

# Hydrogen Infrastructure Challenges for Heavy Duty

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Fuel Cell Seminar, H2@Scale Meeting  
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# Adopted and Pending On-Road ZEV Regulations

## Innovative Clean Transit – fleet requirement

- Starting in 2023 – 25% of annual new bus purchase must be ZEBs (large TAs), 100% by 2029 (all TAs)
- ZEB Roll-Out Plans due June 2020 for large TAs, June 2023 for small
- Early purchase counts toward future compliance
- <https://arb.ca.gov/msprog/ict/ict.htm>



## Zero-Emission Airport Shuttle – fleet requirement

- Phased in fleet turn-over beginning in 2027 (33%)
- Full implementation in 2035
- 2022- Annual fleet reporting
- <https://ww2.arb.ca.gov/our-work/programs/zero-emission-airport-shuttle>

## Zero-Emission Powertrain Certification – manufacturer requirement

- Required for medium and heavy duty vehicles model year 2026 and later
- Support advanced-technology measures and ensure performance and reliability
- <https://ww2.arb.ca.gov/our-work/programs/zero-emission-powertrain-certification>



## Advanced Clean Trucks (Pending) - manufacturer requirement

- Manufacturer ZE truck sales requirement for 2024-2030 MY
- Large companies and fleets must report on vehicle operations and trucking service contracts
- Board hearing December 12-13, 2019, final vote in spring 2020
- <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>

# CARB Incentive Programs

- Low Carbon Transportation

- Demonstration and Pilot Projects: \$362M awarded since FY 2014-15
  - Includes infrastructure when matched with vehicles and equipment
  - \$20M in FY2019-20 budget for drayage pilot
- Voucher programs – include infrastructure enhancements with vehicle/equipment vouchers



- Volkswagen Settlement – Appx D: Environmental Mitigation Trust

- \$5M each for light-duty charging and hydrogen infrastructure



- Community Air Protection Program

- Community guided program - \$740M appropriated since 2017
- Fuel cell technology and hydrogen infrastructure eligible for competitive funding

- Low Carbon Fuel Standard

- Earn LCFS credits for hydrogen fuel dispensed
- Greater value with low carbon intensity hydrogen



# California Energy Commission

- Fuel Cell Demonstrations in Rail and Marine Solicitation - \$6.6M
  - Scoping workshop held October 17 <https://www.energy.ca.gov/event/workshop/2019-10/staff-workshop-identify-research-needs-and-opportunities-demonstrating-fuel>
  - Specifically targeting hydrogen fuel cell demonstrations for rail and commercial harbor craft at California ports.
  - Targeting early 2020 release date
  - Contact: Peter.Chen@energy.ca.gov
- MD/HD ZEV Infrastructure Solicitation - \$47.5M
  - Includes funding for infrastructure for both MD/HD battery-electric and hydrogen fuel cell vehicles
  - Workshop held October 25 to discuss solicitation concepts:
    1. Supporting charging and/or hydrogen infrastructure for MD/HD freight demonstration
    2. Capital expense assistance for infrastructure deployment for transit and fleets
    3. ZEV blueprints for MD/HDV infrastructure,
    4. Support hydrogen infrastructure for rail and marine application
    5. Miscellaneous/innovative applications.
  - <https://www.energy.ca.gov/event/workshop/2019-10/staff-workshop-medium-and-heavy-duty-zero-emission-vehicles-and>
- Contacts: Marc.Perry@energy.ca.gov and Esther.Odufuwa@energy.ca.gov