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REBUTTAL TESTIMONY OF WILLIAM EHRLICH ON BEHALF OF TESLA, INC IN THE MATTER OF THE PETITION OF PUBLIC SERVICE ELECTRIC AND GAS COMPANY FOR APPROVAL OF ITS CLEAN ENERGY FUTURE-ELECTRIC VEHICLE AND ENERGY STORAGE PROGRAM ON A REGULATED BASIS

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TABLE OF CONTENTS

I. INTRODUCTION 3

II. COST CAUSATION PRINCIPLE APPLIED TO EV TARIFFS 3

III. MANAGED CHARGING IN THE CONTEXT OF DC FAST CHARGING 9

IV. CONCLUSION 12

ATTACHMENT 1 – EVERSOURCE CONNECTICUT EV RATE RIDER 13

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 4, 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 feedback related to managed charging in the context of public DCFC stations.

II. COST CAUSATION PRINCIPLE APPLIED TO EV TARIFFS

Q. DID PSE&G PERFORM A COST OF SERVICE STUDY OR ANY COST-BASED ANALYSIS TO JUSTIFY THE EV "TARGET RATE" SET POINT?

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

Q. HOW DID PSE&G ARRIVE AT THEIR "TARGET RATE" SET POINT VALUE?

A. According to PSE&G, the rate "will be determined by PSE&G using a variety of factors including but not limited to market dynamics affecting local customer electric rates and local DC Fast Charging economics."[1] As pointed out in the testimony of Tom Beach on behalf of EVgo, "Most of the 'multiple factors' that PSEG has stated will be included in its determination of the set point rate have nothing to do with the utility's costs."[2] Mr. Beach goes on to point out that most of the factors PSE&G cites among their "multiple 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."[3]

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

A. No.

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.

[1] PSEG Testimony (Reif), at p. 23
[2] Tom Beach Testimony on behalf of EVgo at p.5 Line 24
[3] Ibid, p.6 Line 11

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,[4] she highlights how EV investments can put downward pressure on rates for all utility customers.[5] 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."[6]

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 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?

[4] Environment New Jersey, Environmental Defense Fund, Natural Resources Defense Council, and Sierra
[5] Kathleen Harris Testimony p.11 Line 16
[6] 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

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."[7]

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[8] and stated "any revenue collected from the new class [of CEV loads] beyond the marginal cost to serve them is an overcollection."[9] San Diego Gas and Electric (SDG&E) has also asked the CPUC to approve a settlement[10] in its commercial EV rate proceeding which would 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?

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[7] 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

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

[9] Ibid, p. 44.

[10] *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

A. Yes. From the testimony of Ezra Hausman on behalf of Rate Counsel, "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."[11]

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 DC fast charging (DCFC) stations. Since public DCFC represents, at most, about 20% of customer's charging requirements, there is an expectation that the remaining 80% will come from charging at residential or other commercial accounts.[12] 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.

[11] Ezra D. Hausman, Ph.D Testimony p.31 Line 13
[12] https://www.energy.gov/eere/electricvehicles/charging-home#:~:text=Because%20residential%20charging%20is%20convenient,low%2C%20stable%20residential%20electricity%20rates.

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

A. There are multiple EV rate solutions that better align with cost causation principles and could result in fair and sustainable EV rates while mitigating some of the cost shift concerns. In my initial testimony I recommend a "target rate" 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. Mr. Beach offers an alternative recommendation "to waive or reduce demand charges for a period of time – five to ten years – that is long enough to allow CEV stations to ramp up their usage."[13]

Q. DO YOU SUPPORT A DEMAND CHARGE WAIVER APPROACH AS PROPOSED BY TOM BEACH ON BEHALF OF EVGO?

A. Yes, I agree with Tom Beach's demand charge waiver recommendation as another alternative to the set point approach. A demand charge waiver 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 PSE&G for DC fast charging stations.

[13] Ibid, p.14 Line10

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-end commercial customer average price for bundled service in PSE&G which was 12.19 cents/kWh.[14]

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 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

[14] EIA-861 Table 7 available from: https://www.eia.gov/electricity/sales_revenue_price/

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."[15]

Q. DO YOU AGREE WITH GREENLOTS INTERPRETATION 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

[15] Joshua Cohen Testimony p. 27 Line 581

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, dynamic or time-of-use (TOU) 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 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. .

Q. IS PSE&G CAPABLE OF IMPLEMENTING TIME-OF-USE RATES FOR EV CHARGING CUSTOMERS TO INCENTIVIZE GRID BENEFICIAL CHARGING BEHAVIOR?

A. Yes. From the testimony of Brendan Donnelly on behalf of Market Participants,[16] "PSE&G claims that time-of-use rate design is a core utility function."[17]

IV. CONCLUSION

Q. PLEASE SUMMARIZE YOUR TESTIMONY RECOMMENDATIONS.

A. My recommendations include:

- Change the "target rate" 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.
- 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.

[16] Brendan Donnelly Testimony p. 10 Line 1
[17] PSE&G Discovery Response to Direct Energy, Set I, No. 7.

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.