

WINNING HEARTS AND MINDS

ACCELERATING THE TRANSITION TO
ZERO EMISSION VEHICLES

Vice Chair Sandra Berg
California Air Resources Board

DE.CA.rbonize Transportation



CALIFORNIA
AIR RESOURCES BOARD

California's Commitment to Zero Emission Vehicle Policy

Current Barriers & Winning Hearts and Minds

Policy for Zero Emission Vehicles & Complimentary Measures

- California ZEV Regulation
- State of Technology &
- State of Infrastructure
- State of Consumer Incentives

Barriers to Accelerating ZEVs

- Sustainable Business Models
- Consumer Acceptance

Strategies for Winning Hearts and Minds

- Early Adopters vs Consumer Acceptance
- Tesla Affect
- Experience EVs

California Strong Need for Electrification

- **California is the nation's largest market for passenger cars and light-duty trucks**
 - Over 25 million registered vehicles
 - Over 800 million miles driven every day
 - Over 29 million gallons of gasoline consumed each day
- **Widespread adoption of ZEVs necessary to:**
 - Achieve criteria pollutant (NOx) reductions to mitigate ozone
 - 80% below 2012 levels by 2031
 - Meet California's GHG reduction goals:
 - 40% below 1990 levels by 2030
 - 80% below 1990 levels by 2050

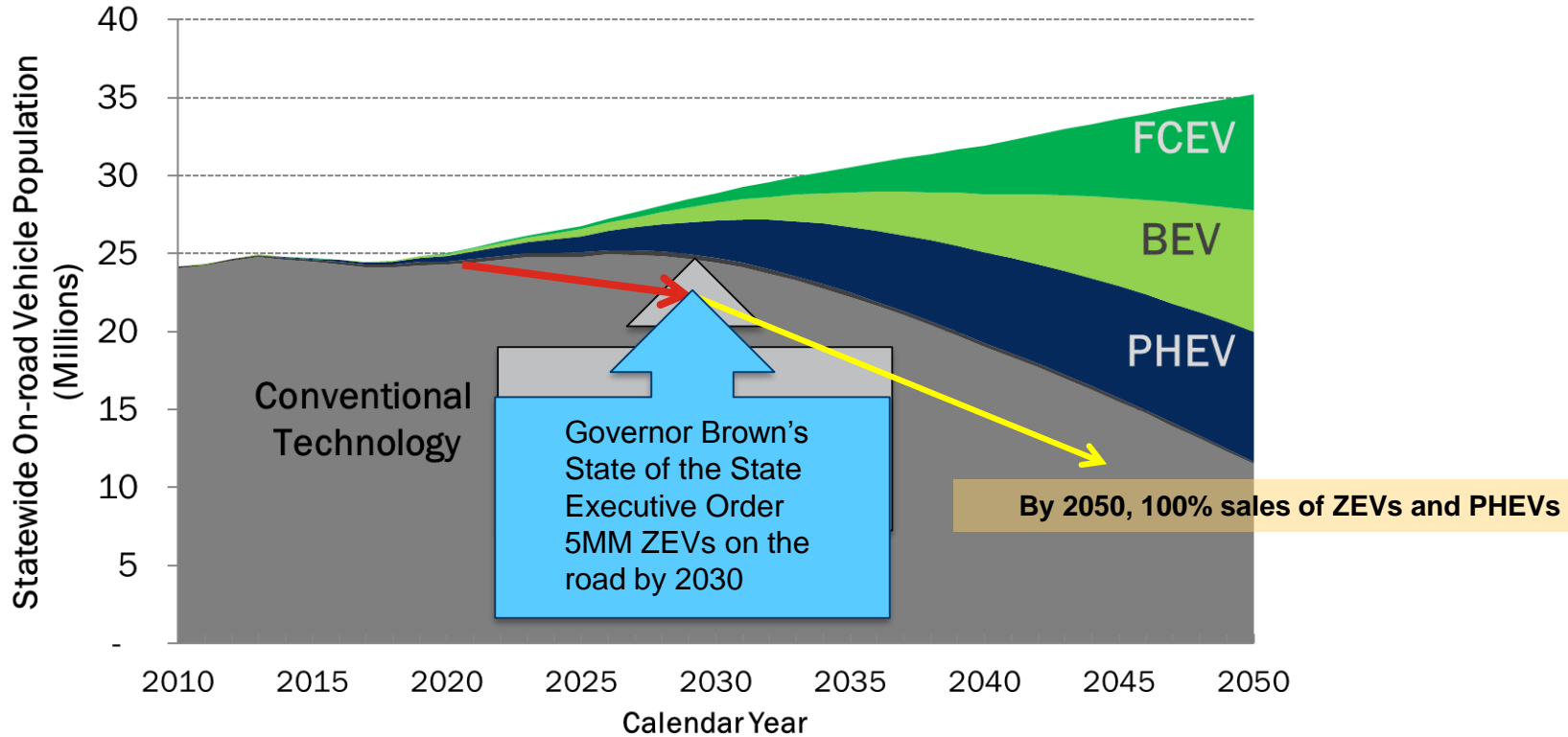
California's Suite of Programs Committed to ZEVs

Program	Year	Description
ZEV Regulation	1990	Requires automakers to sell zero- and near-zero-emission vehicles to reduce criteria pollutant emissions
AB 1493	2002	Requires CARB regulation making automakers reduce GHG emissions from light-duty cars and trucks
AB 32	2006	Requires Scoping Plan identifying strategies for reducing GHG emissions to 1990 levels by 2020
Scoping Plan	2008	Update in 2014
Clean Vehicle Rebate & Public Fleet Projects	2010	Since 2010, ARB has used Air Quality Improvement Program (AQIP) and Greenhouse Gas Reduction Funds (GGRF) to provide rebates for ZEVs and PHEVs
Advanced Clean Cars Regulation	2012	Integrated regulatory package requiring automakers to: (1) meet more stringent criteria pollutant and GHG standards, and (2) sell more zero- and near-zero-emission vehicles
AB 8	2013	Provides \$20 million annually to develop a 100-station hydrogen network
SB 32	2016	Requires 40% reduction below 1990 GHG emissions levels by 2030
Scoping Plan	2017	2017 Update identifies strategies for SB 32 goal

The ZEV Regulation Challenges and Near-Term Plans

- **In the 2018-2025 period, first Year Over Year growth requires a 2.5% annual increase in ZEV credits, capping at 22.5%**
- **Many automakers have banked credits that are important for compliance as regulation stringency ramps up**
- **Minimum compliance with the ZEV Regulation will need to be coupled with complementary market support policies to achieve:**
 - **CA goals of 1.5 Million vehicles by 2025**
 - **3.3 Million cars in conjunction with the nine Section 177 States**
- **Planned 2020 ZEV and LEV rulemaking.**

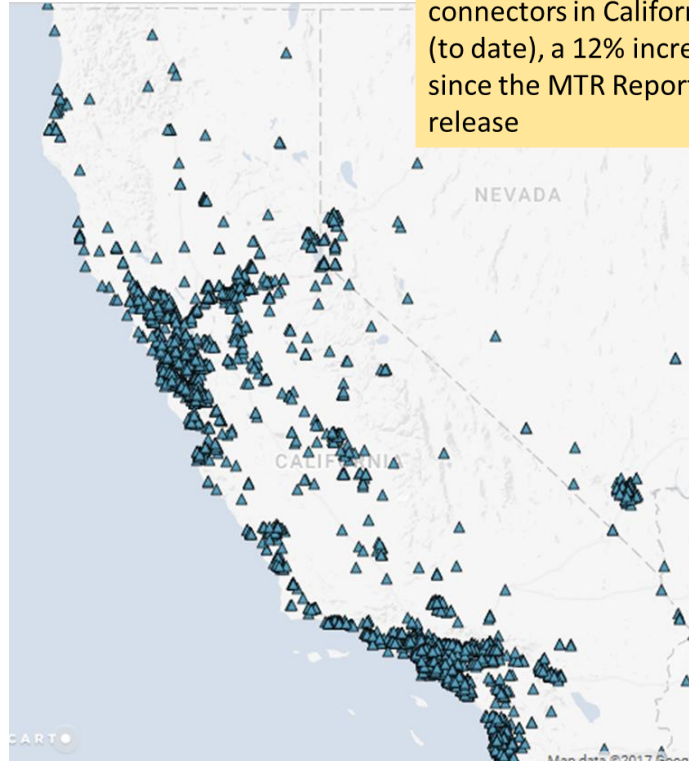
ZEVs Critical Role in Accomplishing California's GHG and Criteria Pollutant Goals



California's Infrastructure Network

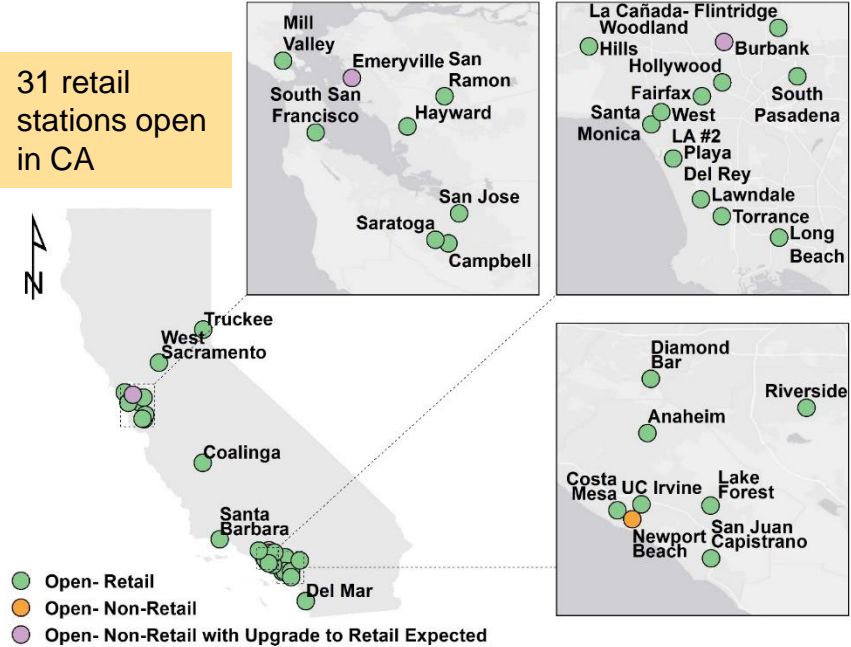
EV Chargers

Over 15,800 EVSE connectors in California (to date), a 12% increase since the MTR Report release



Hydrogen

31 retail stations open in CA

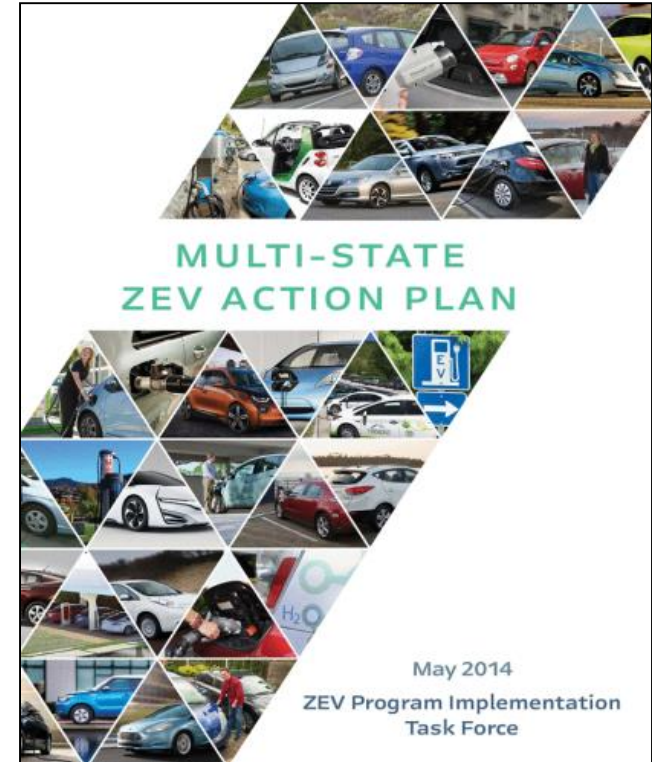


Infrastructure Challenges and Near-Term Plans

- **Several entities working to grow infrastructure**
 - **Target: 250,000 EVSE and 200 H2 stations by 2025**
 - CA Energy Commission
 - CA Utilities Commission
 - Electrify America (VW settlement investments)
- **Ratio of ZEVs to refueling infrastructure is worse in California than anywhere else in the nation as CA sales has out paced infrastructure growth.**
- **Above investments represent less than 50 percent of the remaining 2020 investment need however with Governor Brown additional State of the State funding recommendations & legislative approved we will close the gap.**

Expanding outside of California = Greater Market Share & New Challenges

- **Nine states have adopted California's regulations**
 - CA + 9 States = ~30% of new vehicle sales in US
- **Multi-State coordination**
 - 8-State ZEV memorandum of understanding
 - Commits to actions to support 3.3 million ZEV and PHEVs by 2025
- **Multi-jurisdiction coordination**
 - International ZEV Alliance
 - ARB assisting internationally on ZEV Mandate policy



Consumer ZEV Incentive Programs 2010 - Present

- **ZEV and PHEV Rebates**

- Federal ZEV \$7,500 (200,000 vehicles per OEM)
- CA State CVRP: \$5,000 – Fuel Cell; \$2,500 – EV; \$1,500 – PHEV
- CA State CVRP Plus Up for Low Income new & second market ZEVs, PHEV; Vehicle Scrapping Program replaced with advanced clean cars; financing assistance.

- **HOV Lane Access**

- **OEM Incentives**

- Free Charging
- Hydrogen Fuel Charge Card



California's ZEV SUCCESS to Date – 5% Market Share of New Vehicles Purchased

- **Suite of Comprehensive Policies**
- **Commitment of OEMs 42 different models**
- **Infrastructure**
- **Mixed of Incentive Programs**
- **Job creation**

- **Consumer acceptance is 5% of new car sales statewide**
 - Sales exceed 10 percent in parts of the San Francisco region

ZEV & PHEV Vehicles Sold +360,000 = 5% of New Cars

Governor Brown's Executive Orders:

- **2025 Goal 1,500,000 (8 years)**
- **2030 Goal 5,000,000 (13 years)**
- **8 year \$2.5 Billion Dollar Initiative**

Sustainable Business Models have yet to be realized:

- **Cost Parity is being covered by OEMs to sell cars**
 - Deep discounts through favorable financing
 - Depreciation of ZEV is greater than ICE counterpart
 - Secondary market is under-developed
- **Unclear what the business model is for Infrastructure & Refueling**
 - Charging Stations infrastructure is subsidized vs For Profit Companies trying to establish an on-going business vs Free Charging
 - Hydrogen fueling stations are being subsidized and fuel cost to the consumer is too high therefore subsidized by OEMs

Not clear the extent of Business Disruption for Automobile Dealerships

- Most Auto Dealers are not on board to sell much less replace conventional cars with ZEV. They do not fit their revenue model.

Beyond Customer Acceptance – Who is ready for a Transportation Revolution.....Winning Hearts and Minds

Tesla Brought COOL to Electric Vehicles



Success of the Model S
Gen 3 300,000+ Pre-Orders

Revolutionize:

- On Board Technology & Updates
- Customer Buying Experience
- Customer Driving Experience
- Silicone Valley Aura
- “Wished for” Car

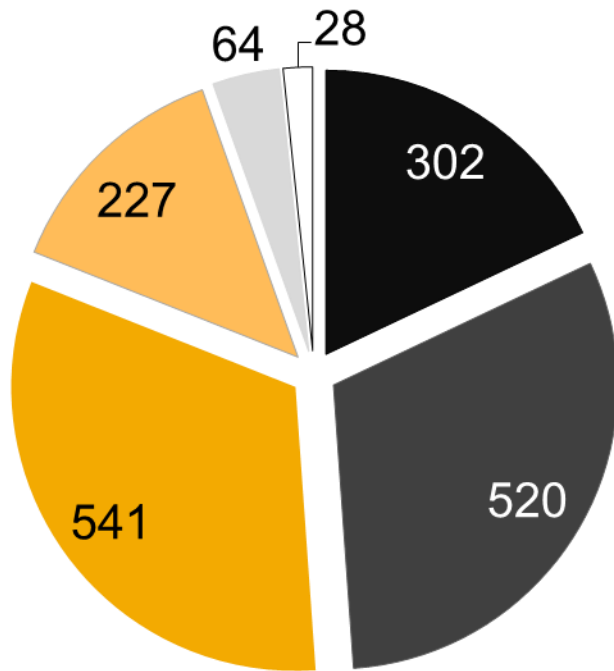
In a study by UC Davis:

- **Half of Californians are not aware of ZEVs vehicles**
- **Less than 30% are aware of incentives and of the 30% only 17% were aware of California incentives**

The following household question demonstrates level of interest in purchasing a ZEV.....

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

- UC Davis Research Project



- ...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

Consumers.....Who is ready for a Transportation Revolution?

We need a comprehensive, strategic program with all key stakeholders to win the transportation revolution.

What's happening today:

- **Multiple entities are conducting Education/Outreach**
 - ZEV Alliance & CA Fuel Cell Partnerships
 - California Electric Transportation Coalition
 - Veloz
 - NESCAUM
 - Electrify America
 - Sierra Club
 - Plug-In America
- **Pilot programs using electric car share**
- **Expanding incentive programs to include greater number**
- **Lead by Example – Think outside your BOX**

What we know for sure....

“We can not solve our problems with the same thinking we used when we created them.”

- Albert Einstein

