Electric Era

Mitigating demand charges with a smarter approach to EV charging

Chris Speet
Enterprise AE
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For public EV fast charging to scale sustainably, charging needs to be economical. For retailers who own and operate EV charging stations, their customers expect the same value and affordability at the charger as they do across the entire shopping experience. Delivering value in EV charging, however, requires controlling the single biggest driver of operating cost: how a site interacts with the electric grid.

Providing consistently low charging prices depends on managing two realities of EV fast charging: high power demand and the complex tariff structures that govern it. Demand charges, coincidental peaks, and billing-demand-based energy blocks can all introduce significant volatility into operating costs. At a single location, these fluctuations might be manageable or absorbed, but at scale, these dynamics are matters of consequence. Without the right technology, it becomes increasingly easy to lose control of operating costs, even in an otherwise high-performing charging program.

To meet pricing expectations at scale, charging infrastructure must shape and stabilize the site's relationship with the grid, smoothing peaks, controlling import, and keeping costs predictable as utilization grows. This requires not only energy storage, but a system capable of dynamically managing how that storage interacts with the grid and the vehicles. Only with that level of control can an EV charging program sustain the economic value proposition.

This paper addresses how retailers can maintain the value promise while scaling a national EV fast charging program under diverse and often unforgiving utility tariffs. It examines the three dominant cost drivers in detail and shows how integrated battery storage and load management can reshape each of these dynamics. It also explores how this approach unlocks otherwise inaccessible tariffs, enables high-power stations at power-limited sites, and avoids the pitfalls of "bolt-on" battery solutions. Taken together, the analysis illustrates a path to deliver affordable, predictable charging prices at scale while keeping grid exposure under tight control.

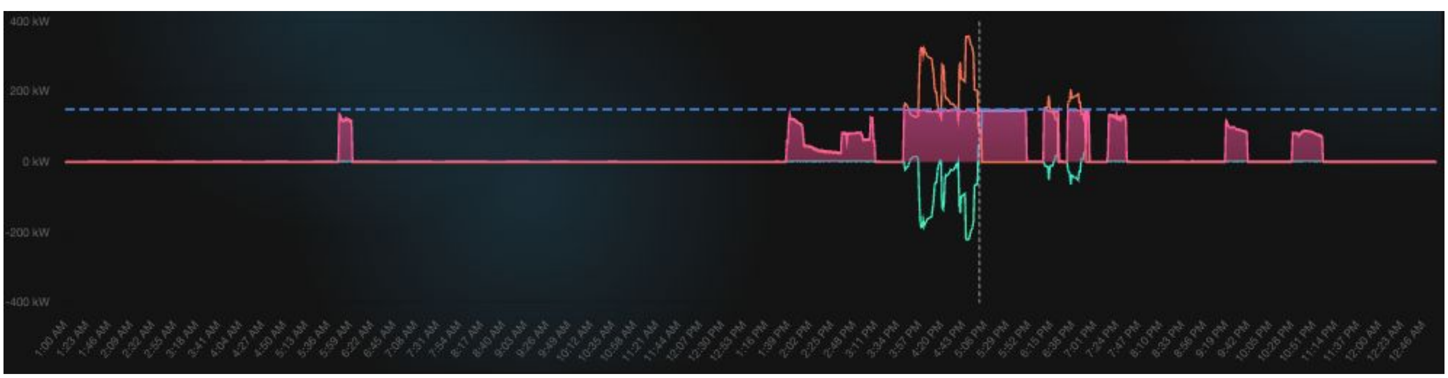
01 Classic Demand Charges

A demand charge is a fee based on the highest level of power (kW) a site draws from the grid during any 15-minute (or 30-minute) interval within the billing month. Instead of tying the charge to when the overall grid is peaking, the utility charges for the site's individual peak, regardless of when it occurs. Even if that maximum load is reached only once, for example, during a brief surge in power, that single moment sets the demand charge for the entire month. For traditional stations, these demand charges can cripple financial performance, particularly in the early years of operation when utilization is low, because a single brief spike in demand can set a high monthly billing peak, forcing fixed demand costs to be spread over a relatively small volume of energy sales.

Electric Era Approach

The Electric Era station is configured with a configurable grid-import limit which is a preset cap on how much power the site is allowed to draw from the utility at any moment. Retailers can set that limit based on the demand charge strategy for the site. The battery supplements any additional power needed above that limit so that vehicle charging can still occur at high power levels without increasing the site's measured peak. As a result, even if the station delivers 600 kW of total output to vehicles, the utility only ever sees the capped grid draw. The battery absorbs short spikes, fills in during clustering events, and ensures that monthly demand charges remain tied to the predictable, intentionally limited grid import, not the moment-to-moment variability of driver load.

This image (below) shows an Electric Era station with a name plate of 600 kW and a fixed grid limit of 150 kW (blue dotted line). The grid serves all demand under 150 kW and the battery fills in utilization above that line. Without this cap, one busy 10-minute window can set your billed demand at the full 600 kW.



Demand Charge Case Study

Assume a typical site is supporting ~35 sessions per day (SPD). Under that utilization profile, the retailer can set a station-level grid-import cap (e.g., 150 kW) that reflects the site's demand-charge strategy, and let the battery supply incremental power above the cap as needed.

Now apply that to a concrete case study: Puget Sound Energy (PSE) and its Large Demand General Service rate. Beginning January 29, 2026, the winter demand charge is $21.63/kW, so a 600 kW site peak equates to about $12,978/month in demand charges. With Electric Era's import cap in place (e.g., 150 kW at ~35 SPD), the station can preserve the driver experience while keeping the utility-metered demand anchored at 150kW $3,245/month, a reduction of roughly $9,734/month (~$117k/year) at a single site.

When forecasting station economics, it's important to recognize that utilities frequently increase demand charges over time. In the PSE example, the demand charge rises in January 2026 from $16.27/kW to $21.63/kW (winter) and from $10.84/kW to $14.42/kW (summer) which, without mitigation, flows straight into higher driver prices or a weaker station P&L. Because tariffs evolve, Electric Era's grid-import cap is configurable, so the retailer can flex the cap seasonally, by utility, or as utilization grows to continually optimize demand-charge exposure while preserving the driver experience.

02 Coincident Peak

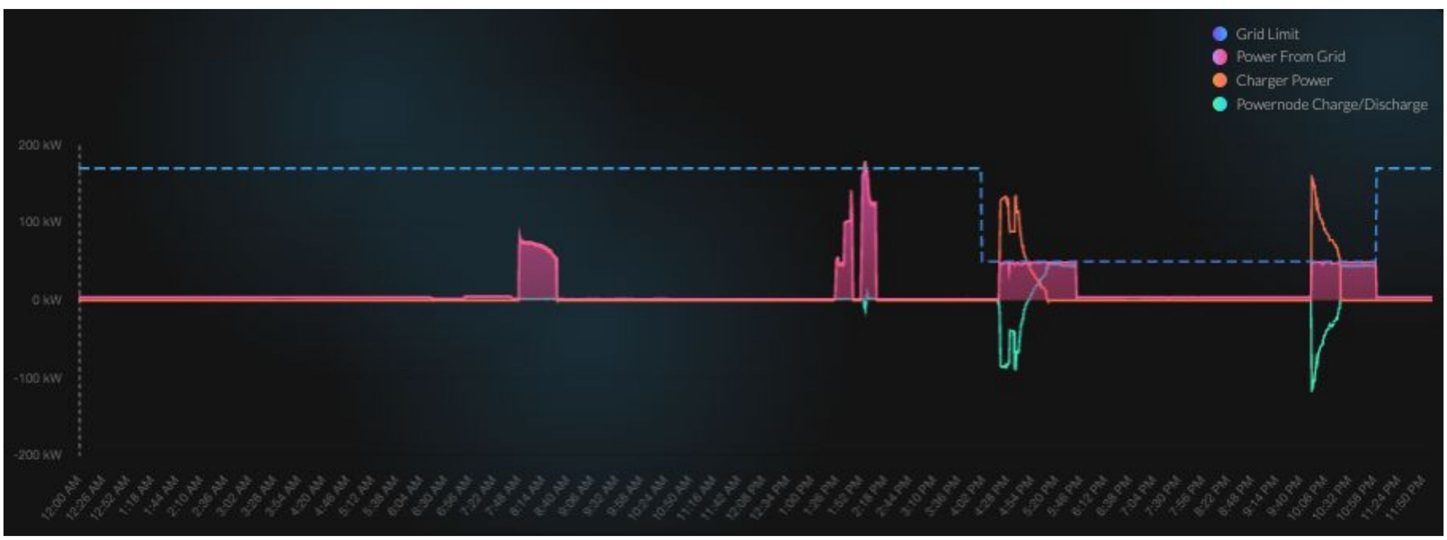
A coincident peak demand charge is a fee based on how much power a site is drawing at the exact time the utility's entire system (or a defined region) hits its monthly or annual peak load. Instead of charging for the site's own highest 15-minute demand, as with a standard demand charge, the utility charges for demand during its system peak event. Many utilities do not provide advance notice and calculate the coincident peak after the fact by identifying when the system peak occurred. Examples include Central Maine Power and Versant Bangor Hydro.

In practice, the financial impact is the same as a classic demand charge: the site is still penalized for being at high kW during a short window, only here the "window" is defined by the grid's peak, not the site's.

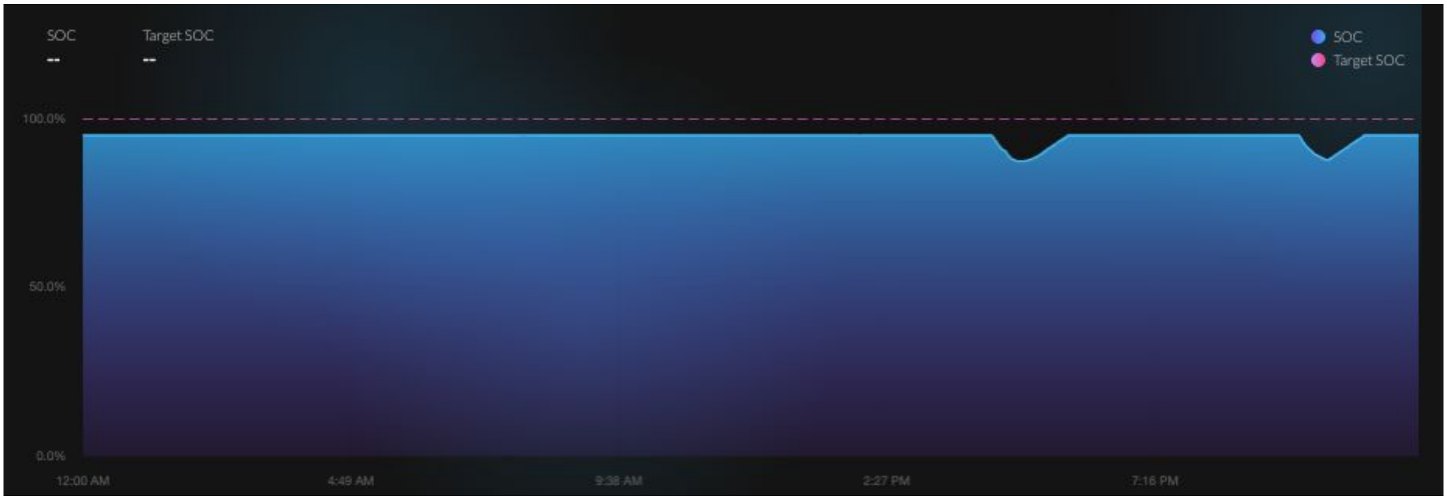
Electric Era Approach

Historical data (publicly available from the utility) reveals when the coincidental peak is likely to occur. Let's assume this is between 5pm and 7pm. The station is configured to restrict the amount of power drawn from the grid during the times that the coincidental peak is likely to occur. During these times the battery is used to supplement the grid power. Outside these times the station operates as normal.

Below is an example of one of Electric Era's stations reducing the grid limit (blue dashed line) between pre-set hours. When the grid limit is reduced and additional power is required it is taken from the battery.



Below is the corresponding impact to the battery state of charge (SOC) during these sessions.



03 The Demand Embedded Rate

A demand embedded rate is a pricing structure where the cost of demand is built directly into the energy charges rather than shown as a separate $/kW line item. Instead of billing explicitly for the highest 15-minute demand, the utility uses Billing Demand to size a series of "hours-of-use" energy buckets and applies different prices to each block. The higher the Billing Demand, the larger these buckets become, meaning more energy must be sold before reaching the lower-priced tiers. In practice, this causes low-utilization sites to pay high effective energy rates, while high-utilization sites with controlled demand quickly access very low marginal costs. The demand charge is still present, but it is hidden inside the energy pricing through the structure of the blocks. Good examples of this type of rate include Georgia Power and Salt River Project.

Electric Era Approach

The Electric Era battery keeps Billing Demand low and stable, which is critical under a demand-embedded rate. By shaving short spikes and capping grid draw, the battery prevents bucket sizes from ballooning and keeps more energy in the cheaper blocks. As utilization grows, the station can deliver higher throughput whilst controlling peak kW, unlocking consistently low marginal costs and avoiding the hidden demand penalties built into this rate structure. Imagine a demand-embedded rate where:

Energy in Block 1 (the "expensive bucket") is $0.20/kWh
Energy in Block 2 (after you've used up Block 1) is $0.10/kWh

With unmanaged demand, your Billing Demand might be 600 kW, so Block 1 is sized at 60,000 kWh. If your site only sells 20,000 kWh that month, you never leave Block 1; every kWh is stuck at $0.20, so your effective cost is $0.20/kWh. With Electric Era capping grid draw at 150 kW, Billing Demand drops and Block 1 might shrink to 15,000 kWh. On the same 20,000 kWh sold, 15,000 kWh are at $0.20 and 5,000 kWh are at $0.10, bringing your effective cost down to $0.175/kWh. That directly translates to a lower everyday cost for the driver.

04 Other Inaccessible Rates

Without a battery, station operators are typically limited to a narrow set of eligible tariffs, most often a variant of a Large General Service rate. As illustrated previously, an integrated battery can be configured in multiple ways to manage demand and grid interaction, expanding the range of viable rate options for a given site. There are numerous examples of this across U.S. utilities; one representative case is outlined below.

Electric Era Approach

By way of example, take the City of Longmont, CO. The utility offers two applicable rates, any customer exceeding 800 kW of demand in two consecutive months is automatically placed on the Commercial Coincident Demand (CCD) rate. For a well-utilized DCFC site without a battery, CCD would typically be the only viable option. Sites able to hold peak demand below the 800 kW threshold remain eligible for the Commercial Demand (CD) rate as well. The optimal rate depends on actual utilization patterns, but the presence of a battery provides the flexibility to select between them. Once a rate is chosen, the battery can then be operated to optimize overall economic performance.

Commercial Coincident Demand Rate (CCD)

Type	Non-Summer Rate
Customer Charge	$500.00
Energy Charge, per kWh	$0.0613
Coincident Demand Charge, per kW	$14.33
Maximum Demand Charge, per kW	$5.21

In this structure, CCD carries a lower demand charge but introduces exposure to an unpredictable coincidental peak. Under this rate, the battery would be operated as described in the "Coincidental Peak" section above.

Commercial Demand Rate (CD)

Type	Non-Summer Rate
Customer Charge	$128.00
Energy Charge, per kWh	$0.0621
Demand Charge, per kW	$17.75

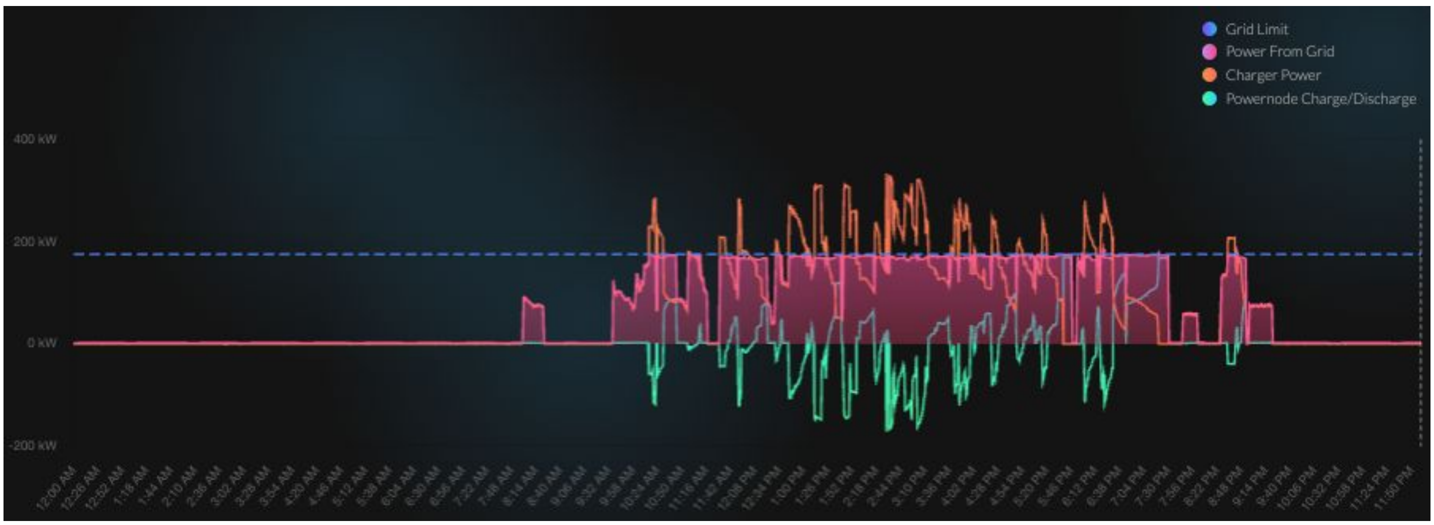
The CD rate includes a higher standard demand charge but removes exposure to coincidental peak events. Under this structure, the battery would be operated using the "Demand Charge" strategy outlined above.

05 Power Limited Sites

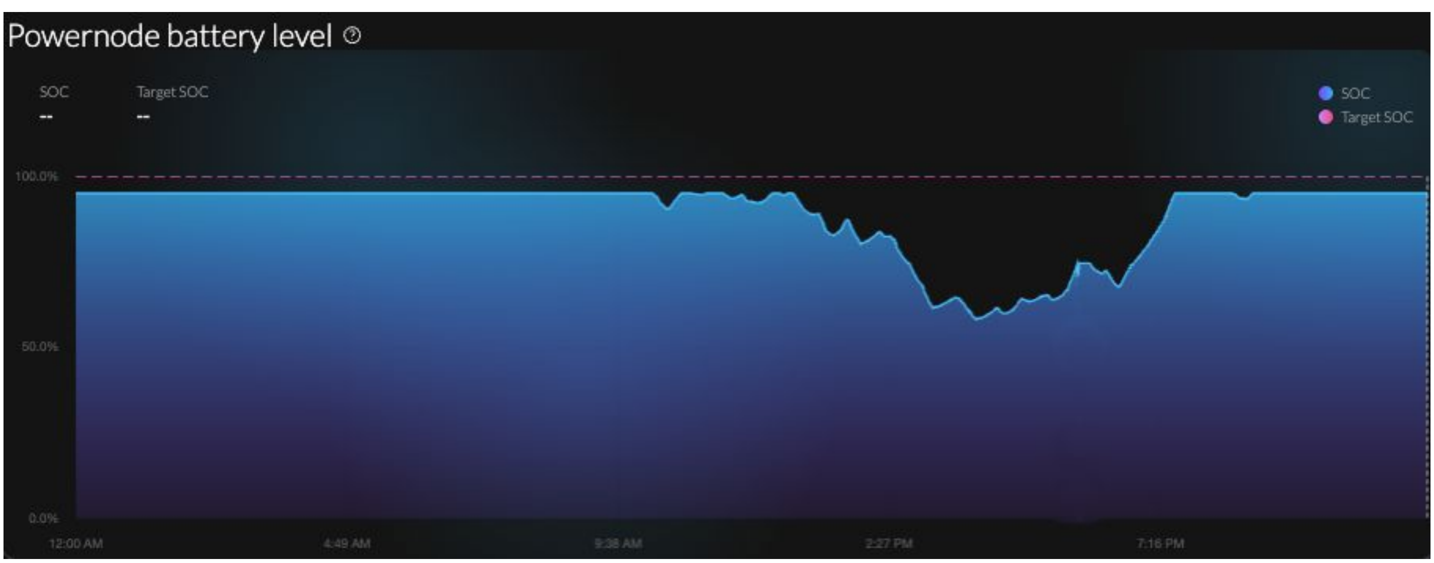
The Electric Era battery can also be used to build stations in locations where power is limited. In this case the battery is used to supplement the available grid power so the total overall power available to the chargers is sufficient to provide a fast charging experience for drivers.

Below is an example of a 3 dispenser/6 port Electric Era station serving 45 sessions on a Sunday afternoon at a major retailer. This site runs off a 175 kW grid connection (blue line) and is supported by a 379 kWh battery capable of 250 kVa.

If site utilization continues to grow, this customer will need to increase the amount of power sourced from the grid but this approach enabled them to build and operate a station while they waited for the utility to provide that power.



The corresponding impact on the battery state of charge during the same period.



06 Other Battery Solutions

Designing a truly reliable battery-backed EV fast charging system is much harder than simply “adding a battery.” Many groups have tried and failed because the real challenge is not the hardware itself, but the intelligence that orchestrates it: seamlessly managing power distribution between the grid, the battery, and multiple vehicles while maintaining a smooth driver experience and clear O&M oversight.

Other solutions also tend to treat the battery as a simple buffer rather than a fully integrated asset. They often cannot “power stack” grid and battery in the way Electric Era’s system does. A large 1 MWh pack, for example, can certainly reduce demand charges but only until it is depleted. At typical DCFC usage levels, that may equate to only a few dozen sessions before performance drops off and costs revert. By contrast, an integrated load management and power-stacking approach is designed to stretch each kilowatt-hour of battery capacity further, support higher throughput, and sustain economic performance over time, not just in the first handful of charging sessions.

We’re often asked if our battery system can simply be bolted onto existing charging sites. In most cases, the answer is no. What feels like the path of least resistance — i.e., retrofitting into a system that wasn’t designed for integrated load management — ends up being the path of most resistance: added complexity and risk in coordinating battery dispatch, protecting the grid connection, and maintaining uptime. It also introduces another vendor into the mix, increasing points of failure and creating more room for finger-pointing when something goes wrong.

07 Implications for Retailers

For large-scale retailers, these tariff dynamics are not edge cases or regional quirks; they are the default backdrop for a national EV charging program, where store footprint spans investor-owned utilities, plus a long tail of municipal and cooperative utilities. Grid risk is therefore not something that can be avoided by selectively siting stations; it is a structural feature of scaling EV charging across the portfolio.

The first implication is systemic exposure rather than isolated risk. Classic demand charges in one territory, coincidental peaks in another, and demand-embedded rates in a third all show up across the network at once. As the charging footprint grows, these local tariff rules roll up into a national cost structure. Without an integrated strategy to manage grid interaction, retailers will see accumulating site-level surprises that make it harder to uphold a consistent pricing proposition across markets.

The second implication is the need for repeatable grid strategies, not one-off fixes. The most durable approach is to develop a small set of standard “grid playbooks” that partners can plug into — i.e., battery-backed, load-managed configurations for challenging tariffs and power-limited sites, alongside simpler approaches where conditions allow. Electric Era’s architecture is designed to serve many of these playbooks, particularly where grid complexity or constraints would otherwise undermine price stability.

08 Conclusion: Enabling Strong Economics in EV Charging

As retailers scale national fast charging networks, the economics of each site will be shaped less by hardware nameplate rating and more by how intelligently that site interacts with the grid. Classic demand charges, coincidental peaks, demand-embedded tariffs, and power-limited interconnections all have the potential to erode margin and drive volatility into charging prices, especially in the early years of operation and at the rollout scale the retailer is targeting.

An integrated battery and load-management system changes that equation. By capping grid import, managing coincidental peaks, controlling Billing Demand on demand-embedded rates, and unlocking access to otherwise inaccessible tariffs, Electric Era's approach turns the grid from a source of cost volatility into a controllable input. The same platform also enables high-power stations at constrained sites, allowing retailers to reach priority locations earlier while still preparing for future utility upgrades.

For retailers, the outcome is not just a more resilient technical architecture, but a charging program that can support the company's core value promise. With the right grid strategy in place, economic value can extend from the aisles of the store to the EV chargers in the parking lot, delivering affordable, predictable energy to customers while preserving sustainable, scalable economics for the network.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