

# Zero-Emission Powertrain Certification (ZEP Cert)

4th Public Workshop  
El Monte, CA  
July 25, 2018

**Meeting materials available at:**

<https://ww2.arb.ca.gov/our-work/programs/zero-emission-powertrain-certification>

**Call-in Number:** 1 (877)-951-7311

**International Number:** 1 (203)-607-0666

**Passcode:** 3187871

**GoToMeeting:** <https://attendee.gotowebinar.com/register/2062147644347345411>

# Agenda

- Changes since last workshop
- Vehicle Certification
- Powertrain Certification
- Next Steps
- Regulatory Language Discussion

# Changes Since Last Workshop

- Alternative Process in HD Phase 2 GHG
  - Excludes ZE vehicle conversions
  - Excludes off-road powertrains
  - Considering making ZEP Cert optional
- Changed communications requirement
- Removal of towing and in-use testing requirements

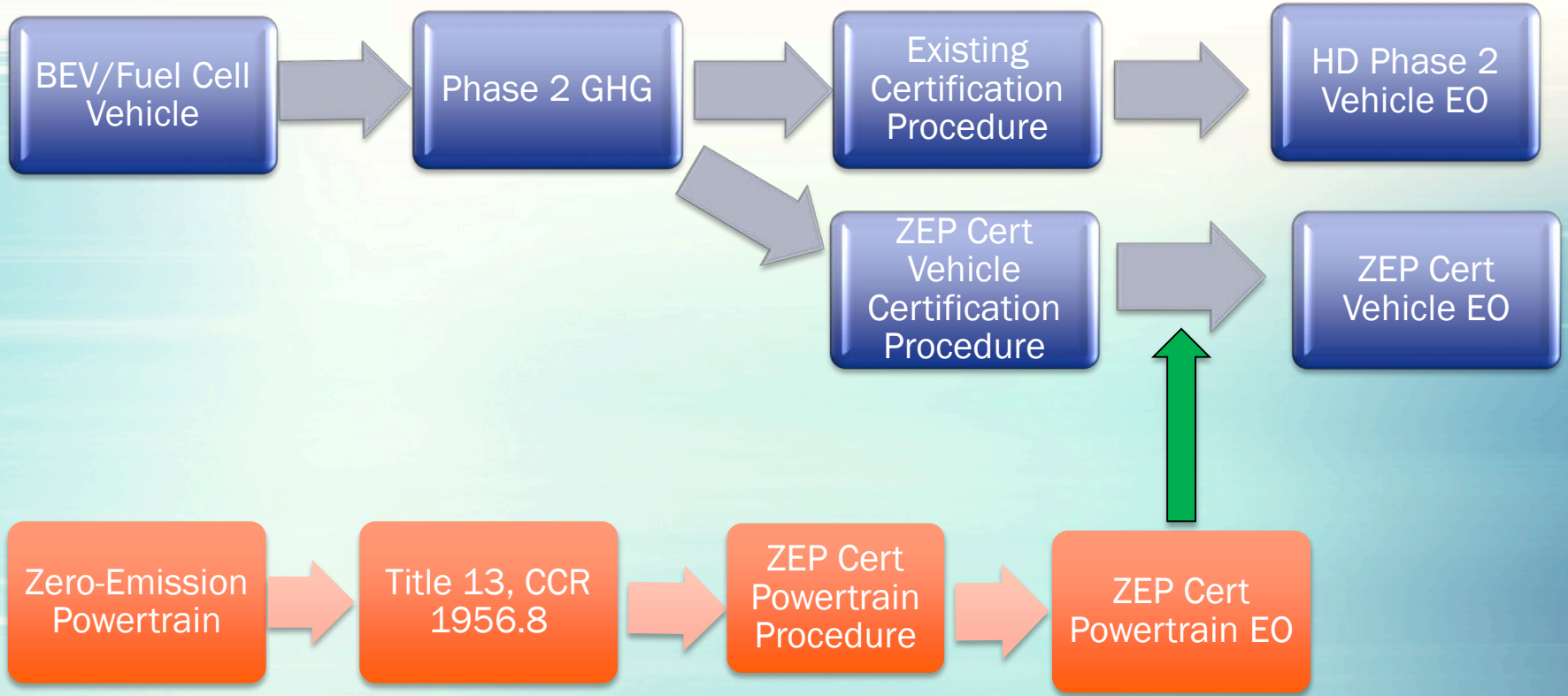
# Zero-Emission Powertrain Certification

## Conceptual ZEP Cert Framework

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# “ZEP Cert” Process (Draft Proposal)



A blue-bordered box containing the text "Vehicle Certification" in a bold, sans-serif font, tilted at an angle.

## Vehicle Certification

# Vehicle Certification Topics

- System Monitoring and Diagnostics
- Service and Repair
- Disclosure Statement
- Warranty and Reporting

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# System Monitoring and Diagnostics (Draft Proposal)

- Required Communications: Must be capable of communicating with scan tool meeting SAE J1978 specifications or J1939 network
- Specific parameters to be communicated through the scan tool: battery voltage, battery temperature, fault codes, remaining usable capacity of battery



## Service and Repair (Draft Proposal)

- Must have a service/dealer-level technical repair manual for the vehicle and provide to CARB
- Must provide updates and technical service bulletins to CARB
- Must provide dealer-level diagnostic software to CARB
- Make available to third-party repair facilities at reasonable cost (may require technical and/or safety training prerequisites)





# Disclosure Statement (Draft Proposal)

Disclosure statement to purchaser about considerations when buying a vehicle with a zero-emission powertrain

- Gradeability needs, acceleration requirements, max speed, range on work cycle, impacts on range from HVAC usage, and charging/fueling infrastructure.
- Warranty information and service/repair locations

Vehicle  
Certification

## Warranty and Reporting (Draft Proposal)

- Defects/workmanship for minimum of 3 years/50,000 miles
- Manufacturer shall specify warranted percentage of usable capacity
- Warranty reporting: Greater of 1% of CA sales or 10 valid claims for the same component failure
- Warranty recall: Greater of 4% of CA sales or 25 valid claims for the same component failure



# Powertrain Certification Topics

- Zero-Emission Powertrain Definition
- Certification Test Groups
- Certification Testing
- System Monitoring and Diagnostics
- Warranty and Reporting

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# ZE Powertrain Definition (Draft Proposal)



“Zero-Emission Powertrain” includes:

- Electric motor
- System controller
- Generator
- On-board charger
- Battery management and thermal management system
- Energy storage system (batteries, capacitors, and flywheels)
- Interface to tractive mechanical power or power to a PTO system

# Certification Test Group (Draft Proposal)



- All powertrains in a test group shall contain same battery characteristics (e.g., chemistry, packaging, cooling strategies, etc.)
- Battery scaling (e.g., additional modules to increase total pack capacity) would be allowed in same test group

# Certification Testing (Draft Proposal)



## Battery Capacity Test:

- SAE J1798 (module-level testing acceptable)
- Testing within pack design parameters
- Results from module testing scalable to different pack configurations

# System Monitoring and Diagnostics (Draft Proposal)



- Must describe monitoring systems:
  - Battery Pack Management
  - Inverter Thermal Management
  - Electric Motor/Generator
  - Charging System
  - Fuel Cell Stack
- Must describe on-board means for assessing battery state of health and usable capacity
- Must identify fault modes and store faults

# Warranty and Reporting (Draft Proposal)



- Defects/workmanship for minimum of 3 years/50,000 miles
- Warranty reporting: Greater of 1% of CA sales or 10 valid claims for the same component failure
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# Further Items for Consideration

- Mandatory vs. Optional
  - Mandatory: Tiered requirements based on sales volume, or
  - Optional process that could be mandated by future ZE programs, including the proposed ZE Airport Shuttle Bus regulation and incentive programs.
- Including a standardized charging compatibility standard (SAE J3068)

# Next Steps

- Proposed regulation released for 45-Day public comments: **October 2018**
- Board consideration: **December 2018**

# ZEP Cert Rulemaking Contacts

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