



POLICIES TO ACHIEVE 2030 TARGETS ON ZEVs AND GHGs

**PRELIMINARY RESULTS FROM THE CALIFORNIA
ENERGY POLICY SIMULATOR**

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**California Climate Policy
Modeling Dialogue**

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ENERGY INNOVATION
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THE ENERGY POLICY SIMULATOR

Canada



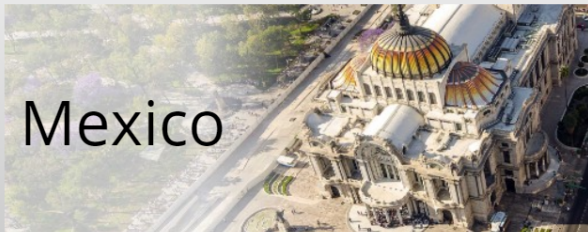
China



Indonesia



Mexico



Poland



United States



Six countries
covering
46% of
global
emissions

<http://energypolicy.solutions>

USER FRIENDLY WEB INTERFACE

POLICY
SOLUTIONS



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v1.1.2

POLICY SCENARIO SELECTOR

New Scenario (unsaved changes)

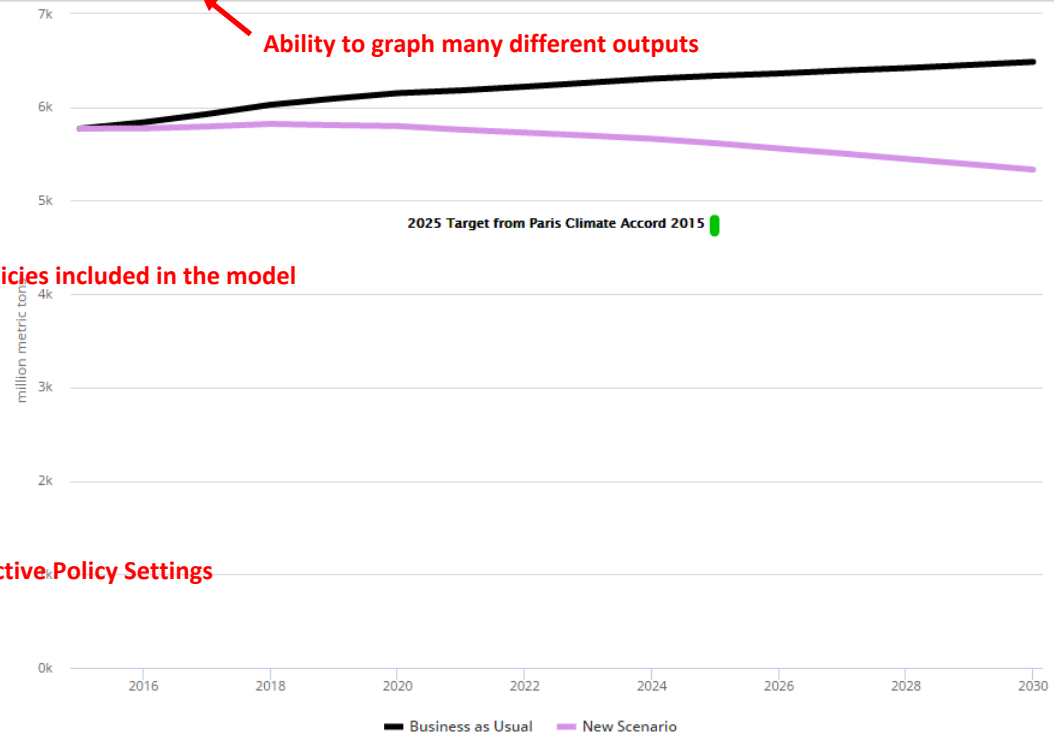
- Transportation
- Buildings and Appliances
- ▾ Electricity Supply
 - Change Electricity Exports
 - Change Electricity Imports
 - Demand Response
 - Early Retirement of Power Plants (Coal)
 - Early Retirement of Power Plants (Nuclear)
 - Grid-Scale Electricity Storage
 - Increase Transmission
 - Plant Lifetime Extension (Nuclear)
 - Reduce Plant Downtime (Preexisting Natural Gas Non)
 - Reduce Plant Downtime (New Wind)
 - Reduce Plant Downtime (New Solar PV)
 - Reduce Transmission & Distribution Losses
 - Renewable Portfolio Standard
 - Subsidy for Electricity Production (Nuclear)

POLICY SETTINGS

- Methane Capture: 75.0%
- Afforestation and Reforestation: 25.0%
- Carbon Tax: 30 [\$ /metric ton CO2e]

OUTPUT GRAPH SELECTOR

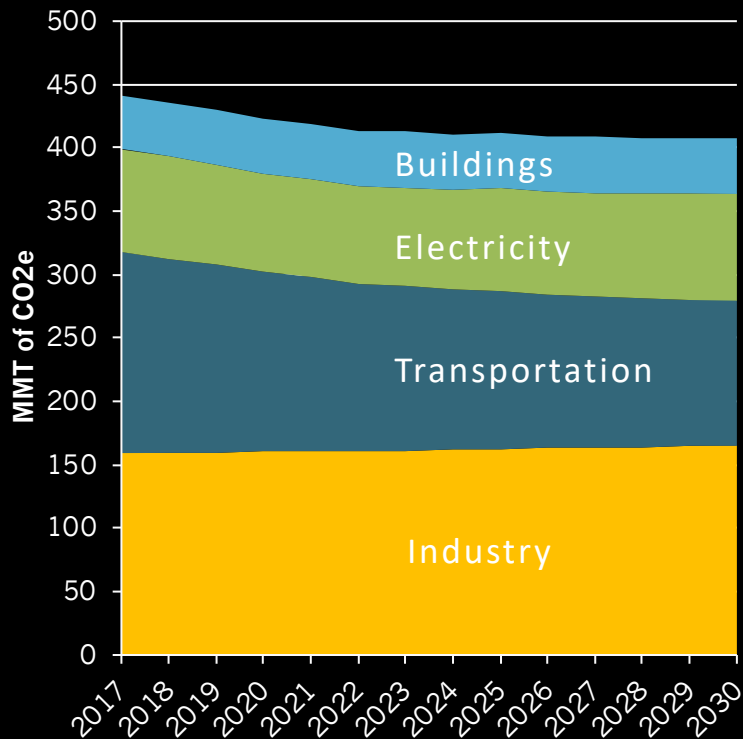
CO2e Emissions (Total)



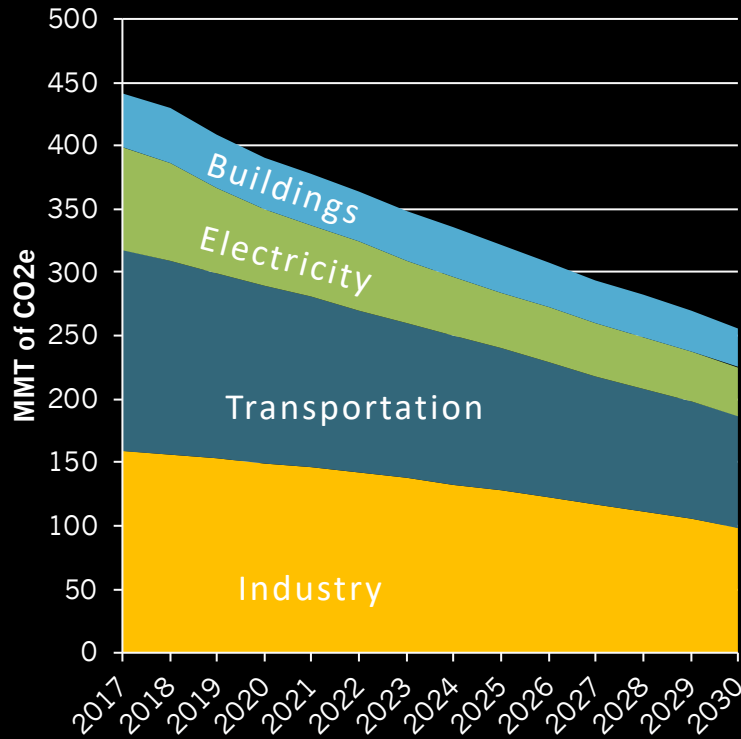
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POLICIES TO ACHIEVE THE 2030 GHG TARGET

Reference emissions



With 2030 policies



Policy highlights:

- SLCP reductions
- 65% RPS and flexibility policies
- \$56 carbon price
- Transport next...

TRANSPORTATION POLICIES

Reference

- Current tailpipe standards
- 2025 ZEV rule
- LCFS at 10% by 2022
- Current incentives for cars and trucks, phasing out over 10 years

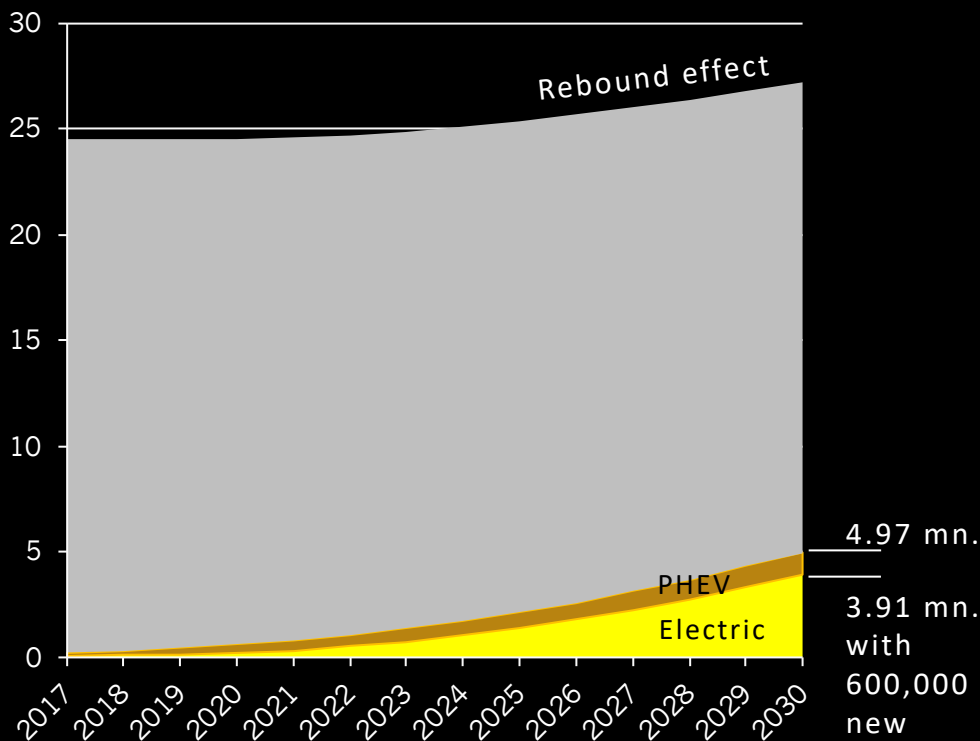
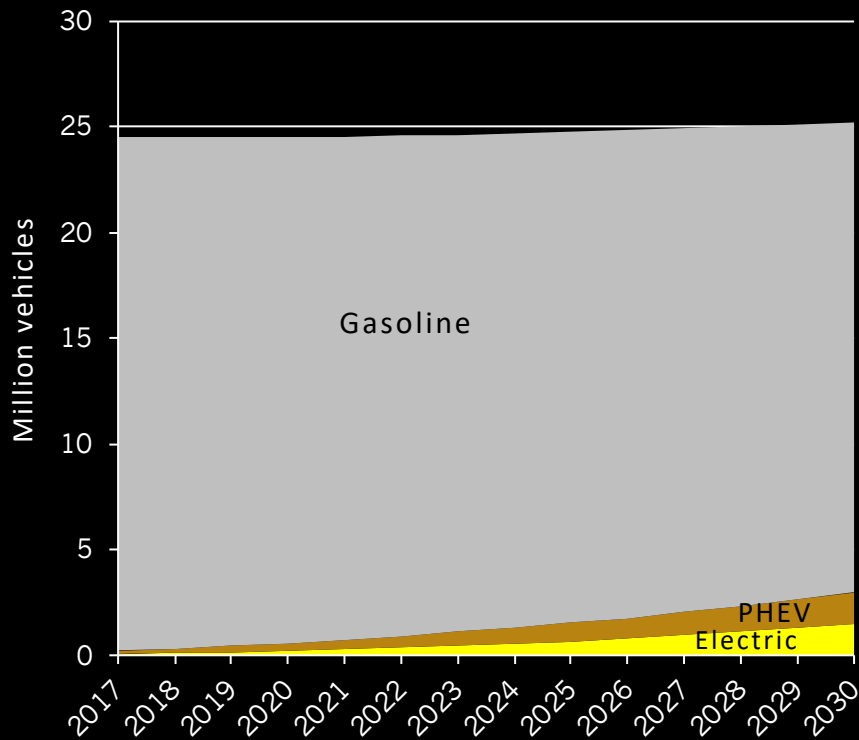
Additional

- Zero Emission Vehicle sales standard for 2030
 - 42% for LDV
 - 10% MDV Freight
 - 50% for new bus sales, approximating clean transit program effects
- New car and truck standards increase efficiency of gasoline and diesel vehicles (+14% over current standards)
- LCFS set to 20% by 2030
- Reflecting anticipated lag in US EPA approval, new standards for ICE and ZEVs increase linearly 2021-2030

LIGHT DUTY PASSENGER VEHICLE STOCK

Reference scenario

5 million ZEVs with 2030 policies *

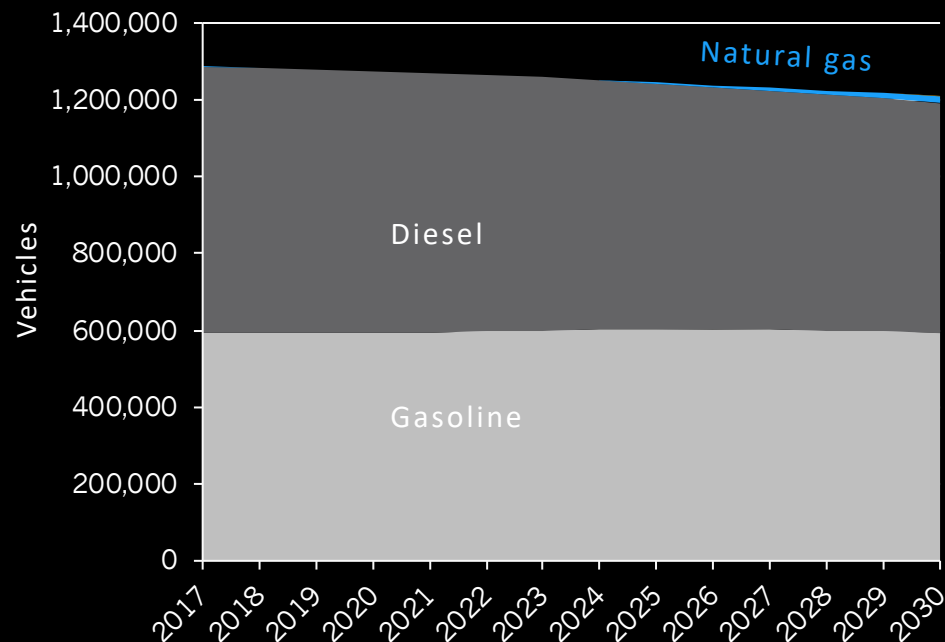


* 4.97 mn LDV + 40,000 MDV + 10,000 Bus > 5 mn

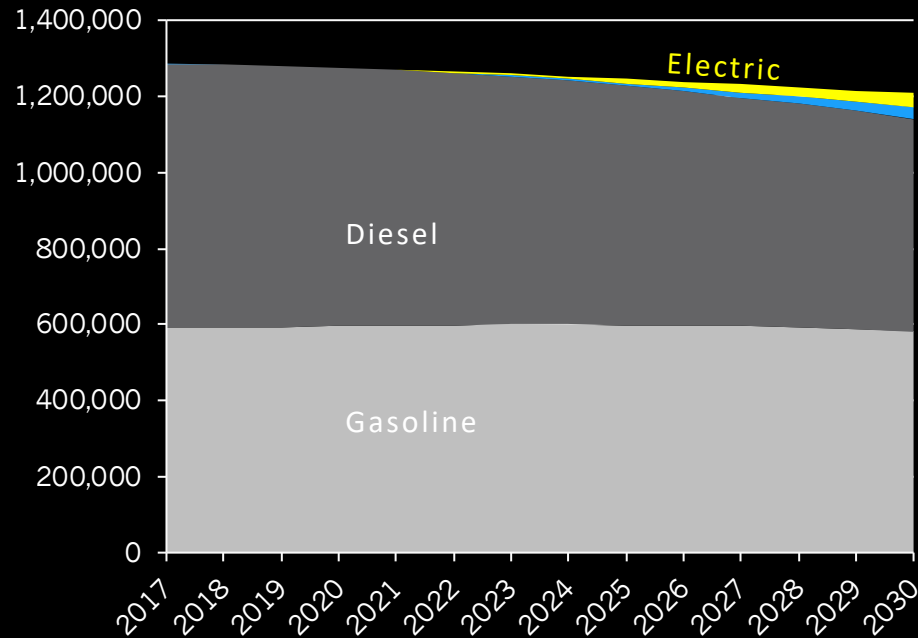
MEDIUM DUTY FREIGHT TRUCK STOCK

~40,000 ZEV trucks and 7,000 new sales in 2030 with 10% ZEV requirement

Reference scenario

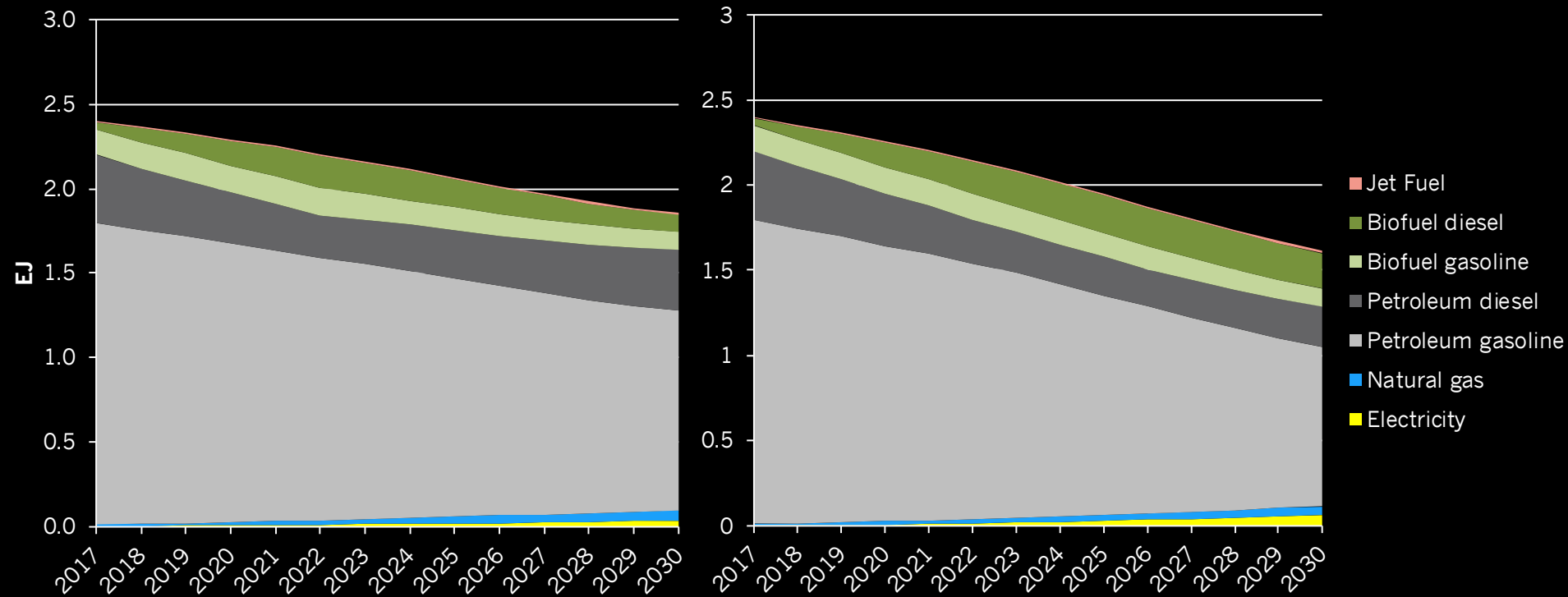


With 2030 policies



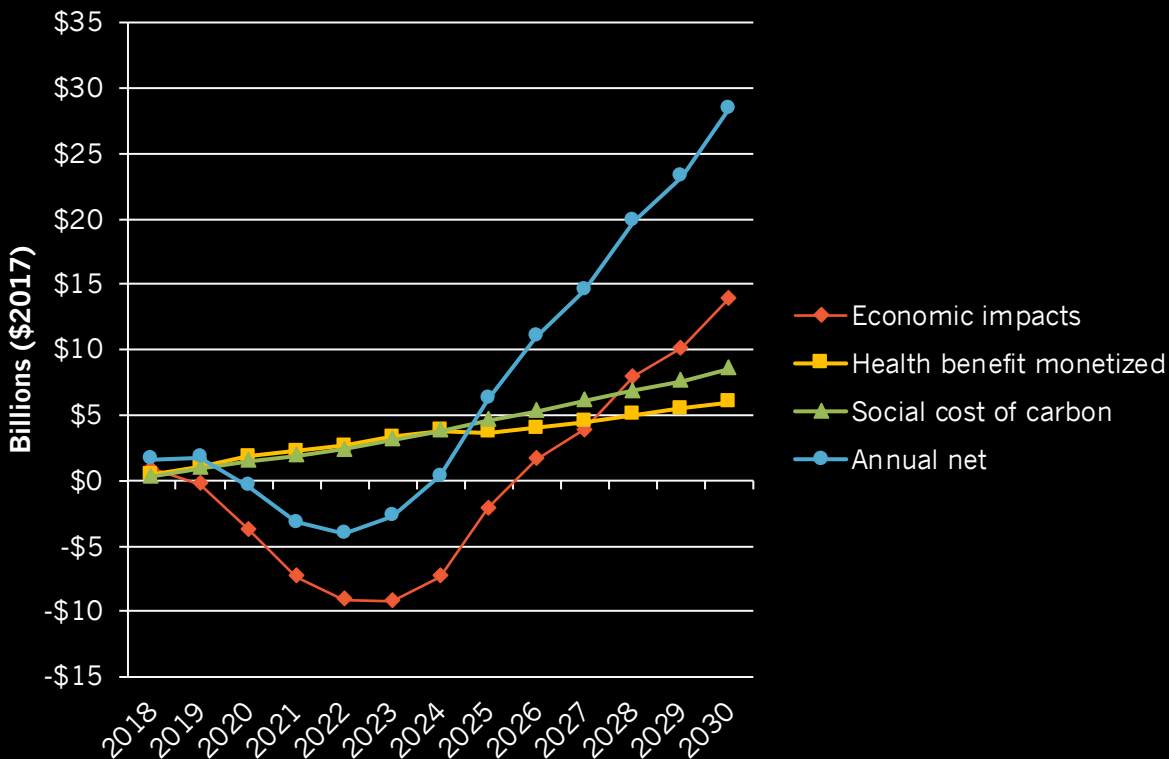
TRANSPORTATION FUEL USE WITH POLICIES

Policies reduce petroleum fuel use 44% vs. 29% compared to 2017



ANNUAL NET POSITIVE SOCIAL IMPACTS IN 2024

- Economic impacts are changes to capital, fuel, and operation costs
- NPV at 7% discount rate:
 - +\$90 million (only econ. impacts)
 - +\$230 million (includes social)



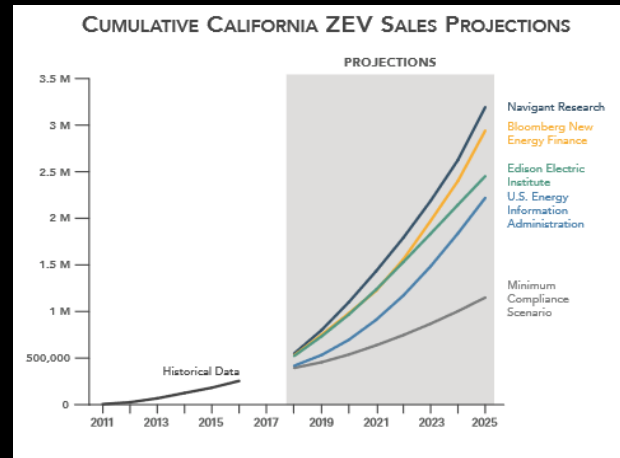
PROMISE AND PERIL

Promise

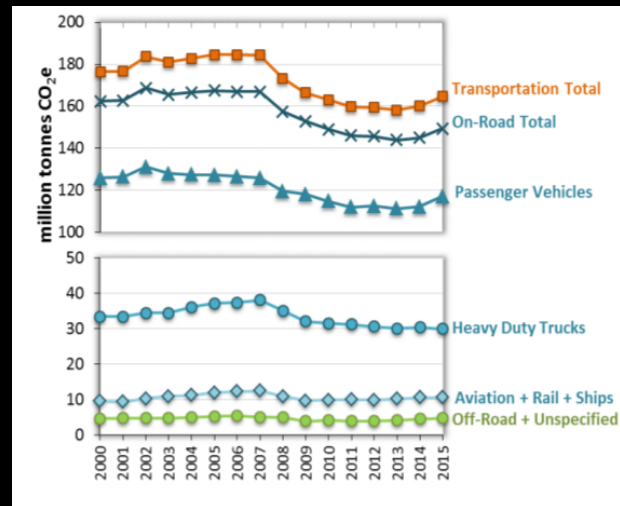
- Other studies also bullish: Scoping Plan graphic→
- Major automaker investments
- Promising early commercial options across a diverse portfolio of startup companies and technologies
- International governmental commitments and market momentum (China)

Peril

- A four-year trend of increasing GHG emissions from transportation
- Inventory goes to 2015 but 2016 MRR data and 2017 tax data point to continued increases
- 2030 targets pose new challenges and uncertainties, but CARB has also advanced the state of the art in cost containment



Source: 2030 Scoping Plan



Source: CARB Inventory

CONCLUSION

Together with other research, California EPS analysis supports the extension and intensification of current policies, and provides new insights on calibration needed to hit 2030 targets.

Despite some apocalyptic predictions, economic growth has been outstanding under AB 32.

Surprisingly fast innovation could happen in transportation. 10 years ago conventional wisdom forecasted a \$150 per ton carbon price necessary to incent renewables.

California EPS results provide further reason for optimism, indicating energy savings and health benefits counterbalance upfront energy transition costs.



THANK YOU

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