

**DOCKETED**

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<b>Project Title:</b>	Electricity and Natural Gas Demand Forecast
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<b>Document Title:</b>	Presentation - Medium and Heavy-Duty Vehicle and Fuel Forecast
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# Medium and Heavy-Duty Vehicle and Fuel Forecast

Transportation Energy Forecasting Unit

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# In This Presentation:

## 2021 Changes & Updates

- Truck classification informed by EMFAC 2021 and Data One
- HVIP incentive scheme change
- Inputs and Assumptions
- Drayage Truck ZEV Shares
- Total of New Trucks Purchased
- ZEV, ICE stock forecasts
- Total Energy Use, Vehicle Miles





# MD-HD Stock Classification

DMV	EMFAC2021	Data One
VIN		VIN11
Weight Class	<b>Weight Class (4 &amp; 5 merged)</b>	Weight Class
Body Type (multiple types)	<ul style="list-style-type: none"><li>• <b>Delivery</b></li><li>• <b>Semi Tractor</b></li><li>• <b>Refuse</b></li><li>• <b>Dump</b></li><li>• <b>Other</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Bus</b></li><li>• <b>Van</b></li><li>• <b>Straight Truck</b></li><li>• <b>Semi Tractor</b></li><li>• <b>Passenger</b></li></ul>
<b>Fuel Type</b>	some fuels	some fuels
<b>County</b>	<b>County</b>	

**Red text:** data used to classify

**Bold text:** classes that trucks are mapped to



# HVIP Vehicle Incentive Vouchers

## Forecast Assumptions

- The CARB HVIP program has set flat rates by weight class for vehicle purchase vouchers
- ZEV drayage truck voucher at \$150,000, others lower
- Buses and trucks in same weight class get same amount
- Assumptions:
  - Flat incentive rates are continued through 2024
  - First, after 2024, the vouchers are reduced to 65% of the 2021 amount
  - Second, also after 2024, the voucher amount follows the trend in truck incremental purchase price



# Zero-Emission Truck (ZET) Forecast Case Inputs and Assumptions

	Low Case	Mid Case	High Case
CARB Regulations	Same as MID Case	Innovative Clean Transit, Advanced Clean Trucks, Airport Shuttle	Same as MID Case
Regional Regulations	Same as MID Case	Implicit for refuse trucks and urban transit buses	Same as MID Case
HVIP (all years)	Same as MID Case	2021 HVIP voucher amount a fixed amount for each class. Held constant to 2024. Thereafter trends with incremental truck price.	Same as MID Case
Hydrogen Price	NREL high price	NREL mid price	NREL low price
Electricity Rates	Commercial Rates, High	Commercial Rates, Mid	Commercial Rates, Low
BEV Truck Prices given battery pack price in 2035	BEV prices based on battery price declining to ~\$97/kilowatt hour (kWh)	BEV prices based on battery price declining to ~\$77/kWh	BEV prices based on battery price declining to ~\$58/kWh
Miles Per Gallon (conventional / alternative)	Same as MID Case	Mid / Mid	Same as MID Case
Range of Operations	Same as MID Case	No constraint on range, assumes available infrastructure with fast charging away from depot	Same as MID Case

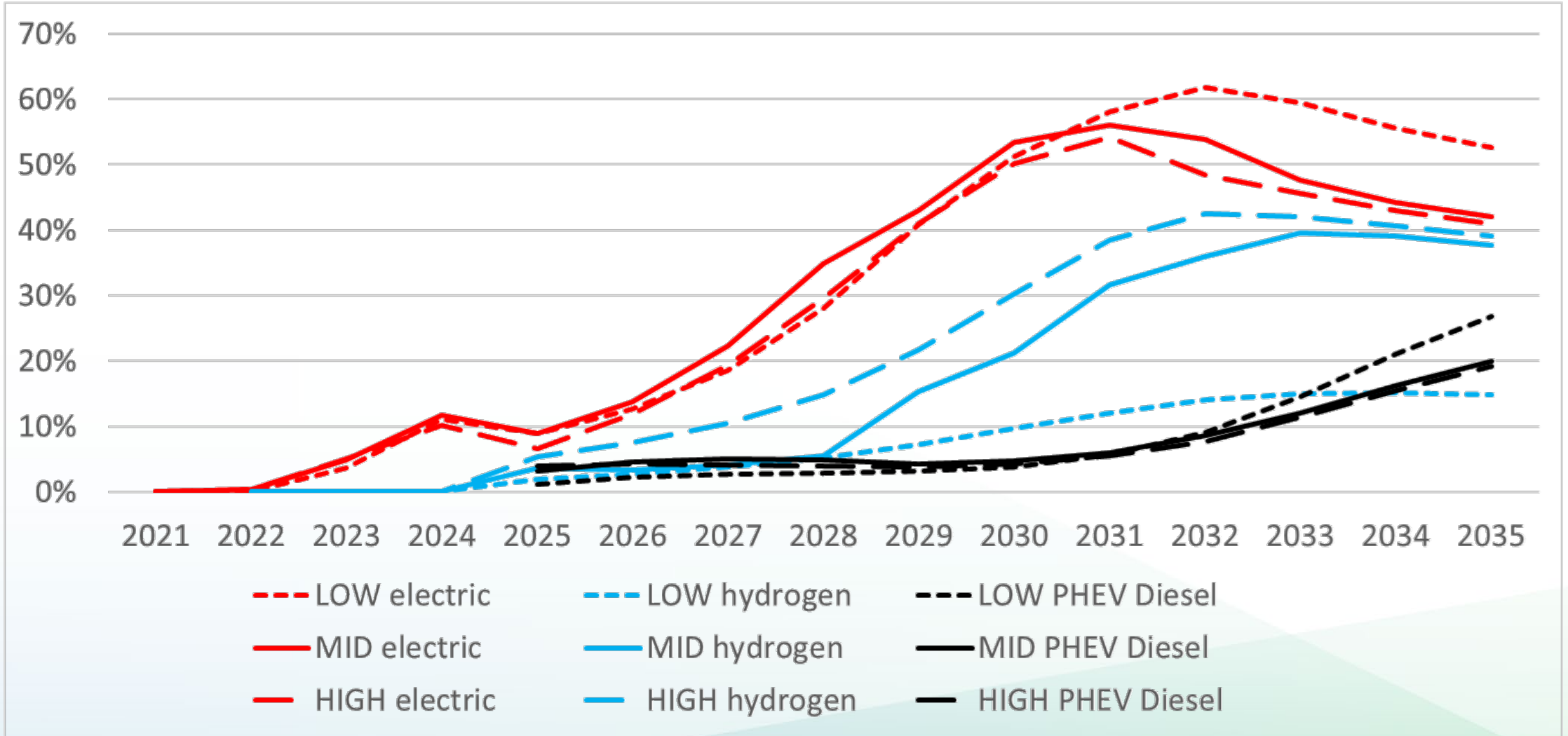


# Forecast Results

Medium- and Heavy-duty Vehicles



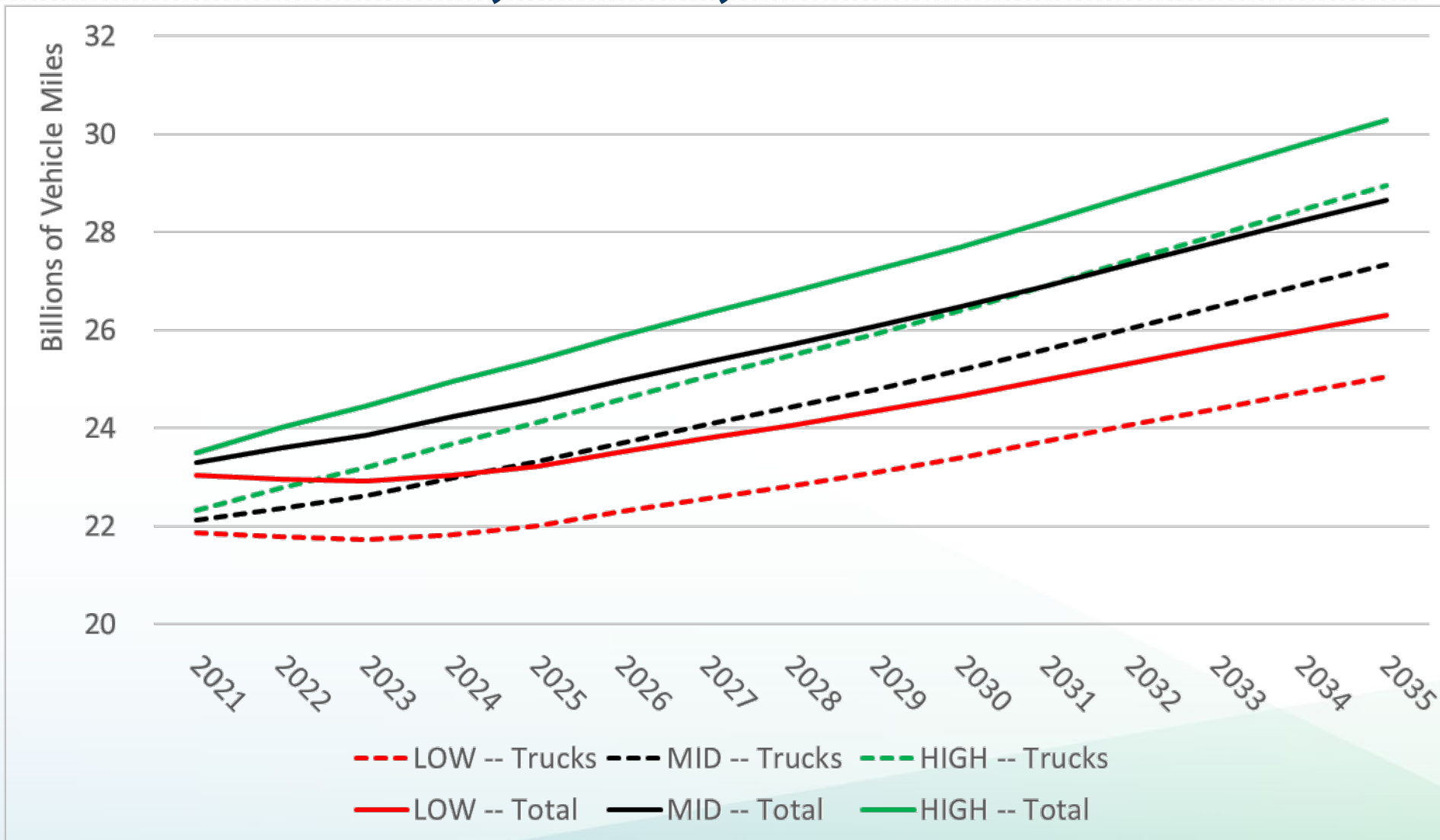
# Market Share for ZEV Port Drayage Semi Tractors







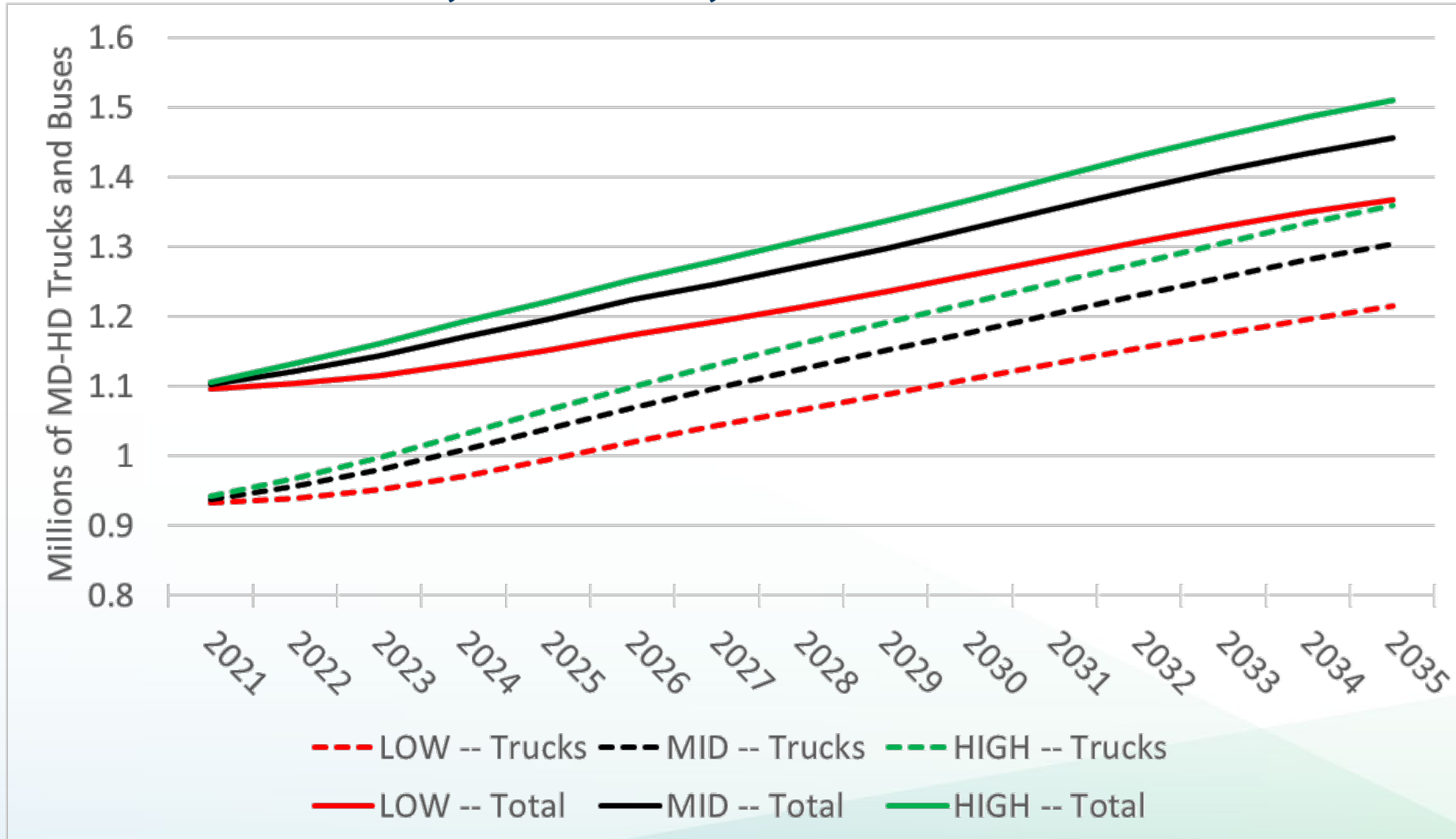
# Truck and Total MD-HD Vehicle Miles Trucks, Buses, and Motorhomes



Source: Energy Commission Staff



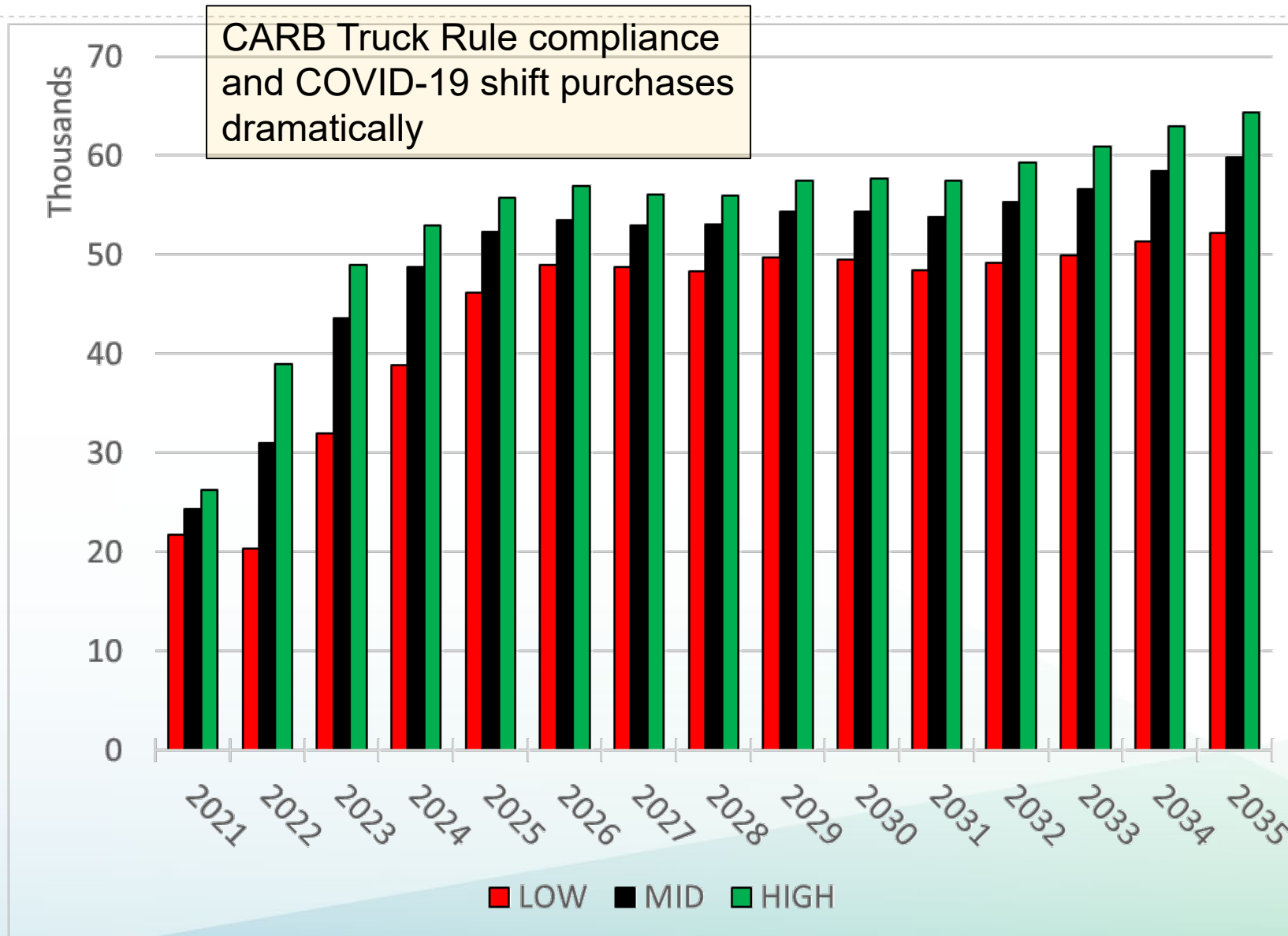
# MD-HD Stock Forecast Trucks, Buses, and Motorhomes



Source: Energy Commission Staff

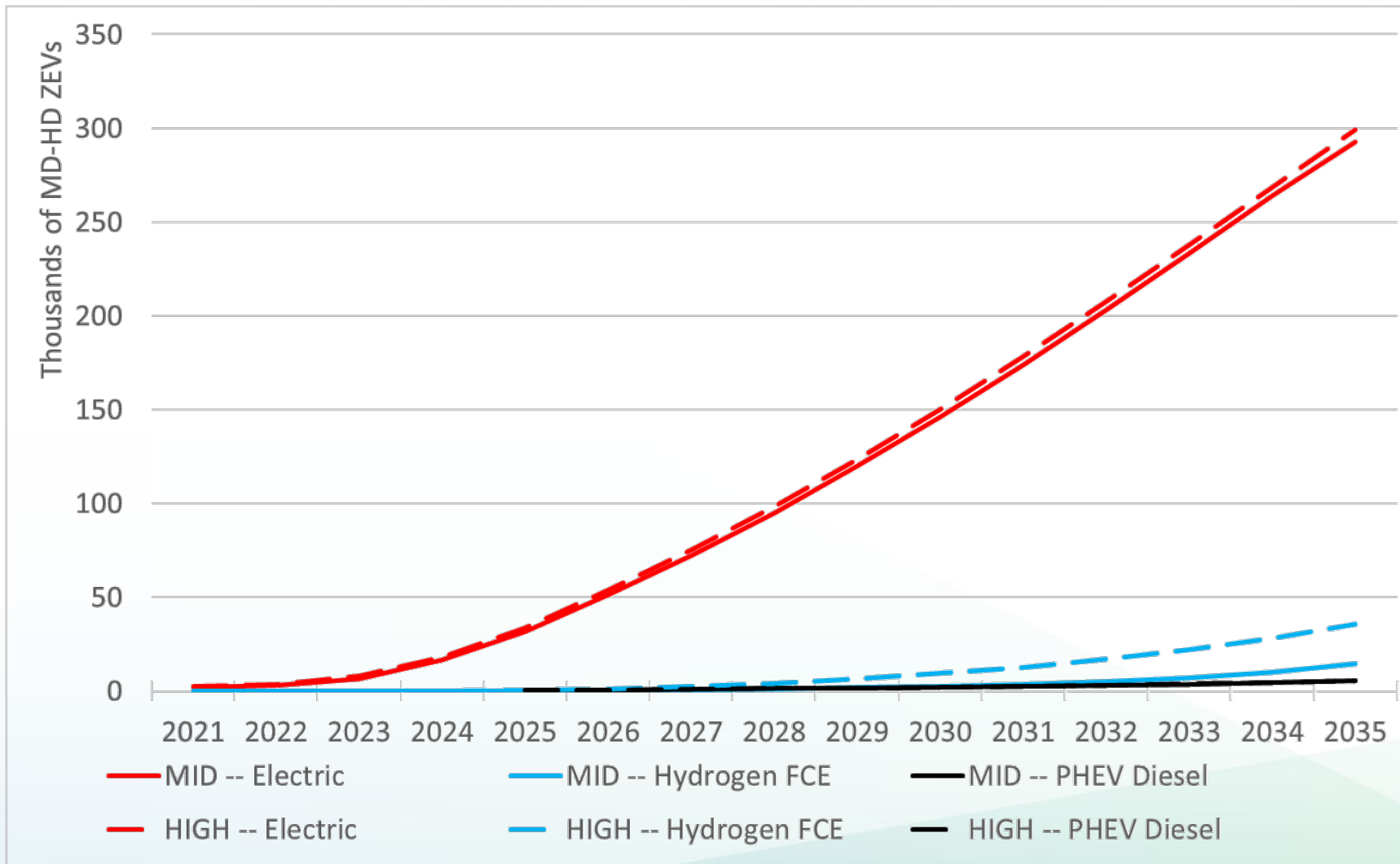


# New MD-HD Trucks Purchased





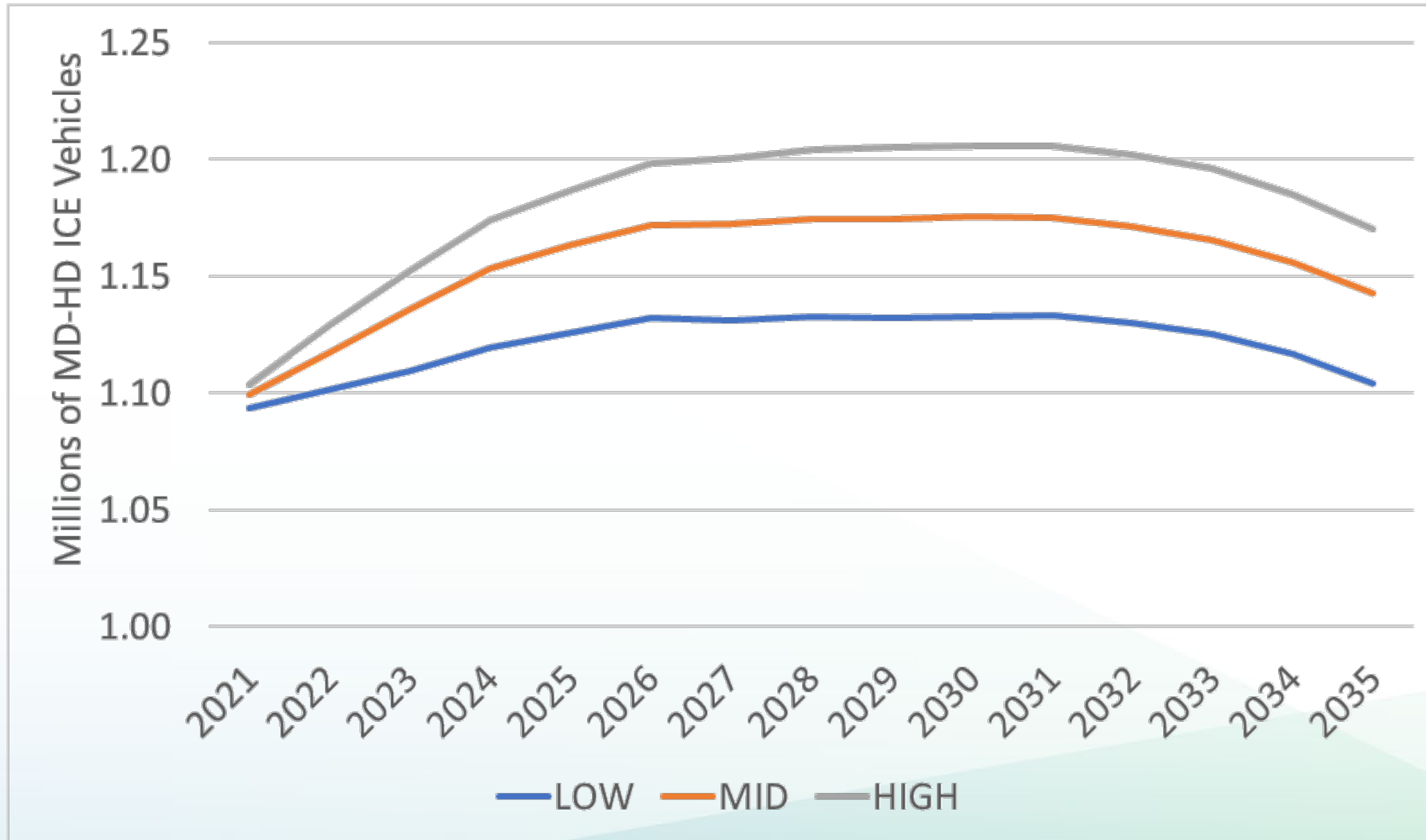
# Zero-emission Truck and Bus Stock



Source: Energy Commission Staff

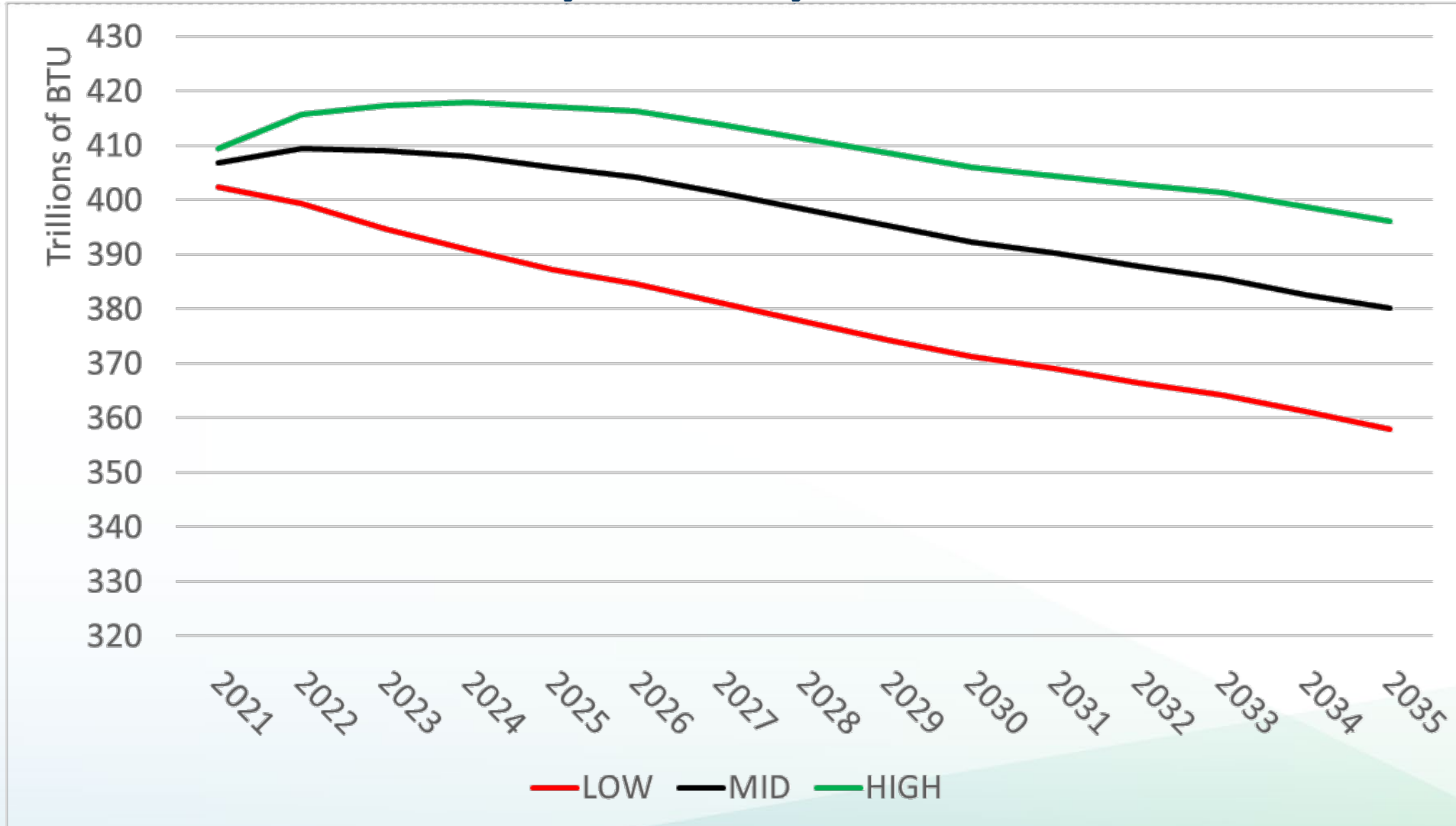


# Internal Combustion MD-HD Stock Trucks, Buses, Motorhomes





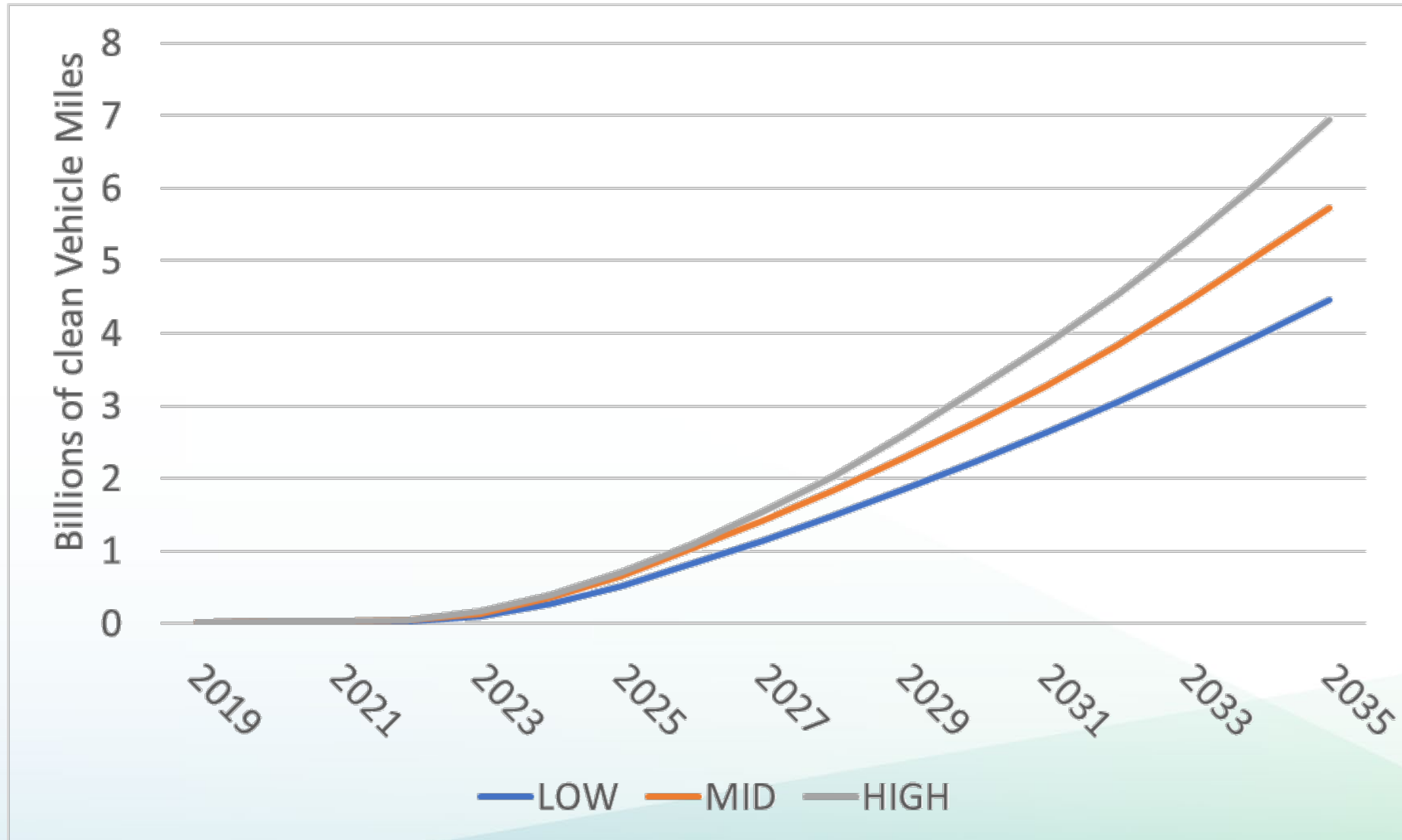
# MD-HD Energy Consumption (Trillion Btu) Trucks, Buses, Motorhomes



Source: Energy Commission Staff



# Clean MD-HD Vehicle Miles





**Thank You!**

