

Proposed California Phase 2 Greenhouse Gas Standards and Amendments to the Tractor-Trailer GHG Regulation

February 8, 2018

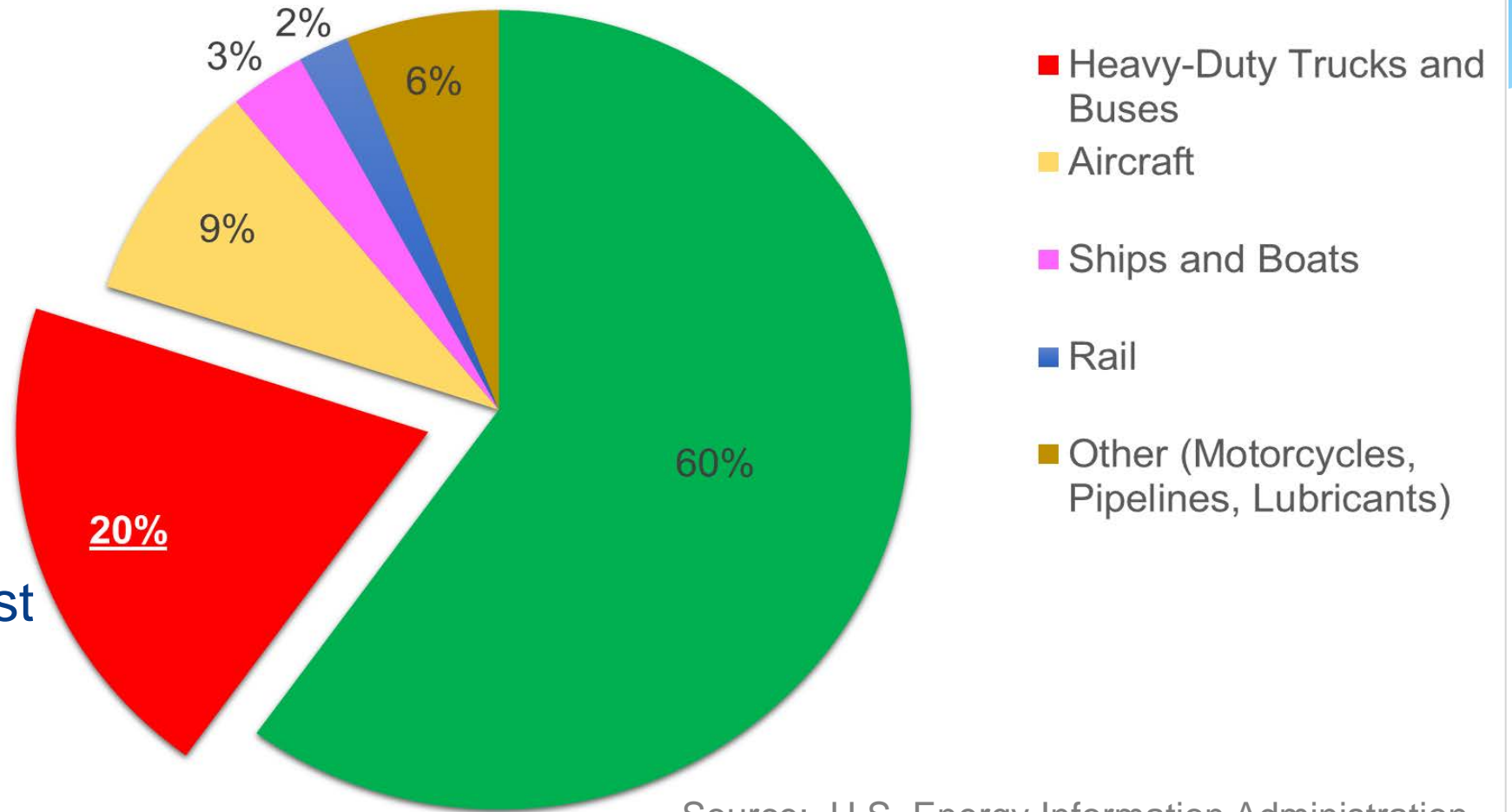
Sacramento, California

Presentation Outline

- Background
- Phase 2 Standards
- California Phase 2 Differences
- Proposed Federal Changes and our Response
 - Trailers
 - Gliders
- Recommendation

Medium- and Heavy-Duty Vehicles are a Significant Source of GHG Emissions

National Transportation GHG Emissions

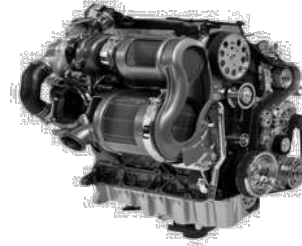


Medium- and Heavy-Duty Trucks are fastest growing segment of transportation sector

Source: U.S. Energy Information Administration
Annual Energy Outlook 2014

Phase 1 GHG Standards

- In 2011, U.S. EPA and NHTSA adopted first national GHG and fuel-efficiency standards for heavy-duty trucks
- Phase 1 covers engines and three vehicle categories:
 - Tractors (Class 7–8)
 - Vocational Vehicles (Class 2b–8)
 - Pickup Trucks & Vans (Class 2b-3)
- CARB harmonized with federal Phase 1 program in December 2013
 - Allowed CARB to enforce and manufacturers to certify in California
 - Will reduce heavy-duty truck CO₂ in California by ~12% in 2030



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Collaboration with U.S. EPA and NHTSA

- 2014-2016: Close coordination as Phase 2 program developed
- CARB staff submitted extensive comments in October 2015 on proposal
 - U.S. EPA modified their proposal
- Outcome: Phase 2 program California can support
 - Allows manufacturers to continue to build a single fleet of vehicles and engines for the U.S. market



U.S. EPA / NHTSA Phase 2 GHG Standards

- Final Rulemaking published in October 2016
 - CARB staff informational update to the Board
- Technology forcing
- Reduce fuel consumption by 82 billion gallons; Lower GHG emissions by 1,100 MMT; Save vehicle owners \$170 billion in fuel costs
- Payback to truck owners in 2 to 4 years
- Tractor-trailer fuel economy increase from ~6 mpg to ~9 mpg
- Closed loophole that was allowing glider makers to circumvent emission standards

Phase 2 Covers Engines, Three Vehicle Categories, and Trailers

Tractors
(Class 7-8)



Vocational Vehicles
(Class 2b-8)



Pickups & Vans
(Class 2b-3)



Engines



$g(\text{CO}_2)/\text{bhp-hour}$

$g(\text{CO}_2)/\text{ton-mile}$

NEW!
Trailers



$g(\text{CO}_2)/\text{ton-mile}$

U.S. EPA / NHTSA Revisiting Trailer and Glider Requirements

- Federal Phase 2 includes trailer standards starting with 2018 MY
 - Truck Trailer Manufacturers Association challenged the standards in court, saying U.S. EPA lacks authority over trailers
 - U.S. Court of Appeals actions stayed the trailer requirements
- Federal Phase 2 contains restrictions on dirty gliders (limits to 300 glider/year)
 - Glider industry petitioned U.S. EPA for reconsideration in July 2017
 - U.S. EPA released proposal on gliders in November 2017
 - Would repeal the current U.S. EPA Phase 2 glider requirements
 - U.S. EPA now says glider vehicles and engines are not “new” so they lack authority

California Phase 2: Harmonizes with the National Program

- Largely harmonizes with U.S. EPA's Phase 2 standards
 - Same structure and stringency levels
 - Same timing (except CA trailer standards take effect in model year 2020)
 - Would allow CARB to certify engines/vehicles and enforce Phase 2 in California
- Some distinctions to credit, labeling, and rule flexibility provisions
- Concurrently, amend TTGHG Rule to allow trailer fleet owners to comply using Phase 2 certified trailers/technology

Projected Phase 2 CO₂ Benefits

- **Overall Phase 2 Benefits:** 207.6 million metric tons (MMT) of CO₂ equivalent cumulative emission reductions in California from 2019 to 2050

Calendar Year	Phase 2 CO ₂ Reductions	
	From Baseline	From Phase 1
2030	23%	13%
2050	34%	24%

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California Phase 2 Differences

- Must certify separately in California
- Special provisions for California-certified transit buses to encourage zero-emission buses
- Minor changes to credit provisions
 - Encourage low-GWP refrigerants and better hybrids
- Minor additional reporting
 - Verify refrigerant leakage is limited
 - Cross-reference vehicle information to engine family to improve inventory and enforcement
- Additional label information to aid in enforcement and inform consumers



Not “Deemed to Comply”

- CARB staff will verify compliance independent of U.S. EPA (no “deemed to comply”)
- Manufacturers must California-certify all vehicles (including trailers) and engines that are manufactured for sale in California
- Future rulemaking: CARB staff could develop an expedited certification option that could streamline upfront certification in exchange for in-use data

Transit Bus Custom Chassis Requirements

- Less stringent custom chassis standards not necessary for transit bus category
 - Bus manufacturers in California already easily meet primary standards: ~450 zero-emission buses (ZEBs) already here
- To discourage transit bus manufacturers from custom chassis certification, California Phase 2 would require:
 - Certify California transit buses to more stringent primary vocational standards; or
 - Surrender federal emission credits to make up for certifying to less stringent custom chassis standards



15-day change

- Demonstrate compliance based on percentage of ZEBs

Advanced Technology Credit (ATC)

- Advanced Technology Credits for zero- and near zero-emission technologies
 - To encourage development, deployment of advanced technologies
- California Phase 2 includes credits for Low-GWP refrigerants as well
- To protect Phase 2 benefits, staff proposed ATCs only for actions that go beyond requirements

15-day change

Technology	Multiplier
PHEVs	3.5
All-electric vehicles	4.5
Fuel cell vehicles	5.5
Low-GWP refrigerants	1.8

- The cap on credits for vehicles produced to meet another CARB requirement will be taken out of this rule and included in future technology mandate rulemakings

A/C System Leakage Rate Reporting Requirements

- A/C refrigerants have high global warming potential, need to control leakage
- Vehicle manufacturers to report detailed A/C system information at time of California certification
 - Detailed specifications of the system components associated with refrigerant leakage
 - SAE J2727 calculation leading to the leak rate estimate
- Helps CARB staff to:
 - Certify and enforce the A/C system leakage requirements
 - Verify manufacturers' leak rate calculations

Consumer Labels on Pickup Trucks and Vans

- Rule requires a new consumer window label on new class 2b and 3 pickup trucks and vans
 - Provides consumers with easy to read information on the relative GHG and smog rating of a particular model
- Letter grade rating (A+ to D)
- Cleaner vehicle rating on left side of slider bar
- Clarify the use of “Worst-Case” configuration

15-day change

California Air Resources Board Flexible-Fuel Vehicle Gasoline-Ethanol (E85)

Environmental Performance

The ratings on this label are not directly comparable to U.S. EPA/DOT Fuel economy rating. For information on how to compare, please see www.arb.ca.gov/ep_label.

Protect the environment. Choose vehicles with **higher ratings**:

Greenhouse Gas Rating (tailpipe only) **Smog Rating** (tailpipe only)

Using alternative fuels may improve scores.

Vehicle emissions are a primary contributor to climate change and smog. Ratings are determined by the California Air Resources Board based on this vehicle's measured emissions. These ratings are not directly comparable to light duty vehicle ratings.

CALIFORNIA AIR RESOURCES BOARD

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Trailers: Phase 2 Requirements and TTGHG Regulation Amendments

- Adopt California Phase 2 trailer standards equivalent to the U.S. EPA Phase 2 trailer standards (implementation begins with 2020 MY)
- Modify California TTGHG regulation to give trailer fleet owners two new compliance options:
 - Phase 2 certified trailer, or
 - Trailer retrofitted with Phase 2 compliant aero and tires



Truck Trailer Manufacturers Association (TTMA) Lawsuit

- TTMA filed petition with U.S. Court of Appeals requesting rescission of the U.S. EPA trailer standards and stay of implementation
 - On August 17, 2017, U.S. EPA Administrator wrote that U.S. EPA will revisit the federal trailer provisions
 - On October 27, 2017, U.S. Court of Appeals stayed the requirements while U.S. EPA reconsiders Phase 2 trailer provisions
- CARB intervened representing California's interests in this lawsuit

15-day change

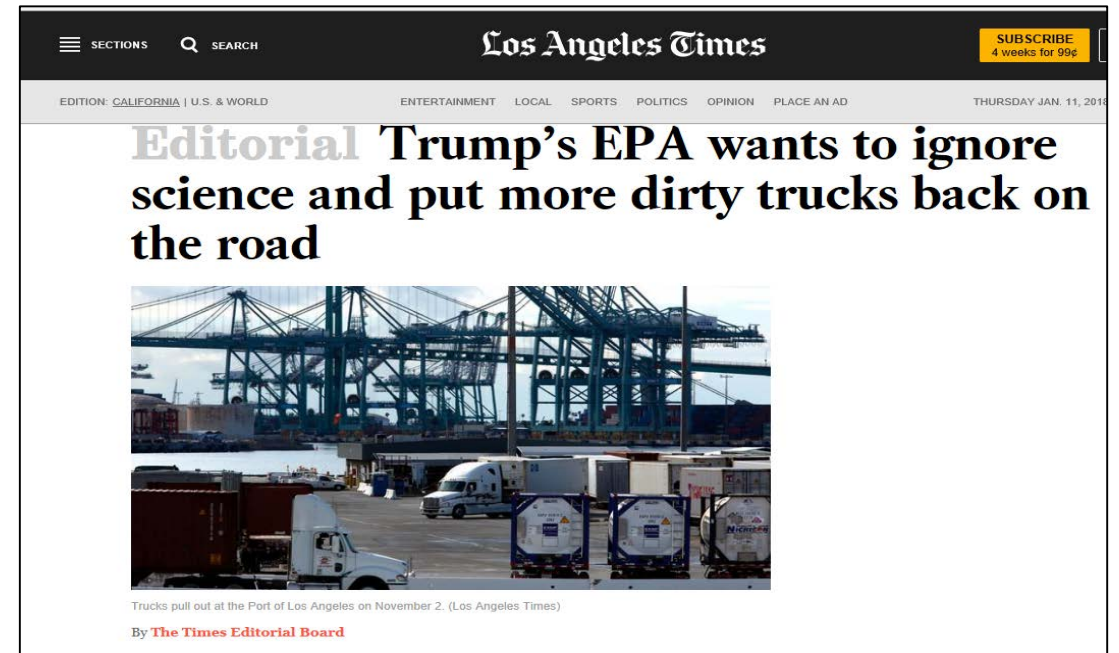
- TTGHG interim provisions for MY 2018 and 2019 trailers
 - CARB to review and approve Phase 2 aerodynamic performance and LRR tire test data not being processed by U.S. EPA due to stay

CARB's Next Steps Re: Trailers

- Implement California Phase 2 trailer certification starting with 2020 MY, for trailers sold in California
- Implement modified TTGHG rule
- Provide flexibility to manufacturers left in limbo while U.S. EPA not implementing trailer requirements
- If U.S. EPA rescinds trailer requirements, propose further modifications to TTGHG to Board in ~2019:
 - Would impact owners of trailers that travel in California (regardless of State of origin)
 - Expand TTGHG applicability (e.g., long and short box-vans, non-box trailers)
 - Increase stringency in-line with Phase 2 trailer requirements

Glider Manufacturers are Circumventing Emission Standards

- Gliders are new chassis/cabs with refurbished engine, transmission and rear axle
 - Historically used to salvage engines from vehicles damaged by accidents
 - Now sold as new
 - Recent sharp increase in glider production to > 10,000/yr in 2015
 - Most gliders powered by pre-2002 engines with no exhaust aftertreatment
 - Glider manufacturers subverting emission standards:
 - “Dial back the emissions clock”



Glider Restrictions in Phase 2

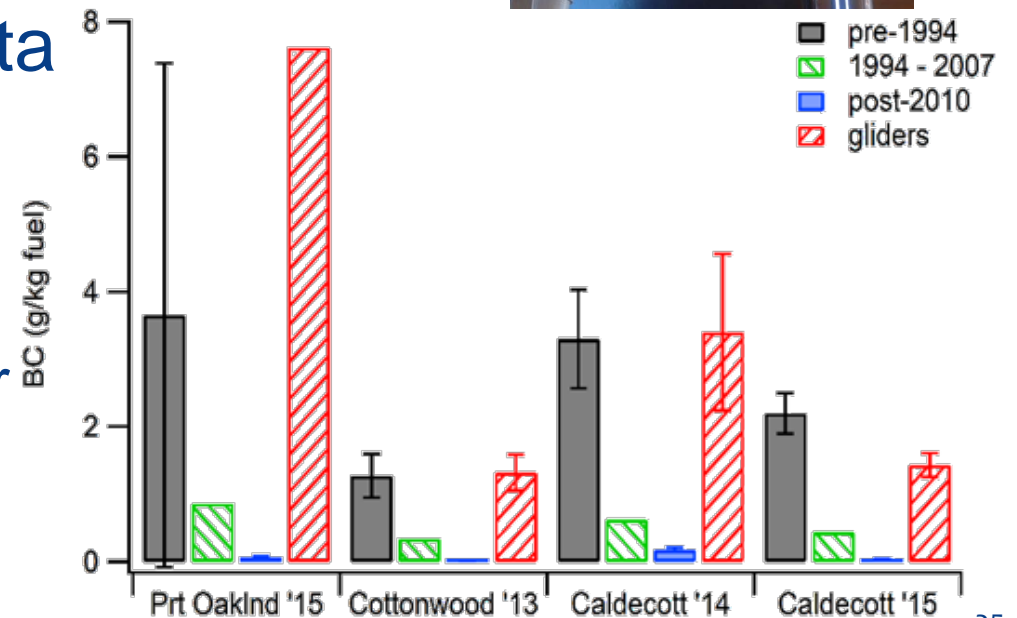


- Phase 2 standards close glider loophole
 - Glider vehicles must comply with GHG standards
 - Glider engines must comply with GHG and criteria pollutant standards for model year corresponding to the vehicle's date of manufacture
 - Effective January 1, 2018, with some transitional flexibilities
 - limits to 300 glider/year

Current Glider Vehicles Are Gross Polluters

- U.S. EPA found:
 - Glider NO_x: 4 to 40 times higher
 - Glider PM: 50 to 450 times higher
- CARB in-use heavy-duty emissions data and Portable Emissions Acquisition System (PEAQS)
 - Glider NO_x: 4 – 10 times higher
 - Glider Black Carbon: 8 – 71 times higher
 - Glider black carbon in highest 4% of all vehicles measured

Glider exhaust



Dirty Gliders Imperil Public Health Gains California and Nationwide

- U.S. EPA Phase 2 projects over 128,000 gliders nationwide by 2025 (5% of entire fleet)
 - Would cause 9,000 to 21,000 premature deaths and \$40 - 140 billion dollars in economic harm nationwide
- Dirty gliders are already on California roads (CARB testing, DMV registrations)
- U.S. EPA public hearing (12/4/2017, Washington D.C.)
 - CARB press release; CARB testified
 - All but two testifiers oppose repeal
- CARB together with Pennsylvania, Vermont, Washington:
 - Submitted comments to U.S. EPA (1/5/2018) strongly urging U.S. EPA not to repeal glider requirements



CARB's Next Steps Re: Gliders

15-day change

- Adopt the final Phase 2 glider kit requirements with one change:
 - Modify the 300 glider/year exemption to allow only 2010 and newer model year engines in gliders
- CARB's Options to Address U.S. EPA Repeal of Glider Requirements:
 - Challenge U.S. EPA's action, as appropriate
 - Increase truck and bus enforcement to find noncompliant gliders
 - Work with states to opt-in to California's truck and bus rule

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Approve Staff's Proposal, with 15-Day Changes

California Phase 2

- Allows California to certify engines, vehicles, and trailers
- Allows California to verify and enforce standards
- Paves way for future GHG reduction
- Restricts dirty gliders

TTGHG

- Aligns with Phase 2 standards
- Provides another pathway to compliance