WHITE PAPER

Winning the EV Charging Race.

A Strategic Playbook for Charge Point Operators

September 2025
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Introduction

2024 marked a critical inflection point for the EV charging sector. While EV adoption has long been the engine of infrastructure expansion, this year challenged that momentum. EV sales growth slowed in key markets, while the pace of public charger deployment—fueled by intense competition and ambitious rollouts—outstripped demand. At the same time, high interest rates and growing investor pressure have forced a strategic shift: from top-line expansion to bottom-line performance.

For Charge Point Operators (CPOs), the message is clear—scale alone is no longer enough. In this maturing, capital-intensive market, sustainable success will depend on profitability, resilience, and smart allocation of capital. Investors are seeking evidence of disciplined growth strategies and robust site-level economics. Many operators are now facing underutilized networks and increasing cost pressures, prompting a hard look at the fundamentals of their business models.

This publication outlines BCG's Strategic Playbook for CPOs and investors—focused on the three pillars that drive competitive advantage: customer centricity, location quality, and operational excellence. These levers not only help to close today's profitability gap but also build defensible positions in a market heading towards consolidation. Read on to explore how leading CPOs are already rethinking pricing, infrastructure strategy, and cost control—and how you can act now to secure a winning position in the EV charging space. With more than $40 billion in value at stake by 2030—and almost $88 billion by 2035 across CPO and eMSP plays—the opportunity is substantial. Understanding how to win in this evolving EV charging landscape isn't just timely—it's imperative.

EV sales slowed in 2024, while public charger build-out exceeded demand

Market Evolution

Growth with Diverging Speeds, Low Utilization and Expected Consolidation

Global EV momentum remains strong—despite the 2024 slowdown, we still project electric vehicles[1] to reach 45% of global light-vehicle sales by 2030. Penetration will be uneven: China is on track for 80%, Europe nearly 60%, while the U.S. may struggle to exceed 30%. Infrastructure build-out mirrors this divergence: China surpassed 3 million public charge points in 2024, Europe crossed 1 million, and the U.S. is hovering near 200,000.

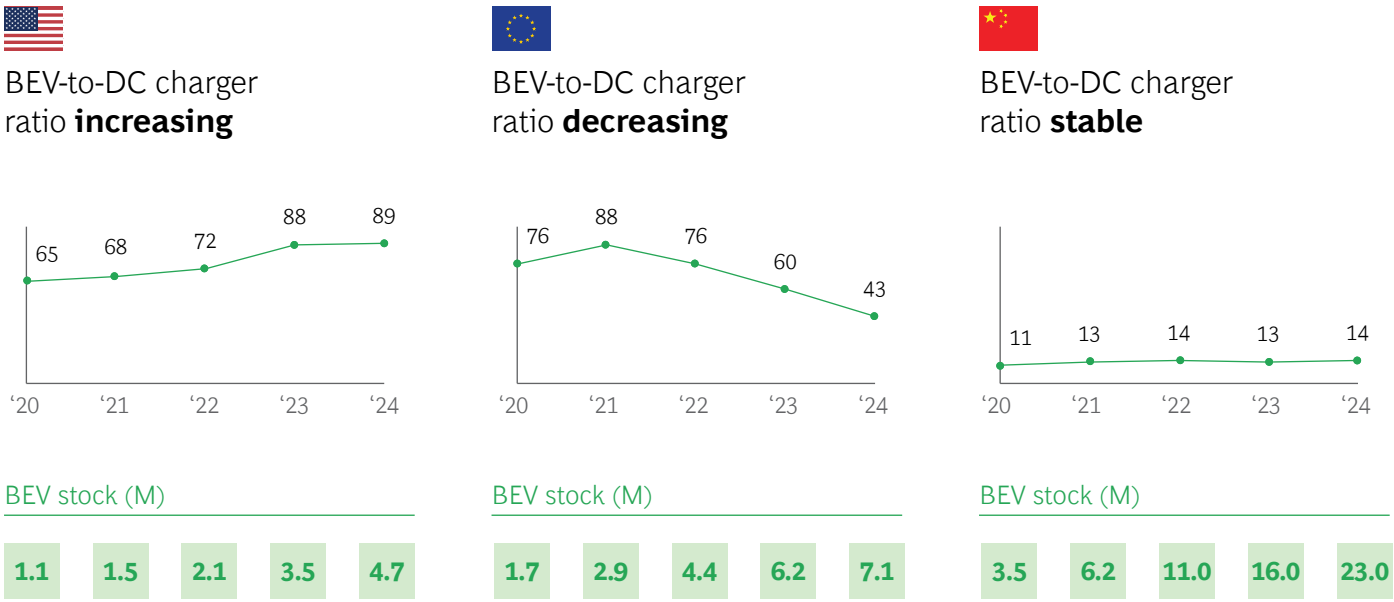
2030

EVs 45% of global sales

Also, the competitive landscape is fragmenting fast. In Europe, the top five high-power-charging operators controlled 76% of charging points in 2021; today their share has fallen to 32%. With more players chasing slower-than-expected demand, utilization is under pressure. As shown in Exhibit 1, Europe's BEV-to-DC-charger ratio dropped from 76:1 in 2020 to 43:1 in 2024, leaving many assets far below break-even. China's ratio has inched up from 11:1 to 14:1 over the same period, while the U.S. ratio went from 65:1 to 89:1, underscoring how a slower infrastructure rollout is amplifying under-supply even as EV adoption lags. Similar behavior has been experienced in the BEV-to-AC-charger ratio.

EXHIBIT 1

CPO utilization is under pressure especially in Europe and China



Note: Europe defined as EU 27+UK+EFTA countries
Source: EAFO; IEA; BCG analysis.

For CPOs and investors, the implication is clear: site growth alone will not guarantee returns. Winning now depends on shifting from footprint expansion to bottom-line optimization—deploying advanced pricing and loyalty models, doubling down on prime locations, and driving operational excellence. As pressure mounts and underutilized assets persist, we expect to see meaningful consolidation across markets, with scale, differentiation, and efficiency determining who stays in the game. Our Strategic Playbook details how to seize this opportunity—read on to position your portfolio for profitable scale and long-term leadership.

1. EVs, as defined in this document, include battery electric vehicles (BEVs) and plug-in hybrid/range-extended electric vehicles (PHEVs/REEVs)

Strategic Playbook

The Three Pillars of CPO Success

EV charging infrastructure is no longer purely a growth play. Leading CPOs are recalibrating their strategies, shifting emphasis from rapid expansion to sustainable profitability in response to rising investor scrutiny and a high-interest rate environment. Examples like EnBW scaling back its 2030 fast charger target and ChargePoint placing greater emphasis on cost efficiency highlight this evolution. Allego's voluntary NYSE delisting in 2024 further underscores how short-term capital market pressures are reshaping strategic priorities across the sector.

Beyond financial headwinds, CPOs must also navigate a complex operating landscape: regulatory fragmentation, a highly interdependent ecosystem, customer behavior and technological uncertainties—ranging from battery-swapping models to range-extended EVs and evolving charging use cases and charging speeds.

Success under these conditions hinges on a clear strategy and disciplined execution across three core pillars as shown in Exhibit 2. First, customer centricity remains paramount—leveraging data-driven pricing strategies and tailored loyalty programs is essential to attract drivers, increase charger utilization, and build long-term engagement.

Second, setting up the right locations is critical. Advanced geo-analytics enable the selection of high-demand sites, while thoughtful technical layout enhances user experience and maximizes throughput, driving both customer satisfaction and long-term site profitability.

CPO Success Pillars

Customer Centricity

Right Locations

Operational Excellence

EXHIBIT 2

Major questions and pain points of CPO CEOs can be solved along three excellence clusters

Major questions and pain points of CPO CEOs

- Which locations to secure?
- Which role will MW charging play?
- How to reach critical scale?
- How to reach profitability fast?
- How to loyalize the customer base?
- How to win against growing competition?
- What are the most attractive partnerships?
- Do I need my own app/eMSP offering?
- How to ensure "delivery" (quality, reliability)?

Three excellence clusters

Customer Centricity
- Advanced pricing
- Customer loyalty

Operational Excellence
- Energy procurement
- Uptime management

Right Locations
- Location Strategy ("where")
- Layout Strategy ("how")

Source: BCG analysis.

Finally, operational excellence—enabled by predictive maintenance, efficient procurement, and integrated energy management—ensures profitability at scale. The right hardware and software backbone is thereby crucial to operational excellence, powering uptime, responsiveness, and end-to-end performance.

Following these three pillars, CPOs can reach profitability while building sustainable and winning positions in a sector that is poised to continue to grow and consolidate in the coming years (we expect almost 6 million public charging points in China, more than 2 million in Europe, and more than half a million in U.S. by 2030).

Customer Centricity: Loyalty, Pricing, and Brand Differentiation

As EV adoption accelerates, customer expectations are evolving rapidly. Today's EV drivers demand transparency, seamless digital experiences, and tailored offerings. Regulatory frameworks like the EU's Alternative Fuels Infrastructure Regulation (AFIR) reinforce these expectations, mandating ad-hoc payment capabilities and transparent pricing. As energy systems evolve, operators face growing requirements for demand flexibility and variable electricity pricing. CPOs must respond by designing intuitive, customer-centric interfaces and pricing models that balance simplicity with sophistication.

Yet many CPOs remain overly anchored in supply-side thinking—focusing on energy costs and competitive pricing—while neglecting the nuances of driver behavior. Few CPOs are testing more advanced pricing schemes. Tesla's dynamic pricing pilots, adjusting rates based on live Supercharger utilization, and IONITY's tiered subscription model "IONITY Passport" are signals of a shift toward demand-sensitive pricing. Expect further experimentation: time-of-day pricing, loyalty-driven incentives, and eventually, behavior-based personalization need to become standard as CPOs seek to optimize both economics and user engagement. A recent pilot in Hannover, Germany, demonstrates the potential of time-of-day pricing: Enercity launched dynamic tariffs across 12 stations, where EV drivers can check next-day prices—set daily at 13:30—based on wholesale electricity rates. These tariffs not only reflect real-time system conditions but also encourage charging when renewable supply is high, creating a win-win for both grid sustainability and driver economics.

CPOs need to significantly elevate their data analytics capabilities to drive future success. Beyond pricing, loyalty and ecosystem integration including partnerships to create, for example, attractive foodvenience offerings will be critical to differentiate and generate competitive advantages. CPOs need to rethink their user experience and eMSP partnerships, requiring investment in digital platforms to embed charging into broader value propositions. The benchmark has already been set by successful fuel retail loyalty programs such as Repsol's Waylet—which offers tailored rewards across a vast partner network and has attracted over 9 million users since its launch in 2017—and Circle K EXTRA, which provides a seamless, tiered rewards experience that includes fuel, food, car washes, and EV charging, all in a single app or membership. For CPOs, creating emotional stickiness and brand preference is essential; without it, price alone will remain the primary battleground and ultimately drive down margins, as we have seen in other "price-driven" industries such as ride-hailing.

Right Locations: Geo-Analytics and Smart Design to Drive Utilization

While the sector's focus is shifting from rapid expansion to profitability, coverage and site quality remain critical differentiators—particularly for en-route and DC charging-focused CPOs. As many operators achieve baseline network coverage, the question is no longer only where to continue to expand and whether to integrate additional use cases, such as truck charging, but which existing locations warrant deeper investment to unlock greater utilization and return on capital.

The next wave of value creation will be driven by smarter deployment decisions. Instead of relying on intuition or simple heuristics, CPOs need to adopt data-rich geo-analytical approaches that simulate site-level demand potential. These models integrate proprietary usage data, third-party commercial insights, and open-source variables such as traffic flows, urban density, and proximity to key highway corridors to guide more precise site-level decisions.

Such sophistication is becoming a prerequisite for sustained competitiveness. In a capital-intensive environment, doubling down on the highest potential nodes—rather than

indiscriminate expansion—is what will separate winners from laggards in the evolving EV infrastructure landscape. A three-step geo-analytical approach as shown in Exhibit 3 identifies optimal locations for EV charging:

1. **First,** assess the current and future landscape of charging supply and demand by modeling vehicle movement patterns—whether general traffic or specific fleet behaviors—and overlaying existing charging infrastructure. This highlights critical supply-demand mismatches and pinpoints gaps in underserved corridors with high utilization potential.
2. **Second,** refine these areas by applying localized suitability filters, ensuring the presence of sufficient electric grid capacity, alignment with high-growth real estate developments, and strategic proximity to consumer adjacencies such as retail hubs, airports, and other high-traffic points of interest. This narrows the focus to zones that combine both feasibility and commercial attraction.
3. **Finally,** rank and prioritize the most promising areas by suitability, integrating road network dynamics to pinpoint specific, high-impact charging locations. This process yields a targeted, actionable list of top-priority EV charging locations optimized for both infrastructure efficiency and user convenience. In some cases, the optimal site may be an existing hub—despite competitor presence—where strong underlying demand and strategic positioning already make it a high-potential location.

Besides the location, the charging station layout is emerging as a key enabler of both brand visibility and customer experience. As the market matures, CPOs need to recognize that infrastructure design is not just a technical consideration—it is a strategic differentiator. We are seeing a shift towards modular station architectures that offer greater scalability, faster deployment, and improved cost efficiency (in fact, we expect ~30-38% cost advantage for modular charging layouts vs. stand-alone chargers by 2030). As highlighted in the recent BCG and EcoG publication **Will Modular Architecture Be the Holy Grail?**, this design philosophy is gaining traction across the industry.

EXHIBIT 3

Three-step geo-analytical approach to identify prime locations

1. Model Charging Supply and Demand Landscape

Model vehicle patterns for all traffic or specific fleet

Overlay existing charger capacity

Identify key supply/demand gaps

2. Overlay Local Suitability Layers

Ensure sufficient electric grid capacity in area

Prioritize high-growth real estate areas

Include proximity to retail centers, airports, and other POIs

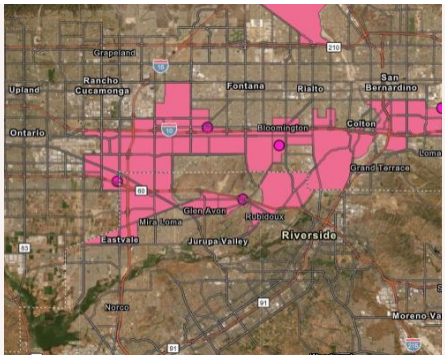
3. Point out Top Locations for Charging

Rank and identify most suitable areas for EV chargers

Locate optimal EV charging sites on road network

KPI outputs from optimization demonstrate net impact of new chargers in an area

Sample Output KPIs and Visuals



85k Vehicle trips within 5 minutes of location

4 Existing DC CPs within 5 minutes of selected location

80% Of chargers within 1 minute of highway

Source: BCG analysis.

Smart station design is proving to be a powerful lever for driving higher utilization. Purpose-built layouts that prioritize visibility, ease of access, and intuitive traffic flow enhance the driver's experience and increase throughput. Design elements such as solar canopies and one-way layouts not only optimize space and energy efficiency but also reduce friction for users—making stations more attractive, more functional, and ultimately more profitable. Fastned stands out as a compelling example. The company has developed a proprietary station layout that integrates highly recognizable solar canopies, aligned with its brand identity and enhancing roadside visibility. Thanks partly to the smart design, average annual MWh delivered per Fastned station has increased +37% from Q1 2022 to Q1 2025. No doubt station design plays a critical role in answering the fundamental question every CPO must address: "Why should a driver choose to charge here—and not somewhere else?"

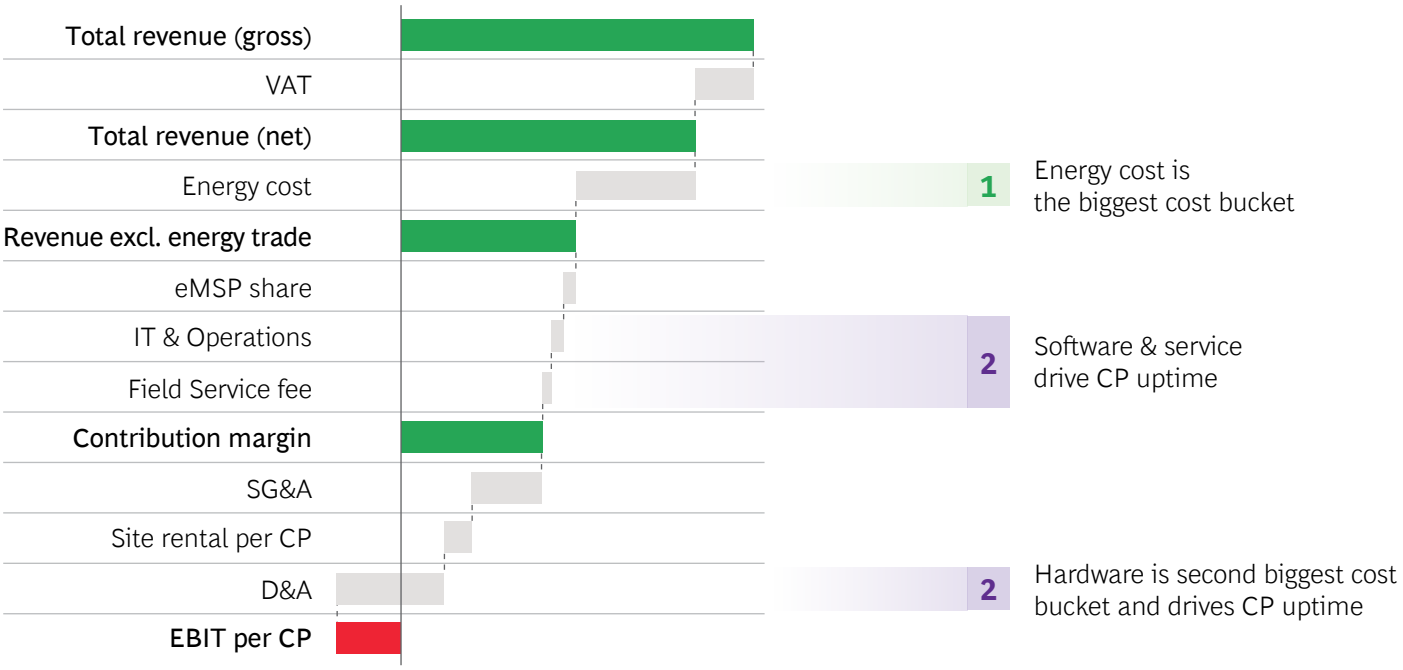
Operational Excellence: Cost Control and Resilience

As CPOs look beyond utilization and pricing levers, two domains stand out for P&L optimization: energy procurement and uptime management (see Exhibit 4). Both areas offer significant opportunities to reduce costs, enhance resilience, and protect margins in an increasingly capital-intensive and competitive environment.

EXHIBIT 4

Two key strategic processes enable P&L optimization for CPOs

Unit Economics - Public - HPC - Europe, 2024, Indicative



Key strategic processes for CPOs

1 Energy Procurement

Managing profitability through cost control

Exploring alternative energy procurement approaches

2 Uptime Management (HW, SW, Services)

Ensuring high-quality hardware procurement

Improving software use & service operations

Source: BCG case experience; BCG charging model.

On the energy side, CPOs need to embrace integrated strategies that blend on-site generation, storage, and smart consumption. Solar canopies are being deployed to reduce grid dependency and emissions, while battery systems help smooth demand peaks and provide flexibility in load management. Long-term PPAs are gaining traction as a means of locking in competitive, stable electricity prices. Hardware and software advancements now enable intelligent load balancing—distributing power efficiently across chargers while integrating renewables and storage. Allego, for instance, has secured 10-year PPAs[2] to anchor cost-effective operations, while Recharge's partnership with Sparkion is bringing high-power chargers with embedded battery solutions to market. To maximize the value of energy procurement, CPOs should also integrate hedging strategies with pricing and marketing levers—aligning cost control with demand generation in a more coordinated and data-driven approach.

Ensuring station uptime is equally critical. This requires robust strategies in field force management, predictive maintenance, hardware procurement, and end-to-end software integration—seamlessly connecting equipment, back-end systems, and user-facing applications. Procuring the right hardware is not a trivial task given the various technological trends and offers on the market: there are continuous advancements in the hardware paired with different functionalities and price points.

Our project experience shows that hardware procurement is a critical lever for CPOs to improve capital efficiency. This includes running structured tenders and conducting rigorous "Should-Cost Analyses"—dissecting charger components down to material and weight level to inform fact-based negotiations. Strategic, early-stage collaboration with hardware manufacturers can unlock even greater value. A leading example is EVGo's recent joint development agreement with Delta Electronics to co-develop next-generation charging infrastructure, aiming for a 30% reduction in gross capex per station. When executed with discipline, double-digit savings in hardware procurement are not only achievable—they are increasingly essential for maintaining a competitive edge.

Now is the Time to Act

The economics of EV charging are being rewritten—what worked in the past won't secure leadership in the years ahead. CPOs that continue to prioritize footprint growth without a clear path to profitability risk falling behind as capital tightens and investors shift focus to financial discipline and asset performance.

Winners will be those who act decisively—deploying targeted strategies across customer experience, site selection, and operational excellence. The upside is real: with the right levers in place, we see the potential for +30% EBITDA uplift and significant value creation at portfolio-level. As the market consolidates, first movers will be best positioned to lead, while laggards may be forced to exit or be acquired under less favorable terms.

The time to act is now. Whether you're a CPO seeking sustainable growth or an investor evaluating your exposure to the sector, this playbook is designed to prompt action. Let's start the conversation—reach out to the authors or your BCG contact to explore how these levers can translate into tangible results for your business.

+30%

EBITDA uplift and significant value creation

2. PPAs = Power Purchase Agreements

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