**STEPS Spring 2017 Symposium**
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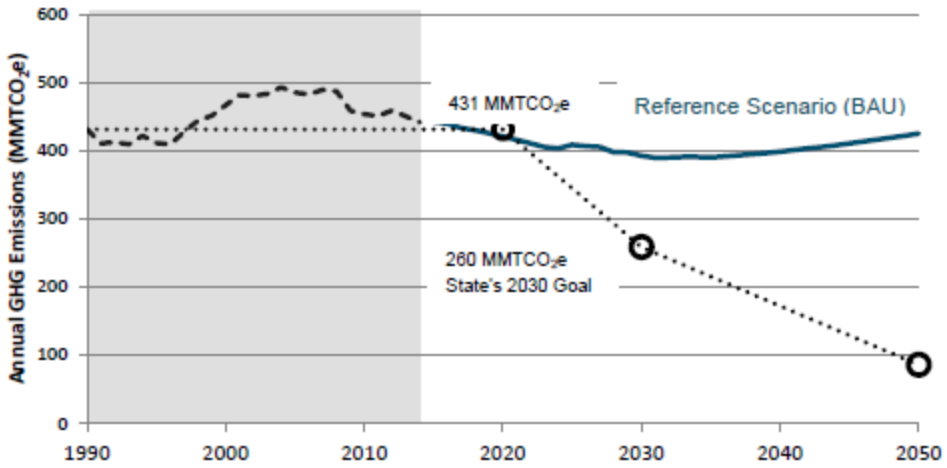
# California's Next Phase of Clean Car and Truck Policies for 2030

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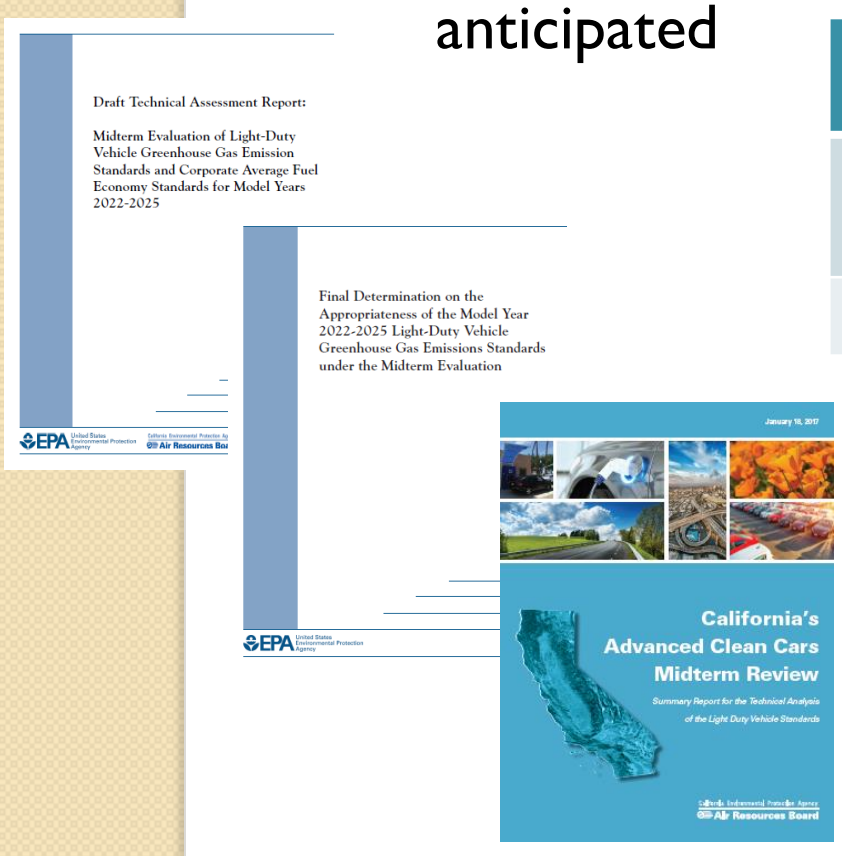
# *We don't yet know what those policy structures will look like…..but*

# Guiding reflections for CARB's 2030 clean vehicle and engine policies

- Emission reductions from transportation sector are needed to reach California's clean air and climate targets
- Pursue new innovative policy frameworks that guide development down lowest-carbon path cost effectively (resist temptation to simply extrapolate)
- Leverage supply-side (regulatory) and demand-side (investments and voluntary actions) approaches
- #1 priority is zero emissions and the trifecta environmental benefit from wide use of sustainable transportation energy
- We are not alone in this journey. Leverage partnerships with other leading jurisdiction (nationally and internationally)
- The current political dust storm (which clouds vision) will pass
- Welcome opportunity to work with auto industry, NGOs, civil society

# Lessons from TAR and Final Determinations

- Existing standards are appropriate (modestly aggressive at best)
- Plenty of technology available at lower costs than anticipated

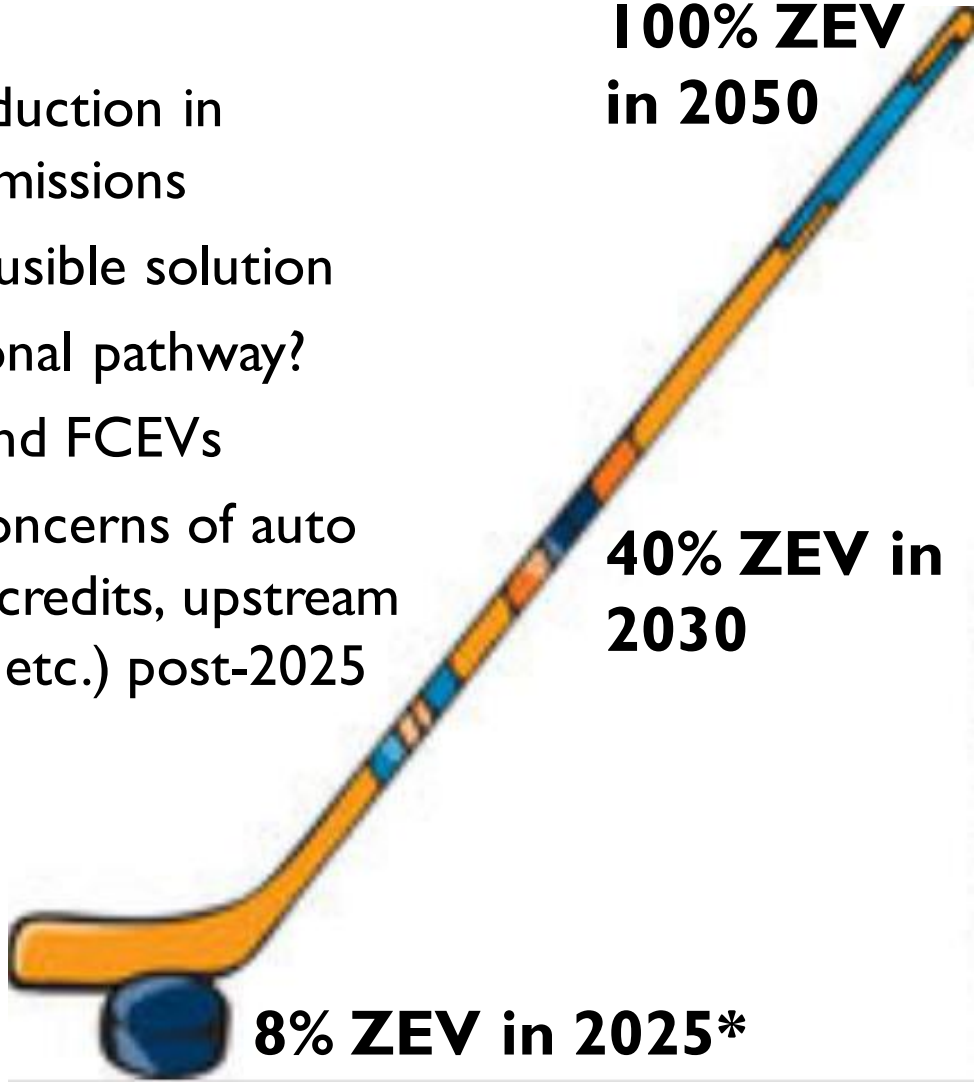



| Incremental vehicle costs to meet 2025 standards | |
|---|---|
| 2012 EPA Rulemaking | 2016 Proposed Determination |
| $1,163 | $875 |

- Fuel savings and better TCO for consumers offset tech costs
- Standards are not a forcing function for ZEVs (3% ZEVs by 2025)

# Is there an optimal hockey-stick?

- End goal is clear
- States need massive reduction in pollution and climate emissions
- Electrification most plausible solution
- What is "*right*" transitional pathway?
- Role of PHEVs, BEVs, and FCEVs
- Addressing flexibility concerns of auto industry (e.g., off-cycle credits, upstream emissions, tech credits, etc.) post-2025




*CARB Midterm Review

# A role for targeted research

- Policy makers pose framing questions
- Researchers can help come up with answers
- 3 Revolutions Policy Initiative is "one small step for man…."
- 21st policy frameworks and how to integrate CASVs or CASEVs?
  - Embrace trends for autonomous, connected, shared mobility
  - Guide development towards more efficiency, lower emissions
- Consider possible peak urban car ownership in ~2020
- Implications of cost parity between BEVs and ICEs in ~2025 or earlier?
- Understanding intersections of car rules with other policies
  - Urban planning and e-mobility – SB375Plus?
  - Adaptable infrastructure
  - Pricing mobility
- Differences between private (light-duty) and commercial (heavy-duty) transport sectors
- The systems approach: putting fuels into vehicle regulations

# Is the effect of the unintended "*catalyst*" for electrification a true turning point?


REUTERS

Patrick T. Fallon | Bloomberg | Getty Images

Hoses connect laboratory emission testing equipment to a red 2016 Volkswagen AG Golf TDI inside the California Air Resources Board Haagen-Smit Laboratory in El Monte, California.

# The car before the truck

- Apply lessons from light-duty program to heavy-duty developments
- California's HD GHG Phase 2 rule
- Upcoming new lower HD NOx standard (and accompanying policies)
- Making fundamental improvements to various related elements
  - Warranty and useful life, Inspection & Maintenance, Not-to-Exceed in-use requirements, opacity
- A Zero Emission Local Truck Mandate or an Alternative?
- Capitalize on California's sizeable HD investments (2300 hybrid trucks, ~200 BE Transit and School Buses, 400 BETs, 80 BE Shuttles, ~40 FECBs)
- Like LDVs, integrate new technology trends (telematics, connected, autonomous) into new clean truck policies

*Looking forward to the opportunities on the road ahead*