Medium and Heavy Duty Vehicle Electrification: The role of investments

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MHD Electrification for Clean Air

Los Angeles, April 2020, rush hour. Source: Chava Sanchez/LAist)
Ozone Still High Due to MHDVs

Source: Daniel Wood/NPR, with data from Environmental Protection Agency Air Quality System and AirNow
Challenges to Electrification

- Upfront cost of electric MHDVs can be up to 2.5x more than diesel counterparts
- Charging stations can cost up to $150,000 (350kW)
- Cost of charging can be as high as diesel
- Potential for large social/system costs associated with charging

- Policies needed to accelerate adoption of these vehicles while maximizing their benefit
- Large opportunity for Transportation & Climate Initiative (TCI) revenues to support this effort
Approaches and Solutions to Electrification Challenges/Opportunities

1. Focus on equitable outcomes
2. Reduce cost of charging infrastructure
3. Upfront vehicle purchase incentives
4. Enabling vehicle-grid integration
5. Standards and mandates
6. Enhanced marketing, education and outreach
1. Provisions for Front-Line Communities

• Equitable deployment of MHD EVs across all communities

• Existing local policies:
  – NYS Beneficiary Mitigation Plan (VW Funds); prioritize funding towards benefits in EJ communities
  – Congestion pricing in NYC used to electrify buses

• TCI revenues: target revenues towards investments which will first improve outcomes in front-line communities (e.g., replace diesel vehicles by order of polluted area)
2. Charging Infrastructure

- Massive upfront cost of charging infrastructure is a barrier to EV adoption

- Existing local policies:
  - New York State Tax Credit for Public and Workplace Charging (commercial, $5k)
  - Charge Ready NY (Level 2, $4k rebate); NYSERDA

- TCI revenues could be used to subsidize purchase and installation of infrastructure, targeted first toward EJ communities
3. Purchase Incentives

• Upfront cost subsidies

• Existing local policies:
  – New York Truck Voucher Incentive Program (NYTVIP); NSERDA administers, money from NYSDOT and NYSDEC.
    • For fleets. Up to $385k for transit buses.
  – New York City Clean Trucks Program (scrappage/replacement); NYCDOT.
    • For Industrial Business Zones. Up to $185k for class 8.

• TCI revenues could be used to subsidize upfront purchase, with efforts to increase adoption in EJ communities
4. Vehicle-Grid Integration

Source: Eric Cutter, Energy & Environmental Economics, EPRI
4. Vehicle-Grid Integration

• Managed charging software

• Wholesale market participation; FERC 841-NYISO 2018 rules submitted

• TCI Revenues:
  – Subsidize purchase of or create incentives to use managed charging software, especially in EJ communities
  – Conduct pilots to test out V2G capabilities
5. Standards & Mandates

• Create some certainty in market for manufacturers, bring economies of scale

• May produce unexpected outcomes, leakage

• Local policies:
  – Advanced Clean Truck Rule, CA (60% of new MHDVs by 2035)
  – Multi-State MHD ZEV MOU (15 states + DC, new ZEV target- 30%/2030, 100%/2050)

• TCI revenues: Invest in R&D to ensure lower cost compliance with mandates
6. Enhanced Marketing, Education and Outreach

• How widely understood is the benefit of electrification?

• Range anxiety, performance concerns, etc. still exist, even if NPV>0

• Local policies:
  – Charge NY (NYSERDA)

• TCI revenues:
  – Can be passed through to cities, local communities groups/advocates, utilities to support MEO
  – Target EJ communities, multiple languages
Conclusion

• The clean energy transformation of this sector presents many challenges and opportunities
  – Smart policies and thoughtful engagement can ensure we achieve the best outcomes

• Research can help identify the policies which will have the largest benefit and help accelerate MHD EV adoption

• Engagement with community groups is key for success in this space