# Survival of the fittest navigating the EV charging software market successfully

This article is partly based on data collected and graciously shared by Deftpower as part of a collaboration between the company and BCG

September 2024 By Markus Hagenmaier, Sebastian Sackmann, Florian Schmieg, and Christian Wagener



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#### Electrification as the driving force

Despite the recent slowdown in electric vehicle (EV) adoption in selected markets, the industry will continue transitioning towards EVs. By the end of this decade, we expect more than 200 million EVs on the road globally.<sup>1</sup> After a temporary stagnation, the increased urgency to address transport-related CO2 emissions, along with increasingly attractive EV offerings for consumers, will push EV sales from around 14% towards the 50% mark in Europe by 2030.

This trend will also demand strong growth of charging infrastructure for EVs. In total, ~122 million public and private charge points (CPs) will be required globally by 2030. Of these, Europe alone will account for ~38 million CPs.<sup>2</sup> While the vast majority (~87%) of these CPs will be located at homes (i.e., classic home "wallboxes"), public and workplace charge points will play a pivotal role as the primary energy source due to their higher power and utilization rates. Overall, we estimate that ~42% of energy will be provided through public charge points and an additional ~15% by workplace CPs, totaling ~57% of EV energy from non-home charging (Exhibit 1).

Running these public CP "powerhouses" not only requires the right hardware, but active management by charge point operators (CPOs), connection to EV drivers, and smart charging integration. These activities are enabled by the underlying EV charging software – a market segment that is often overlooked, but sits at the core of the industry and offers many dynamic opportunities. BCG's extensive project experience in the EV charging software landscape and partnerships with external data providers for public backend solutions in Europe thereby offer a data-driven base for discussion.

1. BCG EV powertrain model

2. BCG EV charging market model

### Exhibit 1 - CPs & Energy Supply | Public CPs providing ~42% of energy despite accounting for only 6% of CPs in Europe by 2030

Number of charging points (M) EV energy supply per CP (TWh) 114 38 +23% +25% 49 33 19 52 17 9 26 24 21 0.3 2023 2026 2030 2023 2026 2030 HOME WORKPLACE DESTINATION EN-ROUTE CAGR 87% **6%** 42% Kev facts 2030 of the total chargers of the total chargers will be of energy will be provided by public will be located at home public (destination and en-route) (destination and en-route) chargers

**Note:** Excludes commercial vehicle charging points (depots, truck stops, loading areas) **Source:** BCG EV charging market model

### A strongly growing market across three distinct segments

The EV charging software market is experiencing significant growth and transformation, driven by the diverse needs of EV charging across various use cases and end-users. The market can be broadly segmented into three main categories based on software functionalities (Exhibit 2):

**Charge Point Management Software (CPMS):** CPMS is the core backend used by CPOs to manage and operate

their charging points. It includes base functionalities such as charging station monitoring, remote error solving, API for third-party integration, roaming enablement<sup>3</sup>, basic load management, billing, and payment management.

#### eMSP (eMobility Service Provider) ("white label")

**solutions:** This software segment refers to frontend solutions, such as mobile applications for EV drivers including payment and billing management. It also includes roaming enablement<sup>3</sup> and connection to fleet management, offering more user-oriented solutions that enhance the charging experience for EV drivers.

3. Note: roaming enablement does not include the roaming fees themselves - those are separate fees taken by roaming providers

**Add-on Services:** This segment refers to additional software functionalities that build upon the basic backend capabilities. It includes features such as customer hotlines, smart charging, and dynamic pricing, which are partly relevant for both CPMS and eMSP solutions and are sold as optional by most providers or by specialist providers.

The market for EV charging software can further be differentiated by the specific needs of customer segments. Private chargers (home, workplace, and depot) often require functionalities like customer identification, general dashboard, load management, and fleet management. On the other hand, public chargers (destination and en-route) focus on features such as roaming enablement, dynamic pricing, and transaction and payment management, catering to the needs of a more transient user base.

# Exhibit 2 - EV charging software market - offerings | Three core offerings of EV charging software providers



1. CPMS = Charge point management system

2. App is the UX-friendly front-end of eMSPs to connect EV drivers with CPOs

**Source:** Expert interviews, BCG analysis

In terms of market size and growth, the EV charging software market in Europe is expected to expand significantly (Exhibit 3). From an estimated €390 million in 2023, the European market is projected to grow at an annual rate of 25% to reach approximately €1.9 billion by 2030. CPMS represents the largest segment, with current revenues of nearly €300 million. This segment is expected to continue growing at a rate of 21% annually, reaching over €1 billion by 2030 (without considering potential upsides from depot and fleet solutions). The add-on services segment<sup>4</sup>, although starting from a smaller base of approximately €40 million, is anticipated to experience the highest growth rate of 40% annually, potentially reaching close to €500 million by 2030. This segment underscores the significant opportunity for backend providers to achieve organic growth by upselling to their existing customer base. Lastly, despite its uncertainties driven by plug-and-charge scale-up and its inherent business model, the classic eMSP ("white label") software market is expected to grow from around €65 million today to approximately €350 million by 2030. This 27% annual growth rate will be driven by the overall scaling of the charging market and the need for a user interface independent of eMSP business model evolution. This forecast is based on the eMSP core segment only – it could experience even stronger growth if eMSP software providers grow into adjacent segments (e.g., integrating into CRM systems of their customers).

### Exhibit 3 - EV charging software market – sizing Europe | ~€1.9bn in 2030 at 25% CAGR ('23-'30) with CPMS as core segment



EV charging software market by segment, in €M, CAGR in %

+**xx%** CAGR 2023-'30

**Note:** Excluding depot revenues **Source:** BCG analysis

4. Note: only selected add-on services included (additional upside potential given e.g., via GHG trading, energy mgmt., CPO aggregation, etc.)

#### Exhibit 4 - Software provider archetypes | Seven archetypes identified

	Core focus of this article									
				$\sim$						
Archetype	Established CPMS software providers	Newcomers and niche players	Proprietary software (/energy) providers	eMSP-centric players	Fleet-centric players	(Smart) home charging solutions	Hardware providers			
Description	Established CPMS providers with broad offering and strong market recognition	Small-scale and niche players as well as start-ups offering CPMS	Mostly energy providers / large CPOs with target to manage their charge points systems in-house	eMSP players, which partly also offer CPMS systems (e.g., via partnerships)	Players customizing their offers to special needs of fleet customers	Home charging providers and smart home (energy) managers	Hardware giants and charging hardware providers with limited direct software offering			
Customer focus <sup>1</sup>	B2B, B2B2B	B2B, B2B2B, B2C	B2B2B, B2B	B2B, B2C	B2B, B2C	B2C	B2B, B2B2B, B2C			
Examples	Large, asset heavy CPOs, municipal utilities, and location owners	Smaller CPOs	Energy suppliers, municipal utilities or companies from the energy industry	OEMs using white label solutions	Commercial electrified fleets	Home-owners that want to manage their charging and energy management	Fleets, or offices that only need basic monitoring services			
Charging Software focus										

1. B2B2B means approach via intermediary / turnkey provider

Strong software focus

Limited software focus

Source: Expert interviews, BCG analysis

# Customer adaptation and solid technology as winning factors in a fragmented vendor landscape

Diving deeper into CPMS as the largest segment, one can see that the European market is characterized by fragmentation and intense competition, hosting over 50 active players. They range from specialized providers focusing on public charging points to hardware suppliers offering basic backend solutions (Exhibit 4).

Through our work, BCG has closely tracked these archetypes, especially the first two due to their pure charging software focus. Using data from an external data provider for CPMS solutions in Europe, we identified different strategies (from focusing on individual markets with very specific customer segments to executing "pan-European plays") and examined how these translated into market shares over time. What are the learnings? Looking at the market development, one can see some of the "business basics" holding true: success to-date has depended on solid technology, clear customer focus, sharp – but not too narrow – regional definition, and organizational excellence (Exhibit 5).

For example, Player A<sup>5</sup> used to be number one in Europe with respect to public CPs under management but failed through a combination of trying to integrate its own hardware, organizational turmoil, and lack of regional focus. While this player supported over 41,000 public charge points with their software in 2022, this number decreased by more than half to just over 17,000 public charge points in 2024. Similarly, Player F acquired and tried to integrate third-party software, with insufficient customer focus or regional ambition. This not only led to stagnation, but even a slight decline in supplied public charge points from around 16,000 to just 15,000.

5. Note: company names not shown due to confidentiality

On the other hand, Player D continued to build a strong customer base in central Europe with focus on medium sized CPOs, continuously developing its software and improving customer service. By doing so, it increased its number of supplied public charge points from 37,000 to 61,000. Similarly, Player B grew from 32,000 to 53,000 supplied public charge points by offering a strong independent software solution paired with the option for a full "CPO as a service" model.

Specialists and newcomers like Player G also grew (though at a smaller scale) during the analyzed timeframe (18,000 to 25,000), further emphasizing that focus is key.

Despite the emergence of "winners and losers" over the last ~1.5 years, the market remains fragmented and lacks a clear frontrunner. Even the top three players together command only about 20% of the market share across Europe.<sup>6</sup> Unlike other software solutions, EV charging software suites appear to be less sticky, with customers showing a willingness to switch providers for various reasons. This dynamic leads to an essential question: in a landscape characterized by "winners and losers" and a propensity for customer migration, how can companies grow and ensure survival moving forward?

# Exhibit 5 - CPMS (market) share development | Several "winners and losers" throughout the last 1.5 years



CPMS shares of public CPs in Europe (sample), in %

Q4, 2022			Q1, 2024
Player A	9.2%	Player D	10.9%
Player D	8.1%	Player B	9.3%
Player E	7.5%	Player E	8.6%
Player B	7.0%	Plaver XX	6.2%
Player XX	6.0%	Plaver XX	4.5%
Player XX	4.9%	Player G	4.4%
Player C	4.5%	Player XX	4.3%
Player G	4.1%	Player A	3.1%
Player XX	<b>3.9</b> %	Player C	3.0%
Plaver F	3.5%	Player XX	2.8%
Player XX	2.8%	Player F	2.6%
Player xx	1.0%	Player xx	2.1%
Player xx	1.6%	Player xx	1.7%
Player xx	1.5%	Player XX	1.7%
Player xx	1.4%	Пауст лл	1
Other	<b>31.9</b> %	Other	33.3%

Note: Based on coverage/sample of ~80% of the market - i.e., market shares likely lower

Source: Expert interviews, Deftpower, BCG analysis

<sup>6.</sup> Note: Market share based on 100% public CPs in Europe (backend information only available for ~80% of the market)

### Five recommendations to win in the future market

Backend providers stand at the crossroads of opportunity and challenge. To not only survive but thrive, providers must embrace a multifaceted strategy, underpinned by innovation, market expansion, and operational excellence. Here we outline a strategic blueprint, with real-world examples and data, to guide CPMS providers toward a prosperous future.

#### 1. Expand horizons: international growth with precision

The past has shown the importance of regional focus. However, as the market matures and CPOs expand to other markets, players active in smaller regions need to take the next step and start "thinking big". This becomes especially important since the top 3 markets in Europe (Germany, France, UK) will account for over 50% of all public charge points by 2030. Not being present in those markets means running the risk of sooner or later being overtaken by bigger players. Thus, we expect future winners to expand strongly in European core markets and increase revenue shares outside of their home turfs.

#### 2. Follow the customer: new services to win mandates

Clear customer focus is another core success factor. Different use cases have different customers, each with distinct feature requests and integration challenges (e.g., hotels have different needs than supermarket chains). At the same time, several large CPOs have decided to (partially) insource their backend development to support dedicated international expansions and minimize data and other dependencies in a dynamic market. As the market matures and selected CPMS providers start to offer superior solutions (e.g., predictive maintenance), we expect large CPOs to re-outsource their CPMS to 3rd party software providers and focus on their core operational tasks. This offers the chance for CPMS providers to win - or win back - lucrative clients and increase retention rates going forward. Similarly, mandates from depots and other fleet operators can offer significant additional upside potential.

#### 3. Accelerate growth: M&A as a shortcut to success

Strategic acquisitions can quickly catapult CPMS providers into new markets. For example, ChargePoint's €250M

acquisition of has.to.be GmbH not only expanded its operational footprint in Europe but also widened its product offering towards full Charging as a Service (CaaS).<sup>7</sup> Given that regional differences are expected to blur in Europe (e.g., thanks to the Alternative Fuels Infrastructure Regulation, or shortly AFIR, in effect since April 2024)<sup>8</sup>, CPMS consolidation can be a successful move to leverage economies of scale and scope.

#### 4. Drive innovation: R&D and eMSP integration as growth engines

To keep up with the double-digit growth of the market, CPMS providers must remain vigilant about technological advancements and innovate continuously. R&D investment not only fuels the development of cutting-edge solutions, but also ensures the necessary adaptability to emerging trends and technologies such as dynamic pricing, V2G (Vehicle-to-Grid) integration, and AI-based predictive maintenance. Moreover, embracing technologies like blockchain for secure, transparent transactions, and plugand-charge for enhanced user identification, can significantly elevate service offerings. Better and deeper integration of CPMS providers with eMSPs is thereby essential to participating in the smart charging evolution. Only by using all available data on driver preferences, state of charge, and departure times can providers unlock additional revenue streams in this segment.

### 5. Profit from progress: redefinition of revenue models amidst rising utilization

As the revenue potential from the CPMS base price is limited, and to leverage the uptake in CP utilization, CPMS providers should test to recalibrate their revenue models, for example via pre-roaming aggregation and energy reselling for smaller CPOs. Similarly, "creative" pricing (e.g., higher transactions fees in exchange for lower base fees, packaging of service fees as part of a turnkey solution) can be an effective leverage against increasing competitive pressures and should be evaluated for applicability to a provider's unique customer base.

We expect only a handful of backend providers to survive in the long term. It is therefore crucial for players to diligently analyze their strategies against the elements of success outlined here. If you want to learn more about the EV charging software market and the recommended strategies, please reach out to our expert team in BCG's Center for Mobility Innovation (CMI).

<sup>7.</sup> https://www.chargepoint.com/de-de/about/news/chargepoint-kundigt-ubernahme-des-europaischen-e-mobilitatssoftwareanbieters-hastobe-im

<sup>8.</sup> Regulation (EU) 2023/1804 of The European Parliament and of The Council of 13 September 2023 on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU

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