

UCDAVIS

PLUG-IN HYBRID & ELECTRIC VEHICLE RESEARCH CENTER

of the Institute of Transportation Studies

Two Studies of Consumer Awareness, Knowledge, Valuation, Experience & Consideration of ZEVs

Governors ZEV Summit

May 4, 2015

Ken Kurani

Tom Turrentine

Nicolette Caperello

Jamie Davies

Jennifer TyreeHagemen

Institute of Transportation Studies

University of California, Davis

PEV Market Development: Annual survey: Dr. Kurani

Goals: Dynamics of awareness, knowledge, experience, purchase intentions in broad car market (including used cars)

Sponsors: California Energy Commission, California Air Resources Board, NESCAUM (Northeast), Oregon, Washington, Delaware,

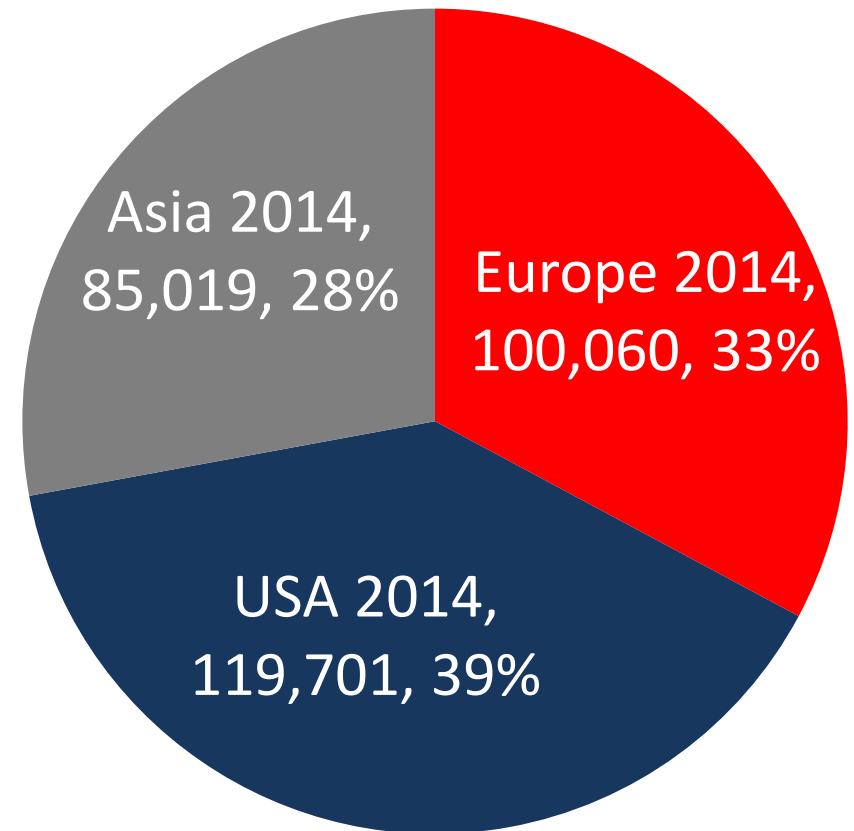
Methodology: Annual “panel” surveys, with interviews & workshops:

1. September 2014: survey 1680 Californians; 3 workshops with 30 PEV & 30 non-PEV owners, 50 “household” interviews with workshop participants
2. January 2015: 5654 completed surveys (13 states), 50 interviews (3 States)

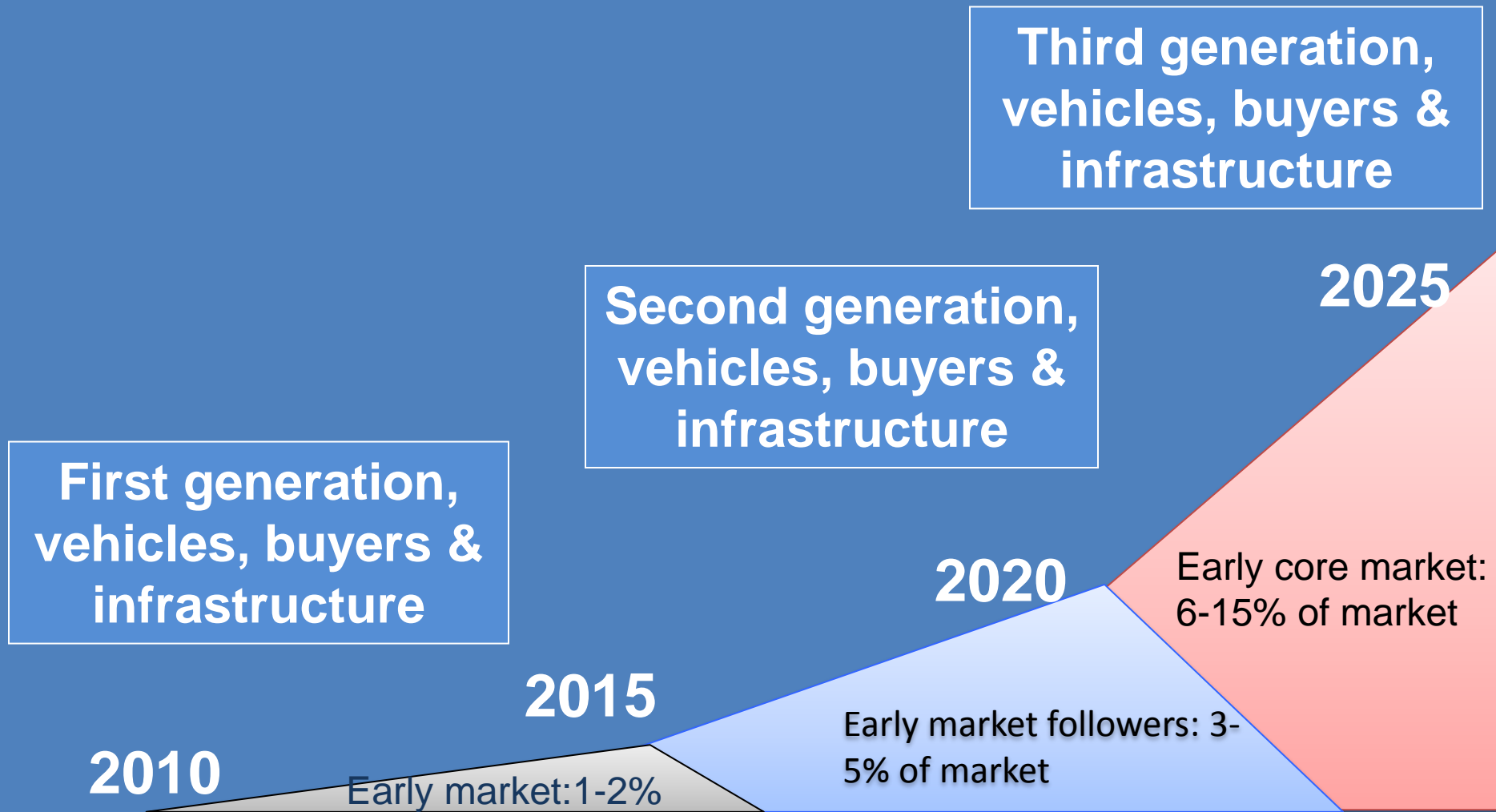
But first, a reminder that It is very early in the PEV market process

- Registered PEVs in the world will reach 1 million this year / 1% of 1 billion vehicles
- The market for PEVs has grown from a few hundred in 2010 to 300,000 per year in 2014 - .3% of 88 million vehicles per year.
- Sales are concentrated in a few regions with strong incentives- West Coast US, Northern Europe, Japan & China.
- California has about 9-10% of world PEVs sales, 2-3% of all vehicle sales

2014 World EV/BEV Sales



Useful to study PEV buyers & potential buyers in light of this development model



Buyers are now experimenting with a range of first generation products & charging experiences: potential buyers

Plug in Hybrid Electric (PHEV)



Extended Range Electric (EREV)



Battery Electric X (BEVx)



Battery Electric (BEV)



“ICE Range” Battery Electric (BEV)



Level 1

Level 2

Level 3 / DC Fast

Home charging

Workplace charging

Public charging

Station charging

Measuring consumer consideration for PEVs in the buyer population

Consumer

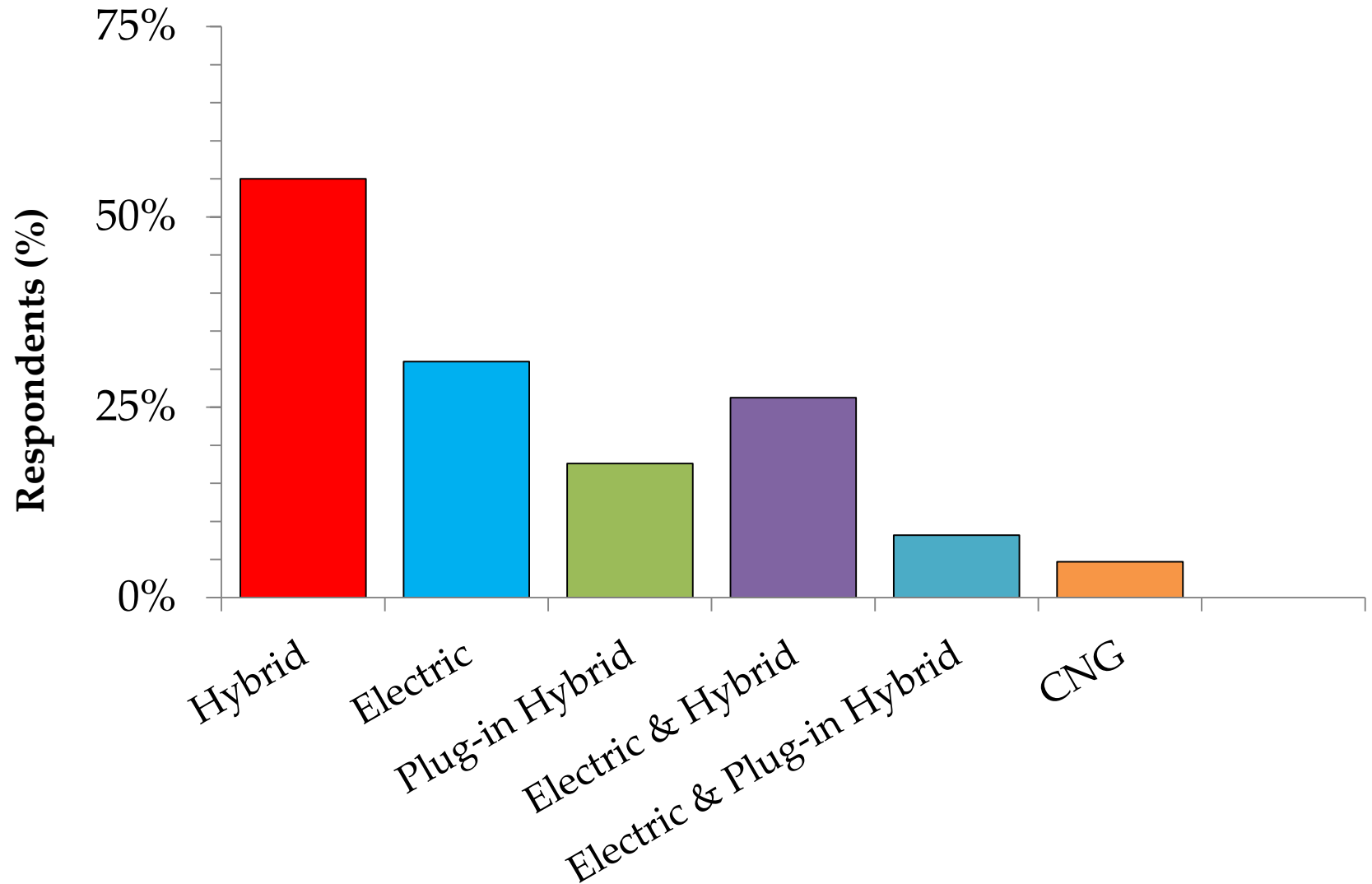
- Awareness
- Knowledge
- Experience
- Values formation
- Consideration



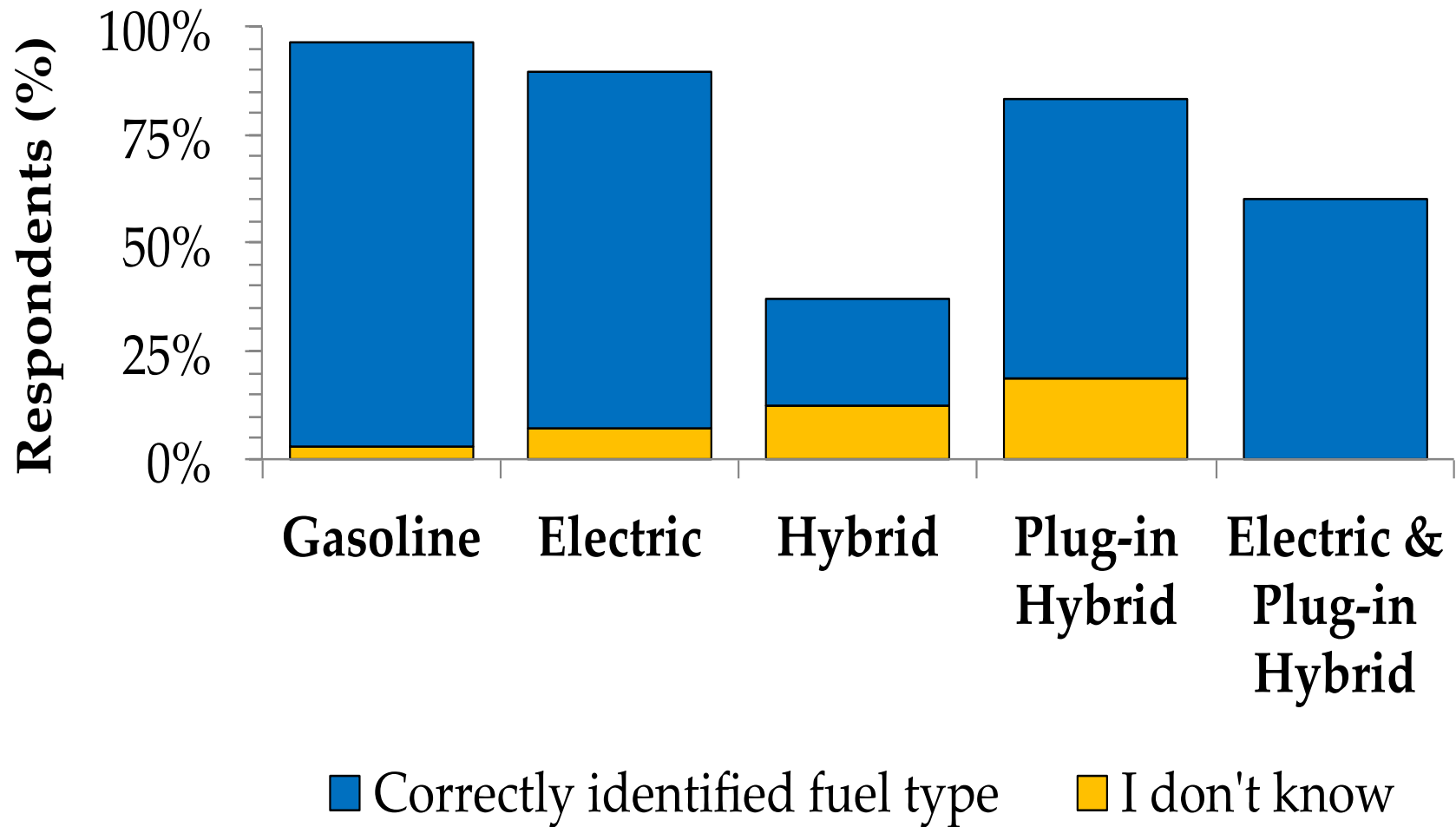
PEV Ecosystem

- Vehicles
 - Types of PEVs
 - Brands, models
 - Performance
- Policy
 - Incentives
 - Goals
- Electricity as a fuel
 - Costs
 - Charging

Awareness of HEVs in California is now over 50%, but...



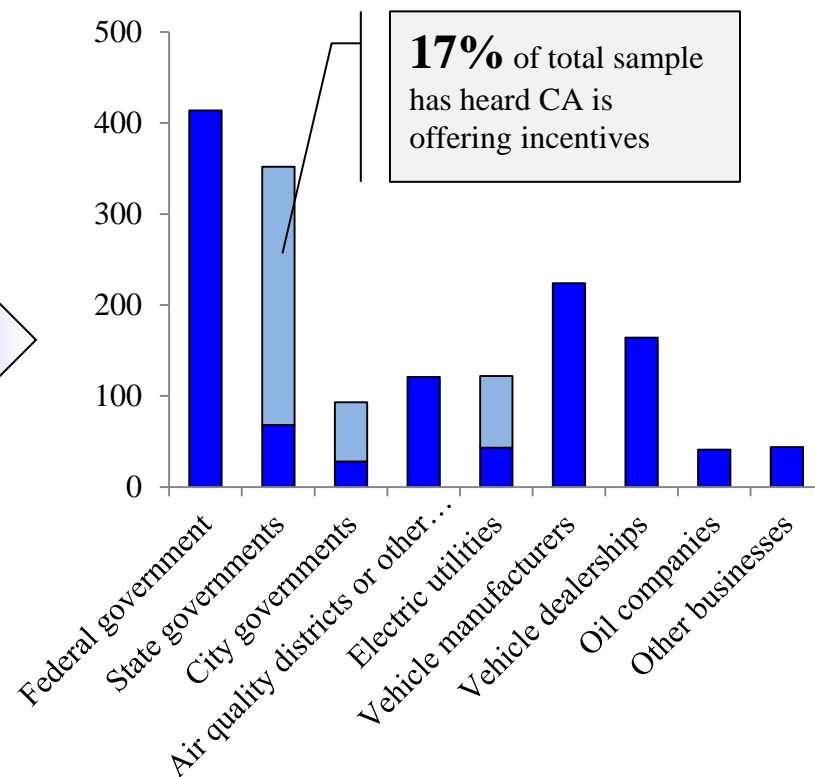
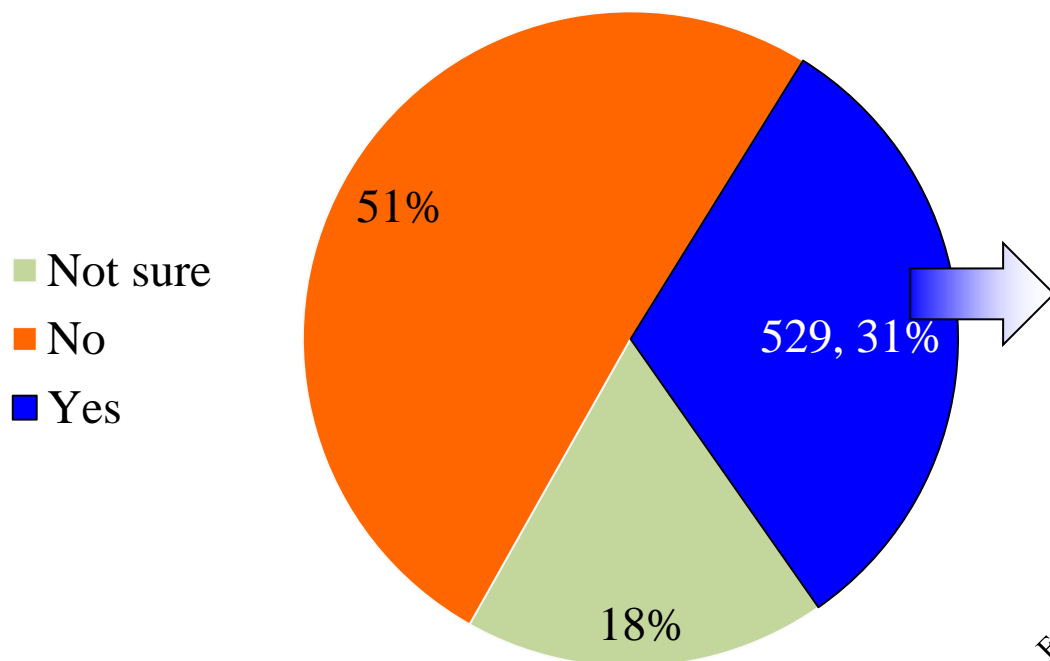
Awareness is not knowledge... Californians don't know how hybrids are fueled,



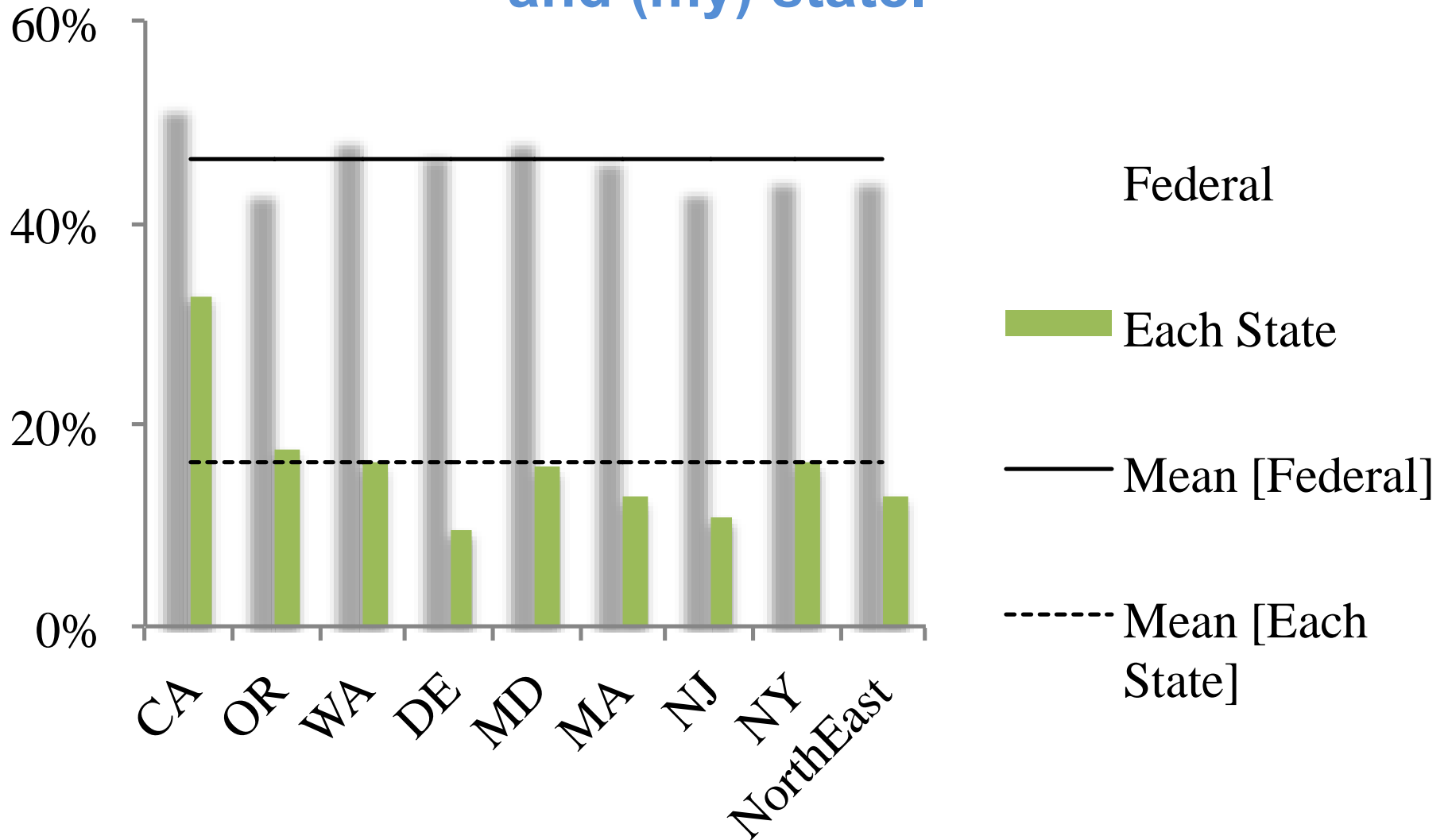
About 1/3 of California buyers have heard of incentives for alt-fuels, but only 17% know about state incentives.

CA: All car owning households
June 2014. n = 1,681

Of those who say “Yes,” how many have heard of incentives from each of these sources?

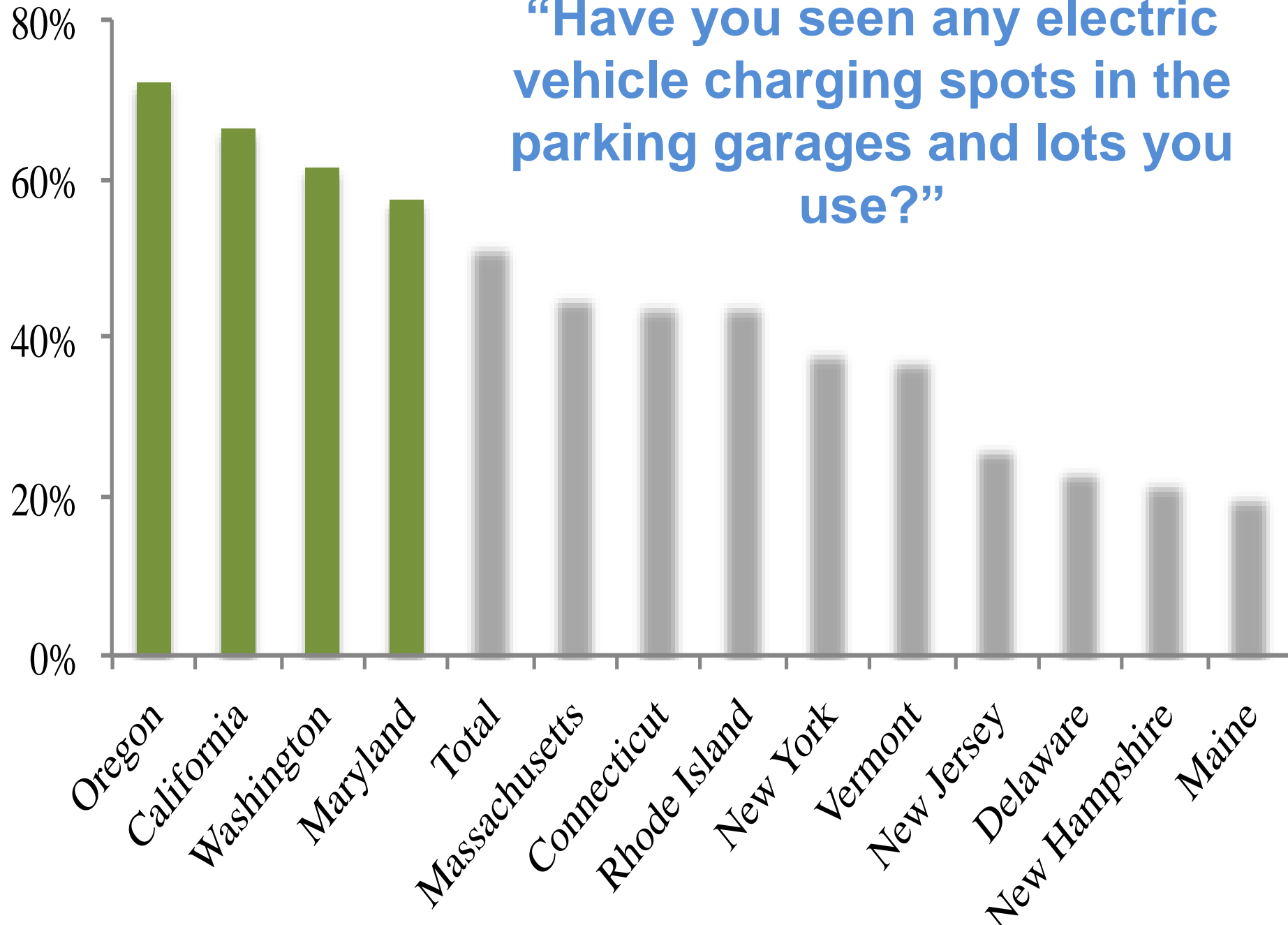


Multi-state: Percent of respondents stating, “Yes, I have heard of incentives from the feds and (my) state.”

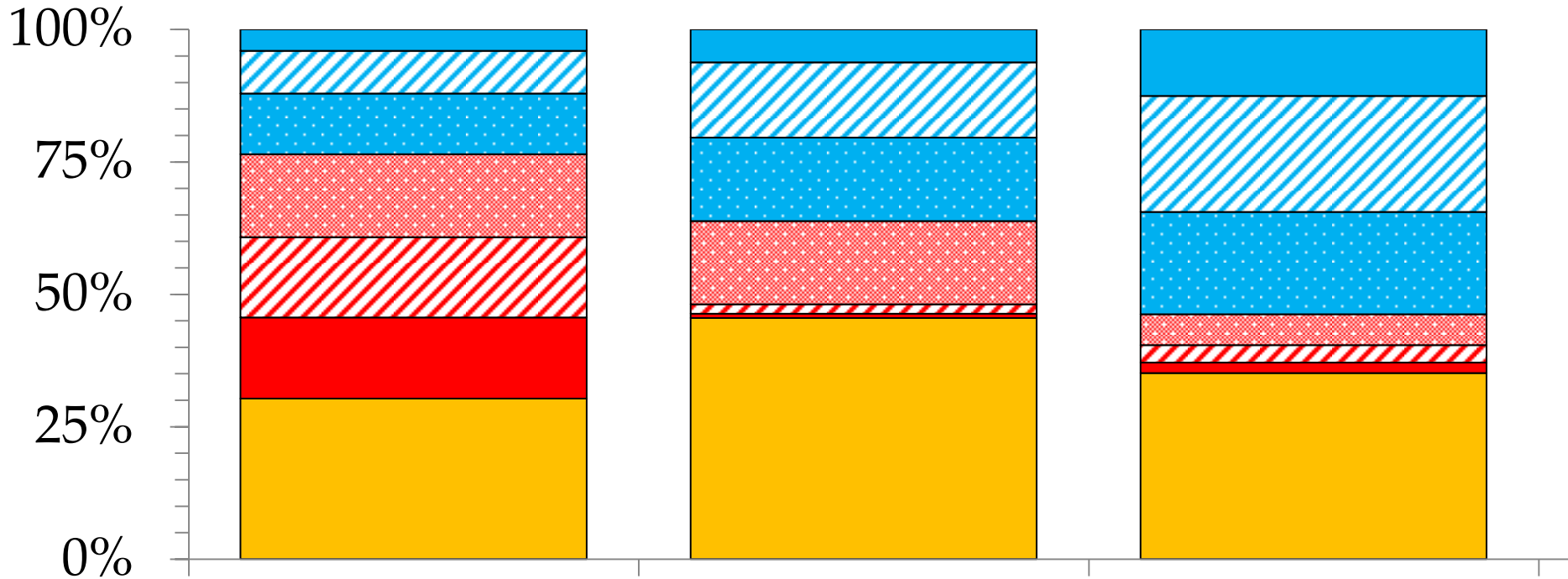


Multi-state

“Have you seen any electric vehicle charging spots in the parking garages and lots you use?”



Perceptions of PEVs and Infrastructure: note the largest category is “I don’t know.”



There are enough places to plug-in

Electric vehicles take too long to charge

Electric vehicles do not travel far enough before needing to be charged

I don't know

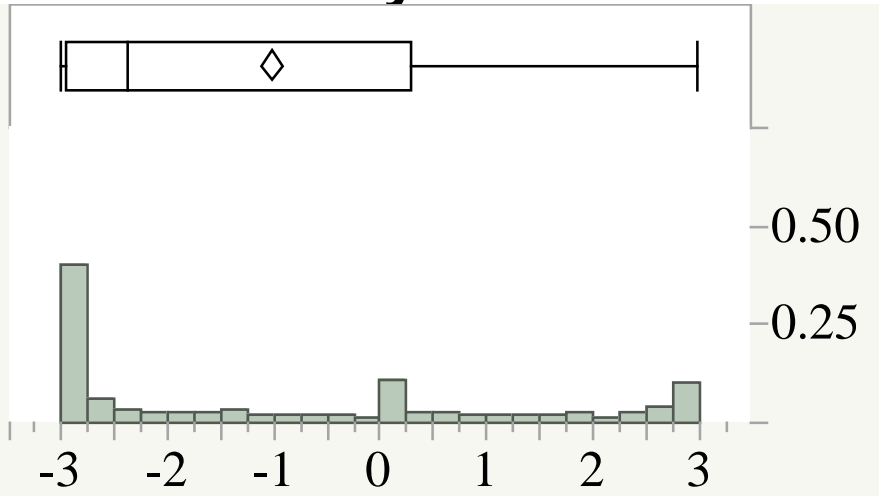
Survey question (%)

- Strongly agree
- Somewhat agree
- Disagree
- I don't know

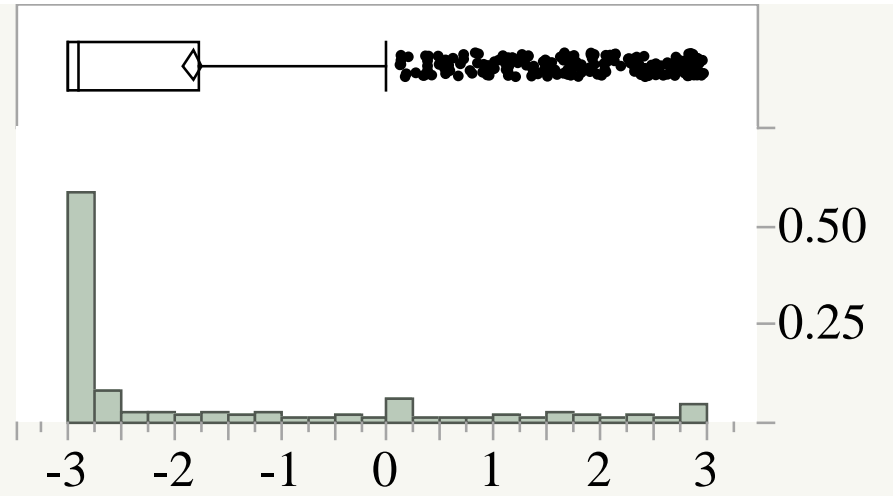
- Agree
- Somewhat disagree
- Strongly Disagree

California data: And as many of us know, the most critical step is direct experience with PEVs: -3 = no experience / 3 extensive

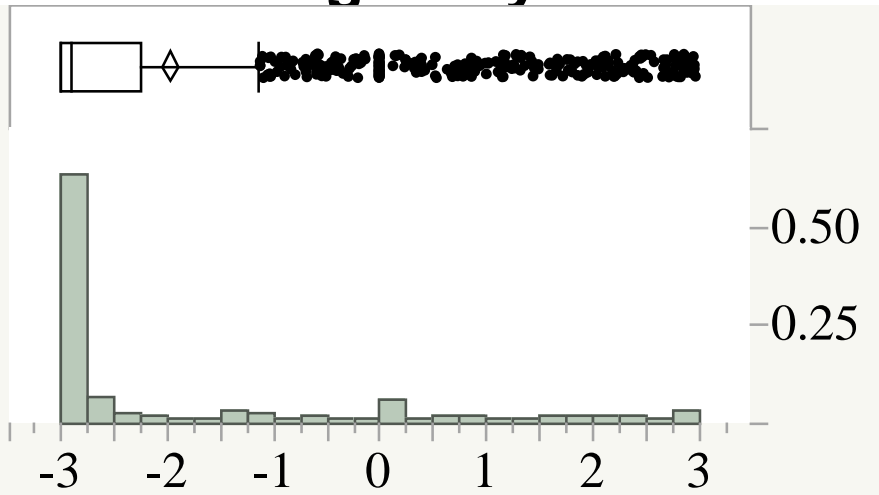
Hybrid



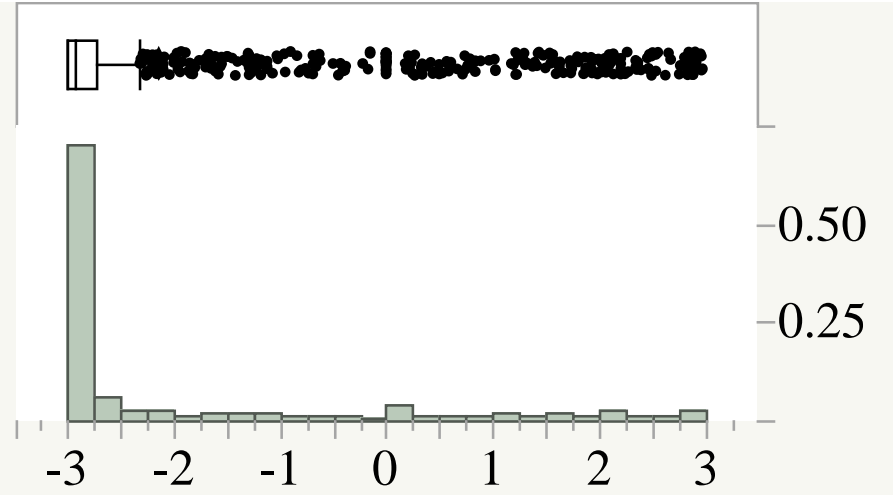
Electric



Plug-in Hybrid

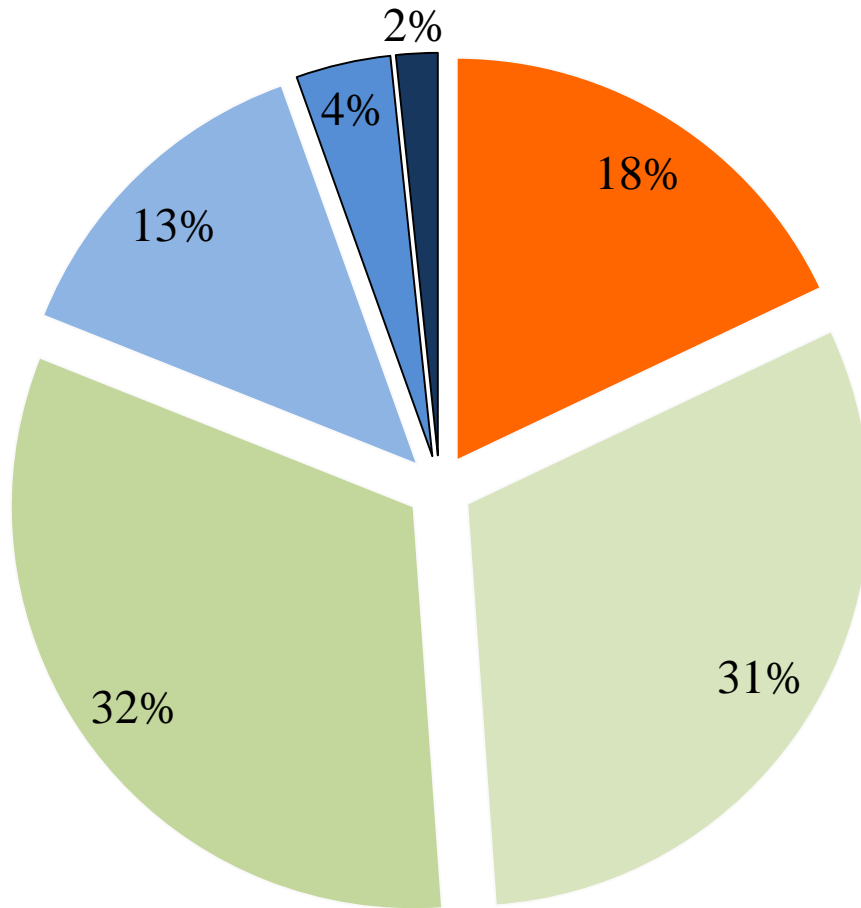


Fuel Cell



Both strong and weak considerations

Have you considered buying a vehicle that runs on electricity for your household?



...have not and would not...

...have not ...but maybe some day we will

...idea has occurred, but no real steps have been taken...

...gathered information, but haven't really gotten serious

...shopped for one, visited a dealership...

...already have a vehicle powered by electricity

Take away messages

- Consumer awareness, valuation, and consideration of ZEVs stops at (or before) awareness.
- Awareness and knowledge of vehicles is not the same as awareness and knowledge of incentives.
- We'll be developing more precise estimates of all of these and more.