

**DOCKETED**

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<b>Project Title:</b>	Electricity and Natural Gas Demand Forecast
<b>TN #:</b>	229045
<b>Document Title:</b>	Light-Duty Vehicle Demand Forecast
<b>Description:</b>	Presentation by Mark Palmere of CEC
<b>Filer:</b>	Raquel Kravitz
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# Light-Duty Vehicle Demand Forecast

Mark Palmere

California Energy Commission

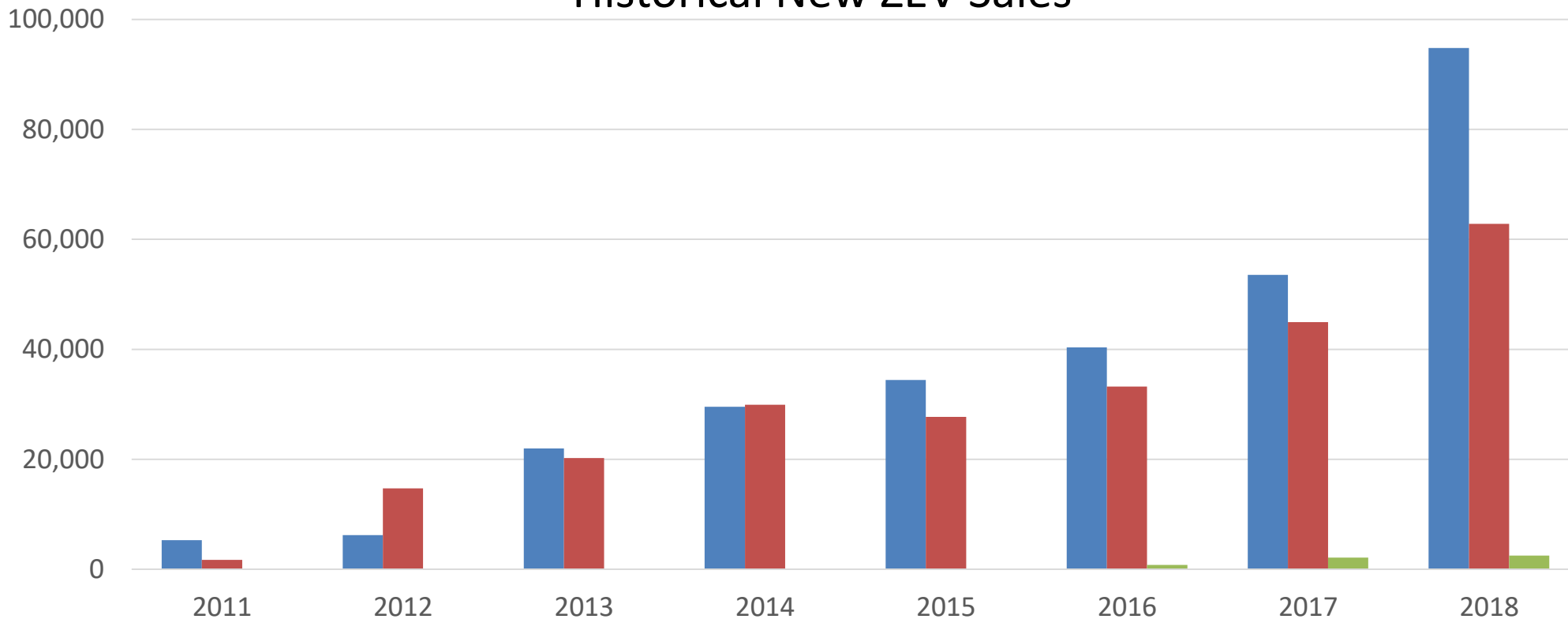
Transportation Energy Forecasting Unit

July 22, 2019



# ZEV Sales Have Been Rising Dramatically

Historical New ZEV Sales



Source: California New Car Dealers Association (CNCDA)

■ BEV ■ PHEV ■ FCV



## ZEVs Rose to Account for 8 Percent of New Vehicle Sales in 2018

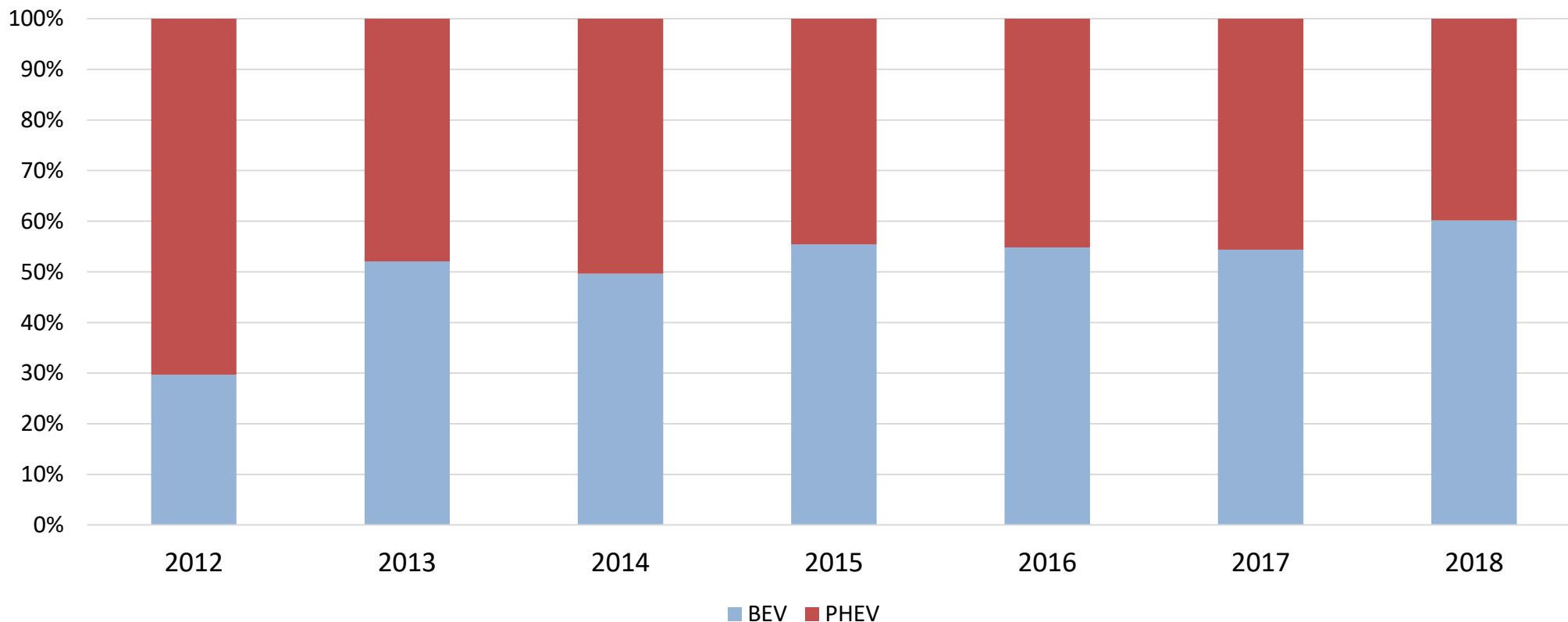
Historical ZEV Share of Total New Vehicle Sales

	2010	2011	2012	2013	2014	2015	2016	2017	2018
BEV	0.02%	0.43%	0.41%	1.28%	1.60%	1.68%	1.93%	2.62%	4.74%
PHEV	0.00%	0.14%	0.96%	1.18%	1.62%	1.35%	1.59%	2.20%	3.14%
FCV	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.10%	0.12%



# BEVs Have Begun Outselling PHEVs

## Historical Light Duty PEV New Vehicle Sales Fuel Type Ratio



Source: California New Car Dealers Association (CNCDA)



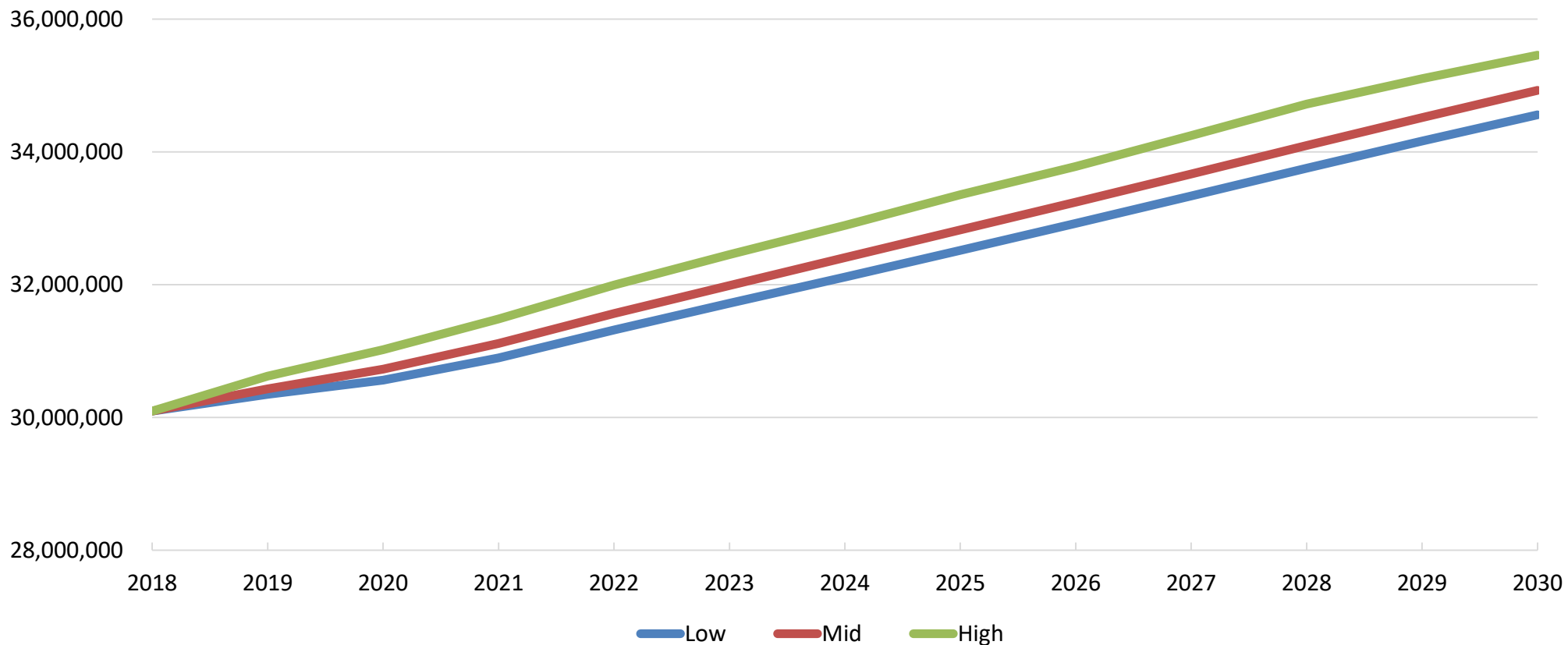
# Vehicle Attributes Inform CEC Forecasts of New Vehicle Sales

- Attributes used in “vehicle choice” decisions
- Account for regulatory requirements
- Base year and projections through 2030
- Light-duty vehicle attributes
  - Range
  - Retail Price
  - Fuel Economy
  - Acceleration
  - # of Makes/Models
  - Refueling Time
  - Maintenance Costs
  - Cargo Capacity



# Light-Duty Vehicle Population Rises With Population and Income

Total Light-Duty Vehicle Population Forecast

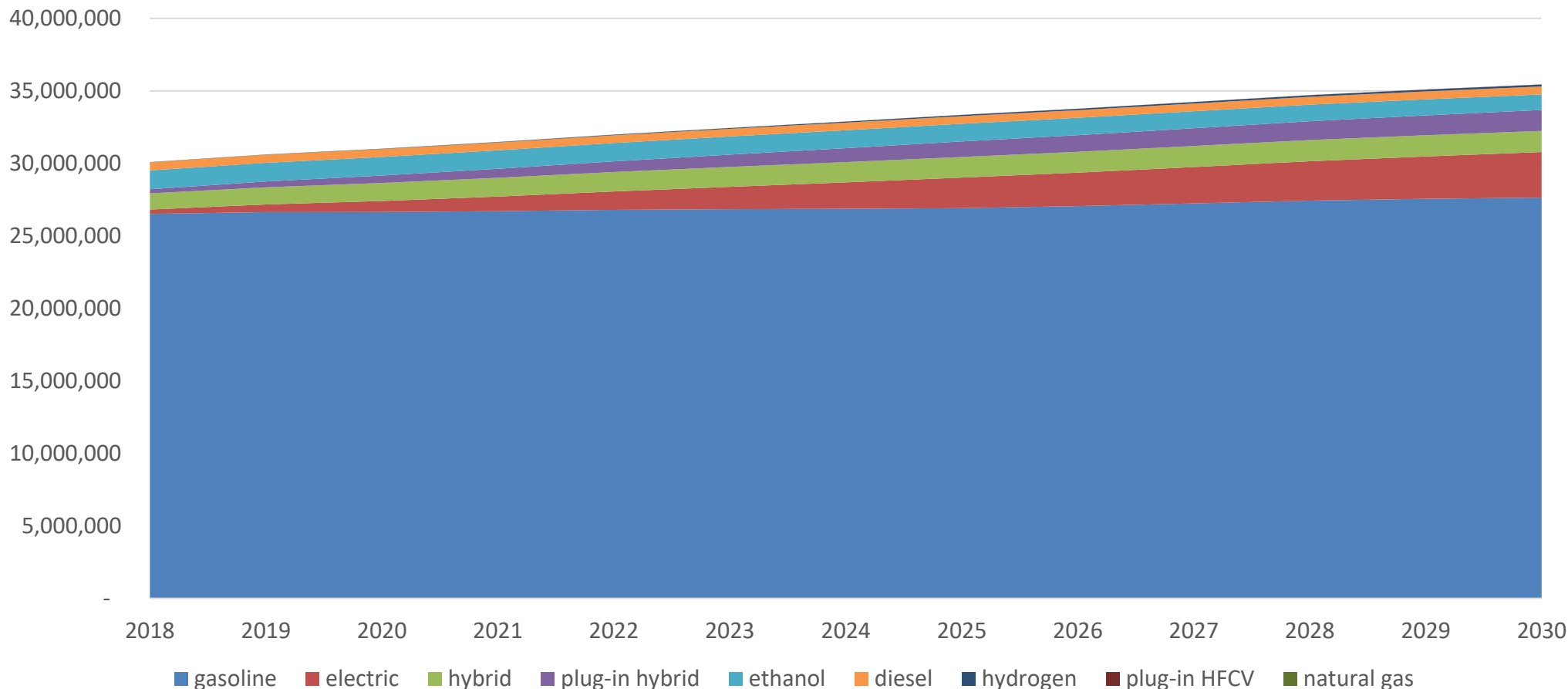


Source: California Energy Commission



## Gasoline Continues to be Most Popular Fuel Type, But Electric Continues to Increase

### Light Duty Vehicle Population Forecast by Fuel Type, High Case







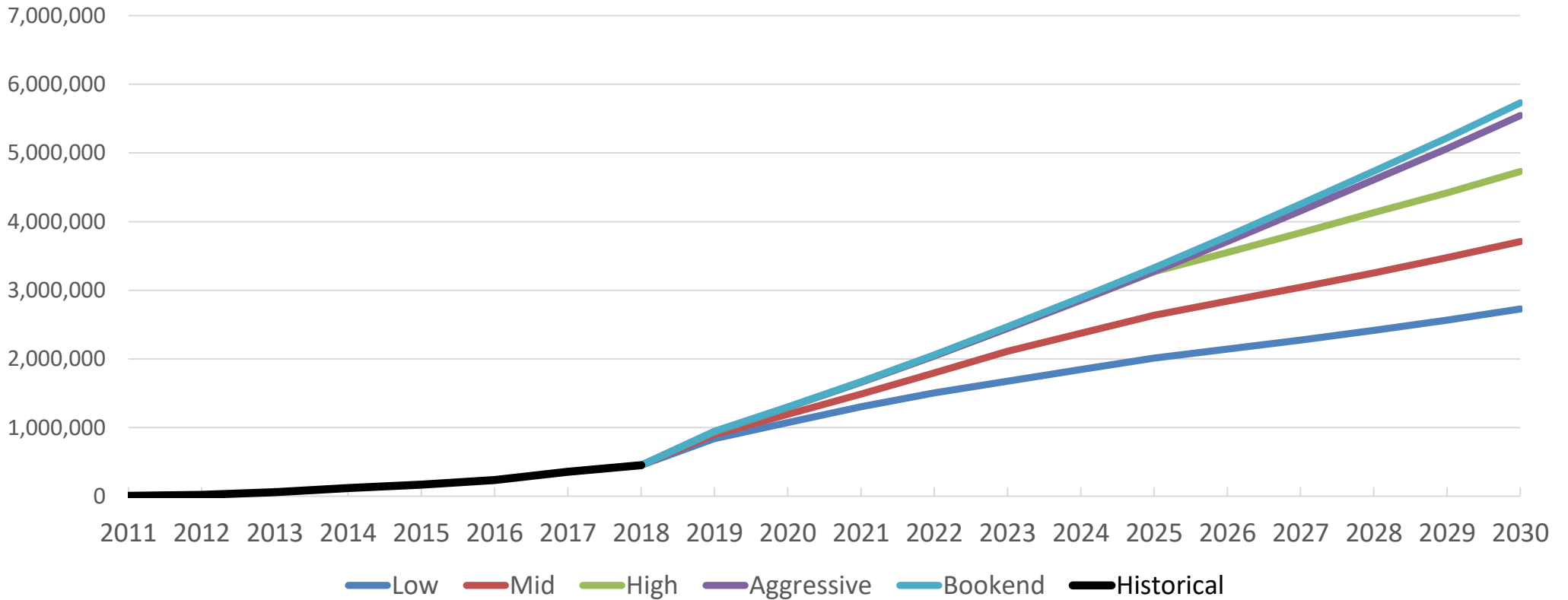
# 2019 IEPR Scenarios Reflect Expectations of Market

INPUTS	ZEV SCENARIOS, 2019				
	Low	Reference	High	Aggressive	Bookend
<b>PREFERENCES</b>					
<b>Consumers' PEV Preference</b>	Constant at 2017 Level	Increase with PEV market growth	Increase with PEV market growth	Increase with PEV market growth	Increase with PEV market growth
<b>INCENTIVES</b>					
<b>Federal Tax Credit</b>	Decreasing starting 2019, Eliminated after 2022	Decreasing starting 2019	Decreasing starting 2019	Decreasing starting 2019	Decreasing starting 2019
<b>State Rebate</b>	To 2025	To 2025	To 2025	To 2030 for BEV/FCV	To 2030 for BEV/FCV
<b>HOV Lane Access</b>	To 2021	To 2023	To 2025	To 2025 for PHEV, to 2030 for BEV/FCV	To 2025 for PHEV, to 2030 for BEV/FCV
<b>ATTRIBUTES</b>					
<b>Availability of PEVs (in 2030)</b>	PEV models available in 11 of 15 BEV and 14 of 15 PHEV classes	PEV models available in 12 of 15 BEV and 14 of 15 PHEV classes	PEV models available in 13 of 15 BEV and 14 of 15 PHEV classes	PEV models available in 13 of 15 BEV and 14 of 15 PHEV classes	Models available: BEV in 15, PHEV in 14, FCV in 8, PHFCV in 7 CEC LDV classes
<b>Vehicle / Battery Price (by 2030)</b>	PEV prices based on battery price declining to ~\$120/kWh	PEV prices based on battery price declining to ~\$100/kWh	PEV prices based on battery price declining to ~\$80/kWh	PEV prices based on battery price declining to ~\$70/kWh	PEV prices based on battery price declining to ~\$70/kWh
<b>Max Range (Midsize, 2030)</b>	~333 miles	~341 miles	~341 miles	~341 miles	~341 miles
<b>Refuel Time (2030)</b>	15 -21 min	15 -21 min	10-16 min	10-16 min	10-16 min
<b>Time to Station (2030)</b>	7-8 min	Same as gasoline	Same as gasoline	Same as gasoline by 2025	Same as gasoline by 2025
<b>FORECAST RESULTS</b>					
<b>2030 ZEV Population</b>	2.7 million	3.7 million	4.7 million	5.5 million	5.7 million



## ZEVs Surpass 3.5 Million in Mid Case, 4.5 Million in High Case

Preliminary ZEV Stock Forecast, Statewide

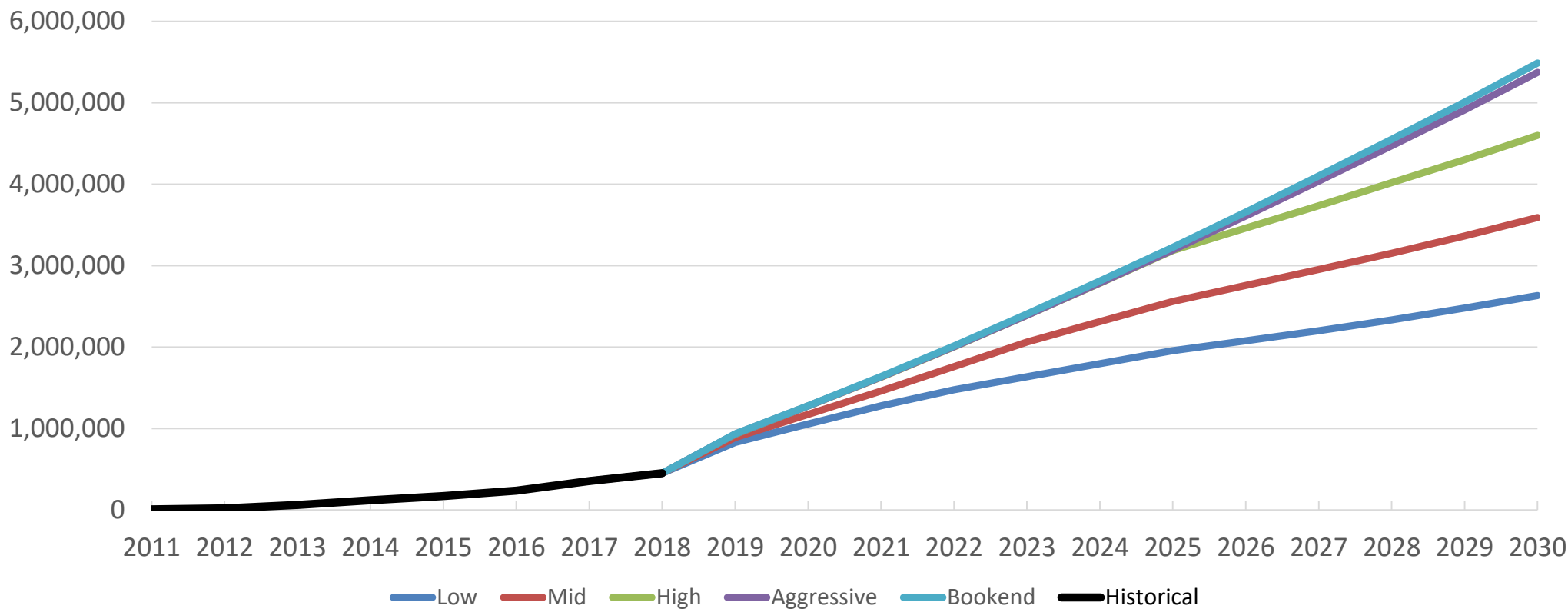


Source: California Energy Commission



# PEVs Make Up Vast Majority of ZEV Population

Preliminary PEV Stock Forecast, Statewide

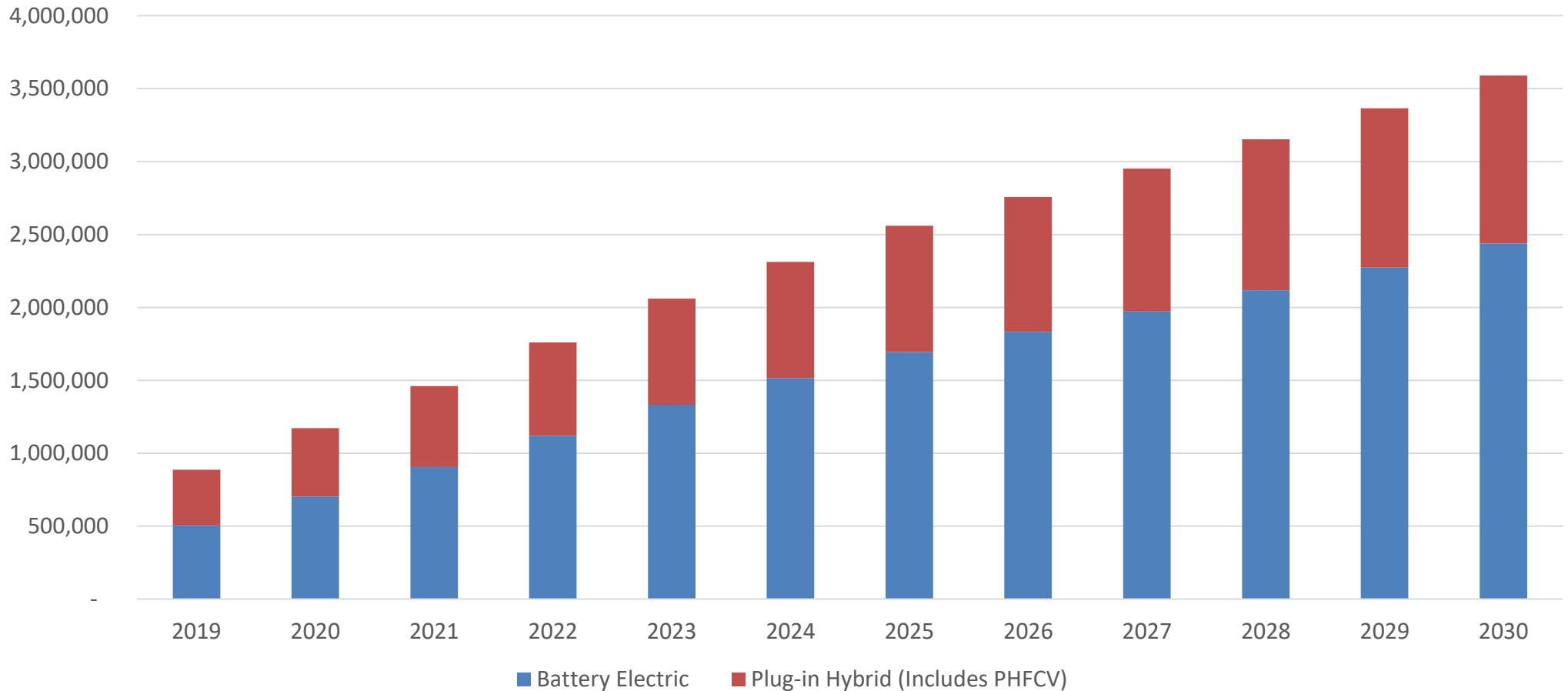


Source: California Energy Commission



# BEVs Increase Margin Over PHEVs

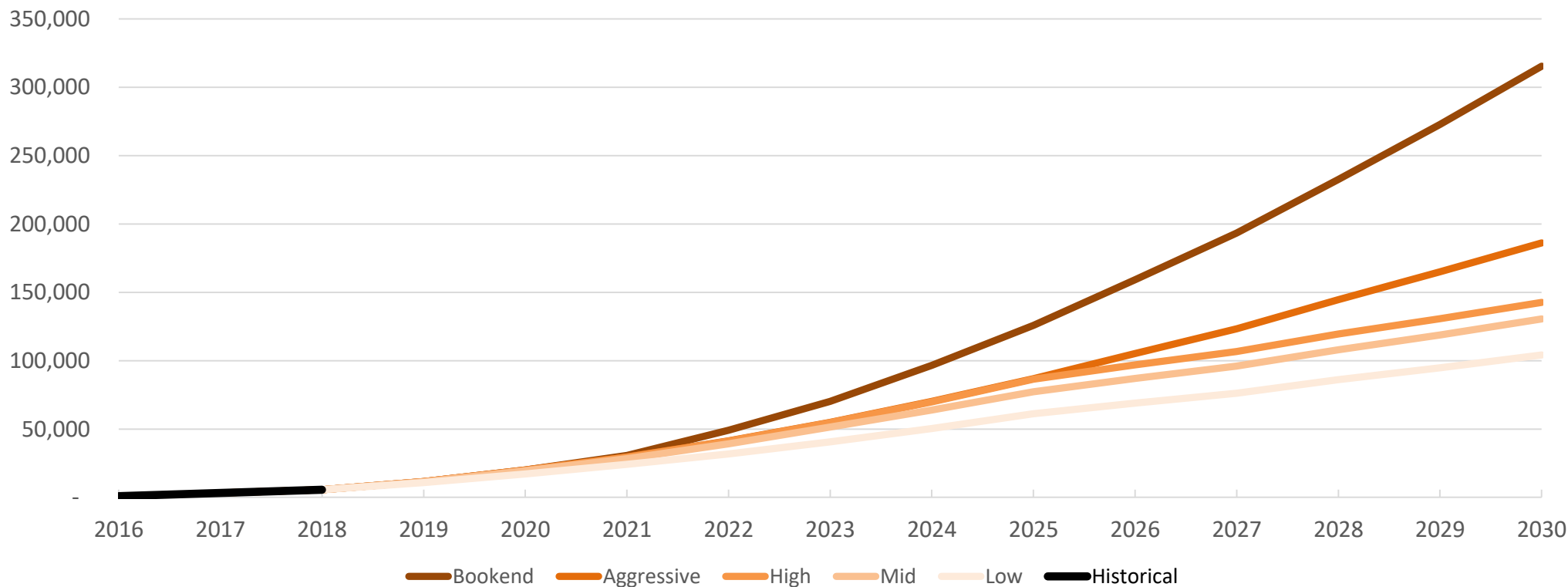
Forecast PEV Stock by Fuel Type, Mid Case





# Fuel Cell Vehicles Make Inroads in LDV Market

Preliminary Hydrogen Vehicle Stock Forecast, Statewide



Source: California Energy Commission



# Comments? Questions?

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