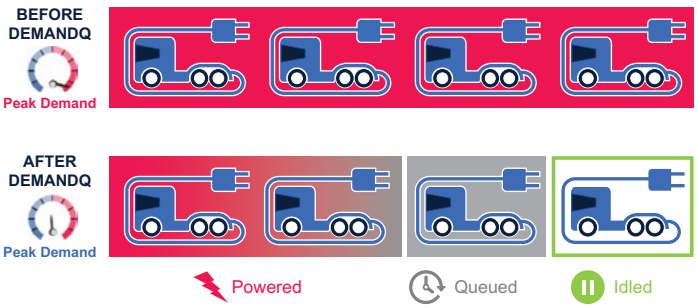
DEMANDQ

Intelligent Demand Optimization for EV Fleet Charging

DemandQ's patented Intelligent Demand Optimization SaaS currently serves 50 million square feet of diverse commercial property across 46 states in the US. In response to the rapidly expanding deployment of EV fleets, DemandQ has fully integrated its services with the Open Charge Point Protocol, enabling 24/7/365 reductions in electric utility costs and associated operational risks for commercial, industrial and municipal EV customers.

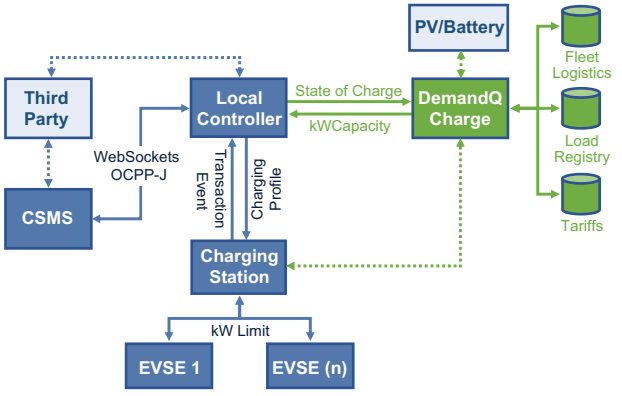


Redistributes the timing and use of power with **Intelligent Demand Optimization dramatically reducing peak demand charges**

DemandQ's services manage EV generated peak demand at the point of charge, maintain the primary on-time operational objectives of fleet management, and ensure the fulfillment of the target charge state of each EV battery in the fleet.

Charging sites are being installed as an auxiliary service in retail and commercial settings throughout the US. These EV stations often share the same grid power source as the business site. DemandQ's Intelligent Demand Optimization cloud service automatically adapts to the entire load presented by these complex sites, holistically mitigating coincident peak demand in near real time.

DemandQ integrates with the EV charging environment through an OCPP-compliant Local Controller. OCPP-J transactions are routed to and from the Local Controller, which in-turn governs the charging profile of the Charging Station EV Supply Equipment. Inputs to DemandQ's system include the current and desired state of charge, continuously updated fleet logistics, current system capacity, and governing utility tariffs.



OCPP-J transactions are routed to and from the Local Controller, which in-turn governs the charging profile of the Charging Station EV Supply Equipment (EVSE). Multiple configurations can be enabled with this architecture.

Case Study: Baseline versus DemandQ EV Optimization

This case study analyzes the impact of DemandQ's technology upon a charging station with four EVSEs rated at 350 kW.

Scenario: Twelve fleet vehicles with 550 kWh batteries arrive and depart according to a pre-determined schedule, with a target 80% state of charge upon departure. Each of the vehicles in this analysis have a rated capacity of 290 kW.

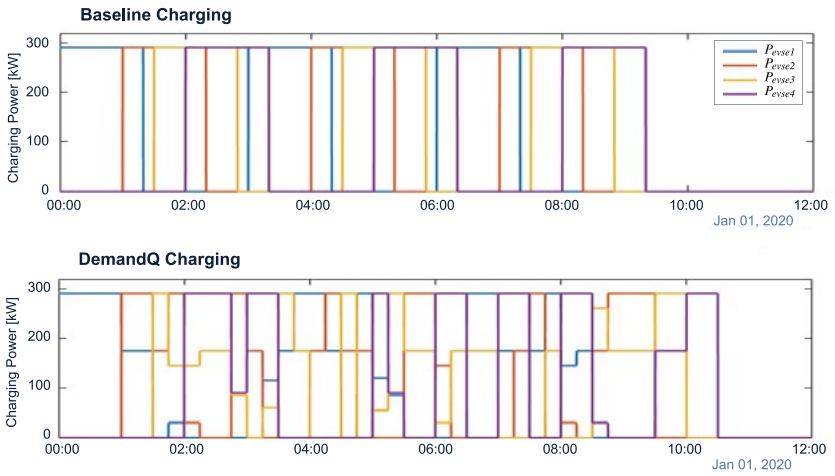
Assumptions: Each EV can remain on-station charging at a variable rate for up to 1.9 times the minimum time required to achieve 80% charge without disrupting the operational schedule of vehicles in the queue.

EV Schedule (starting SoC: 10%; target SoC: 80%)

EVSE	Arrive	Depart	Arrive	Depart	Arrive	Depart
1	00:00	02:30	03:00	05:30	06:00	08:30
2	01:00	03:30	04:00	06:30	07:00	09:30
3	01:30	04:00	04:30	07:00	07:30	10:00
4	02:00	04:30	05:00	07:30	08:00	10:30

The baseline charging plan achieves the desired state of charge by providing the maximum power allowed for each EV (up to 290 kW). The EVSEs provide a constant level of power from the time the vehicle arrives, right up until it reaches its target state of charge. All departure schedules are satisfied.

The DemandQ charging plan assesses the current and future needs of each EVSE, and dynamically optimizes power allocation. As a result, the amount of power for each EVSE is dynamically optimized throughout the charging period. Departure schedules and target state of charge are maintained.



Comparative Performance Analysis

DemandQ's integration and inter-operations with EVSEs has a dramatic impact on the 15-minute moving average used by utilities to compute demand charges. As detailed in the above graph, by implementing DemandQ's Intelligent Demand Optimization, the coincident peak demand of the Charging Station in this study is reduced by over 40%. Applying the nationwide average of $11/kW, DemandQ's algorithm would save over $6,000/month per a Charge Station of this type.