility system and cost recovery perspective because electric vehicles have the capability of consuming electricity across multiple customer classes.

A driver may charge at home one day in the residential rate class, and another day charge at a public fast charger in the commercial customer class. As a result, it is essential to consider the potential incremental revenues in other classes that can be induced in other customer classes from greater access to public DCFC stations. Since public DCFC represents approximately 20% of customer's charging requirements, there is an expectation that the remaining 80% will come from charging at residential or other

[9] Opening Testimony of Ezra Hausman PhD on behalf of Rate Counsel in BPU Docket No. EO18101111 – PSE&G CEV-EVES Program Filing, p.31 Line 13

commercial accounts.[10] Incremental revenues in other customer classes would also increase if DCFC accounts serve less than 20% of the total charging requirements or if DCFC stations operate at higher load factors.

Q. WHAT ALTERNATIVE EV RATE SOLUTIONS EXIST THAT COULD BETTER ALIGN WITH COST-BASED RATEMAKING?

A. There are multiple EV rate solutions that could result in fair and sustainable EV rates. In my initial testimony I recommend a “set-point” approach similar to what has been implemented in Eversource Connecticut’s EV Rate Rider (see Attachment 1) where rate components billed on a demand basis are set to a commercial customer class average per kWh value and then that kWh value is applied to EV charging stations in lieu of a kW-based demand charge. Interestingly, the Eversource Connecticut EV Rate Rider was also cited as an exemplary commercial EV charging rate in the testimony of ChargePoint, EVgo, and Electrify America.[11]

An alternative EV charging friendly tariff cited by ChargePoint and EVgo[12] is Virginia Dominion’s GS-2 rate which is billed as a non-demand rate for usage below 200 kWh per kW of billed demand and only billed as a demand rate if usage rises above this level

[10] https://www.energy.gov/eere/electricvehicles/charging-home#:~:text=Because%20residential%20charging%20is%20convenient,low%2C%20stable%20residential%20electricity%20rates.
[11] ChargePoint Kevin Miller Testimony p.45 Line 9, EVgo Carine Dumit Testimony p.16 Line 3, Electrify America Jigar Shah p.18 Footnote 18
[12] ChargePoint Kevin Miller Testimony p.45 Line 11, EVgo Carine Dumit Testimony p.16 Line 16

roughly equivalent to 28% load factor.[13] Another common approach is to offer all volumetric time-of-use (TOU) rates which have a similar effect as Virginia's GS-2 rate in the sense that EV charging stations are not billed demand charges but instead are provided TOU price signals to better incentivize grid beneficial charging behavior.

Q. DO YOU SUPPORT ALL VOLUMETRIC TIME-OF-USE RATES FOR DCFC CHARGING APPLICATIONS?

A. Yes. Volumetric TOU rates are a good fit for EV charging and there are numerous examples across the country of utilities implementing TOU rate designs for EV charging applications.[14] A well-designed TOU rate for EV charging applications could achieve a similar outcome to what I initially recommended with the Eversource Connecticut EV Rate Rider. The reason I recommended the Eversource Connecticut EV Rate Rider is that rate is more similar to the set-point type approach proposed by ACE for DC fast charging stations through the rate component of their Offering #9.

Q. WITHOUT A COST OF SERVICE STUDY WHAT WOULD BE A FAIR RATE TO CHARGE EV CHARGING LOAD?

A. Until a more evidence-based justification is provided, I believe EV charging load should be charged a rate similar to the existing customer class average. In the case of DC fast chargers on commercial rates, a fair price would be something similar to the 2019 year-

[13] Dominion Virginia GS-2 Tariff Sheet available at: https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/business-rates/schedule-gs2.pdf?la=en&rev=65c74050107549f299d48689f738e948&hash=7CBE70107AE10C66B8EB5C5A1E248D12
[14] See ChargePoint Kevin Miller Testimony p.44 Line 18 to p.46 Line 1 for rate examples.

end commercial customer average price for bundled service in ACE which was 14.25 cents/kWh.[15]

Q. BEYOND THE SET-POINT RATE COMPONENT OF OFFERING #9 WAS ANY OPPOSITION OFFERED TO THE MAKE-READY COMPONENT OF OFFERING #9?

A. No. From the testimony of Ezra Hausman PhD on behalf of Rate Counsel, "The provision of make-ready work represents a reasonable utility role in support of private charging investment, and is consistent with Staff's 'Shared Responsibility' model. If the board chooses to move forward with the Company's petition, this element could be approved."[16]

Q. DO YOU AGREE WITH MR. HAUSMAN'S RECOMMENDATION OF APPROVAL FOR THE MAKE-READY COMPONENT OF OFFERING #9?

A. Yes. However, I maintain my position provided in opening testimony that the make-ready component of Offering #9 should be disassociated from the rate component of Offering #9.

III. MANAGED CHARGING IN THE CONTEXT OF DC FAST CHARGING

Q. WHAT IS MEANT BY MANAGED CHARGING?

A. Managed charging can refer to a number of different load control and management schemes. When I refer to "managed charging" I am referring to the proactive curtailment

[15] EIA-861 Table 7 available from: https://www.eia.gov/electricity/sales_revenue_price/
[16] Testimony of Ezra Hausman, PhD on behalf of Rate Counsel p.44 Line 8-11.

of EV charging load resulting in diminished charging power levels to EV drivers relative to what the EVs would normally receive.

Q. IS MANAGED CHARGING MORE APPROPRIATE FOR LEVEL 2 OR DC FAST CHARGING STATIONS?

A. Managed charging, to the degree it is implemented by different charging providers, is a better fit for Level 2 charging stations given the long dwell time associated with Level 2 charging. In the context of DC fast charging, EV drivers expect to be able to charge their vehicle quickly and have relatively short dwell times which is a poor fit for managed charging. When a customer is at a DC fast charger their primary goal is to charge their vehicle as quickly as possible. Any unexpected reduction in charge rate could result in a negative user experience. Some DC fast chargers also are affected by station congestion during peak times (holidays, weekends, etc), any reduction in charger power level would have the unintended consequence of further exacerbating station congestion and EV driver wait times.

Q. DID ANY INTERVENORS SUGGEST MANAGED CHARGING FOR DC FAST CHARGERS?

A. Yes. In Greenlots testimony, Mr. Cohen states “In the context of DCFC, unfortunately there has been a trend towards unmanaged charging, premised on the notion that in this context, drivers always need full power immediately and must be as fully charged as quickly as possible. In fact, there are often opportunities to reduce both site host and system costs through technology and dynamic rates or fee structures that could be a valuable subject for evaluation in the context of a pilot."[17]

Q. DO YOU AGREE WITH GREENLOTS CHARACTERIZATION OF MANAGED CHARGING FOR DC FAST CHARGING?

A. No. Most EV drivers who visit a DC fast charging station do in fact want and expect fast charges and the shortest sessions possible. It is also rare for drivers to fully charge their batteries at DCFC stations because battery recharge rates decrease as the battery state of charge increases. Finally, it is in the interest of station owners to maximize vehicle throughput at a station in order to recover their costs and avoid having to invest in additional charging station capacity.

Q. DO YOU AGREE THAT DYNAMIC RATES COULD BE VALUABLE TO ENCOURAGE SPECIFIC CHARGING BEHAVIORS IN THE CONTEXT OF DC FAST CHARGING?

A. Yes. As stated previously, dynamic or time-of-use rates from utilities that send clear price signals about when electricity prices are most expensive is important to encourage charging behavior that benefits the grid. Utility rates are foundational for any managed charging program, because they allow charging operators to explore strategies for reducing costs without having to curtail or throttle power levels. For example, charging

[17] Greenlots Joshua Cohen Testimony p. 32 Line 672

operators can price their service to reflect higher cost periods and to encourage EV drivers to use the DCFC station during off-peak periods if they can.

IV. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY RECOMMENDATIONS.

A. My recommendations include:

- Change the Offering #9 set point from a value-based assessment of factors to the commercial customer class average cost of electricity as a default until a cost of service study can provide justification for a different value.
- Disassociate the rate component of Offering #9 from the make-ready component of Offering #9.
- Do not mandate any managed charging schemes in the context of DC fast charging due to potential customer experience impact. To the degree managed charging is desired, send price signals through TOU rates and allow EV drivers to intelligently manage their charging based on those time-based price signals.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes it does.

ATTACHMENT 1 – EVERSOURCE CONNECTICUT EV RATE RIDER

THE CONNECTICUT LIGHT AND POWER COMPANY, DBA EVERSOURCE ENERGY

ELECTRIC VEHICLE RATE RIDER

AVAILABILITY AND APPLICABILITY:

This rider is available to serve the entire requirements of electric vehicle (EV) charging stations, which are available to the public. The Company defines public charging stations as those made available and accessible by, the public and may include on-street parking spaces and public parking spaces in lots or parking garages. Eligibility and acceptance of a customer for service under this rider is subject to the review and approval by the Company.

Service under this rider shall be separately metered and is available only to the load of an electric vehicle charging station approved by the Company.

MONTHLY RATE:

Rates for electric service provided to a facility under this rider shall be determined in accordance with the Company's general service rate schedule that would otherwise apply to the load being served. Where a rate component of such schedule is priced on a demand basis (i.e., per kW or per kVA) the EV customer under this Rider will be subject to a charge determined on an equivalent per kWh basis using the corresponding average price of such rate component.

TERM:

There is no minimum term for customers electing to receive service under this rider.

Supersedes Electric Vehicle Rate Rider Pilot
Effective July 1, 2014
by Decision dated June 4, 2014
Docket No. 13-12-11
Revised to Reflect New Trade Name October 1, 2015
Docket No. 14-05-06

Effective April 1, 2019
by Decision dated March 6, 2019
Docket No. 17-10-46RE01