

# Proposed California Phase 2 Greenhouse Gas Standards (CA Phase 2 GHG) and Potential Amendments to the Tractor-Trailer GHG Regulation

Second Public Workshop

August 31, 2017

Sacramento, California

California Environmental Protection Agency  
 **Air Resources Board**

WEBCAST PARTICIPANTS - PLEASE E-MAIL  
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## Presentation Outline

- **Introduction and Background**

- Background
- Summary of the first public workshop
- California (CA) Phase 2 Timeline
- Separate Rulemaking for Zero Emission Vehicle Certification Procedure
- Potential Separate Later Rulemaking to Address Improved Aerodynamics for Vocational Vehicles
- Overlap with Advanced Clean Local Truck Measure: Potential Adjustments to Advanced Technology Multipliers

- **Update on Areas Where CA Phase 2 May Differ from Federal Program**

- **CA Phase 2 Certification**

- **California Warranty Process**

- **Plans to Address Potential Changes to the Federal Phase 2 Trailer Requirements**

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## Introduction and Background

## Phase 2 GHG Standard Background

### \* Federal Phase 2 GHG Regulations

- Final rulemaking published Oct. 2016

- ☐ Combination Tractors
- ☐ Trailers (not regulated in Phase 1)
- ☐ Vocational Vehicles
- ☐ HD Pick-ups and Vans

### \* California proposing to adopt Phase 2 regulation that largely harmonizes with Federal Phase 2

- ☐ Enables California to certify vehicles and engines
- ☐ Enables California to enforce requirements
- ☐ Ensures California requirements will remain in place even if Federal Phase 2 revoked

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## Summary of the Feb. 6, 2017 Public Workshop

\* Not “Deemed to Comply” with California Phase 2 if federally certified

\* Areas Where California Phase 2 May Differ from Federal Phase 2:

### Credit Provisions

- Additional credits for use of Low-Global Warming Refrigerants
- Additional requirements for Plug-in Hybrid Electric Vehicles (PHEVs) to qualify for advanced technology credit multiplier

### Engine and Vehicle Certification Requirements

- Require vehicle manufacturers to include engine family for each certified vehicle in end-of-year report
- Require vehicle manufacturers to provide additional air conditioning system information to support A/C leakage standard
- Establish zero emission vehicle certification procedure

### Label Information

- Additional information required in vehicle label to aid in enforcement
- Require “light-duty style” consumer labels for heavy-duty pick ups and vans

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## Summary of the Feb. 6, 2017 Public Workshop

### \* Areas Where California Phase 2 May Differ from Federal Phase 2 (cont.):

#### Other Provisions

- Exclude certain categories from the vocational custom chassis provisions
- California sales limits for specialty vehicles (amphibious, speed-limited etc.)
- Continue to include ethane in the hydrocarbon emission standards for natural gas compression-ignition engines

#### Other Things Worth Noting

- Adopting federal selective enforcement audit provision
- **NEW!** Do not adopt the federal anti-tampering provision
- Plans to Address Potential Changes to the Federal Phase 2 Trailer Requirements

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## California Phase 2 Timeline

- |  |                 |
|--|-----------------|
| * First public workshop                              | Feb. 6, 2017    |
| * Second public workshop                             | Aug. 31, 2017   |
| * Draft regulatory language                          | Sept.-Oct. 2017 |
| * Public comment on staff report begins              | Dec. 2017       |
| * Board consideration of California Phase 2 proposal | Feb. 2018       |

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## Staff Contact

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## Zero Emission Vehicle (ZEV) Certification Procedure

## Need for Heavy-Duty Zero-Emission Certification Procedures

- \* Standardized evaluation criteria to validate zero-emission technology performance in order to:
  - ☐ Support Advanced Clean Local Trucks, and other potential technology-advancing CARB regulations and incentive programs
  - ☐ Help ensure product reliability and increase consumer confidence
- \* Possible evaluation criteria: Durability, Efficiency, Performance, Range, etc.
- \* Tentative Board Date – Late 2018 / Early 2019
  - ☐ Not included in the February 2018 Phase 2 proposal
  - ☐ Separate public process
- \* Workshops on HD ZE Certification Procedures to be scheduled

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## Potential Separate Later Rule for Improved Aerodynamics for Vocational Vehicles



## Aerodynamic Potential

- \* Aerodynamic devices shown to reduce GHG emissions in heavy-duty trucks
- \* CARB Tractor-Trailer Greenhouse Gas and U.S. EPA Phase 2 rules have integrated aerodynamic features into Class 7-8 heavy-duty trucks



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## Effectiveness of Aerodynamic Devices on Vocational Vehicles

- \* CARB contracted with National Renewable Energy Laboratory (NREL) to assess emissions benefit of aerodynamic devices on vocational vehicles
- \* Side skirts, wheel covers, front and rear fairings were studied
- \* Link to Report: <https://www.nrel.gov/docs/fy17osti/64610.pdf>

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## Aerodynamic Devices Beneficial

Aerodynamic Device(s)	Fuel Consumption Reduction (%)
Side Skirts	~6%
Front Fairing	~6%
Side Skirts + Front Fairing	~10%
Rear Fairing	~4%

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## Next Step: Vocational Vehicle Fleet Study

- \* Hired NREL/UCI to study the make-up of vocational vehicle fleets in California
- \* To be completed by early 2019
- \* Determine which vehicles that could benefit from the use of aerodynamic devices
- \* Not proposing vocational aerodynamic requirements in Feb 2018 CA Phase 2 rulemaking



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## Voluntary Fleet/Truck Participation

- \* CARB staff is looking for fleet participation on the vocational survey study.

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## Overlap with Advanced Clean Local Truck Measure: Potential Adjustments to Advanced Technology Multipliers

## Advanced Clean Local Trucks Strategy

- \* Accelerate early market for heavy-duty zero emission trucks
- \* Evaluating initial manufacturer sales requirement
  - ❑ Class 2B to Class 8 vocational
  - ❑ 2.5% to 15% of California heavy-duty sales zero emission vehicle mandate phasing in 2023 to 2030
    - Some credit for plug-in electric hybrids, range extenders, electric PTO options
- \* More info at <https://www.arb.ca.gov/msprog/actruck/actruck.htm>

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## Advanced Technology Multipliers

**NEW!**

- \* Phase 2 includes credit multipliers for manufacturers that produce ZEV or hybrid vehicles
  - ❑ Multipliers range from 3.5 to 4.5
- \* Must balance goals of accelerated use of zero-emission technologies and short-term greenhouse gas reductions
  - ❑ Reduction in the multipliers based on level of heavy-duty ZEV mandate is being considered

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## Update on Areas Where CA Phase 2 May Differ from Federal Program

Areas Where CA Phase 2 May Differ from Federal Program

### Vocational Custom Chassis Provisions

## California Proposal in Feb. 2017 Workshop

- \* In the federal Phase 2 Standards, vocational custom chassis manufacturers have an option to certify to less stringent standards than the primary vocational standards through a simplified process
- \* In last workshop, staff proposed to exclude transit buses and refuse trucks from the custom chassis provisions
- \* Transit buses and refuse trucks are ideal candidates for hybridization or electrification

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## Since Last Workshop...

- \* Staff reached out to transit bus and refuse truck manufacturers
  - ☐ Hybridization pathway
    - Technology is there, but low market acceptance (high upfront cost, not as much fuel saving given current low diesel fuel cost)
  - ☐ Electrification pathway
    - Refuse trucks – not yet commercialized and still in early demonstration
    - Transit buses – currently offering electric buses and getting orders from transit agencies
  - ☐ Complex certification process (full GEM vs. simplified GEM)

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## Revised California Proposal

- Staff is proposing to exclude transit buses only from the custom chassis provisions
  - ☐ For transit buses certified with federal custom chassis standards, manufacturers would meet the primary vocational standards through the use of GHG credits
  - ☐ Per advanced technology credit provisions, only need ~2% of total CA transit bus production as electric buses to compensate for other buses that only meet custom chassis standards
  - ☐ Various federal and California incentive programs support transit fleets and electric bus production/purchase:
    - Federal Transit Administration fund - FTA, Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project - HVIP)
- Refuse truck manufacturers may use custom chassis **NEW!**

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Areas Where CA Phase 2 May Differ from Federal Program

## Plug-in Hybrid Electric Vehicles Credits Provisions

## California Proposal in Feb. 2017 Workshop

- \* The federal Phase 2 Standards allow for an advanced technology credit multiplier of 3.5 for plug-in hybrid electric vehicles (PHEVs)
- \* In the last workshop, staff proposed, in order to qualify for advanced technology credit multiplier in California, PHEVs must have:
  - ☐ No NOx emissions increases
  - ☐ All-electric range (AER): 35 miles (25 miles for fast charge)
  - ☐ For electric power take off (ePTO): Meet HVIP ePTO duty cycle for typical work day
- \* These requirements are consistent with CARB's requirements for PHEV funding under our incentive programs

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## Since Last Workshop...

- \* Staff reached out to heavy-duty vehicle manufacturers
  - ☐ No NOx emissions increase
    - Need to ensure that NOx emissions from heavy-duty hybrid vehicles are not increased over similar conventional vehicles
  - ☐ All electric range (AER)
    - 35-mile AER heavy-duty hybrid vehicles are not yet commercialized and still in early demonstration
    - PG&E currently operates 10 EVI utility hybrid trucks (16,500 lbs. GVWR) with 30-mile AER
    - Mack class-8 refuse trucks with Wrightspeed hybrid powertrain achieving 20-mile AER
    - Kenworth T680 class-8 truck (prototype currently being built) designed to achieve 30-mile AER

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## Revised California Proposal

- \* Staff is proposing to phase in the all-electric range (AER) requirement

Vehicle Model Year	AER (miles)		ATC Multiplier
	Time Charge	Fast Charge	
2017 - 2020	0	0	1.5 (Phase 1)
2021 - 2023	10+	10+	3.5*
2024 - 2026	20+	15+	3.5*
2027+	35+	25+	3.5*

**NEW!**

\* Note: If the AER is less than as specified in the AER columns for the respective vehicle model year, an ATC multiplier of 1.5 would apply.

- \* Staff is retaining the ePTO and no-NOx increase provisions as originally proposed in the previous workshop

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Areas Where CA Phase 2 May Differ from Federal Program

## Additional Credits for Low-Global Warming Potential (low-GWP) Refrigerants

## Adopted Federal Phase 2 Standards

- \* Federal Phase 2 Standards include an A/C refrigerant leakage standard that sets a maximum cap for refrigerant leak rate.
  - ☐ Leak rate may not exceed 11.0 grams per year, or 1.50% of refrigerant capacity per year, whichever is greater.
- \* Federal Phase 2 Standards do not include any requirement or credit incentive for the use of low-Global Warming Potential (GWP) refrigerants.

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## Low-GWP Refrigerants: Light-Duty Fleets

- \* Regulations
  - ☐ Incentives: A/C credits in CARB and U.S. EPA vehicle GHG regulations
  - ☐ Requirements: EU Mobile Air Conditioning Directive, U.S. EPA high-GWP refrigerants status change to “unacceptable” (recently repealed by a court ruling)
- \* HFC-134a (GWP=1,300) is the current most common refrigerant used in light-duty vehicles.
- \* Low-GWP alternatives approved by U.S. EPA Significant New Alternatives Policy (SNAP) program
  - ☐ HFO-1234yf (GWP<1) is being used in millions of newer vehicles.
  - ☐ CO<sub>2</sub> (R-744) (GWP=1) is being offered by at least 1 OEM.
  - ☐ HFC-152a (GWP=138) in secondary-loop system is being developed by industry.

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## Low-GWP Refrigerants: Medium-/Heavy-Duty Fleets

### \* Regulatory status

- ☐ No requirement or incentive in U.S. EPA Phase 2 Standards
  - ✓ Lack of demonstrated commercially available alternatives
  - ✓ Relatively small refrigerant emissions as compared with tailpipe CO<sub>2</sub> emissions – likely insufficient incentive
- ☐ CARB Short-lived Climate Pollutants Plan calls for state-level measures on this issue, if no federal actions

### \* Low-GWP alternatives status

- ☐ HFO-1234yf: SNAP-approved for classes 2b and 3; Chemours preparing SNAP application for heavier classes
- ☐ CO<sub>2</sub> (R-744) and HFC-152a: SNAP-approved for all MVAC, including for MDV/HDV
- ☐ Lack of vehicle manufacturer movement to adopt low-GWP alternatives

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## CA Phase 2 Proposal for Low-GWP Refrigerant Credit

**NEW!**

- \* Credit for a vehicle using a low-GWP (GWP≤150) refrigerant:

Credit = per year credit × useful life (years)

**Per year credit**

MY1	MY2	MY3	MY4	MY5	MY6+
0.56 Mg	0.56 Mg	0.56 Mg	0.56 Mg	0.56 Mg	0.28 Mg
Or					
1.26%	1.26%	1.26%	1.26%	1.26%	0.63%
of annual tailpipe CO <sub>2</sub> emissions allowed by the CO <sub>2</sub> standard for that MY, whichever is less					

- \* Model year one (MY1) is the first model year for which any manufacturer applies for and receives the low-GWP credit for a given vehicle category.
- \* Once the first manufacturer(s) has/have received a credit for a vehicle category, the credit schedule in this table starts for all manufacturers of that vehicle category.

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## Low-GWP Refrigerant Credit - Explanation of the Values

- \* 0.28 Mg is the annual emission reduction for a vehicle that uses a refrigerant with a GWP of 150, compared with the current most common refrigerant, HFC-134a (GWP=1,300), assuming an average leak rate of 245.8 g/year (finding from an CARB research study).
- \* 0.63% is 0.28 Mg divided by the average annual tailpipe CO<sub>2</sub> emissions for the medium- and heavy-duty vehicle categories covered by Phase 2 - 44.6 Mg, as calculated using outputs of EMFAC2014.
- \* The MY1 credit of 0.56 Mg is 0.28 Mg multiplied by a factor of 2.0.
- \* Multiplier of 2.0 is the average ratio of the incremental cost per emission reduction from using low-GWP refrigerants to the incremental cost per emission reduction from using “conventional” technologies to reduce tailpipe CO<sub>2</sub> emissions.

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## Low-GWP Refrigerant Credit - Potential Uses

- \* Low-GWP refrigerant credit can only be used in California Phase 2 Standards.
- \* Manufacturers may use the credit to offset:
  - ☐ Compliance deficit due to more stringent standard for transit buses in CA Phase 2 rule as compared with federal Phase 2 rule
  - ☐ Decrease of Advanced Technology Credits due to more stringent requirement for PHEV multiplier in CA Phase 2 rule as compared with federal Phase 2 rule

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Areas Where CA Phase 2 May Differ from Federal Program

## Require Detailed System Information as part of A/C Leakage Standard Certification

## Adopted Federal Phase 2 A/C Leakage Standards Certification Requirements

- \* Federal Phase 2 Standards § 1844-01(d)(7)(iv) (A/C Leakage Standards Certification Requirements) require the following information be submitted to certify to A/C leakage standards:
  - ☐ Refrigerant leakage rate (leak score)
  - ☐ Type of refrigerant
  - ☐ Refrigerant capacity (charge size)

## CA Phase 2 Proposal for Detailed A/C System Information Requirements for A/C Leakage Standard Certification

### NEW!

- \* Detailed A/C system information is required except for systems using low-GWP ( $\text{GWP} \leq 150$ ) refrigerants.
- \* Cover letter and summary table
  - ☐ Including vehicle make, model, model year, engine family, vehicle family; refrigerant type, A/C leak rate, capacity, and percent leak rate, whether A/C meets leakage limits

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## CA Phase 2 Proposal for Detailed A/C System Information Requirements for A/C Leakage Standard Certification (cont.)

- \* A/C system schematic
  - ☐ Showing topological layout of the following A/C components: compressor, heat exchangers, expansion device, hoses, metal pipelines, joints
  - ☐ Systems with major variations must be illustrated by separate schematics. "Major variation" refers to different topological layout of A/C components.
- \* SAE J2727 spreadsheets
  - ☐ A "worst-case" scenario A/C configuration may be chosen to represent a group of A/C configurations, only if such configurations have the same refrigerant capacity, and are different in only one of the following aspects: 1) numbers or types of joints, 2) lengths, inner diameters, or permeation rates of high-pressure-side hoses, 3) lengths, inner diameters, or permeation rates of low-pressure-side hoses, or 4) numbers or types of compressor seals.

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## Benefits from Detailed A/C System Information Requirements

- \* Detailed A/C system information will allow CARB staff to:
  - ☐ Verify refrigerant containment technology assessment and leak rate calculation
  - ☐ Track technological development
  - ☐ Align with certification requirements in our LEV III regulation for light-duty vehicles

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Areas Where CA Phase 2 May Differ from Federal Program

## Separate California Phase 2 Credit Tracking

**NEW!**

## Potential CA Phase 2 Differences

- \* Custom chassis option not available for transit buses
- \* Additional requirement to get plug-in hybrid (PHEV) advanced technology credits (no NOx increase, all-electric range –AER, HVIP ePTO)
- \* Low global warming potential (GWP) refrigerant extra credit

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## Separate California Phase 2 Credit Tracking Requirement

**NEW!**

- \* Manufacturers can track compliance with the California differences via a simple spreadsheet
- \* If none of the differences apply, CA credit tracking is NOT required
- \* If one or more of the differences apply, CA-specific credit tracking is required:
  - ☐ Credit deficit, due to more stringent transit bus standards and additional requirement for PHEV advanced credits, could be compensated by use of Averaging, Banking, and Trading (ABT) of CA credits or federal credits
  - ☐ Credit generated from low GWP refrigerant to be used for ABT in CA only

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## Spreadsheet Template – Example (Low GWP Credit)

	A	B	C	D	E	F	G	H	I	J
1	EXAMPLE CALIFORNIA ABT Report									
2	(For Model year 2023)									
3	Case 2 - Low GWP Refrigerant Extra Credit									
4	Each manufacturer enters a row for each family/subfamily produced in CA, where the credits are generated									
5	MODEL YEAR 2023 ABT SUMMARY									
6										
7										
8	** "Subfamily" is a group of vehicle configurations that have the same FEL									
9										
10	Vehicle Family	Subfamily	Ave Set	MY	Subcategory	CA Projected Sale Volume (Units)	Useful Life (years)	Low GWP Refrigerant Credit (Mg)	CREDIT BALANCE FAMILY (Mg)	COMMENT
11										
12										
13										These low GWP refrigerant credits can be used for ABT in CA
14										
15										
16										
17										
18										
19										
20	NET BALANCE OF CALIFORNIA EMISSION CREDITS									
21										
22	2022 CREDIT BALANCE (FINAL)									
23	Averaging Set	2021 CA BANKED CREDITS	2022 CA BANKED CREDITS	2023 CA CREDIT BALANCE	COMMENT					
24					These 2023 MY GWP refrigerant credits can be used in CA only					
25										
26										
27										
28										
29	CA CREDIT BALANCE (FINAL)									
30	Averaging Set	2021 CA BANKED CREDITS	2022 CA BANKED CREDITS	2023 CA BANKED CREDITS						
31	HHDV									

## California Credit Tracking Spreadsheet

**NEW!**

- \* Report all vehicle families/sub-families produced for sale in CA that are affected by the CA differences
- \* Credits/deficits are calculated based on CA sales
- \* Credits/deficits can be used/compensated within the same averaging set
- \* Detail how deficit to be compensated (through use of ABT of CA and/or federal credits)

## Transit Bus Emission Credit Tracking

**NEW!**

- \* Report all transit bus families/sub-families produced for sale in CA that are certified with federal custom chassis standards
- \* Retire any custom chassis credits generated by these CA-sold vehicles in the federal report
- \* Show how deficit to be compensated through use of ABT of CA and/or federal credits

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## PHEV Emission Credit Tracking

**NEW!**

- \* Report all PHEV families/subfamilies produced for sale in CA that show NOx increase and/or do not meet AER/ePTO requirement
- \* Deficit in federal-earned PHEV credit from these CA-sold PHEV because these vehicles do not get multiplier of 3.5 (if not meet NOx requirement, regardless whether or not to meet AER/ePTO requirement, multiplier = 1 ; if meet NOx requirement but not meet AER requirement, multiplier = 1.5; for ePTO PHEVs, if meet NOx requirement but not meet HVIP ePTO duty cycle, multiplier = 1.5)
- \* Two options:
  1. Manufacturers to compensate for deficit by use of ABT of CA and/or federal credits
  2. Manufacturers to retire the federal credit difference earned from using 3.5 multiplier in the federal report (i.e., retired federal credits = emission delta x (2 or 2.5) x CA sales volume)

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## Federal Credits to be Used for Offsetting CA Deficit

### NEW!

- \* Federal credits that would not be allowed under CA program (such as those generated through custom chassis provisions, or PHEVs that have NOx increase and/or do not meet AER/ePTO requirement) cannot be used to offset CA deficits
- \* Manufacturers to provide justification/paper document that show the criteria are met
- \* Federal credits used to compensate for CA deficit need to be retired in the federal report
- \* CARB will track credits used to offset CA deficit

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Areas Where CA Phase 2 May Differ from Federal Program

## Vehicle Labeling – Additional Emission Control Identifiers

## Federal Phase 2 Label Requirements Do Not Require Emission Control Identifiers (ECIs) for Tractors and Vocational Vehicles

- \* Emission control identifiers required on the label for certified pick-ups/vans and trailers, but optional for tractors and vocational vehicles
  - Due to increase in the number of emission control systems available to meet Phase 2 tractor and vocational vehicle standards

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## Proposed California Phase 2 Label Requirements include ECIs for Tractors and Vocational Vehicles

- \* Require emission control identifiers on the label for certified tractors and vocational vehicles in California for items that can be inspected in the field
  - Enforcement staff must be able to identify required emission control system components during a vehicle inspection
- \* Staff is proposing to align with the federal agencies on the engine, trailers, and pick-ups and vans labeling

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## Proposed ECIs for Vocational Vehicle Labels (Class 2b-8 Vocational Trucks)

**NEW!**

Idle Reduction Technology	
Engine Shutoff System	IRT
Tires	
Low Rolling Resistance Tires (drive)	LRRD
Low Rolling resistance Tires (steer)	LRRS
Tire Pressure monitoring system	TPMS
Automatic tire inflation system	ATI
Aerodynamic Components	
Aerodynamic side skirt and/or fuel tank fairing	ATS
Aerodynamic roof fairing	ARF
Adjustable height aerodynamic roof fairing	ARFR
Aerodynamic front fairing	AFF
Aerodynamic rear fairing	AREF

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## Proposed ECIs for Tractor Labels

**NEW!**

Idle Reduction Technology	
Engine Shutoff System	IRT
Tires	
Low Rolling Resistance Tires (drive)	LRRD
Low Rolling resistance Tires (steer)	LRRS
Tire Pressure monitoring system	TPMS
Automatic tire inflation system	ATI
Aerodynamic Components	
Aerodynamic side skirt and/or fuel tank fairing	ATS
Aerodynamic roof fairing	ARF
Adjustable height aerodynamic roof fairing	ARFR
Gap reducing tractor fairing	TGR
Engine	
Waste Heat Recovery (Rankine)	WHR

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## Staff Contract

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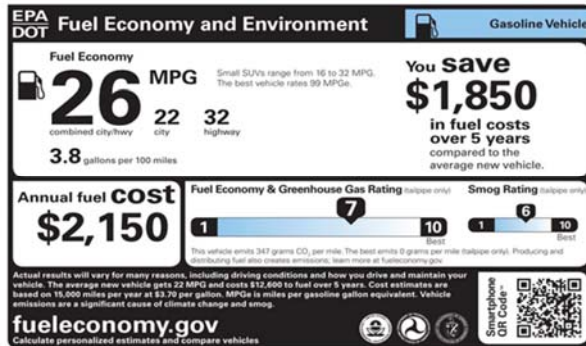
Areas Where CA Phase 2 May Differ from Federal Program

## Consumer Window Labels

Heavy-Duty (HD) Pickups and Vans

## Current Consumer Window Label for Light Duty Vehicles

- ❖ Federal Fuel Economy and Environment Label is required beginning MY 2013 light-duty vehicles
- ❖ CARB Environmental Performance Label is currently optional for light-duty vehicles



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## California Proposal for HD Pickups and Van Consumer Labels in Feb. 2017 Workshop

- ❖ Adopted Federal Phase 2 Standards
  - ☐ Did not include window label requirements
- ❖ We proposed requiring CARB Environmental Performance Label, with minor changes, for new heavy-duty pickups and vans for MY 2021+

After the first workshop, staff continued the discussion with environmental groups, heavy-duty pickup and vans manufacturers, and associations.



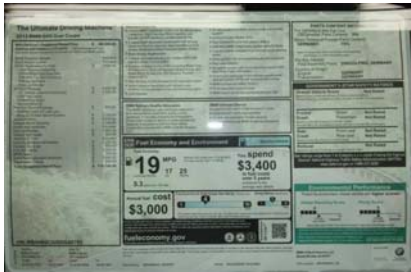
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## California Proposals: Label Placement

**NEW!**

❖ Proposed CARB consumer window label:

- ☐ May be placed or incorporated within the vehicle Monroney sticker; or
- ☐ May be placed separately and next to Monroney sticker.



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## California Proposals: Consumer Window Label

**NEW!**

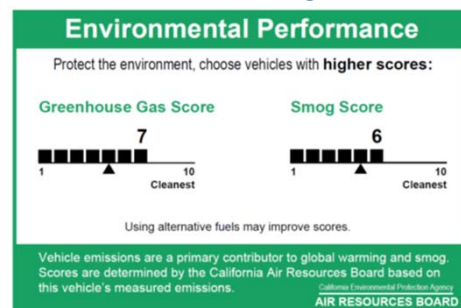
Alternative 1:

Modified Federal Fuel Economy and Environment Label



Alternative 2:

CARB Environmental Performance Label, with minor changes



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## Proposal: Smog Scoring System based on Standards

**NEW!**

Vehicle Class:

- MDV4 – class 2b
- MDV5 – class 3

Vehicle Class	California Emissions Standard	NMOG + NO <sub>x</sub> (g/mile)	Smog Rating
MDV4, MDV5	ZEV	0.000	10
MDV4	LEV3 SULEV150	0.150	9
MDV4	LEV3 SULEV170	0.170	8
MDV4	LEV3 ULEV200	0.200	7
MDV5	LEV3 SULEV200	0.200	
MDV5	LEV3 SULEV230	0.230	6
MDV4	LEV3 ULEV250	0.250	5
MDV5	LEV3 ULEV270	0.270	4
MDV4	LEV3 ULEV340*	0.340	3
MDV4	LEV3 LEV395*	0.395	2
MDV5	LEV3 ULEV400	0.400	
MDV5	LEV3 ULEV570*	0.570	1
MDV5	LEV3 LEV630*	0.630	

\*These vehicle emission categories are only applicable through 2021 model years.

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## Proposal: GHG Scoring System based on CO<sub>2</sub> Emission Compliance Level

**NEW!**

GHG Rating	Grams per mile CO <sub>2</sub>
10	0
9	1-300
8	301-350
7	351-400
6	401-450
5	451-500
4	501-550
3	551-600
2	601-650
1	>650

← Full Electric Vehicle

← Phase 2 Compliant Vehicle in 2027

← Phase 2 Compliant Vehicle in 2024

← Phase 2 Compliant Vehicle in 2021

← Phase 1 Compliant Vehicle

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Areas Where CA Phase 2 May Differ from Federal Program

## California Sales Limits for Specialty Heavy-Duty Vehicles with Off-road Engines

## California Proposal in Feb. 2017 Workshop

- \* Federal Phase 2 standards allow the use of a non-road engine in the following “specialty” heavy-duty vehicle types:
  - ☐ Hybrids (up to 1,000 per manufacturer per model year (MY))
  - ☐ Amphibious, speed-limited and certain all-terrain vehicles (up to 200 per manufacturer per MY)
- \* CARB’s Innovative Technology Regulation (ITR) addresses issues pertaining to heavy-duty hybrid vehicles with an off-road engine
- \* For amphibious, speed-limited and certain all-terrain vehicles, CARB staff proposed to align with the U.S. EPA, but set much lower California-specific sales limits
  - ☐ Prevent disproportionate share of these vehicles being sold in California

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## Since Last Workshop...

- \* Staff reached out to heavy-duty vehicle manufacturers on the proposal for California-specific sales limits
  - ☐ No comments received

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## Revised California Proposal

**NEW!**

- \* Staff is proposing the following California sales limits for these “specialty” heavy-duty vehicles (amphibious, speed-limited and certain all-terrain vehicles) powered by a non-road engine:
  - ☐ Up to 25 vehicles per manufacturer per model year
  - ☐ Based on California’s shares of population (12.1%) and GDP (13.8%) compared to the U.S. population and GDP

Contact: Robert Nguyen, Staff Air Pollution Specialist, CARB Phase 2 team member  
[rnguyen@arb.ca.gov](mailto:rnguyen@arb.ca.gov) or tel. (916) 327-2939

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## CARB’s Mobile Source Certification Programs: CA Phase 2 Certification

New Vehicle/Engine Programs Branch (NVEPB)

## Presentation Outline

- \* Mission
- \* Organization
- \* Certification Functions
- \* Certification Process
- \* Electronic Certification System
- \* Required Information – GHG Phase 1 vs. Phase 2

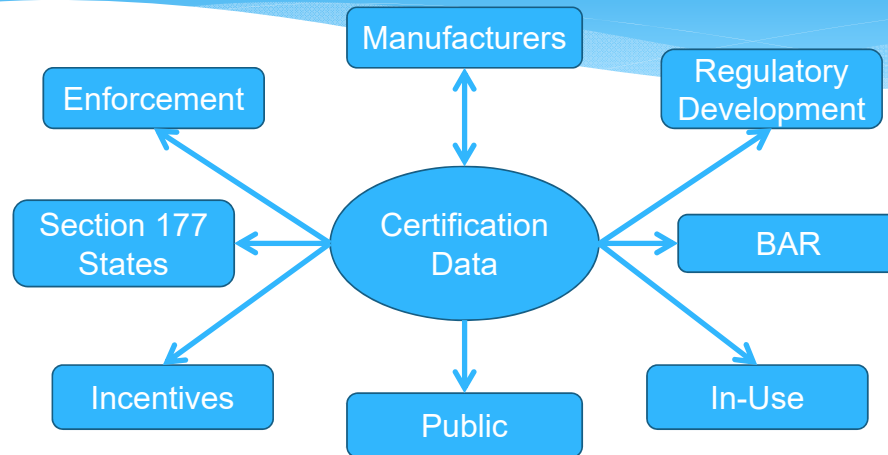
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## Mission

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## Certification Data Client Base

Certification is the cornerstone of mobile source programs



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## Why is Certification Needed?

- \* Implement regulations as adopted
- \* Realize emission reductions
- \* Ensure product emissions are compliant
- \* Identify responsible party
- \* Create a level playing field for manufacturers
- \* Provide guidance to manufacturers to meet requirements

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## Certification Functions

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## Certification Functions

- \* Develop certification processes for new and amended regulations
- \* Review applications to ensure manufacturers are in compliance with emission standards and requirements
- \* Issue Executive Orders (over 3,500 applications and 500 manufacturers for 2016 Calendar Year)
- \* Maintain Online Databases for Aftermarket Parts and Certification
- \* Provide Certification Assistance/Guidance Documents to Manufacturers
- \* Perform Title 13 New Engine/Vehicle Testing
- \* Review Production Line Testing Data
- \* Evaluate Averaging, Banking, and Trading Credits
- \* Conduct Confirmatory Testing of Certification Engines/Vehicles

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## Certification Process

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## Pre-Certification Steps

- \* Certification Preview Program Meetings
  - ☐ Discuss product offerings, test and certification plans, carry-over/carry-across proposals
  - ☐ New standards/requirements
- \* Work with manufacturers to approve certification methods/procedures
  - ☐ Durability/emissions procedures
  - ☐ Auxiliary Emission Control Devices (AECD)
  - ☐ Alternative/modified test fuels
  - ☐ Anti-tampering methods for adjustable parameters

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## Major Certification Steps

### 1. (New Mfrs.) Register with CARB

To register as a new manufacturer in CARB's Document Management System (DMS), manufacturer must provide the following items:

1. **Letter of Intent** - Introduction, Contact information, Technical description of your engine/vehicle/battery.
2. **Electronic signature letter** - List of manufacturer employees authorized to sign and submit documents. Electronic signature letter must be submitted by regular mail with wet signature.
3. **DMS Form** (Excel spreadsheet) - List of manufacturer's contacts by topic.

### 2. Group vehicles/engines/equipment into exhaust & evaporative/permeation families, *including GHG engine and vehicle families*

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## Major Certification Steps (cont.)

### 3. Demonstrate durability & emissions compliance for each family

### 4. Submit Applications to CARB electronically

- Description of make/models covered and emission control systems
- Emissions data and analysis
- Emission label samples
- Emission warranty statement and warranted parts list
- Greenhouse Gas Emissions Model (GEM) GHG information

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## Major Certification Steps (cont.)

5. Submit Compliance Statements
  - Vehicle/engine/equipment was tested and in compliance with standards
  - No increase in toxic or noxious emissions and causing no unsafe conditions to operator or vehicle
  - Production vehicles/engines/equipment being in all material respects the same as described in application
6. Receive Executive Order from CARB

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## Major Certification Steps (cont.)

7. Do not introduce vehicles/engines/equipment into commerce in CA until certified
8. Receive CARB approval for any emissions-related production running changes
9. Submit requests to CARB to add models to engine/vehicle families so updated EOs can be processed

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## Certification Application Checklists

- \* A complete certification application contains all the elements identified in the certification checklists
- \* Different checklists for different engine/vehicle categories
- \* Checklists are living documents (new regulations/ standards/technologies will lead to new checklist items. CARB will notify manufacturers in advance or when change occurs)

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## Certification Application - Example Cert Checklists

On-Road Heavy-Duty Diesel Engine	
✓	Checklist
	Signature Letter (FYWC)
	Durability Plan/Report
	Carryacross Table *
	Maintenance Schedule
	AECD
	Sensors Table
	SCR Inducement Strategies *
	Description of SCR Catalyst *
	DPF Regen. Strategy *
	Tamper Resistance
	Cover Letter
	Statement of Compliance
	Warranty Statement
	Exhaust + GHG Application
	Report of Ammonia Slip Values *
	Label Picture
	Actual Label (FYMC)
	Clean Idle label Picture/Actual *
	ABT Plan *
	Delegated Assembly Plan *
	OBD or EMD Approval **
	NTE Deficiency Declaration *
	Approved Waivers *

On-Road Heavy-Duty Otto Engine	
✓	Checklist
	Signature Letter (FYWC)
	Durability Plan/Report
	Carryacross Table *
	Maintenance Schedule
	Tamper Resistance
	AECD
	Sensors Table *
	Cover Letter
	Statement of Compliance
	Warranty Statement
	Exhaust + GHG Application
	Label Picture
	Actual Label (FYMC)
	ABT Plan *
	Delegated Assembly Plan *
	OBD or EMD Approval **
	Approved Waivers *
	EPA Certificate of Conformity

FYWC – First year or when changed

FYMC – First year or when material/supplier changed

GHG – Greenhouse Gas

\* - If applicable

\*\* - OBD approval is not needed to accept an application for filing. However, EO issuance is contingent upon receipt of an OBD approval letter.

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## Post-Certification Steps

- \* Process Running Change and Field Fix requests
- \* Review Quarterly Production Line Testing (PLT) reports
- \* Determine, at end of model year, compliance with fleet average standards, phase-in requirements, Averaging, Banking, and Trading (ABT) provisions

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## Electronic Certification System

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## CARB Electronic Certification System Overview

- \* Document Management System (DMS): stores the supporting certification documents (e.g., label design, warranty statement, ECS description, durability test plan)
- \* Electronic Certification System (E-Cert) - *Coming Soon*:
  - Certification data input by manufacturers (e.g., emission levels, DFs, vehicle model description)
  - GEM inputs and outputs
  - System generates Executive Orders
- \* **DMS + E-Cert** = complete application

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## Document Management System (DMS)

- \* Secure Access 24/7 via the internet
- \* Documents organized by category into a predefined structure
- \* Documents automatically routed to correct staff for review
- \* Helps managers and staff track and search documents
- \* Documents are shared with other CARB staff
- \* Monthly training is provided to manufacturers & CARB Users

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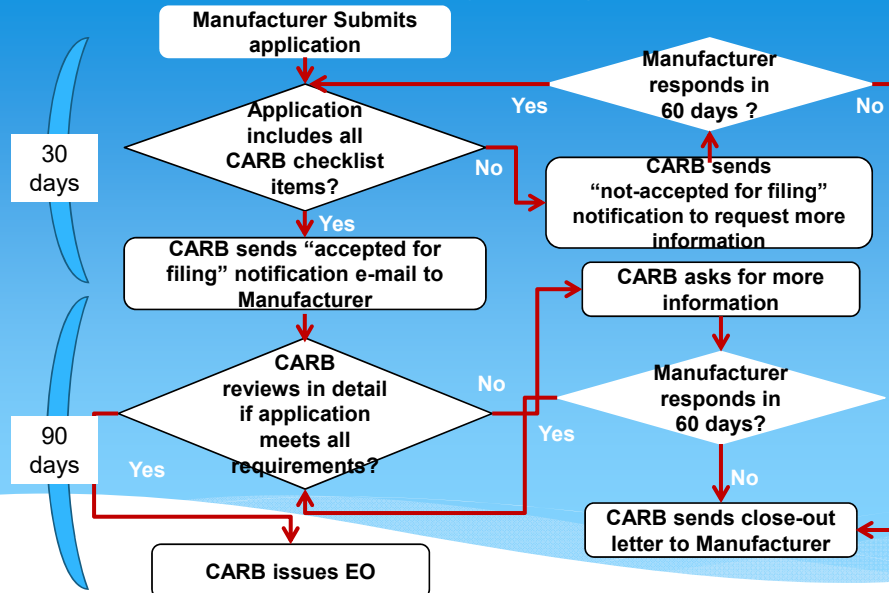
## Electronic Certification System (E-Cert)

E-Cert is being developed for use in 2019

- \* Manufacturers submit the data elements into a database for certification
- \* Web based submittal process
- \* GEM inputs and outputs
- \* Data requirements and user manuals will be provided by CARB staff
- \* The Executive Order will be generated by the system

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## Certification Process



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## Overview of Certification Processes for California Phase 1 and Phase 2

### California Phase 1 “Deemed to Comply” Approach

- \* Manufacturers “deemed to comply” with the California Phase 1 regulation if they demonstrate compliance with U.S. Phase 1 regulations
- \* Copies of all data submitted to U.S EPA in accordance with 40 CFR 1036.205, 1036.250, 1037.205, and 1037.250 required to be submitted to CARB

## California Phase 1 Certification Process

- \* Register with CARB's DMS (and ECERT once available)
- \* Decide certification path – “Deemed to Comply” or “CA Only Certification”
- \* Submit Required Information (including U.S. EPA C of C for “Deemed to Comply option) to receive Executive Order
- \* Provide sample label for review and testing
- \* Submit required End of Year (EOY) information within 90 days after the end of the model year
- \* If using ABT provision, Submit ABT reports by March 31 after the end of the model year

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## California Phase 1 Certification Process: List of Required Information for Engine Certification

- \* U.S EPA Certificate of Conformity
- \* U.S. EPA Application Package
  - ☐ General Family Information
  - ☐ Emission Test Data
  - ☐ Engine Installation Instructions
  - ☐ Label
  - ☐ CO<sub>2</sub> FCLs; CH<sub>4</sub>, N<sub>2</sub>O FELs
  - ☐ Useful life
  - ☐ Deterioration Factors
  - ☐ Statement of Compliance
  - ☐ Warranty
  - ☐ Maintenance Instructions
  - ☐ AECDS
  - ☐ ABT Plan
  - ☐ California production volumes

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## California Phase 1 Certification Process: List of Required Information for Vehicle Certification

- \* U.S EPA Certificate of Conformity
- \* U.S. EPA Application Package
  - ☐ General Family Information
  - ☐ GEM Inputs
    - ☐ AES info (tractor only)
    - ☐ Weight reduction info
    - ☐ Aerodynamic evaluation (tractor only)
    - ☐ Tire LRR data
  - ☐ GEM Output
    - ☐ CO<sub>2</sub> FEL
  - ☐ Statement of Compliance
  - ☐ Label Sample
  - ☐ Warranty
  - ☐ Maintenance Instructions
  - ☐ AECDS
  - ☐ ABT Plan
  - ☐ California production volumes

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## For California Phase 2, “Deemed to Comply” Approach is No Longer an Option

- \* Manufacturers are required to California-certify their vehicles and engines that are manufactured for sale in California
- \* Provides ARB more ability to verify compliance independent of U.S. EPA

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## California Phase 2 Certification Process

- \* Register with CARB's DMS (and ECERT once available)
- \* Submit Required Information (see next slide) to receive Executive Order
- \* Submit required End of Year (EOY) information within 90 days after the end of the model year
- \* If using ABT provision, Submit ABT reports by March 31 after the end of the model year

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## California Phase 2 Certification Process: List of Required Information for Engine Certification

### \* California Application Package

- |   |  |
|---|--|
| <input type="checkbox"/> General Family Information   | <input type="checkbox"/> Deterioration Factors         |
| <input type="checkbox"/> Emission Test Data / CO <sub>2</sub> FCLs; CH <sub>4</sub> , N <sub>2</sub> O FELs | <input type="checkbox"/> Statement of Compliance       |
| <input type="checkbox"/> Engine Installation Instructions   | <input type="checkbox"/> Warranty                      |
| <input type="checkbox"/> Label  | <input type="checkbox"/> Maintenance Instructions      |
| <input type="checkbox"/> Useful Life  | <input type="checkbox"/> AECDS                         |
|   | <input type="checkbox"/> ABT Plan                      |
|   | <input type="checkbox"/> California production volumes |

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## California Phase 2 Certification Process: List of Required Information for Vehicle Certification

### \* California Application Package

- |   |  |
|---|--|
| <input type="checkbox"/> General Family Information   | <input type="checkbox"/> Useful life                     |
| <input type="checkbox"/> GEM Inputs   | <input type="checkbox"/> Statement of Compliance         |
| <input type="checkbox"/> AES info (tractor only)  | <input type="checkbox"/> Label                           |
| <input type="checkbox"/> Weight reduction info  | <input type="checkbox"/> Warranty                        |
| <input type="checkbox"/> Aerodynamic evaluation (tractor only)                                      | <input type="checkbox"/> Maintenance Instructions        |
| <input type="checkbox"/> Tire LRR data  | <input type="checkbox"/> AECDS                           |
| <input type="checkbox"/> Engine maps/ Transmission files/ Rear Axle ratios/ Powertrain family data/ | <input type="checkbox"/> ABT Plan                        |
| <input type="checkbox"/> A/C refrigerant data   | <input type="checkbox"/> California production volumes   |
| <input type="checkbox"/> ATIS/TPMS  | <input type="checkbox"/> Engine models in vehicle family |
| <input type="checkbox"/> GEM Output   |  |
| <input type="checkbox"/> CO <sub>2</sub> FEL  |  |

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## California Phase 2 Certification Process: Phase 2 Trailer Certification Process

- \* Define trailer families, subfamilies (2027+ when Averaging allowed), and configurations
- \* Results from aerodynamic evaluation, tire CRR testing, other inputs used in compliance equation
- \* Off-cycle technology improvement factor and supporting documentation (if applicable)
- \* Identify FCL for family/subfamily.
- \* CO<sub>2</sub> emission calculation inputs and results using compliance equation

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## California Phase 2 Certification Process: Phase 2 Trailer Certification Process (cont.)

- \* Provide sample trailer label
- \* Provide warranty and maintenance documents
- \* End-of-Year production report (90 days after end of MY)
- \* If averaging after in MYs 2027+, End-of-Year Averaging report (90 days and 270 days after end of MY))

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## Staff Contact

Compression-Ignition & Heavy-Duty Certification Section –

Manager - Kim Pryor at (626) 575-6640 or [kpryor@arb.ca.gov](mailto:kpryor@arb.ca.gov)

On-Road Light-Duty Certification Section –

Manager - Duc Nguyen at (626) 575-6844 or [dnguyen@arb.ca.gov](mailto:dnguyen@arb.ca.gov)

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# Proposed California Heavy Duty GHG Phase 2 Warranty Requirements

Sharon C. Lemieux, P.E., Chief

In-Use Programs Branch

Emissions Compliance Automotive Regulations and Science Division

August 31, 2017

California Environmental Protection Agency  
 **Air Resources Board**

## Presentation Outline

- \* How California Warranty Program Differs from Federal Program
  - ☐ Why California has its own program and requirements
- \* Warranty reporting for GHG Components under CA Phase 2
  - ☐ What components will be covered
  - ☐ What reports will be required
- \* New Proposed right of entry

## How California Warranty Program Differs from Federal Program

### CARB's Emission Warranty Information Report (EWIR) Regulations

- \* California's EWIR regulations are unique and effective in correcting in-use emissions related problems
- \* CARB's EWIR warranty reporting provides more information than U.S. EPA's Emission Defect Information Reports (EDIR) to inform corrective actions
- \* CARB shares EWIR data with the U.S. EPA to inform federal corrective actions
- \* California DMV emissions related recall tie-in typically results in a >90% capture rate
- \* U.S. EPA does not have a program to tie emissions related recalls to vehicle registrations in other states

## CARB's vs. U.S. EPA's Emission Warranty Reporting

	<b>EWIR (California ARB)</b>	<b>EDIR (Federal EPA)</b>
Report Frequency	Every quarter	One time
Minimum requirements	One percent or 25 vehicles or engines (whichever is greater)	25 or more vehicles or engine reported
Claim Rate	Cumulative claim rate over each quarter	One snapshot when > 25 vehicles or engines reported
Parts Deterioration Rate	Can be analyzed based on quarterly data	Not specified
Reporting Period	Depends on the warranty period, ranging from 3 - 12 years	One time
Repair code	Repair or replace parts identified	NA
Sales Number	California Only (except some HDD manufacturers)	Nationwide
Content	Reports emissions related warranty by specific part number	Part description determined by the manufacturer

## Benefits of CARB's Warranty Program

- \* CARB monitors warranty activity through the EWIR program for GHG components on engines, vocational tractors, and trailers
- \* It is expected that manufacturers continue to improve part design and durability if rates are currently unacceptably high
- \* Corrective action will result in reduced emissions when defective parts are replaced
- \* Encourages manufactures to continue to improve part design and durability leading to reduced emissions and customer satisfaction

## Benefits of CARB's In-Use Vehicle Programs

- \* In-Use Programs consisting of EWIR and in-use compliance from 1983-2012 resulted in nearly 3 million recalls and 800,000 extended warranties in California alone
- \* EWIR related corrective action significantly reducing vehicular emissions and maintains an “Even Playing Field” among manufacturers
- \* Compliance with California and Federal emissions regulations and results in an emissions benefit estimated at 1.2 tons per day NO<sub>x</sub>+NMOG
- \* Field investigations verify issues and ensure accuracy of reporting

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## Warranty Reporting for GHG Components under CA Phase 2

## Warranted Part Definition

\* 13 CCR § 2035 (2) (B)

... any part installed on a motor vehicle or motor vehicle engine by the vehicle or engine manufacturer, or installed in a warranty repair, which affects any regulated emission from a motor vehicle or engine which is subject to California emission standards.

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## HD Diesel Vehicle Warranty Periods

Category	Part Affected	Warranty Period	Regulation
LHD, MHD, HHD†	Emission-related parts	5 years/ 100K miles/ 3000 hrs + base mechanical warranty + extended warranty	13 CCR 2036 (c)(4)
MHD, HHD	GHG components	5 years/100K miles	13 CCR 2036 (c)(4.2)*
LHD	GHG components	5 years/50K miles	13 CCR 2036 (c)(4.1)* (8.1)*
Tractors	GHG components (except tires) Tires	5 years/100k miles 2 years/24K miles	13 CCR 2036 (c)(4.2)* 40 CFR 1037.120*
Trailers	GHG components (except tires) Tires	5 years 1 year/12K miles	40 CFR 1037.120*

† LHD 14,001-19,500 lbs GVWR, MHD 19,501-33,000 lbs GVWR, HHD >33,000 lbs GVWR

\*Proposed amendment

## GHG Components Warranty 40 CFR 1037.120

- \* Tires, automatic tire inflation systems, vehicle speed limiters, idle shutdown systems, fairings, and hybrid system components, and devices added to the vehicle to improve aerodynamic performance
- \* Air conditioning refrigerants (for vehicles subject to air conditioning leakage standards)
- \* Applicability: HD Engines, Vocational Tractors/Trailers, Medium-duty Vehicles

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## Warranty Reporting 13 CCR 2144-2146

- \* **Emissions Warranty Information Report (EWIR)** 13 CCR 2144.
  - ☐ Required when unscreened warranty claims  $\geq$  1% or 25 parts whichever is greater
- \* **Field Information Report (FIR)** 13 CCR 2145
  - ☐ Required when unscreened warranty claims  $\geq$  4% or 50 parts whichever is greater
- \* **Emissions Information Report (EIR)** 13 CCR 2146
  - ☐ Required when screened warranty claims  $\geq$  4% or 50 parts whichever is greater

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## Field Information Report or FIR 13 CCR 2145

- \* Manufacturers are required to submit an FIR within 45 days of an EWIR when unscreened warranty claims reach a 4% or 50 (whichever is greater) failures level.
- \* FIRs must include the following information:
  - A. A description of the emission related component's failure and the probable cause for its failure.
  - B. The true failure rate of the engine family or test group.
  - C. A projection of the total number and percentage of unscreened warranty claims expected during the engine family's or test group's useful life.

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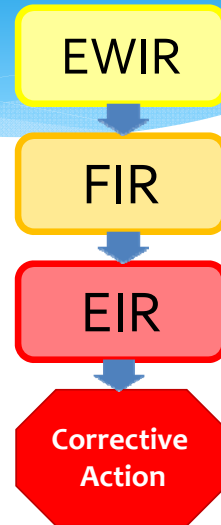
## Emissions Information Report EIR 13 CCR 2146

- \* An EIR shall not be required sooner than 45 days after the FIR has been submitted
- \* CARB can require an EIR for "cause" 13 CCR 2146(a)(2)
- \* EIRs must include the following information:
  - A. A description of the impact on emissions.
  - B. A description of the impact on drivability, fuel economy, and performance.
- \* Manufacturers are subject to corrective action after a true failure rate of 4% is reached
- \* Manufacturers must work with CARB to implement corrective action in the form of an extended warranty and/or recall
- \* Contact their customers so they are aware of the recall

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## Corrective Action Timeline

- \* Manufacturers are required to submit an EWIR within 25 business days of the start of each quarter. An EWIR is only required if warranty data indicates an unscreened emission related failure rate that is  $\geq 1\%$ .
- \* If the emission related component failure rate is  $\geq 4\%$  manufacturers are required to submit an FIR due 45 days after the EWIR is received.
- \* If the FIR does not state a meaningful reason of why the component failed, the manufacturer must submit an EIR within 45 days of submitting the FIR.
- \* If the true failure rate is  $\geq 4\%$  manufacturers must issue a recall or extended warranty.



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## Proposed Right of Entry Provisions

## Current Right of Entry for Warranty Repair Stations

### CARB Right of Entry for Warranty Repair Stations

- \* California H&SC 43008.6

... an authorized representative of the executive officer... has the right of entry to any premises owned, operated, used, leased, or rented by an owner or operator of any vehicle operated for commercial purposes in order to inspect any such motor vehicle, secure emission samples therefrom, or inspect and copy any maintenance, use, or other records pertaining to that vehicle.

- \* California H&SC 43012

... an authorized representative of the executive officer, or a representative of the department ... has the right of entry to any premises owned, operated, used, leased, or rented by any new or used car dealer, as defined in Sections 285, 286, and 426 of the Vehicle Code, for the purpose of inspecting any vehicle for which emissions standards have been enacted or adopted or for which emissions equipment is required and which is situated on the premises for the purpose of emission-related maintenance, repair, or service, or for the purpose of sale, lease, or rental, whether or not the vehicle is owned by the dealer.

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## Current Right of Entry for HD Warranty Repair Stations (cont.)

### CARB HD Inspection Provisions

- \* Verification Regs 13 CCR 2702(r)

For the purpose of selecting new diesel emission control strategies for testing and/or inspection to determine compliance with this regulation, an agent or employee of CARB, with prior notice and upon presentation of proper credential, has the right to enter any facility (with necessary safety clearances) where diesel emission control strategies verified under these Procedures are located or kept.

- \* Aftermarket DPF Procedures section (m) Compliance

(4) CARB has the right of entry to any facility owned, operated, used, leased or rented by an applicant or installer in order to inspect or verify compliance with the provisions of this Procedure.

- \* Truck and Bus 13 CCR 2025(v)

For the purpose of inspecting vehicles subject to this regulation and their records to determine compliance with this regulation [*includes warranty repairs*], an agent or employee of CARB, upon presentation of proper credentials, has the right to enter ANY facility (with any necessary safety clearances) where vehicles are located or vehicle records are kept.

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## Right of Entry for HD Warranty Repair Stations (cont.)

- \* Authority clearly given to CARB to inspect both LD and HD facilities
- \* Clarifying language needed to harmonize CARB rights of entry for inspection at all warranty repair stations, such as adding the proposed language below to 13 CCR 2141:

The Executive Officer shall reserve the right to verify a manufacturer's warranty reporting and claims through audits which include, but are not limited to, inspecting repair records, vehicles, and engines at any authorized repair facility.

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## Staff Contact

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**Field Operations and Warranty Section**  
Phone Number: (626) 575-7009  
Email Address: [jwong@arb.ca.gov](mailto:jwong@arb.ca.gov)

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# CARB Staff Plans to Address Potential Changes to the Federal Phase 2 Trailer Requirements

## Presentation Outline

- \* Truck Trailer Manufacturers Association (TTMA ) Lawsuit
- \* Federal Phase 2 Trailer Standards and California's Tractor-Trailer GHG Rule
- \* California's Options
- \* Next Steps

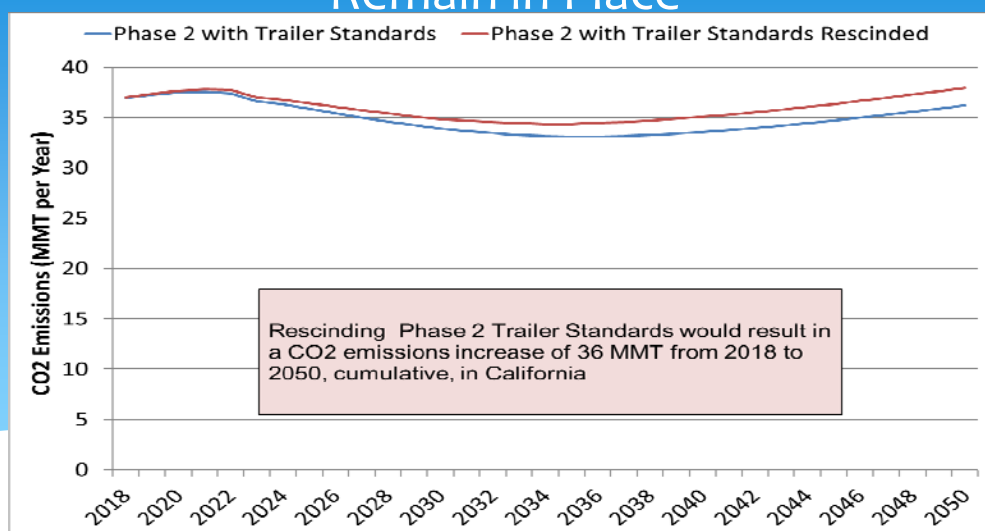
## TTMA Lawsuit Requests U.S. EPA to Rescind Phase 2 GHG Standards for Truck Trailers

**NEW!**

- \* On December 22, 2016, the TTMA filed a lawsuit that challenges and seeks to vacate the provisions of the federal Phase 2 rule that apply to trailers.
- \* On August 17, 2017, U.S. EPA and NHTSA announced that they will reconsider the Phase 2 trailer provisions, however in the meantime, the Phase 2 trailer provisions remain in effect
- \* The lawsuit and reconsideration of the trailer provisions however, does not affect California's authority to establish standards for trailers hauled by heavy-duty tractors and CARB is accordingly proposing to establish specific requirements for trailers.

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## California Would Benefit If Trailer Phase 2 Standards Remain in Place



Source: ARB EMFAC 2014

## Federal Phase 2 Trailer Standards

- \* US EPA's trailer program begins January 1, 2018
- \* Four step phase in of standards
  - ☐ Model Years 2018, 2021, 2024, 2027
- \* Separate categories for:
  - ☐ Long box (longer than 50 feet) box vans
  - ☐ Short box (50 feet and shorter) box-vans
  - ☐ Non-box trailers

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## Federal Phase 2 Trailer Standards Structure Same as Basic Structure for Tractors

- \* Certification by trailer manufacturer
- \* Standards reflect gram/ton-mile emission rate of tractor pulling trailer
- \* Compliance equation approach, based on GEM model
- \* Standards based on application of low-rolling resistance (LRR) tires, automatic tire inflation systems (ATI)/Tire pressure monitoring systems (TPMS), and aerodynamic technologies

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## California Tractor-Trailer GHG Rule (TTGHG Rule) Also Impacts Trailers

- \* Regulates owners of fleets traveling in California
- \* Also impacts California-based shippers and brokers
- \* Effective January 1, 2010
- \* Reduces GHG emissions from long-haul tractor-trailers by improving
  - ☐ Tractor aerodynamics
  - ☐ 53'+ box-type trailer aerodynamics (skirts, etc.)
  - ☐ Tire rolling resistance
- \* Based on elements of U.S. EPA SmartWay Program
- \* Web link for more info on TTGHG Rule:  
<https://www.arb.ca.gov/cc/hdghg/hdghg.htm>

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## California's Options

- \* For this workshop, CARB explored two scenarios:
  1. Federal Phase 2 trailer standards remain effective
  2. Federal Phase 2 trailer standards are significantly weakened or removed

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## CARB Plan If Federal Phase 2 Trailer Standards Remain Effective

- \* California Phase 2 (February 2018)
  - ☐ Harmonize with U.S EPA Phase 2, including trailer certification requirements
- \* Modify Current California Tractor-Trailer GHG Rule (TTGHG 1) (2018-2019)
  - ☐ Sunset requirements for long (53 '+') box-type trailers at model year 2018, or
  - ☐ Add additional requirement that Phase 2 certified trailers are compliant with TTGHG 1 rule
- \* California TTGHG 2 Rule (tentative) (2020-2022)
  - ☐ Dependent on results of Ce-CERT Trailer Activity Study (completion 4/2018), may propose requirements for aerodynamic technologies on MY 2024+ non-box trailers (i.e. flatbeds and tankers)

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**NEW!**

## CARB Plan if Federal Phase 2 Trailer Standards are Significantly Weakened or Removed

- \* California Phase 2 (February 2018)
  - ☐ Harmonize with U.S EPA Phase 2 ( trailer certification requirements weakened or removed)
- \* Modify California TTGHG 1 (2019)
  - ☐ May propose more stringent aerodynamic technology requirements for MY 2020 long (53'+) box-type trailers (SmartWay Elite)
  - ☐ May propose MY 2018-2019 long box-type trailers be retrofitted to SmartWay Elite by 2024
- \* California TTGHG 2 Rule (2020-2022)
  - ☐ May propose CARB aero/tire/complete trailer verification procedures and test methods similar to Phase 2
  - ☐ May restructure TTGHG1 to address Phase 2 trailer categories for MY 2024+(e.g. >50 foot box van, ≤ 50 foot box van...)
  - ☐ May propose aero/tire/tire pressure requirements similar to Phase 2 MY 2027+ standards, for MY 2024+ trailers
  - ☐ May propose aero requirements on non-box type trailers (decision based on C-CERT study)

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## California's Regulatory Strategies If Phase 2 Trailer Standards Remain or are Weakened/Removed

Regulated Entity	Federal Phase 2 Trailer Standards REMAIN	Federal Phase 2 Trailer Standards WEAKENED/REMOVED
Trailer Manufacturers	<ul style="list-style-type: none"> <li>Adopt Phase 2 Trailer Certification Standards (2018)</li> </ul>	<ul style="list-style-type: none"> <li>Adopt NO/WEAKENED Trailer Certification Standards</li> </ul>
Trailer Fleet Owners	<ul style="list-style-type: none"> <li>Phase 2 Certified Trailer compliant with TTGHG1 Rule (2018-2019)</li> <li>Possible TTGHG2 Rule for aero on non-box trailers (2020-2022)</li> </ul>	<ul style="list-style-type: none"> <li>May expand TTGHG1 requirements (2019)               <ul style="list-style-type: none"> <li>SmartWay Elite for new (2020MY) and retrofit (2018-2019MY)</li> </ul> </li> <li>TTGHG2 Rule (2020-2022)               <ul style="list-style-type: none"> <li>May adopt verification /test methods</li> <li>May expand applicability to all 10 Phase 2 trailer categories (2024+MY)</li> <li>May adopt standards similar to Phase 2 for aero/tires/ATIS (2024+MY)</li> <li>Possible TTGHG2 Rule for aero on non-box trailers (2020-2022)</li> </ul> </li> </ul>

## Next Steps

- \* February 2018 - Adopt California Phase 2 regulation that harmonizes with federal Phase 2 trailer requirements
- \* Mid-2018 – Workshop to Present Results of Ce-CERT Study and Discuss TTGHG 2
- \* 2018-2022: TTGHG 2 rule development

## California Phase 2 Rulemaking Next Steps

- \* Sept.-Oct. 2017: Share draft regulatory language – solicit stakeholder feedback
- \* Dec. 2017: Public comment on staff report begins
- \* Feb. 2018: Board consideration of California Phase 2 proposal