

DOCKETED	
Docket Number:	20-IEPR-02
Project Title:	Transportation
TN #:	234172
Document Title:	Presentation - AB 2127 Charging Infrastructure Needed Hardware & Software
Description:	S2. 2 Noel Crisostomo, CEC
Filer:	Raquel Kravitz
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	8/3/2020 11:18:00 AM
Docketed Date:	8/3/2020



AB 2127 Charging Infrastructure: Needed Hardware & Software

Noel Crisostomo, Fuels and Transportation Division

August 4, 2020

Integrated Energy Policy Report

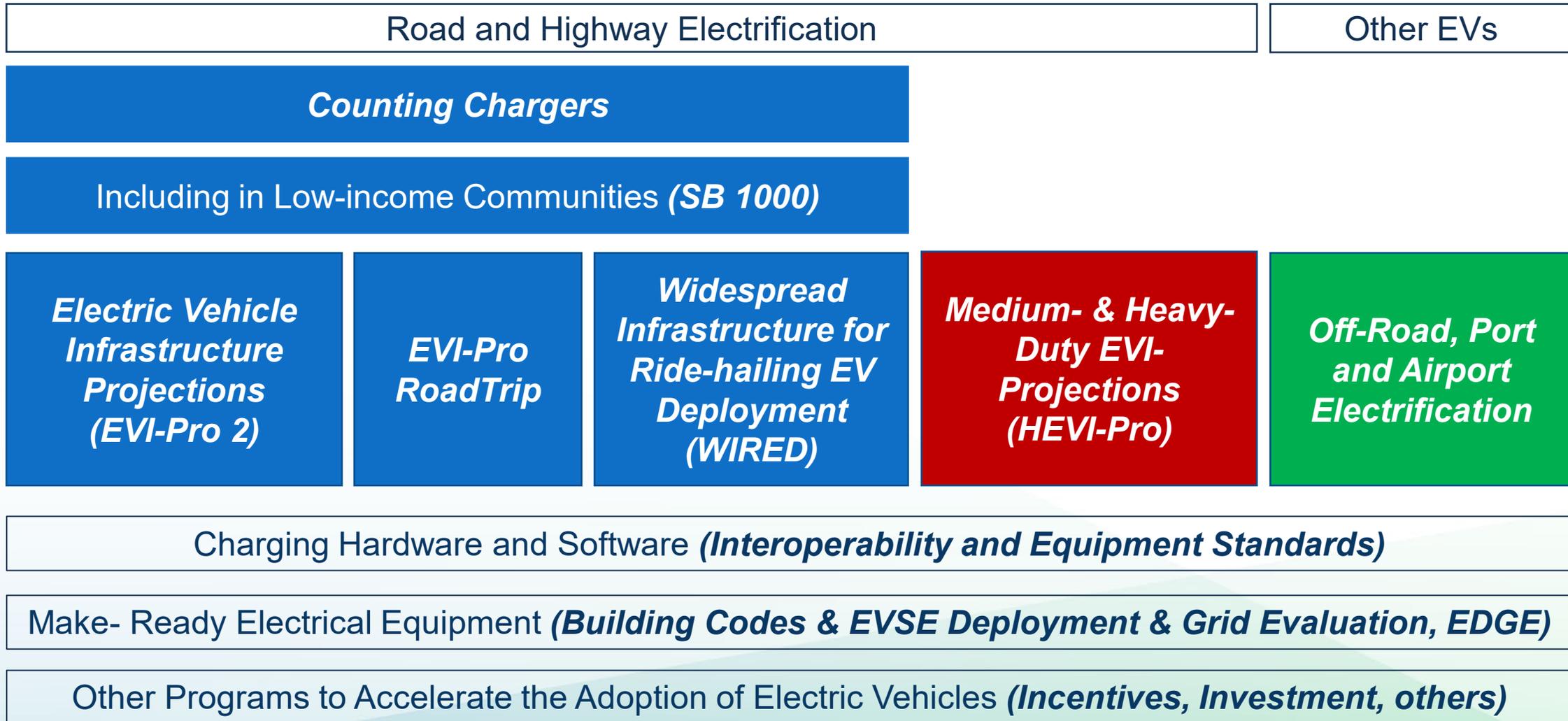


Outline: Hardware & Software Needs

- AB 2127 Directive, Legislative Finding and Declaration
- Charging Equipment Goals and Vision for Global Interoperability
- Interoperability Permeates Charging Infrastructure Deployment Strategies
 - Sharing convenient charging (M/HDV Connector)
 - Saving costs and grid impacts with flexible EVs (Smart Charging)
 - Accessing open and reliable charging (Roaming and Management)



...Consider all necessary charging infrastructure, including, but not limited to:





Charging Equipment Goals

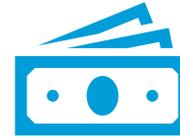
Convenience



Ensure that technologies employed in plug-in hybrid and electric vehicles work in a harmonious manner and across service territories.

Public Utilities Code 740.2 (e)

Cost Control



EVs and charging that can record consumption and remotely communicate could assist in renewables integration, and reduce fuel costs for drivers who charge in a manner consistent with grid conditions.

Public Utilities Code 740.12(g), AB 2127 (2018)

Customer Choice



Standardized, open charging systems that ensure easy access by all in a competitive, and highly-innovative market.

U.S. DOE EERE Public Plug-In Electric Vehicle Charging Infrastructure Guiding Principles



Charging Equipment Goals

⚡ Interoperability “will provide standardized devices that are capable of functioning as intended with each other, without special effort by the user.”

Harmonized standards and regulations [will create:]

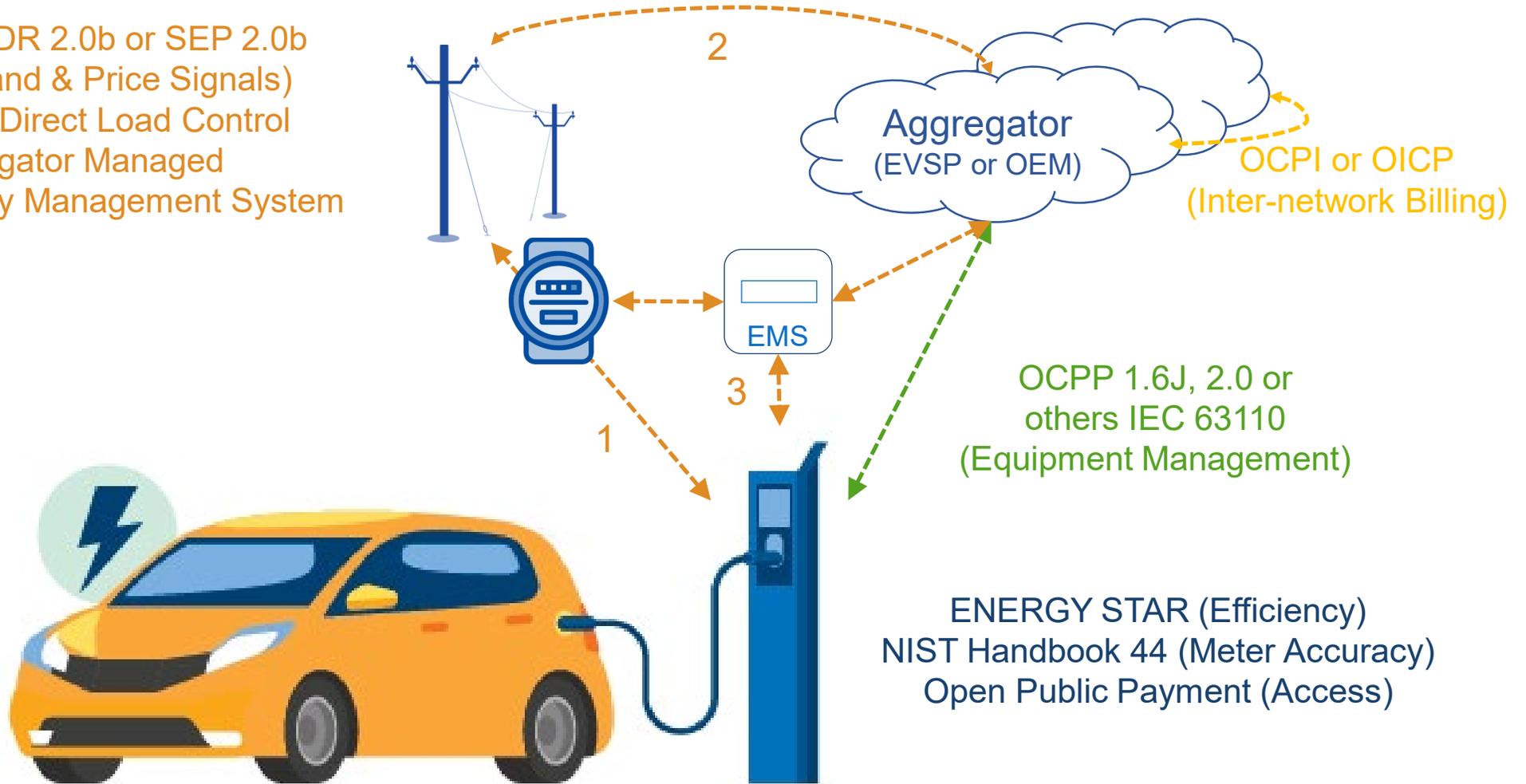
- Interoperable PEVs, EVSE, and communication networks
- Predictable investment requirements [to achieve scale]



Hardware-Software Solutions

OpenADR 2.0b or SEP 2.0b
(Demand & Price Signals)

1. Utility Direct Load Control
2. Aggregator Managed
3. Energy Management System



ENERGY STAR (Efficiency)
NIST Handbook 44 (Meter Accuracy)
Open Public Payment (Access)

ISO/IEC 15118
(Vehicle-To-Grid Communication)



Standardization drives economies of scale *and* innovation through “coopetition”

Harmonize to Scale

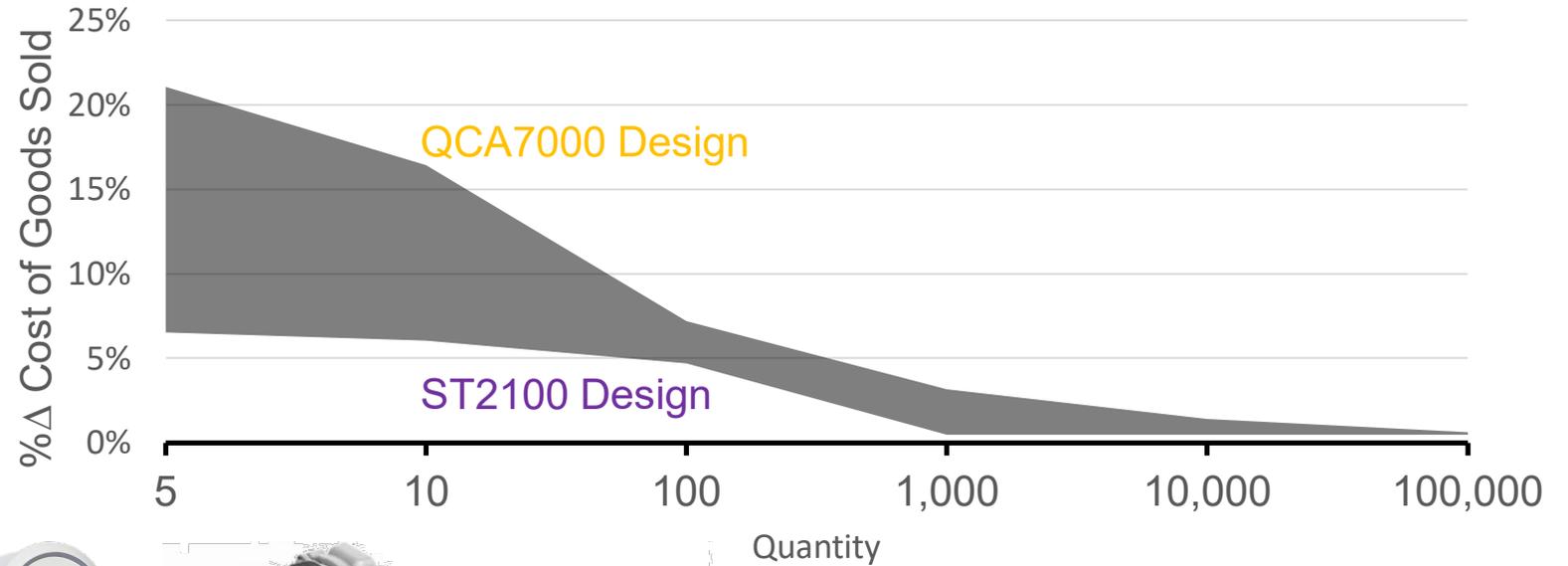
Interoperable: Convenient, Controllable, and Competitive



Portfolio of Solutions Best Fit for the Local Environment

Local & Project Level ↔ Statewide Ecosystem

Marginal Component Cost for High Level Communication (Level 2 EVSE)





Convenience for Customers



Local & Project Level ↔ Statewide Ecosystem

Assess Needs

Expand Electric Vehicle Infrastructure Projections

Regional Readiness Plans and Community Blueprints

Standards-based connectors and communication

- Moderates network size by improving utilization among EVs
- Reduces costs to achieve EV production and use goals
- Saves equipment costs and driver search costs at stations



High Power Charging for Commercial Vehicles *TBA*
(Credit: Tesla, Daimler, CharIN)

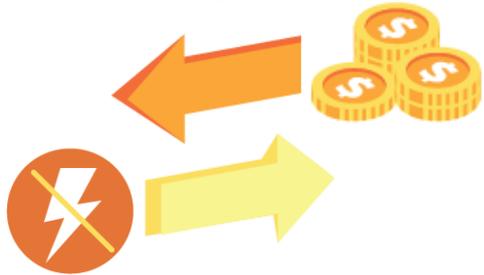
ISO/IEC 15118
Vehicle-To-Grid Communication



Controllable Costs

Grow Partnerships

Lever Public and Ratepayer Investment with Private Capital



Local & Project Level ↔ Statewide Ecosystem



Standards-based chargers and communication

- Improves customers' ability to dynamically manage rates and capacity, paving the way to V2G resiliency
- Assists the business case for EVs by creating opportunities for valuable customer- and grid services





Competition and Choice

Electric For All

Robust Supplier Ecosystem & Installation Workforce



Construction, Energization, and Sustained Operations

Standards-based network communication interfaces

- Permits reliability monitoring, offers customers options among networks, and enables repair by technicians
- Facilitates cooperation among competing networks, while ensuring a seamless customer experience

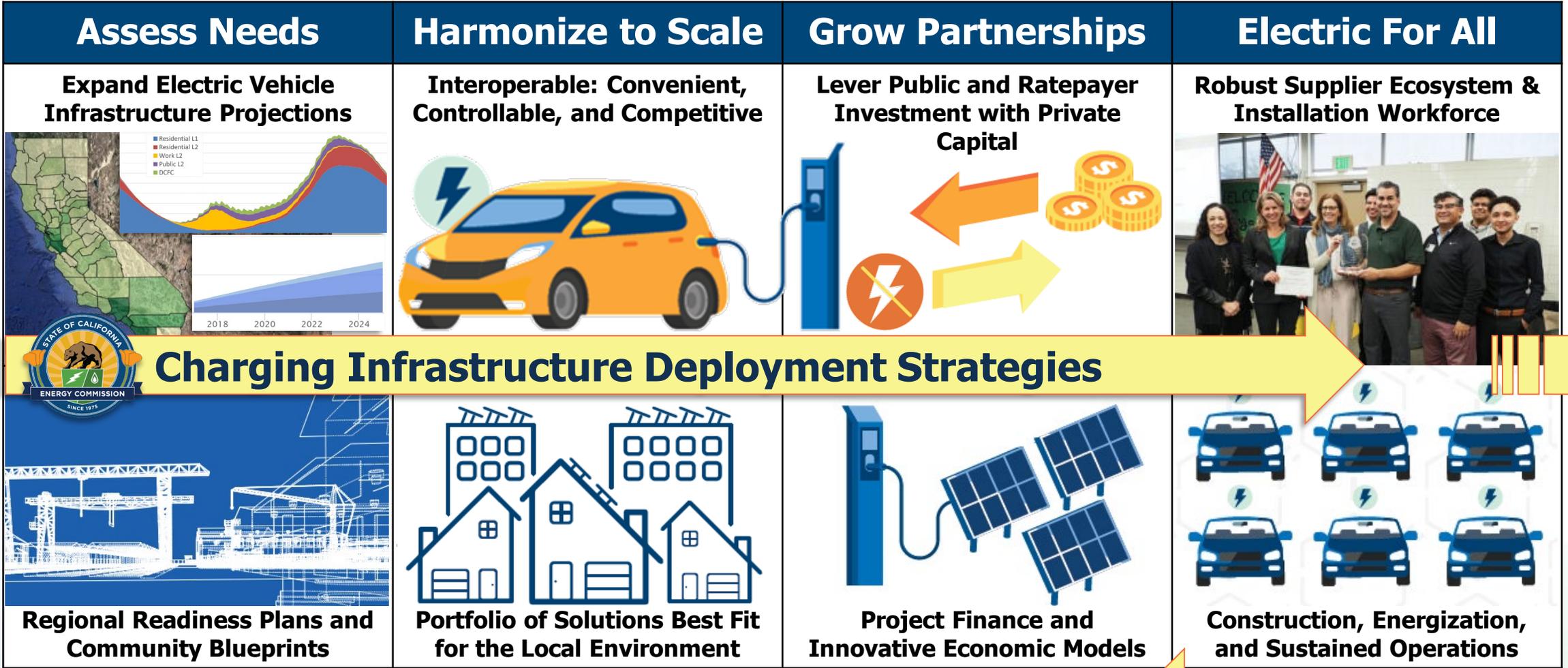


Local & Project Level ↔ Statewide Ecosystem



Interoperable EV Charging is Key...

Local & Project Level ↔ Statewide Ecosystem



Biennial & Ongoing Updates



...as the market remains fragmented.

California and its partners should standardize for widespread transportation electrification to be powered with 100% clean energy.

- **Automakers:** Collaborate upon standards and compete on implementation
- **Labs:** Streamline and subsidize **electrical manufacturer** functional testing & validation
- **CEC:** Support **electrical manufacturers** and fund chargers reflecting automaker technology roadmaps to achieve economies of scale
- **Utilities:** Support customers and **aggregators** through grid and network infrastructures





Thank you! Questions & Feedback?

Contact:

Noel.Crisostomo@energy.ca.gov

Webpage:

<https://www.energy.ca.gov/programs-and-topics/programs/electric-vehicle-charging-infrastructure-assessment-ab-2127>