

# Do consumers cross-shop ICEVs, HEVs, and PEVs?

STEPS 2016 Project 13: A Quasi-Experiment in Consumer Choice  
of Conventional and Alternative Fuel Vehicles.

Ken Kurani, Gil Tal, Nicolette Caperello  
PH&EV Center  
23 May 2017

It is assumed they do, or  
that it would be a good thing if they did

- Analysts
- Automakers and dealers
- Automotive press
  
- Do consumers?
  - No.

# Study Design

- Plan D: Convenience sampling
  - Vehicles parked on UCD campus
    - PHEVs and BEVs first, then corresponding ICEV and HEV variants
  - Convenience sampling strictly limits results to sample
    - The half of the sample that are ICEV/HEV buyers are drawn from 98% of car owners
  - + Focused look at a comparatively rich PEV eco-system
    - PEVs and PEV drivers; special financing offers from PEV manufacturers; and, charging in many parking facilities

# Resulting in these vehicles...

Make-Model	ICEV	HEV	PHEV	BEV
Fiat 500	█			█
Ford C-Max	█		█	
Ford Focus	█			█
Ford Fusion	█	█		
Toyota Prius		█		

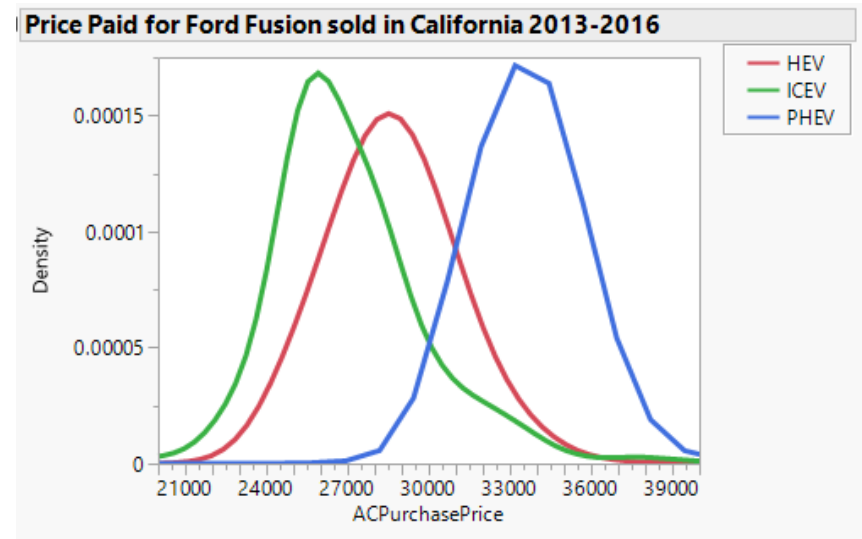
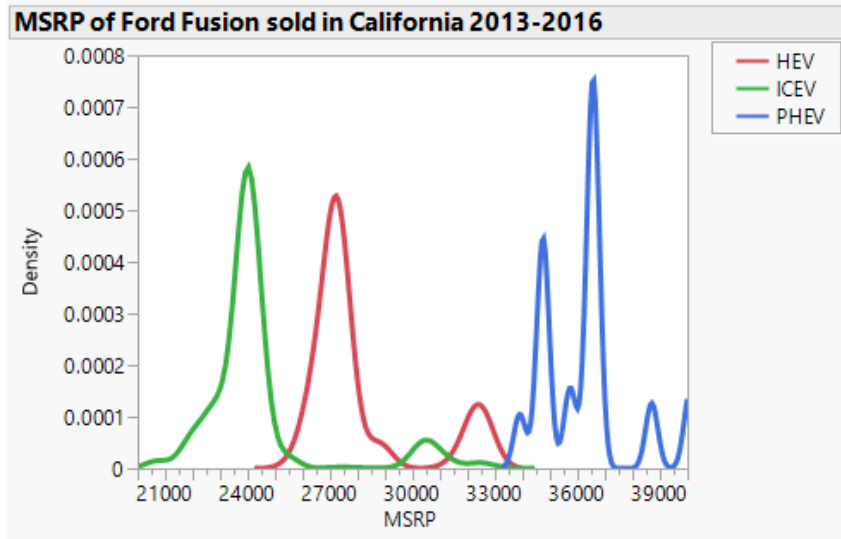
# ...driven by these people

- Female/male
- Student/staff/faculty
  - Anticipated age, income difference between students and staff/faculty
- Live in Davis/Commute from out of Davis

# ICEV and HEV drivers

- None cross-shopped PEVs
  - Those who knew PEVs existed...
    - Dismissed PEVs at the first sign of a potential problem
      - Price too high; *no knowledge or consideration of incentives*
      - Range too short; *confused about HEV/PHEV/BEV distinctions; wrong about vehicle range, no knowledge of charging*
      - Can't charge at home; *cant' imagine a PEV without home charging; no knowledge of other charging*
  - Those who didn't know PEVs exist...
    - They did not consider PEVs at all because, well, they don't know PEVs exist

# Ford Fusion in CA: MSRP vs. Price Paid by powertrain flavor



Based on 15,157 vehicles reported by Experian.

	MSRP, mean	Price paid, mean
Fusion ICEV	\$24,400	\$26,800
Fusion PHEV	\$36,300	\$33,400
<b><math>\Delta</math> PHEV-ICEV</b>	<b>\$11,900</b> (~50%)	<b>\$6,600</b> (~25%)

# PEV owners

- Some attention to HEVs.
- Generalization that PEV owners did not cross-shop ICEVs is largely substantiated.
  1. PEVs only
    - Volt, Tesla, C-MAX, **Prius Plug-in**
  2. HEVs as gateways to PEVs (among people unfamiliar with PEVs)
    - Cars she drove: Fit (ICEV) (“cheap”), Prius (HEV) (“expensive, no deals), **Fiat 500e**, Fiat 500 (ICEV) (“cheap and clunky” compared to BEV).

Cars she did not drive: SMART (too small), Nissan (too long to wait—info. from on-line message boards), Ford (doesn’t like to buy American), Honda and Toyota (didn’t think they offered leases).
  3. HEVs considered with PEVs (among those familiar with PEVs)



# Interpretations: Different questions; different engagement

- ICEV/HEV buyers: **“Why would I buy a PEV?”**
  - If they haven’t heard of PEVs being for sale, they haven’t asked anything
- PEV buyers: **“How do I get a PEV?”**
- ICEV/HEV buyers, lack engagement, either
  1. Simply don’t they know PEVs are a possibility, or
  2. Have no impetus to solve even the first imagined problem and thus none to explore whether there is a second or third.
- PEV buyers have impetus to solve one problem and move on to the next until they own a PEV

“It takes two good reasons to buy a PEV and one flimsy excuse not to.”

Gil Tal

# Market Implications

- Create Awareness—of everything, still
  - PEVs, really
    - The distinction between HEVs, PHEVs, and BEVs (and FCEVs?)
  - Incentives
  - Range, charging, and their relationship
- Instigate engagement