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<td><strong>Docket Number:</strong></td>
<td>17-IEPR-12</td>
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<td><strong>Project Title:</strong></td>
<td>Distributed Energy Resources</td>
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<td><strong>Document Title:</strong></td>
<td>Presentation - California Vehicle-Grid Integration Roadmap Gap Analysis and Update</td>
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<td><strong>Description:</strong></td>
<td>By Kiel Pratt and Noel Crisostomo, June 13, 2017</td>
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<td><strong>Filer:</strong></td>
<td>Doris Yamamoto</td>
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<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
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California Vehicle-Grid Integration Roadmap Gap Analysis and Update

2017 IEPR Joint Staff Workshop on the Review of Actions and Status of State Level Roadmaps
June 13, 2017

Kiel Pratt
Research & Development
California Energy Commission

Noel Crisostomo
Fuels & Transportation
California Energy Commission
Outline

• Three Tracks
  – Goals
    • Activities
    • Shared-Agency Responsibilities
      – Cross-Functional

• Current status of goals
  – Underline = Activity Ongoing/Result Pending
Three Interrelated Tracks

1. Determine VGI Value and Potential
2. Develop Enabling Policies, Regulations and Business Processes
3. Support Enabling Technology Development
Track 1: Value and Potential

Goals:
• Confirm VGI electrical system impacts
• Determine VGI value
• Confirm VGI market potential
• Formulate VGI business models
• Research, development and demonstration
Track 2: Enabling Policies, Regulations and Business Processes

Goals:

- Ensure coherence between state policies, programs and national standards
- Define VGI-related products and programs
- Define VGI program or product eligibility
- Clarify VGI-related product and program requirements
- Clarify settlement
- Define verification and conflict resolution protocols
- Define signals and messaging
- Research, development and demonstration
Track 3: Enabling Technology Development

Goals:

• Develop enabling technology requirements
• Improve performance
• Identify and inform about performance
• Research, development and demonstration
Track 1: Value and Potential

Confirm VGI electrical system impacts
- SCE Smart Charging, PG&E BMW iChargeForward 1 & 2, SDG&E Power Your Drive, EPIC (ChargePoint, CSE, EPRI), LA Air Force Base, NRG Settlement R&D

Determine VGI value
- E3/LBNL DR Potential Study, NREL National Economic Value Assessment of PEVs, LBNL VGI-Soft, CPUC DRP/IDER/IRP, CEC IEPR/IRP

Confirm VGI market potential
- LBNL VGI-Soft, CPUC DRP/IDER/IRP, CEC IEPR/IRP, CEC EVI-Pro Model

Formulate VGI business models
- Various OEMs, PowerTree, NSI V2G Bus, EMW, ChargePoint, Greenlots, BMW iChargeForward 2, Proterra, BYD, Oxygen Initiative, Nuuve, EVgo DCFC Rate Design, Research, development and demonstration (RD&D)
- EPIC, Submetering Protocol, EV Pilot Survey Database, DOE Grid Modernization Lab Consortium Projects

Underline = Activity Ongoing/ Result Pending
Track 2: Enabling Policies, Regulations and Business Processes

Ensure coherence between state policies, programs and national standards

• Alignment within VGI Communications Protocol Working Group

Define VGI-related products and programs

Define VGI program or product eligibility

Clarify VGI-related product and program requirements

Clarify settlement

• *ESDER/DERP/MRE, Submetering Protocol, DMS EV Fueling Systems, LCFS

Define verification and conflict resolution protocols

• CEC Title 20, Submetering Protocol, CAISO/CPUC Multi-Use Applications

Define signals and messaging

• Industry Standards → VGI Communications Protocol Working Group

Research, development and demonstration

• All pilots informing above activities
Track 3: Enabling Technology Development

Develop enabling technology requirements
• VGI Communications Protocol Working Group, Specifications for State Fleet

Improve performance
• Scaled manufacturing of battery and microcontrollers, software development, and pilot results

Identify and inform about performance
• Analyze accuracy, measurement, and latency of load management (CAISO AGC, IOU DR & Smart Meters, 3rd Party Submeters)

Research, development and demonstration
• Alternative & Renewable Fuel Vehicle Technology Program, Electric Program Investment Charge Program (12 Investment Plans), IOU ratepayer-funded DR and infrastructure programs, POU ratepayer-funded programs, NRG Settlement, DOE/EPA-funded technology demonstrations

Underline = Activity Ongoing/ Result Pending
Questions for Discussion & Next Steps

• Parties’ Feedback
  – Is progress in the right direction?
  – Is progress on course to meet Governor Brown’s Executive Order and SB 350 Electrification Targets?

• Agency Actions
  – VGI Communications Protocol Working Group
  – Additional funding opportunities EPIC and ARFVTP Research, Demonstration, & Deployment funding
  – Synthesis of Prior Research
Thank You

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