DOCKETED	
Docket Number:	20-IEPR-02
Project Title:	Transportation
TN #:	233572
Document Title:	Vehicle-Grid Integration
Description:	Presentation by Tom Ashley, Greenlos
Filer:	Raquel Kravitz
Organization:	Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/22/2020 8:51:13 AM
Docketed Date:	6/22/2020

Vehicle-Grid Integration

Value – Barriers – Vision





Value // Barriers

Opportunities + Challenges:

- Many value drivers some inherent, some monetizable
- Cost v. value balance of focus tends to be on cost not value
- Accessibility most value streams largely inaccessible
- Time many value components more valuable and more accessible in the future than now
- Scale simple lack of scaled deployment challenges the clarity of value and limits vision for market structuring and development
- These are all addressable!



Vision

Market construct/mechanism that:

- Is clearly defined
- Is relatively easy to access
- Drives EV and/or EV charging investment
- Identifies system value above low-hanging fruit IOU ratepayer benefits
- Reliable and bankable value can shift but not beyond reasonable bounds
- Allows models to translate value over time into value up front
- Leverages and helps drive widely deployed technology/standards





Smart/Managed Charging is the Foundation for Maximizing System Benefits from Transportation Electrification

Managed EV charging ("V1G") is a powerful and flexible grid resource

- Utilizes controlled, dispatchable one-way flows of energy (as opposed to "V2G"), without added storage
- Provides demand response, demand charge mitigation, and load shifting/shaping
- Supports intermittent generation integration, distribution system upgrade deferrals, and system efficiency
- Can provide further distribution and transmission level grid services

Managed charging, with or without storage, enhances EV load management



Advanced Vehicle-Grid Integration Research and Demonstration Project Monterey Park, California





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Advanced Vehicle-Grid Integration Research and Demonstration Project

Key Goals & Benefits

Greenlots selected by the California Energy Commission to develop an integrated hardware and software platform to monitor and control multiple DCFC chargers and on-site storage to:

- Optimize charging to reduce 15-minute metered demand;
- Provide demand response capacity with EV charging load during system peak hours;
- Shift DCFC EV charging loads to mid-day to coincide with photovoltaic generation;
- Increase DCFC utilization with integrated public and private EV fleet scheduling; and
- Evaluate second-life EV battery effectiveness and capacity degradation rates for DCFC demand management





To the journey forward...





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