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

Value – Barriers – Vision
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
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
Advanced Vehicle-Grid Integration Research and Demonstration Project
Monterey Park, California
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...