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Docket Number:	17-IEPR-12
Project Title:	Distributed Energy Resources
TN #:	218219
Document Title:	Presentation - California Vehicle-Grid Integration Roadmap Gap Analysis and Update
Description:	By Kiel Pratt and Noel Crisostomo, June 13, 2017
Filer:	Doris Yamamoto
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	6/13/2017 11:23:09 AM
Docketed Date:	6/13/2017



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

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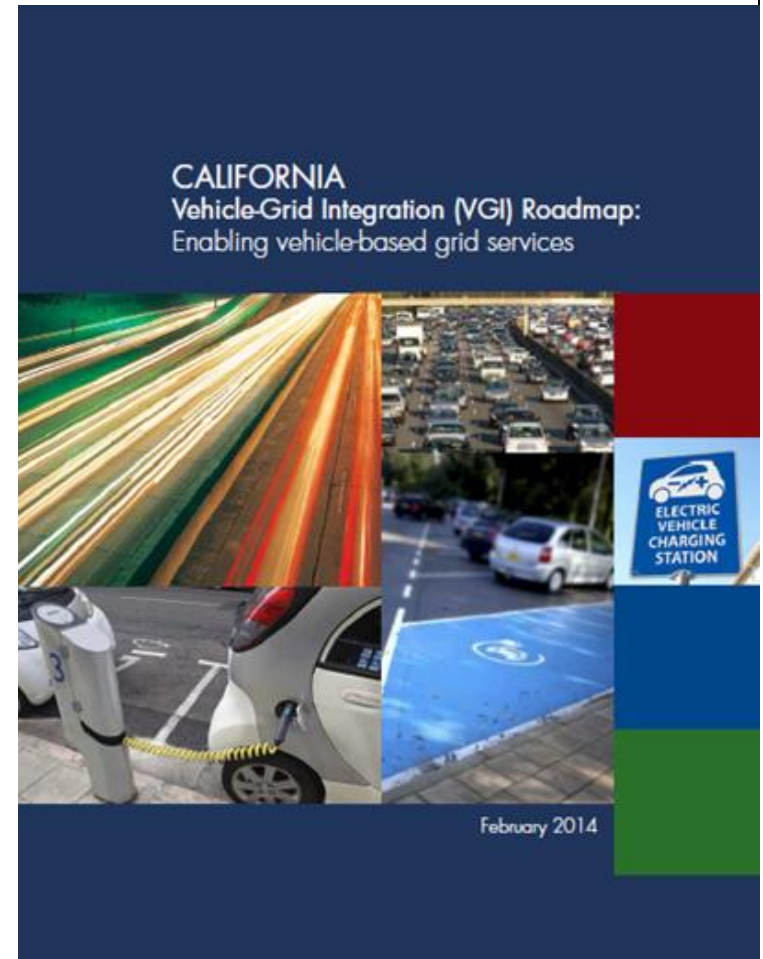
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California Energy Commission



Outline

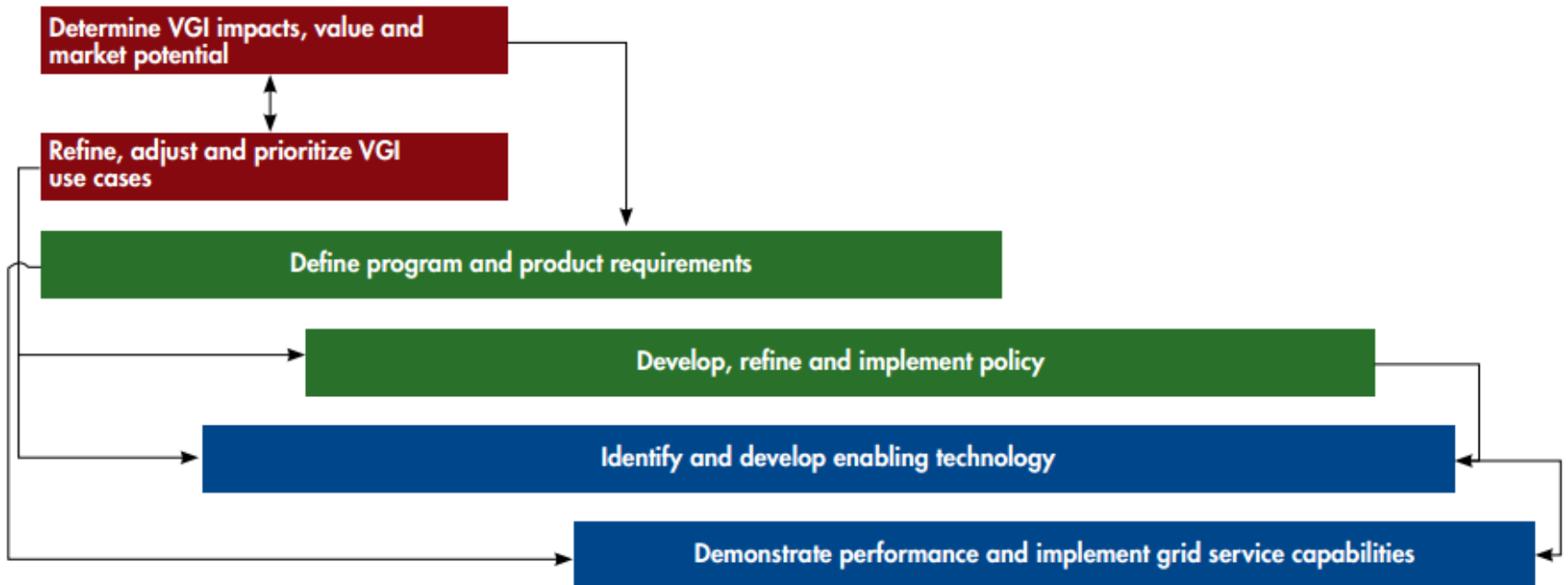
- Three Tracks
 - Goals
 - Activities
 - Shared-Agency Responsibilities
 - Cross-Functional
- Current status of goals
 - Activity Ongoing/Result Pending





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



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

} → IOU/POU Rate & Charging Programs
→ CEC Investments
→ ISO Initiatives*



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



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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