TRANSPORTATION MODELS: INFORMING SPECIFIC POLICIES

CALIFORNIA CLIMATE POLICY MODELING DIALOGUE
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FEBRUARY 23, 2015
DIFFERENT MODELS FOR VARYING LEVELS OF POLICY DECISIONS

• Policy Decision Makers
  • Economy-wide models – GO/Legislature, Setting targets
  • Sector detailed models – Agencies, rule development

• Examples of sector specific models
  • Vision tool to inform ARB transportation policies
  • Switch tool to inform electric grid policies (CEC, PUC)
UNIQUE VALUE OF TRANSPORTATION MODELS (1)

• Rigorous match to existing ARB policies & inventories
  • Captures nuances of regulations (e.g. ACC, LCFS), including regulatory metrics, credits, compliance projections, etc
  • Captures newest official emissions inventories

• Detailed mobile sector disaggregation by vehicle class
  • To inform specific mobile sector rules, plans
  • Allows detailed assumptions of technology by vehicle class
UNIQUE VALUE OF TRANSPORTATION MODELS (2)

• Incorporates multiple pollutants
  • CO2e, NOx, PM2.5, VOC/ROG
  • WTT criteria emission factors for CA facilities (in-state controlled stationary sources)
  • AB 32 GHG emissions accounting boundary (portions of upstream fuel production occurring in-state)

• Detailed spatial resolution; Data for ozone simulations
  • State, air basins, counties, census block
TRANSPORTATION MODELS NEEDED WITH DISAGGREGATED DETAILS

- ACC-LEV: On-road gCO2e/mi & gNMOG/mi, credits
- ACC-ZEV: ZEV sales, eVMT, credit nuances
- HDV Phase I GHG Std:
- HD Engine NOx Std:
- HDV Truck/Bus Fleet rule:
- LCFS: Credits, in-state GHG benefits from production
- SB 375: “Off-model” strategies
- Identify priorities for research & public incentives

**HDV Inventory nuances:**
- Average age by use profile
- Out-of-state migration
- Accelerated turn-over
"POLICY DASHBOARD" – EXAMPLE SCENARIO

- LEVIII - 231 gCO2e/mi in 2025
- Standard - 4.4% / yr - 5.3% / yr

- LCFS2 - 15% Reduction in 2030
- LCFS - 10% Reduction in 2020

- ZEV - 15% in 2025
- ZEV Sales

- Power Generation Share (%)
- Nuclear
- Large Hydro
- Renewable
- RPS - 33% reduction in 2020
BASELINE INVENTORIES

SCAB NOx Emissions

- Non-Energy
- Ind - Not Fuels
- Refinery + O/G
- Elec Ut *
- Bldg - Comm
- Bldg - Res
- Other Trans
- Air (intra. for GHG)
- OR Equip
- OGV + HC
- Rail (fr+pass)
- HDV
- LDV + Bus

Statewide GHG Emissions

* For GHG EI, electricity part of buildings & industry

ARB Vision, Feb 23, 2015
KEY TRANSPORTATION QUESTIONS TO ADDRESS EMISSIONS TARGETS

Systems

• How do strategies cut across climate, criteria, and community health goals?
• Which strategies achieve 2032 NOx & 2050 GHG targets?

Mobile Technology

• What are benefits of new HD NOx Stds & Cert changes?
• What scale of electrification in varying mobile sectors?

Fuels

• What does an LCFS+ 18% target in 2030 look like (SP)?

Activity Change

• What are the benefits of VMT reductions beyond SB 375?
• Are there efficiency improvements across freight modes?
1. Need for strong ZEV Reg to 2025; Pure ZEVs are critical
2. Need to expand GHG standards to 2030 & beyond
   - LEV GHG+: <50 gCO2e/mi by 2050 (WTW, new on-road levels)
   - LCFS+: >50% reduction by 2050 below 2010
   - HDV GHG rule, SB 375, RPS, etc
3. 2032 NOx achievement → larger reliance on TTW
4. New heavy-duty engine standard critical (up to 90% lower)
   - NG trucks may be larger compliance approach than diesel
5. Fuel infrastructure coordination needed statewide
   - Hydrogen, Electricity, CNG, LNG
   - Evaluate networks to support multiple sectors
INSIGHTS: MULTI-POLLUTANTS

Tradeoffs to Manage (between pollutants)

• Methane leakage (increased NG demand for NOx benefits)
• Biofuel production (in-state for GHG, but adds WTT NOx)

Win-Win (criteria & GHG) – “No Regrets Investments”

• ZEV powertrains & renewable electricity/H2 (not biomass)
• Waste diversion & reuse – Renewable Natural Gas
  • Landfills, Dairy waste, Waste water treatment plants (WWTP)
• Electrification of buildings
• Power-to-Gas (P2G) fuel production
  • Electric grid balancing, H2 supply, & NG decarbonization
SOME PERSPECTIVE ON CHANGE

1980 → 2015 → 2050

- Autonomous vehicles?
- Millennials w/o cars?
- Telecommuting?
- Cold fusion?
- Algae biofuels?
- Compact living?