Consumption Trends and Implications for a Decarbonized Logistics System

Session 4. Sustainable Freight – Achieving California’s ZEV Truck Transition Targets

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Are we on track to decarbonize freight?

...we are playing catch up, we can’t act fast enough
Decarbonizing and Mitigating Local Impacts

Where we hope to get to...

The Good!
Environmental Impacts - Freight

- Availability & introduction of ZEVs
  - Battery electric
  - Fuel Cell
- Fuel & emission standards
- Incentives and programs

- Estimates for Southern California
  - CSTDM flows
  - EMFAC rates

Decarbonization Scenario (Reductions from 2012)

Previous Policies and Strategies (Pre-ACT) (Reductions from 2012)
**ZEV Technology Readiness**

**Parcel Deliveries**
- **TCO**
- Technical feasibility
- Incentives (purchase & LCFS)

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Potential Efforts at POLA/LB

- Transition 17,000+ trucks by 2035
- Incentives will be needed
- Emissions reduction:
  - 10.3 million metric tons CO2
  - ~50% PM
  - ~95% NOx & SOx

Jaller and Youssefzadeh (2021). Rewards Program to Electrify Short-Haul Drayage Trucks
Where we are...

Reality Check
Diesel Dominate the Market

Survey to carriers in 2019

Jaller et al. 2020. Fostering the Use of Zero and Near Zero Emission Vehicles in Freight Operations
Various Vocations & Requirements

• Classes 3 – 7
  • >90% travel less than 150 miles per day

• Class 8
  • <60% travel less than 150 miles per day
  • ~20% travel more than 500 miles per day

Source: Estimated by the team from CA-VIUS Data
I-5 Freight ZERO Pilot Demo
Demonstrating New Freight Technologies

No ZEV available to perform these movements
Only available
• Diesel
• Natural
Significant Emissions Reductions can be Costly and Non-efficient

Reducing emissions by 60% increases:
- Replenishment costs by 1.52%,
- Transportation costs by 160.97%.

Reducing remaining 40% of emissions, increases:
- Replenishment costs by 5.43%
- Transportation by 232.71%.

Each Column: Number / Use rate

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Consumption Trends...

Threats!
Consumption Trends
Hard to Keep Up

Net carbon emissions: +19%
Carbon intensity: -16%
Remarks!
Discussion

• We have a solid set of policies driving:
  • Innovation, adoption, and use (e.g., ACT, ACF)

• We will continue to need support (e.g., incentives) for:
  • Capital investments on vehicle technologies & infrastructure

• Hopefully, we have a fast ramp-up…we need it
  • Though, we are still waiting for the commercialization and market readiness of various technologies

• We need to start looking at the demand side of freight, the one that drives the system
  • We will always be playing catch up, if the measures are not able to reduce impacts faster than net emissions
Questions?

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