DOCKETED

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Publicly Owned Utilities & Transportation Electrification

California Energy Commission
Lead Commissioner Workshop

Oct 5, 2016

Philip Sheehy,
Technical Director

Agenda

- **Review California Transportation Electrification Assessment**
- **Notes from the Ground**
- **Questions**

California Transportation Electrification Assessment

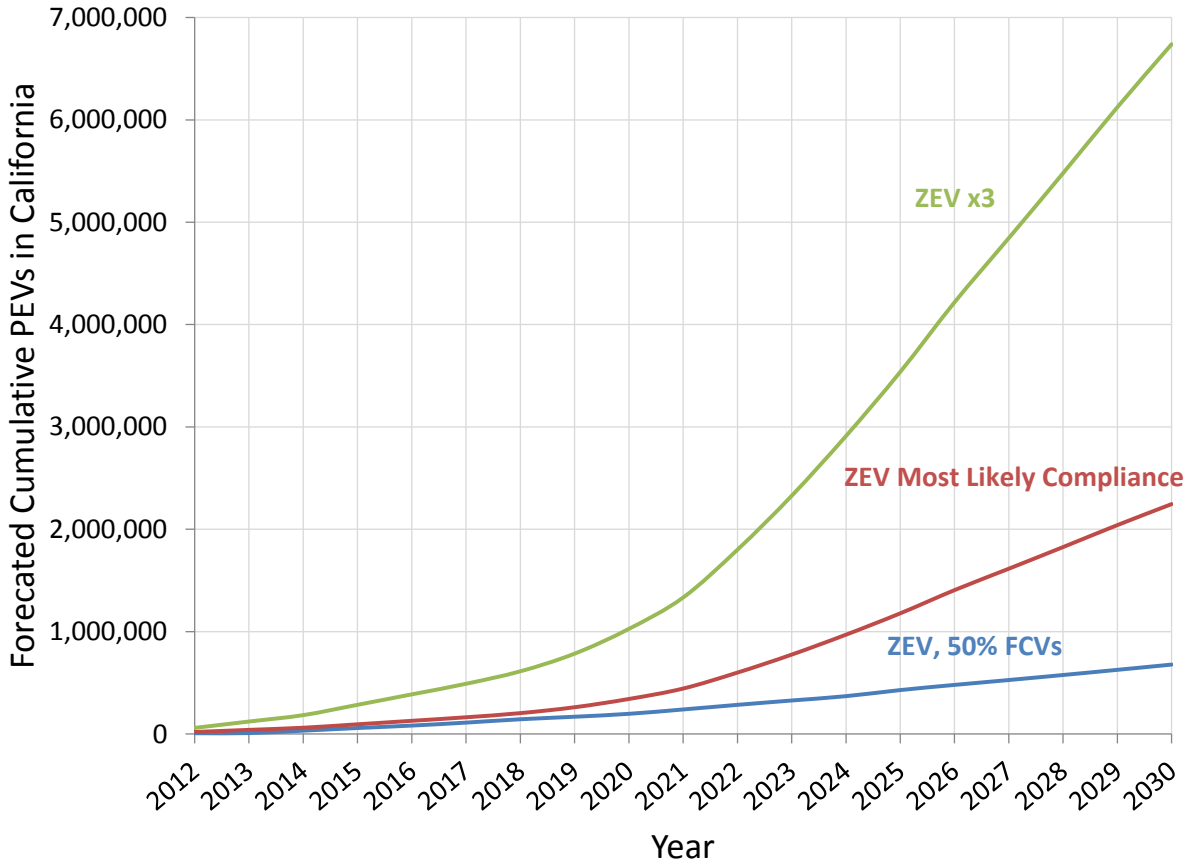
Brief Overview of Findings

Overview

- **Who: ICF + E3 (Phase 2) + EPRI (Phase 3)**
- **Client: California Transportation Electrification Coalition**
- **Engaged Stakeholders: PG&E, SCE, SDG&E, SMUD, City of Palo Alto, LADWP, and CMUA members**
- **What: Market Sizing & Cost/Benefit (Phase 1) and Grid Impacts (Phase 2)**
  - Market Sizing: What does the market look like out to 2030? (18 segments covered)
  - Cost/Benefit: What are the costs and benefits of transporation electrification?
  - Grid Impacts: Is there a case for utility investment in infrastructure?

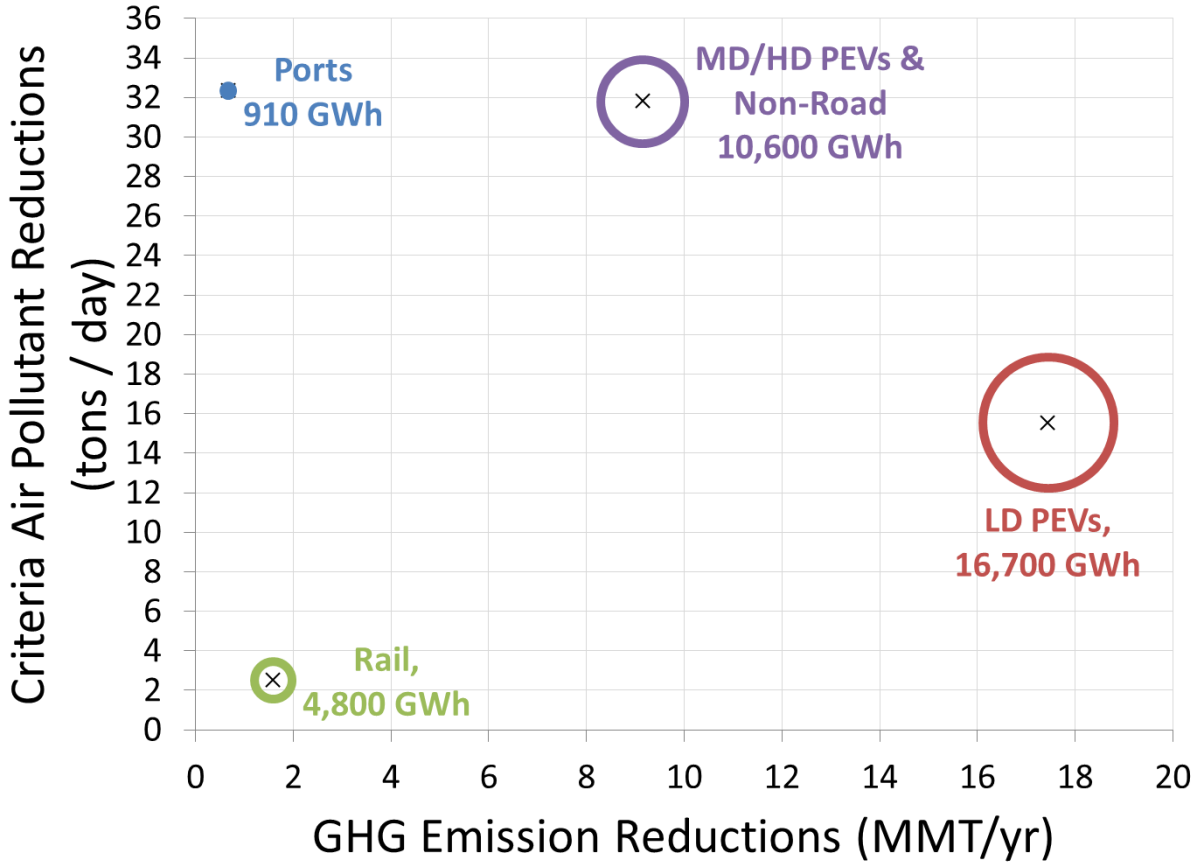
Market Sizing

RANGE OF PEV ADOPTION SCENARIOS CONSIDERED



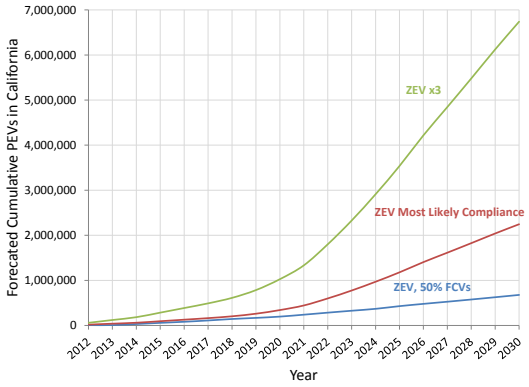
Benefits

AGGRESSIVE ADOPTION BY 2030

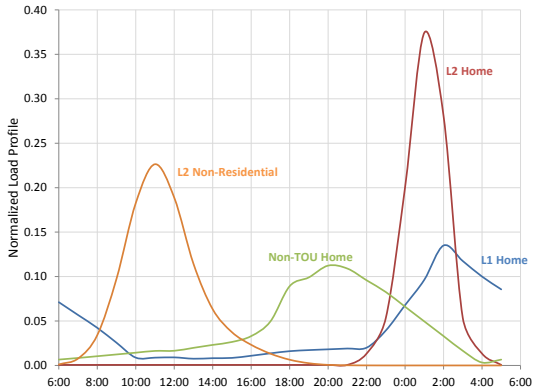


Grid Impacts

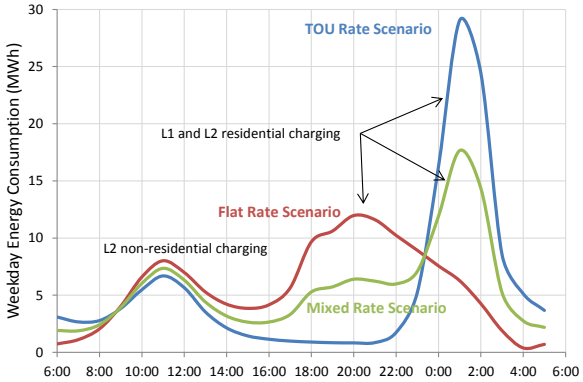
Vehicle Forecast



Load Shapes



Rate Scenario



Energy Consumption

Vehicle Type	VMT		eVMT		Energy Consumption (kWh)					
					Daily			Annual		
	Daily	Annual	Daily	Annual	Res	NonRes	Total	Res	NonRes	Total
PHEV10	41.0	14,965	10.0	3,650	2.8	0.7	3.5	1,022	256	1,278
PHEV20			20.0	7,300	5.6	1.4	7.0	2,044	511	2,555
PHEV40			30.6	11,169	8.6	2.1	10.7	3,127	782	3,909
BEV	29.5	10,768	29.5	10,768	8.3	2.1	10.3	3,016	754	3,770

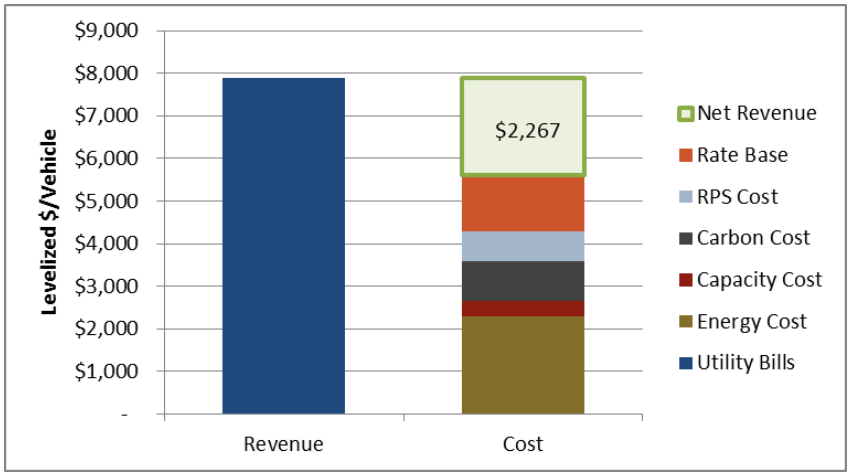
Developed modification for each scenario whereby the eVMT for each PEV-type is increase by one mile per day per year, not to exceed 39 daily VMT. Additional charging is assumed to happen on commercial circuits.

Grid Impacts (ctd)

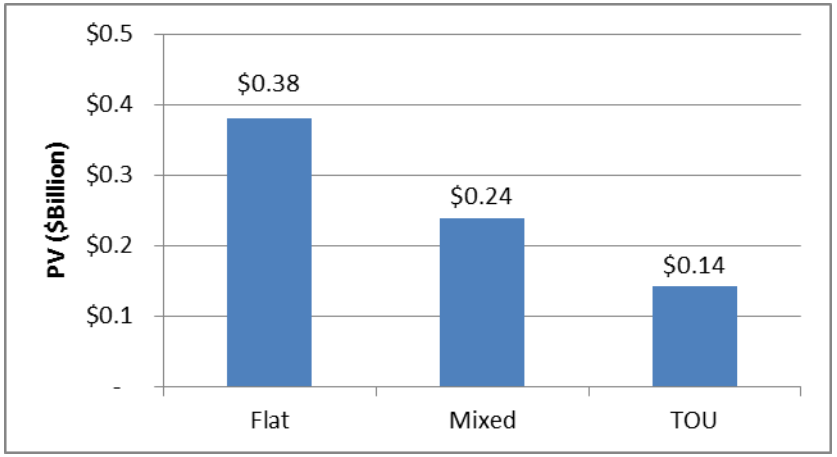
KEY FINDINGS

- **PEV provide environmental and societal benefits**
- **PEVs will reduce rates for all customers**
- **PEVs pass CARB and CPUC cost-effectiveness tests**

LOAD BENEFITS TO RATEPAYERS



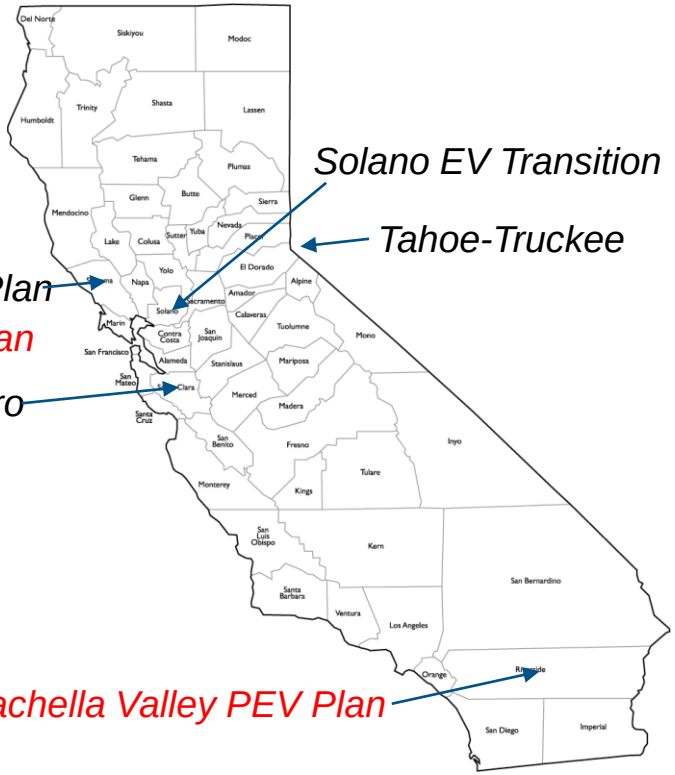
DISTRIBUTION UPGRADE COSTS



Where to Jump In?

Some Thoughts from the Ground

ICF Project Engagements



Solano EV Transition

Tahoe-Truckee

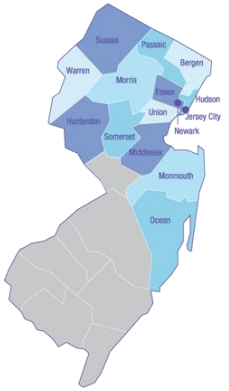
Sonoma Shift Plan

Bay Area PEV Plan

Driving to Net Zero

Coachella Valley PEV Plan

North Jersey Alternative Fuel Infrastructure

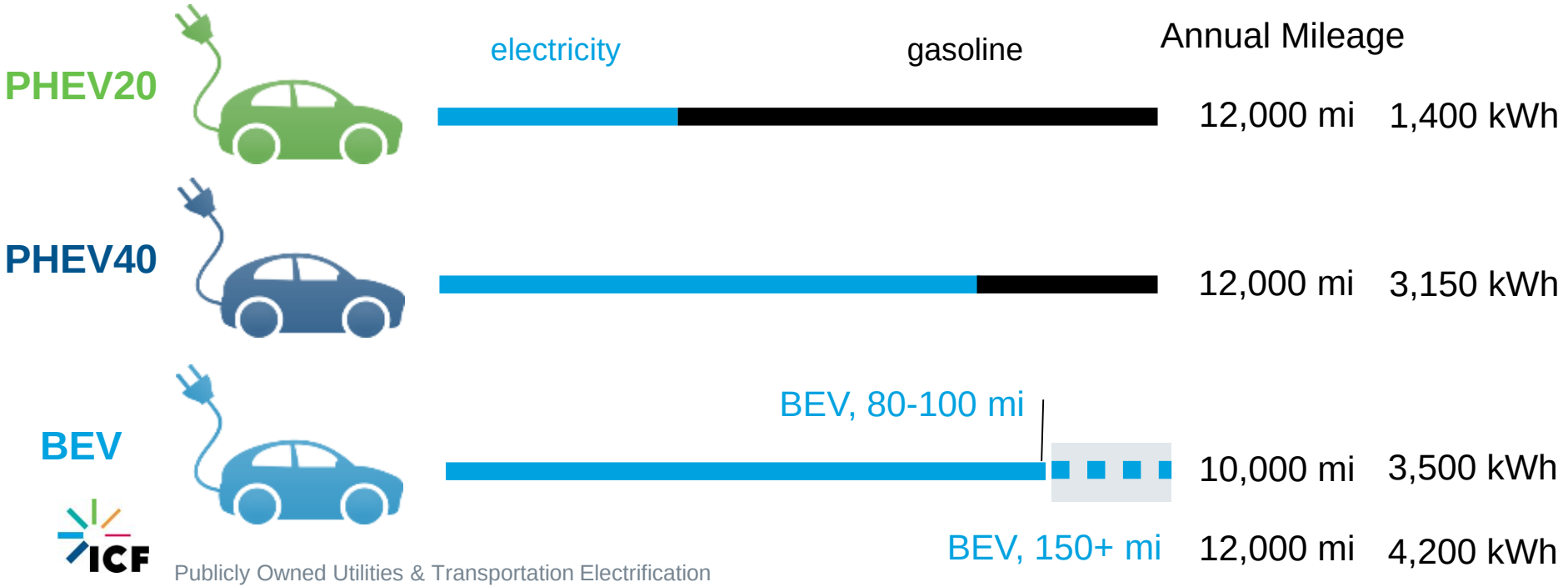


Ready to Roll! Southeastern Pennsylvania

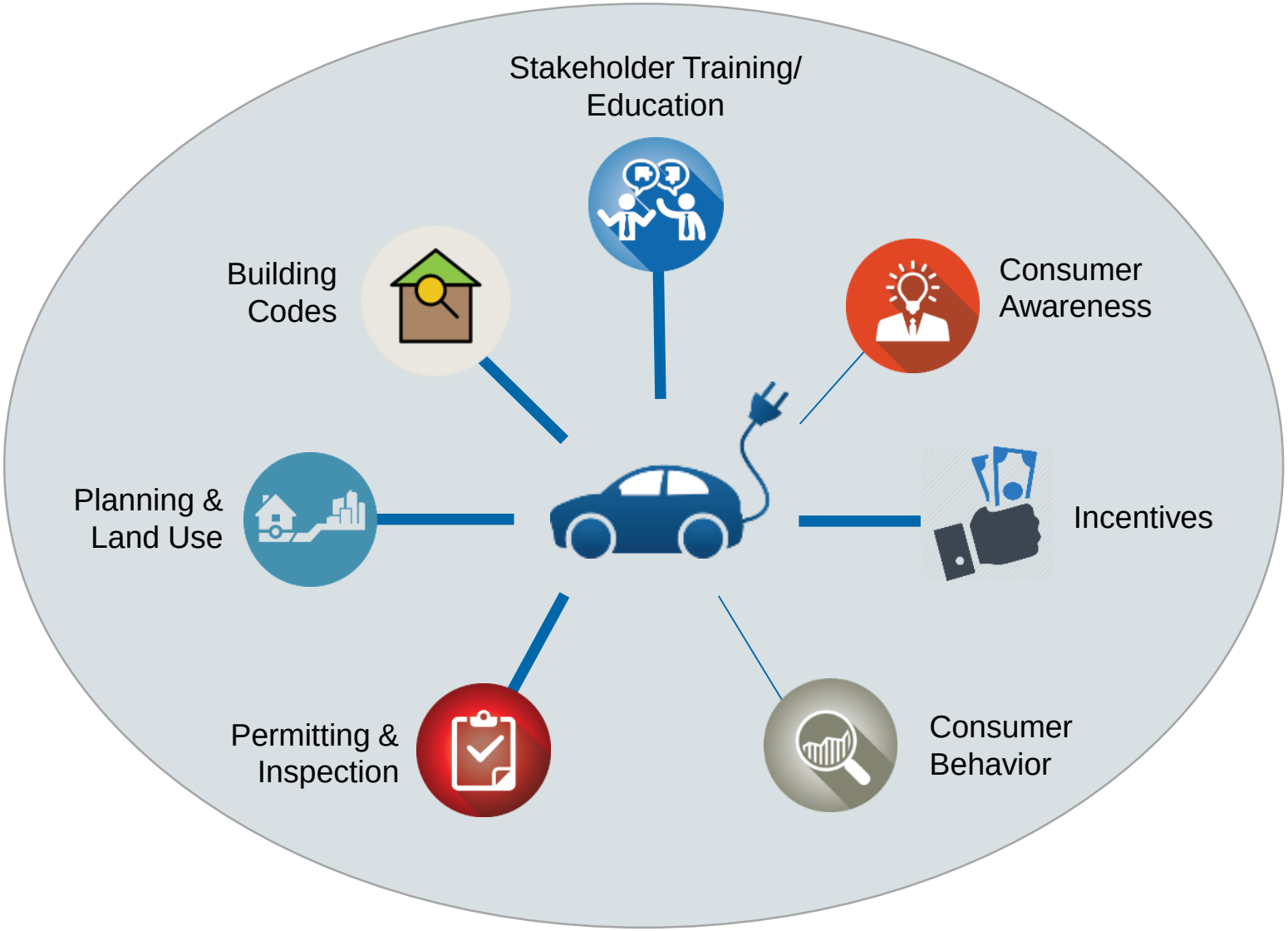
Apart from the shameless plug, this slide is more of a disclaimer: The views expressed are ICF's alone; further, they are neither reflective of any single engagement nor should they be misconstrued to represent those of an agency listed above.

Charging / Driving Behavior

- **How and where are people charging their vehicles?**
  - Considerable variation across vehicle architectures
- **PHEV owners are driving their vehicles just as much as other vehicle owners are driving their conventional vehicles**
- **BEV owners with range of 80-100 miles drive their vehicles less than other vehicle owners.**



Review of Core Elements of Readiness Planning



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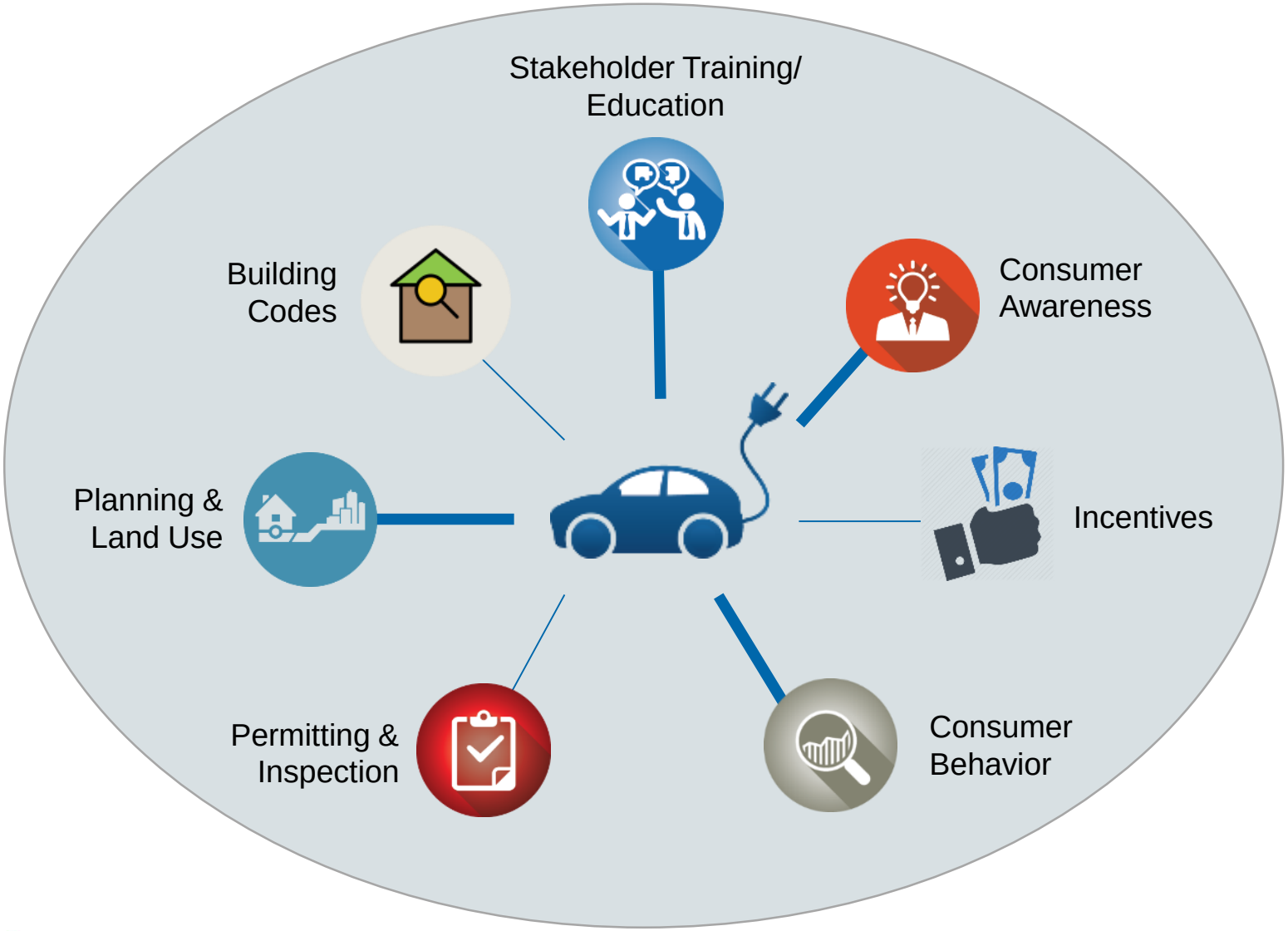
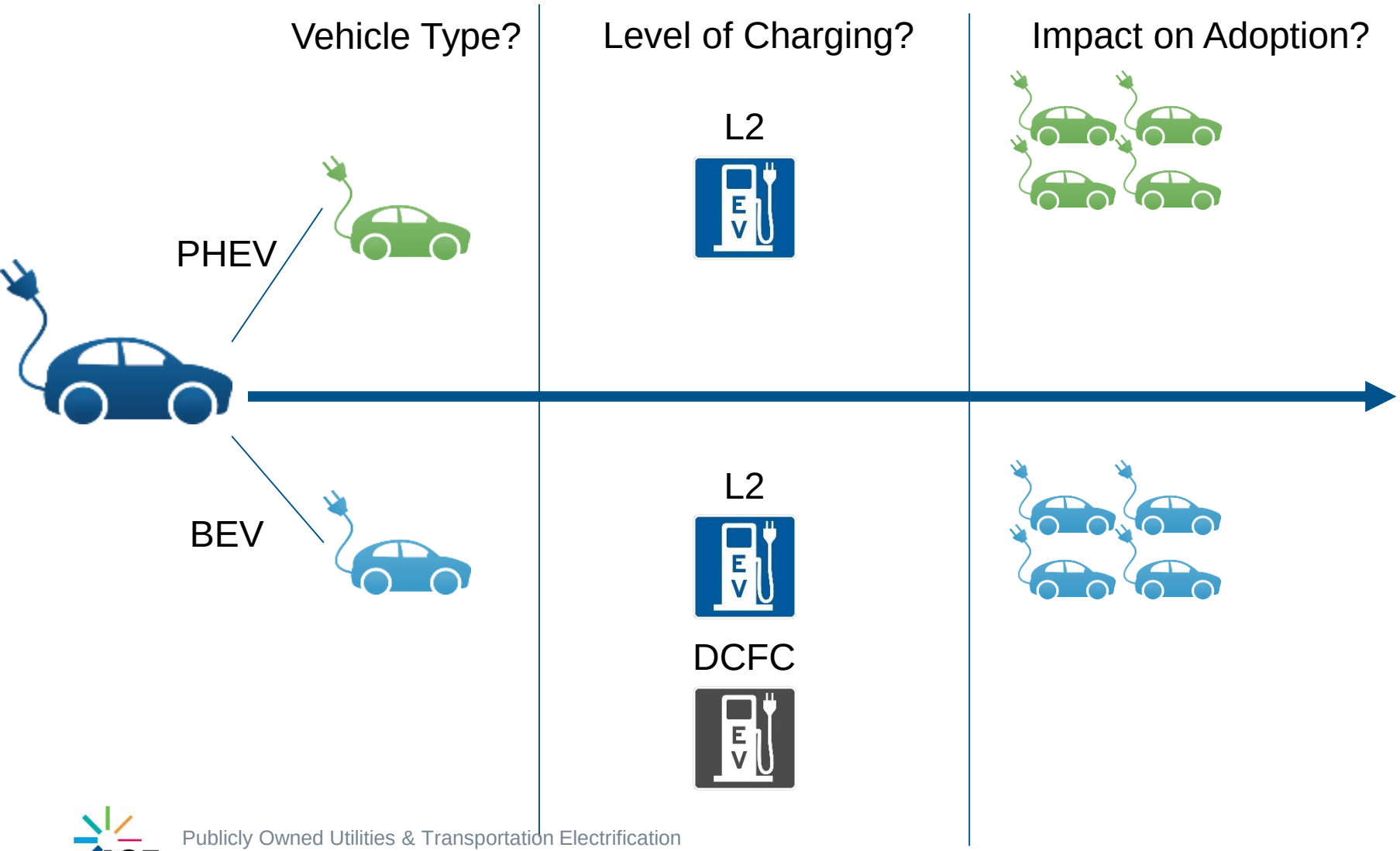


What are the Real Challenges Facing the Market?



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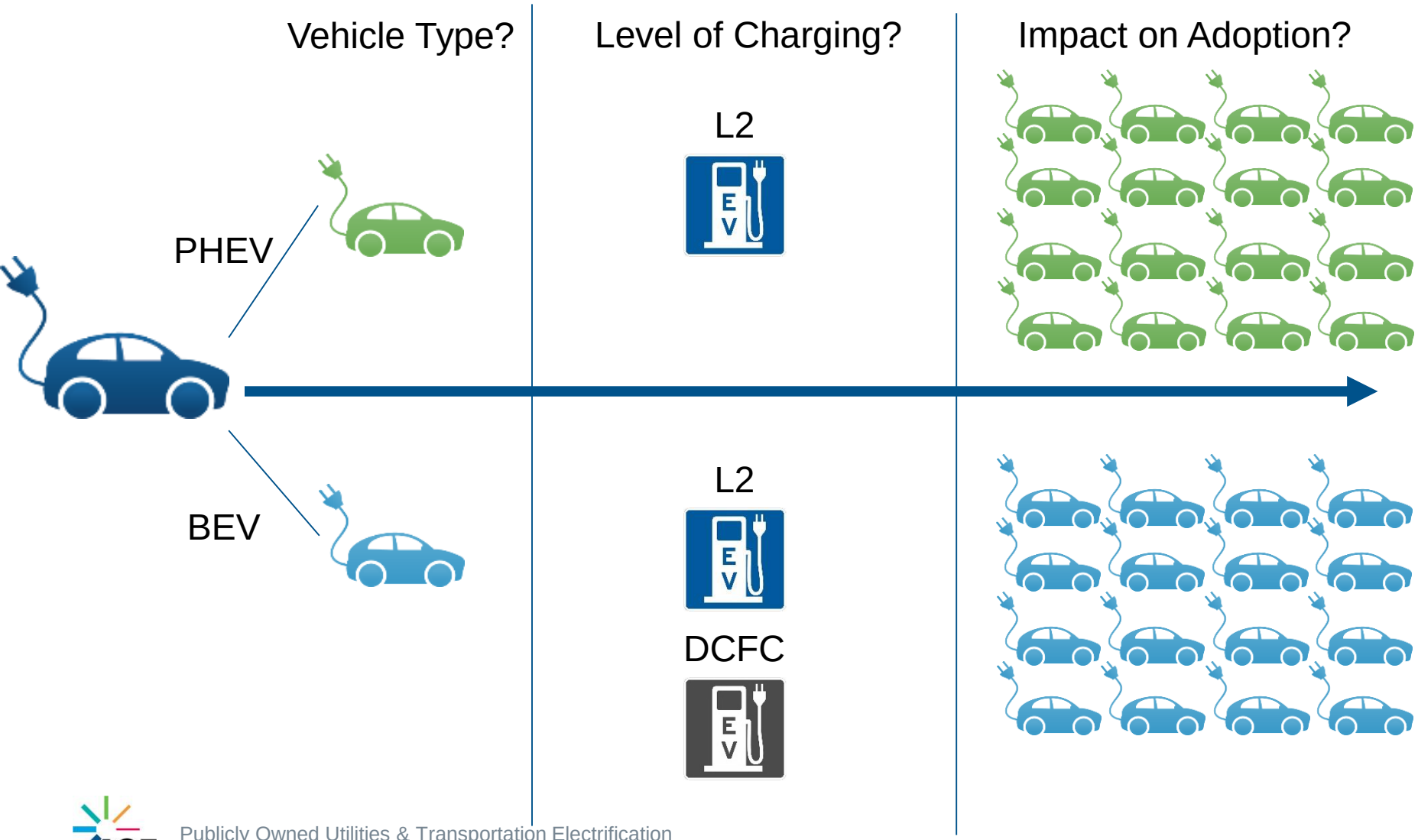
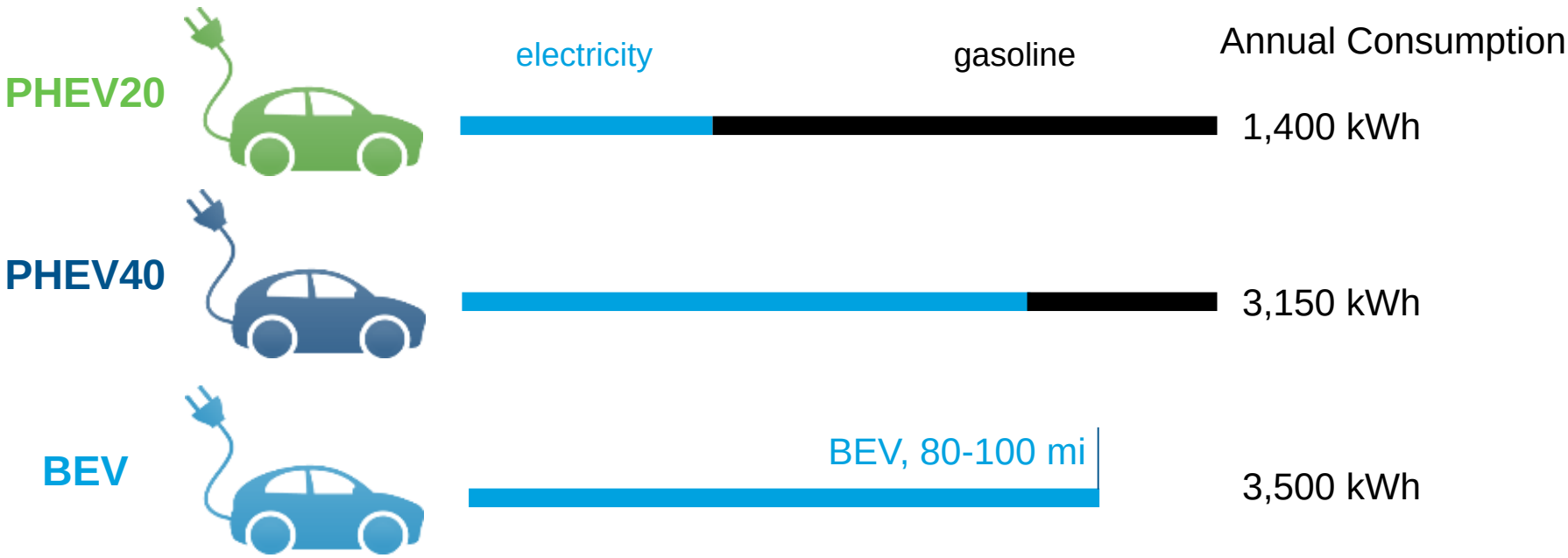
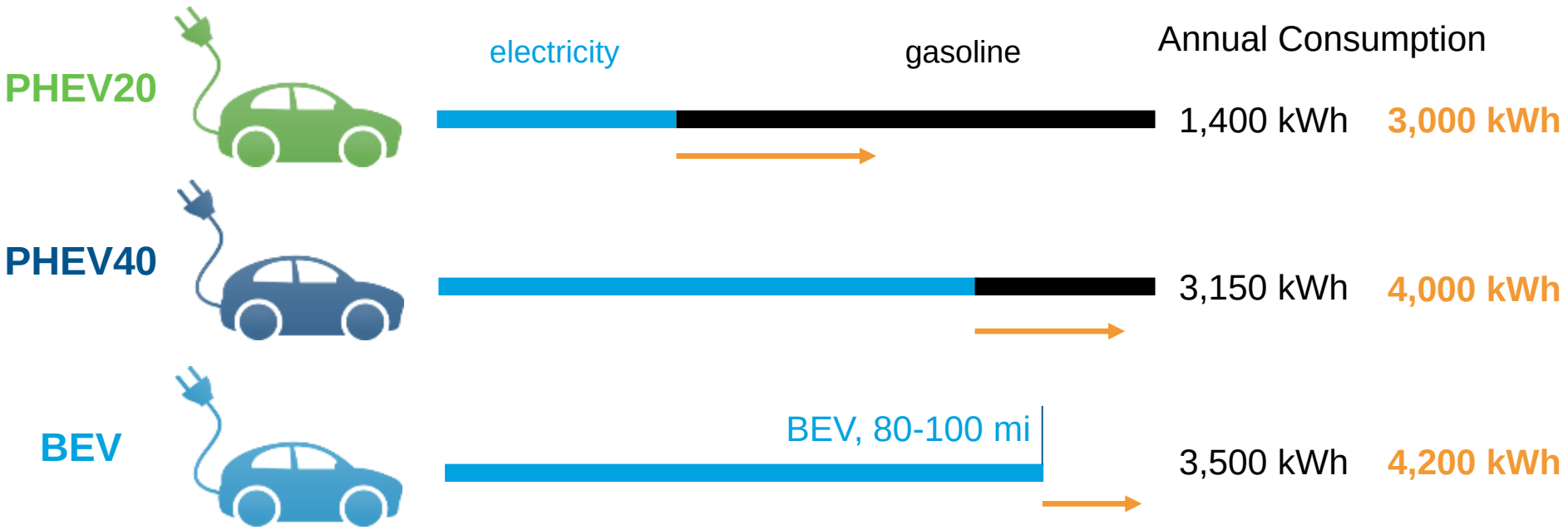


Thinking beyond accelerating adoption



Thinking beyond accelerating adoption

Utility intervention



Thank you

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