

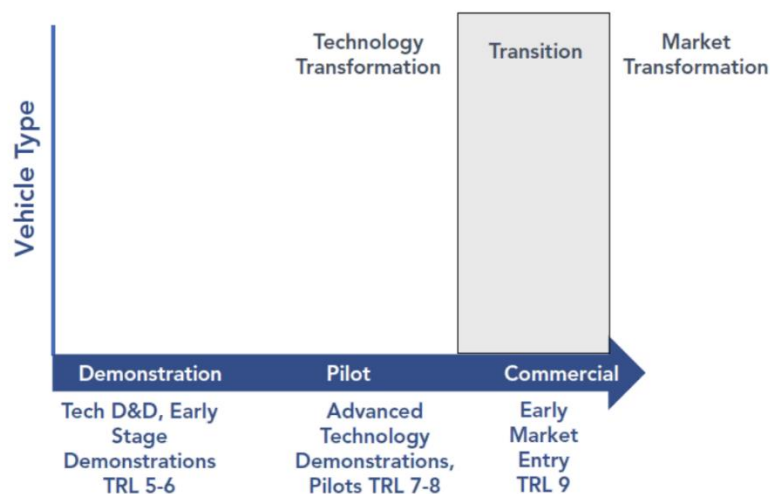
CARB Long-Term Heavy-Duty Investment Strategy

Cory Shumaker, Development Specialist

On June 16, the California Air Resources Board (CARB) held a teleconference workgroup meeting on the Fiscal Year (FY) 2020-21 Long-Term Heavy-Duty Investment Strategy. The Strategy, built upon previous years' work, is required under SB 1403, the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program (Lara, Chapter 370, Statutes of 2018), and includes an update on school buses throughout the State. This document will be incorporated into the upcoming FY 2020-21 Funding Plan for Clean Transportation Incentives. The strategy is a road map for low carbon transportation funding for heavy duty vehicles and equipment. The next 2020-21 Long-Term Heavy-Duty Investment Strategy workgroup will be held in July.

During the workshop, CALSTART presented their market readiness indicators consisting of 4 main categories:

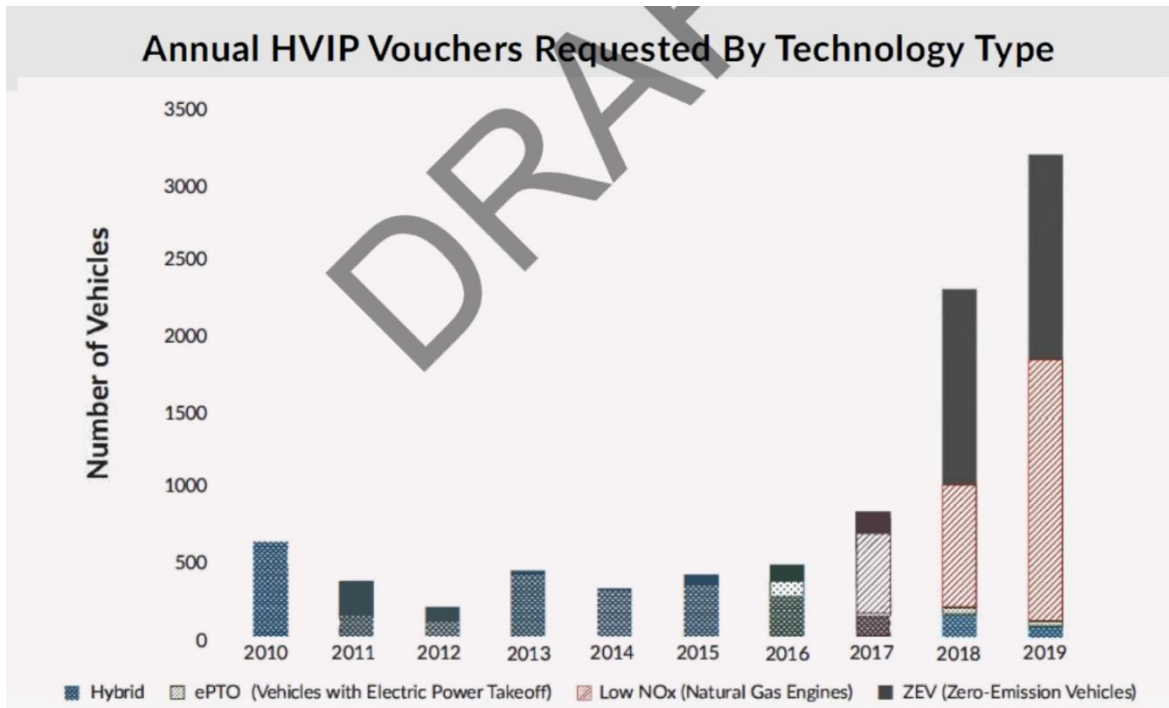
1. Market Acceptance Indicators:
 - a. Significant volumes as a % of market volume
 - b. Participation by large OEMs
 - c. Mass production and integration into OEM manufacturing lines
 - d. End user confidence
 - e. Established secondary market and parts/service network measured by number of used vehicles sold and comparable residual value.
 - f. Comment: One criterion could also be private investment in infrastructure
 - g. Comment: Warranties and supply chain could be added.
2. Technology Performance Indicators:
 - a. Compatible with significant number of duty cycles.
 - b. Operational benefits of new technology compared to conventional
 - c. Achieves cost-effective emissions reductions by dollars per ton of avoided emissions.
 - d. Provides opportunity for technology transfer to other applications
3. Barriers to Adoption
 - a. Supported by adequate infrastructure
 - b. Vehicle and infrastructure technology is standardized and unimpeded by code requirements
 - c. Technology supported by adequate statewide service network
4. Economic Factors
 - a. Achieves TCO with parity
 - b. Low incremental purchase cost compared to conventional alternative
 - c. Low indirect/replacement/transition costs from changing technology



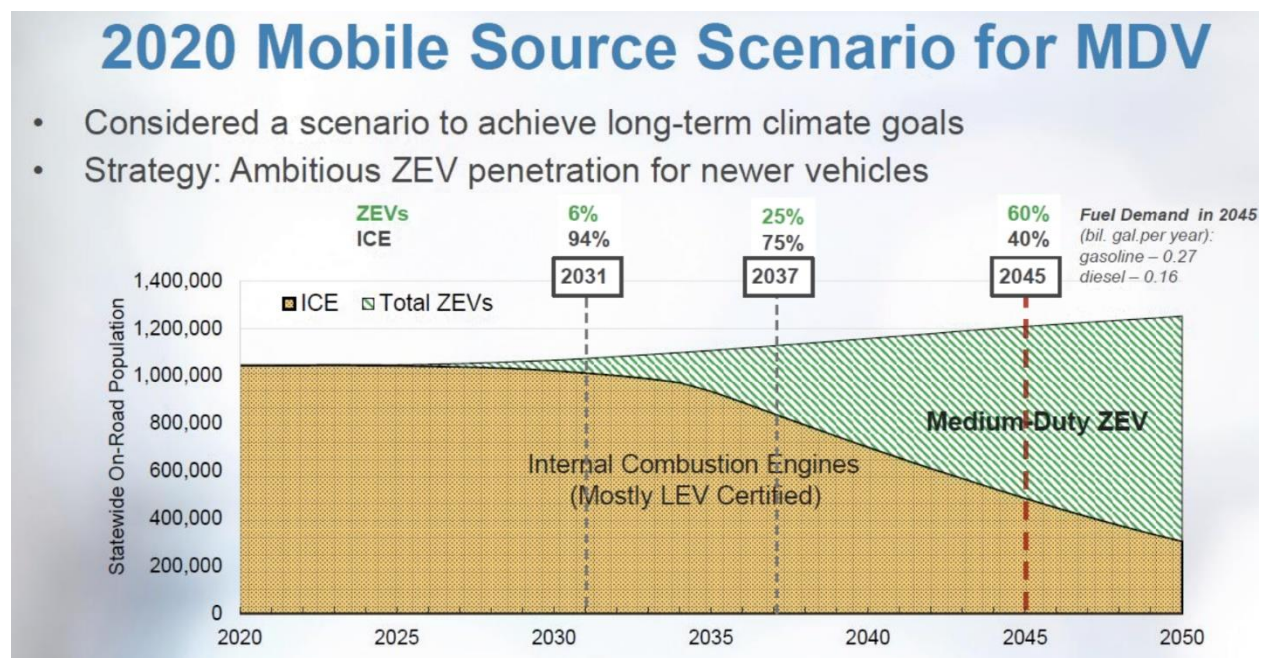
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Part of the Long-Term Investment Strategy is HVIP. The following are HVIP Success Metrics: Public Health, the Green Economy and Tech Status.



Towards the end of the workshop the 2020 Mobile Source Strategy was presented on Heavy-Duty and Medium Duty. This strategy is released every 5 years. This year a draft will be made public in the fall with a CARB Board approval pending in December. Medium duty vehicles are responsible for 7% of statewide mobile source NOx and 5% of statewide mobile source GHG emissions. Medium-duty strategies include: ZEV technology transformation starting in 2024, and enhanced LEV regulations through Advanced Clean Cars 2.0.



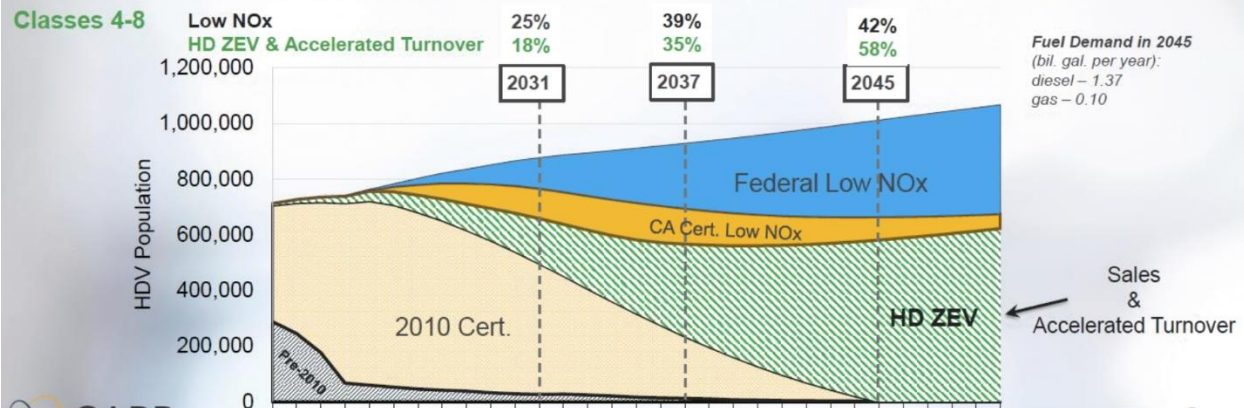
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On-road heavy duty sector is responsible for 33% of statewide NOx emissions and 16% of statewide mobile source emissions. Heavy-duty strategies include: ZEV technology penetration starting in 2024 and cleaner diesel technology; Low NOx diesel starts in 2024.

Meeting Midterm Goals

- To achieve NOx reduction needed to meet the air quality goals over the next two decades while also charting a course to achieve longer-term climate change goals
- Ambitious ZEV penetration for newer vehicles combined with accelerated turnover of older vehicles (e.g., 2010-certified)



Meeting Long Term Goals

- To achieve NOx reduction needed to meet near term air quality goals, and also maximize the number zero-emission trucks for longer term climate goals
- A hyper ambitious ZEV penetration combined with accelerated turnover of older vehicles

