

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1461

In the Matter of)

INVESTIGATION INTO RATE)
STRUCTURES FOR ELECTRIC)
VEHICLE CHARGING)

**COMBINED RESPONSE TO OPENING COMMENTS
AND BENCH REQUEST OF THE
CITIZENS' UTILITY BOARD OF OREGON**

February 9, 2011



A. Utility Ownership of Electric Vehicle Service Equipment (EVSE) Guideline

i. Affiliated Ownership

CUB is no longer tentative in its position that utilities should not be prohibited from owning and operating publicly available (commercial) EVSEs. This is a change in position from CUB’s Opening Comments, where I stated:

CUB is in favor of allowing utilities to install and operate EVSE stations that are available to the public. This support is tentative, however, and only reflective of the current, emerging marketplace. With the current dearth of EVSE stations, it is advisable that utilities help launch a system of charging infrastructure.¹

This change in position is influenced by further review of the issues of rate base and the “used and useful” principle.

The Commission asked the parties to comment on the implications of the “used and useful” standard (ORS 757.355) on utility-owned EVSE. CUB did the requested research, which confirms that adopting a mandate for an affiliate ownership structure of EVSE would preclude any issues with this standard from arising, as the standard only applies to utility investments that are part of rate base. If utilities that intend to operate EVSE are required to do so under an affiliate structure, where the entity operating the EVSE is financially separate from the utility’s regulated operations, then this financial separation should be an effective means of preventing the EVSE from becoming part of the regulated utility’s rate base, thereby shielding ratepayers from bearing any of the costs of installing, operating, and maintaining EVSE infrastructure.

ii. Who should bear the cost?

As I stated in CUB’s Opening Comments, publicly available (commercial) EVSE will not be used to provide a service to the general ratepaying classes, but instead will

¹ UM 1461, CUB Opening Comments, page 10.

only be used by EV drivers.² The customer class that utilizes EVSE – EV drivers – should therefore bear the associated costs, with any overruns becoming the responsibility of the utility’s EV-focused affiliate.

B. Distribution System Upgrades Guideline

CUB’s position on distribution system upgrades remains unchanged from CUB’s Opening Comments. I have not found any compelling reason to treat distribution upgrades that are required for the installation and use of EVSE any differently than other system upgrades. Distribution infrastructure costs are currently recovered from all customers of a utility in the form of a monthly distribution charge on each customer’s bill and a per-kWh charge, both of which varies by rate class.³ There is a danger in setting a precedent for separately billing individual customers for distribution system upgrades based on a specific end use. Costs are spread across the entire system for upgrades that are necessitated by customers installing hot tubs or building additions to their homes; it would be unfair to adopt a new system for upgrades associated only with EVSE.

CUB does foresee one potential wrinkle in the cost responsibility of EVSE with regard to distribution system upgrades. If, in the future, EVs are able to function as a flexible resource to help balance wind generation, it could be argued that some of the cost of EV-associated distribution system upgrades should be assigned to the cost of wind integration. While EVs may not have the capability to balance load in the near-term, it is worth noting the possibility for the purpose of policy discussions going forward.

² *Ibid.*

³ UM 1461 CUB Opening Comments, page 6.

C. Rate Design Guideline

i. Separate Metering Infrastructure

I argued in CUB's Opening Comments that separate metering is largely unnecessary for residential EVSE, and encouraged the Commission to direct Oregon utilities to work with smart meter and EV manufacturers to develop standardized information-sharing technology between these devices.⁴ The cost of installing a separate meter for each household that purchases an EV is, if not prohibitive, at least a hindrance to widespread EV adoption. Further, the technology to record energy usage data from charging is already built in to most EV and EVSE models that are coming on the market. From CUB's point of view it makes more sense to utilize the existing capabilities in the vehicles and charging stations than it does to install even more equipment on the premises of EV owners. Commercial charging stations may be of a more complex nature, but it is likely that comparable metering technology will already be on board new commercial-grade EVSE as it is released as well.

There may well be cases, both residential and commercial, where separate meters may need to be deployed by the utility in order to effectively assess EV charging usage. These special cases would likely remain until standards for communications and interoperability between EVs, EVSE, and smart electric meters are developed by the National Institute of Standards and Technology (NIST). CUB understands this, and therefore does not advocate for any mandatory Commission ruling on the issue of separate metering.

⁴ UM 1461 CUB Opening Comments, page 7.

ii. Time-of-Use Rates and Other Rate Structures

The Commission has asked for further input regarding the potential for time-of-use (TOU) and other time-, date-, and load-sensitive rate structures for EV owners. CUB's position is that a TOU rate be made available as an option for EV owners⁵ (as it stands now, most customers have an option to switch to TOU rates), but not be made mandatory. There are certainly positive aspects to TOU rates that would benefit both EV owners (lower off-peak charging rates) and utilities (peak load reduction). However, some customers may be reluctant to purchase an EV if it means that their entire electric billing structure will need to be altered. This issue is magnified if, in the absence of technology that can separately meter EVs, EV owners are made to switch to whole-house TOU rates. While I have a good level of confidence that the existing technology in EVs and EVSE can provide utilities with charging usage data, there is the chance that some utilities may view a whole-house rate structure as necessary to ensure that there are proper incentives for charging vehicles during off-peak hours. I stand firmly by CUB's position that TOU rates should not be made compulsory for EV owners or any other customer class, but should certainly be made available to customers who opt for that type of rate structure.

iii. Service Interruptibility

The Commission also requests that parties discuss the issue of service interruptibility. It is CUB's position that with the development of proper communications technology between utilities and EV users, customers should be given a wide range of charging plan options, including voluntarily interruptible service. Customers should be given the option, either directly from the utility or from a third-party aggregator, to find a

⁵ UM 1461 CUB Opening Comments, Page 11.

plan that fits their needs and comfort level with regard to price, reliability, and flexibility. Customers who place a premium on reliability, for example, should be allowed to opt out of any service interruptibility agreement and forgo any potential benefits from participating. Customers who are more flexible should be allowed to sign up for a plan that will include the option for the utility to interrupt the charging of their vehicle if necessary in exchange for a reduced rate.

iv. Future signaling systems-excess wind and hydro charging

Beyond interruptibility, I also encourage utilities to look towards the future and consider the potential for intelligent charging systems that can signal EVs to commence charging when there is excess wind and hydro capacity available.⁶ Concerns are often expressed about the impact of intermittent wind generation and excess wind generation on the grid as a whole. EVs can help solve this problem, as EVs are an adaptable, intermittent load that can be used to offset the intermittent resource. A customer can plug in his or her EV and ask that it be charged by a specific time. The actual time of charging can vary as long as the vehicle is fully charged by the specific time requested by the customer. This type of intelligent charging has the potential to both reduce emissions associated with EV charging and reduce the impact of vehicle charging on utilities' distribution systems.

Comparing the choice of TOU rates to intelligent charging that offsets intermittent wind suggests that intelligent charging is the preferred approach. TOU rates will encourage customers to use a timer that will delay charging until off-peak hours. My understanding of EV charging is that the energy flow is at its highest during the earliest

⁶ NWECC did an excellent job of describing this issue in its Opening Comments. See UM 1461 NWECC Opening Comments, Section III.A.

part of the charging period, with charging slowing as the battery reaches full capacity. TOU rates for EV owners will likely result in the concentration of charging during the first couple of hours of the off-peak time period. If EV adoption is widespread, this could add a significant fixed load between the hours of 10pm and midnight. Utilities could meet this load by allowing the generation that is used to meet peak load (6pm to 10pm) run a little bit longer. This practice would provide little benefit to the system, other than sparing the utility from having to add peak resources during the 6pm to 10pm timeframe.

Intelligent charging, on the other hand, can be designed to help utilities balance wind production. Under this type of program, the utility would be able to communicate with the EV or EVSE and ramp charging up or down to help balance the intermittent production of wind during the overnight hours. The EV will be adding value to the system by helping to balance wind. It can be argued that the electric system in the Northwest needs an intermittent load to balance the intermittent resource of wind.

In UE 189 PGE stated that its smart metering system would be able to communicate with smart appliances such as EVs. Rather than requiring utilities to focus time and energy on designing new pricing structures, CUB would prefer utilities to work towards intelligent charging. CUB recommends that the PUC require all utilities to report within 6 months of the closure of this docket on what would be required to implement such a system in their Oregon service territories.

v. Additional Considerations – pricing signals

I also stress that these rate structures should be revenue-neutral in aggregate, but should also have enough variation in rates across different time periods that customers are motivated to adopt them. There may be a trial-and-error period involved in getting the

rates to a proper level to influence consumer behavior, so utilities will likely need a degree of flexibility in setting these rates. Pilot programs may be useful to help utilities learn about consumer behavior under new rate structures, and a relatively frequent review of rates may also be necessary to ensure that the tariffs are being sufficiently adopted by new customers and are remaining revenue-neutral.

D. IRP Flexible Resources Guideline

CUB has no objections to Staff's proposed IRP guideline as laid out in the Commission Bench Request. I note, however, that talks with utility staff and industry experts indicate that vehicle and battery manufacturers have been very reluctant to discuss allowing utilities or any other third parties access to the battery storage capacity on board EVs. Until agreements are realized with manufacturers to allow utilities to utilize EV batteries as storage capacity on at least a trial basis, I would caution utilities from forecasting any substantial amount of flexible capacity from EVs in their IRPs.

E. Planning and Reporting Guideline

CUB believes that it is imperative for utilities to gather data on the system impacts and energy usage patterns of EV owners, and to report these findings to the Commission on a regular basis. The initial rollout of EVs is a major opportunity for utilities to learn about EV owners' usage patterns, as well as how customers will use their own usage data in relation to charging their vehicles. The Commission, Staff, and interested parties should work to develop a reporting framework for utilities to share this data, either in the context of this docket or in a separate proceeding.

CUB's reporting plan preference would be some sort of minimal quarterly report from each utility detailing the number of registered EVs in the service territory, the

number of these customers on each available rate plan, and the average electricity consumption of customers by entire household and/or by vehicle (to the extent that vehicle-level data is available). A more involved annual report should also be required from each utility, describing observed usage patterns by time of day and week, distribution system impacts (for both normal and peak loads), and any use of EVs as a load-balancing resource. This is, of course, not intended to be a comprehensive list of the types of data that CUB would like to see reported, but rather is a rough list that should help the parties develop a standardized reporting framework.

F. Additional Guidelines

CUB's only new proposal at this time would be a mandate from the Commission that each utility be required to report, within six months of the closing of this docket, a comprehensive analysis of what would be required under its distribution system to allow for EVs to be charged as a variable load that offsets intermittent wind.

Respectfully Submitted,
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UM 1461– CERTIFICATE OF SERVICE

I hereby certify that, on this 9th day of February, 2011, I served the foregoing **COMBINED RESPONSE TO OPENING COMMENTS AND BENCH REQUEST OF THE CITIZENS' UTILITY BOARD OF OREGON** in docket UM 1461 upon each party listed in the UM 1461 OPUC Service List by email and, where paper service is not waived, by U.S. mail, postage prepaid, and upon the Commission by email and by sending an original and one copy by U.S. mail, postage prepaid, to the Commission's Salem offices.

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