Planning for Grid Readiness: New Jersey's Electric Vehicle Forecast

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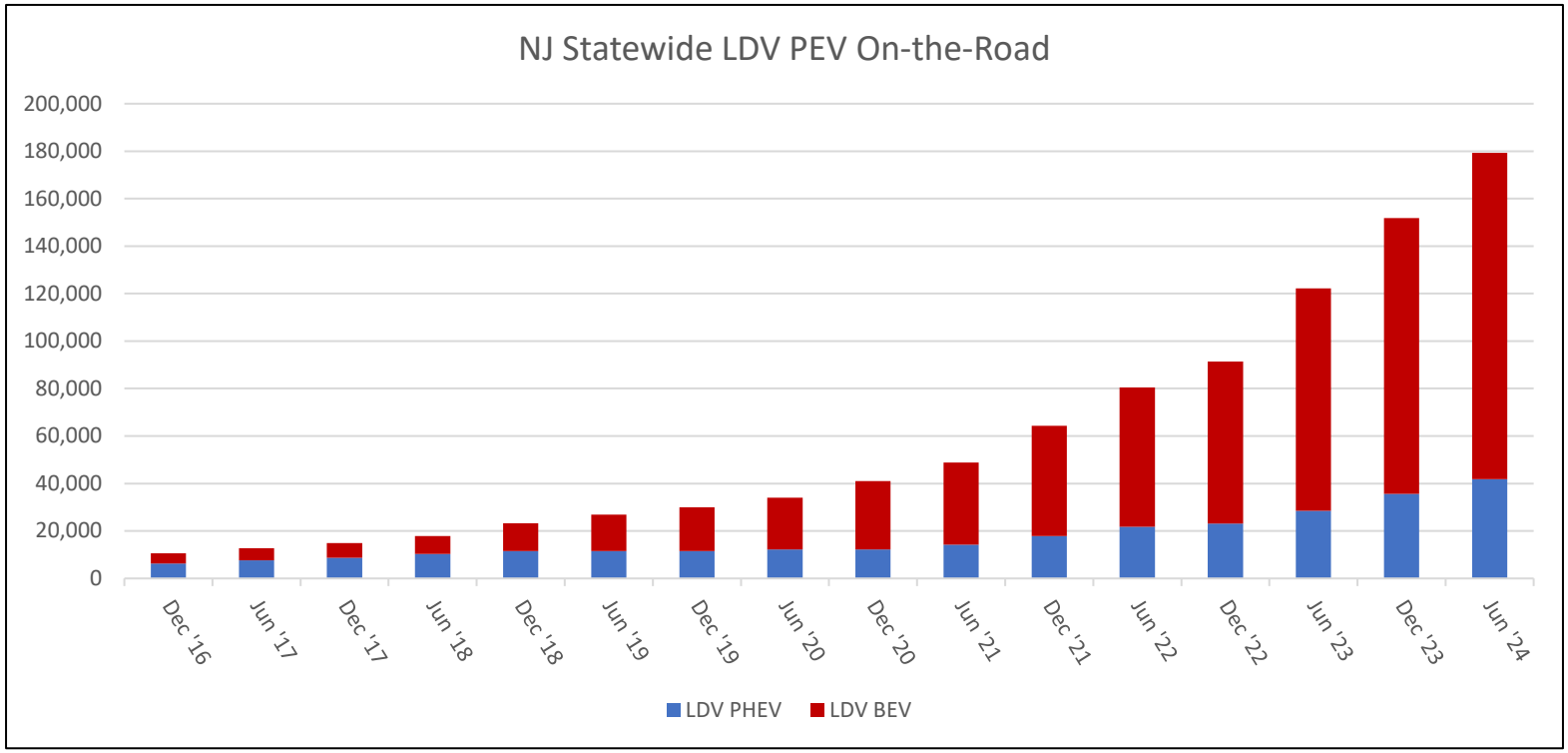
Growing EV Population In New Jersey (Historical)



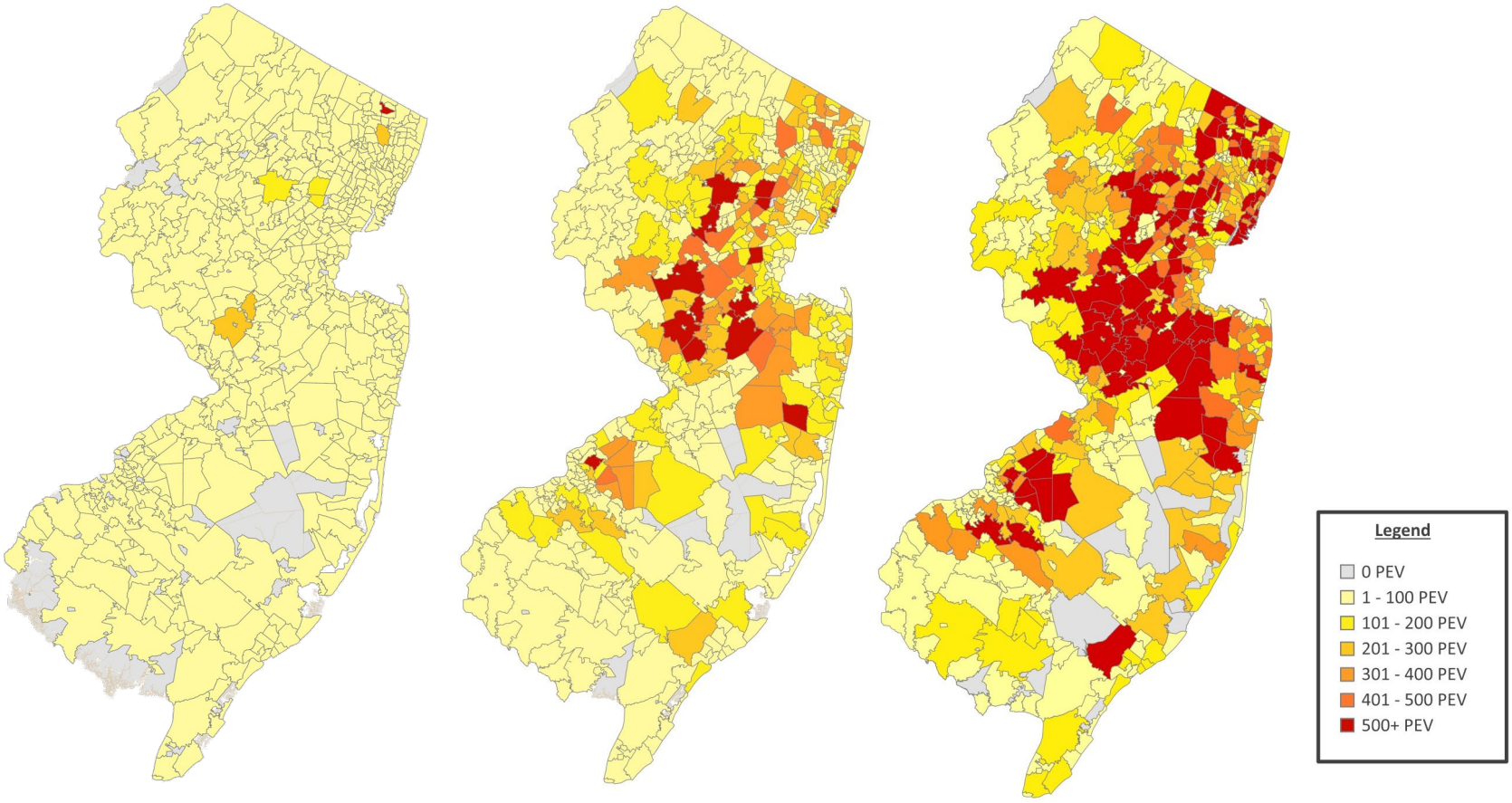
While EV Sales Continue To Be Strong, The Y/Y Growth Rate Has Slowed Significantly. But The Long Term Outlook Remains Strong.

PEV Penetration Over Time (Light-Duty Vehicles)

End Of Year, 2016

End Of Year, 2021

End Of Year, 2023



EV Market Development Actions In New Jersey

- **Passage Of New Jersey's Landmark EV Law (Jan 2020):**
  - **Vehicle Goals: 330K by 2025, 2 million by 2035, 85% of sales by 2040**
  - $300M Vehicle Rebate Program (over 10 years), Up To $4,000 Rebate **– Expanded Federal ITC**
  - Public Fast Charging: at least 200 Locations/400 Chargers By 2025 **– Big Federal-$ Boost (NEVI)**
  - Chargers for 15% of multi-family, 20% of overnight establishments by 2025
  - State Fleet: 25% Electrified By 2025, 100% by 2035
  - NJ Transit Bus Purchases: 10% by 2025, 50% by 2026, and 100% by 2032

- **New ACCII Rule: 100% Of Light-Duty Sales Electrified By 2035**
- **Adoption Of New Jersey Version Of "Advanced Clean Truck" Rule**

- **DEP Funding Streams (VW, RGGI, Federal) – Both Vehicles & Chargers**
- **BPU Funding Streams (SBC) – Both Vehicles & Chargers**
- **EDA Funding Streams – Both Vehicles & Chargers**
- **Utility Incentive Programs (especially for "Make-Ready")**

- **Recent Policy Dissonance**
  - **(NJ) Reductions in Vehicle Rebates, New Registration Fees, Elimination of State Sales Tax Waiver**
  - **(NJ) Delays In Public Charging Infrastructure Deployment**
  - **(NJ) Delays In Needed Incentives For Medium- and Heavy-Duty Fleets**
  - **(US) Constraints On Federal-ITC Eligibility**

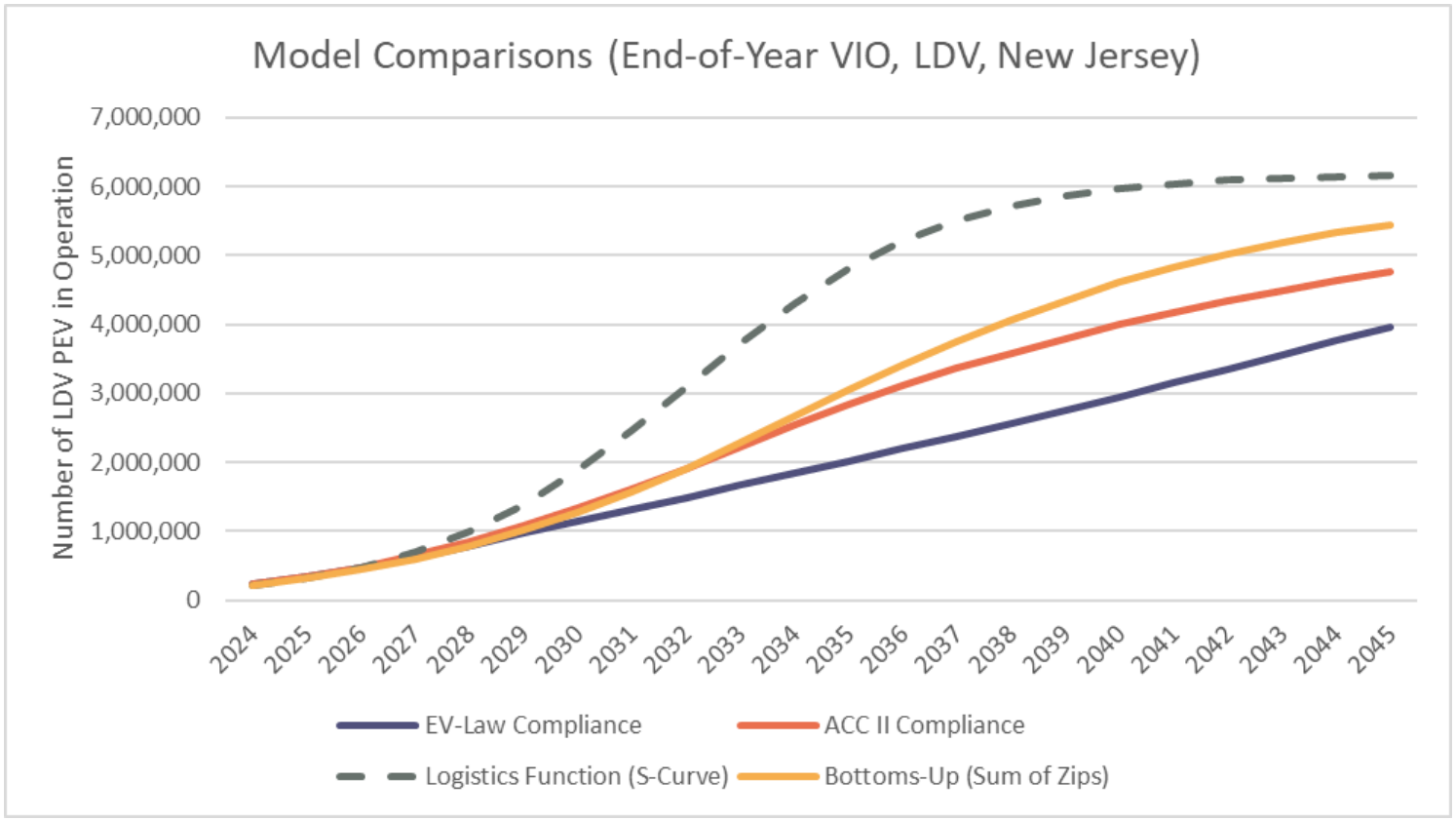
Forecast Update - 2024

- **Gabel Associates (and ChargEVC) Have Been Tracking/Forecasting EV Adoption In NJ Since 2016**
  - Based on new market data every six months (sales, vehicle registrations from DEP)
  - Models have become more sophisticated over time, growing to cover all market segments
  - Multiple models developed to quantify forecast-spread and sensitivities
  - Recent focus has been on granular projections to support “Grid Readiness” studies

- **Latest Forecast Update – Fall 2024 (2024 – 2045)**
  - Four Different Models – Both “Bottoms Up” and “Tops Down”
  - Covers “Full Market” (both Light-Duty Vehicles (LDVs) and Medium- and Heavy-Duty Vehicles (MHDVs))
  - Projects Adoption At The Zip-Code Level (to support grid impact planning)
  - Estimates both vehicle adoption, as well as energy and power impacts (per hour)
  - Quantifies grid impacts in 13-subsegments (by vehicle types and charging segment)
  - Models revised to account for current market “slow-down”

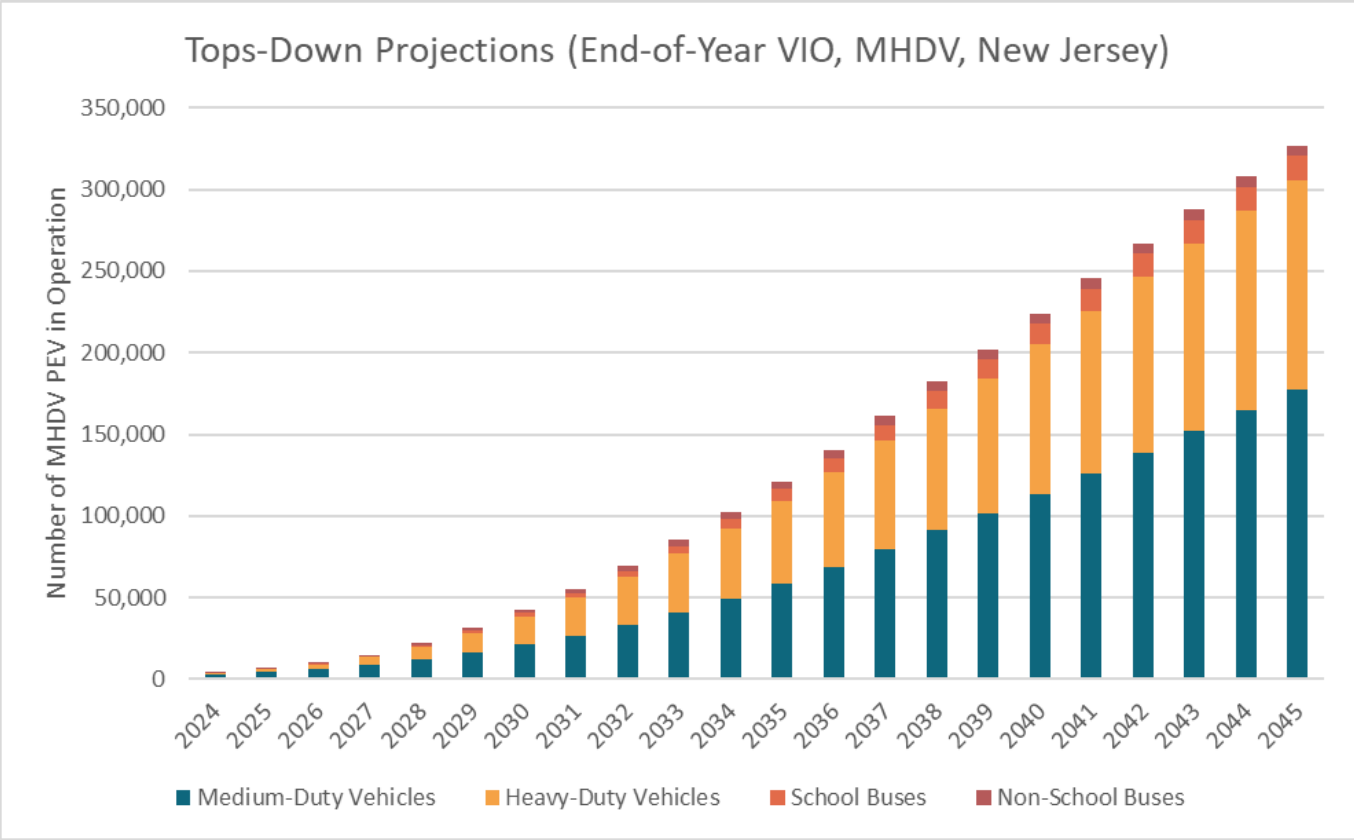
- **New Models For This Update**
  - Tops Down – Compliance with NJ EV Law
  - Tops Down – Policy Compliance (ACCII and ACT)
  - Tops Down – S-Curve (standard “new technology diffusion model” (logistic function))
  - Bottoms Up – Projection Of Historical Trend (Bounded Third-Order - ~4M data points)

Forecast Update (Fall 2024) – Light-Duty Vehicles



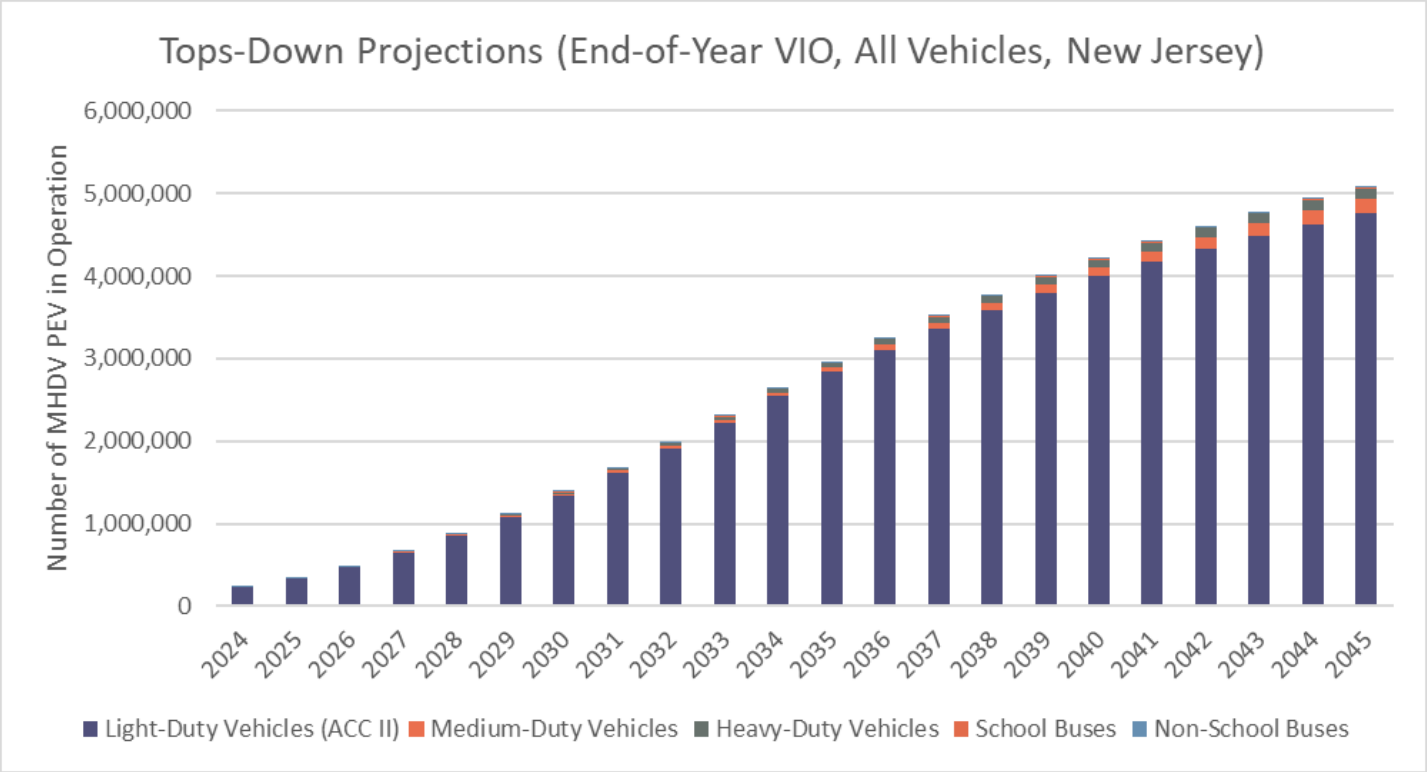
- S-Curve & Sum-Of-Zips Are Projections Of Historical Trend – Minimal Assumptions
- The S-Curve Likely To Be Most Accurate Long Term, But Sum-Of-Zips Best Match Now

Forecast Update (Fall 2024) – Medium- & Heavy-Duty Vehicles



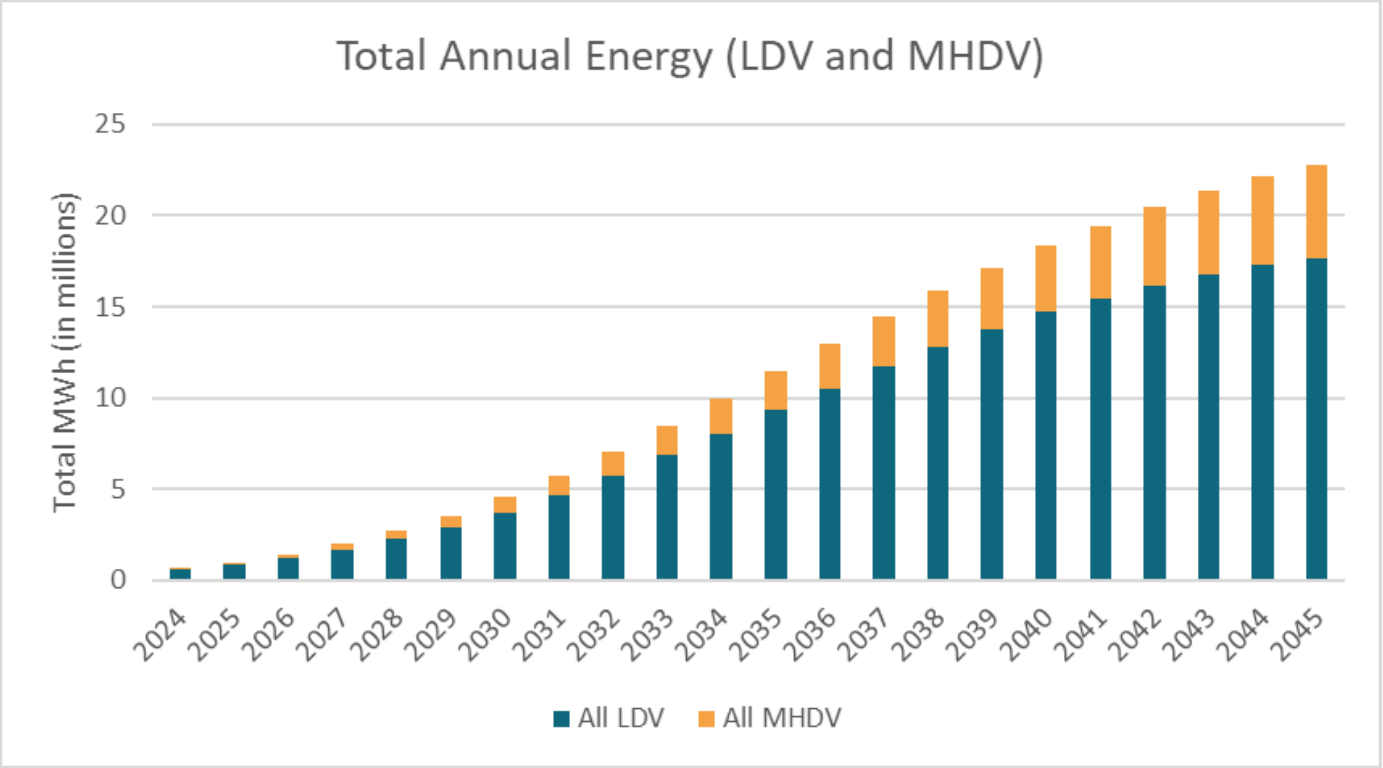
- Historical data for MHDV is virtually non-existent – this curve based on ACT
- MHDV-PEV adoption growing fast, From 1,379 (June-2022) to 3,392 (June-2023)
- MDVs appear to be exceeding ACT goals, but HDVs are far below ACT requirements

Forecast Update (Fall 2024) – Full Market Projection (Vehicles)



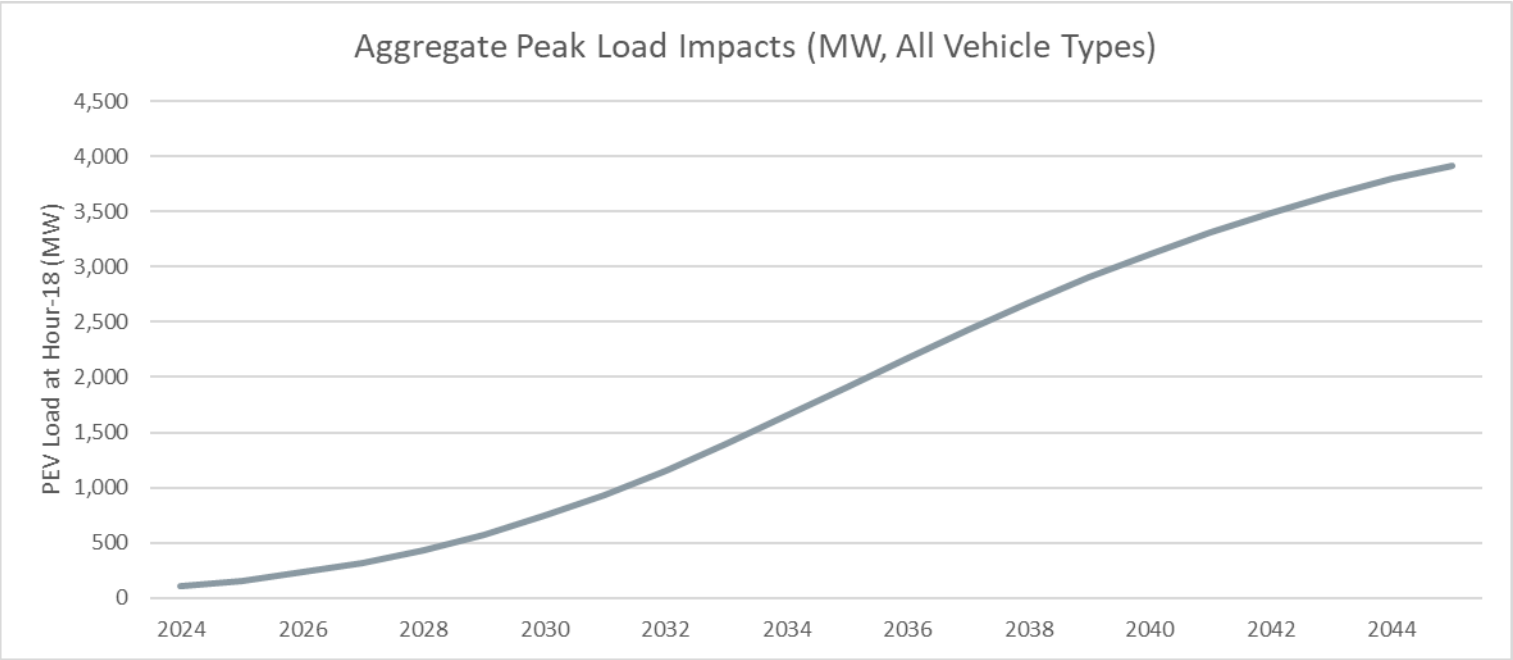
LDVs Dominate Vehicle Counts, Especially Short Term

Forecast Update (Fall 2024) – Energy Impacts



- LDVs Dominate Energy Impacts, Especially Through 2030
- By 2045, Vehicle Charging Represents ~ 30% Of Current Consumption

Forecast Update (Fall 2024) – Power Impacts (at Peak Time)



- By 2045, Vehicle Charging Increases PEAK-Load By ~20% (at 6PM)
- Peak-Load Has A Large Impact On Costs For all Users
- Although MHDVs Have Modest Impact On Energy, They Can Have A Larger Impact On Peak-Load, Including Localized Feeder Hotspots
- Power Estimates Are Very Sensitive To WHEN EVs Are Charged, Not Yet Clear What Impact Storage Or Managed Charging May Have On Mitigation.

Forecast Update (Fall 2024) – Observations

- PEV Population Has Doubled (or more) Every Two Years (historically)*
- By That Measure, The 2025 EV-Law LDV Goals Are Within Reach, Although Should Be Considered A Stretch Given Current Slow-Down and Recent Policy Decisions
- BEVs Have Become Dominant In Recent Years, But PHEVs Now Surging
- Biggest Factors That Impact LDV Adoption: Affordability And Availability Of Fast Public Charging. NJ Has Lost Position On Both Over Last 2 Years.
- Public Charging Perceptions Very Sensitive To Both Geographic Distribution (chargers in the right place) And Reliability.
- Next Phase Of Development Is For MHDVs & Fleets, But Few NJ Programs So Far
- **Strategic Priorities Moving Forward: PEV Affordability, Availability Of Fast Public Charging, MHDV & Fleet Electrification Incentives, Strategies To Reduce Peak Load**

* Except in 2020, during pandemic