



Zero-Emission Vehicle Infrastructure – Policy and Deployment

California Energy Commission

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Origins of the Clean Transportation Program



- Transportation sector: significant greenhouse gas emissions and public health impacts
- Pollution disproportionately burdens vulnerable and disadvantaged communities
- Clean Transportation Program created to invest in a cleaner, healthier transportation system
- Provides up to \$100 million per year



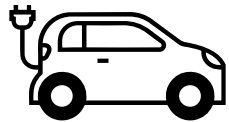


Investments in Fiscal Years 2023–2024 to 2026–2027

Total: \$1.85 Billion

Not counting base Clean Transportation Program funds after 2023–2024

(State Budget Act funds are subject to change)



\$658 Million

Light-Duty EV Charging Infrastructure



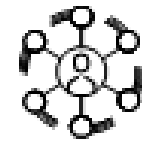
\$1.15 Billion

Medium- and Heavy-Duty ZEV Infrastructure



\$46 Million

Emerging Opportunities



\$5 Million

ZEV Workforce Development

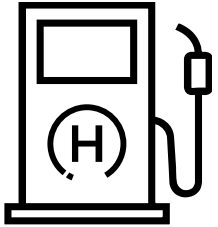
+

\$384 Million

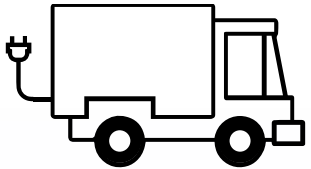
National Electric Vehicle Infrastructure



Medium- and Heavy-Duty ZEV Infrastructure



- Broad range of MD and HD vehicle infrastructure
- Both hydrogen refueling and EV charging



- Zero-emission port infrastructure

**\$1.15
Billion**

- Drayage truck targeted funds
- School and transit buses



Funding Allocations Table

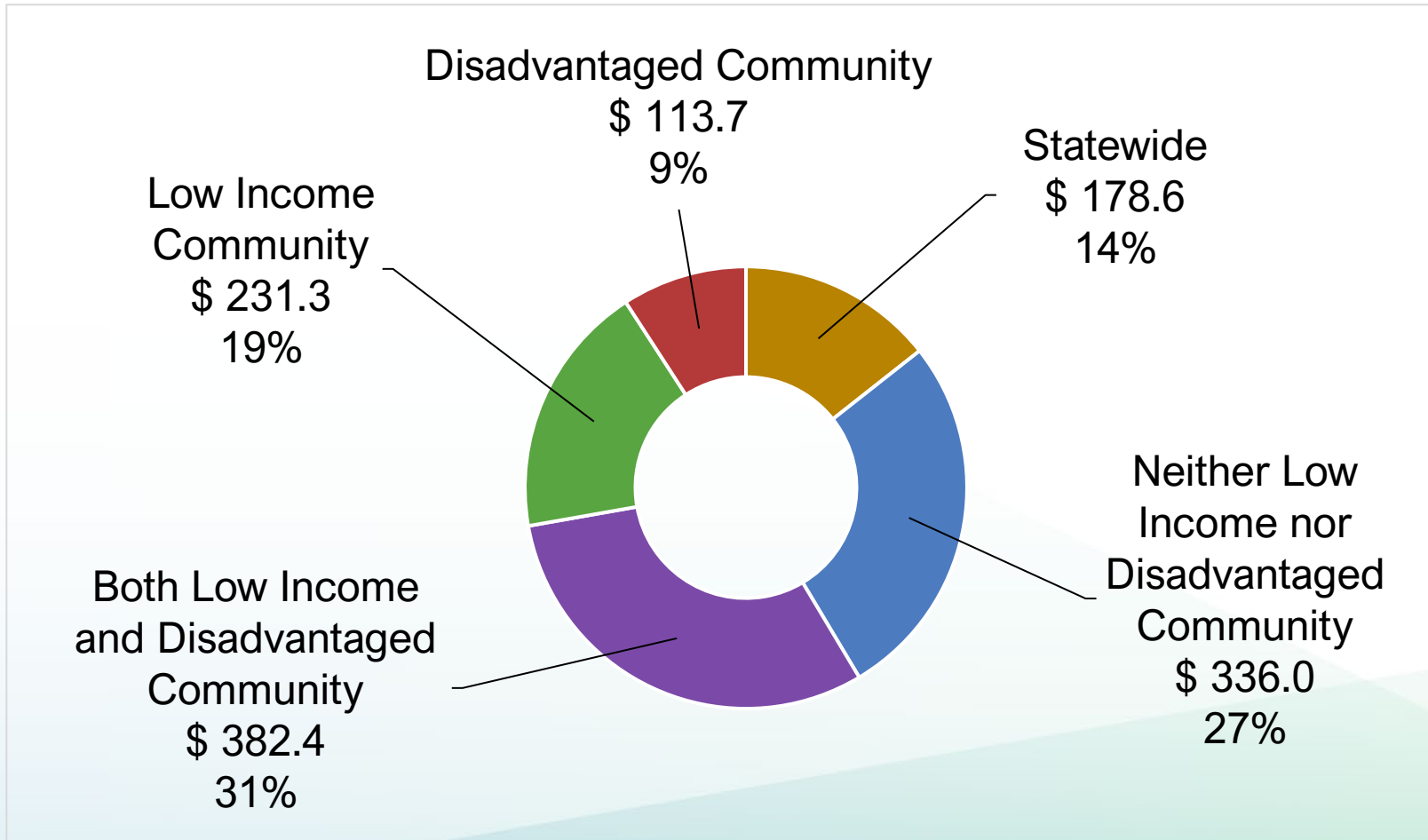
Category	Eligible Fuel Types	Funding Source	2023–2024	2024–2025	2025–2026	2026–2027
Light-Duty Charging Infrastructure	Electric	Clean Transportation Program (Base)	\$42.6	-	-	-
Light-Duty Charging Infrastructure	Electric	Greenhouse Gas Reduction Fund (GGRF)	-	\$120	\$140	\$80
Equitable At-Home Charging	Electric	GGRF	\$95.0	\$80	\$60	\$40
Medium- and Heavy-Duty Infrastructure	Electric, Hydrogen	Base	\$47.6	-	-	-
Drayage Truck Infrastructure	Electric, Hydrogen	GGRF	\$80.75	\$50	\$50	\$49
School Bus Infrastructure	Electric	General Fund (Proposition 98)	\$125.0	\$125	\$125	-
Clean Truck, Bus, and Off-Road Equipment Infrastructure	Electric, Hydrogen	GGRF	\$137.75	\$137	\$89	-
Port ZEV Infrastructure	Electric, Hydrogen	GGRF	-	-	-	\$130
Emerging Opportunities	Electric, Hydrogen	GGRF	-	-	\$46	-
Workforce Training and Development	Electric, Hydrogen	Base	\$5.0	-	-	-
		Total Base	\$95.2			
		Total General Fund and GGRF	\$438.5	\$512	\$510	\$299

- Not including approx. \$384 million in federal NEVI funds
- Not including future CTP funds



Share of Projects in Disadvantaged and Low-income Communities

- **58.6%** when excluding projects that do not yet have assigned locations
- **68.4%** when also excluding projects known to be statewide



Source: CEC; as of July 2023

*Dollar amounts in millions



Infrastructure Analysis

2025



1.5 MILLION
EV'S SOLD



INCLUDING
10,000 FAST
CHARGERS

250,000
CHARGERS INSTALLED



200 OPEN
HYDROGEN STATIONS

2030



5 MILLION
EV'S SOLD

2035



100%
ELECTRIC SALES FOR
NEW PASSENGER VEHICLES



100%
ELECTRIC OPERATIONS
FOR DRAYAGE TRUCKS
AND OFF-ROAD VEHICLES
& EQUIPMENT

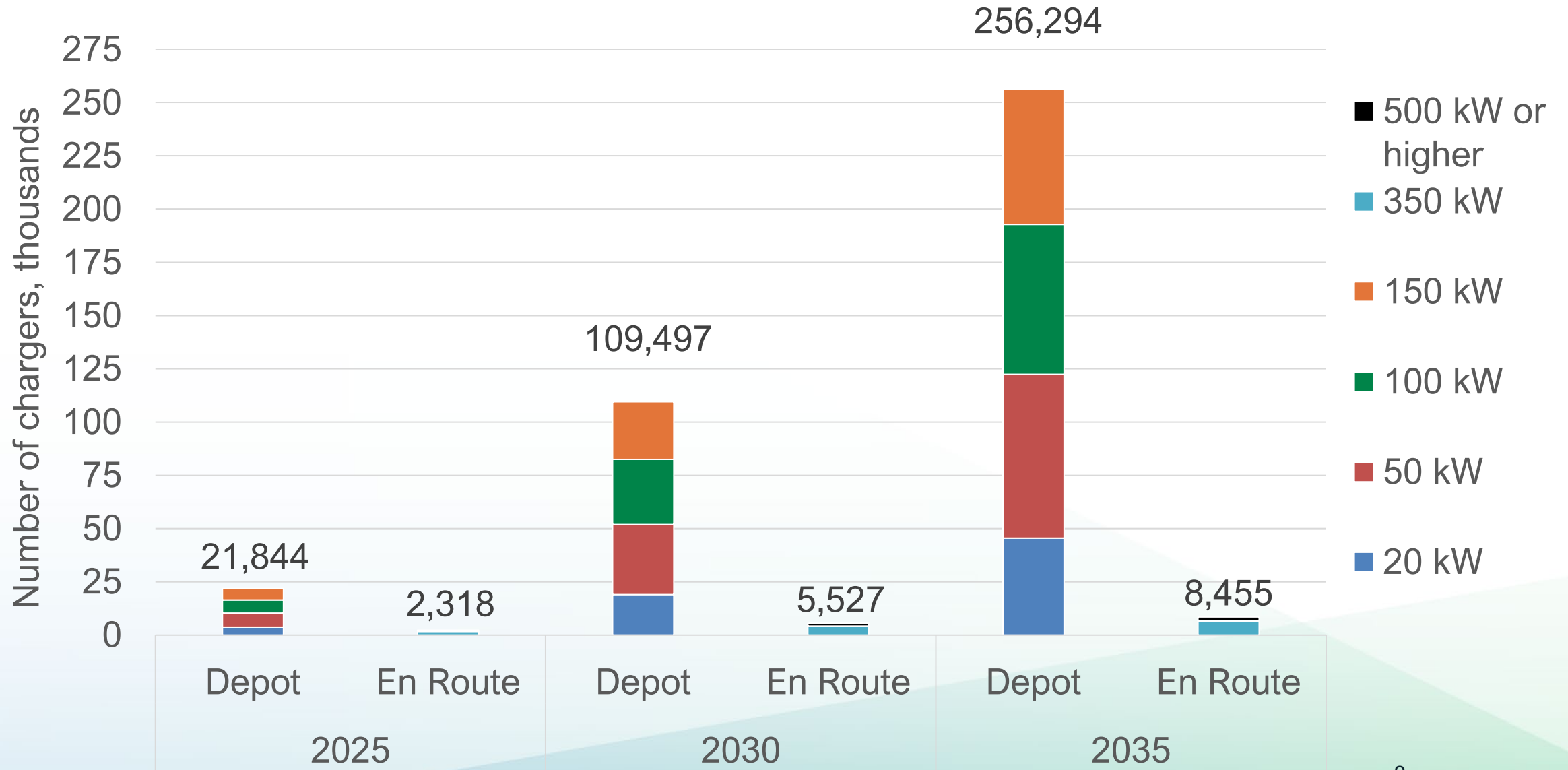
2045



100%
ELECTRIC OPERATIONS
FOR MEDIUM- AND
HEAVY-DUTY VEHICLES

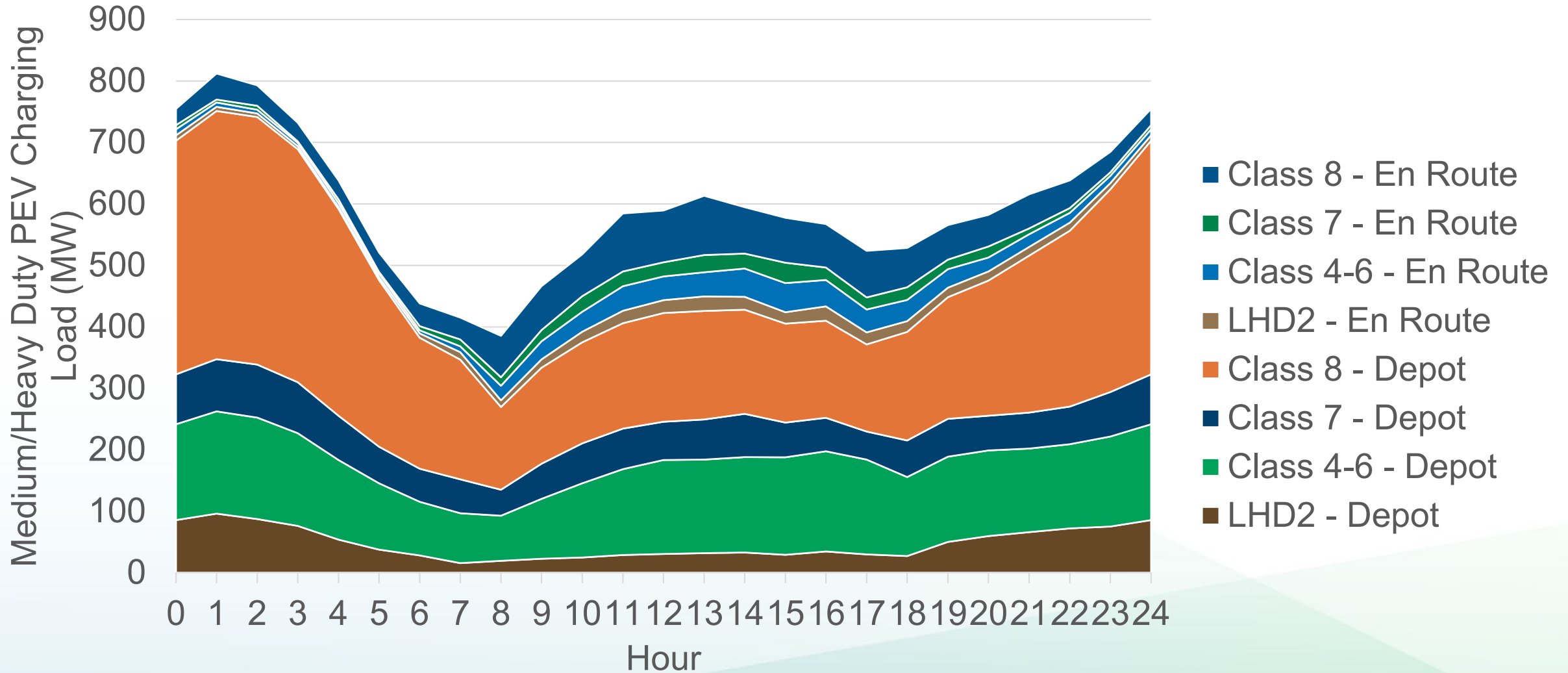


Medium-/Heavy-Duty Charging Needs





Medium-/Heavy-Duty Charging Load





Inaugural Assessment of Hydrogen Infrastructure Needs for Medium- and Heavy-Duty Vehicles

Senate Bill No. 643
CHAPTER 646
An act to add and repeal Section 43871 of the Health and Safety Code,
relating to air pollution.
[Approved by Governor October 7, 2021. Filed with Secretary
of State October 7, 2021.]
LEGISLATIVE COUNSEL'S DIGEST
SB 643, Archuleta. Fuel cell electric vehicle fueling infrastructure and
fuel production: statewide assessment.
Existing law generally designates the State Air Resources Board as the
state agency with the primary responsibility for the control of vehicular air
pollution. Existing law requires the State Energy Resources Conservation
and Development Commission (Energy Commission), in partnership with
the state board, and in consultation with specified state agencies, to develop
and adopt a state plan to increase the use of alternative transportation fuels.
This bill would, until January 1, 2030, require the Energy Commission,
in consultation with the state board and the Public Utilities Commission, to
prepare a statewide assessment of the fuel cell electric vehicle fueling
infrastructure and fuel production needed to support the adoption of
zero-emission trucks, buses, and off-road vehicles at levels necessary for
the state to meet specified goals and requirements relating to vehicular air
pollution, as provided. The bill would require, among other things, the
statewide assessment to consider all necessary fuel production and distribution
infrastructure, as specified, to meet those goals and requirements
and to examine existing and future fuel production and distribution
infrastructure needs throughout the state, including in low-income
communities. The bill would require the Energy Commission to regularly
seek data and input relating to fuel cell electric vehicle fuel production and
fueling infrastructure from specified state agencies and interested
stakeholders. The bill would require the Energy Commission to complete
the statewide assessment by December 31, 2023, and to update the statewide
assessment at least once every 3 years. The bill would require the Energy
Commission to post the initial and updated statewide assessments on its
internet website. The bill would provide that the statewide assessment does
not constitute a directive instituting a mandate on state funding or limit the
ability of the Energy Commission to award funds related to specified
categories of projects on a competitive basis.

91

- Established by Senate Bill 643 (Archuleta, 2021)
- Statewide assessment of hydrogen refueling infrastructure for medium- and heavy-duty FCEVs, off-road applications and clean H2 supply
- Inaugural report December 31, 2023; every 3 years through January 1, 2030



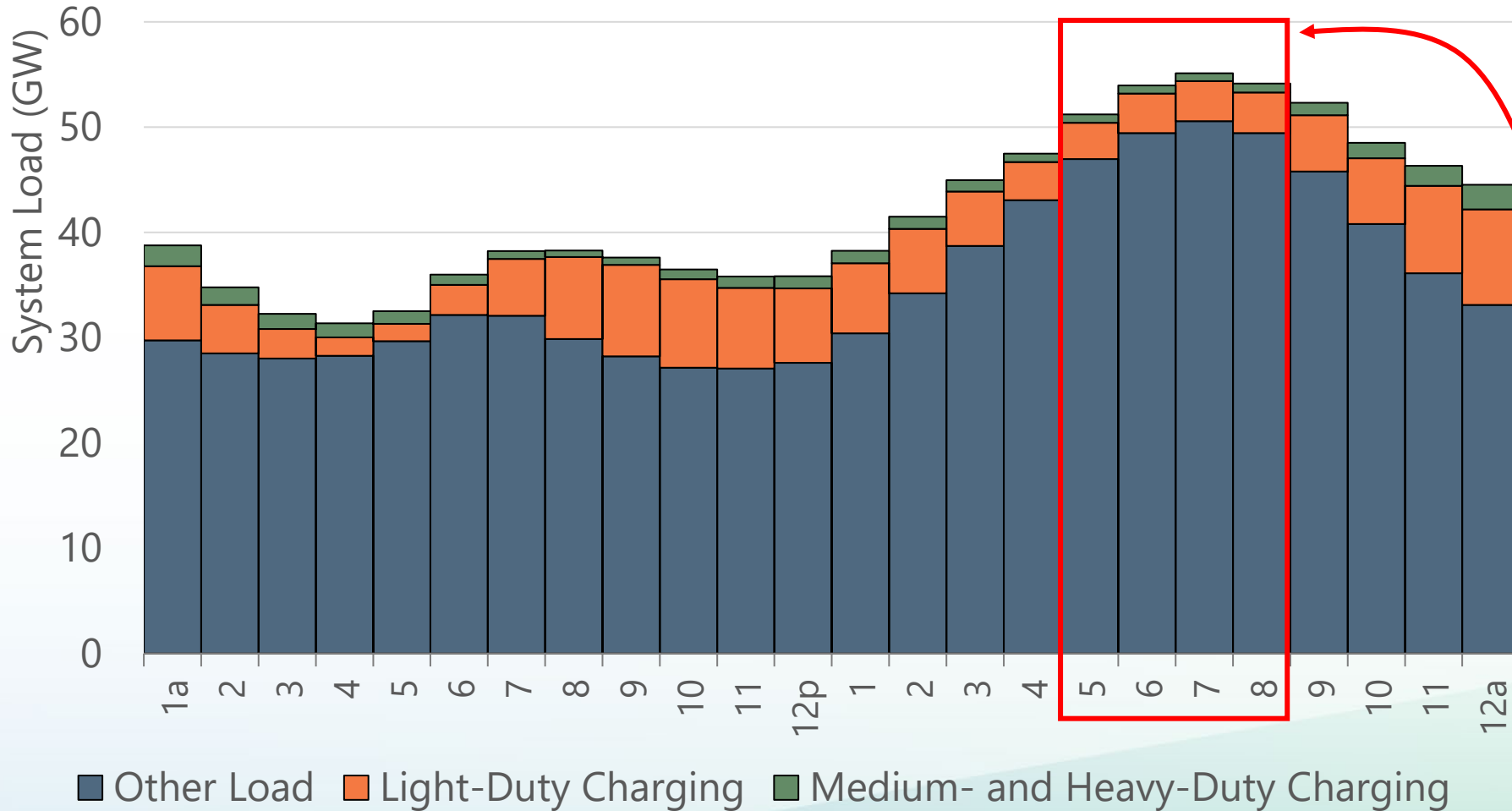
Key Takeaways from Inaugural Assessment

- Variance between MDHD infrastructure scenarios demonstrates current level of uncertainty
- Fuel cell electric buses are no longer demonstrating, they are part of transit fleets
- Off-road/nonroad fuel cell electric applications are predominately demonstrations
- Clean hydrogen production needs to ramp up to meet anticipated demand



EVs and the Grid

2022 IEPR Planning Scenario - CAISO Summer Day in 2035



2022 IEPR Forecast anticipates that EVs represent only about 20% of total daily average load, and only 10% of load **during peak hours**.

Additional policies and technologies could decrease peak demand further, or even make EVs a *source of energy supply* during critical peak periods.



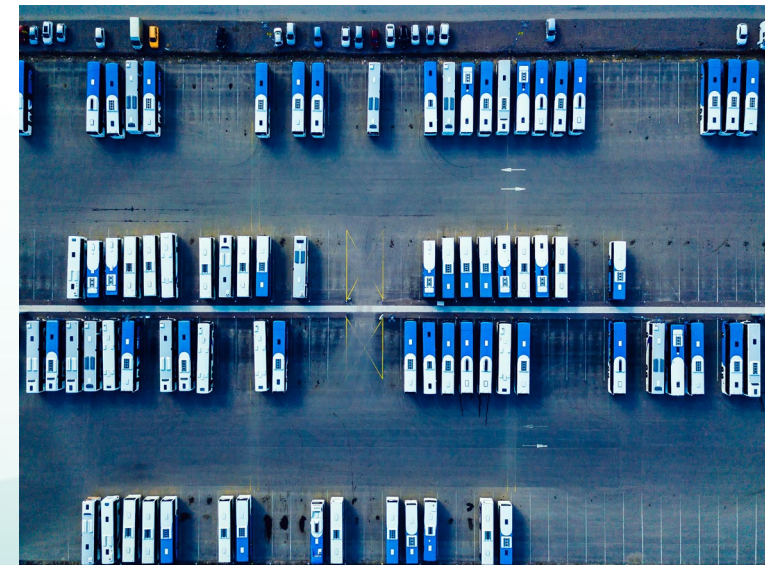
Incentives for Zero-Emission Commercial Vehicle Infrastructure





EnergIZE Quick Stats

- 375 Applications Reviewed
- 191 Awards
- \$115.3M Incentives Awarded
- \$100.1M DAC/LIC Incentives
- \$284.3M Match Share
- 1,862 Chargers & 47 H2 Dispensers
- 2,370 EVs & 854 FCEVs Supported



Standard Funding Lanes

Fast-Track

- Coordinated with CARB's HVIP program and other vehicle funding programs
- First round in 2022; with subsequent rounds each year
- Most recent lane opened in Feb 2024.

Hydrogen

- First round in 2022; with subsequent rounds each year
- Lane will open on April 17, 2024

Jump Start

- Equity focused
- First round in 2022; with subsequent rounds each year
- Most recent lanes opened in Feb 2024

Public Charging

- First round in 2022; with subsequent rounds each year

Set-Aside Funding Lanes

School Bus

- Launched in 2023
- Current window closes in April 2024

Transit Bus

- Launched in 2023
- Will open in April 2024 and close September 2024

Drayage Truck

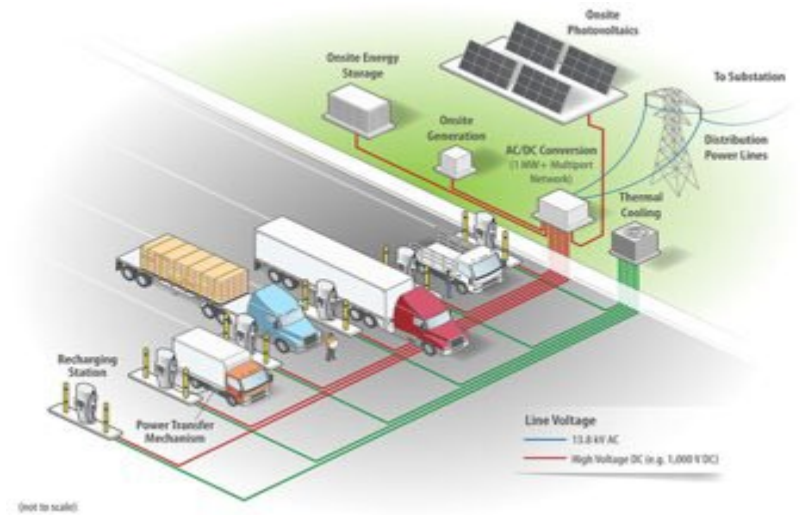
- Launched in 2023
- Will open in April 2024 and close September 2024



Implementation of Medium- and Heavy-duty ZE Infrastructure Blueprints

Solicitation Concept (GFO-23-603)

- Implementation of CEC-approved blueprints (GFO-20-601)
 - “Blueprints for Medium- and Heavy-Duty Zero Emission Vehicle and Infrastructure”
- Notice of Proposed Awards released



Source: NREL 1MW Charging Research Project



Project Groups

- Charging Infrastructure for Medium- and Heavy-Duty Zero-Emission Vehicles
- Hydrogen Refueling Infrastructure for Medium- and Heavy-Duty Zero-Emission Vehicles



Medium- and Heavy-duty EV Charging and Hydrogen Refueling for Designated Corridors

GFO-23-602: (CRITICAL PATHS)

- Support medium- and heavy-duty ZEV hydrogen refueling and/or charging stations along priority clean freight corridors
- Notice of Proposed Awards released
- \$34M proposed for awards
- 7 locations, including
 - On the I-5
 - On the I-710
 - On the I-15
 - plus others





Advanced Technology Demonstration and Pilot Projects



Emerging Opportunities (in ZEV technology)

- Aviation
- Rail
- Marine



Solicitation information

- \$50 million in CEC funds; also has CARB funds
- Notice of Proposed Awards



Electric School Bus Bi-Directional Infrastructure

Solicitation Overview

- Charging infrastructure with bi-directional power flow
- Notice of Proposed Awards posted on September 27, 2023
- \$10.8 million proposed to be awarded





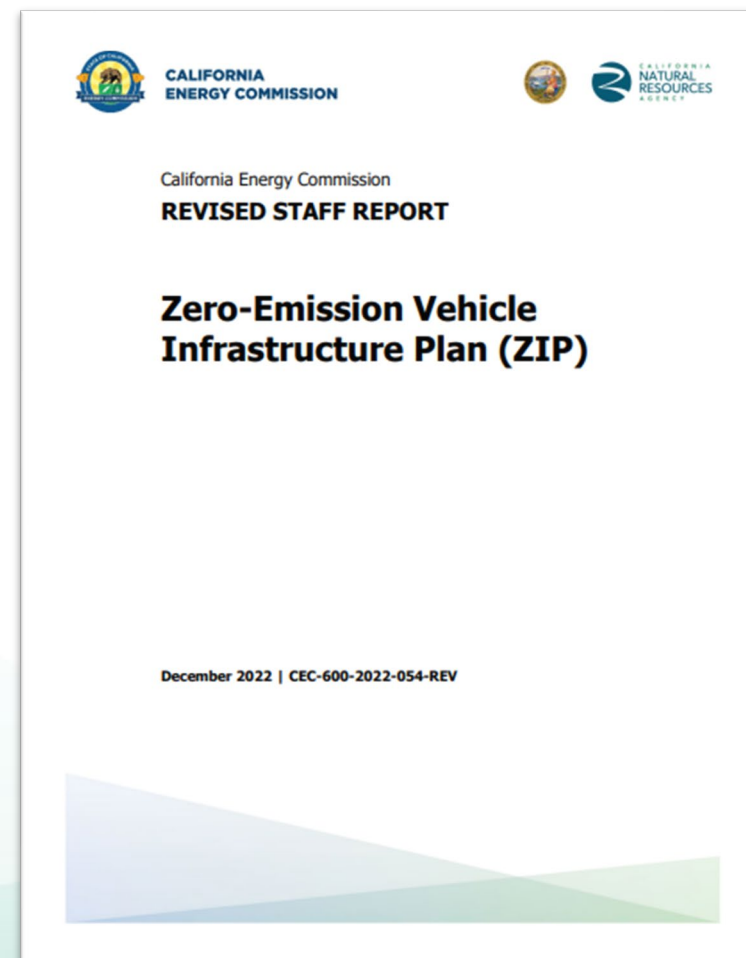
2024 Zero Emission Vehicle Infrastructure Plan (ZIP)

2022 ZIP published December 2022

- Documents state efforts in deploying ZEV infrastructure
- Provided actions for near- and long-term infrastructure deployment

2024 ZIP under development

- Focus on assessment of current ZEV infrastructure
- Deployment plan to meet ZEV infrastructure needs
- Publish draft this summer





Thank You!

ZERO EMISSIONS

