CALIFORNIA
AIR RESOURCES BOARD

2023 Truck and Engine Manufacturers Association Compliance Workshop

General Compliance Session

May 2, 2023

CARB's Southern California Headquarters

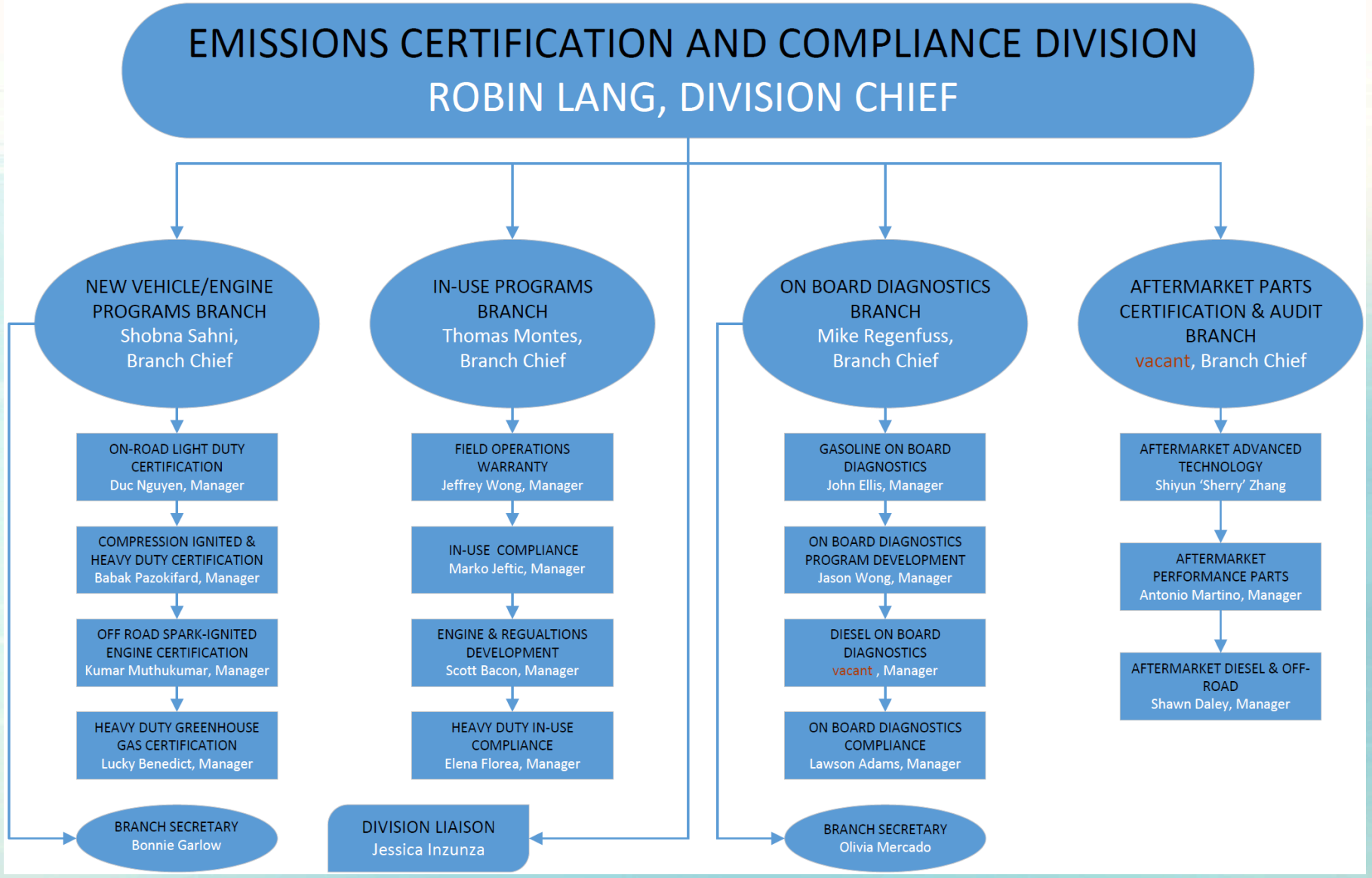
Close to 100 tours hosted so far!

New SoCal CARB Headquarters

Includes state-of-the-art laboratory capabilities

- Dynamometer cells for cars, trucks, and motorcycles
- Portable emissions measurement systems (PEMS) facilities for cars and trucks
- Large and small engine testing
- Sophisticated chemistry lab
- Evaporative and running loss SHEDs
- Expanded testing capability with altitude, road grade, and temperature simulation, etc.

Emissions Certification and Compliance Division Organization Update



Program Scope

Everything that moves (almost)







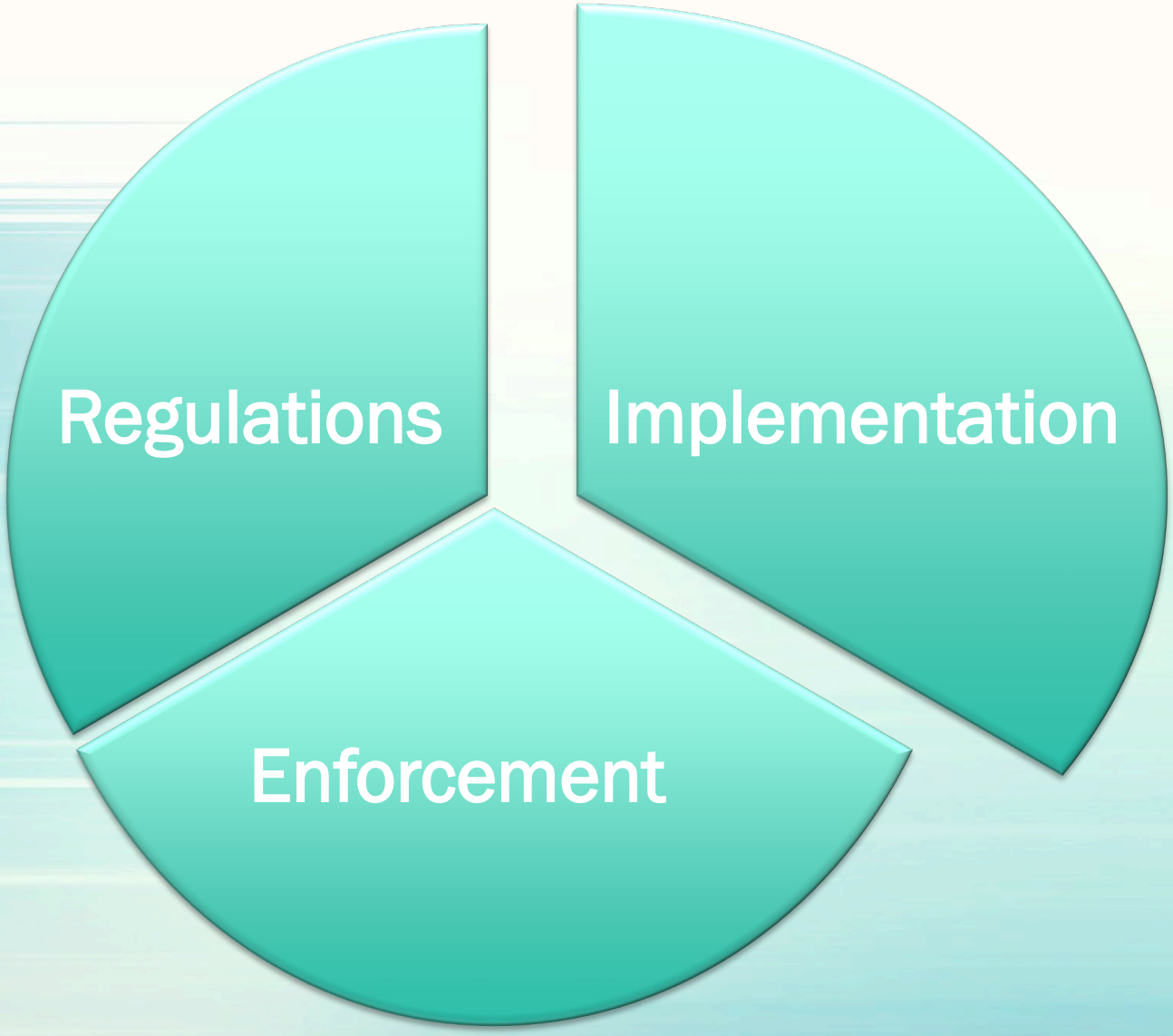







Program Goals

- Ensure vehicles/engines meet regulatory requirements before they are sold in California
- Verify compliance in the field, and resolve issues
- Protect against emissions increases from aftermarket parts and
- Reduce in-use emissions through emission control retrofit program implementation



Implementation (Certification & In-Use Compliance) is one piece of the puzzle

Visits to CARB
Certification Preview Plan (CPP)

- CARB encourages manufacturers to hold CPP meetings every year
- CARB welcomes in-person meetings at Riverside Facility
- CARB also hosts tours of the facility
  - Contact staff for scheduling of meetings/tours
  - EMA manufacturers have already been on tours and met with CARB in-person

2022 Calendar Year Executive Orders Issued for New Vehicles/Engines

CARB

General New Vehicle Certification Topics

New Systems Implemented in 2022

- Submitting Applications in e-File
  - eDMS shut down and e-File is now active for all domains/vaults
  - Please let us know if you have any requests/suggestions
- Invoicing for Certification Fees
  - Also came online and is working fairly well except for invoice revisions
  - Please work with certification staff if there are issues with payment

Posting Executive Orders

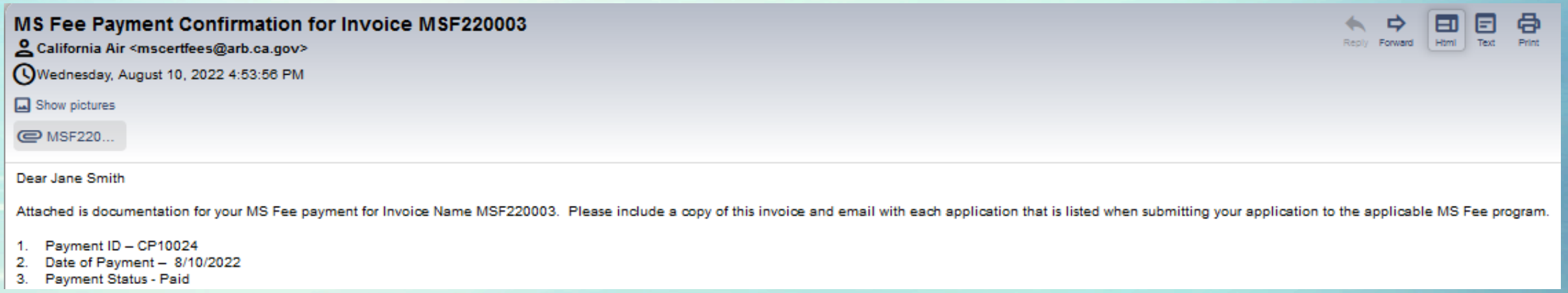
- Internal processes are being updated to streamline the submittal, review, and approval of certification applications, and the publication of Executive Order (EO) files and associated data.
- Public EO webpages have been updated to the current CARB web format utilizing the modified processes. https://ww2.arb.ca.gov/new-vehicle-and-engine-certification-executive-orders
- Files and data are presently being updated monthly; these updates will be increasingly more frequent as the modernization effort continues.

Mobile Source Certification Fee Implemented

- Manufacturers must pay certification fees for each new certification application
  - https://ww2.arb.ca.gov/mobile-source-certification-and-compliance-fee-regulation-meetings-workshops
- Verify correct fee category and fee type are selected on invoice
- The “Unique Application Identifier” is the engine/vehicle or evaporative family name listed on the application

Mobile Source Certification Fee Best Practices

- Certification Fees part of certification previews to plan better for OEMs
- Manufacturers must wait 5 days before submitting payment
- Application review begins when fee for correct fee type is received
- Example of payment confirmation email after payment has been cleared



MS Fee Payment Confirmation for Invoice MSF220003

Reply Forward Html Text Print

California Air <mscertfees@arb.ca.gov>

Wednesday, August 10, 2022 4:53:56 PM

Show pictures

MSF220…

Dear Jane Smith

Attached is documentation for your MS Fee payment for Invoice Name MSF220003. Please include a copy of this invoice and email with each application that is listed when submitting your application to the applicable MS Fee program.

1. Payment ID – CP10024
2. Date of Payment – 8/10/2022
3. Payment Status - Paid

- Manufacturers must include the “Final Invoice” on the first page of each cert app

CARB

Mobile Source Certification Fee Changes Ahead

- Certification Fee amount changes every MY until MY25
  - These changes will be reflected at the time of invoice submittal
- Base / Carryover / Partial Carryover
  - The definitions under 13 CCR 2901
- Streamlined Carryover / Partial Carryover Process
  - Guidance issued in Mail-Out # ECARS 2015-7
- Review can only happen after the certification fee is paid

Heavy Duty E-Cert Status

- The data requirements, business rules, and XML schema that will be used during testing are available on the E-Cert webpage: https://ww2.arb.ca.gov/e-cert
- Manufacturer testing for on-road and off-road engines, HDZEP, HD vehicles, and EVAP will begin in July 2023
- Question: How many are developing systems and will not use the webform?

Heavy Duty E-Cert Status

12/22
- Latest version of the data requirements posted

7/23
- Workshop in late June
- Web form available to test in July

9/23
- Web form available for Manufacturers to use
- Recommended for 24MY

CARB

Contact Information

New Vehicle and Engine Programs Branch

Shobna Sahni, Branch Chief

Shobna.Sahni@arb.ca.gov

Emissions Certification and Compliance Division

Robin Lang, Division Chief

(626) 575-6827 Robin.Lang@arb.ca.gov

Compression Ignition and Heavy-Duty Certification Section

Babak Pazokifard, Manager

(951) 542-3343 Babak.Pazokifard@arb.ca.gov

Heavy-Duty Green House Gas Certification Section

Lucky Benedict, Manager

(951) 542-3082 Lucky.Benedict@arb.ca.gov

Compression Ignition & Heavy-Duty Certification Section

Over 525 bhp Provision Summary

- Per 13 CCR 1956.8(a)(2)(C)2, manufacturers of engine families with max rated power ≥ 525 bhp may certify by:
  - Submitting Federal Certificate of Conformity (COC) &
  - Demonstrating compliance with:
    - Idling Requirements in 1956.8(a)(6)
    - Warranty Requirements in 13 CCR 2036
    - Requirements specific under 13 CCR 1956.8(a)(2)(C)2.b.i and ii
- All documents submitted to EPA to receive the COC must also be submitted into CARB's eFile system.

Certifying Hydrogen ICE

- Spark-ignition means:
  - Engines with a spark plug or other sparking device
  - Operating characteristics significantly similar to the theoretical Otto combustion cycle
  - Usually uses a throttle to regulate intake air flow to control power

- Compression-ignition means:
  - Engine that is not a spark-ignited
  - Operating characteristics significantly similar to the theoretical Diesel combustion cycle
  - Non-use of throttle to regulate intake flow for controlling power

13 CCR 2421, 40 CFR 1036.801, 40 CFR 1039.801 as adopted by CARB

Certifying Hydrogen ICE

- CARB has received information from certifying H2 ICE manufacturers that suggests these engines conform to the definition of spark-ignition and should be certified accordingly

- CARB welcomes feedback and discussions with manufacturers on Hydrogen ICE topics

EMA Q+A

- Q: Is there a formal process for CARB to timely communicate updates to EOY templates or could these be done on a regular schedule so that manufacturers know when to expect them?

- A: Most templates are posted on the website. When there is an update, CARB staff will communicate through email to manufacturers with a link.

Overview of Diesel Engine Manufacturers' DF Validation Results

DF Validation Program Introduced

- CARB/EPA requested manufacturers to validate existing DFs and provided guidance through mailouts and workshops

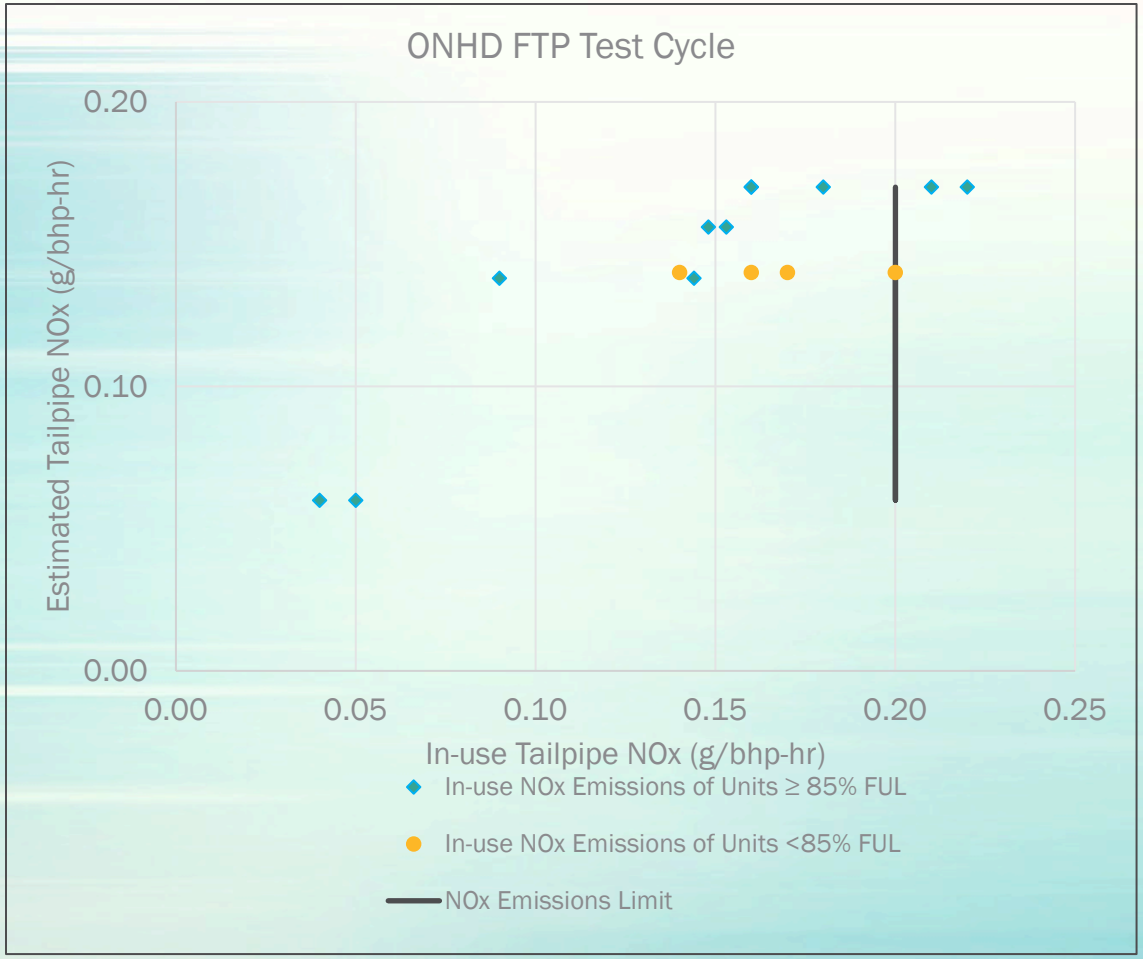
- Manufacturers conducted DF validations as part of the 2022 and later model year certification effort using several validation options considered acceptable by the agencies

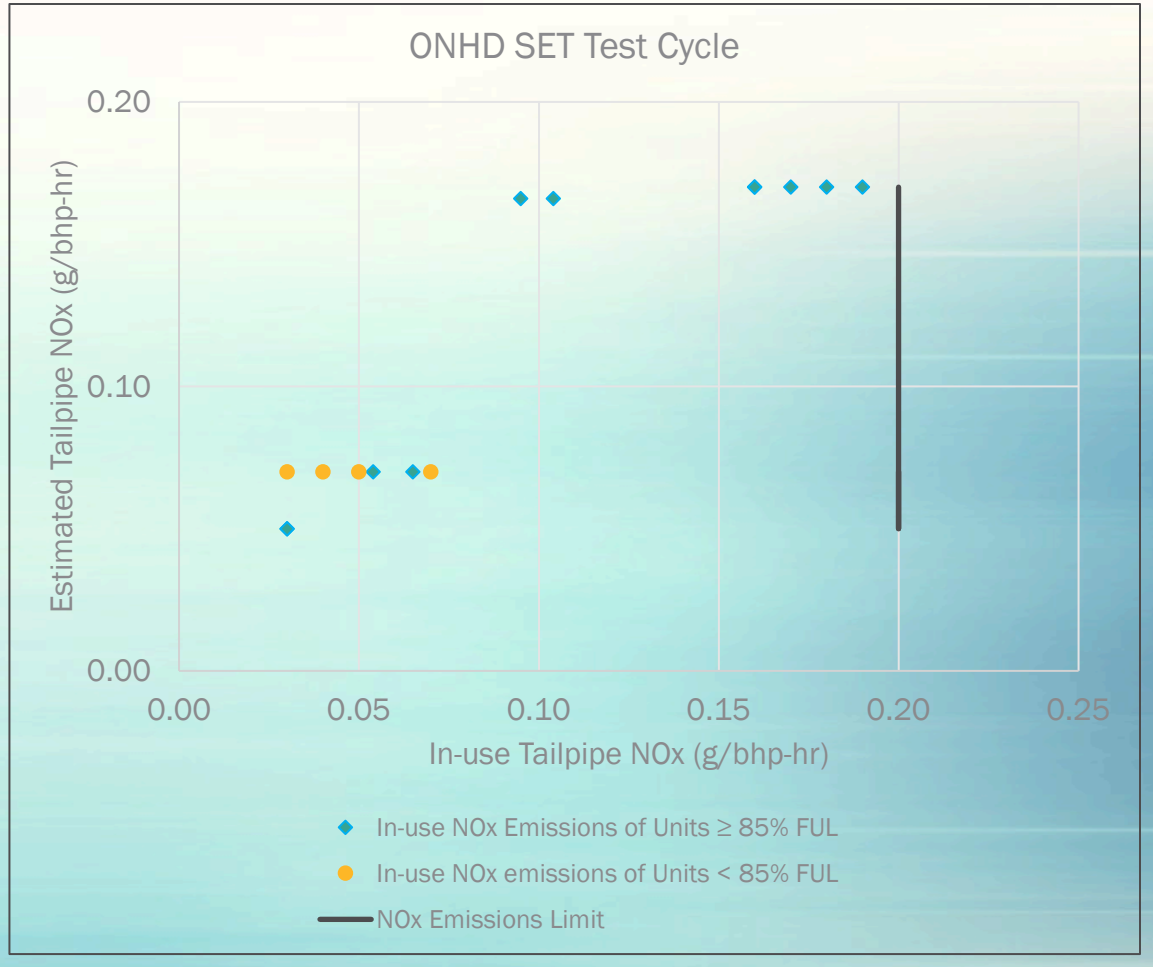
DF Validation Performance for On-Road Heavy-Duty Engines

- Prior to certifying 2022 model year engines:
  - 8 on-road HD DFs have been evaluated
  - This covered 22 engine families

- Pathways manufacturers selected for on-road HD DF validation:
  - Engine dyno testing of 15 in-use units
  - FUL demonstrations of 2 units in the lab

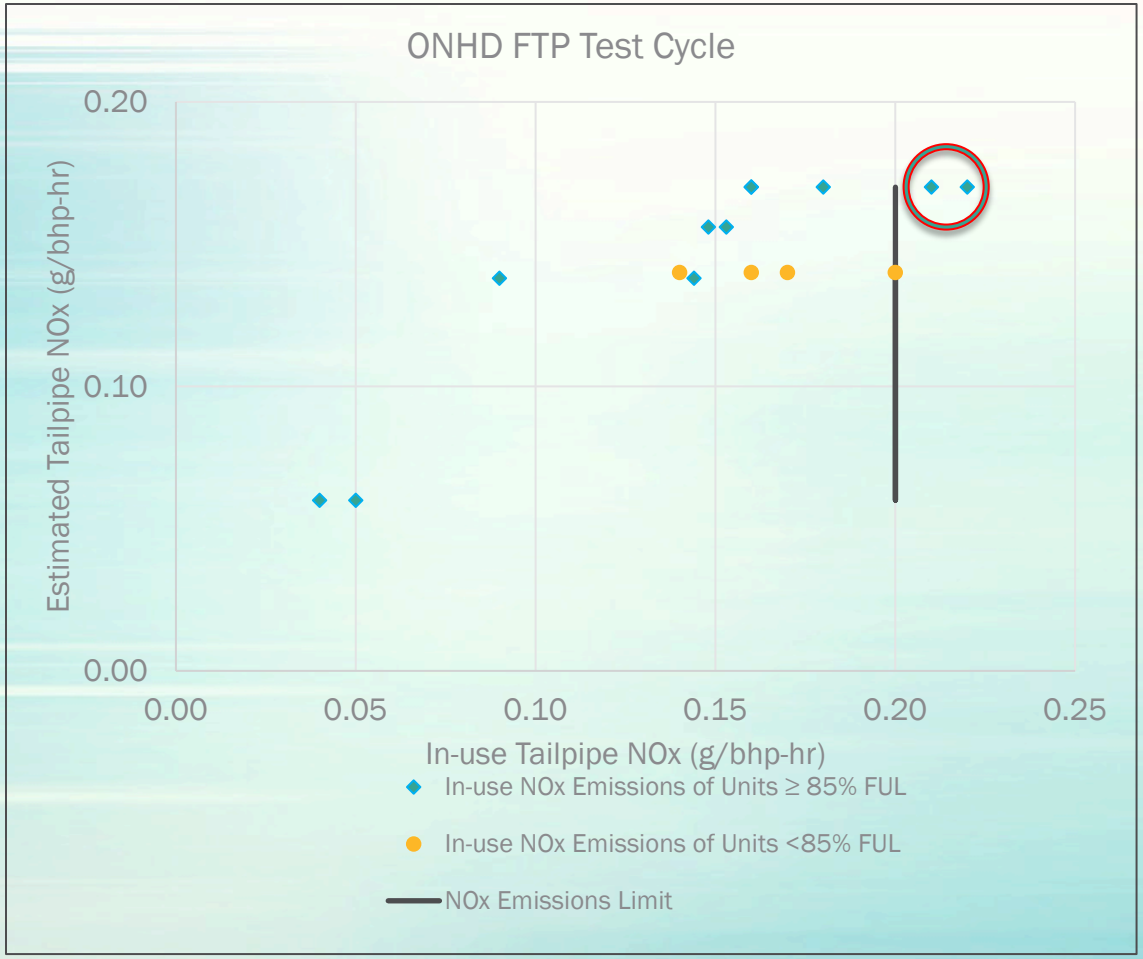
Comparison of In-use NOx Emissions to Estimated NOx Emissions at FUL

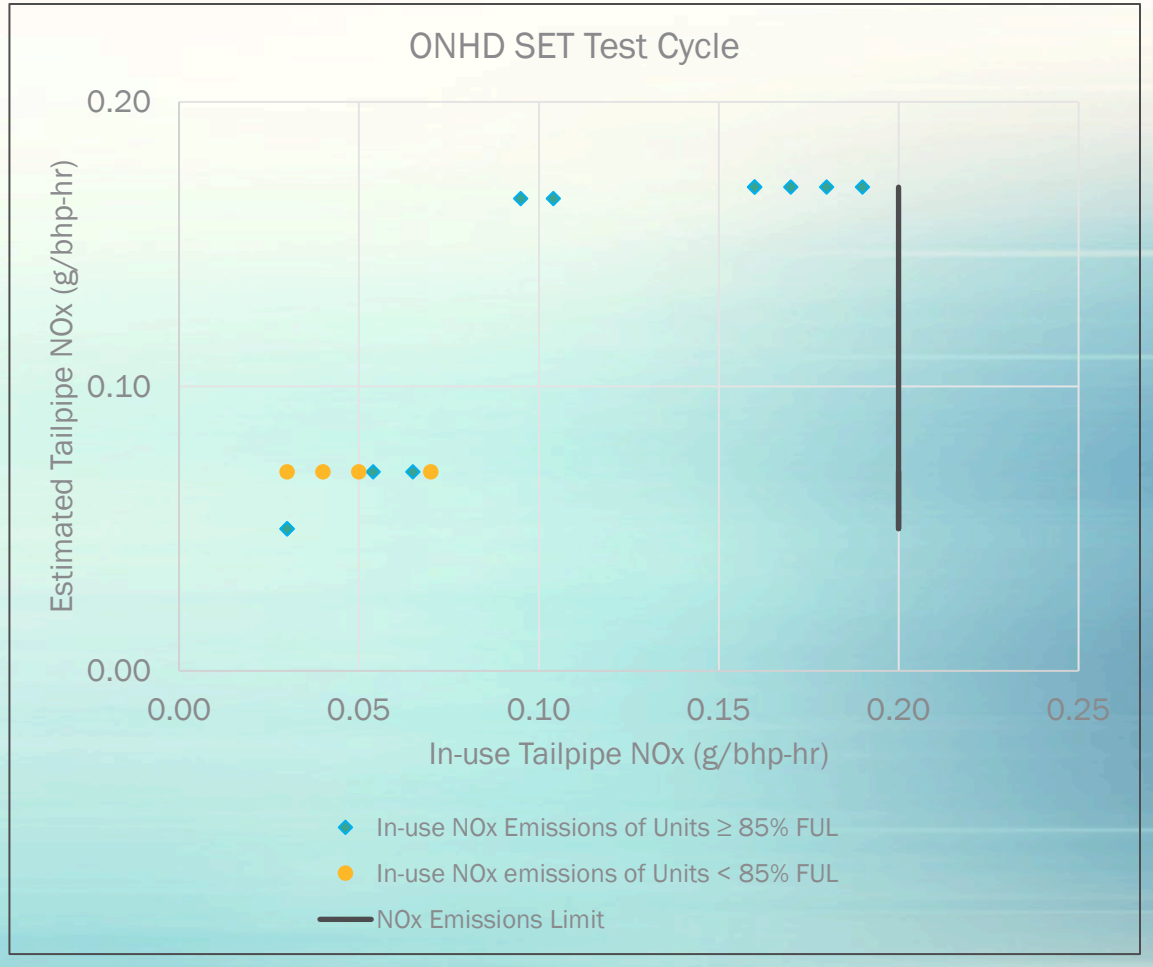




CARB

Comparison of In-use NOx Emissions to Estimated NOx Emissions at FUL





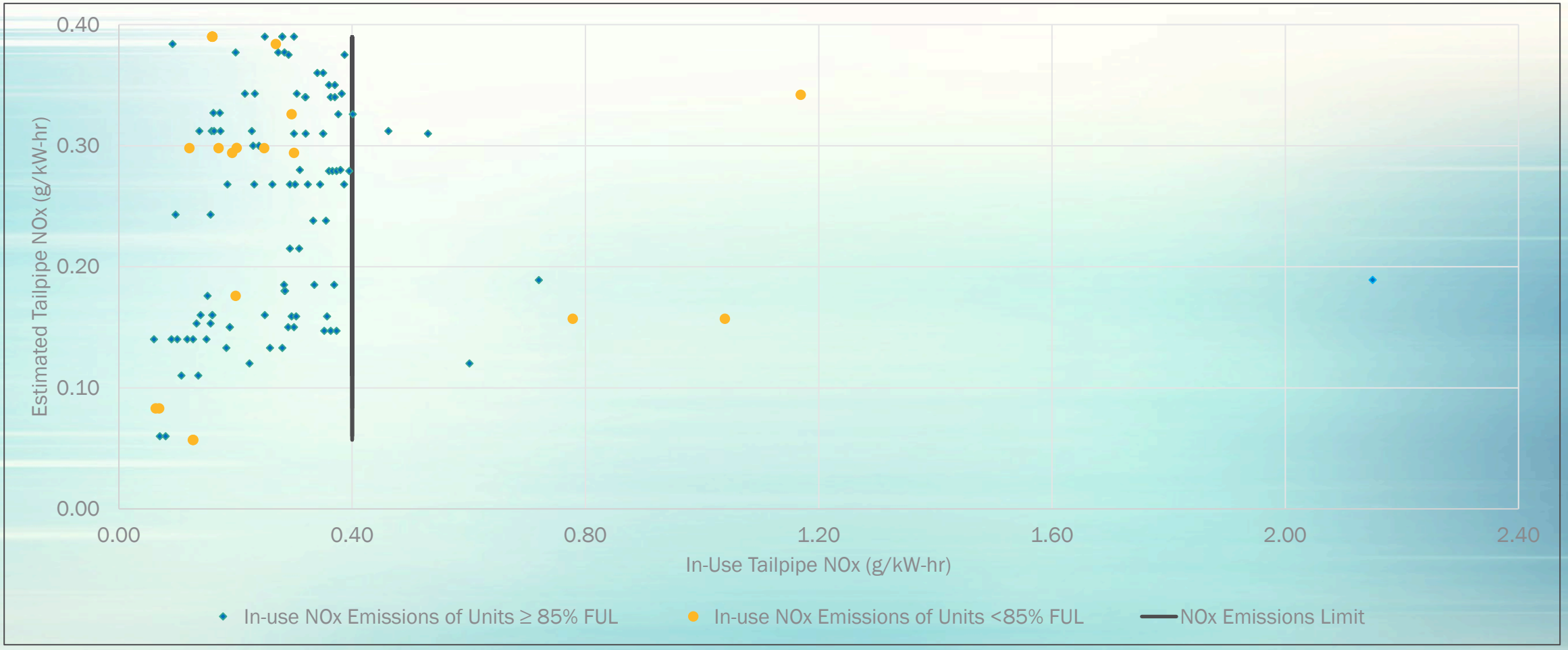
CARB

DF Validation Performance for Off-Road Diesel Engines

- Prior to certifying 2022 model year engines:
  - 54 off-road diesel DFs have been evaluated
  - These DFs cover 135 engine families

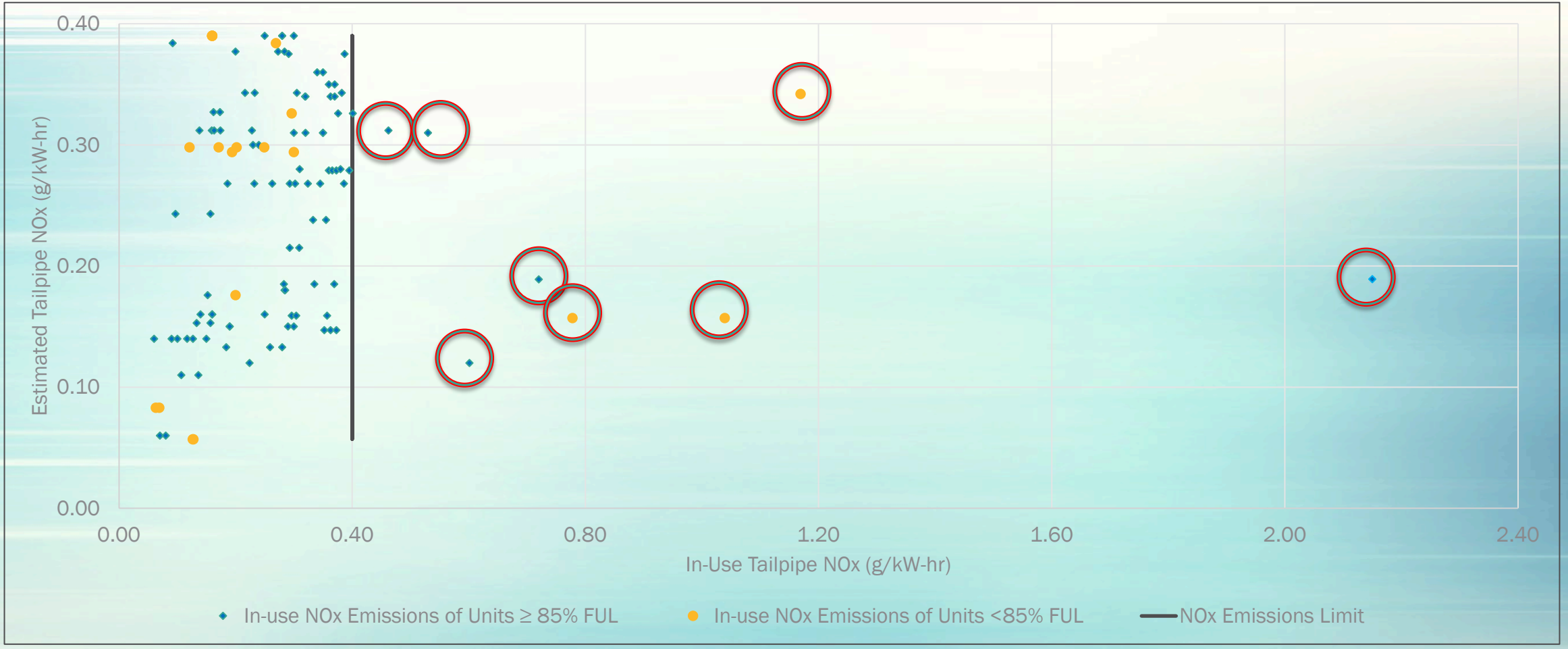
- Methods manufacturers selected for off-road DF validation:
  - Engine dyno testing of 129 in-use units
  - FUL demonstrations of 2 units in lab
  - On-board NOx sensor data for 35 units

Comparison of In-use NOx emissions to Estimated NOx at FUL on NRTC Test Cycle



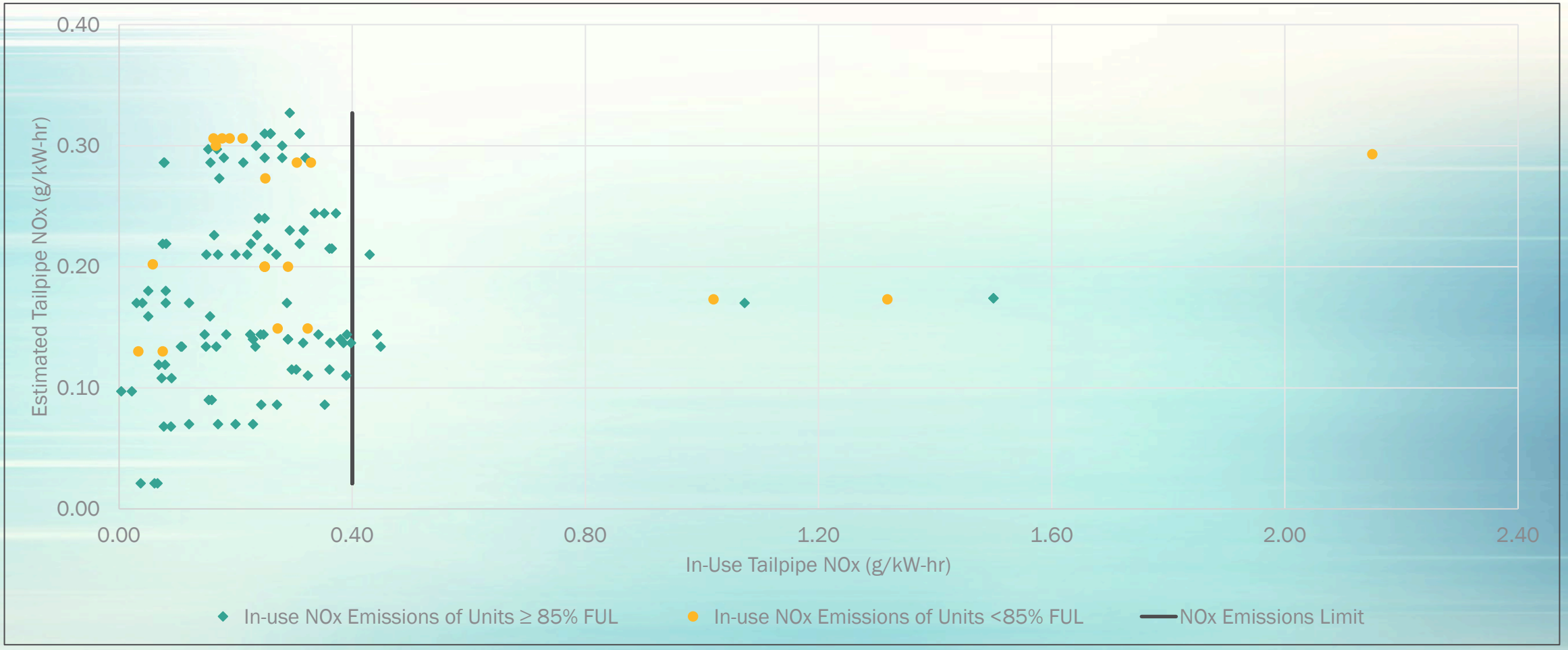
CARB

Comparison of In-use NOx emissions to Estimated NOx at FUL on NRTC Test Cycle



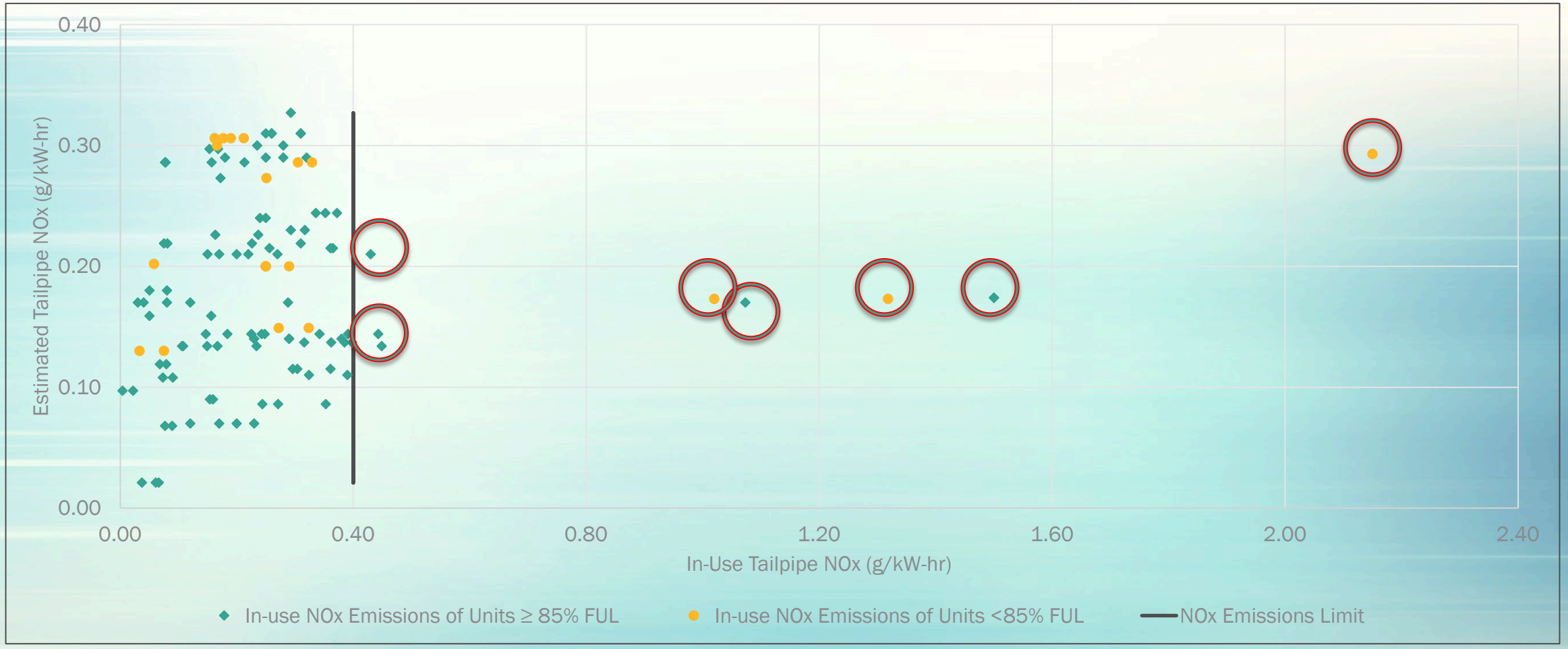
CARB

Comparison of In-use NOx emissions to Estimated NOx at FUL on RMC Test Cycle



CARB

Comparison of In-use NOx emissions to Estimated NOx at FUL on RMC Test Cycle



CARB

On-Board NOx Sensor Data for Off-Road Diesel Engines

- On-board NOx sensor data from 35 in-use units were collected prior to MY 2022 certification
- Evaluations were based on Moving Average Window principle
- Passing criteria: 90th percentile of valid windows be less than a confirmatory factor limit of 1.5x the applicable standard
- Pass results were obtained from all in-use units using this method of DF validation

CARB

DF Validation Findings

- 2 on-road and 10 off-road in-use units had emissions above the NOx and PM standards.

- 4 DFs were not successfully validated
  - Covered 14 engine families

Outcome from DF Validation Program

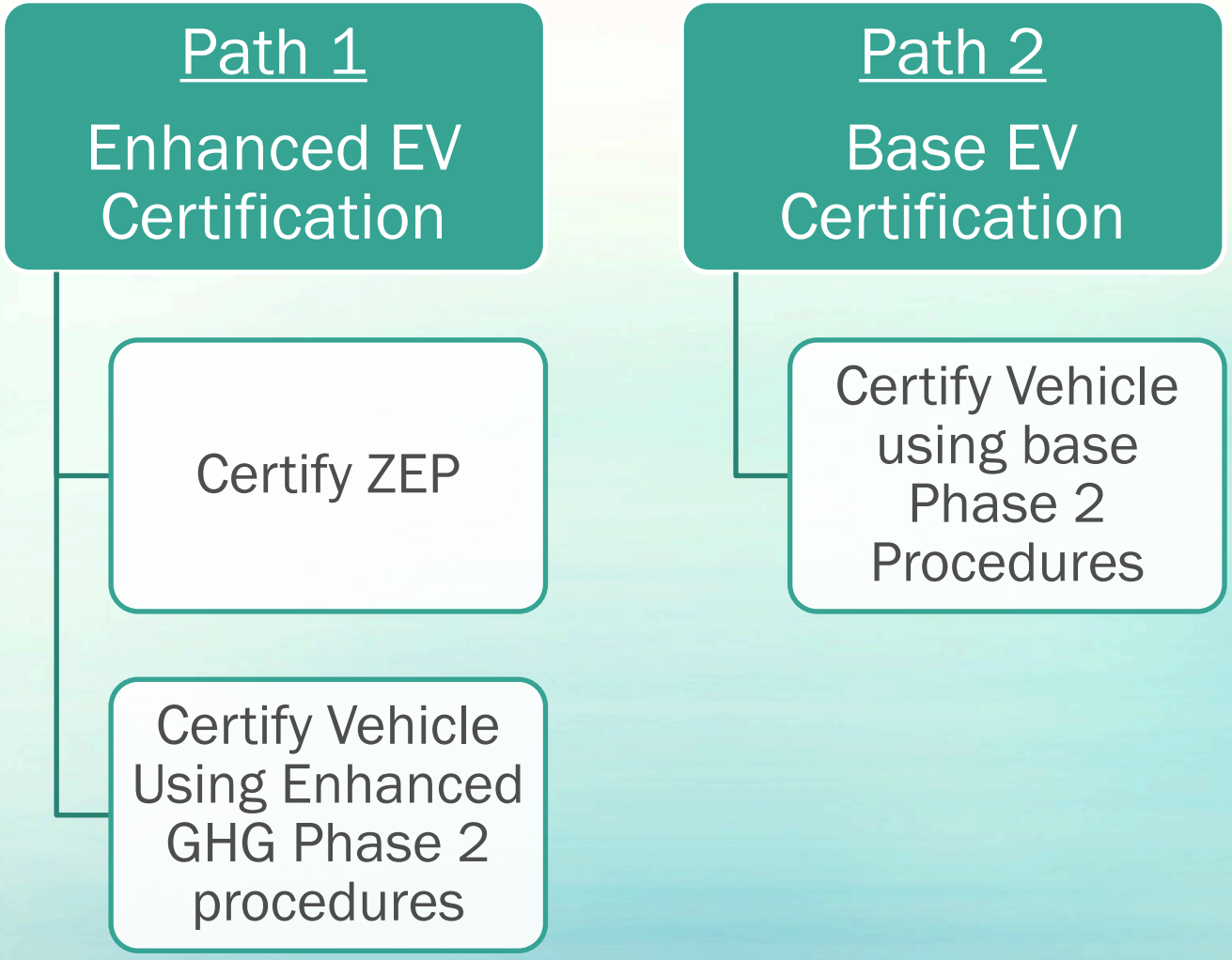
- Manufacturers with non-compliant units have taken necessary measures to comply with CARB's emissions regulations:
  - Re-evaluating of historical DF test procedure
  - Re-designing engine systems
  - Performing new durability demonstrations
  - Implementing corrective action on non-compliant engines

Heavy-Duty GHG Certification Section

Outline

- Certification Activities
- Zero Emissions Vehicle and Powertrain Certification
- CA-ABT program for ZEP/ZEV
- Reminders

Zero Emissions Vehicle Certification



CARB

Zero Emissions Vehicle Certification (Contd.)

Some issues/reminders

- Rated Energy Capacity Test for Battery-Electric Powertrains: if an alternative test procedure is used other than the SAE J1798 procedure, pre-approval is needed prior to submitting certification application.

- The Enhanced Electric and Fuel-Cell Vehicle Certification requires additional documents compared with the standard GHG certification (CA test procedure 1037.115 B. California Provisions).
  - Malfunction Information
  - Trip Meter
  - Required Access for Diagnostic Communications Tools Compatibility
  - Readily Accessible of Rated/Usable Energy Capacity (BEV)
  - Availability of Tools description
  - Sales Disclosures
  - Owner's Manual

California-Only Averaging, Banking, and Trading (CA-ABT) program

(Heavy-Duty Zero-Emission Averaging Set)

- The CA amendments to 40 CFR 86.007-15 B allows electric vehicle manufacturers, who certified with CARB and produced and delivered vehicles for sale in CA, to participate in the CA-ABT program starting in the 2022 model year.
- ZEP/ZEV families with models used in class 4 through 8 vehicles are eligible to generate criteria pollutant (e.g. NOx) credits.
- Credit Life: only up through model year 2026.
- CARB is currently working on a template for ZEV manufacturers to be used for calculation and reporting CA-ABT Credits. The reports need be submitted within 180 days of the end of the model year (June 30)

Reminders

- Phase 2 CO_2 standards changes for both Tractor and Vocational vehicles (primary) for MY2024.
- Submit applications early– At least 90 days before start of production.
- Review all applicable regulations including CARB amendments to EPA regulations in 40 CFR 1037.
- Cert fees must be paid prior to submitting applications for review. For ZEP applications, the fee is based on calendar year, instead of Model Year.
- Manufacturers are reminded to submit 2022MY end of year reports.
  - (1) total U.S.-directed production and (2) CA production reports (*90 days from end of production) and
  - ABT (CO_2) (90 days and 270 days from end of production)
  - CA-ABT (criteria pollutant)(180 days from end of production)
- Please use CARB Phase 2 ABT (CO_2) Report Template (**September 2022) and CA-ABT (criteria pollutant) Report Template (April 2023) when reporting ABT credits.

*changes within 270 days from end of production will be accepted. ** the template will get updated for MY2022

Reminders (Contd.)

- ZEP Family Naming Convention should follow the family naming conventions provided in the Mail-Out #ECC 2020-04.
- ZEP EO must be signed prior to the issuance of Enhanced Vehicle EO.
- Per 40 CFR 1037.525 (b) (5), tractor manufacturers shall determine separate values of $F_{alt\text{-}aero}$ for at least two high-roof day cabs and two high-roof sleeper cabs for model year 2024. The test requirement is cumulative.
- Please get CARB preliminary approval for aerodynamic test plans (new or any major amendments).
- Starting from MY2023, manufacturers are required to provide VECI label samples for anti-tampering testing.

EMA Q+A

- Q: When will the CARB NOx reporting template be available?

- A: For Criteria pollutant reporting for ZEVs and ZEPs, we expect a draft template to be available the first week of May 2023 and the final version be available by 5/30/23

EMA Q+A

- Q: CARB AC (Air Conditioner) System review and approval takes longer time which impacts Vehicle EO. What can be done to improve the AC system review process?

- A: The overall processing time has significantly improved from 2022 MY to 2023 MY. We suggest that manufacturers, particularly those with large AC packages, submit AC packages before the main application. Also the entire application should be submitted at least 90 days before the Executive Order is requested.

EMA Q+A

- Q: If manufacturers have to upload Transmission & Axle file, can we have the ability to see what is submitted and edit file names and family names?

- A: The filename is based on the metadata. The manufacturer can change the metadata if the workflow is in the “NAFF” or “info-needed” states. For CARB’s e-file system, the files are visible to the manufacturer after submission. We suggest contacting your certification representative if changes to the filename are needed.

Questions