

Successfully Transitioning the Commercial Vehicle Industry to Zero Emission

SAE Government/Industry Meeting
Washington, D.C.

January 18, 2024

Truck & Engine Manufacturers Association (EMA)

- Heavy-duty on-highway manufacturers:

Cummins

PACCAR

Navistar

Stellantis

Blue Bird

Daimler

Volvo

GM

Hino

Isuzu

- EMA member companies are at the forefront of developing zero-emission vehicles (ZEV) and powertrains
- Investing billions of dollars to develop and bring to market battery-electric vehicles (BEV), fuel-cell electric vehicles (FCEV), and hydrogen-fueled internal combustion engines (H2ICE)
- Providing technical guidance to dealers and fleets on successfully deploying ZEVs.
- Investing and advocating to assist in developing the infrastructures needed to power heavy-duty (H-D) commercial ZEVs

H-D ZEVs Unique Requirements

- Commercial vehicle fleets are businesses that invest capital to earn a positive financial return
 - Vehicles must be able to complete the necessary work -- profitably
- Market requires manufacturers to produce a broad range of highly diverse and customized products
- Final stage manufacturers must develop bodies and truck equipment suitable for zero-emission chassis
- Unique infrastructures require:
 - Locations at terminals, depots, and truck stops
 - Significant space and pull-through capability
 - Rapid delivery of a great deal of energy
 - Upgrades to the electricity grid
 - Hydrogen fueling for FCEV and H2ICE

Regulatory Landscape

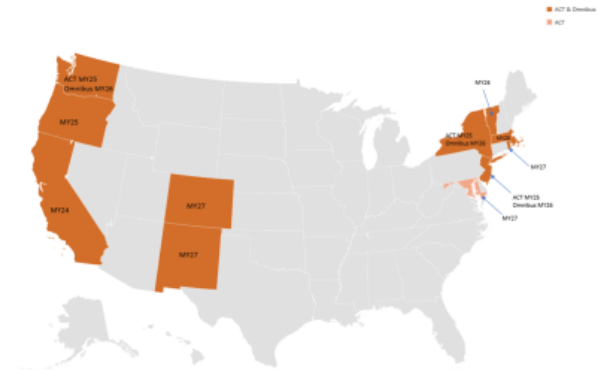
- **EPA - Nationwide**

- GHG Phase 2 – effective 2021, 2024, 2027
- Ultra-Low NO_x – effective 2027
- GHG Phase 3 – effective 2027(?)



- **CARB – California + Opt-In States**

- Omnibus Low-NO_x – effective 2024, 2027, 2031
 - Opt-in: CO, MA, NJ, NM, NY, OR, RI, VT, WA
- Advanced Clean Trucks (ACT) – effective 2024
 - Opt-in: CO, MD, MA, NJ, NM, NY, OR, RI, VT, WA
- Advanced Clean Fleets (ACF) – effective 2024
 - 100% ZEV sales mandate in 2036
 - Opt-in: ?
- EPA has not yet granted CARB waivers



Successful H-D Rule Elements

- Technological feasibility
- Sufficient leadtime
- Regulatory certainty and stability
- Enabling conditions mandated (*e.g.*, ULSD, DEF)
- Nationwide alignment between EPA and CARB
- Manufacturers' ability to provide commercial vehicles and powertrains that meet their customers' needs
- Historically, H-D rules have been exceptionally successful
 - Reducing pollutant emissions to near zero levels
 - Achieving significant greenhouse gas reductions

H-D ZEV Requirements

- ZEVs must be able to complete work of commercial fleets
- ZEVs must be profitable for fleets to purchase and operate
 - Incentives required until cost effective
- Sufficient infrastructures must be available
 - Public and private
 - Suitable for diverse products
 - Electricity charging and hydrogen fueling
 - Operational before a fleet takes delivery of ZEV
- Unlike previous H-D rules, infrastructure development is not required by ZEV sales mandates
- Holistic approach is needed to develop the H-D ZEV market
 - Vehicles available
 - Fleets' ability to successfully operate vehicles
 - Infrastructures available to recharge and refuel



H-D ZEV Regulations

- GHG Phase 3 and ACT rules will require manufacturers to sell a minimum percentage of ZEVs to comply
 - Manufacturers will sell as many ZEVs as they can
 - However, the rules do not mandate that fleets buy ZEVs
- If the market will not absorb enough ZEVs for manufacturers to meet the mandated percentages
 - Manufacturers will be forced to reduce traditional vehicle sales to meet ZEV adoption percentages
 - Fleets will retain existing traditional vehicles longer
 - Potential unintended consequences:
 - Reduced manufacturing employment
 - Increase freight costs
 - Increased CO₂ emissions from old vehicles
 - Increased NO_x emissions from old vehicles

GHG Phase 3 Next Steps

- Final rule is under review by White House OMB
 - Expected publication in March 2024
 - EMA will continue advocating for:
 - Achievable ZEV adoption percentages
 - Leadtime for the necessary infrastructures to develop
 - Review of infrastructure development in time to adjust requirements – up or down
- Manufacturers will continue advancing H-D ZEVs by:
 - Developing and bringing to market a broad range of products to meet the needs of commercial vehicle fleets
 - Advising dealers and fleets on successfully deploying ZEVs
 - Assisting and advocating to assist in developing the infrastructures needed to power H-D ZEVs
 - Advocating for necessary electricity grid upgrades

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