

California's Leadership and Innovation – A National and International Perspective

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Presented at the California Energy
Commission (CEC) Integrated Energy Policy
Report Workshop on Transportation
March 27, 2014



Outline

- Transportation Focus
- LDV and HDV
- Fuels
- Legislation and Regulation
- U.S. Leadership
- Global Leadership
- Lessons for Future Directions

Why is California a Recognized Leader?

- Historical air quality challenges in 40's, 50's and 60's
- Provisions in the U.S. Clean Air Act in 1970 and subsequent amendments
- Test ground for rest of U.S.
- Sustained public, legislative and administrative support
- Leadership from CARB in association with air districts

National Impact

- Federal Clean Air Act Exemption for California vehicle emissions standards
 - To meet “compelling and extraordinary” conditions
 - Must meet or exceed federal regulations
 - Can be adopted by other states
 - (15 including Northeast states, Oregon, Washington)
- California Firsts (Examples)
 - Lead-free gasoline
 - Low-sulfur fuels
 - Three-way catalytic converter
 - Stringent NO_x control
 - First GHG emissions standards for LDV in 2004

Policy Instruments

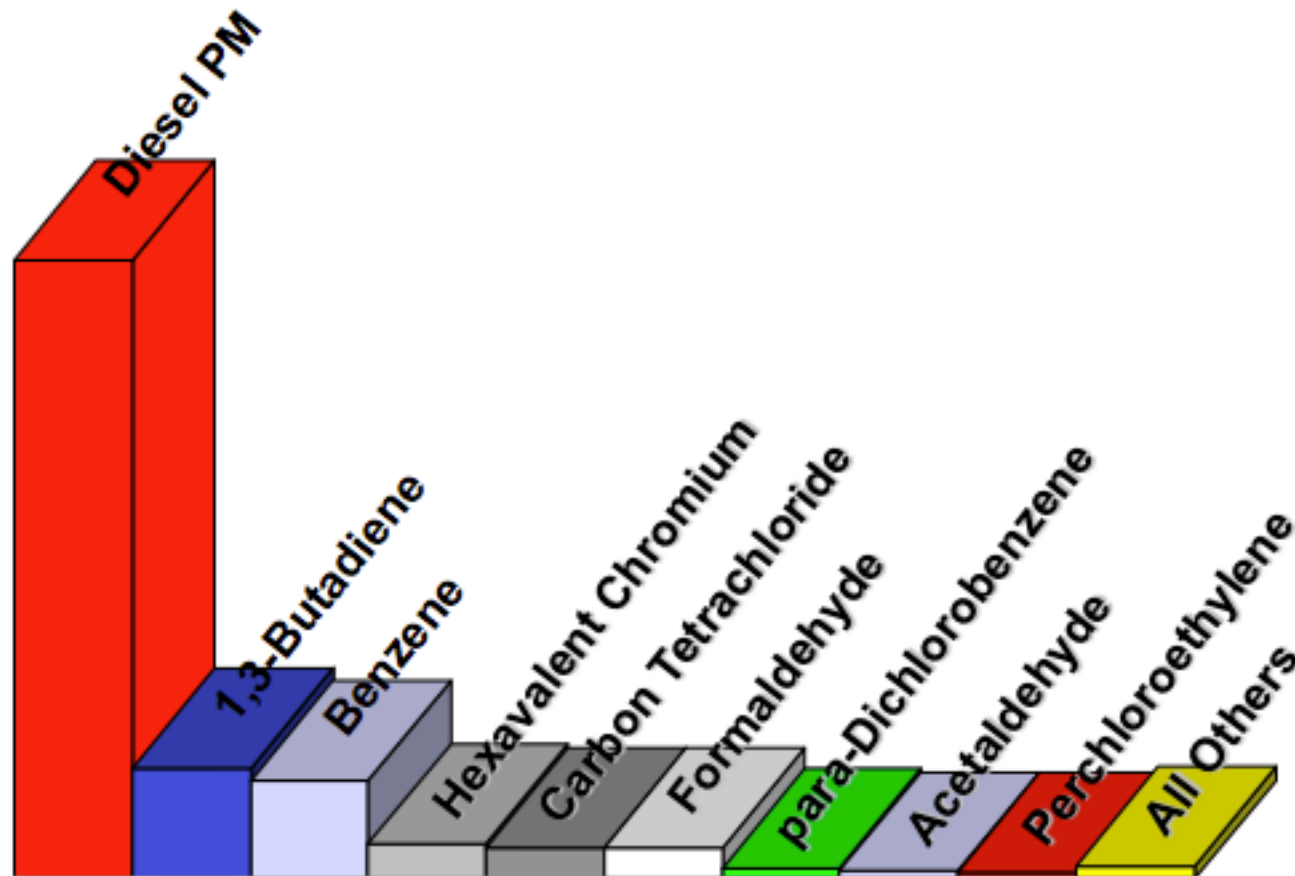
- Performance-Based Emission Standards
 - After treatment effective, but turnover slow
 - Retrofits and repowering also beneficial
 - Fuel improvements provide immediate benefits
- Incentive Funding
 - \$150M per year for diesel engines
 - \$1B for port trucks and equipment
- Market-based Programs
 - Carbon emission trading for large sources
- Enforcement and Monitoring Programs

Landmark Finding in 1998 – Diesel Particulate as TAC

- The identification of diesel particulate matter as a toxic air contaminant – and a probable carcinogen – had a major impact
- Diesel Risk Reduction Plan (DRRP) approved by Board
- Significant Global implications e.g. Tokyo

Cancer Risks from Airborne Toxics *

(90% of risk from traffic pollutants)

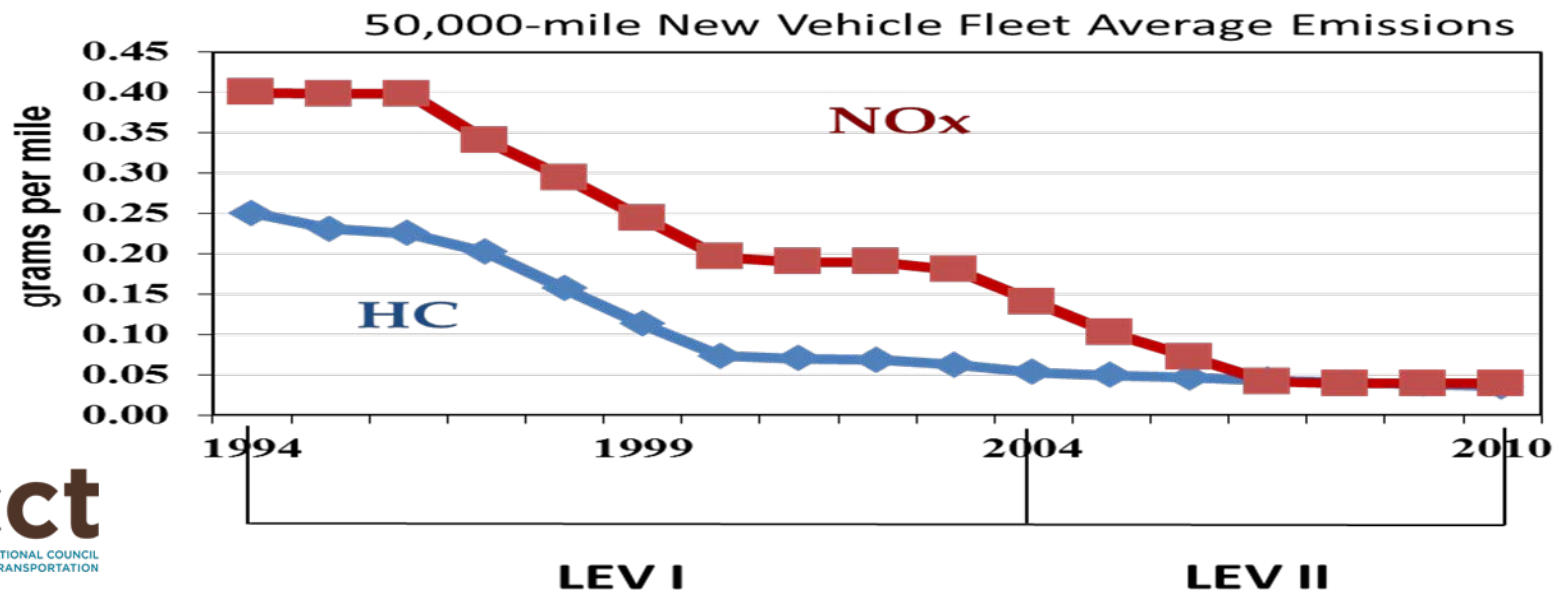
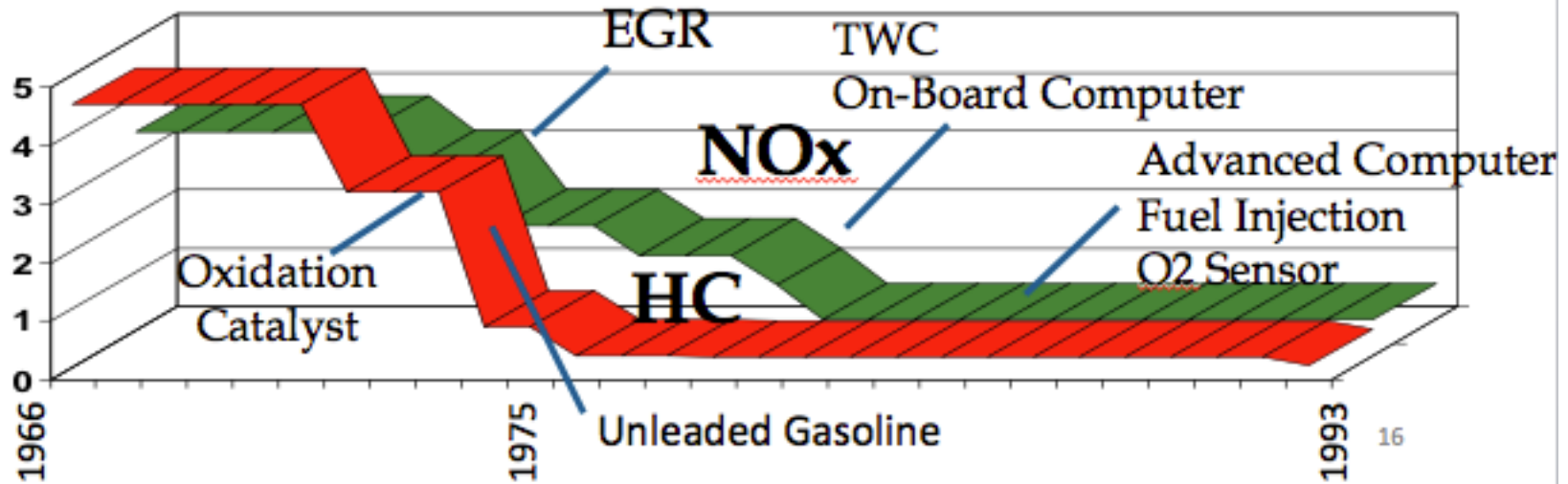


* Estimated 400 cases/year in 2005 (dioxins not included)

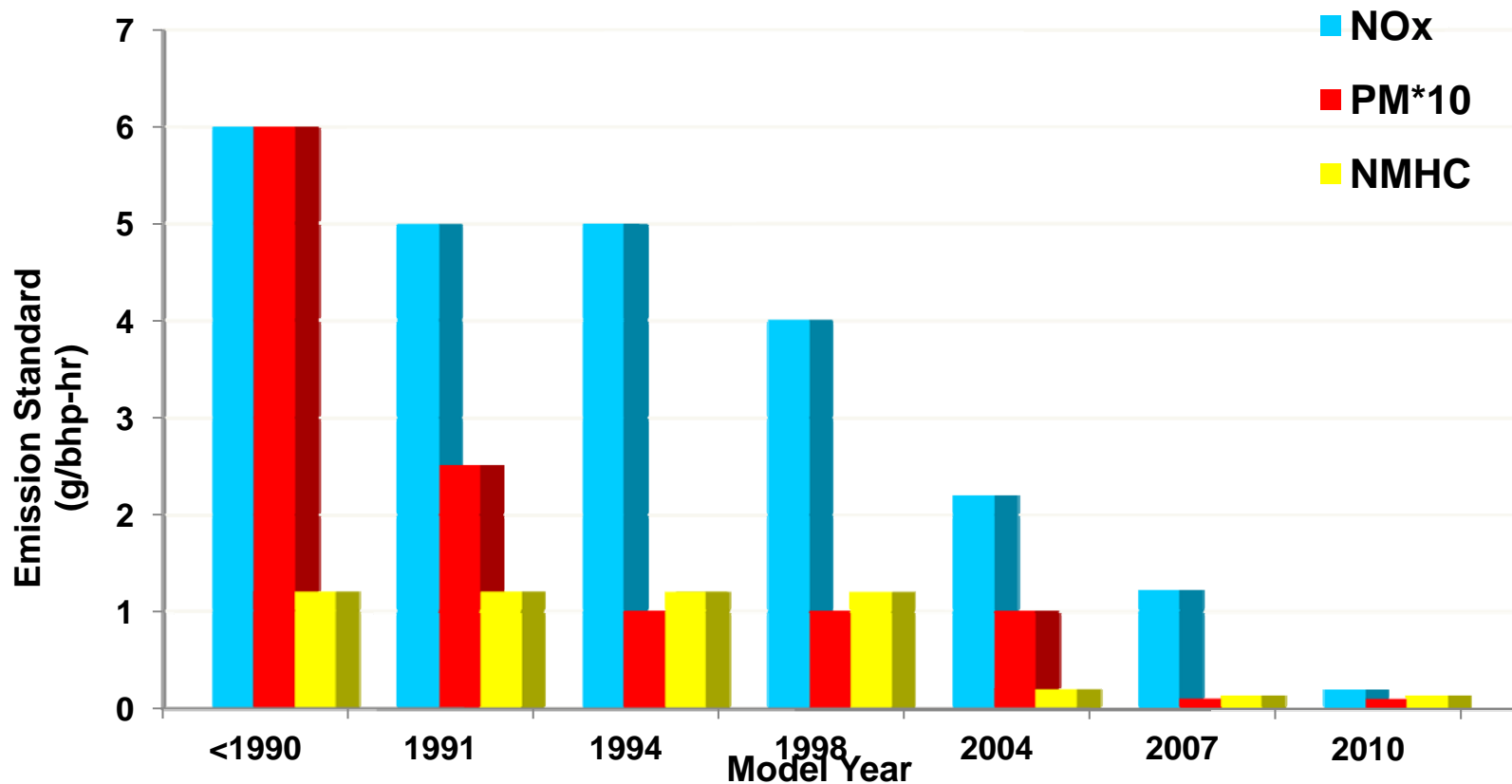
Performance-Based Regulations

- Mobile Sources (>99% gasoline, 98% diesel reduction)
 - Cleaner engines
 - After treatment
 - Cleaner gasoline & diesel fuel
 - Alternative fuels – Importance of Methanol and Natural Gas
- Stationary Sources (80-90% reduction)
 - Low-NO_x burners
 - Selective catalytic reduction
 - Cleaner fuels
- Area Sources (>75% reduction)
 - Vapor recovery – at gas station and on-board vehicle
 - Low-volatility solvents, paints, consumer products

Light-Duty Emission Standards



Heavy-Duty Emissions Standards



Key California Leadership Programs

- LEV, especially ZEV requirement for LDV
- ZeBus
- GHG regulation following AB 1493 (Pavley)
- LCFS
- AB 32 – Family of programs

Major California GHG Policies

- Transportation
 - 54.5 mpg fleet average by 2025
 - 1.5 million zero emission vehicles by 2025
 - 10% lower carbon intensity by 2020
 - ~7.6% per capita VMT reduction by 2020, ~12% by 2035 (SB 375)
- Electricity Generation
 - 33% renewable by 2020
 - No coal after 2025 (SB 1368)
 - 12,000 MW renewable self generation by 2025
- Energy Efficiency
 - Appliance standards
 - \$2.5B for school retrofits (Prop 39), retrofit existing building (AB 758)
 - Zero energy new residential buildings by 2020, commercial by 2030
- Water
 - 20% per capita water consumption reduction by 2020
- Waste
 - 75% diversion by 2020 (AB 341)

Key California Programs – Incentives and Subsidies

- Vehicle registration fees & application
- First major application – Technology advancement program at SCAQMD
- Support for infrastructure e.g. AB 8
- Key role for CEC and ARB
- Coupling of transportation and renewable energy – BEVs and FCEVs

Role in Developing World

- Most countries follow the European standards
- However, California is looked upon for technology forcing standards, enforcement and compliance
- Chile adopted California stricter NO_x standards
- Many other countries, including the U.S., get benefit of strict California standards, earlier
- California is a desired MOU partner:
 - China
 - India – ICAMP
 - Mexico

Lessons For Future Directions

- Continue to include both criteria pollutants and GHG's to protect public health and climate
- Continue leadership in deploying zero emissions technologies (BEVs, FCEVs) with renewable energy
- Continue to support infrastructure for EVs, FCEVs and emerging natural gas vehicles (especially in medium and heavy duty sector)
- Continue the implementation of AB 32 objectives and set example for other countries (e.g. C & T)
- Use California auction revenues to benefit all California residents e.g. SB 535

Thank You!