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EV Submetering: Beneficial Electrification Pilot Report Executive Summary

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Executive Summary

The ComEd Submetering Pilot ("Pilot") assessed the feasibility and accuracy of using EVSE (Electric Vehicle Supply Equipment) as submeters for utility billing. If proven accurate, EVSE-based submetering could enable more precise and cost-effective billing for EV charging, reduce the need for separate utility meters, and unlock new opportunities for utilities to design EV-specific rates and programs that better serve customers. The Pilot included both Residential and Commercial participants and incorporated lessons from prior California-based pilots and existing standards that could inform ComEd's future program design.

Among Residential participants, the Pilot demonstrated strong engagement from ComEd's EV driver community, with response rates to the Pilot's initial Expression of Interest form exceeding typical survey and email campaigns. This provided a great base of possible participants to choose from for the 10 to 20 Pilot spots. This smaller scale was intentional, as the objective was to conduct a focused field test of the technology rather than generate statistically representative results. Data inconsistencies were observed across EVSE, disaggregated AMI, and vehicle data-tracking sources (Geotab GO9 devices plugged into each participating vehicle's OBD-II port), with variations averaging approximately 10%. Installation and operation of Geotab data loggers also introduced logistical challenges, and some EV models were not compatible with charging data collection. Nearly 100 (95%) of surveyed participants expressed willingness to share charging data or install a separate meter in exchange for lower EV charging costs. Interest in installing a separate meter fell to about 50% when participants were asked to cover the cost ($100+) of installing a separate meter to access lower rates, suggesting that submetering-capable EVSE must be priced competitively with standard models to gain adoption.

On the Commercial side of the Pilot, recruitment focused on charging sites that already had separate meters tied to EVSE. Many charging network operators, including some of the largest public networks, were reluctant to share data as they saw no upside or advantage to doing so. Appeals to meter infrastructure savings were ineffective when presented to commercial customers who generally viewed the installation of a dedicated meter as a minimal cost burden. Moreover, the need to install a separate meter for other purposes outweighed potential benefits the charging-site host might have obtained from eliminating it. Despite these challenges, the Pilot successfully enrolled 10 commercial charging locations with separate meters dedicated to their charging stations.

Five EVgo fast charging sites, three ComEd workplace sites with Level 2 ChargePoint stations, and two school district parking locations equipped with Nuvve vehicle-to-grid (V2G) fast chargers. Analysis of the Commercial Pilot data revealed discrepancies across the EVSE and meter data, averaging a 6% difference between the two data sources.

Few standards currently govern EVSE submetering, with California being the only state to adopt an Electric Vehicle Submetering Protocol (EVSMP). Prior pilots and market experience among California utilities confirm that EVSE, disaggregated AMI, and third-party data sources often do not fully align, making EVSE that meet the EVSMP a viable pathway toward more accurate and reliable submetering solutions.[1,2]

The Pilot confirmed that the Level 2 and Direct Current Fast Charging (DCFC) EVSE models evaluated are not sufficiently accurate for utility-grade billing. To achieve reliable billing, utilities need EVSE with embedded, verified, utility-grade metrology and complete access to session-level data. Future pilots should focus on residential and commercial participants and include EVSE or submeters (installed between their EVSE and electrical panel) that meet recognized utility-grade standards. Including both types of systems ensures that all customers can benefit from EV time-of-use (TOU) rates. Using EVSE and submeters approved under the California EVSMP guarantees a minimum accuracy class of at least 2% (meaning the equipment operates at 98% accuracy in field settings), allowing pilots to focus on other factors, such as methods for data transmission, application of data for billing, and EVSE connectivity. Findings from these pilots can support a request for Commission authorization to use EVSE as submeters for billing or to develop a standard defining accuracy, criteria, and testing requirements for EVSE as submeters. In pursuing such a standard, we recommend starting with the California EVSMP.

Overall, the Pilot demonstrated strong customer interest in residential EVSE submetering, identified critical data accuracy and operational challenges, and explored the possibility of effective and efficient delivery of EV-related rates and TOU structures that can lower charging costs for customers without requiring secondary smart meter installations.

[1] California Public Utilities Commission. (2023). Electric Vehicle Submetering Protocol (EVSMP) requirements and implementation guidance. CPUC.

[2] Nexant, Inc. (2019). California statewide plug-in electric vehicle (PEV) submetering pilot: Phase 2 evaluation report. Prepared for the California Public Utilities Commission. https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-vehicles/submetering-pilot