



EV Infrastructure Load Model

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Acronyms and Initialisms

- AATE – Additional Achievable Transportation Electrification
- AMI – Advanced Metering Infrastructure (data)
- CAISO – California Independent System Operator
- CEC – California Energy Commission
- EV – Electric Vehicle
- GVWR – Gross Vehicle Weight Rating
- IEPR – Integrated Energy Policy Report
- LADWP – Los Angeles Department of Water and Power
- LD – Light-Duty
- LBNL – Lawrence Berkeley National Laboratory
- MDHD – Medium- and Heavy-Duty
- MW – Megawatt
- PGE – Pacific Gas & Electric
- SCE – Southern California Edison
- SDGE – San Diego Gas & Electric
- SMUD – Sacramento Municipal Utility District
- TOU – Time of Use

Note: All charts, diagrams, and graphics, unless otherwise indicated, were developed by CEC staff.

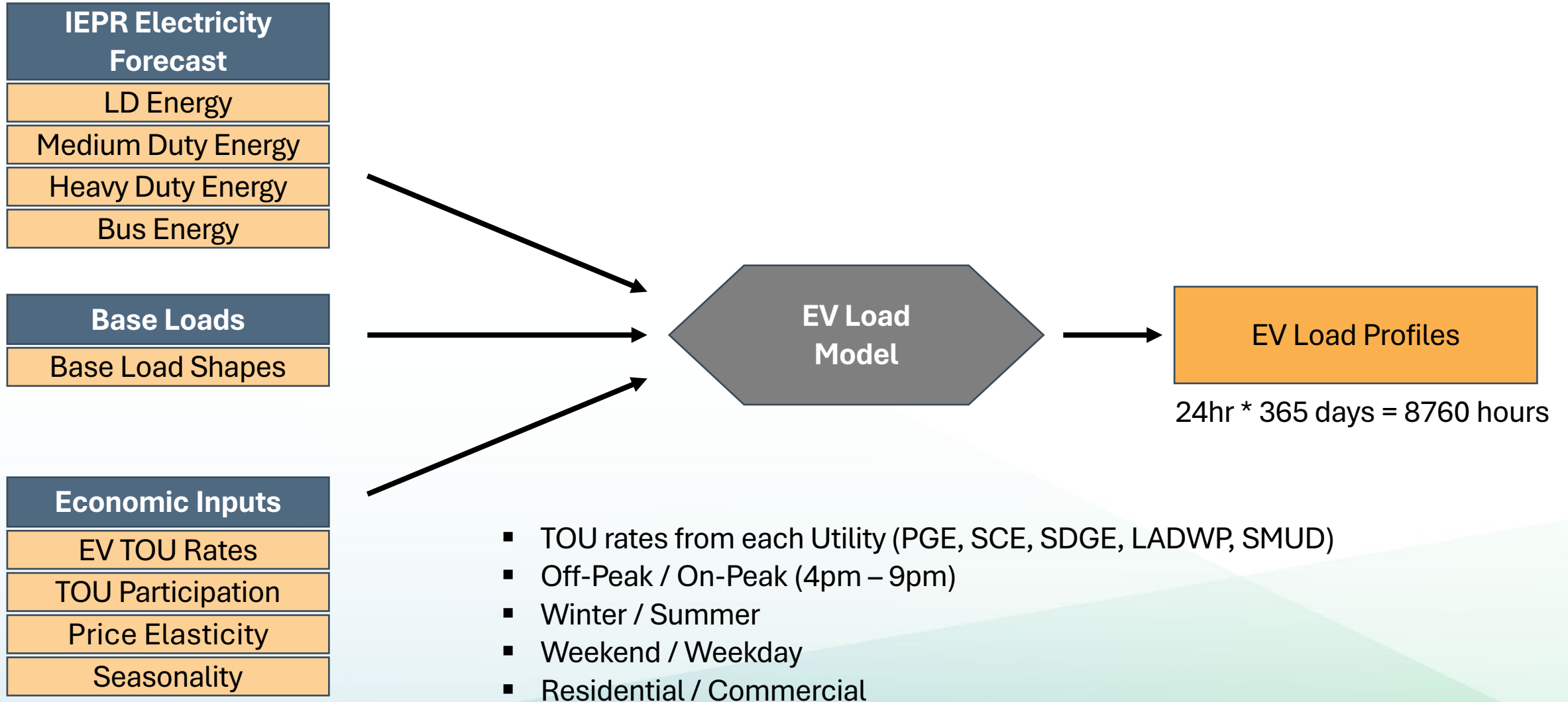


Load Shapes VS Load Profiles

- Terms "load shapes" and "load profiles" are often used interchangeably
- “Shapes” = shape of the hourly load (i.e., normalized)
- “Profiles” = Both shape and magnitude (i.e., kilowatts) of load



Model Schematic





Types of Load shapes

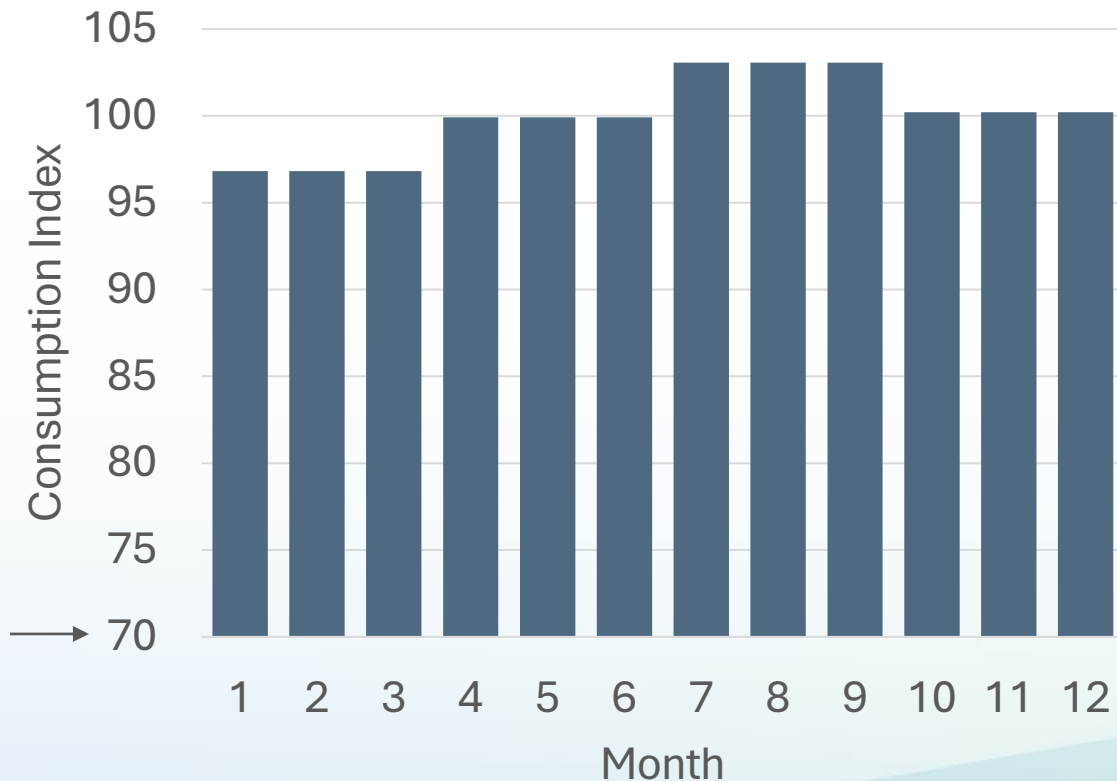
- **Weekday and Weekend**
- **Light-Duty Input Load Shapes** (from 2017 ChargePoint data)
 - Personal vehicles
 - Single family home
 - Multi-family home
 - Destination charging
 - Commercial vehicles
 - Govt / Rental vehicles
- **Medium- and Heavy-Duty Input Load Shapes** (from Lawrence Berkeley National Lab)
 - GVWR3, GVWR456
 - GVWR7, GVWR8 COMBO, GVWR8 REFUSE AND RECYCLING, GVWR8 SU, GVWR8 IRP, GVWR8 Port
- **Bus Input Load Shapes** (from Lawrence Berkeley National Lab)
 - School Bus, Urban Bus, Intercity Bus, Other Bus



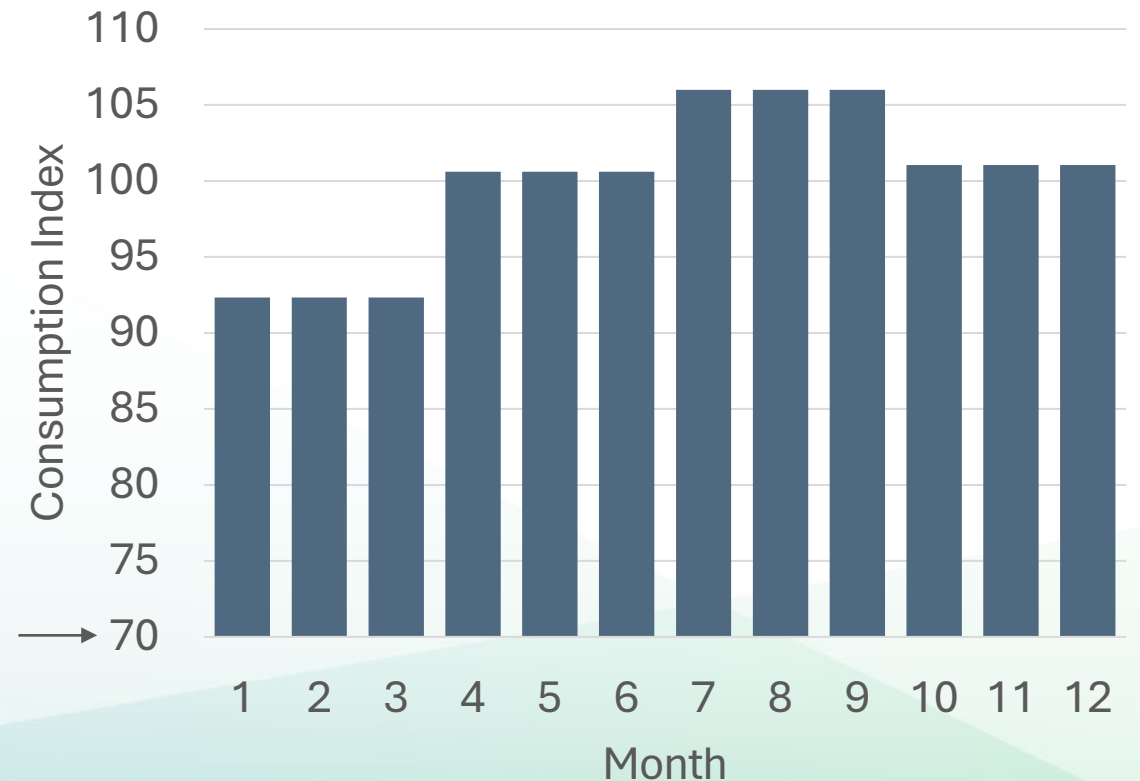
Load Profile Updates: Seasonality

Seasonality based on quarterly gasoline and diesel sales tax from California Department of Tax and Fee Administration

LD Quarterly Consumption Index



MDHD Quarterly Consumption Index





EV Load Model Assumptions

- Gasoline sales tax informs LDV seasonal electricity demand
- Diesel sales tax informs MDHD seasonal electricity demand
- Input load shapes and Price Elasticity Factor are the same for all utilities
 - No input load shapes that are region specific
- Input load shapes stay the same into the future
- Increasing away-from-home share of charging
- TOU rates (the ratio between off peak and on peak hours) remain the same throughout the forecast years

Future AMI Analysis will help better
inform load shapes



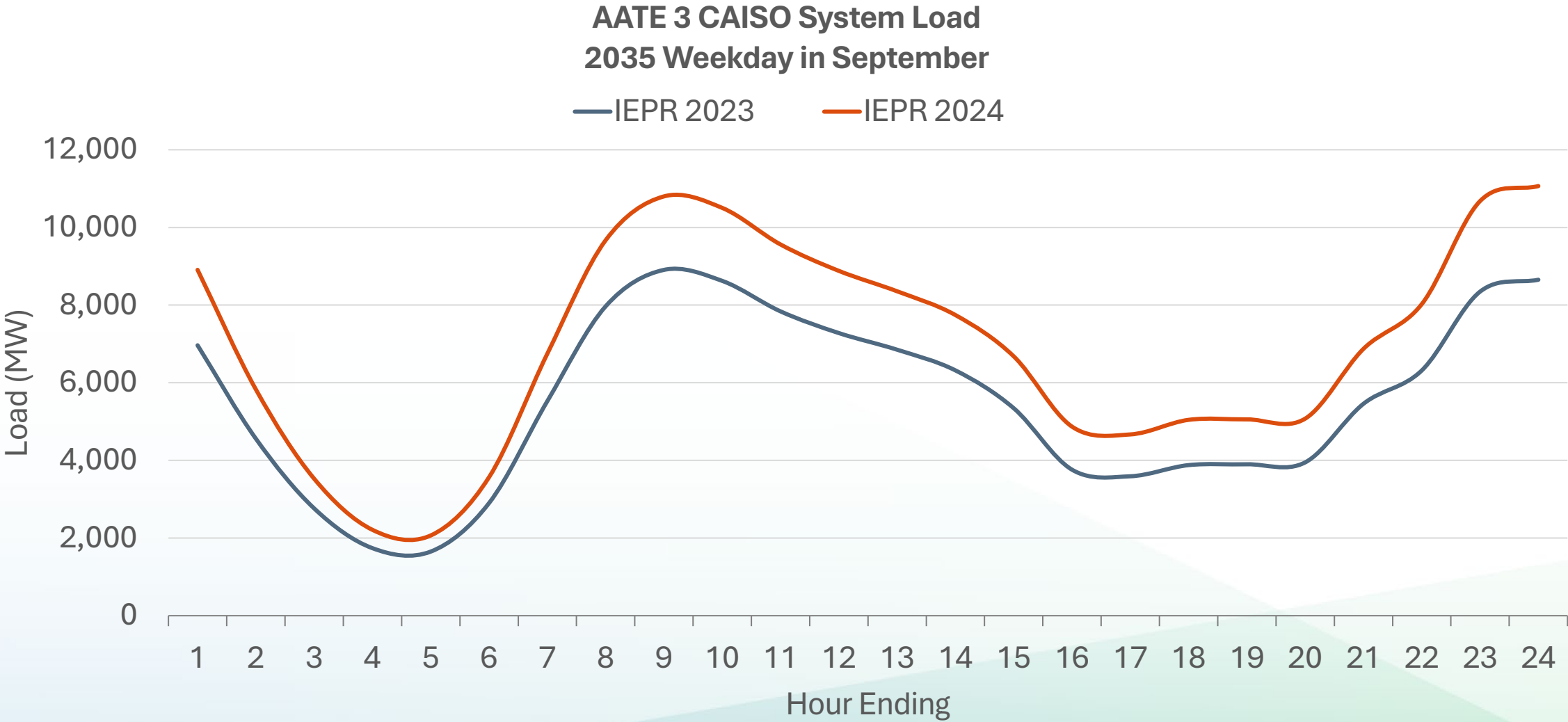
EV Load Model Updates

Inputs

- EV TOU rates for each utility (**updated as of Sept 2024**)
- Seasonality - Gasoline/diesel sales tax records by quarter (**updated**)
- Input Load Shapes (LDV – 2017 ChargePoint, MDHD – LBNL) (**same**)
- Price Elasticity Factor (**same**)
- TOU participation (**same**)
- Proportions of personal vehicle charging mode shares [e.g., at-home single family, at-home multifamily, away-from-home] (**same**)

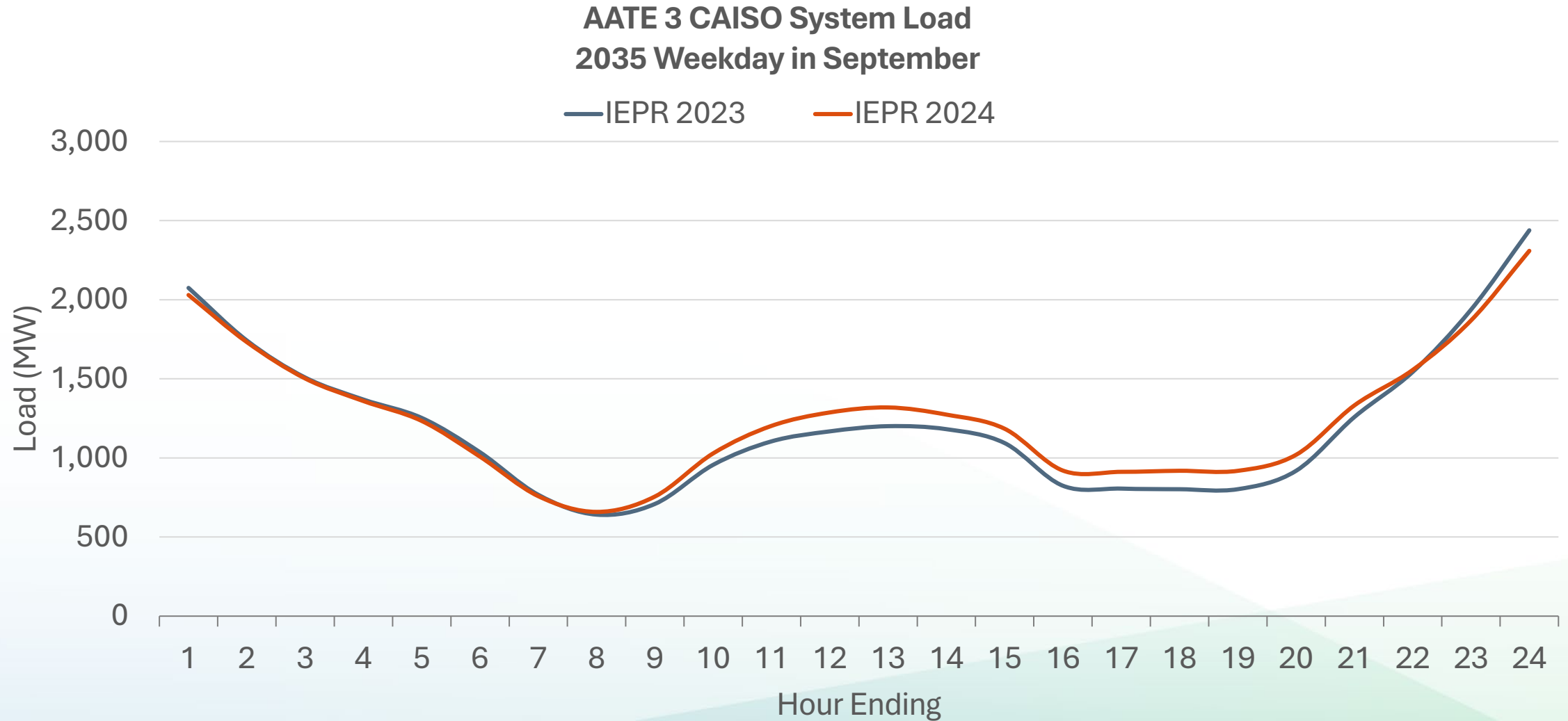


EV Load Profile – LD Vehicles



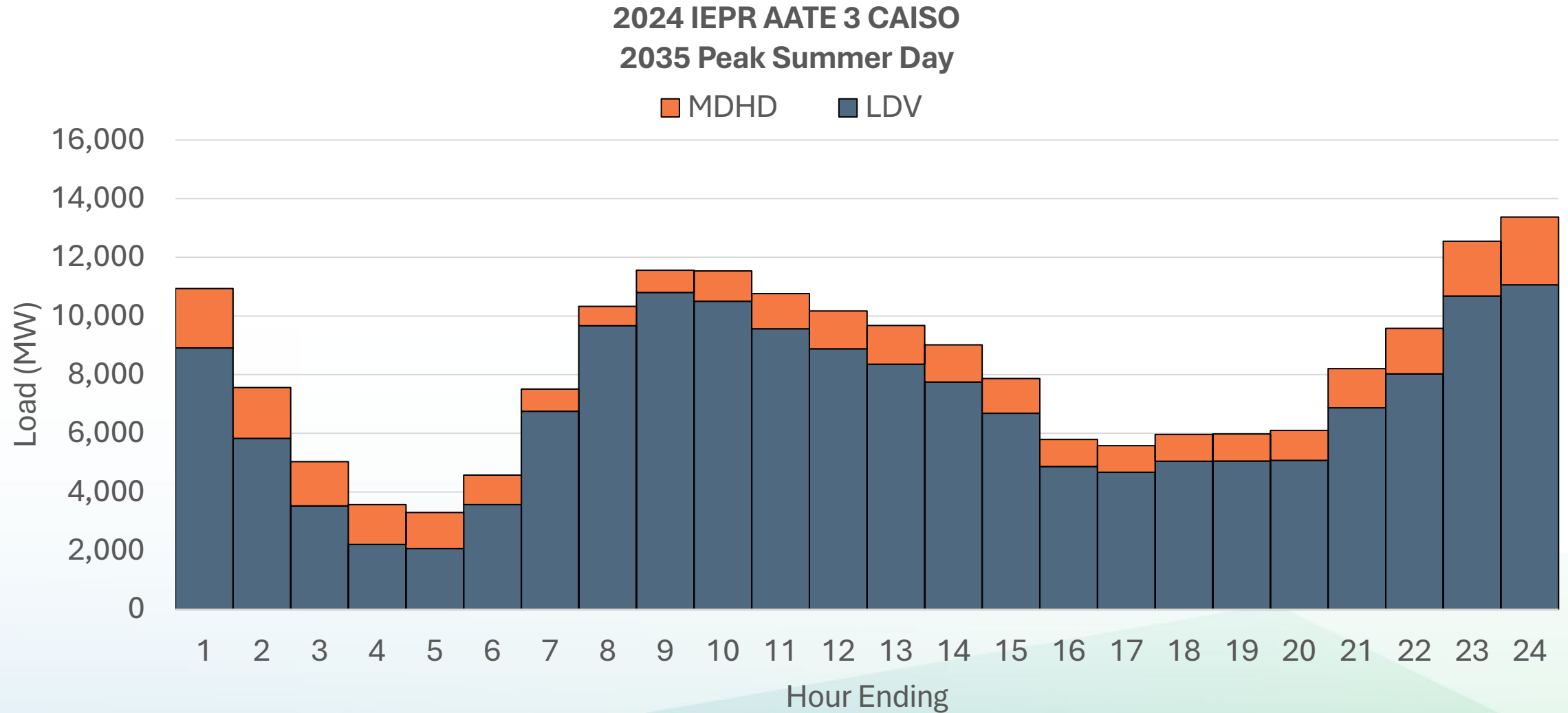


EV Load Profile – MDHD Vehicles





EV Load Profile – System Load





Thank You!

Questions via Email

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