



Clean Transportation Program: A Hydrogen Perspective

Ben De Alba, Advisor to Commissioner Patty Monahan

May 13, 2020



Presentation Outline

1. California's pursuit of 100 public hydrogen stations
2. Clean Transportation Program's greater focus on Medium- and Heavy-Duty Vehicle Investment
3. Renewable hydrogen production and its place in the Clean Transportation Program



Our Five Commissioners



David Hochschild
Chair



Janea A. Scott
Vice Chair



Karen Douglas
Commissioner



J. Andrew McAllister
Commissioner



Patty Monahan
Commissioner



The Clean Transportation Program

Assembly Bill No. 118

CHAPTER 750

An act to add Article 11 (commencing with Section 44125) to Chapter 5 of, to add Chapter 8.9 (commencing with Section 44270) to Part 5 of Division 26 of, and to add and amend Sections 44270, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicle air pollution, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 28, 2013. Filed with Secretary of State September 28, 2013.]

AB 118, Nunez. Alternative fuel and vehicle technologies: funding programs.

(1) Existing law in the Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or not-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

This bill would provide that the state board has no authority to enforce any element of its existing clean fuels outlet regulation or other regulation that requires or has the effect of requiring any supplier, as defined, to construct, operate, or provide funding for the construction or operation of any publicly available hydrogen-fueling station. The bill would require the state board to aggregate and make available to the public, no later than June 30, 2014, and every year thereafter, the number of hydrogen-fueled vehicles that motor vehicle manufacturers project to be sold or leased over the next 3 years, as reported to the state board, and the number of hydrogen-fueled vehicles registered with the Department of Motor Vehicles through April 30. The bill would require the commission to allocate \$20 million annually, as specified, until there are at least 100 publicly available hydrogen-fueling

Assembly Bill No. 8

CHAPTER 401

An act to amend Sections 41081, 44060.5, 44125, 44225, 44229, 44270.3, 44271, 44272, 44273, 44274, 44275, 44280, 44281, 44282, 44283, 44287, 44299.1, and 44299.2 of, to add and repeal Section 43018.9 of, and to repeal Section 44299 of, the Health and Safety Code, to amend Sections 42885 and 42889 of the Public Resources Code, and to amend Sections 9250.1, 9250.2, 9261.1, and 9853.6 of the Vehicle Code, relating to vehicular air pollution, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 28, 2013. Filed with Secretary of State September 28, 2013.]

LEGISLATIVE COUNSEL'S DIGEST

AB 8, Perea. Alternative fuel and vehicle technologies: funding programs. (1) Existing law establishes the Alternative and Renewable Fuel and Vehicle Technology Program, administered by the State Energy Resources Conservation and Development Commission, to provide to specified entities, upon appropriation by the Legislature, grants, loans, loan guarantees, revolving loans, or other appropriate measures, for the development and deployment of innovative technologies that would transform California's fuel and vehicle types to help attain the state's climate change goals. Existing law specifies that only certain projects or programs are eligible for funding, including block grants administered by public entities or not-for-profit technology entities for multiple projects, education and program promotion within California, and development of alternative and renewable fuel and vehicle technology centers. Existing law requires the commission to develop and adopt an investment plan to determine priorities and opportunities for the program. Existing law also creates the Air Quality Improvement Program, administered by the State Air Resources Board, to fund air quality improvement projects related to fuel and vehicle technologies.

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**Established in 2007 by
Assembly Bill 118 (Núñez, 2007)**

**Extended through January 1, 2024
by Assembly Bill 8 (Perea, 2013)**

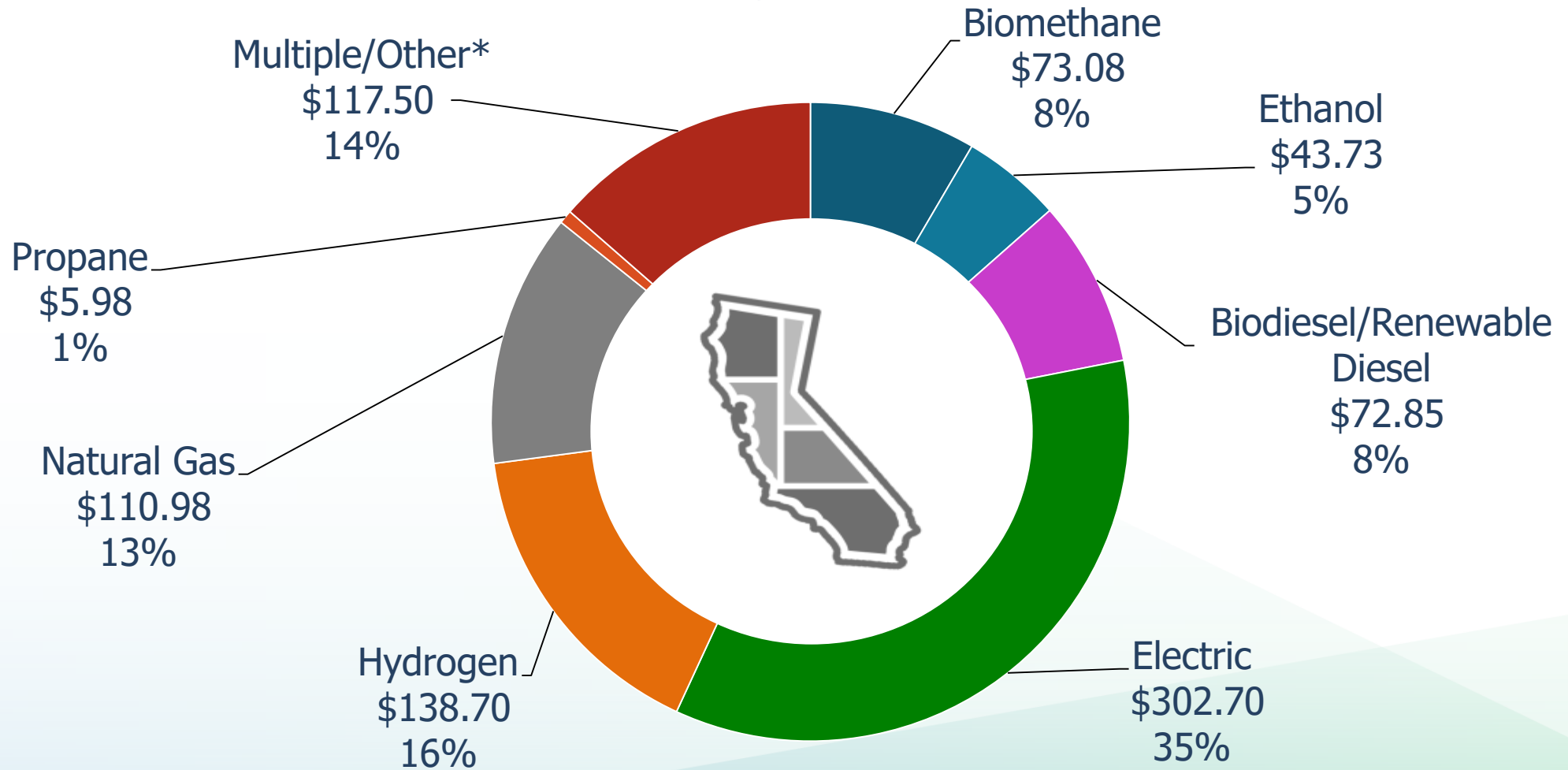
**\$100 million per year with funds
collected from vehicle registration
fees**

**\$20 million per year for hydrogen
stations to establish at least 100
H2 stations**



Clean Transportation Program Funding To-Date

Funding in Millions



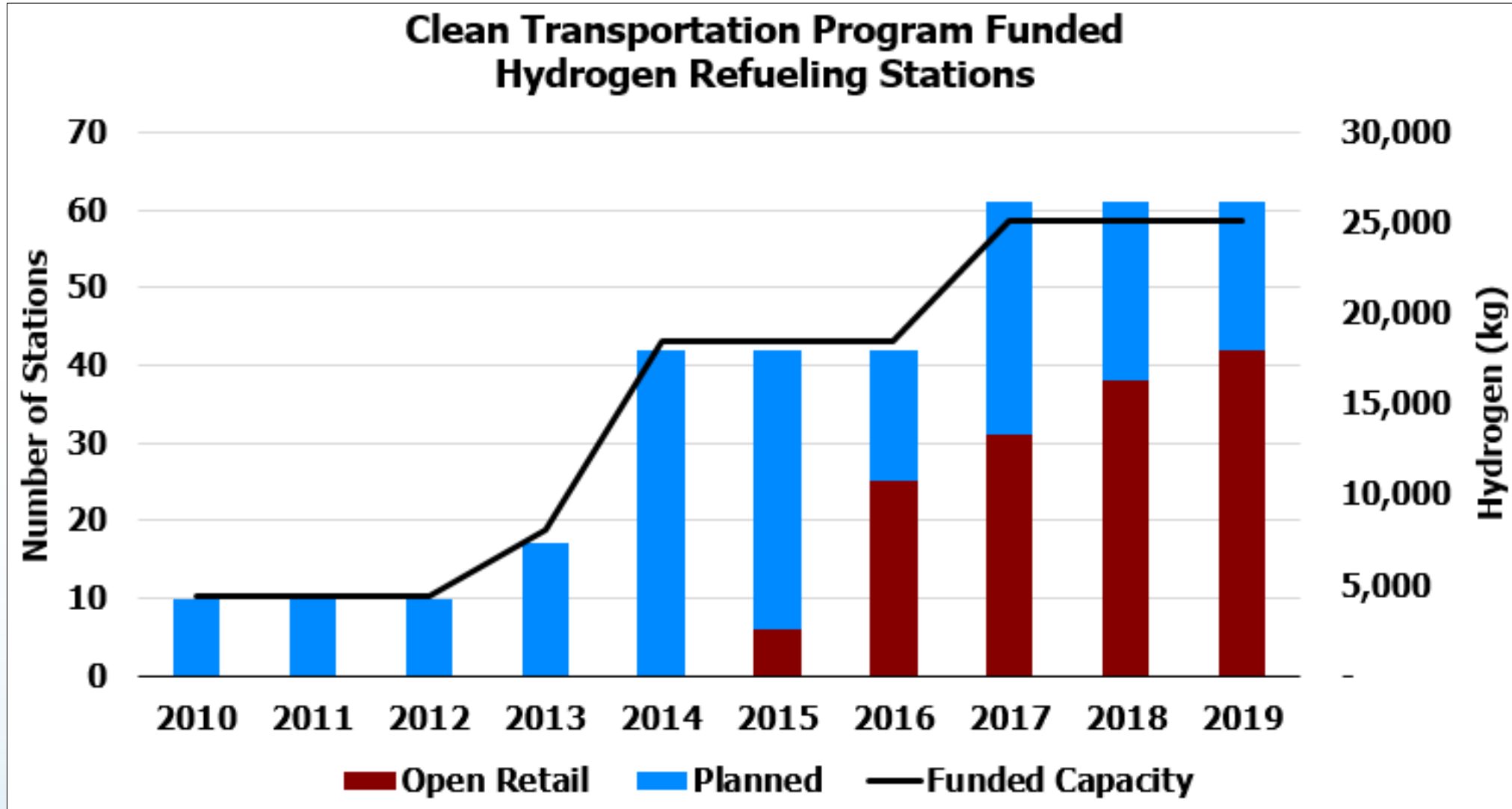
As of December 1, 2019



California's Pursuit of 100 Public Hydrogen Stations



Pursuit of 100 Hydrogen Stations





Pursuit of 100 Hydrogen Stations

Station Sizes Increasing

Early Stations

- 180 kg/day capacity with gaseous storage
- 350 kg/day capacity with liquid storage
- One fueling position (hose)



New Stations

- 360 kg/day capacity with gaseous storage
- 800 to 1,200 kg/day capacity with liquid storage
- Two or more fueling positions (hoses)



Pursuit of 100 Hydrogen Stations

Year-to-Year Growth	2016	2017	2018	2019
Percentage of disadvantaged community population within 15-minutes of an open retail station	12.8%	18.6%	23.0%	23.3%
Number of open retail stations	25	31	39	43
Average daily hydrogen dispensed (fueling demand)	280 kg	1,200 kg	2,600 kg	3,300 kg
Passenger FCEVs in California based on CARB analysis of DMV data (as of October of each year)	925	2,473	5,014	6,826



Pursuit of 100 Hydrogen Stations

New funding solicitation released December 2019 (GFO-19-602)

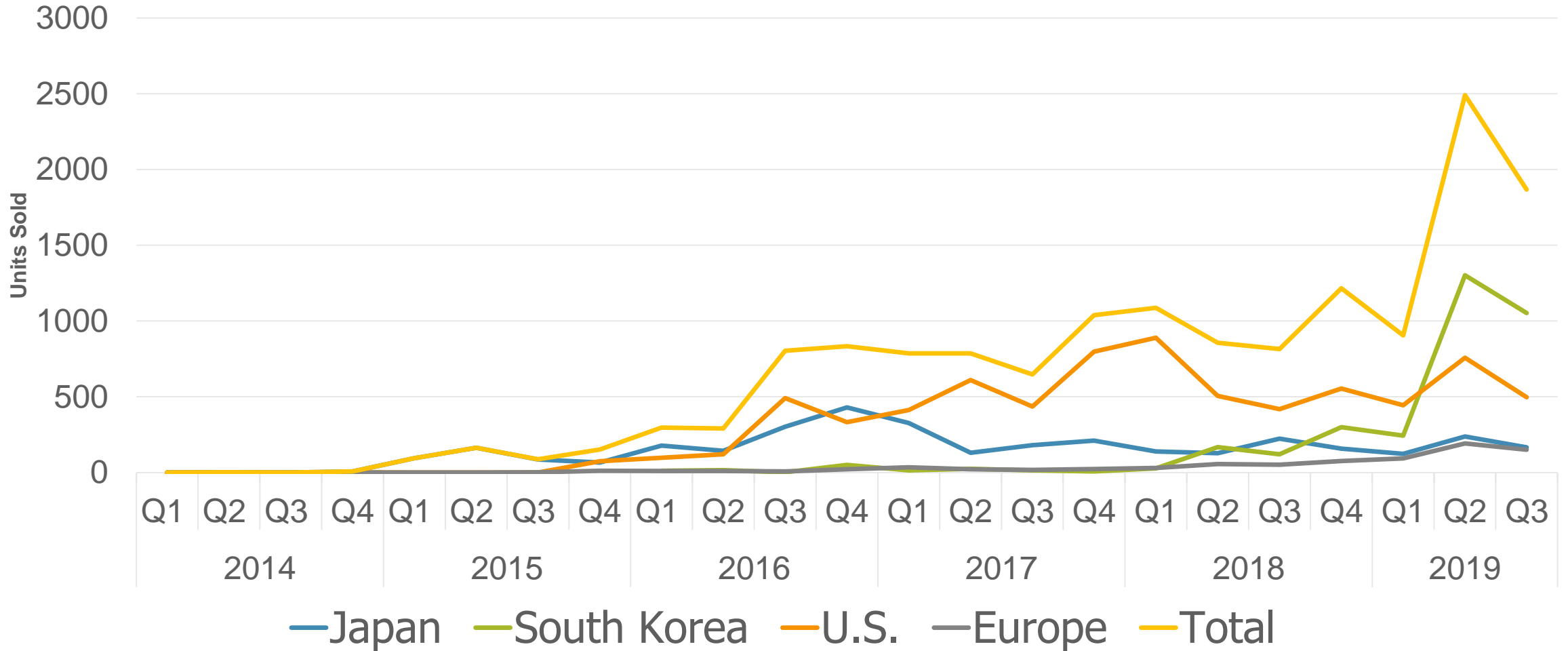
Up to \$115.7 million available, subject to future appropriations and Clean Transportation Program Investment Plan funding allocations

- \$45.7 million from prior funding allocations available
- Anticipate meeting the AB 8 goal of at least 100 publicly available stations with this solicitation



Pursuit of 100 Hydrogen Stations

FCEVs Sales (# of Units Sold)



Source: Bloomberg NEF



A Greater Focus on MDHD



Greater Focus on MDHD FCEVs

Medium- and Heavy-Duty Vehicles key to a Clean Energy Future

- MD/HD vehicles are 3% of CA's vehicles
 - 70% of state's on-road NOx emissions; 45% of on-road PM emissions
 - 21% of on-road GHG emissions
- All new bus purchases by all California transit agencies must be zero-emission buses by 2029 per CARB's Innovative Clean Transit regulation



Greater Focus on MDHD FCEVs

MDHD Hydrogen Demonstrations – Vehicles and Infrastructure

2010: H2 Bus Refueling Station in Emeryville, CA

2010: H2 Bus Refueling Station for AC Transit

2013: 40-foot Fuel Cell Transit Bus operated by SunLine Transit

2014: Fuel Cell Hybrid Electric Walk-In Van Deployment Project (UPS)

2016: Zero Emission Cargo Transport II Project

2018: Renewable H2 Fueling at Scale for Freight at Port of Long Beach



Greater Focus on MDHD FCEVs

Current MDHD Solicitation Concepts

Solicitation Concept	Title	Funding Amount	Concept Workshop
1	Zero-Emission Vehicle (ZEV) Infrastructure Deployment for Advanced Freight Vehicle Demonstrations	\$20 million	TBD
2	ZEV Infrastructure Deployment for Transit Fleets	\$20 million	April 10, 2020
3	Zero-Emission Blueprint for MD/HD Vehicles and Infrastructure	\$3 million	April 2, 2020
4	Hydrogen Fuel Cell Demonstrations in Rail and Marine Applications at Ports	\$6 million	October 2019
5	Innovative Charging and Refueling Solutions	\$4.5 million	TBD
6	Block Grant for MD/HD ZEV Refueling Infrastructure Incentive Projects	\$50 million*	April 2, 2020
	Total Funding Currently Available	\$53.5 million	

*Subject to future appropriations and Clean Transportation Program Investment Plan funding allocations



Low-Carbon Fuel Production





Renewable Hydrogen Production

Category	Funded Activity	2020-2021	Next 2½ FYs
Zero-Emission Vehicles and Infrastructure	Light-Duty Electric Vehicle Charging Infrastructure and eMobility	\$92.7*	\$40.2
	Medium- and Heavy-Duty Zero-Emission Vehicles and Infrastructure	\$20	\$114.8
	Hydrogen Refueling Infrastructure	\$20	\$45
Alternative Fuel Production and Supply	Zero- and Near Zero-Carbon Fuel Production and Supply	\$10	\$25
Related Needs and Opportunities	Manufacturing		\$10
	Workforce Development	\$3.5	\$3
Total		\$146.2	\$238

*FY 20-21: \$51 million one-time legislative expenditure authority to increase EV charging infrastructure



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