CALIFORNIA
PLUG-IN ELECTRIC VEHICLE COLLABORATIVE

PEVC Activities and Market Observations

September 9, 2011
CEC IEPR Fuels Workshop
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www.pevcollaborative.org

Agenda

- Vehicle & charging station “numbers”
- PEV Collaborative Activities
- Stakeholder Activities – Interesting trends

Vehicle and Charging Station “Numbers”

PEVs Available Now or by 2012

Release: Spring 2012
20 – 30,000 world sales/yr
15 US launch states

Prius Plug-in Hybrid

2012 Honda Fit EV

Release: 2012

Release: **Dec 2010**
10 - 15,000 2011 US sales

2011 Chevrolet VOLT

2011 BMW ActiveE

Release: Late 2011

Release: January 2012
2,000 US sales 2012
Eventually 20 – 30,000
world sales

2011 Mitsubishi i-MiEV

2011 Ford Focus Electric

Release: Late 2011

Release: **Dec 2010**
15 - 20,000 2011 US sales

2011 Nissan LEAF

2012 Tesla Model S

Release: Mid-2012
5,000 sales in 2012, ramp
up to 20,000/yr in 2013

Range of Potential CA PEV Sales

Potential ***2011*** California sales:
- 5,000 Volts
- 10,000 Leafs

US Sales to Date (July 2011)
- 3,000 Volts (1,100 in CA)
- 4,130 Leafs

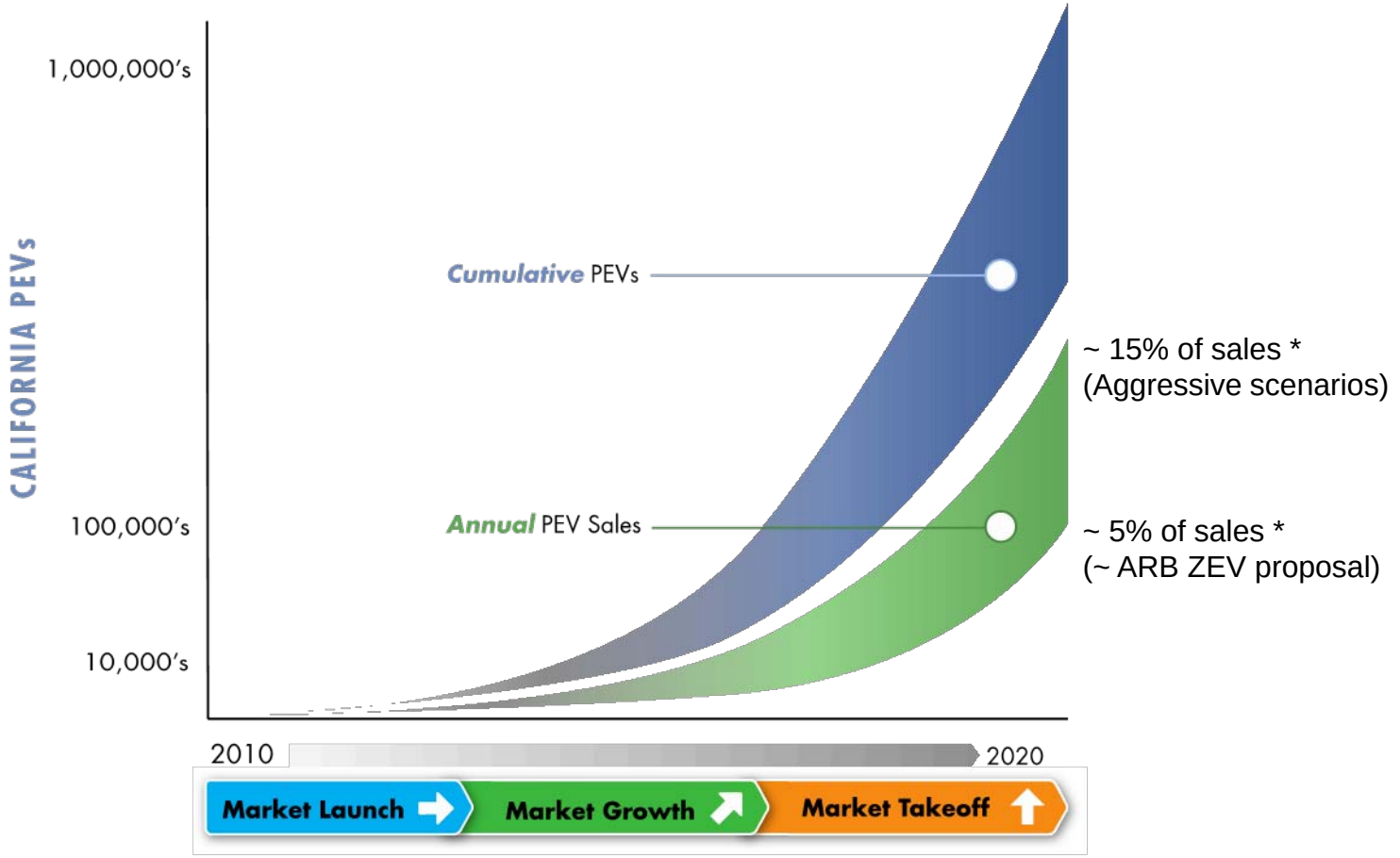


Figure 4. *A vision for sustained PEV market expansion in California*

** Assumes 1.6 million CA LDV market sales in 2020*

Varying PEV Market Projections

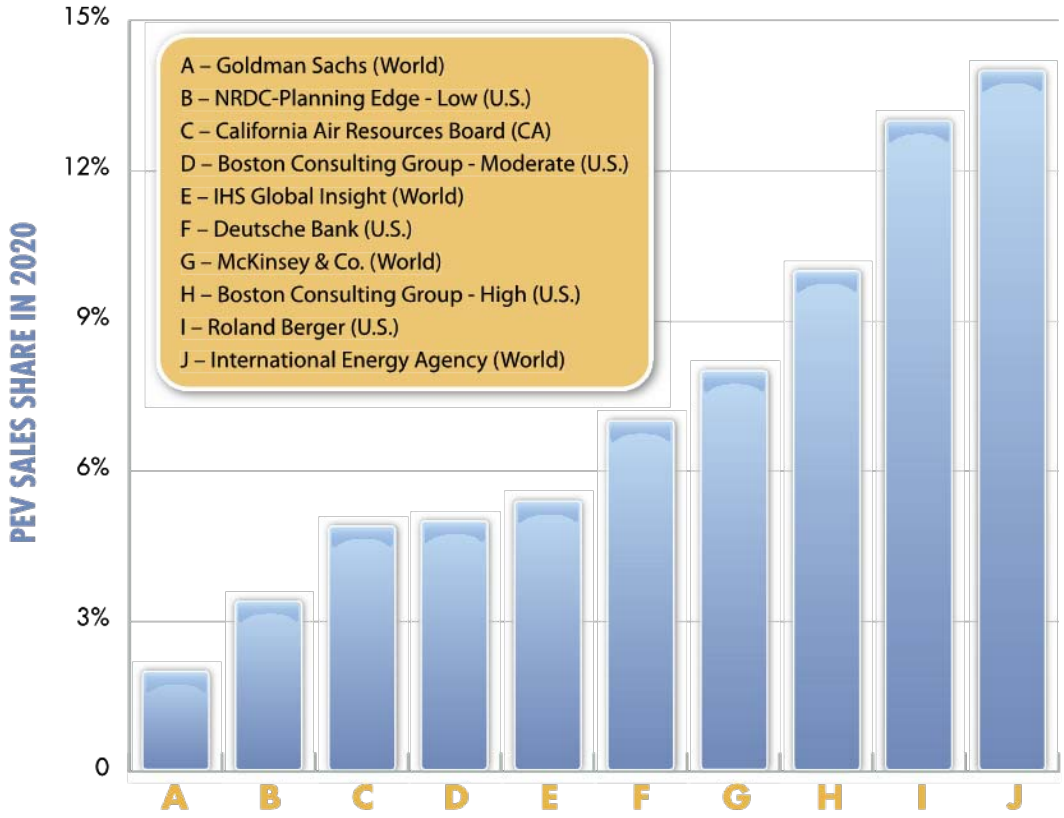


Figure 1. *An example of PEV market projections for 2020*

Wide variation in projections – Depends on assumptions such as battery price, consumer demand, and future policy requirements

Charging Stations

- 1,300 Legacy chargers
  - 500 being upgraded

New Stations Planned:

- CEC $ for 4,000 residential and public chargers
- DOE EV Project in SD, SF
- Bay Area: Grants for 5,000 residential & public, 50 fast charge, & Battery Switch
- South Coast: Grants for 4,000 residential and public
- San Diego: EV Project with 1,200 residential/fleet, 1,500 public, & 30 fast charge

PEV Collaborative Activities

Addressing Market Challenges

- Near-term “Market Launch” (~ 2011 – 2013)
  - Streamlining residential EVSE
  - Establishing local planning for public EVSE
- Mid-term “Market Growth” (~ 2014 – 2018)
  - Vehicle/battery cost reductions
  - Residential EVSE: sub-meter, smart Level 1
  - Workplace charging
- Long-term “Market Takeoff” (~ 2020 and beyond)
  - Vehicle/battery cost reductions
  - New cost factors: LCFS, Fuel Taxes, V2G

Working Group (WG) Overview

1. Infrastructure Coordination (CEERT, GM, SMUD, Sonoma)
   - *Share experiences among major metropolitan areas throughout the state*
   - *Clarify issues on statewide infrastructure codes/policy topics*
2. Messaging and Communications (ARB, BMW)
   - *Develop common set of core messages and value propositions for PEVs*
   - *Provide expert resource support for policymakers, news media, etc*
3. Government Coordination and Incentives (BAAQMD, CALSTART)
   - *Align and streamline multiple incentive programs*
   - *Coordinate multi-stakeholder proposals for external fund opportunities*
4. Market Expansion (Better Place, ICCT, Nissan, NRDC)
   - *Develop solutions to challenges for transition from "early adopters"*
   - *Focus on customer perspectives and sustainable business models*
5. Research (SCAQMD, UC Davis)
   - *Summarize research needs for California PEV market growth*
   - *Synthesize existing research outcomes for Collaborative members*

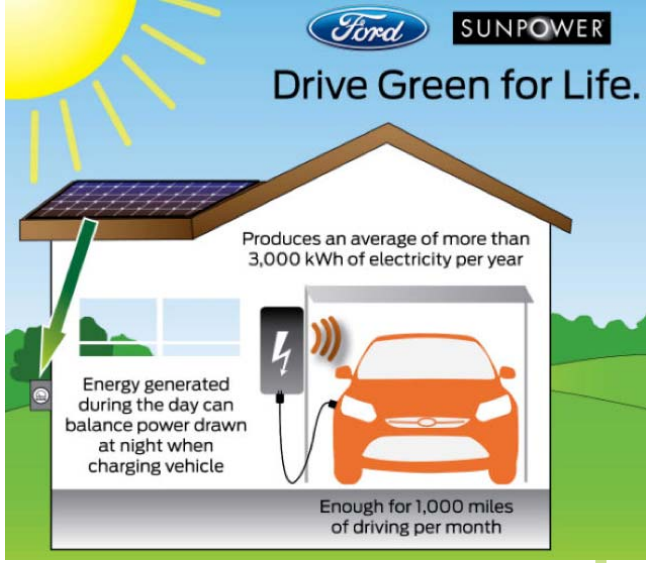
(Co-chair organizations)

PEVC Proposal to U.S. DOE

- PEV Community Readiness program – Clean Cities
- CA proposal: $1M for statewide program
- SCAQMD Prime, 6 regions partnered together
  - South Coast, Bay Area, San Diego, Sacramento, Central Coast, San Joaquin Valley
- Project Goals
  - Compile regional guidelines document, toolkit
  - Conduct regional workshops with planners
  - (6) Regional infrastructure strategic plans
  - Coordinating Council to share ideas

Stakeholder Activities – Interesting Trends

Unique OEM Activities



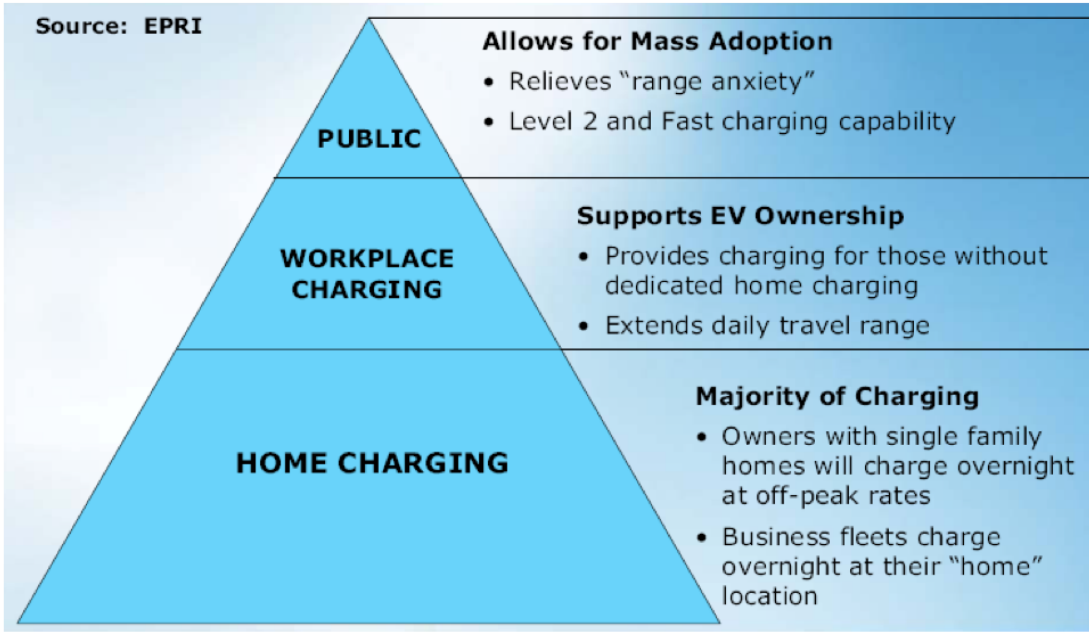
- Ford and SunPower
- GM and OnStar – Utilities
- Nissan – V2H in Japan
- Nissan and CityVentures (EV ready homes)
- Daimler and Car2Go (300 EVs in San Diego car share)
- Research / Demo highlights:
  - GM and ABB – battery second use project
  - Nuuv in Denmark V2G – 30 aggregated BEVs

Charging Partnerships

- GM with SPX
- Nissan with AeroVironment
- Leviton supplier for Ford, Mitsubishi, Toyota
- Best Buy contractor for Ford, Mitsubishi
- 350Green public charging at 800 Walgreen stores
- GE WattStation distribution through Lowes
- DOE charging station programs: ECOtality (14,000 in US) and Coulomb (4,600 in US)

Emerging Charging Trends

- To address cost of residential EVSE and electricity
  - "Smart" Level 1 cordset
  - Vehicle communication with utility
  - Sub-meters and EV-TOUs
- PHEVs rely more on public charging than BEVs
- Workplace charging needs emphasis, Level 1 may be OK
- Multi-unit dwelling (MUD) property unique challenges



SDG&E 2011 Experience

- Strategic input to the Smart Grid Deployment Plan
- 454 Leaf & 68 Volt scheduled deliveries
- Over 460 signed up for experimental PEV rate & study
- 61% with homes build after 1990; 84% after 1980
- Tend to be higher income; 22% have panels < 100 amp
- 35% are PV customers; 7 to 8 kWh average use per day

SDGE
A Sempra Energy utility

- Facility plan

Experimental New Business Models

- Better Place in Denmark
  - Buy vehicle w/out battery; monthly membership fee for infrastructure access, battery lease
- NRG in Texas
  - Monthly membership fee for unlimited home and public charging ($80/month), includes home charger
- 350Green (SD, SF)
  - Partner with Walgreens for public charging
  - $3-4 per 90 min charge, or monthly fee for unlimited

2011 Membership

State Government
- ARB
- CEC
- CPUC
- Legislature members
- Governor's office

Automakers
- BMW
- CODA
- Ford
- GM
- Honda
- Nissan
- Tesla
- Toyota

Regional Government
- CAPCOA, Sonoma
- BAAQMD
- SCAQMD

Utilities
- LADWP
- PG&E
- SCE
- SDG&E
- SMUD

Network Providers
- Better Place
- Clean Fuel Connection
- Coulomb
- ECOtality
- NRG

Advocacy Organizations
- American Lung A.
- CalETC
- CEERT
- NRDC
- Plug In America
- UCS

Consulting / Research
- CALSTART
- EPRI
- ICCT
- UC (Dav, Berk, LA)

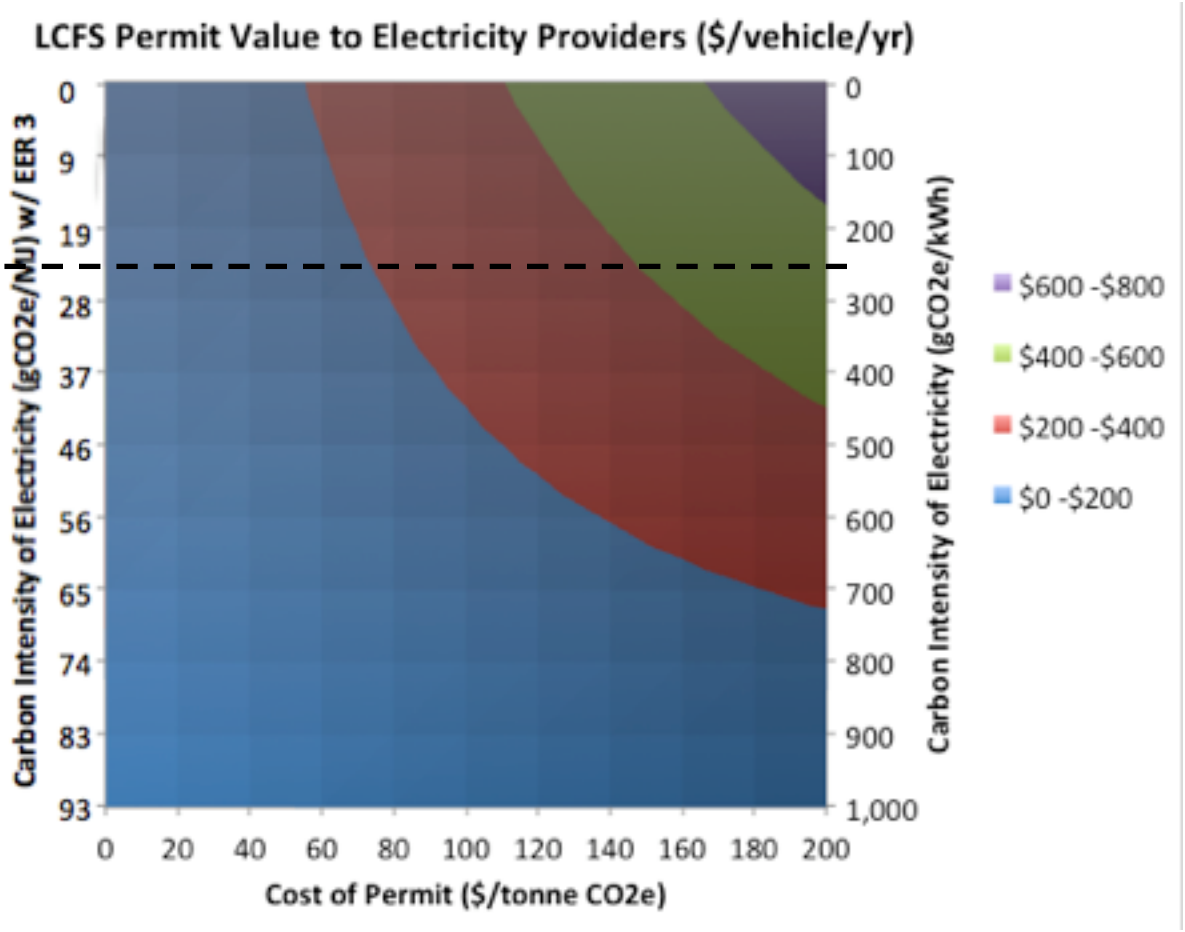
BACKGROUND MATERIAL

CA Agency Activity

- CPUC – EV Rule approved July 14, 2011
  - Restricts ownership of residential EVSE from utilities
  - Utility notification (PEVC task)
  - Required utility EV load profile research by 2013
  - Sub-meter protocol
  - New EV Time of Use (TOU) rates to be proposed
- CEC
  - AB 118 Infrastructure - $8M for EVSE this round
  - PIER – Continued funding for UCD PH&EV Center
- CARB
  - Revised vehicle regulations – LEV/ZEV to 2025
  - DriveClean improvements
  - Revised AB 118 vehicle incentives

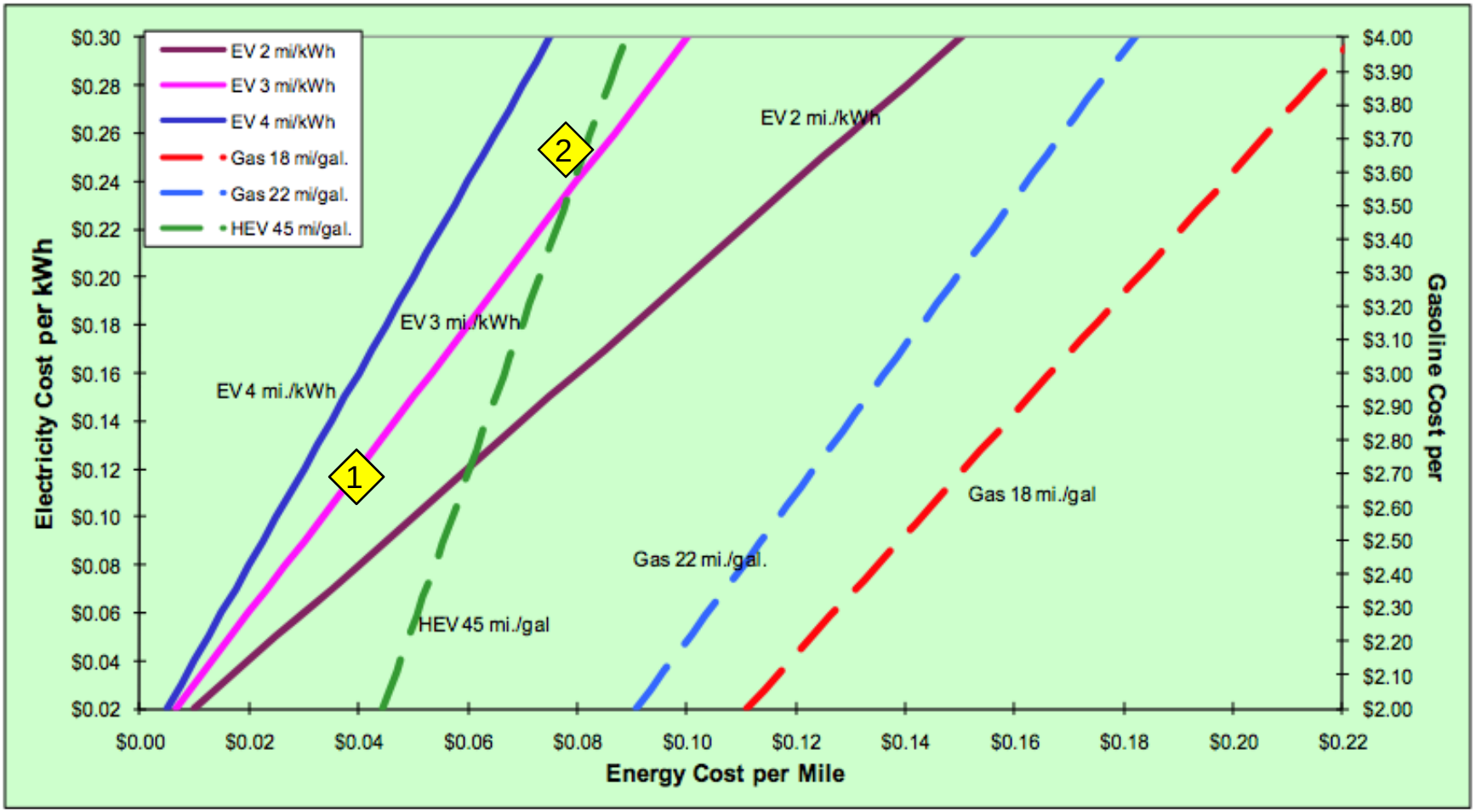
UCD Study: LCFS value for BEVs

CA 2020 Grid



Other future "potential" cost factors based on recent studies:
a) Feebate ~$2,000 for BEV, b) V2G services $1,000+/yr (speculative)

DOE: Comparing Energy Costs/Mi



Example cases:

1. Nissan Leaf @ today's ave CA grid price
2. Prius @ today's ave CA gasoline price

New 2050 Studies – Same Story