

Optimal Aggregator Scheduling Strategies for Vehicle-To-Grid Services

SPEAKER:
Eric Sortomme

DATE:
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TIME:
4:30PM-5:30PM

PLACE:
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ABSTRACT:

Vehicle-to-Grid (V2G) has been proposed as a way to help increase the adoption speed of Electric Vehicles (EVs) and is an integral part of the smart grid. Through V2G, utilities can mitigate the impacts of EV charging and increase their ability to integrate intermittent renewable energy sources. Unidirectional V2G is especially attractive because it requires little if any additional infrastructure other than communication between the EV and an aggregator. The aggregator in turn combines the capacity of many EVs to bid into energy and ancillary services markets.

This research develops algorithms for unidirectional ancillary services for use by an aggregator. Several smart charging algorithms are used to set the point about which the rate of charge varies while performing regulation. An aggregator profit maximization algorithm is formulated with optional system load and price constraints analogous to the smart charging algorithms.

Simulations on a hypothetical group of 10000 commuter EVs verify that the optimal algorithms increase aggregator profits while reducing system load impacts and customer costs. These algorithms can be extended to demand responsive loads.

SPEAKER BIO:

E. V. Sortomme graduated Magna Cum Laude from Brigham Young University in 2007 with a Bachelors of Science in Electrical Engineering. He is currently a PhD Candidate at the University of Washington with research emphasis on SmartGrid technologies, including microgrids and vehicle-to-grid, and wind power integration. He is a co-recipient of the 2010 UW Department of Electrical Engineering Chair's Award. His employment experience includes internships with Wavetronix LLC and Puget Sound Energy. He became a student member of IEEE in 2008 and has authored or co-authored a plethora of additional technical publications.