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W E B I N A R S E R I E S

MODELING THE GRID IMPACTS OF EV CHARGING

June 3, 2020

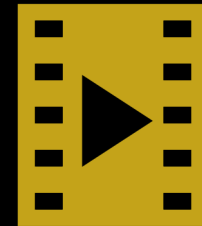
HOUSEKEEPING



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MODELING THE GRID IMPACTS OF EV CHARGING

Walter Schaefer, ERS

WHY DO WE MODEL?



Estimate impacts of EV adoption and infrastructure deployment



Compare multiple scenarios quickly and accurately



Test effectiveness of various managed charging solutions



Rank options based on customer priorities



Determine optimal system configuration

MODELING CONSIDERATIONS

Charging Operations

- Rate of EV adoption
- Scale of EV adoption
- Vehicle type
- Charge speed

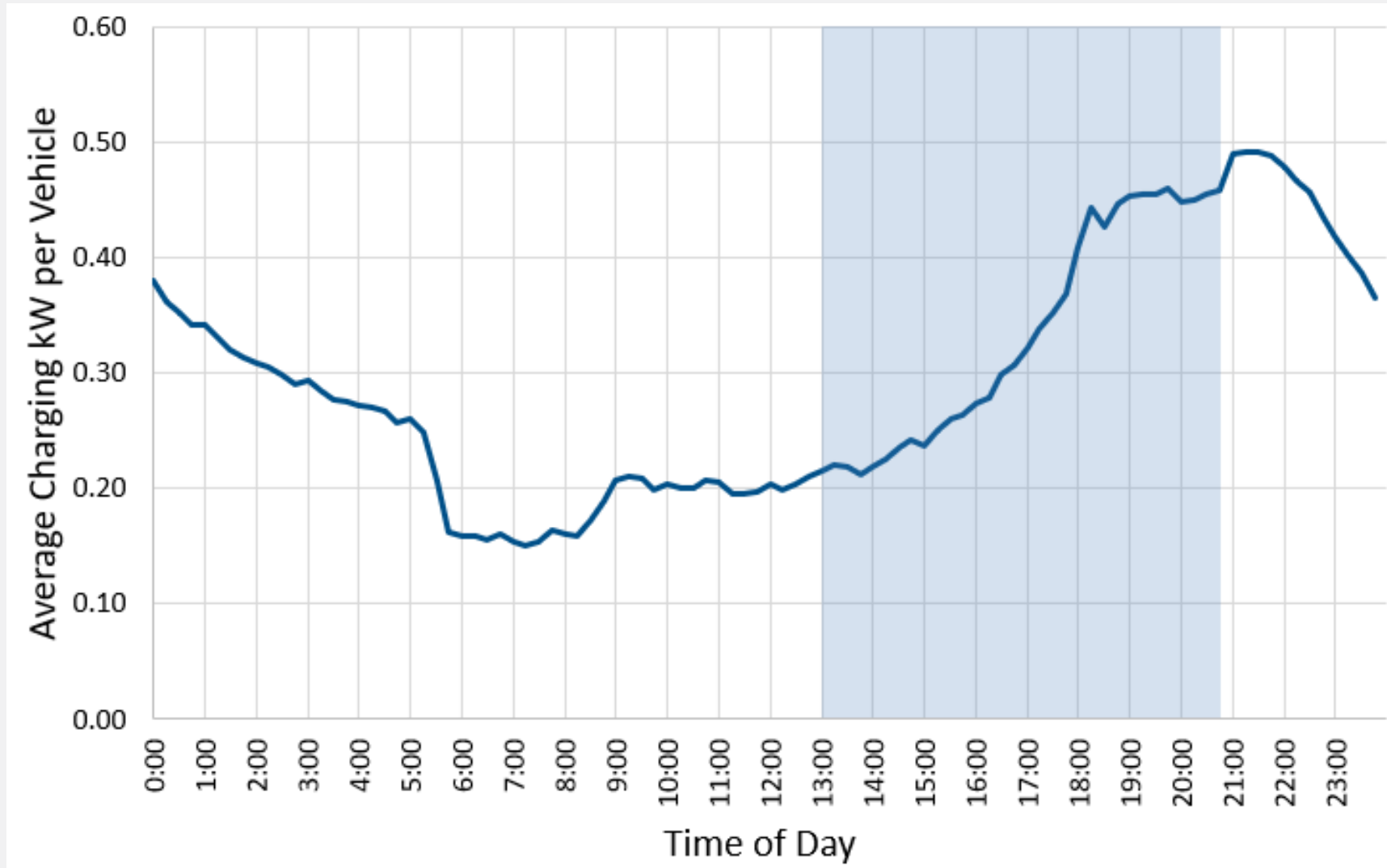
Facility Operations

- Facility type
- Location
- Billing structure
- Interaction with other DERs

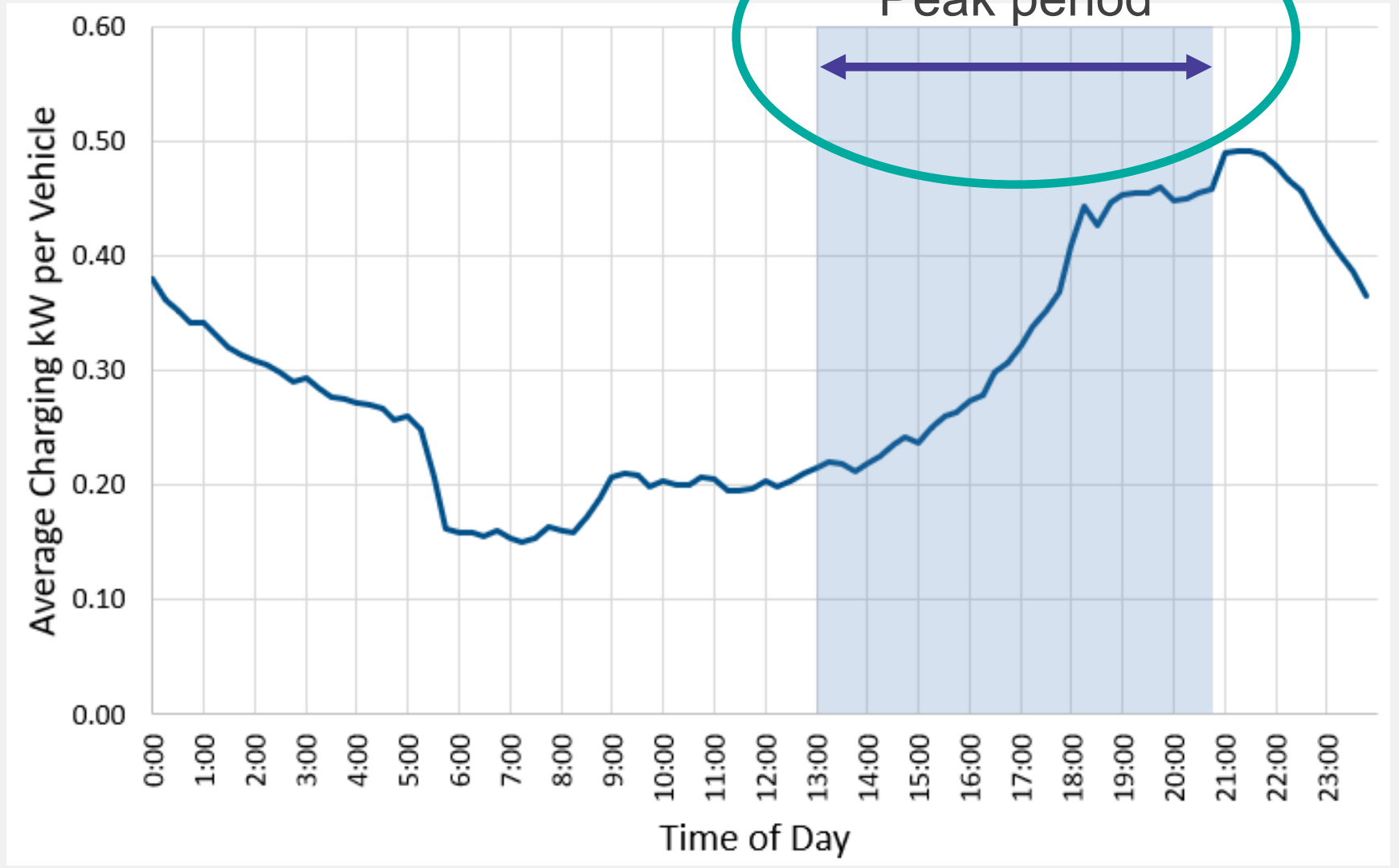


CHARGING OPERATIONS: DIFFERENCES IN CHARGING BEHAVIOR ACROSS EVs

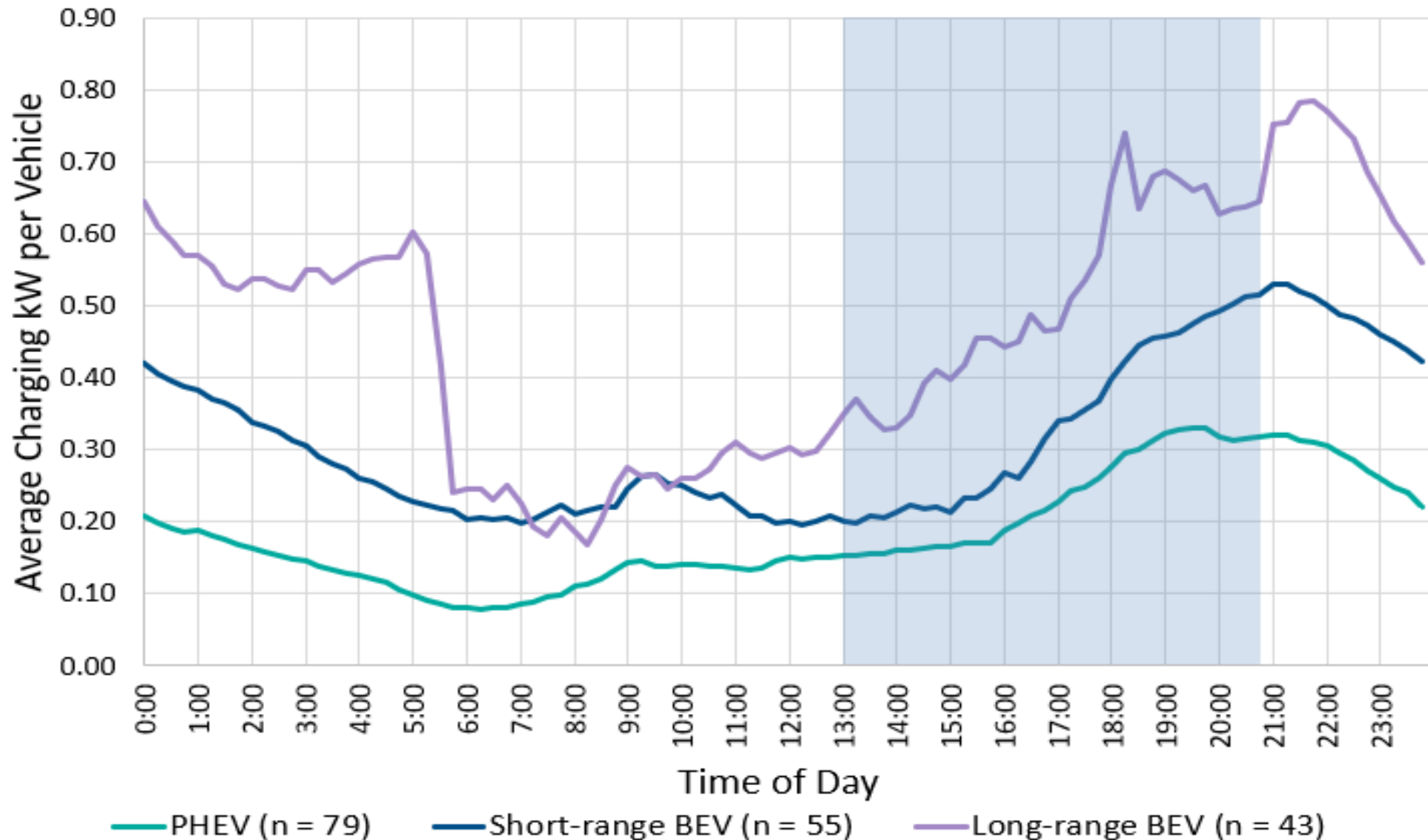
UNMANAGED CHARGING HAPPENS ON-PEAK



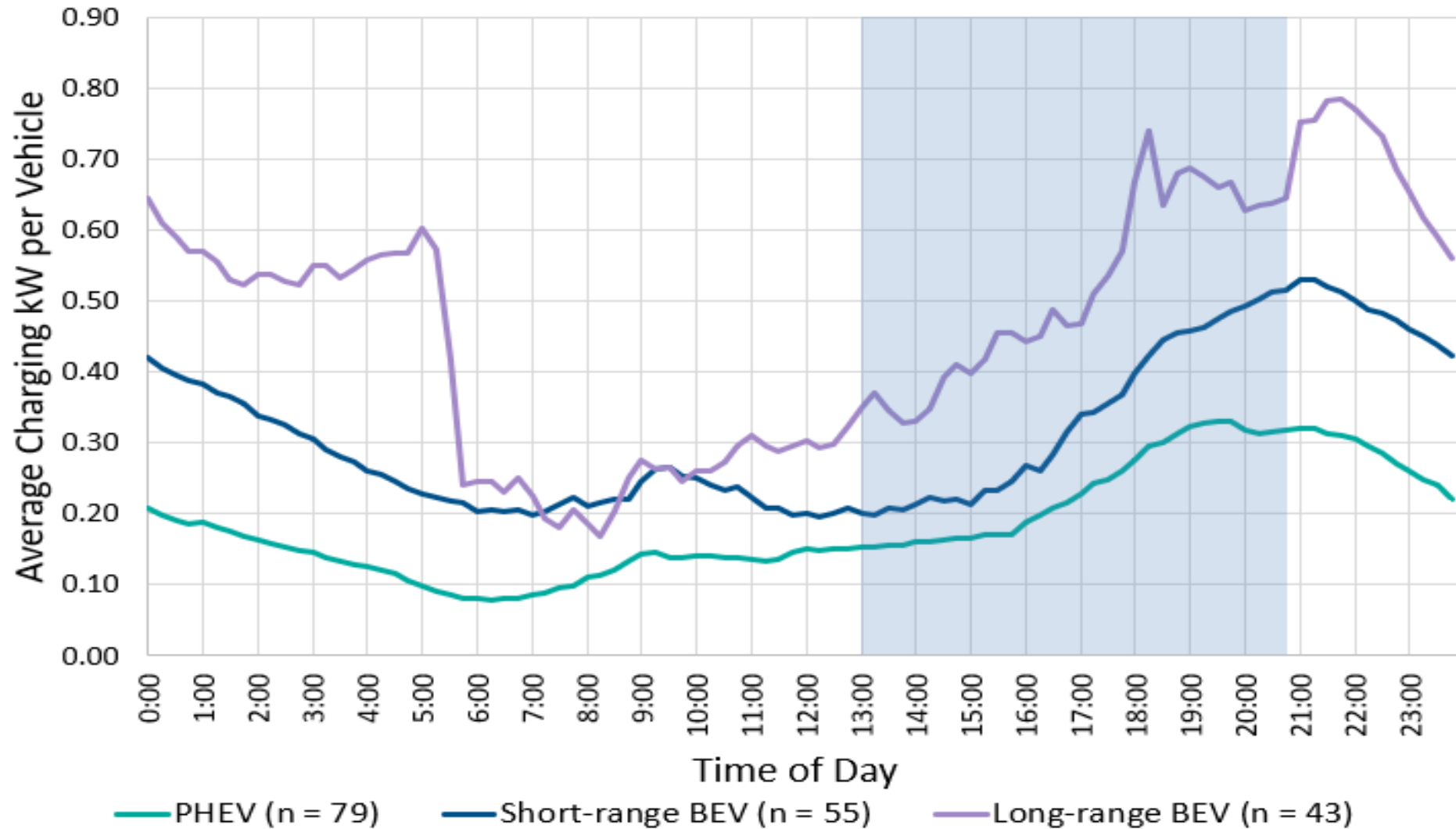
**UNMANAGED
CHARGING
HAPPENS
ON-PEAK**



LOAD MAGNITUDE VARIES BY VEHICLE TYPE



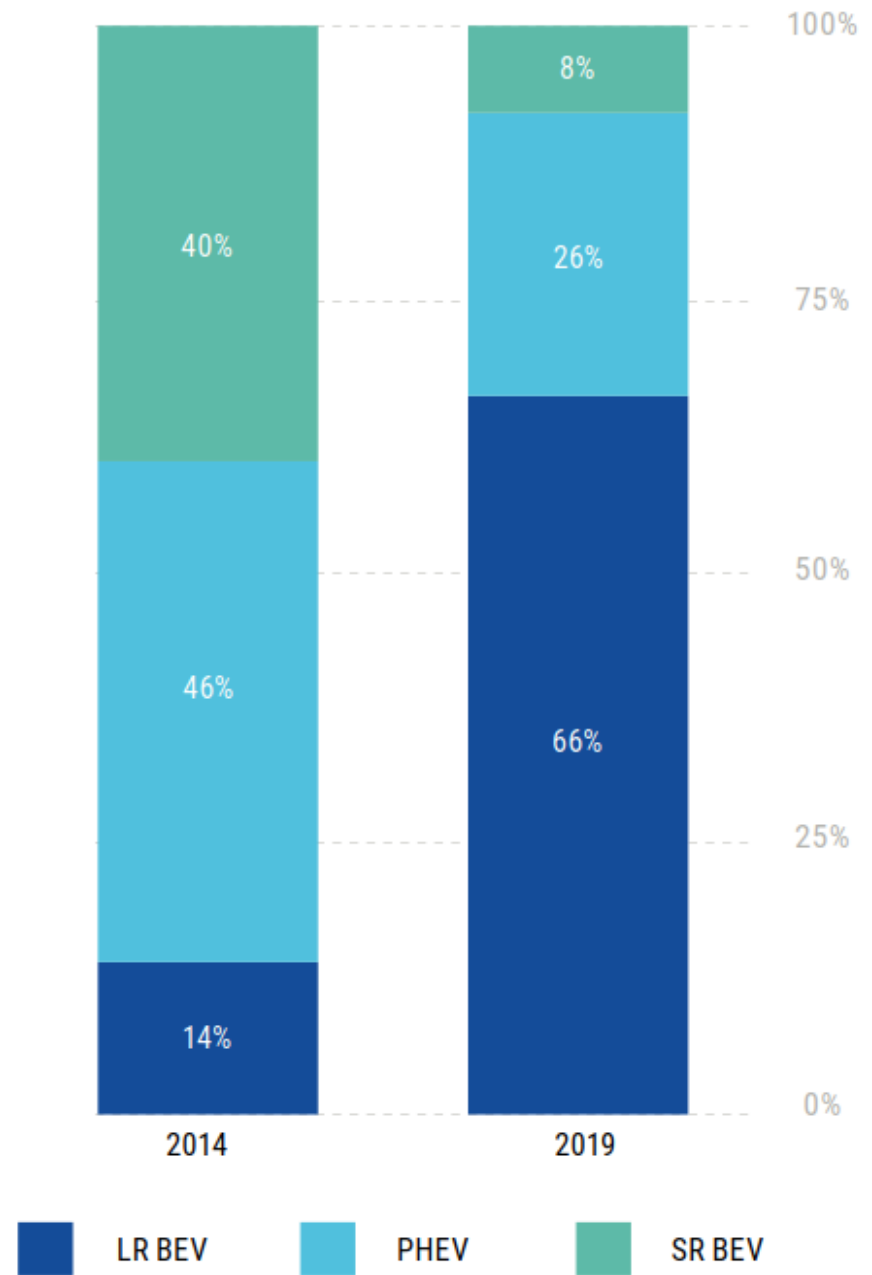
Vehicle type	kWh per day
PHEV	5.1
Short-range BEV	8.1
Long-range BEV	14.0





...AND CUSTOMERS WANT BIGGER EVs

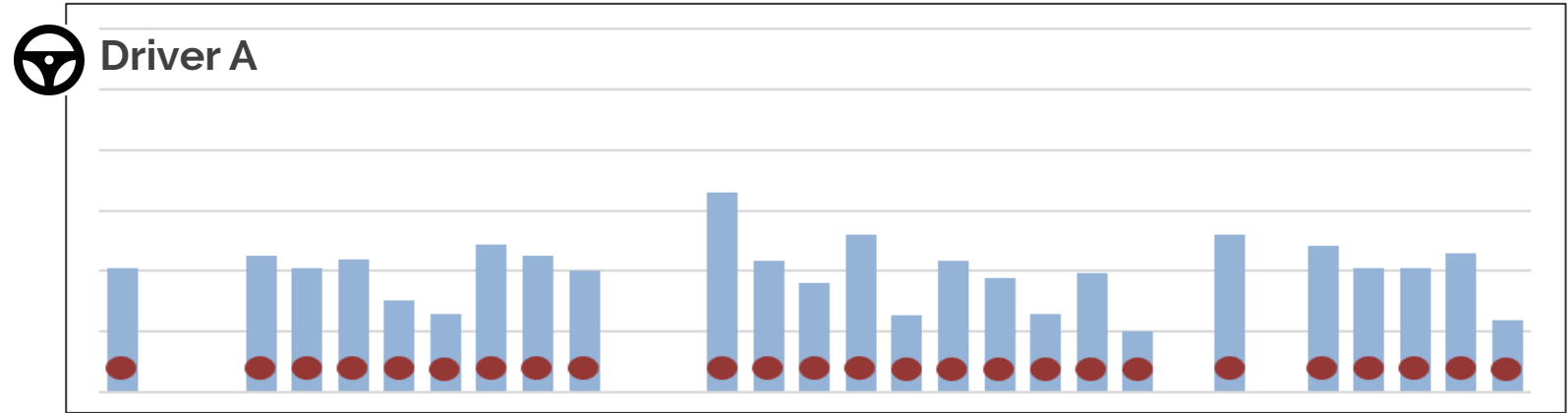
Electric vehicle composition by year, 2014 & 2019



Source: FleetCarma, EV Growing Pains

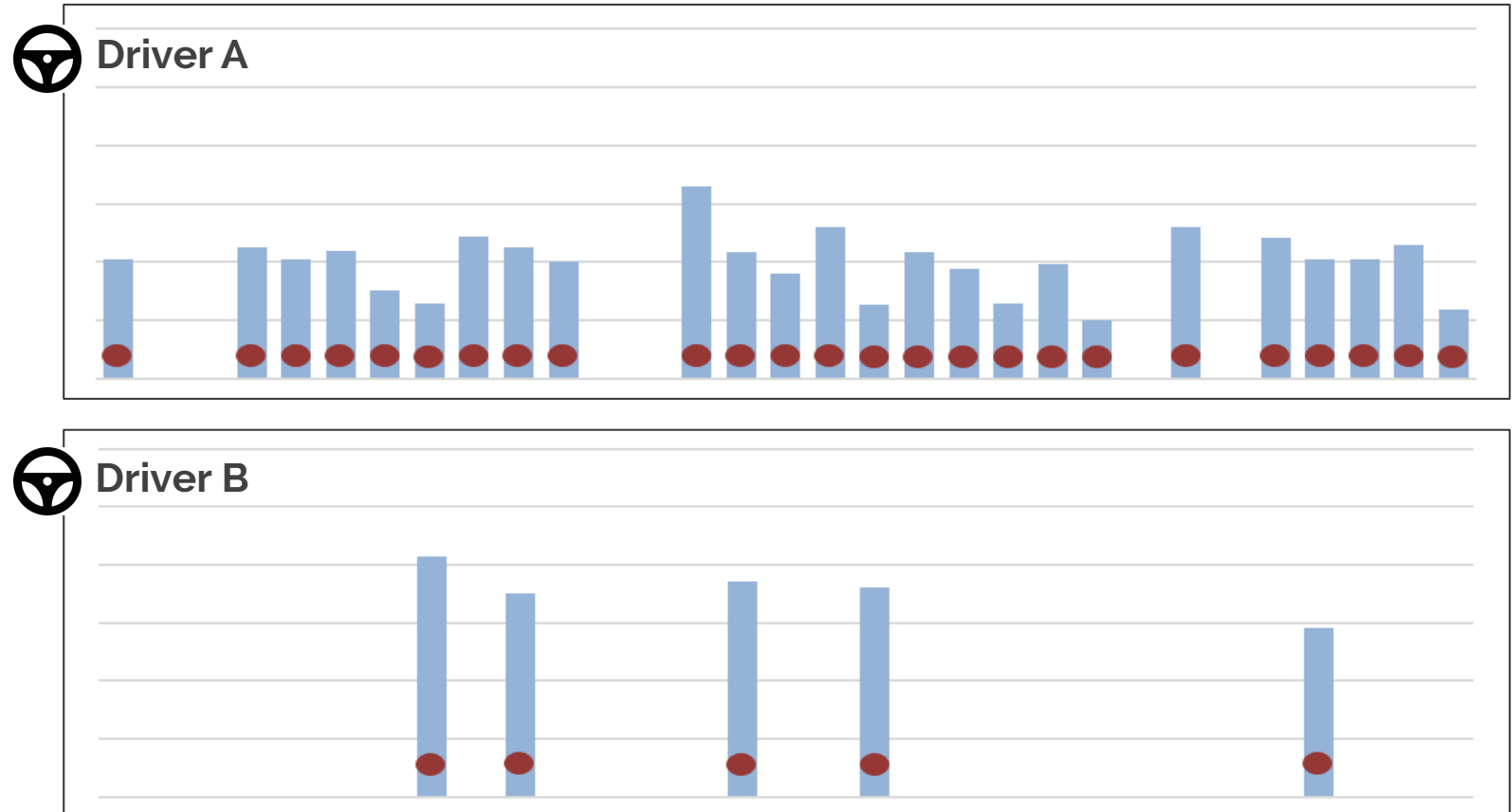
Charging behavior varies from driver to driver

● = Peak kW for the day



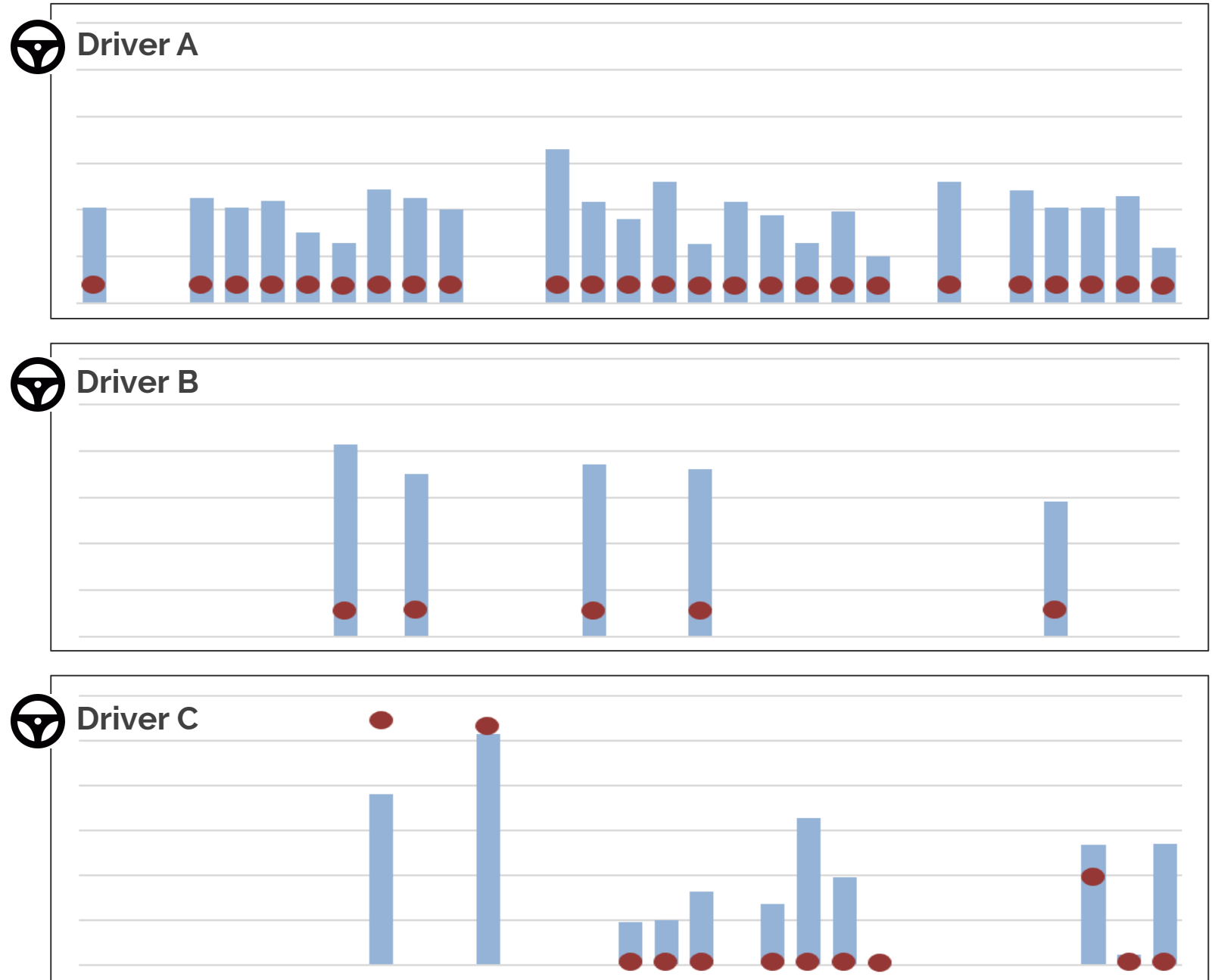
Charging behavior varies from driver to driver

● = Peak kW for the day



Charging behavior varies from driver to driver

● = Peak kW for the day



Vehicle Side: Summary



Unmanaged charging happens on-peak



Long-range EVs have the greatest grid impact



...They're also the fastest-growing segment, and battery size and charge rates are expected to increase



Driver-to-driver variability is unpredictable and random

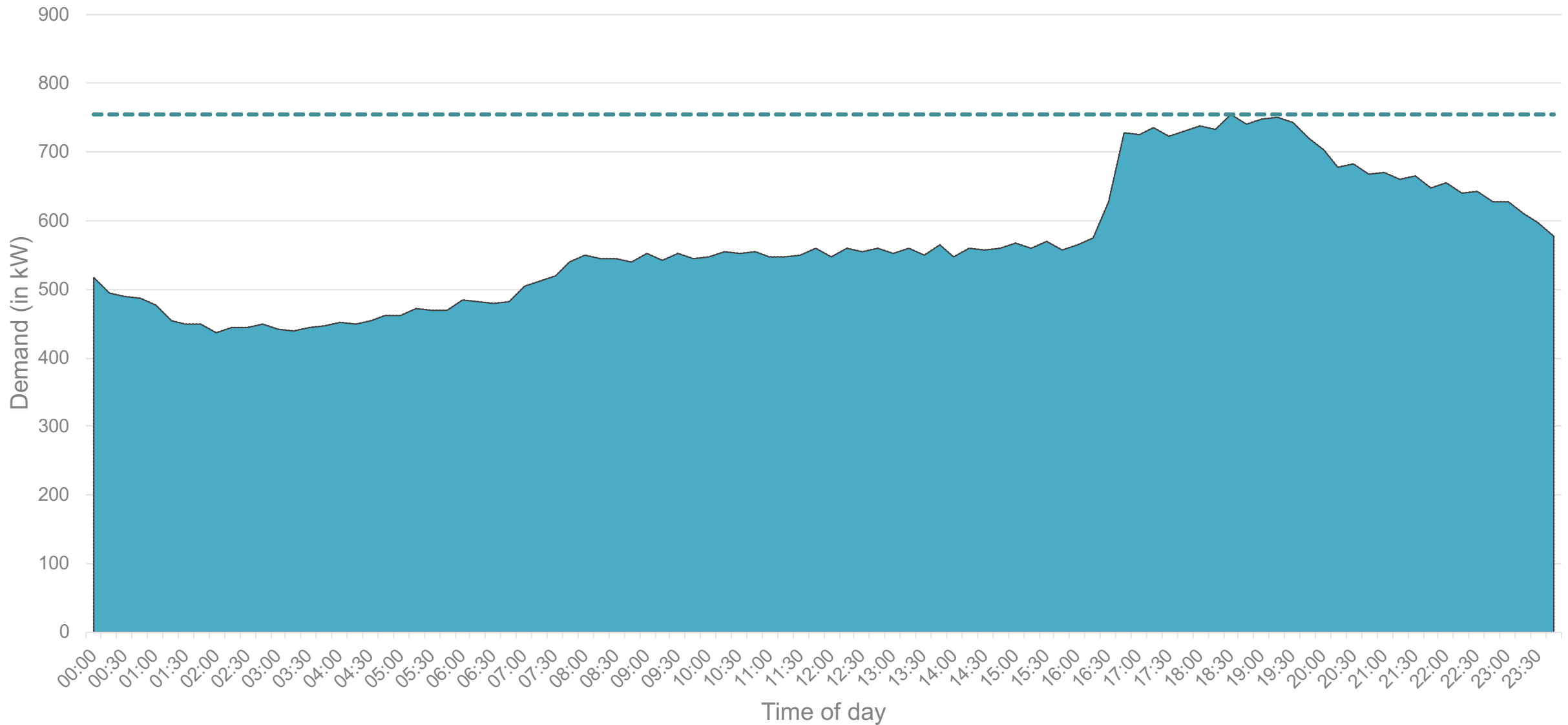


Vehicle-side modeling and forecasting will only get more complex

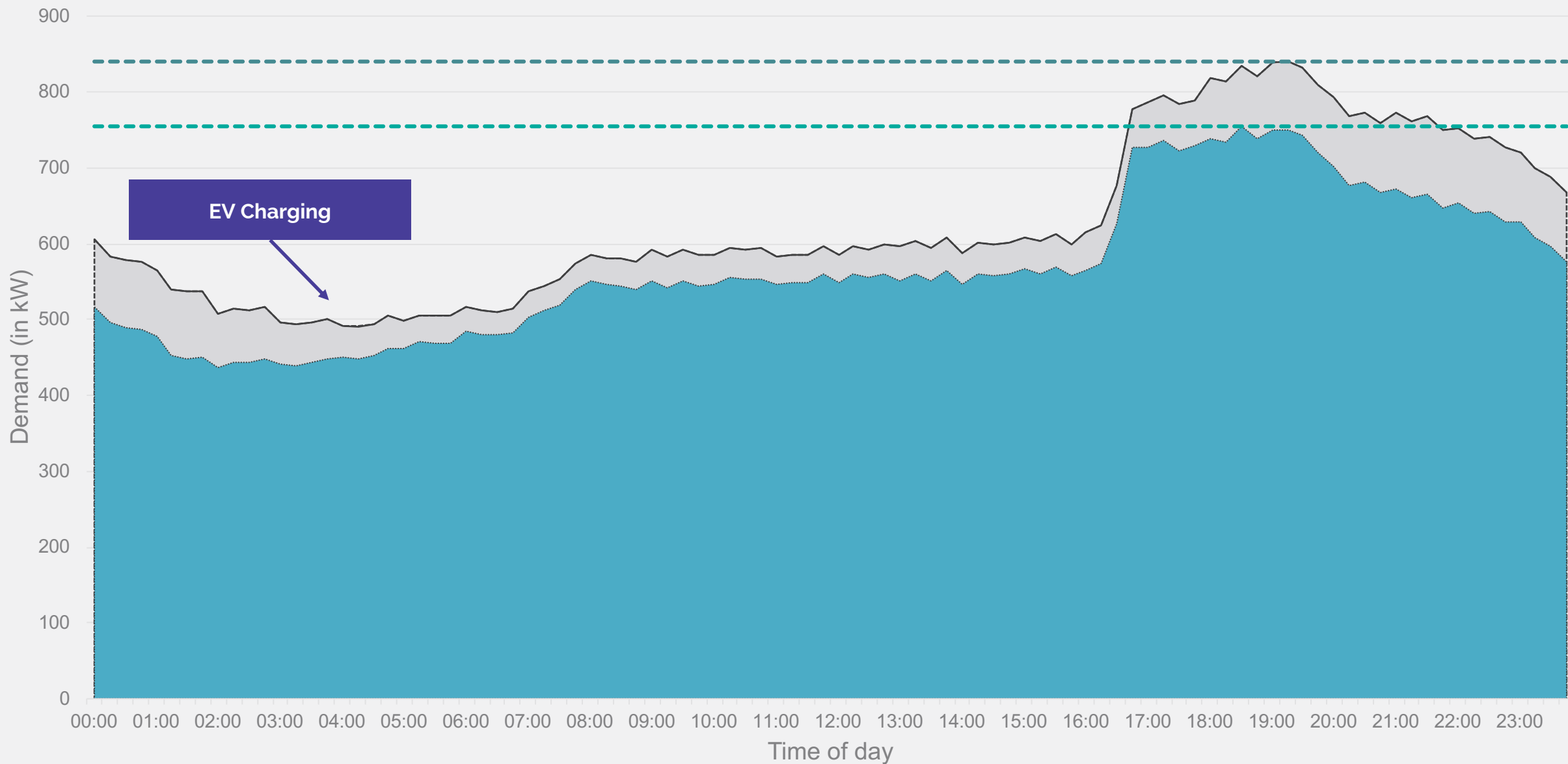
**FACILITY
OPERATIONS:
MODELING EV
CHARGING AT
EXISTING
FACILITIES**



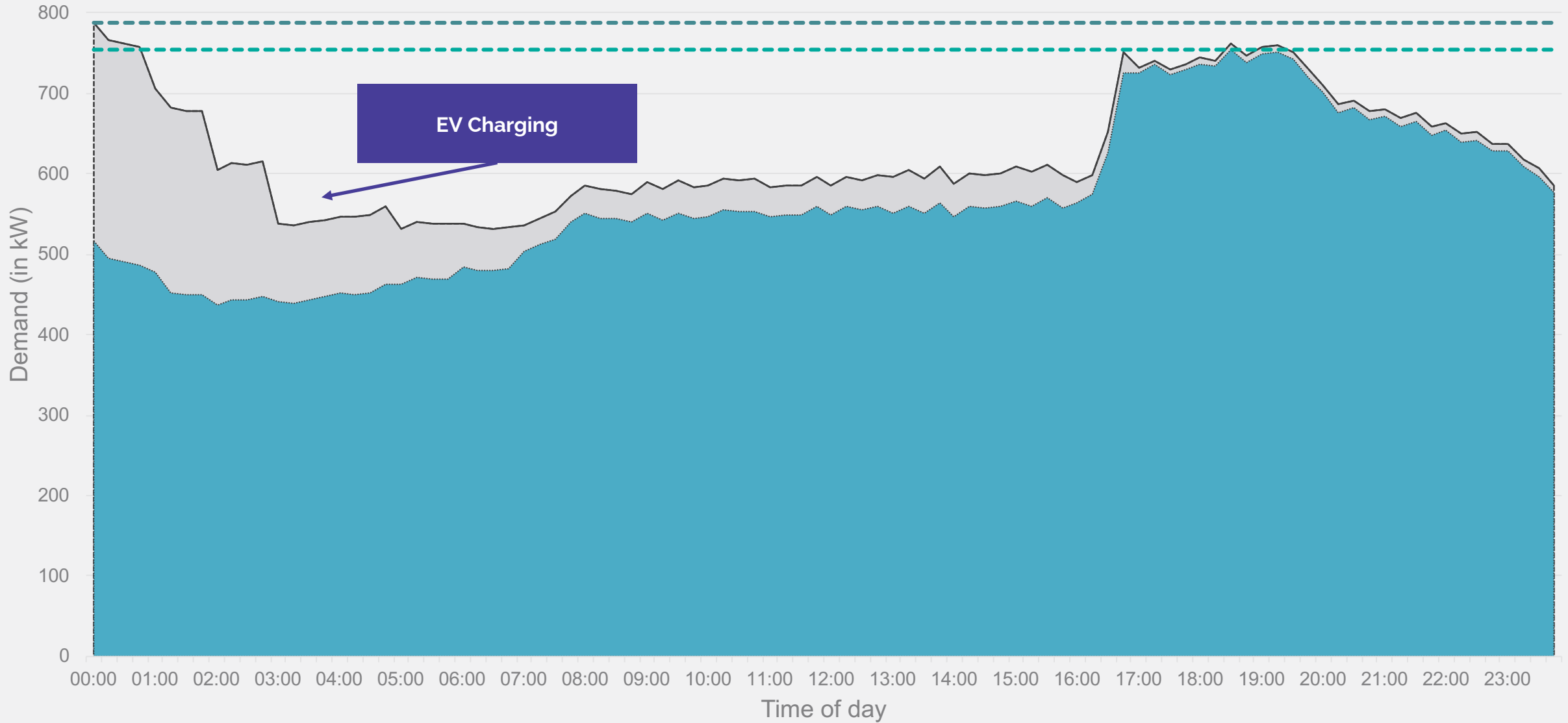
MULTIFAMILY RESIDENTIAL



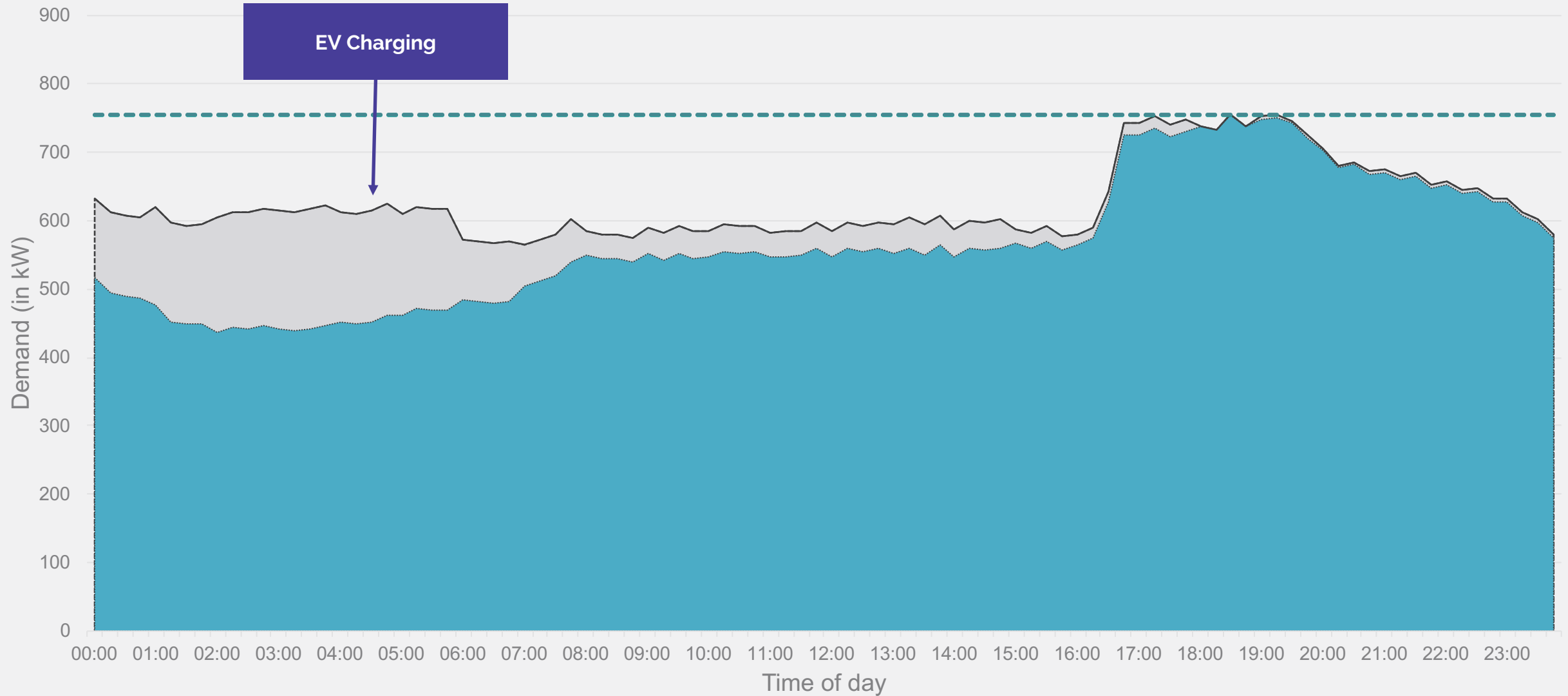
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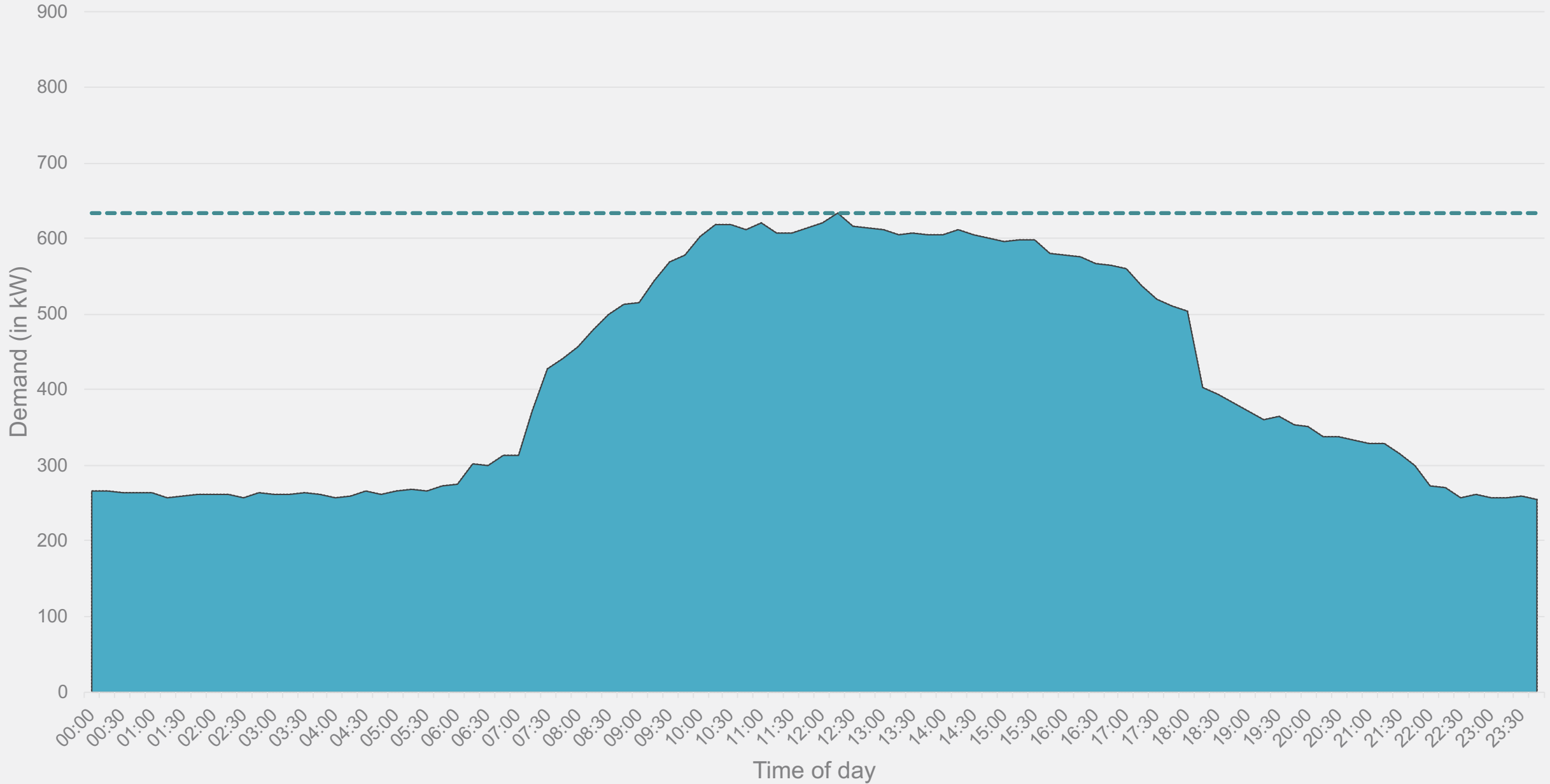
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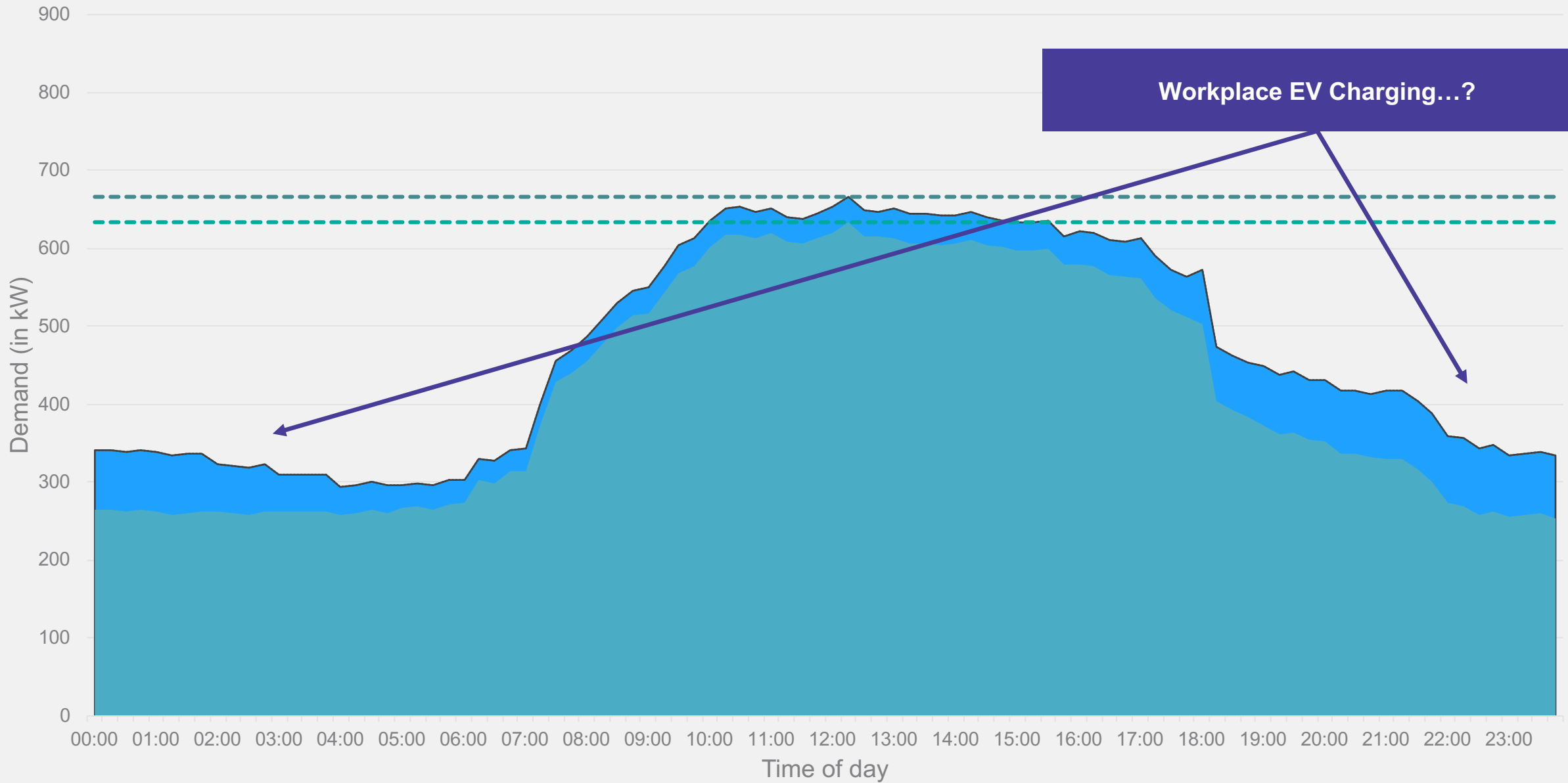
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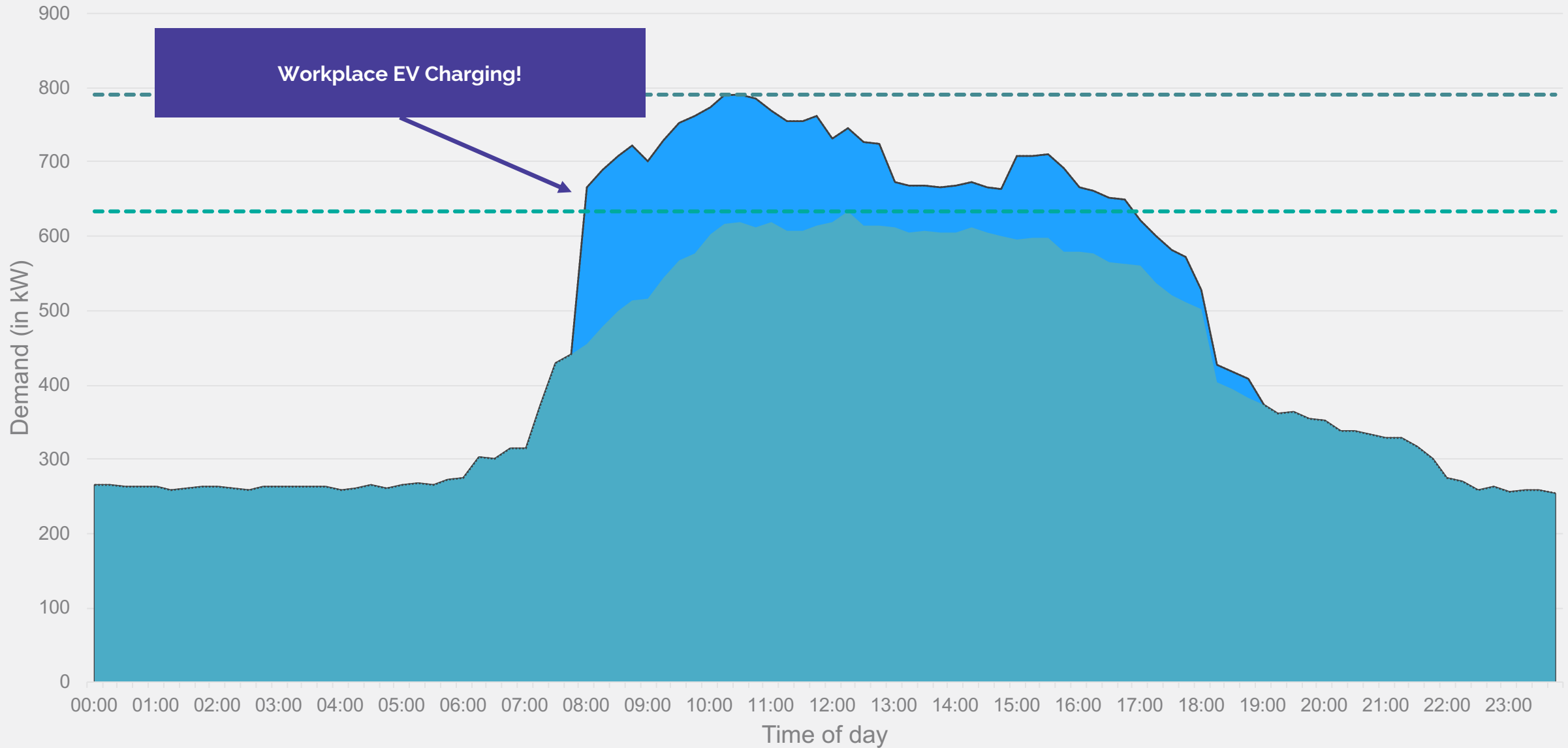
WORKPLACE



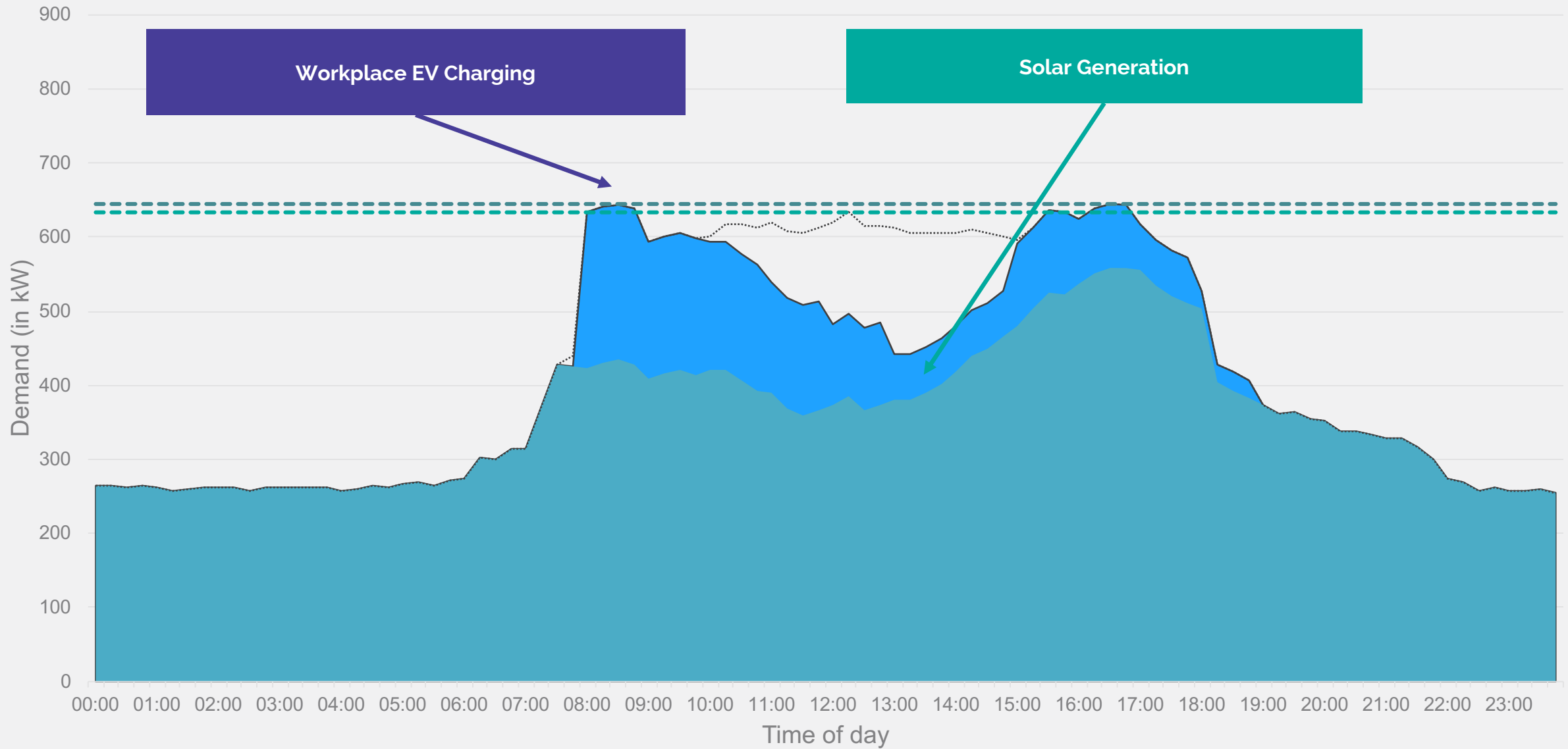
WORKPLACE



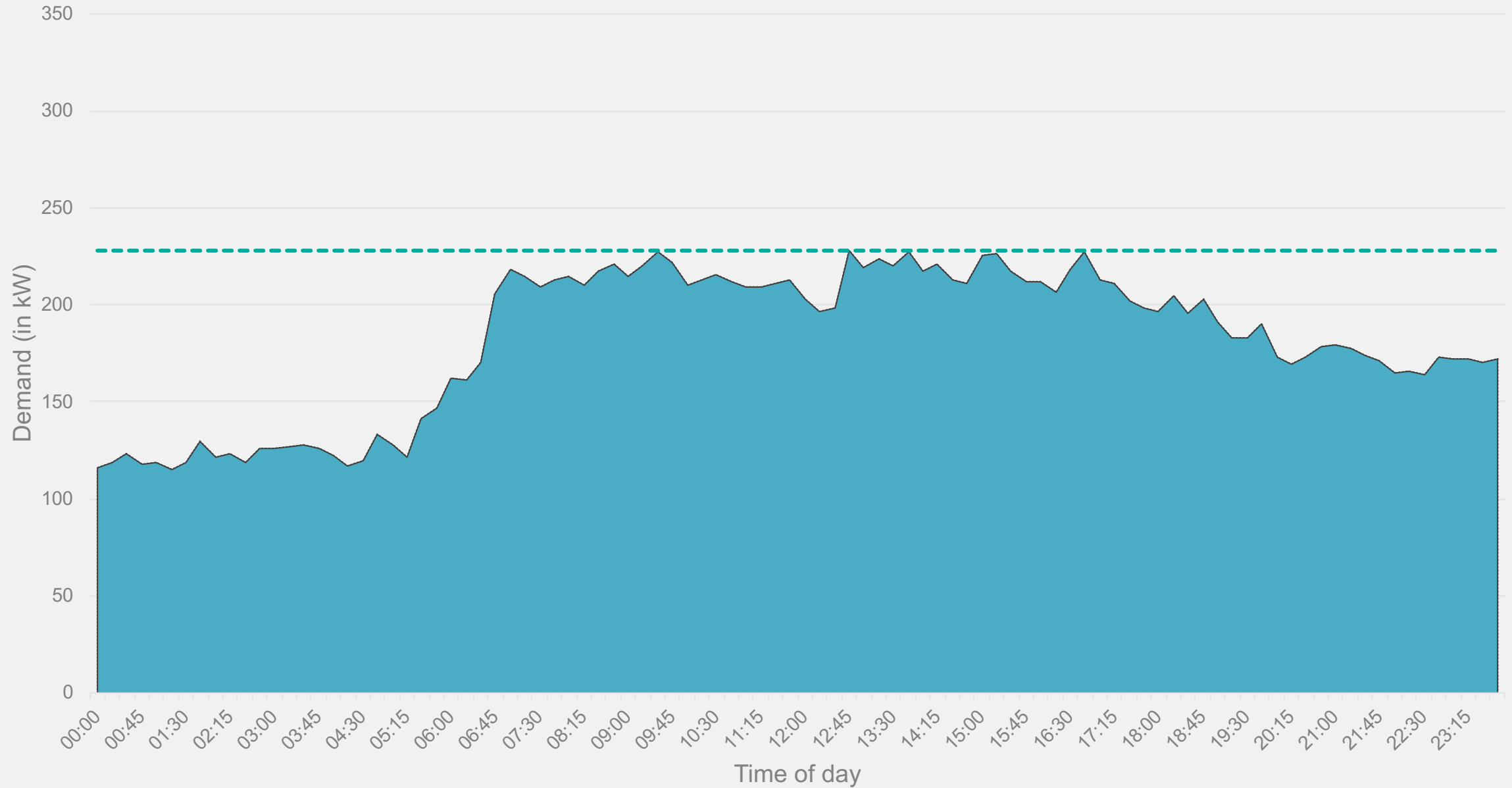
WORKPLACE



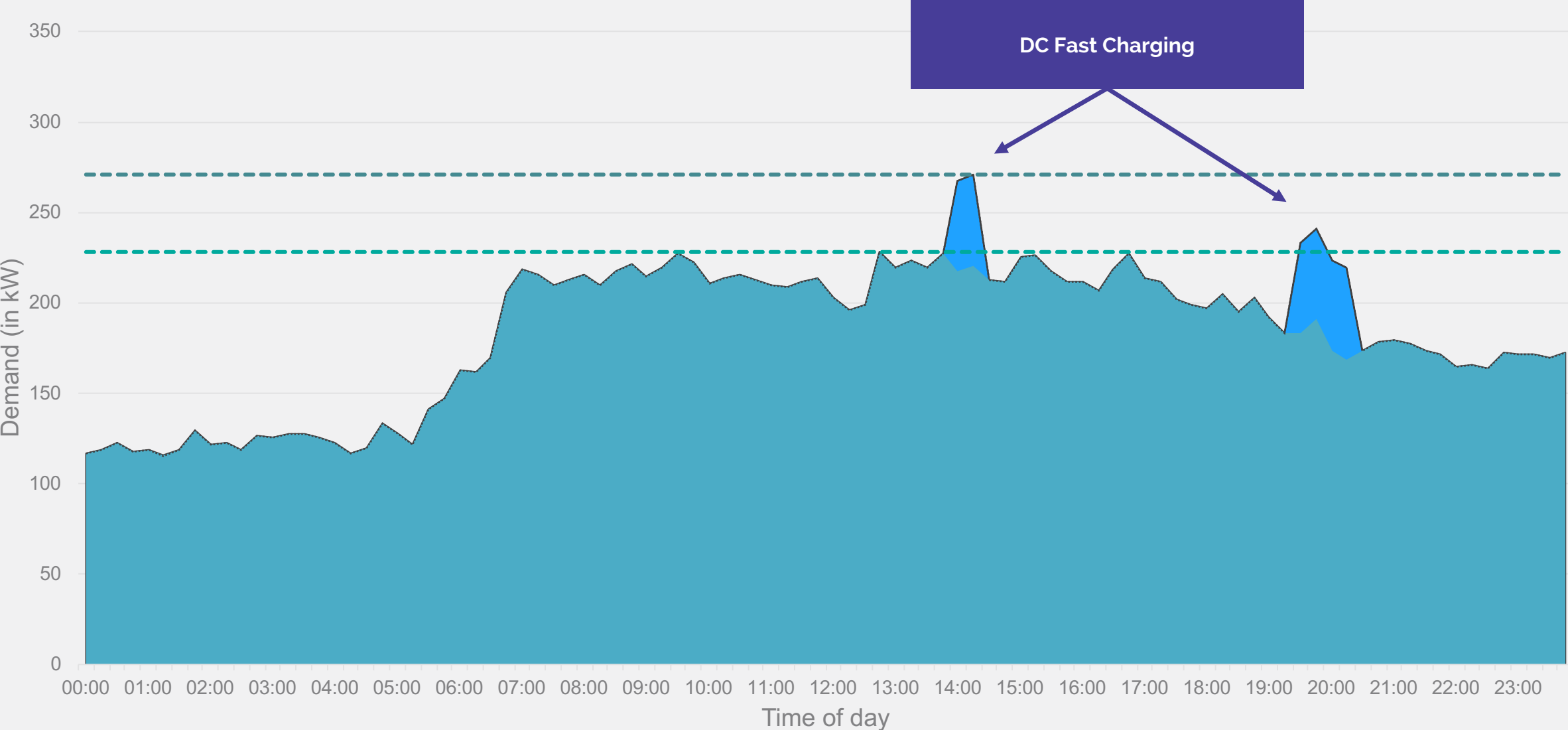
WORKPLACE



RETAIL



RETAIL



Facility Side: Summary



Existing load shape varies by facility type, location, and existing DERs



Type of EV charging depends on facility type

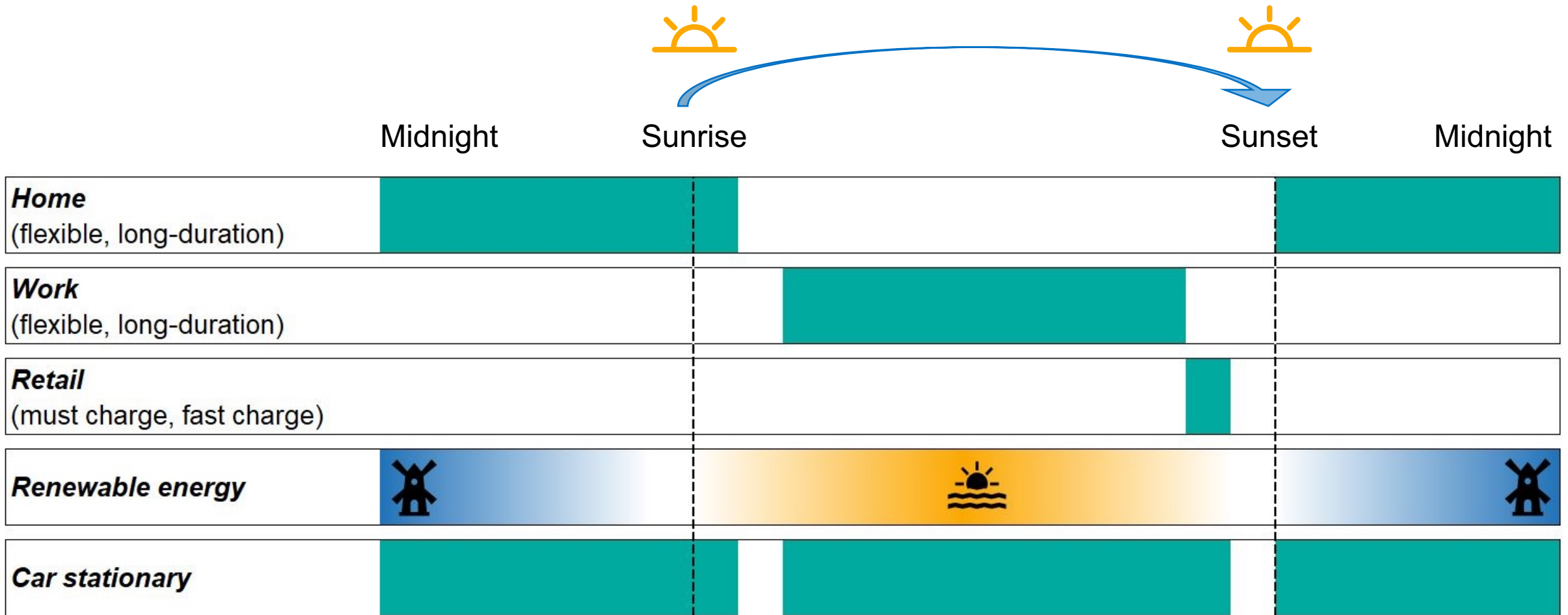


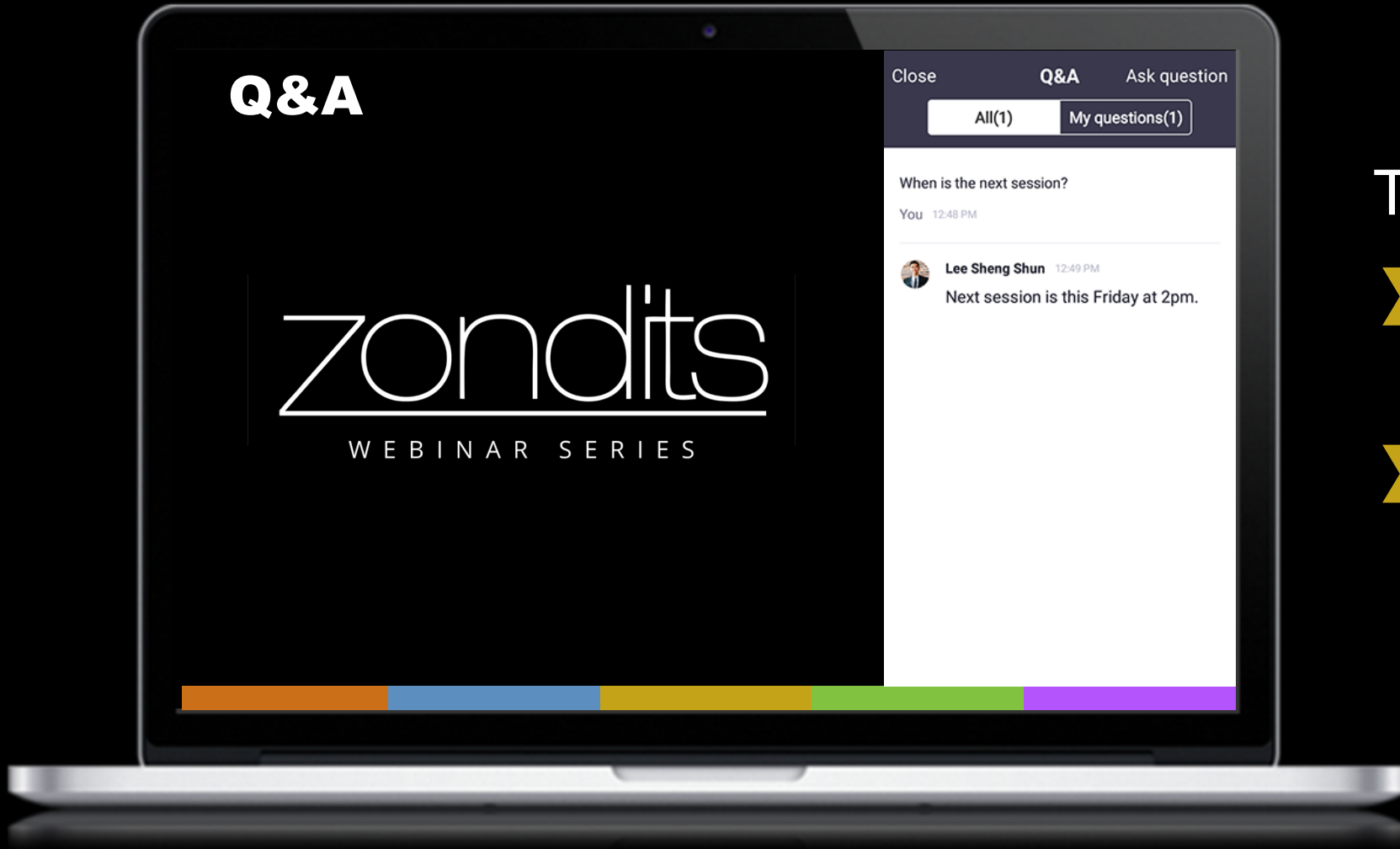
Charging load management solutions vary by driver population



Modeling impact of EV charging is case-by-case, lends itself well to flexible, modular tools

A DAY IN THE LIFE OF AN EV





To ask a question:

- Type your question into the Q&A box.
- Click Send.

THANK YOU FOR JOINING US TODAY!

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