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National Grid

Transitioning to the Future Grid:
Exploring Strategies to Optimize the Grid Transition

Advanced Energy Group (AEG)
EV Fleet Taskforce

May 23, 2024

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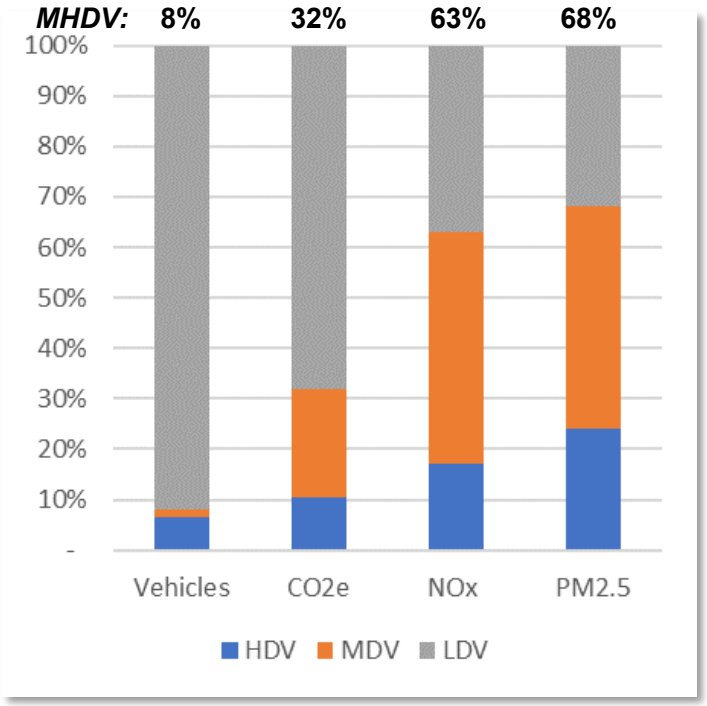
Context >> Importance of Medium/Heavy Duty Vehicle (MHDV) Electrification

Transportation causes >45% of GHG emissions and is a leading cause of air pollution in the Northeast. While MHDVs only account for ~8% of vehicles, they account for >30% of CO_2 and >60% of air pollutants.

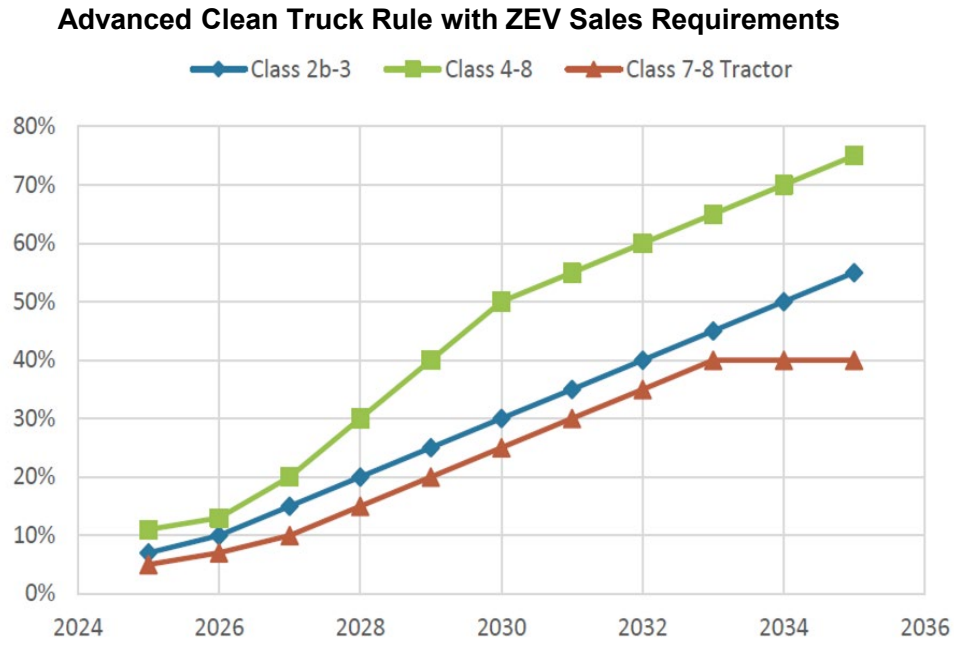
MHDV % of Vehicles & Emissions (US)[1]



Electrifying trucks results in:

- >8 x CO_2 Reduction*
- >30 x $PM_{2.5}$ Reduction*

Aggressive Clean Transportation Goals[2]



Advanced Clean Truck Rule 2035:

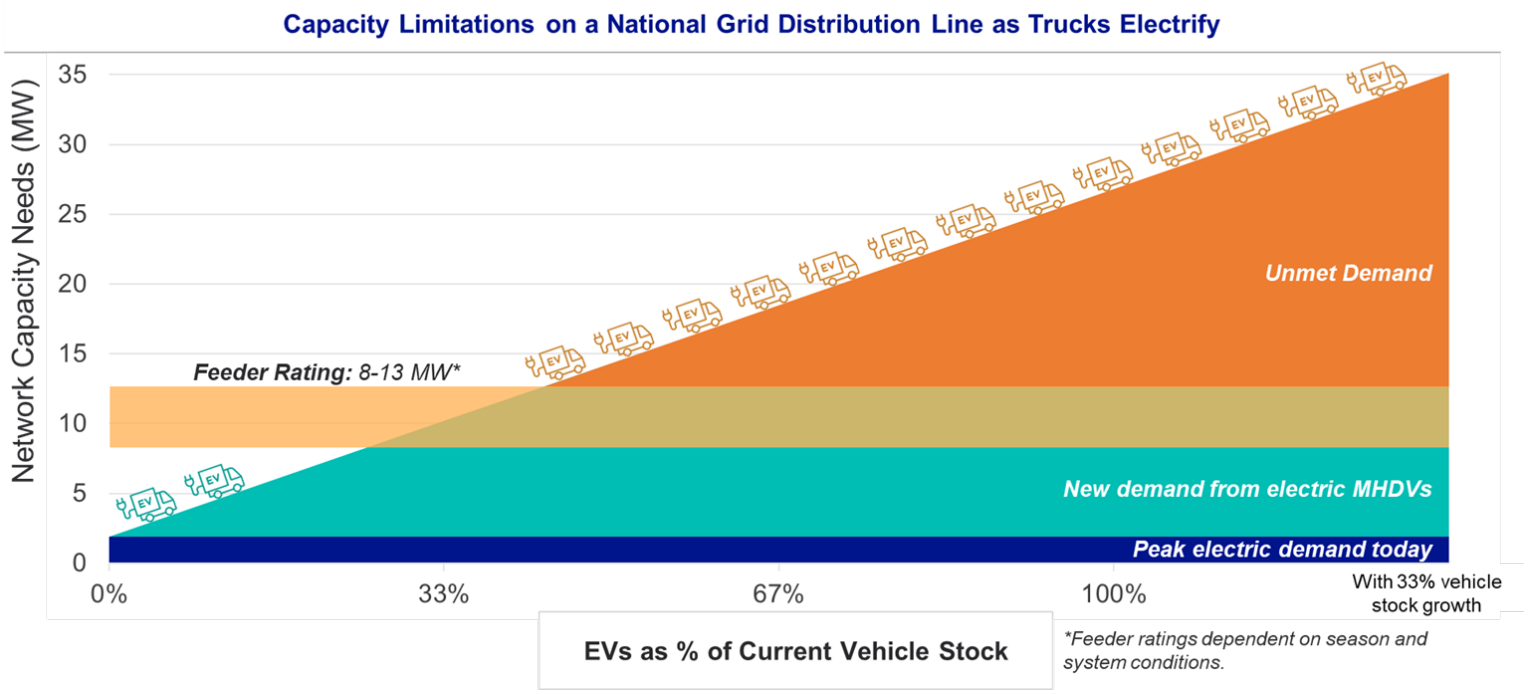
- Class 2b-3: 55% of new sales
- Class 4-8: 75% of new sales
- Class 7-8: 40% of new sales

Sources: 1) CALSTART, The Advanced Technology Truck Index: A US ZET Inventory Report, January 2022.
2) MA CECP for 2025 and 2030 **https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download**.

AEG Challenge >> Problem Statement

MHDV charging is expected to introduce substantial new "spot loads" on the grid, but utilities don't have visibility early enough to design and deploy the solution to provide sufficient power.

- **Current Process –** Utilities require a level of certainty to prudently build new infrastructure to address spot loads and therefore only begin work after they receive an application or load letter from the customer.
- **Time Line Misalignment –** Building grid infrastructure takes significantly longer than building EV infrastructure. Therefore, utilities would need to forecast where additional power will be needed and begin the process before receiving a load letter or application from the customer.
- **Forecasting –** Forecasting the exact location, timing, magnitude and load curve is a new challenge.



AEG Challenge >> Task Force Overview

Under the current process, utilities don't have visibility into future EV spot loads early enough to design and deploy the solution to provide sufficient power.

- Critical Obstacle: An approved, equitable forecasting methodology that enables anticipatory planning for EV spot loads which is supported by comprehensive energy legislation.
- 90 day goal: Stakeholder roundtable connected to an industrial business zone located within an EJ community with a high prevalence of MHDV fleets to align on criteria for an utility EV forecasting methodology that would expedite decarbonization in a financially feasible and equitable manner.
- 12 month goal: Stakeholder report regarding the need for an equitable MHDV forecasting methodology with success criteria submitted to DPU to support its Grid Modernization efforts.
- Core Taskforce Members:

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TRUCKING ASSOCIATION OF MASSACHUSETTS TAM

MASS MOBILITY HUB

EVERSOURCE

AEG Challenge >> Task Force Objective, Scope, & Approach

The Objective of this task force is to gain consensus on a process to identify and prioritize industrial fleet depot sites to proactively design and build T&D upgrades to support EV charging load.

Task Force Scope and Approach

	Develop Initial Process	Identify Representative Site	Define Categories	Define Load Calculation Approach	Define prioritization criteria	Convene Stakeholders	Refine Process and Gain Consensus
Activity	Create a strawman of the process to identify and prioritize no regrets sites See slide 5	Review initial study areas Select by: # of fleets # of vehicles charging load EJCs grid infrastructure Other	Type of Vehicle Operating Profile Charging method	Identify variables (e.g., miles travelled/day, battery size, Managed charging opportunity define assumptions for each archetype	Identify criteria (e.g., peak power, time to need, lead time required, DAC/EJC) Determine weighting for each criteria	Share info with fleets about EV trucks available today Validate info from fleets on existing number and type of trucks, operating profile etc. Validate assumptions for defining load	Refine initial process based on Stakeholder input at meeting Continue to share process and gain consensus from the industry and ultimately DPU
Date	January	February	March - May	March - May	March - May	May 30, 2024	June - November
Outcome/ Deliverable	Initial Process	Representative industrial site with multiple fleet depots	5-10 representative fleet types with similar charging needs	Approach for calculating load curves and power requirements over time for each fleet category	List of criteria and weighting	Summary of stakeholder input	Revised process