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Updating the California Vehicle-Grid Integration Roadmap

2017 IEPR Joint Agency Workshop on the Integration of Distributed Energy Resources in the California Grid

June 29, 2017

Noel Crisostomo
Lead Air Pollution Specialist, Fuels & Transportation Division
California Energy Commission
Three Interrelated Tracks

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

Party Feedback (6/13)
- Accelerate adoption to meet goals.
- Ensure customer simplicity, understand user reactions to increasingly complex rates, and potential roles for 3rd parties to simplify and deliver services.
- Use data to inform infrastructure design and deployment
- Examine and inform VGI value
- Modify Rule 21 to interconnect mobile storage devices (V2G).
- Protect EVs from IP-based attacks with cybersecurity standards.

Future Updates to Roadmap
- Reflect new ZEV Action Plan and Transportation Electrification (SB 350), market designs, procurements, incentives
- Synthesize prior research
- Align with updated charging infrastructure demand modeling (EVI-Pro) & deployment strategy
- Consider interagency VGI Communications Protocol Working Group output
- Coordinate with CEC Transportation Technology Roadmap
Thank You

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Appendix

SPECIFIC VGI ROADMAP ACTIVITIES EXCERPTED FROM CEC PRESENTATION FOR 6/13/17 IEPR WORKSHOP
Outline

• Tracks 1, 2, 3
  – Goals
    • Activities
    • Shared-Agency Responsibilities
      – Cross-Functional

• Current status of goals
  – Underline = Activity Ongoing/Result Pending
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 \(\rightarrow\) 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