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Filer:	Raquel Kravitz
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PEV Forecasting Approach

IEPR Commissioner Workshop on the 2017 California Energy Demand Preliminary Electricity Demand Forecast

August 3, 2017

Aniss Bahreinian

Transportation Energy Forecasting Unit

Demand Analysis Office

Energy Assessments Division

Overview

Purpose

Focus on methodology elements of the California forecasts, including scenario definitions:

- California Utilities
- CEC Forecasting Approach

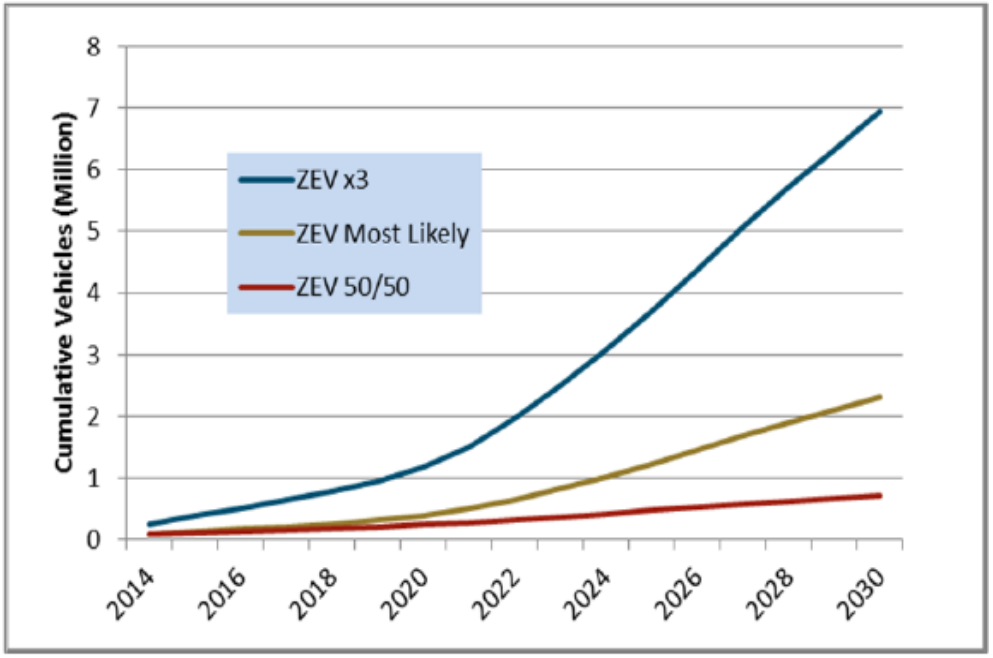
California Utilities

Utilities' PEV projections, to varying degrees, rely on:

- Achieving the existing state policies' goals
- 2014 CalETC's Transportation Electrification Assessment (TEA) study by ICF
- Navigant's forecast of technology market shares.
- 2016 Energy Commission IEPR Update
- TEA study's high PEV scenario is based on 3 times ZEV (2012) growth in 2025.

Transportation Electrification Assessment (TEA) Study: ZEV (2012) Based Scenarios

In line with Current Adoption (Low): ZEV Compliance (Assuming a 50/50 split between PEVs and Fuel Cell Vehicles.)
In Between (Mid): ZEV Program "Most Likely Compliance" Scenario
Aggressive Adoption (High): ZEV Program "Most Likely Compliance" Scenario x 3



Source: ICF, California Transportation Electrification Assessment, September 2014
http://www.caletc.com/wp-content/uploads/2014/09/CalETC_TEA_Phase_1-FINAL_Updated_092014.pdf

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

CEC Light Duty Vehicle Forecast

Light duty vehicle demand forecast is based on:

- Economic & demographic forecasts.
- The CEC's 2016-2017 residential and commercial surveys of consumer preferences (conducted by Resources Systems Group, RSG).
- Updated LDV models based on survey results.
- Latest projections of vehicle attributes, accounting for announced/projected technology developments in 2017 and beyond.

CEC Model

- Based on discrete choice analysis, developed by McFadden at UC Berkeley.
- Derived from economic theory (Random Utility).
- McFadden used this analysis to predict BART ridership for Bay Area before it was built.
- The model has many applications in transportation, energy & marketing.
- Survey data is used to update the model.

Determinants of Technology/Fuel Type Choice (1)

Consumer Preferences

- Preferences for Technology/Fuel Type: accounts for substitution between different technology/fuel types.
- Preferences for Vehicle Class: accounts for substitution between different Classes of vehicles.

Government Incentives

- State Rebate
- Federal Tax Credits
- HOV Lane Access

CEC Vehicle Technology Introduction Schedule: Preliminary Forecast

	Class	Gasoline	Hybrid	PHEV	EV	FCV	Diesel	FFV
1	Subcompact						2017	
2	Compact					Mirai		
3	Midsize					Clarity (2017)		
4	Large						2017	
5	Sport		2017		2020		2015	2015
6	Crossover - Small Car			2019	2016			
7	Crossover - Small Truck						2015	
8	Crossover - Mid			2019			2016	
9	Sports Utility - Compact			2020	2019		2017	
10	Sports Utility - Midsize			2020				
11A	Sports Utility - Large							
12	Van Compact		2019	2017				
13A	Van - Large			2020				
14	Pickup - Compact		2020			2023	2016	
15A	Pickup - Standard		2017					

Exists 2015 - 2030

Introduced — YEAR

Eliminated — YEAR

Never Introduced

Determinants of Technology/Fuel Type Choice (2)

Vehicle Attributes

- Vehicle Price
- Fuel Economy
- Cost per Mile
- Maintenance Cost
- Range
- Acceleration
- Cargo Capacity
- Number of Makes & Models
- Refueling Time

Infrastructure

- Time to Fuel Station

Questions?

Aniss.Bahreinian@energy.ca.gov