Virginia State Corporation Commission
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Case Number (if already assigned)	PUR-2020-00051
Case Name (if known)	Ex Parte: Electrification of Motor Vehicles
Document Type	CMMT
Document Description Summary	Comments supporting electrification of motor vehicles and their potential benefits to the grid, ratepayers, and climate stabilization. Identical to previous submission, with signature added.
Total Number of Pages	5
Submission ID	19138
eFiling Date Stamp	6/23/2020 4:54:35PM

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Comments to the State Corporation Commission of the Commonwealth of Virginia

in reference to Case Number PUR-2020-00051

Ex Parte: Electrification of Motor Vehicles

Submitted by The Nature Conservancy Virginia Chapter

June 23, 2020

The Nature Conservancy Virginia Chapter thanks the State Corporation Commission for the opportunity to share our comments about the impact of electric vehicles (EVs) on electricity services. We commend the Commission for being proactive on this timely topic. We believe the SCC can help facilitate an accelerated transition to electric vehicles in a way that benefits Virginians and could potentially lower electric bills for all ratepayers. Sophisticated use of advanced metering infrastructure (AMI) could accommodate EVs while avoiding increases in peak demand, smoothing out abrupt changes in energy demand, and making more efficient use of some power generators.

In Virginia, transportation emits more carbon dioxide pollution than any other sector, including the power sector. As part of a global solution, large-scale conversion from conventional to electric vehicles is key to limiting the severity of climate change. Climate change itself is a threat to grid reliability and affordability because it will cause more frequent temperature extremes and stronger storms. Initiatives that encourage faster adoption of EVs will have additional indirect benefits to ratepayers by reducing greenhouse gas emissions that lead to grid instability.

In answering the selection of questions below, we used the following guiding principles:

- While time of use rates have value, people should pay the same regardless of what the electricity is used for. EV owners and operators should not have access to lower electric rates than other customers. Rather, rates should incentivize everyone to use less electricity.
- EV owners and all customers should be incentivized to shift electricity use away from peak demand hours and toward peak generation hours. The construction of any new generation, including solar and wind, should be kept to a minimum to reduce both costs and negative environmental impacts.
- EV owners and owners of other types of energy storage should have the option to sell electricity to the utility during high peak demand events. When the utility buys energy from distributed energy storage owners at a lower price than the marginal price in the PJM market, all ratepayers save money.

3. Whether and how rate designs should be structured to incentivize the use of electric vehicles?

Electricity rates for electric vehicles should be structured the same as for other residential rates. Lower "fuel" prices are already a large incentive for purchasing an EV and are a significant savings in the lifetime ownership costs of an EV. To accelerate EV adoption, additional incentives should be used to reduce upfront costs of owning an electric vehicle, not operating costs. Such incentives are beyond the responsibility of the SCC and the utilities.

4. Whether and how rate designs should be structured to incentivize charging of electric vehicles during off-peak times?

Time of use rates should ultimately be available to all customers, with support from advanced meter infrastructure that gives consumers real-time feedback about - and control over - their energy consumption and costs. Rates should be low enough during off-peak hours and high enough during peak hours to strongly motivate EV owners to avoid charging during peak hours.

Until investor-owned utilities develop plans that justify the expense of widespread installation of AMI, there may be a role for EV chargers to play in offering time-of-use rates to EV customers only. Some EV chargers can provide time-of-use data to utilities. All customers would be better served if EV customers charge in off-peak hours, so these EV chargers could be an adequate substitute until AMI is more widely available.

To keep rates low for all customers and meet Virginia's carbon reduction goals, it is imperative that the increase in EV ownership does not result in the construction of new power plants requiring carbon-based fuel. Additionally, the construction of any new generation, including solar and wind, should be kept to a minimum to reduce costs and negative environmental impacts.

5. Can and should rate regulation prevent cost shifting to consumers who do not own or operate electric vehicles?

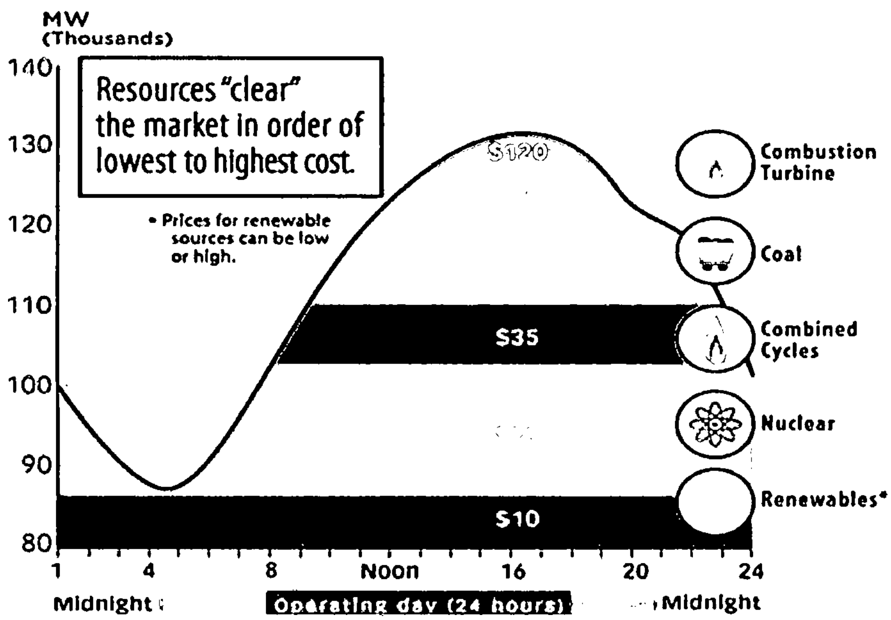
Yes. Rate regulation should prevent cost shifting to consumers who do not own or operate electric vehicles. Those who can afford to purchase EVs should not shift the cost of charging them to those who cannot afford EVs. Any consideration of whether cost shifting has occurred should account for customers' total electricity *bills* rather than only electricity *rates*. Some rates may appear on the surface to shift costs onto non-EV owners, but a more holistic analysis could show that rates encouraging EV adoption could result in savings for all customers. A calculation of cost shifting to a set of customers should account for the value of the costs *avoided* by that same set of customers. For example, if rates for a customer class increase to pay for something that avoids the need to construct new power plants, those customers will not have to share the additional expense of paying for the new power plants, and thus cost shifting has not necessarily occurred.

An example of this type of scenario is illustrated in our response to question 10 below.

10. What rate designs should be employed to compensate EV owners for power delivered to the grid?

The rate should be structured so that EV owners will be highly motivated to charge their EVs in low-demand hours. The rate at which EV owners are compensated for power delivered to the grid should be higher than they bought it for, yet lower than the marginal price of energy on the PJM market. The rate should also compensate EV drivers enough to overcome the inconvenience of not being able to drive at the time the utility wants to draw power from the vehicles. This ideal rate would save money for all rate payers by avoiding the need to purchase the most expensive – and often most polluting – power from PJM.

The following hypothetical example is based on the graph below. An EV owner charges their vehicle at night, when retail time of use (TOU) rates are $30/MWh. The next day, the utility experiences a high peak demand event. If the utility taps into the stored energy in EVs, they can avoid purchasing the highest cost electricity resource, which costs $120/MWh wholesale. The next highest fuel price to clear the market is $100. If the utility company pays EV owners $65/MWh, the utility company saves significant expense for all of its rate payers. Meanwhile the EV owner earns enough compensation for their electricity to make the inconvenience worthwhile.



source: Energywatch[1]

[1] Energywatch. "Reports: PJM Electricity Markets Explained" https://go.energywatch-inc.com/electricity-market-explained-download

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The agreement between the utility and the EV owner should not require the owner to give the utility access to the EV battery whenever the utility says it is needed. Rather, the agreement should be based on a price offered by the utility, which the EV owner can choose to accept or reject at the time the stored energy is requested by the utility. The EV owner should always have the choice of when to drive their vehicle. EV owners need access to third-party apps that will give them real-time information about electricity prices so that they can decide when to accept the utility's offer to buy their stored energy.

Furthermore, the rate that is available to EV owners who delivery energy to the grid should be "storage technology neutral." If a customer does not own an EV but does own a home battery system such as a Tesla Powerwall, they should be able to sell electricity to the utility at the same rate as EV owners. This would encourage the proliferation of distributed energy storage in a variety of forms.

Incentivizing distributed energy storage would benefit rate payers in at least two ways. First, it would lower the cost of meeting peak demand for all ratepayers. Second, it would reduce the need for utility-scale energy storage projects and peaker plants, since distributed stored energy could be used as backup power for intermittent and non-dispatchable renewable energy.

14. Is the market for providing public charging stations competitive or should it be considered a natural monopoly with service provided exclusively by regulated utilities? If the market is competitive, to what extent is utility ownership of charging stations appropriate and are there specific geographic areas where utility ownership of charging stations may be appropriate?

Generally, the market for public charging stations should be competitive. It does not fit the definition of a natural monopoly in which start-up costs and fixed costs are so high that the most efficient number of firms in the industry is one.

There may, however, be regions of the state in which a competitive market does not best serve customers. One example is rural areas where public chargers may not get enough business to attract private investment. However, rural areas need public charging stations to reduce the "range anxiety" that prevents people from driving EVs. In rural areas where people have few alternatives to driving, EVs will be especially impactful in reducing carbon emissions.

A competitive market may also be insufficient in low-income highly populated areas, which can have trouble attracting many sectors of private business. Public EV charging stations in these areas are important to increase equity in the transition to electrified transportation. In urban areas, residents may not have access to charging infrastructure in their own apartment buildings or garages. Owning an EV may be feasible only if public charging stations are conveniently located near homes and local businesses. Additionally, public charging stations will attract people to do business in low-income urban communities, because they can charge their vehicles while conducting business. An absence of public charging stations could further exacerbate the inequality faced in these neighborhoods.

In both rural and low-income urban areas, government ownership of public charging stations may be most appropriate. Government intervention would be warranted to achieve the public goods that

cannot be achieved by a competitive market. Those public goods include:

- Reducing air pollution by accelerating the transition to electric vehicles
- Increasing equality and equity in Virginia by making EVs more feasible for everyone
- Developing rural parts of VA as business and tourist attractions because visitors will not worry about whether they can charge their EVs

In locations where the government intervenes to place charging stations, customers and taxpayers might be best served if the government grants full or partial ownership of the charging stations to utilities. Charging rates at these chargers should be the same as rates at competitively priced charging stations throughout the rest of the state.

Government and utility decisions about adding charging stations to communities should be done with input from community stakeholders. People living in a community understand its needs best; if adding chargers would have an overall negative impact, for example by raising housing prices, the wishes of the community should be respected, and chargers should not be installed.

Thank you for considering our comments.

Signed,

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