CALIFORNIA
PLUG-IN ELECTRIC VEHICLE
COLLABORATIVE

DOCKET	
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DATE	Sept 09 2011
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PEVC Activities and Market Observations

September 9, 2011
CEC IEPR Fuels Workshop
Joshua Cunningham

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

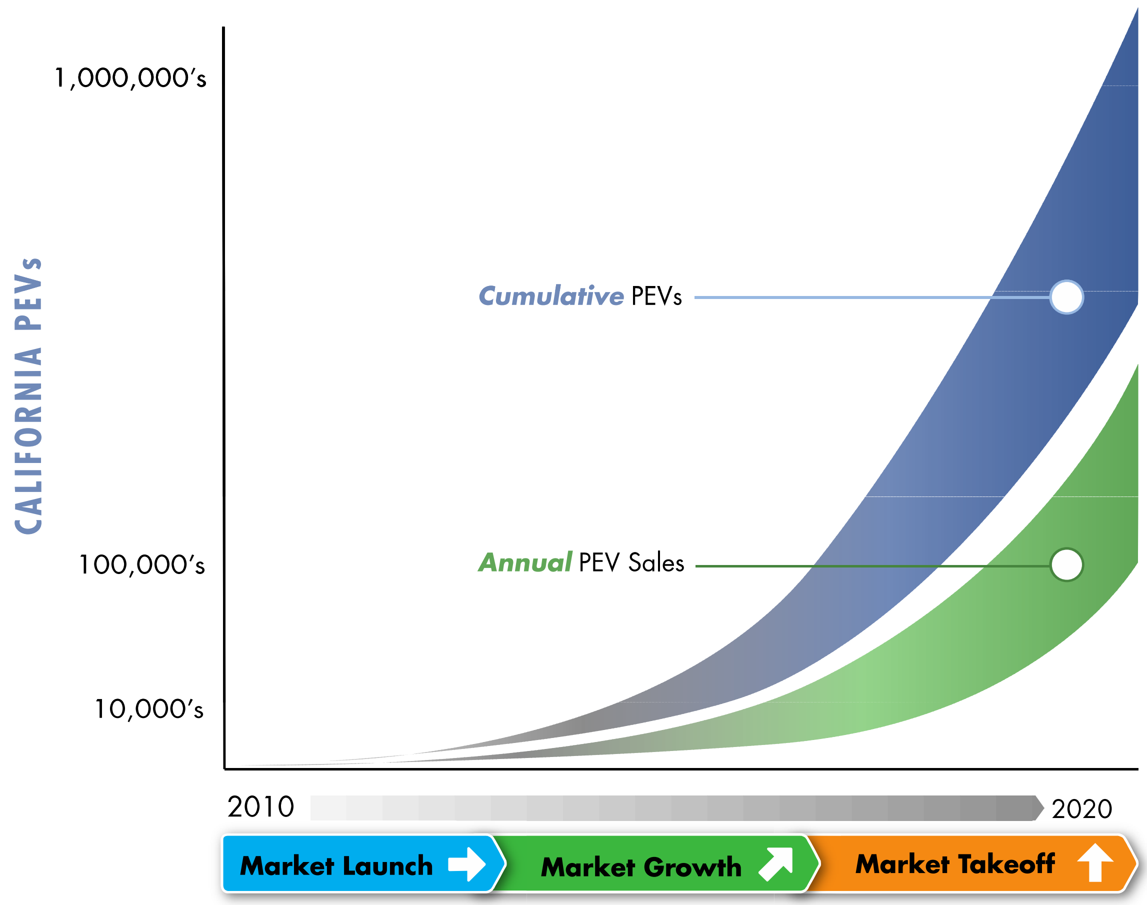
2012 Tesla Model S

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



~ 15% of sales *
(Aggressive scenarios)

~ 5% of sales *
(~ ARB ZEV proposal)

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

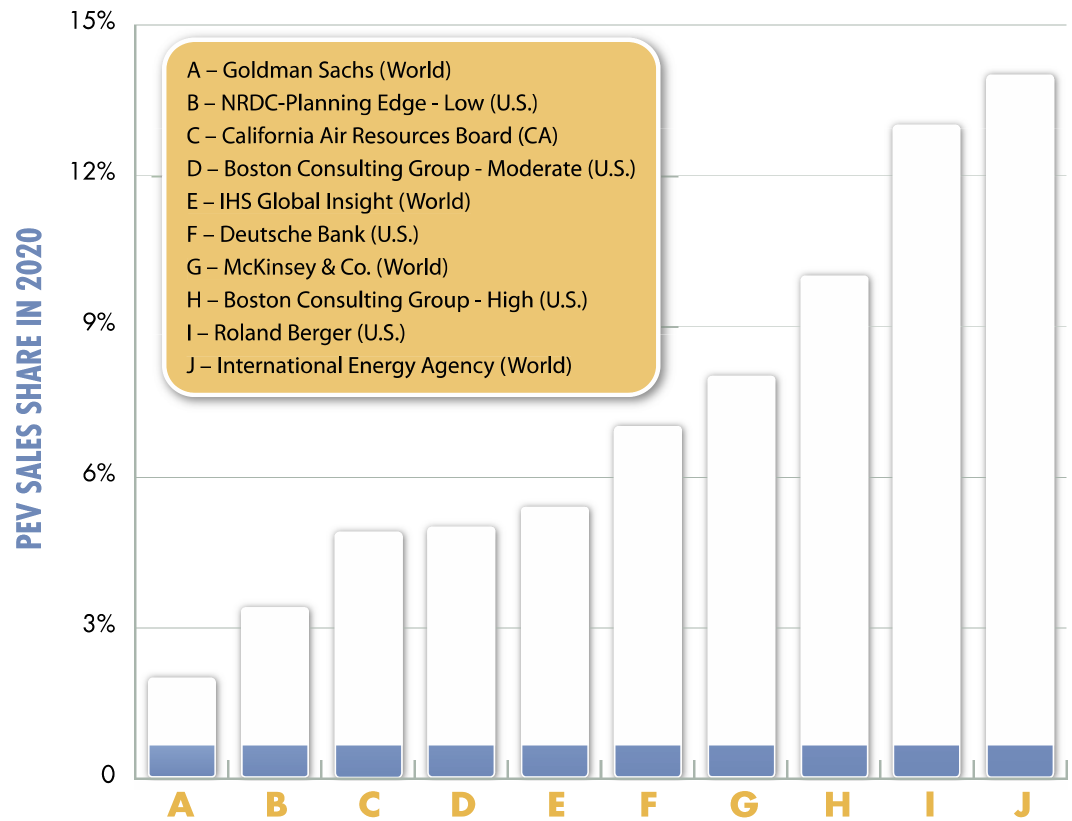


Figure 1. *An example of PEV market projections for 2020*

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

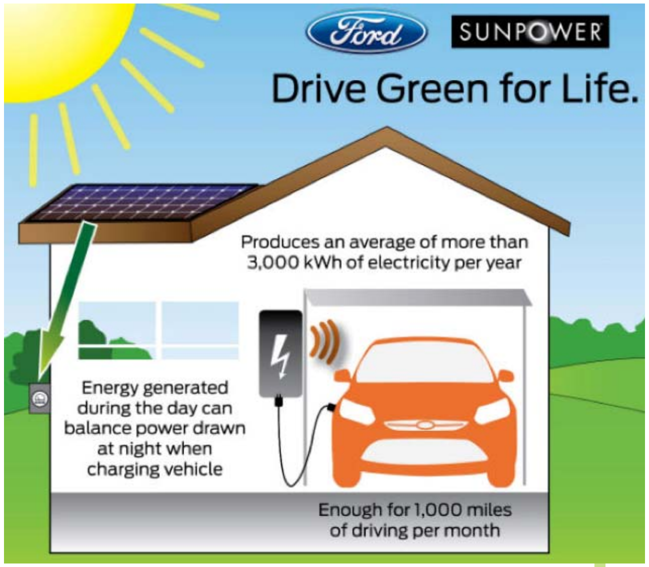
(Co-chair organizations)

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



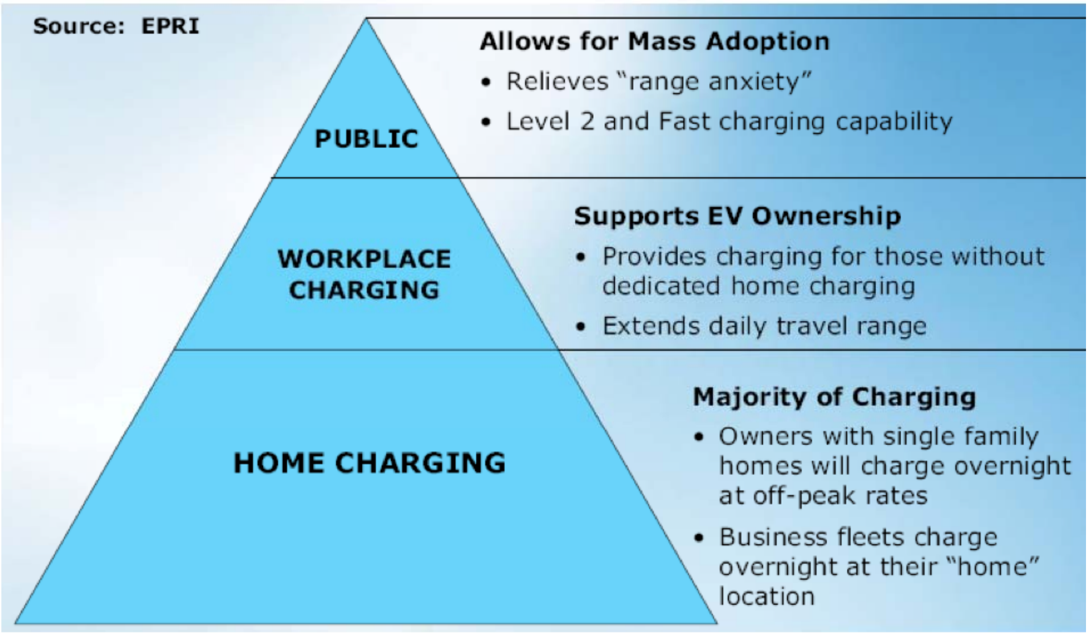
- Ford and SunPower
- GM and OnStar – Utilities
- Nissan – V2H in Japan
- Nissan and CityVentures (EV ready homes)
- Daimler and Car2Go (300 EVs in San Diego car share)
- Research / Demo highlights:
  - GM and ABB – battery second use project
  - Nuuv in Denmark V2G – 30 aggregated BEVs

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**

- **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

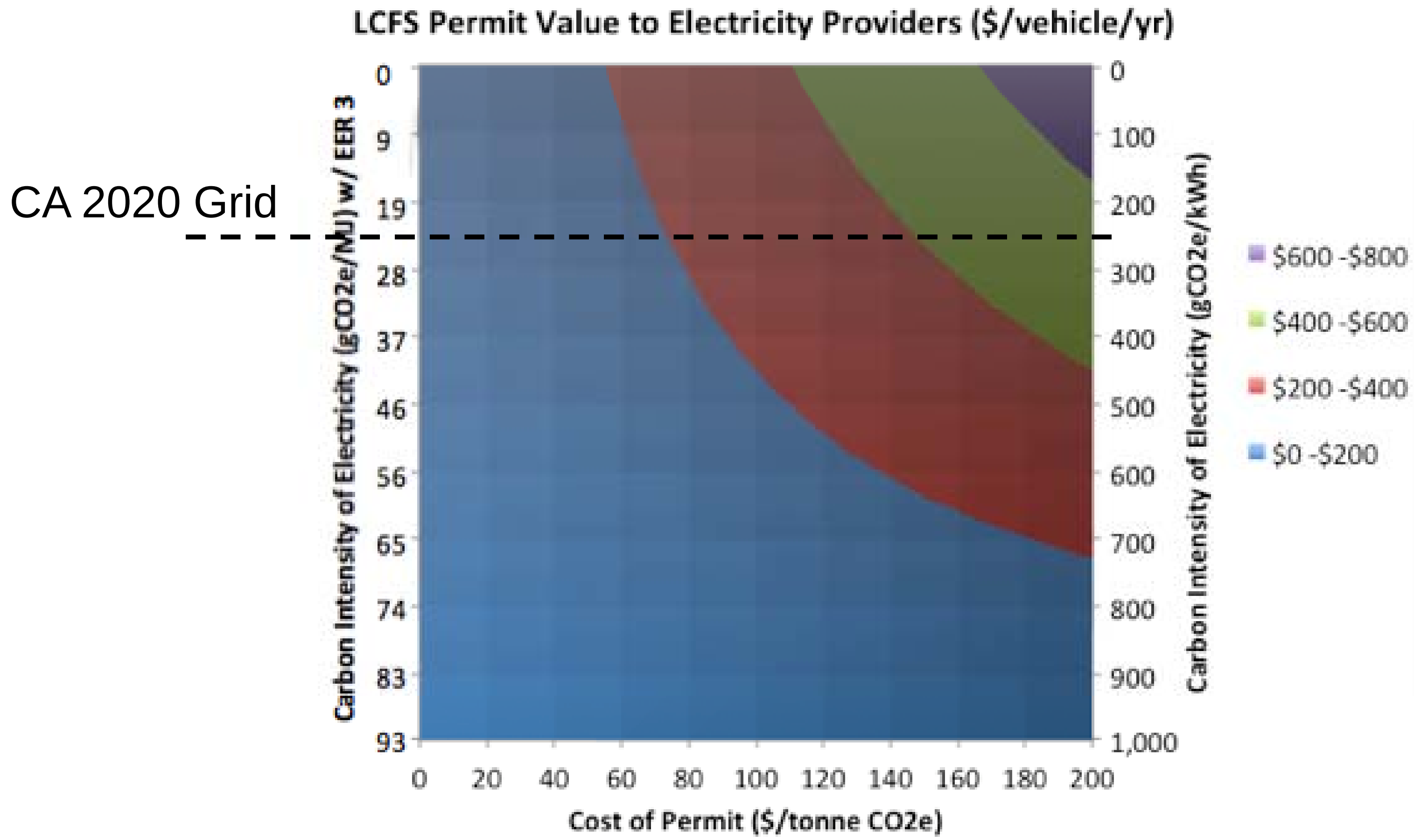
Consulting / Research
- CALSTART
- EPRI
- ICCT
- UC (Dav, Berk, LA)

BACKGROUND MATERIAL

CA Agency Activity

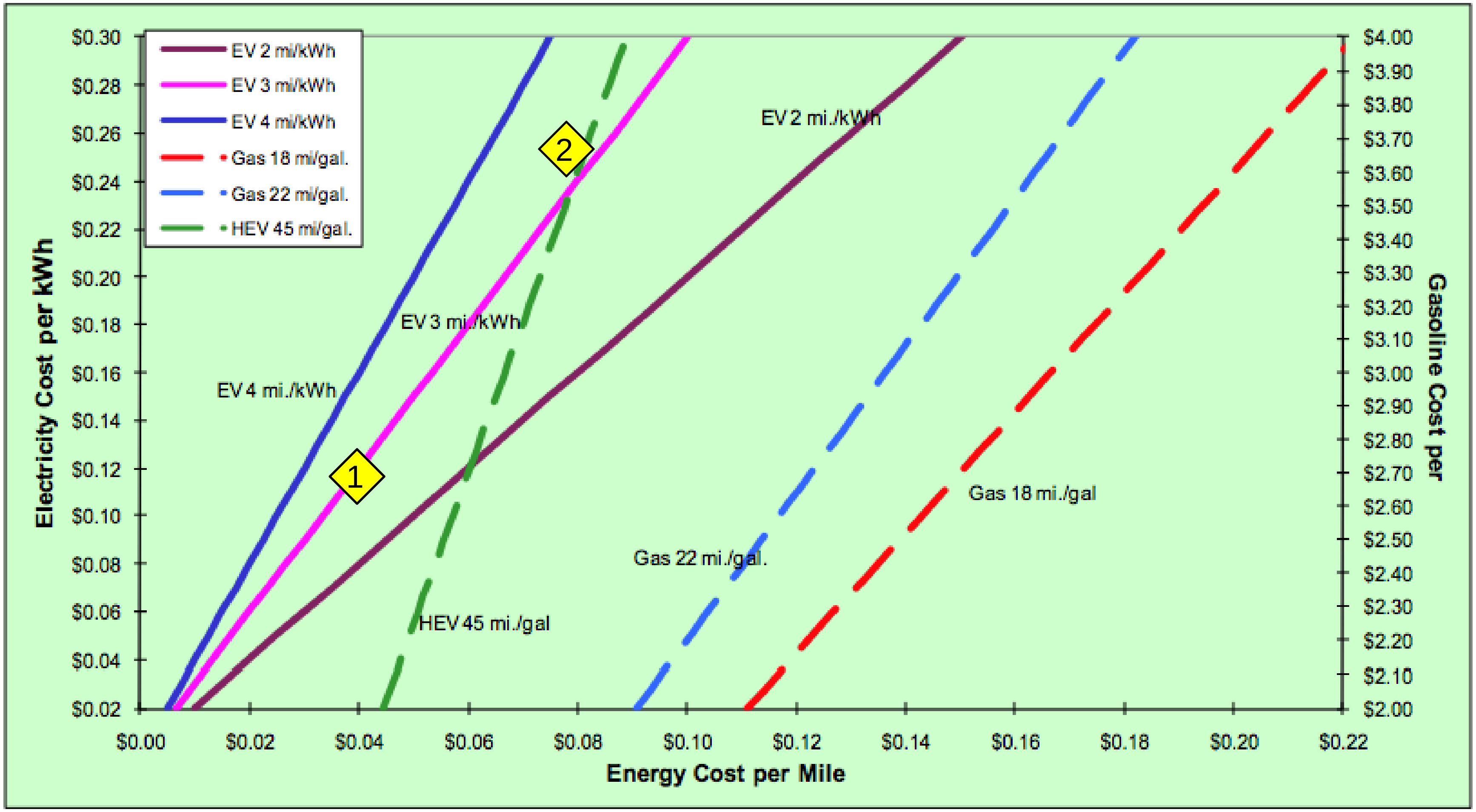
- CPUC – EV Rule approved July 14, 2011
  - Restricts ownership of residential EVSE from utilities
  - Utility notification (PEVC task)
  - Required utility EV load profile research by 2013
  - Sub-meter protocol
  - New EV Time of Use (TOU) rates to be proposed
- CEC
  - AB 118 Infrastructure - $8M 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



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

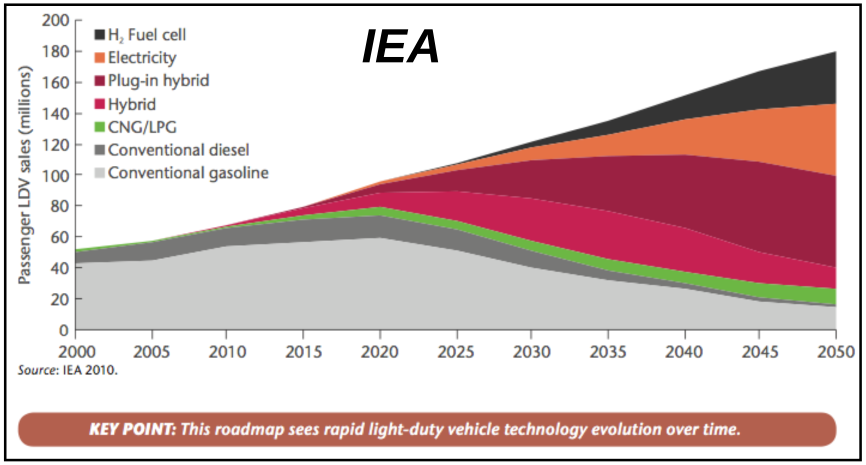
DOE: Comparing Energy Costs/Mi



<u>Example cases</u>:

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

New 2050 Studies – Same Story



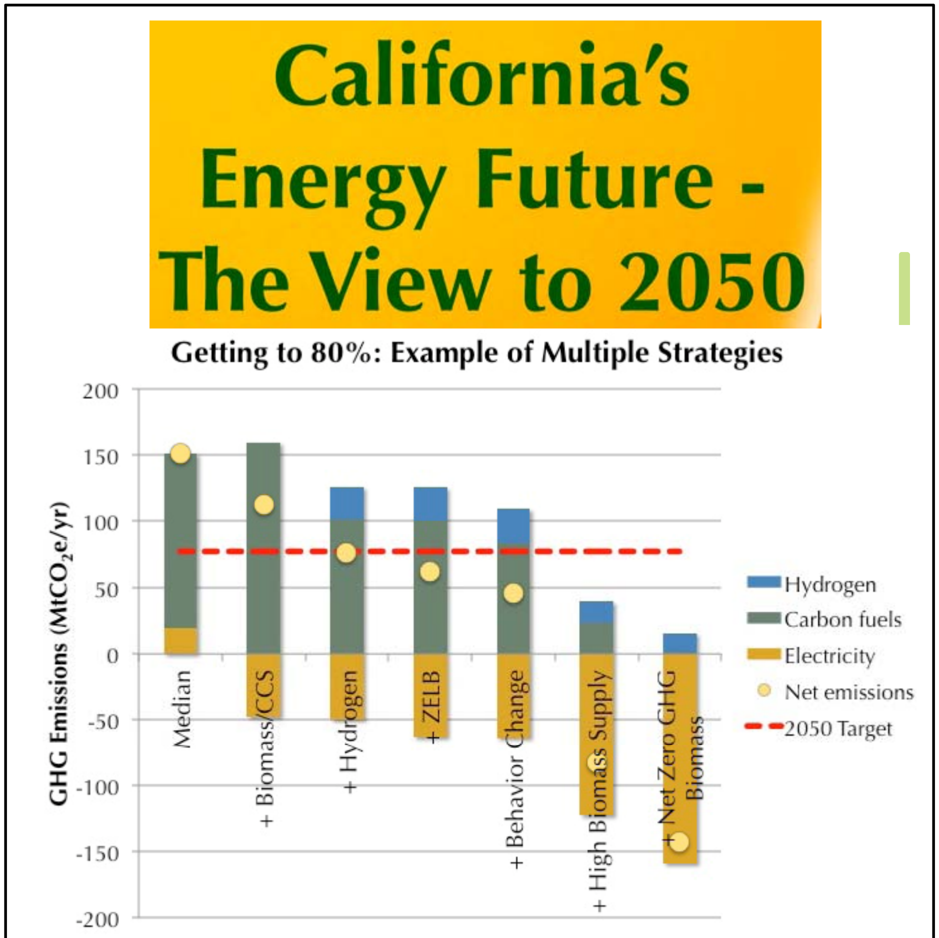


Figure 9. Example of multiple strategies that reduce emissions to 80% below 1990 levels and beyond.