SEPA Report: Residential EV Time-Varying Rates That Limit System Peaks

Customers on EV-Specific Time-Varying Rates are More Likely to Charge Off-Peak Compared to Generic Counterparts

WASHINGTON, D.C. – Without a thoughtful approach to encourage off-peak residential charging, the predicted rapid growth in electric vehicle (EV) adoption could lead to costly distribution system impacts and infrastructure upgrades for utilities. A new report from the Smart Electric Power Alliance (SEPA) shows that EV time-varying rates effectively incentivize off-peak charging, and that customers are interested in using them.

Produced in partnership with The Brattle Group, Enel X, and E4TheFuture, the report provides empirical evidence on factors that increase customer enrollment in EV time-varying rates. The analysis is based on a survey of nearly 3,000 EV customers and 28 utilities offering EV rates - the most comprehensive survey on the topic to-date. The findings show that successful rate offerings do not necessarily require a large peak to off-peak price differential, and that utilities may engage broader segments of their customer base and achieve higher enrollment rates by offering multiple distinct EV rate options.

“EV-specific rate deployment is a relatively new area, but our study has identified a number of important patterns emerging from recent experience,” said Ryan Hledik, a Principal of The Brattle Group and co-author of the report. “Utilities can directly influence many of the EV rate deployment elements that correlate to high enrollment levels.”

Other key findings include:

- Customers on an EV-specific time-varying rate were more familiar with the rate rules and more likely to charge off-peak compared to their generic time-varying rate counterpart.

- Where utilities have proactively developed residential EV rates, enrollment has been more than twice as high as rates that were required or recommended by customers, governance boards, or legislatures.

- Designing rates that save customers money, require limited up-front fees, and have limited barriers to enrollment can lead to participation rates that roughly double those of other EV rate offerings.

- 72% of non-enrolled customers indicated that they were willing and able to charge their EV during off-peak hours if the rate resulted in bill savings and was convenient to use.

- EV time-varying rates are an effective first step for utilities to develop strong customer relationships and trust which can serve as a bridge between passive and active managed charging in the future.

- The best utility opportunity for customer engagement is immediately after an EV purchase. Typically, once the EV is purchased and the charger is installed, customer engagement is reduced and "momentum" towards the EV time-varying rate enrollment is lost.

"An EV rate may be a customer's first exposure to load management. A utility should make every effort to ensure that the experience is positive to acclimate customers to the idea of using their vehicle battery for future vehicle-grid integration programs," said Erika Myers, Principal of Transportation Electrification at SEPA and one of the report authors. "Reducing barriers to participation, like up-front enrollment fees and short off-peak charging windows, is absolutely crucial to maximize enrollment."

"The survey data from our JuiceNet customers was clear: EV drivers not enrolled in TOU rates are primarily motivated to charge when it is most convenient, but could be influenced if the savings were greater," said Lauren Burke, Senior Director, Marketing & Development at Enel X. "Given the diversity of customer charging preferences and price sensitivities, utilities have an opportunity to engage more EV owners and increase enrollment rates by offering multiple rate options."

"Now is a crucial moment for electric utility rate design planning to prepare for the massive influx of EV adoption and necessary charging," said Steve Cowell, president of E4TheFuture, the nonprofit organization that funded the report. "The new information in this report can help utilities successfully accommodate and integrate EVs on their path to reaching clean energy goals."

"SECC's research shows that consumers are generally not aware of alternative rate options, including EV-specific rates, but once informed, they are interested in them," said Patty Durand, president and CEO of Smart Energy Consumer Collaborative (SECC), whose consumer surveys are cited in the new report. "To drive enrollment, utilities need to focus heavily on education, especially to the tech-savvy and eco-friendly customer segments that are more interested in EVs."

The report, “Residential Electric Vehicle Rates That Work: Attributes That Increase Enrollment,” was made possible by funding from E4TheFuture and Enel X.

All utilities should be preparing today for significant EV penetration. For more on how utilities should support, plan and deploy EV charging infrastructure, download SEPA’s report, Planning for an Electric Vehicle Future: How Utilities Can Succeed.

For more information about SEPA’s Transportation Electrification pathway, including the electric vehicles 450+ member working group, click here.

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