Vehicles in the Cap

Alternative Regulatory Options to Limiting Passenger Vehicle GHG Emissions as Required by California's Global Warming Solutions Act (AB 32)

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ENVIRONMENTAL DEFENSE

finding the ways that work

Outline

- Motivation: AB 32 - §38590 "Pavley Backup" requirement – what it means
- Policy design options – quick overview
- The "carbon burden" concept
- Conclusions / analysis needs

AB 32 - §38590 "Pavley Backup"

What does it say?

What does it mean?

AB 32 "Pavley Backup" Requirement

§38590. If the regulations adopted pursuant to Section 43018.5 [AB 1493] do not remain in effect, the state board **shall** implement alternative regulations to control mobile sources of greenhouse gas emissions to **achieve equivalent or greater** reductions.

AB 32 "Pavley Backup" Requirement

- EDF recommends that CARB act now (in the scoping plan) to identify, develop and adopt "Pavley backup" regulations per §38590 - an insurance policy

- Such regulations should target automakers, but allow complete discretion for the form of emissions reduction (to avoid repeating Pavley-type challenges).

- “Equivalent” reductions required under §38590 should account for (include) multiplier effect of other states' adopting Pavley.

AB 32 "Pavley Backup" Requirement

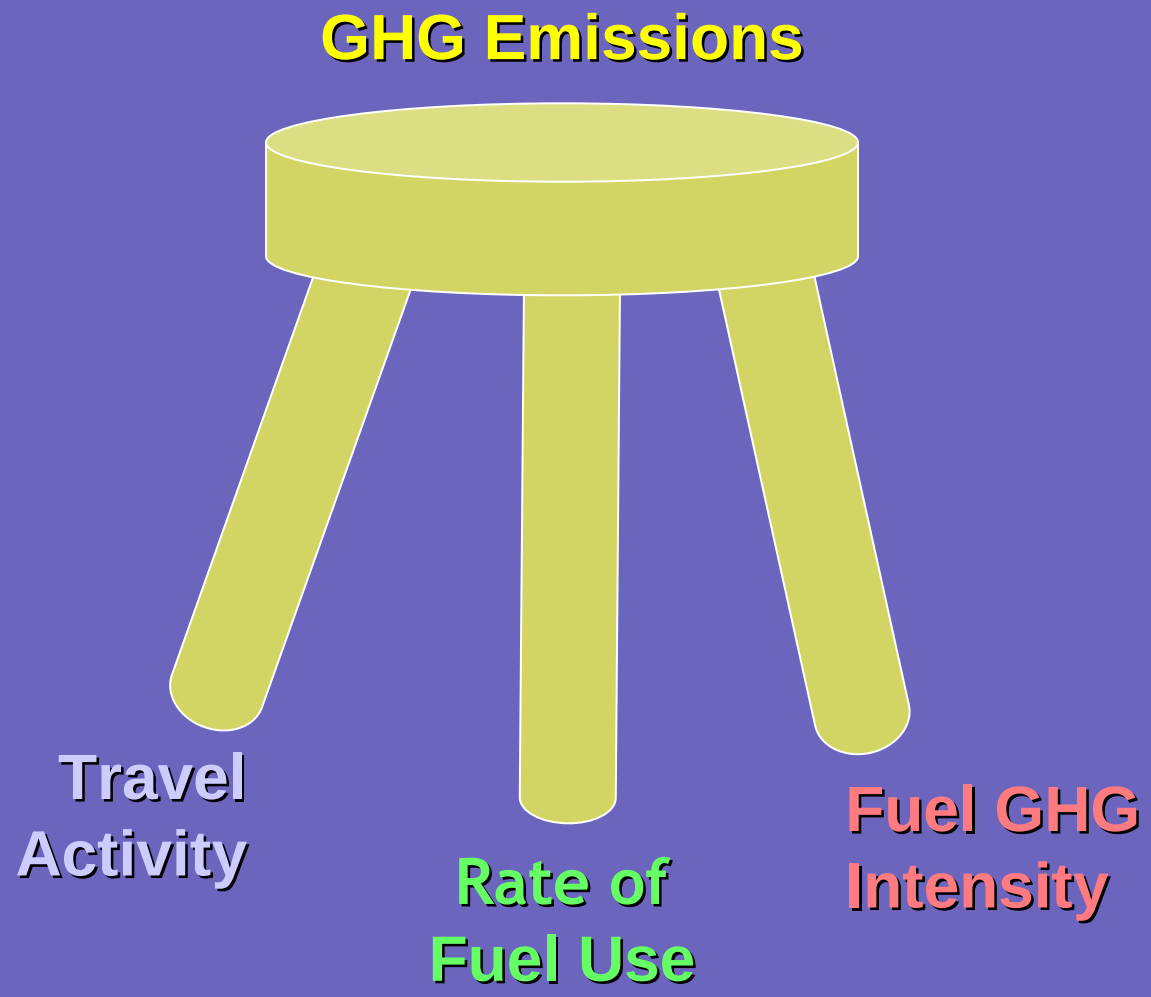
- *§38590 – CARB shall implement alternative regulations to … achieve equivalent or greater reductions.*

- Projections of cumulative Pavley reductions[1]
  - California only adoption of Pavley
    - 55 MMT (2016) 158 MMT (2020)
  - California + other adopters (multiplier effect)
    - 158 MMT (2016) 434 MMT (2020)

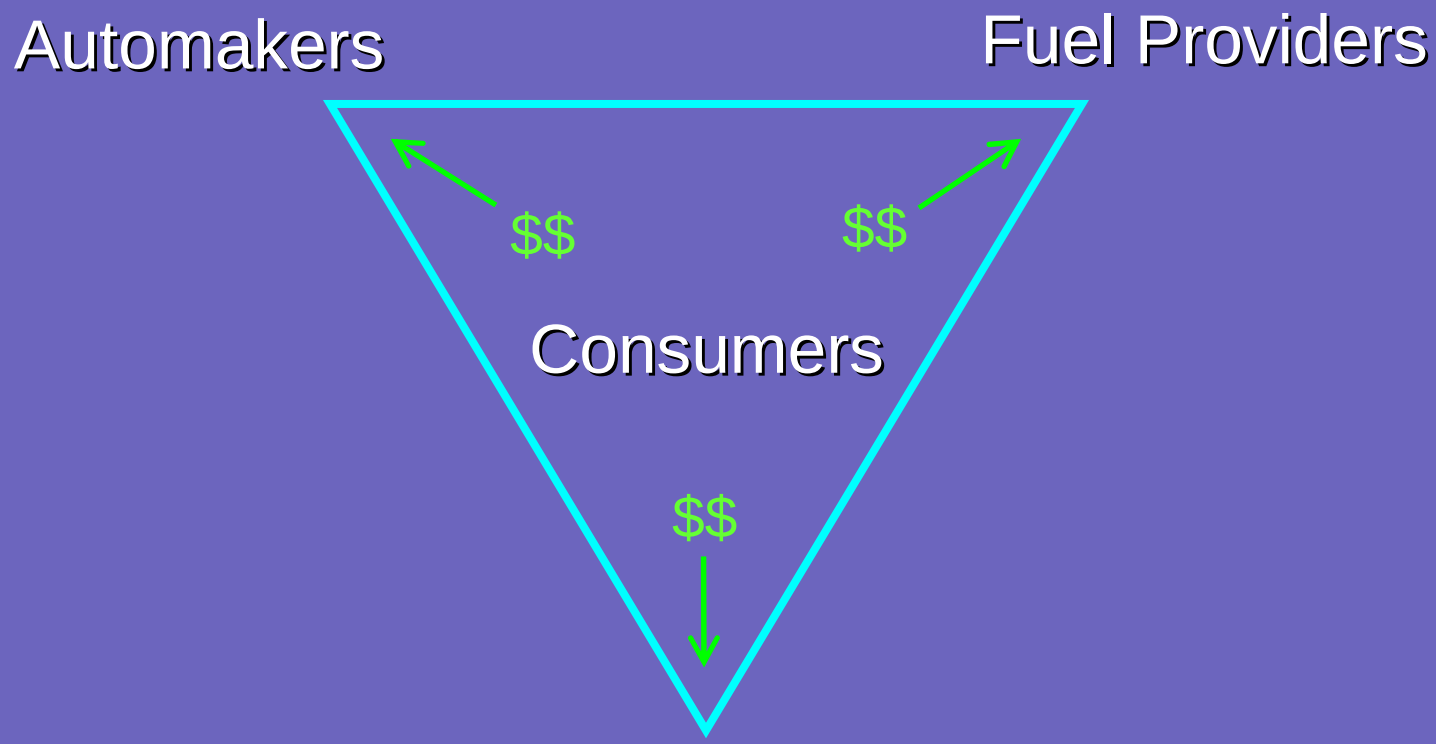
1 - Feb 25, 2008, CARB, Comparison Of Greenhouse Gas Reductions For The United States And Canada Under U.S. Cafe Standards And California Air Resources Board Greenhouse Gas Regulations

Policy Design Options

Traditional Factors for Analyzing Transportation GHG Emissions



Actors Whose Decisions Influence Auto Sector GHG Emissions



Basic Options for Auto Sector Policy Design

- Performance standards for both automakers and fuel providers
  - (e.g. Pavley and LCFS)
- Fuel providers submit allowances; automakers regulated with performance standards
  - (e.g. Fuels in cap, LCFS, and Pavley)
- Automakers submit allowances; fuel providers regulated with performance standards
  - (e.g. Carbon burdens, LCFS)
- In all cases, need additional measures for:
  - Land-use and infrastructure planners and providers
  - Consumers and other end users

The "carbon burden" concept –

(Vehicles in the cap)

"Vehicles in the Cap" policy option

- Automakers required to submit allowances to cover the lifetime use-phase GHG emissions from the new fleets they sell each year
- Metric: lifetime "carbon burden"
- Effectively limiting auto carbon burdens will require low-carbon fuel, hence this policy works in tandem with the LCFS.
- Automakers can trade, purchase offsets, etc., in the broader carbon market.

Auto Fleet Carbon Burden Defined

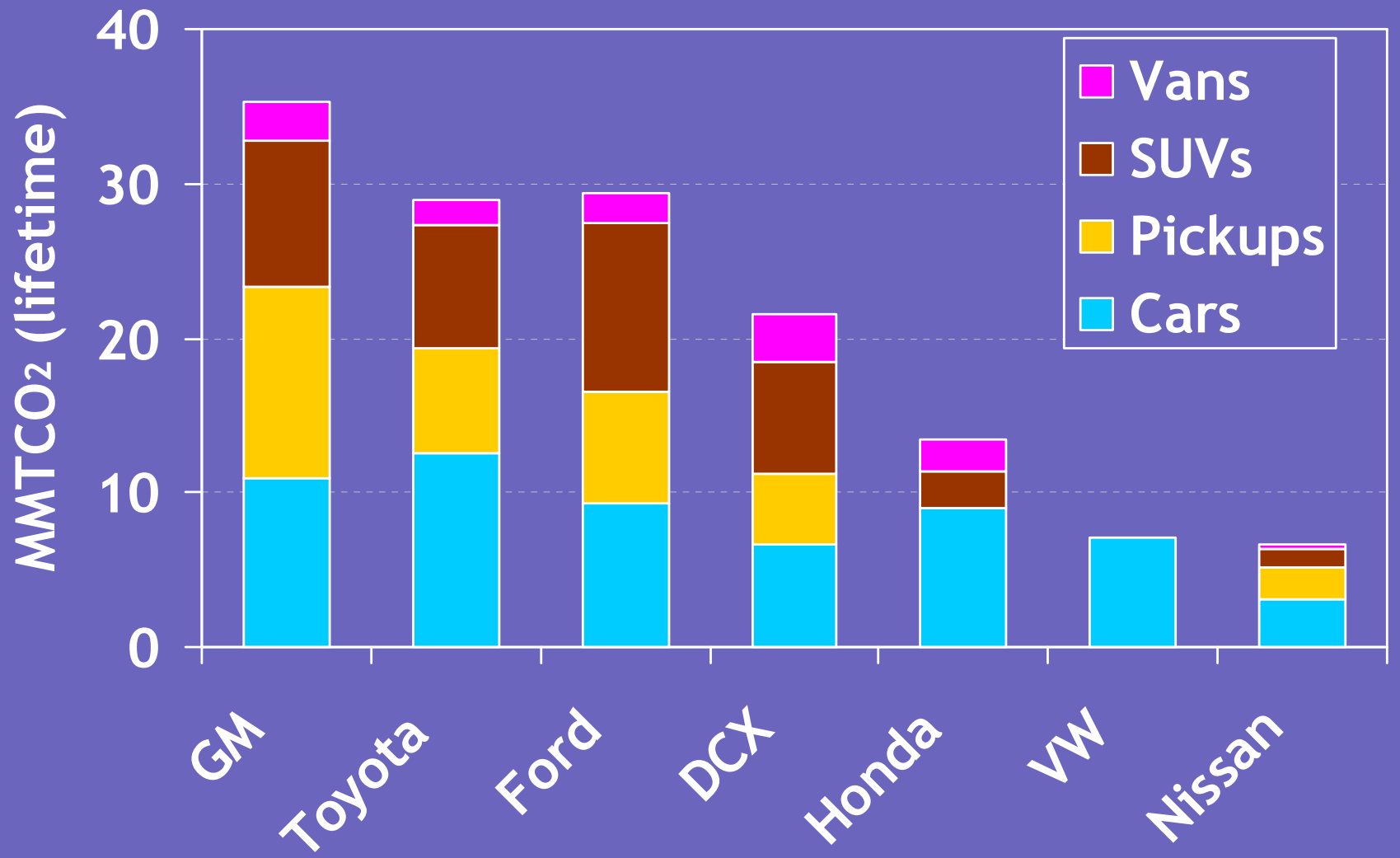
- Expected lifetime emissions from a fleet of vehicles sold in a given year
- Depends on four main factors:
  - Expected lifetime VMT (e.g., 180,000 miles)
  - In-use fuel consumption rate (Btu/mile)
  - GHG intensity of the fuel expected over the vehicle lifetime (gCO_2e/Btu)
  - Expected lifetime emissions of other global warming gases
- Computed as a summation over types of vehicles and fuel they will use

Achieving Carbon Burden Reductions

- Compliance pathway at the discretion of the vehicle provider
  - On-board improvements to reduce fuel consumption – with an adjustment for technology use in other states (equal to the Pavley multiplier)
  - Trading
  - Offsets purchasing
  - VMT reduction strategies
  - Others…

New Fleet Carbon Burdens in California

by Automaker and Vehicle Type, 2002

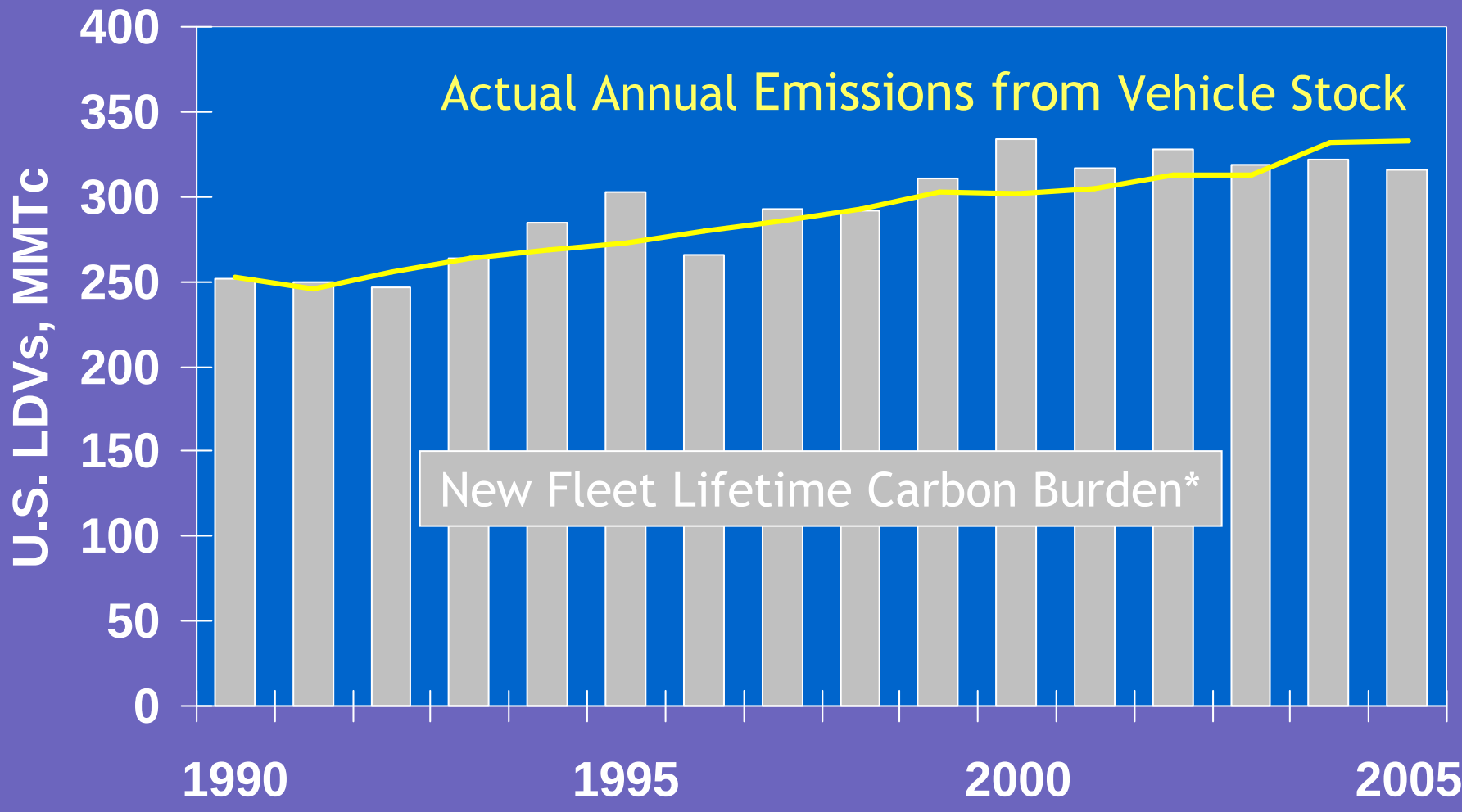


Developing Carbon Burden Targets

- Back calculation from future inventory target
  - Can use models (e.g., EMFAC) similar to those used for air quality attainment
  - Need to specify average fuel GHG intensity

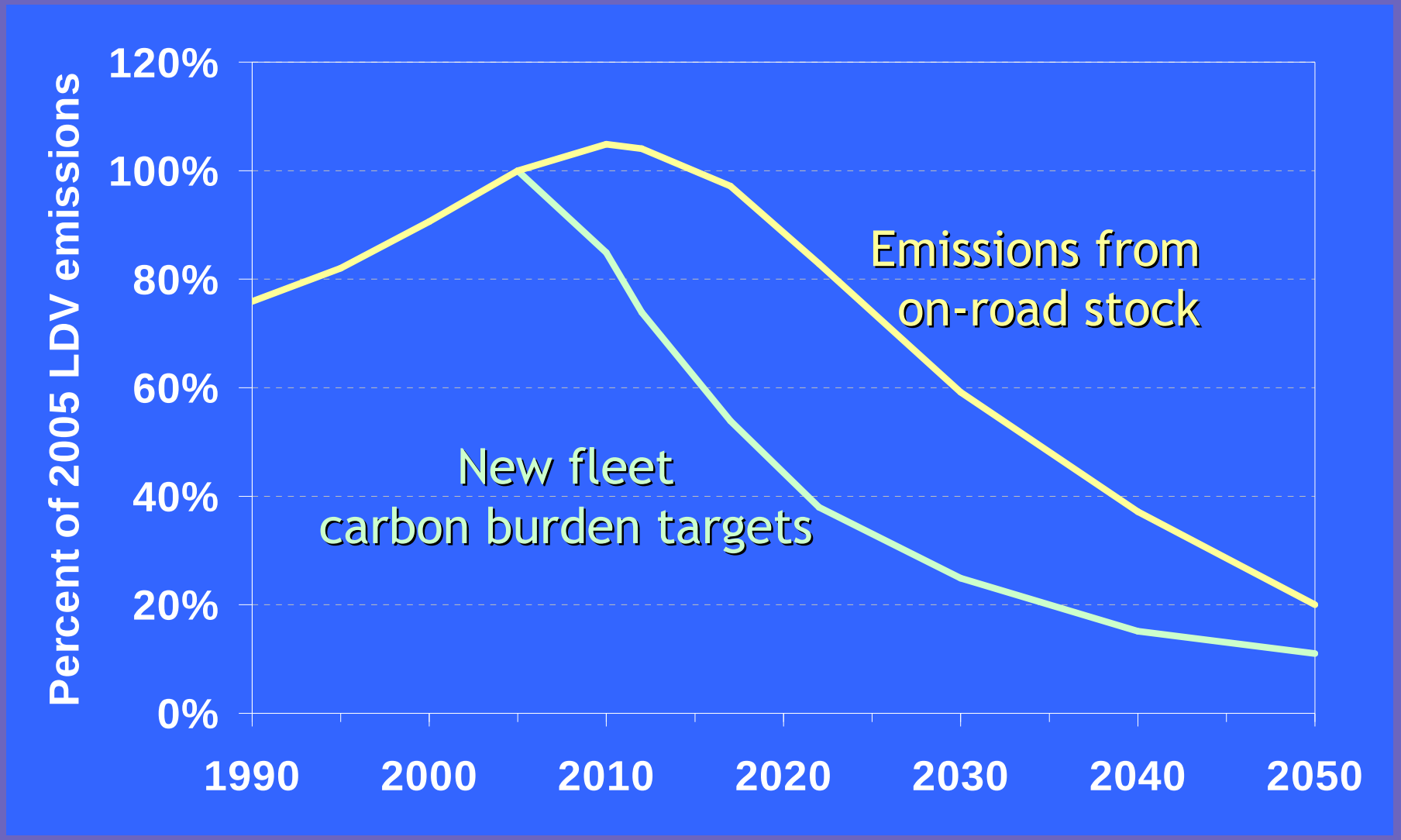
- Important note: A range of solutions (mix of fuels and vehicles that will use them) can satisfy the target
  - One or more solutions needed for technical justification
  - Policy remains technology neutral

New Fleet Carbon Burdens Compared to On-Road Vehicle Stock Emissions



*assumes the same 150,000 mile lifetime for all years

Example Auto Carbon Burdens Trajectory



Conclusions / analysis needs

Conclusions

- If AB 1493 does not remain in effect, AB 32 requires alternative regulations to achieve equal or greater reductions from mobile sources.

- Multiplier effect [2] of Pavley (approx 2.74 x)
  - 158 MMT (2020) → 434 MMT (2020)

2 – Based on adoption by California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

Conclusions

- "Vehicles in the Cap" is an approach for meeting the requirements of AB32
  - Require automakers to submit allowances equal to lifetime carbon burden of new fleets sold each year
  - Simultaneously require LCFS to ensure use of low-GHG fuels needed to achieve the carbon burden limits
  - Target setting similar to traditional analyses used for mobile source inventory control
- Enables integration of auto sector into a broader market-based system as authorized by AB 32

Analysis Needs

- Develop California-specific carbon burden targets as needed to achieve "equal or greater" reductions.
- Examine feasible combinations of vehicles, fuels and offsets needed to meet the carbon burden targets.
- May need longer horizon for LCFS
- Examine approaches for verifying actual vehicle fuel use (automated sampling, surveys)
- Care needed to avoid double counting, e.g., of electric sector emissions for EVs, in carbon burden calculations, if cross-sector trading is allowed

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