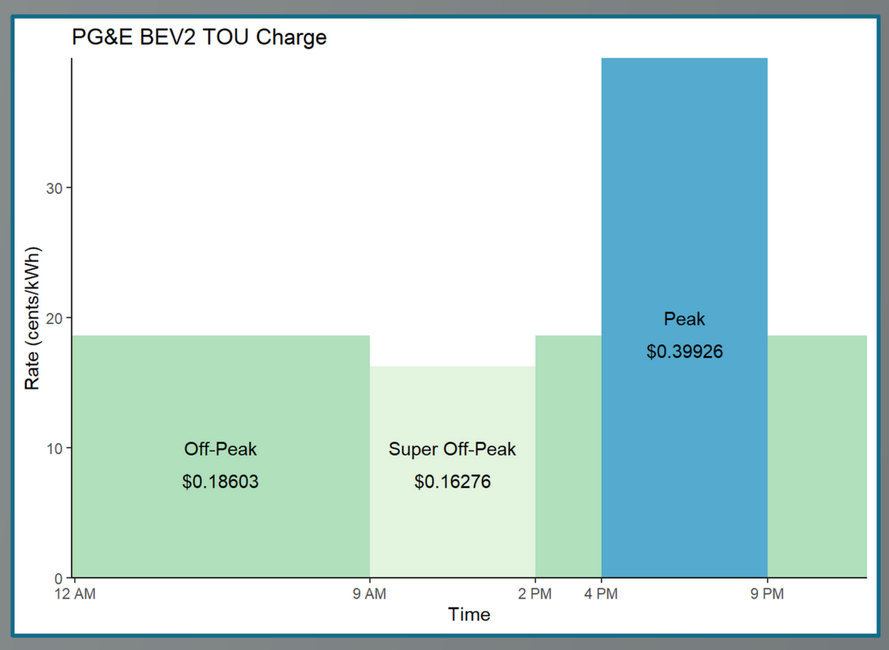
OPTIMIZING CHARGING HABITS TO REDUCE COSTS FOR COMMERCIAL FLEET OPERATORS

PROTERRA

As fleets continue to electrify, utilities must create rate structures that promote grid health and inspire further investment in electric vehicles. EV fleets present unique electricity consumption behaviors characterized by predictable charging patterns and dramatic demand fluctuations. These behaviors, if properly harnessed, can offer utilities an opportunity to balance the load on the grid. Our study explores how our fleet customers modify their charging to take advantage of various financial incentives such as Time-of-Use (TOU) and demand charges, which in turn helps utilities manage these fluctuations effectively.

TOU Rate Structure Example



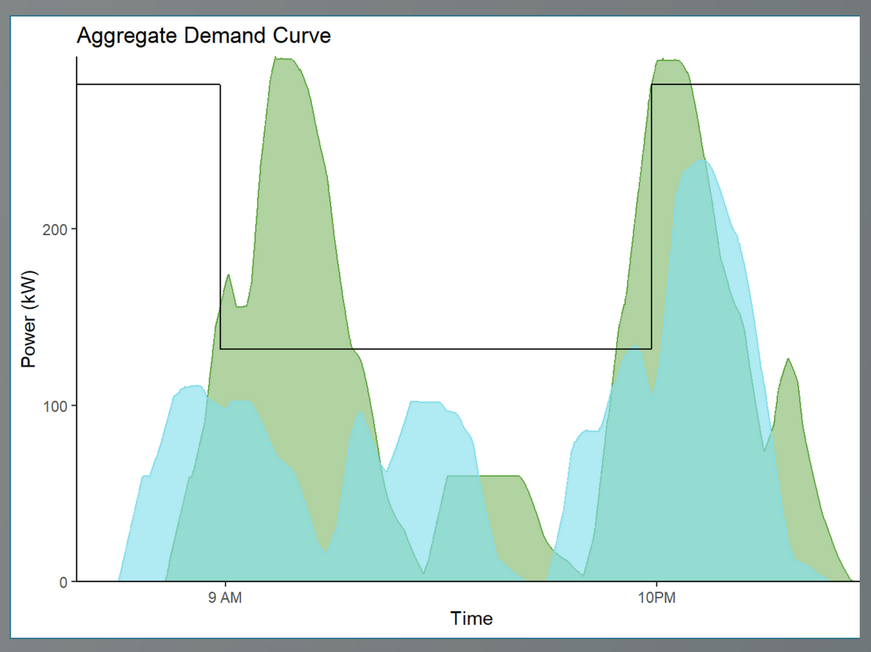
Time-of-Use Component

This EV subscription rate plan includes time-of-use (TOU) charges where customers pay less than half of the “on-peak” rate during “off-peak” and “super off-peak” hours.

- Peak: 4 PM – 9 PM daily
- Off-Peak: ALL OTHER TIMES
- Super Off-Peak: 9 AM – 2 PM daily

Given the magnitude of the on-peak charge, customers can significantly reduce their monthly electricity bill by avoiding charging their vehicles during the 4PM – 9PM “on-peak” window.

TOU + Demand Charge Customer Case Study



TOU + Demand Charge Customer Case Study

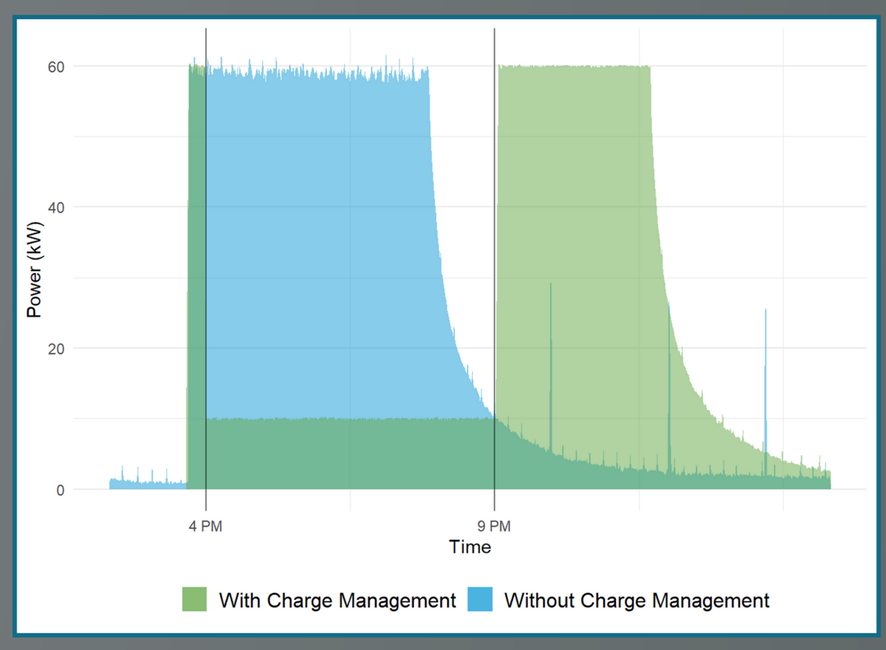
A Mid-Atlantic based utility company has a large general service rate structure with demand and TOU charges. The on-peak window for this rate structure is over 12 hours each day, and the on-peak charge is only $0.022/kWh higher than the off-peak charge. Peak Window: EDT: 9AM – 10PM daily or EST: 6AM – 10PM daily

The goal: reduce maximum charging during the on-peak window.

The Solution: A charging strategy with two demand limits to optimize costs:

- 1.132kW limit during the on-peak window to reduce energy consumption and spread charge sessions over a longer period of time
- 2.282kW limit during the off-peak window to limit overall demand charges

Proterra Customer TOU Charging Load Curve



TOU Charging Case Study

One Proterra customer based in Southern California finishes its routes around 3PM. For operational reasons, the vehicles are plugged in just before 4PM, right at the start of the Peak Period. This caused the majority of charging sessions to occur during the on-peak window.

The customer used Valence charge management to automatically shift charging until after 9PM. **The proportion of on-peak energy consumption dropped by over 40 percentage points, cutting the customer’s electricity cost by over 21%.**

Conclusion

As commercial fleet operators expand the electric portion of vehicles in their fleets, controlling energy costs become increasingly important. Proterra supports customers with managed charging by performing fleet modeling and utility bill analysis to determining optimal charging strategies. These strategies are then implemented for customers using the Proterra Valence™ Fleet and Energy Management platform. Through its smart energy management capabilities, Valence ensures that fleet vehicles are charged and available when needed, while minimizing electricity costs and impacts on the grid.

PROTERRA VALENCE™ FLEET & ENERGY MANAGEMENT