



California Energy Commission

Demand Analysis Working Group

Update on PEV Forecasting Scenarios

August 2, 2018

Aniss Bahreinian

Demand Analysis Office

Energy Assessments Division

Aniss.Bahreinian@energy.ca.gov / 916-653-0381



Energy Commission Transportation Demand Cases

Cases represent different levels of transportation electricity demand

Demand Case	Population	Income	Fuel Prices	
			Petroleum Fuels	Electricity / Natural Gas / Hydrogen
High Demand	High	High	High	Low
Mid	Mid	Mid	Mid	Mid
Low Demand	Low	Low	Low	High



2017 PEV Scenarios Need Revisions

INPUTS	PEV SCENARIOS				
	Low	Mid	High	Aggressive	Bookend
PREFERENCES					
Consumers' PEV Preference	Constant at 2017 level	Increase with PEV Market Growth	Increase with PEV Market Growth	Increase with PEV Market Growth	Increase with PEV Market Growth
INCENTIVES					
Federal Tax Credit	Eliminated after 2019	Decreasing starting in	Decreasing starting in	Constant Through 2030	Constant Through 2030
State Rebate	To 2020	To 2025	To 2025	To 2030	To 2030
HOV Lane Access	To 2021	To 2025	To 2025	To 2025 for PHEV / 2030 for EV	To 2025 for PHEV / 2030 for EV
ATTRIBUTES					
Availability of PEVs (in 2030)	PEV models available in 11 of 15 CEC LDV classes	PEV models available in 11 of 15 CEC LDV classes	PEV models available in 11 of 15 CEC LDV classes	PEV models available in 13 of 15 CEC LDV classes	PEV models available in all CEC LDV classes
Vehicle / Battery Price (by 2030)	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 ~\$89/kWh	PEV prices based on battery price declining to ~\$73/kWh	PEV prices reach parity with gasoline vehicles
Avg. Range (2030)	~ 230 miles	~ 230 miles	~ 270 miles	~ 270 miles	~ 270 miles
Refuel Time (2030)	15 - 21 min	15 - 21 min	10 - 16 min	10 - 16 min	Same as Gasoline
Time to Station (2030)	7 - 8 min	Same as gasoline	Same as gasoline	Same as gasoline	Same as gasoline by 2025
FORECAST RESULT					
PEV STOCK in 2030	2.6 mil	3.3 mil	3.9 mil	5.3 mil	5.9 mil
Cost of State Rebate Extension to 2030	-	-	-	\$7.1 billion	\$8.2 billion



DAWG Survey Respondents' Expectations

- Slight improvement in fuel economy,
- Half the participants expected, in 2025, vehicle range for cars and light trucks between 200-300 miles.
- CVRP to expire in 2025, or even earlier,
- Federal tax credit is somewhat to very likely to expire,
- HOV access for BEVs will possibly be eliminated
- Elimination of HOV lane access for PHEVs is slightly likely.
- Consensus on the availability of in at least one PEV model by 2025, in every class except for large vans and standard pickups, about which there were differing opinions.
- Price parity to occur either within 3-5 years, for cars, and by 2029 for light trucks.
- The average number of PEV models expected to be available was 105, in 2030.
- Average level II cost per kWh, in 2030, projected to be between 16 and 20 cents, and between 31 and 35 cents for DC Fast Charging. More discussions necessary.



New 2018 Policy Considerations

- ZEV Executive Order: More funding for rebates to support the 2025 goals (adjust low case) and more charging stations (lower time to station).
- CAFÉ Standard proposed changes: MPG standards held constant at 2021 level, in the low case (impact on other attributes not accounted for). **Preliminary test shows that holding the standard at the 2021 level (but without change in California ZEV mandate) will have very small but negative impact on ZEV, and positive impact on conventional vehicle demand.**
- Steel/Aluminum Tariffs: on Steel, aluminum, imported automobiles and automotive parts, higher vehicle prices in the low case. **Literature shows an impact of less than \$200 increase in price of a \$30,000 vehicle, may result from 25% steel tariffs and 10% aluminum tariff.**



2017 Domestic Brand Market Share

LDV Type	Brand	Volume	Market Share
BEV		45,449	
	Domestic	13,108	29%
	Foreign	15,704	35%
	Tesla	16,637	37%
PHEV		41,677	
	Domestic	19,410	47%
	Foreign	22,267	53%
All LDV	Detroit Three		*29%

Source: Energy Commission and CNCDA*, 2018 Report <https://www.cncda.org/news/2018-quarter-1/>



Our PEV Scenario Expectations

- The low will scenario will be lower, and the high scenario will be higher, generating a greater range of forecast compared to 2017 forecast.
- Battery pack prices will be lower, in the high case; close to what was used in the 2017 aggressive scenario
- Time to station will be lower, in the high scenario,
- MPG will be held constant, after 2021, in the low scenario.
- Trade war will persist, till 2024, in the low scenario.