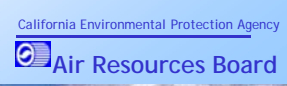


California Climate Change Policy and the Importance of Hydrogen Vehicles

Tom Cackette
California Air Resources Board

California Congressional Briefing
February 16, 2011



Greenhouse Gas Standards: 2017+ Passenger Vehicles

- In May, 2010 President directs EPA & NHTSA to develop GHG and fuel economy standards for 2017-2025 model passenger vehicles
 - Requests CA participate in technical assessment
 - Report by Sept. 30
 - We accept, and request report evaluate a range of annual GHG improvements
 - 3% to 6% per year
 - Standards provide GHG emission reductions for next few decades

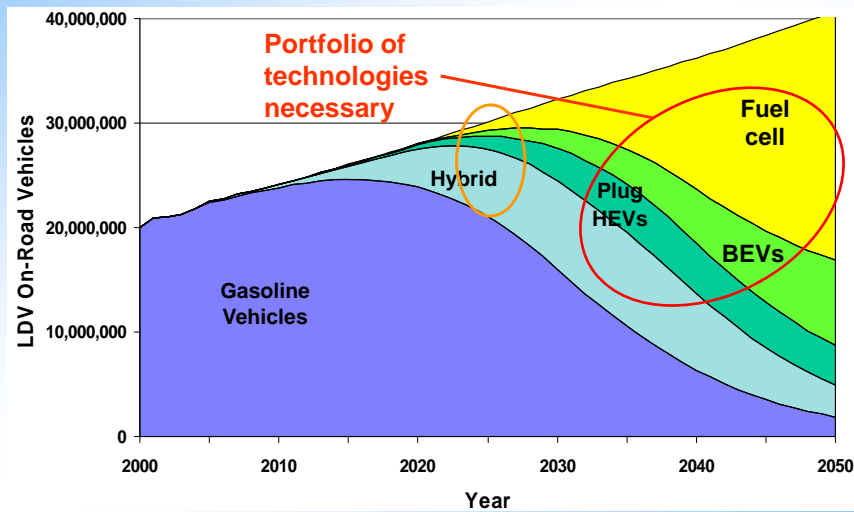


Will Next National GHG Tailpipe Standards Require Fuel Cell or Electric Vehicles by 2025?

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Scenario (Improvement/year required)	CO2 gpm	Reduction in GHG	% Advanced Vehicles Needed - 2025
2016	250	Baseline	
3%	190	24%	0%
4%	173	31%	0%
5%	158	37%	1%
6%	143	43%	9%

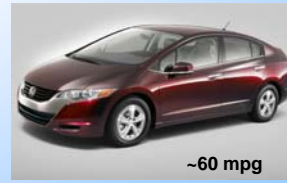
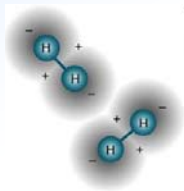
Roadmap to Reduce Passenger Vehicle GHG by 80% by 2050*



* One possible scenario

Why Hydrogen Plays a Role

- Non-carbon fuel
- Can be made from renewable sources
 - Low carbon emissions from production
- Fuel cells very efficient
- One of a portfolio of technologies necessary to achieve deep carbon reductions



Fuel Cell Vehicles in CA

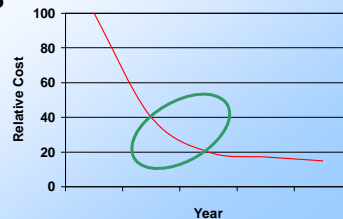
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CA ZEV Mandate – Passenger Vehicles

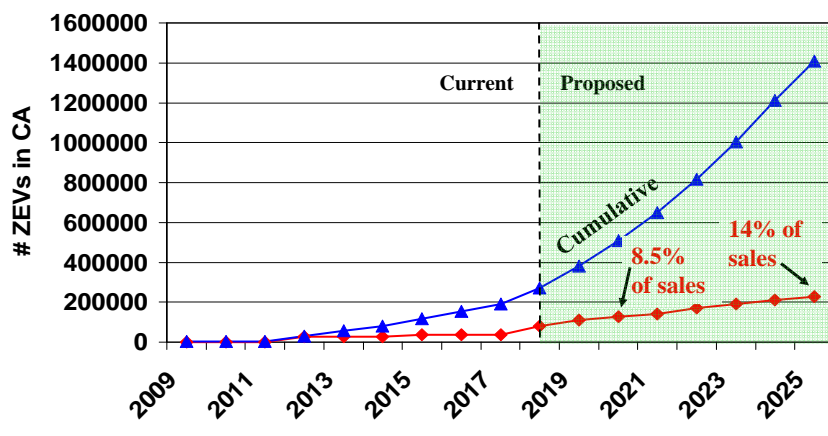
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- Achieve early commercialization of ZEVs by 2025
- Sufficient volume of ZEVs to achieve major cost reductions by 2025
- Sustainable growth post-2025 – rate affected by GHG tailpipe standards



Current Thinking: ZEV Program 2018+

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*Assumes max. use of plug HEVs. **Includes plug vehicles and FCVs only; excludes NEVs

Summary

- To address climate change, carbon emissions from passenger vehicles must be reduced
 - Need more efficient vehicles, and low carbon fuels
- H2 fuel cell vehicles meet these criteria
 - Practical for larger cars and SUVs
 - Battery electric vehicles work best for smaller vehicles
- Portfolio of low carbon technologies needed to meet 2050 climate goal
 - Need early commercialization by 2025, to:
 - Provide time for market growth and fleet turnover