

MARCH 4, 2020

Assessing California's Climate Policies— Transportation

PRESENTED TO:

Senate Environmental Quality Committee
Hon. Benjamin Allen, Chair

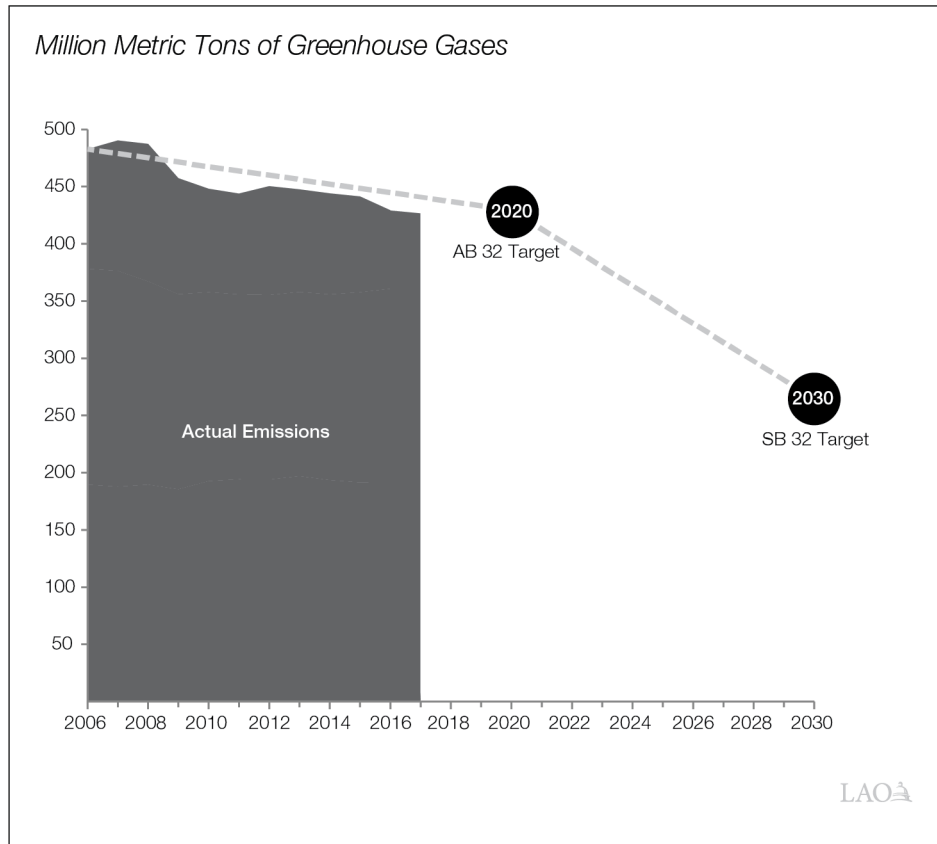
and

Senate Transportation Committee
Hon. Jim Beall, Chair

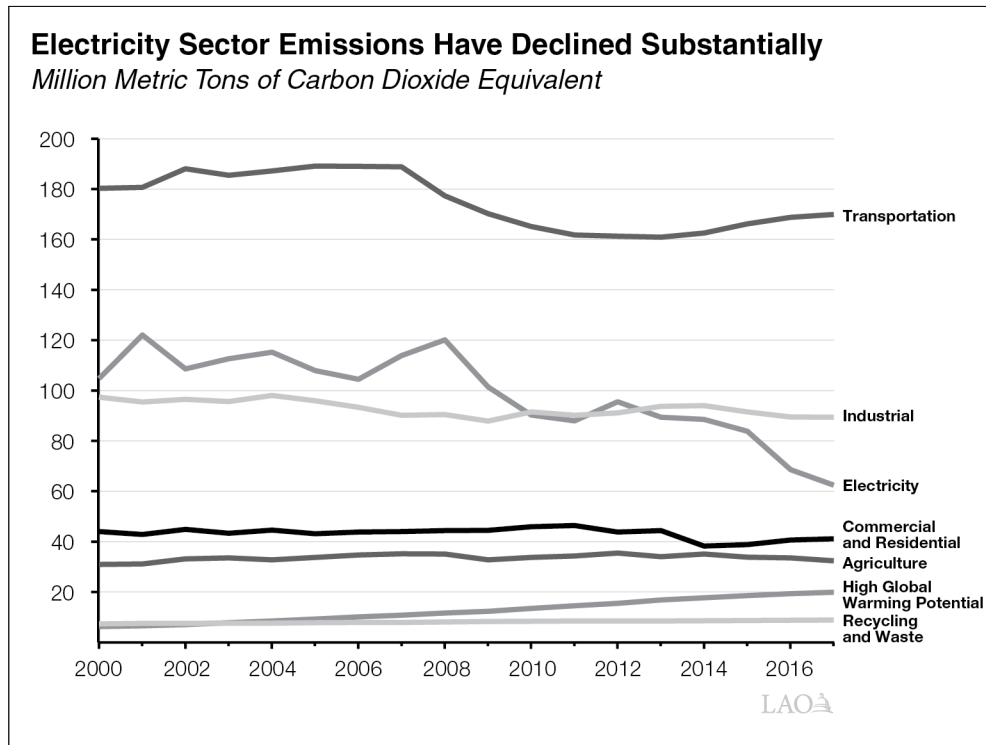


LEGISLATIVE ANALYST'S OFFICE

Met 2020 Target Early, but 2030 Target More Ambitious



Past GHG Emission Reductions Driven Almost Entirely by Electricity Sector



Major Transportation Policies Intended to Reduce GHGs

State Oversees Various Programs Designed to Reduce Greenhouse Gas (GHG) Emissions in Transportation Sector

Light-Duty Vehicle Programs

- **Clean Vehicle Rebate Project.** Rebate for purchase or lease of a new zero-emission vehicle (ZEV).
- **Clean Cars 4 All.** Rebate to retire an older, high emission vehicle and replace it with a newer zero or lower-emission vehicle.
- **Single-Occupant Vehicle Decals.** Program that allows ZEV drivers to use the high-occupancy lane even when containing only a single individual.
- **Clean Car Standards.** Joint state and federal regulation requiring auto manufacturers to incrementally improve fuel efficiency and reduce GHG emissions from their vehicle fleets over time.
- **ZEV Mandate.** State regulation requiring auto manufacturers to increase the number of ZEVs sold in the state.
- **Public ZEV Infrastructure Funding.** Funding to support the installation of public electric vehicle recharging and hydrogen refueling stations.

Heavy-Duty Vehicle Incentives

- **Demonstrations and Pilots.** Grants for technologies and equipment that are not yet commercially available.
- **Programs for Early Commercial Deployment.** Incentives for technologies that have passed the pilot stage and commercial models are starting to become available.
- **Programs Focused on Local Pollution Reductions.** Programs primarily focused on reducing near-term reductions in local emissions, such as incentives for vehicle replacements.
- **ZEV Fueling Infrastructure.** Programs that fund infrastructure for heavy-duty vehicle charging and refueling stations.

Low Carbon Fuels

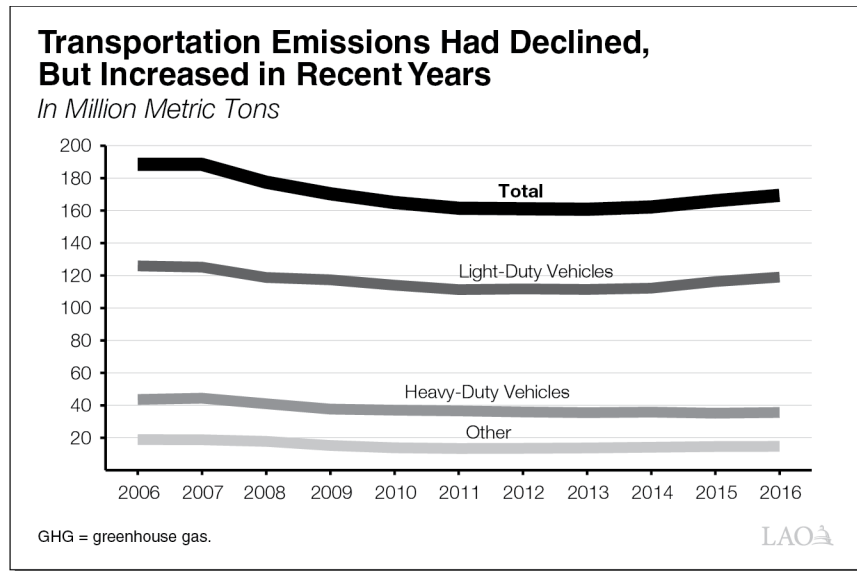
- **Low Carbon Fuel Standard.** Regulation requiring reductions in the carbon intensity of transportation fuels.

Vehicle Miles Traveled

- **SB 375.** 2008 legislation requiring regional transportation planning agencies to create plans to reducing light-duty vehicle miles traveled.



LAO Assessment— Light-Duty Vehicle Programs



In our December 2018 report issued pursuant to Chapter 135 of 2017 (AB 398, E. Garcia), *Assessing California’s Climate Policies—Transportation*, we assess the effects of state GHG reduction policies in the transportation sector.

► **Magnitude of GHG Effects From Light-Duty Programs Unclear**

- Major programs include Clean Vehicle Rebate Project incentives, fueling infrastructure, high-occupancy vehicle stickers, and Clean Car Standards.
- Light-duty vehicle incentives and regulations likely reduced GHG emissions relative to what they otherwise would have been, but estimates of degree to which each program contributes to reductions is unclear.

► **Potential Issues for Future Research**

- Identify design features to make rebate programs most effective.
- Better understanding of the interactions among different programs.
- Determine how infrastructure spending is best targeted.



LAO Assessment— Heavy-Duty Vehicle Incentives

▶ **Near-Term GHG Reductions Generally More Costly Than Alternative Approaches**

- The California Air Resources Board (CARB) estimates that its heavy-duty incentive programs reduce emissions at a cost of roughly \$600 per ton, with costs ranging from \$250 to \$3,000. This far exceeds costs of other climate programs, including cap-and-trade (\$17 per ton) and renewable portfolio standards (roughly \$60 to \$70 per ton).

▶ **Supporting Early Stage Technologies Could Have Significant Long-Term Benefits**

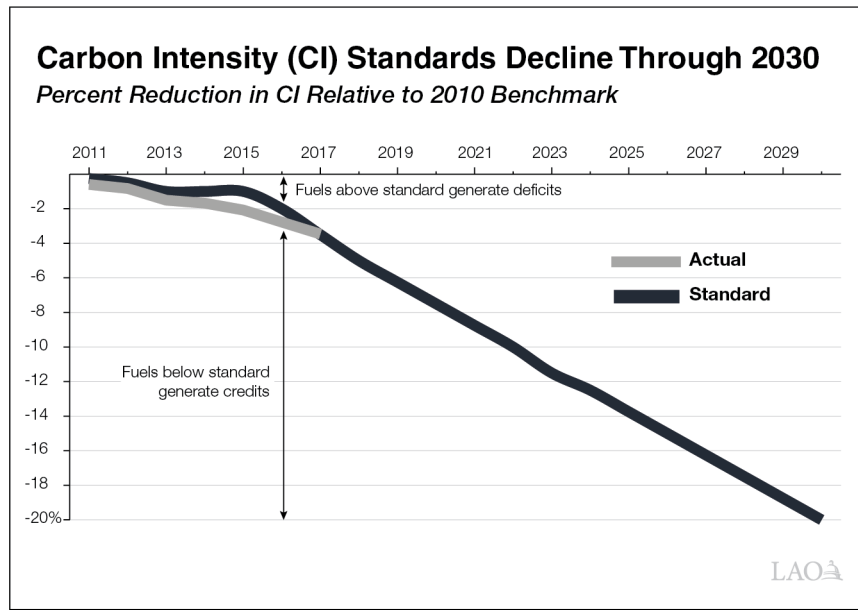
- “Knowledge spillovers” from pilots and demonstrations could provide social benefits by supporting development of new technologies.

▶ **Heavy-Duty Programs Could Have Substantial Benefits for Local Air Quality**

- Heavy-duty vehicles are the largest source of nitrogen oxides in South Coast and San Joaquin Valley, and 70 percent of total known cancer risk is from diesel particulate matter.



LAO Assessment— Low Carbon Fuel Standard (LCFS)



- ▶ **Program Effectively Taxes High Carbon Fuels and Subsidizes Low Carbon Fuels**
 - System of tradeable credits used to demonstrate compliance with statewide carbon intensity (GHGs per unit energy) standard.

- ▶ **Carbon Intensity of Transportation Fuels Is About 4 Percent Less Than 2010**
 - Primary reductions come from ethanol blended into gasoline and diesel substitutes (renewable diesel and biodiesel).
 - CARB estimates program reduced emissions by about 2.4 million tons in 2016



LAO Assessment— Low Carbon Fuel Standard (LCFS)

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- ▶ **Credit Prices Indicate Marginal Emission Reduction Costs Over \$200 Per Ton**

- ▶ **Other Issues to Consider**
 - Do other benefits, such as innovation, outweigh relatively high costs?
 - Is this the most effective way to promote innovation?
 - What is the role of LCFS in promoting electric vehicles?



LAO Assessment— Vehicle Miles Traveled

- ▶ **SB 375 Requires MPOs to Plan to Meet GHG Emission Reduction Targets**
 - Chapter 728 of 2008 (SB 375, Steinberg) requires Metropolitan Planning Organizations (MPOs) to develop plans to meet emissions targets by reducing vehicle miles traveled (VMT) from light-duty vehicles. Plans to reduce VMT include funding transit and active transportation.
 - Over \$1 billion annually allocated to programs intended to reduce VMT, including cap-and-trade funding going to Affordable Housing and Sustainable Communities and transit programs.

- ▶ **No Evidence of Any Major Impact to Date**
 - VMT per capita statewide higher in 2016 than in 2005.
 - Possible explanations include (1) plans might not be getting implemented at local level, (2) not enough time has passed, and (3) some strategies included in plans might not be effective at reducing VMT.



LAO Assessment of Transportation Policies— Key Takeaways

► Overall Magnitude of Impacts of Policies Are Unclear

- There are some estimates of program benefits and costs before they are implemented (prospective analyses), but not many estimates of actual program effects after they are implemented (retrospective analyses).
- Large number of policies targeting transportation emissions creates challenges.
 - **More Difficult to Evaluate Effects of Each Policy.** For example, it is unclear which of the several electric vehicle policies is the most effective approach for increasing electric vehicle adoption.
 - **Potential Lack of Coordination Across Agencies.** For example, three state agencies administer different heavy-duty vehicle and infrastructure incentive programs.
- **Recommendation.** Establish robust system for retrospective evaluation of the effects of state climate policies.

► Policies Are Relatively Costly Ways to Reduce GHGs

- Based on available information, transportation-specific policies generally are more costly than cap-and-trade. Cost-effectiveness is increasingly important as GHG goals become more ambitious.
- **Recommendation.** Use economy-wide pricing to achieve low-cost GHG reductions. Ensure cap-and-trade program implementation is consistent with Legislature’s GHG goals.

► Complementary Policies Could Be Valuable in Limited Other Circumstances

- In some instances, there might be strong rationale for additional policies that complement a carbon price. Examples could include (1) addressing other GHG-related “market failures”—such as underinvestment in research and development activities—and (2) reducing co-pollutants.



LAO Assessment of Transportation Policies— Key Takeaways

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- **Recommendation.** Ensure complementary policies effectively target other market failures or policy goals not addressed by carbon pricing.
- California is about 1 percent of global GHG emissions. Legislature might want to consider the degree to which each program encourages emission reductions in other jurisdictions. These could include (1) policies that serve as demonstration for other jurisdictions and/or (2) policies that promote advancements in technologies that could be used in other jurisdictions.
- **Recommendation.** Focus on policies that are most likely to encourage GHG reductions in other jurisdictions to maximize overall GHG reduction benefits.

