# Market Guide for Electric Vehicle Charging Solutions

Published 16 April 2022 - ID G00758592 - 19 min read

By Analyst(s): Lauren Wheatley, Pedro Pacheco

Initiatives: Executive Leadership: Sustainability; Energy and Utilities Digital Transformation and Innovation

Growing demand for electric vehicles resulting from environmental concerns, corporate net-zero strategies and government financial incentives is driving a broad range of enterprises to invest in EV charging solutions. Executive leaders can use this guide for insight on turnkey EV charging solutions.

## Overview

### Key Findings

- The drive to decarbonize business, along with changing regulations regarding internal combustion engine (ICE) vehicles and electric vehicle (EV) government incentives, is causing the EV charging market to rapidly evolve.
- Transport is one of the main sources of emissions for enterprises. Electric mobility can help address these emissions and is a powerful tool in any enterprise's sustainability toolkit.
- Enterprises electrifying their vehicle fleets and encouraging EV adoption by employees as part of their sustainability strategies need solid charging operations to run their EV fleets effectively.
- The market for EV charging solutions is moving toward "carefree" charging operations (turnkey EV charging solutions) as these solutions provide advantages, including a single contract, price certainty, transference of risk, reduction of management efforts and consistent quality.

### Recommendations

Executive leaders investing in turnkey EV charging infrastructure must:

- Promote the benefits of sustainability and support the changing transportation needs of your vehicle fleet, employees and visitors by enabling the provision of EV charging.
- Maximize return on investment by mapping potential EV charging solutions to your long-term sustainability strategy. ROI and business benefits will vary by enterprise, so ensure that all financial model possibilities and incentive schemes are explored.
- Reduce the need for iterative and expensive EV charging infrastructure upgrades by ensuring a modular solution is deployed from the outset that will adapt with changing user needs over time.
- Position your enterprise to capitalize on revenue streams that EV charging may provide by ensuring that enabling hardware and software technologies are adopted.

## Strategic Planning Assumption

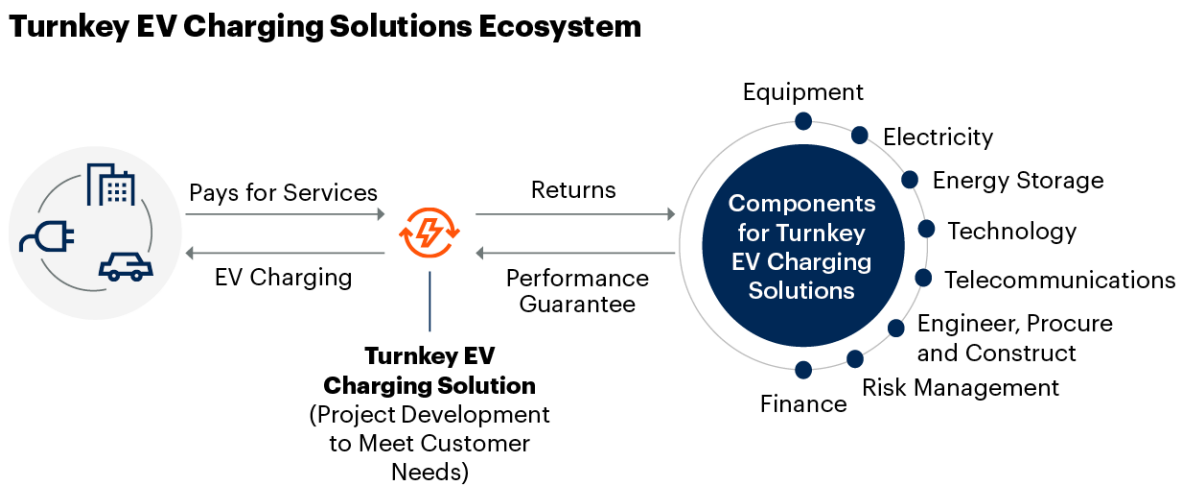
By YE25, 30% of enterprises will not have invested enough in EV charging infrastructure to meet their decarbonization goals.

## Market Definition

A wide range of entities (see Note 3) with parking lots or land require support for their sustainability strategies, brand, business models and fleet operations by providing electric vehicle charging facilities for their employees, customers, tenants and/or visitors. However, many do not want to assume the risk associated with developing, procuring, installing and operating this type of infrastructure with internal resources.

Turnkey electric vehicle charging solution providers can deliver end-to-end packages that deliver site assessment, design, installation, and ongoing operational and maintenance capabilities to these enterprises on a subscription basis (see Figure 1).

Figure 1: Turnkey EV Charging Solutions Ecosystem




Source: Gartner
758592_C

Gartner

## Market Description

Many governments are working to limit the effects of climate change. As a result, most companies are increasingly focused on their environmental impacts and looking for new ways to reduce their carbon footprints and expand business models.

Providing the ability for employees and direct/indirect customers to charge their electric vehicles is becoming the norm. However, most enterprises lack technical expertise and resources, and may have constrained capital expenditure (capex) or operating expenditure (opex) allocations as EV charging is not a core activity.

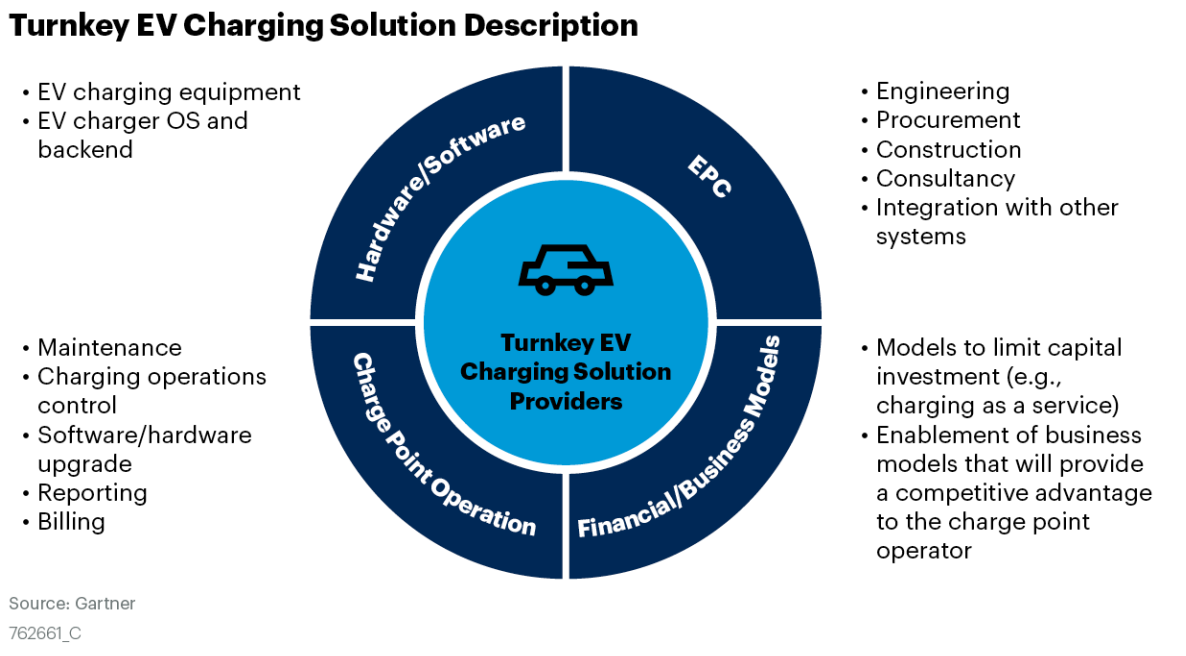
It's common to find EV charger manufacturers and engineering procurement and construction (EPC) companies installing EV chargers. However, the solutions provided by these vendors may not meet the full needs of enterprises that want to develop their EV charging ecosystem. For example, EV charger manufacturers and EPC companies often (see Notes 1 and 2):

- Lack understanding of how to report EV charging impacts on carbon footprint calculations.
- Lack understanding of what EV charging solutions to install to meet varying user needs and where to install them.

- Lack the expertise required to navigate the permitting process to permission and commission a site.
- Are unwilling or unable to bear the capital investment to deploy the infrastructure.
- Are limited in relation to the management and maintenance of the infrastructure.
- Are unwilling or unable to hire employees to run EV charging operations.

Several vendors have realized these limitations and adapted their business models to capitalize on these needs. These turnkey EV charging solution providers (see Table 1) can allow enterprises to bypass internal roadblocks. Many providers offer a broad range of services related to the installation and ongoing management of EV charging operations. The aim of these providers is to deliver turnkey EV charging that is easy to implement without large upfront investments of capital. Figure 2 highlights core EV charging infrastructure functionalities.

## Figure 2: Description of Turnkey EV Charging Solutions




A minimum viable turnkey EV charging solution provider should cover the following core functionalities:

- **EPC.** The provider handles engineering, procurement and construction tasks, such as:
  - Developing site plans, managing permitting, collaborating with local regulators and officials, and designing an EV charging layout that allows drivers to easily access vehicle charging.
  - Evaluating the site energy load and power requirements to identify optimal charging system design that ensures reliable charging. Site design can include distributed energy resource integration to optimize site load and keep operating costs low.

- **Financial and business models.** There is a range of different models that the provider can offer. For example:
  - Enabling the infrastructure owner to avoid capital investment.
  - Providing a competitive advantage in the market, such as an EV charger booking system or a loyalty points system for EV charger users.
  - EV charging as a service. This is a subscription-based EV charging package that provides turnkey EV charging solutions to infrastructure owners for a monthly subscription fee over a fixed term, hence minimizing capex, which can be a hindering factor for enterprises.

- **Charge point operation.**
  - Open-standards-based operating systems: Operating systems built on open standards and often utilizing the Open Charge Point Protocol (OCPP), among others. [1] This means that the software can communicate between charging stations, networks and the utility grid. In addition to providing customers with the ability to choose from a variety of charging stations, the OS can communicate with other software platforms and integrate into utility demand response programs. It allows design of flexible solutions for the customers that can grow and adapt with business needs and the industry over time.
  - A software platform with API-to-driver apps: Software solutions help manage charging infrastructure, mobile apps and driver web portals to provide a high-quality experience for EV drivers while keeping data secure.
  - Operations and maintenance (O&M): O&M services ensure maximum uptime of charging stations, for example:
    - Development of a plan for operation and maintenance, which can be run by the provider or the infrastructure operator itself.
    - Preventive and corrective maintenance: Corrective and annual preventive maintenance ensures high station performance and prevents equipment issues.
    - Remote software and hardware monitoring: Remote monitoring with configurable real-time alerts and tickets captured for asset management.
    - Hardware parts replacement: Guaranteed dispatch times for hardware parts that need repair (including wear and tear). Certified technicians to ensure rapid response to issues and high uptime of charging stations.
    - Reporting: Quarterly reporting illustrates performance against SLAs.
    - Performance service-level agreements: Uptime performance warranty and expedited SLAs to maximize system performance.
  - Service management of the EV charging infrastructure: Addressing end-customer queries and tackling other aspects that hinder the operation of this infrastructure.

- **Hardware/software.** Besides deploying the necessary hardware and software, the provider must make sure these operate according to open standards that guarantee broad interoperability among different hardware and software makers. The OCPP from the Open Charge Alliance is an example of the type of standardization to ensure hardware/software interoperability. More broadly, the software should enable business functionality; for instance, automating data collection and integrating with environmental, social and governance (ESG) software.

A more complete service would also include the provision of electricity delivered via the utility grid and generated on-site.

## Market Direction

Gartner predicts a 26% compound annual growth rate (CAGR) for the sales of plug-in vehicles by 2030 (see Forecast Analysis: Electric Vehicle Shipments, Worldwide). This large increase will trigger major needs in terms of EV charger infrastructure. Enterprises should ensure provider EV charging infrastructure is configurable to meet the varying needs and pace of evolution across EV customer types and locations. For example, the balance of charger outputs and number will currently be different in urban areas and cities, where EV adoption is higher than in more rural areas. It is important that each business case is assessed individually to identify the correct charging equipment and pricing strategy.

The demand for EVs will grow in line with the stringent limits several governments are putting on vehicle tailpipe emissions, such as seen in China and the EU. Increasing demand for EVs, cities closed to internal combustion engine vehicles, carbon emissions targets and favorable government policies for installing fast-charging stations is expected to drive the growth of the EV charging infrastructure market. Enterprises need to be aware that the market will develop in several directions that could affect their future EV charging infrastructure. Choose a vendor who can offer a breadth of service and support across these areas now and in the future:

- **Improved charger distribution.** The total number of chargers will be better distributed across locations that are more in line with the routine of EV drivers — namely home, workplace and retail. This specifically entails providing EV charging in apartment blocks, an area that still today remains almost completely untouched.

- **Power output.** There will be a progressive increase in the power output of EV chargers, aimed at reducing charging times — a key parameter for EV practicality. This is an area where EV charger infrastructure will struggle to keep up with vehicle technology due to its longer planned life span.

- **Interoperability.** Interoperability in terms of EV charger usage and payment will be a major area for development as the current situation is unsustainable in terms of user experience. This means the ability of every user to access every charger from every network while payment is automatically made by the vehicle. This functionality is known as "Plug & Charge" and is enabled by the ISO 15118 standard that defines vehicle-to-grid communication principles. [2] Several recent EVs and EV charger models are already enabled for "Plug & Charge."

    - In relation to ISO 15118, bidirectional charging will grow. Effectively, this means the vehicle can sell electricity to the grid at a higher price than its user has originally paid. This represents a potential revenue opportunity for EV fleets, as electric utilities may tap into bidirectional charging to help stabilize electric grids.

    - There will also be a progressive development in terms of the interoperability between EV charger hardware and software. OCPP is already the most common protocol used to allow a high level of interoperability between chargers and different operating systems. This interoperability will also grow in the back end, allowing the charger operating system to interact with supervisory control and data acquisition (SCADA) systems that are used by a particular company for several purposes in relation to infrastructure control. In addition, EV charger operating systems will evolve on the application of artificial intelligence (AI) with the purpose of enabling better load management and more advanced self-healing capabilities. The OS will become more of an enabler for new business and operational models. This is true, for instance, for dynamic pricing, charger prebooking or loyalty programs.

- **Heavy-duty vehicles.** EV chargers specifically for heavy-duty vehicles will be available this year, thanks to the newly created megawatt charge system (MCS) standard, which allows a large long-haul truck to fully charge in 15 to 20 minutes. [3] This technology will be essential for fleets of long-haul trucks and buses that need quick turnaround time. In addition, companies investing in MCS charging infrastructure will also be able to cater to other types of transport, such as ships, trains and aircrafts. In the future, it won't be unusual to see ports equipped with EV chargers that can serve both trucks and ships.

## Market Analysis

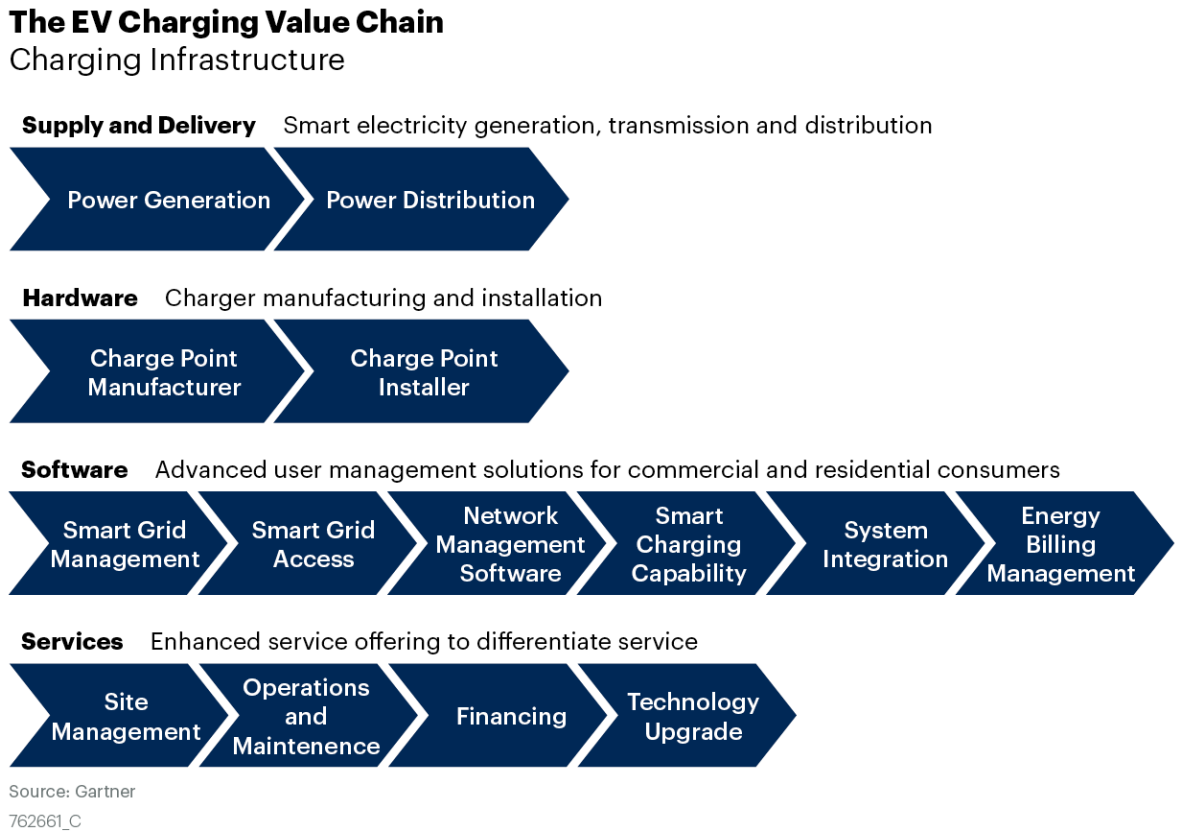
Prepandemic, daily commutes were a significant source of greenhouse gas emissions. Commutes averaged six miles in the EU and up to 40 miles in the U.S. [4,5] At the same time, many enterprises own fleets of vehicles, ranging from cars for business travel to vans and trucks for product/supply distribution. The use of vehicles significantly adds to the organization's carbon footprint and can be a visible and more quantifiable source of emissions that the company can mitigate. Already, governments are targeting emissions from fleets. The Netherlands, for example, has announced a new mandate that companies with over 100 employees must report $CO_2$ emissions from business travel. [6]

A decarbonization strategy should be holistic and address different aspects of the enterprise, including sourcing, resource use, waste management and transportation. While other modes of transport can offer low-emission alternatives where road transport is necessary, EVs are currently the most efficient way of reducing carbon footprints. In addition to reducing environmental impact, there are business and societal benefits of installing EV charging infrastructure, including:

- Capitalizing on incentives and economic conditions, such as additional taxation for ICE vehicles, driven by regulatory policymaking decarbonization initiatives.
- Encouraging the shift of public attitudes toward EVs, creating a positive feedback loop that plays a role in the dynamics of EV ownership and charging availability, by meeting the increasingly urgent need for charging infrastructure.

The turnkey EV charging solution market is expanding in the number of players and the breadth of services provided. A decade ago, this market was limited to a few EV charger manufacturers providing EPC in addition to the hardware and software, but the market is starting to move in the direction of "carefree" charging operations. In this concept, enterprises simply need to put forward the investment and, in return, a vendor will install the chargers, maintain them and manage their operation (see Figure 3).

Figure 3: The EV Charging Value Chain




ChargePoint is an example of how the concept of "turnkey EV charging solution" has evolved. Besides the usual site EPC and subsequent maintenance contract, the company offers "ChargePoint as a Service." [7] Under a three- to four-year contract, the company will also proactively monitor the EV chargers to solve any technical issues in less than a day. ChargePoint also provides cloud plans for companies that need to keep a substantial number of chargers connected to the cloud.

Other vendors offer different types of services. For instance, EVgo will offer integration of the EV's operating system with telematics for fleet management systems. Such integration is important, for instance, so that the fleet management system can plan the usage of each fleet vehicle to each vehicle's state of charge. Alternatively, the charging site's electrical load management system can prioritize the vehicle that is needed more from an operational standpoint.

However, the needs of fleet operators extend far beyond their chargers, as drivers may need to charge their vehicles within a broad geographic area — that implies using third-party networks. For that reason, a number of turnkey solution providers also offer a ubiquitous charging solution, allowing the charging costs to be charged directly to the enterprise that owns the EV.

There are currently three main types of turnkey EV charging solution providers:

- **EV charger manufacturers** that decide to expand their offer beyond EPC. Some of these EV charger manufacturers are already controlled by energy companies (EVBox, which is owned by ENGIE).
- **Energy companies** (utilities, oil and gas) progressively channeling more investment into the EV charging business (bp Chargemaster).
- **Pure-play companies** whose main focus is EV charging services (ChargePoint).

While the background of the vendor should not be a primary influencing factor, it may give an indication of the type of partner that might best deliver solutions that align with your enterprise needs. Vendors associated with utilities can sometimes allow you to leverage a more favorable agreement by including charging and electricity supply under the same contract. Utilities with a strong presence within a certain geographic area may also have more technical support resources that could be deployed, depending on skill sets. Pure-play vendors tend to focus on their main strength, which is service. This is their main competitive advantage and, for that reason, the one they will focus on the most from a strategic standpoint.

The turnkey EV charging market is still in its infancy when it comes to vendors offering turnkey EV charging solutions, as the vast majority of providers stop at maintenance contracts or installation warranties. In addition, these vendors may not be able to offer possibilities to develop new operational and business models around EV charging. This is something you will have to take into your own hands by choosing an EV charger OS that enables greater possibilities in this area. This also means selecting the right hardware to go with that software. Modular upgradable chargers prepared for ISO 15118 are a must-have for those looking at a future-oriented EV charging operation.

All stakeholders expect to take the opportunity to make an EV charging infrastructure system a sustainable and profitable business. The business models remain fluid and can be reconfigured to suit different requirements. The main revenue streams are:

- **Marked-up electricity sales.** Sell electricity with a sufficient markup to recover the cost of the infrastructure on either a per-charge or energy use fee to the public.
- **External contributions.** Potential, market-specific value may come from:
  - Grants and low-interest loans
  - Tax exemptions and incentives
  - Construction-related incentives from EV-ready buildings
  - Carbon credits and other environmental and emissions-related incentives
- **Advertising.** Revenue can be collected from marketing and branding opportunities. These will rarely be sufficient to cover the initial investment but can help to justify the business case.
- **Ancillary services to the grid.** As the amount of renewable energy increases, electricity systems need energy storage and flexible demand — bidirectional EVs can fulfill this role. However, the long-term reliability of this revenue is uncertain; saturated markets will result in lower reward rates for these services.

The delivery of these business models will require new partnerships and alliances between the involved parties across the value chain. Without these new partnerships and collaborations in place, the e-mobility transition may struggle to reach its full potential. A well-designed, flexible, strategically located EV charging facility with the optimum number and type of charging stations that is built upon strong alliances with solid and diversified revenue streams would be highly likely to succeed.

## Representative Vendors

*The vendors listed in this Market Guide do not imply an exhaustive list. This section is intended to provide more understanding of the market and its offerings.*

### Market Introduction

A representative sample of turnkey EV charging solution providers is shown below (see Table 1).

### Table 1: Representative Vendors in Turnkey EV Charging Solutions

(Enlarged table in Appendix)

| Vendor | Product, Service or Solution Name |
|---|---|
| Blink Charging | EV Charging Solutions |
| bp pulse | bp Chargemaster |
| Centrica Business Solutions | EV enablementCommercial EV solutions |
| ChargePoint | ChargePoint as a Service |
| EVBox | EVBox Care |
| EV Connect | EV Charging Management Solutions |
| EVgo | EVgo Fleet Solutions |
| Pod Point | Pod Point Fleet EV Charging |
| Schneider Electric | EVlink Field Services |
| SemaConnect | Charging as a Service |
| Siemens | Fleet Charging Management |
| Tata Power | EV Charging Solutions |

Source: Gartner (April 2022)

## Market Recommendations

Executive leaders investing in turnkey EV charging infrastructure must:

- Take action to promote sustainability and support the changing transportation needs of your vehicle fleet, employees and visitors by providing EV charging solutions.
- Maximize return on investment for your EV charging solution by ensuring all financial model possibilities and incentive schemes are explored. Consider making calculations for lifetime value or include the economic loss potentially of having ICE vehicles that are in the future very expensive and possibly punitive to own. Charging as a service can remove upfront capex costs altogether. Although selecting a turnkey provider can often have higher upfront costs, the choice can bring benefits such as savings in terms of time or even headcount to coordinate different vendors. Also, a vendor with a strong track record in your target geographies can, in some situations, bring benefits in dealing with administrative matters such as permitting.

- Reduce the risk of iterative and expensive EV charging infrastructure upgrades by ensuring a modular solution is deployed that will adapt with changing user needs over time. Future-orient charging technology choices by supporting investments in technologies, such as “Plug & Charge,” that heavily improve ease of usage as well as making fast charging widely available. Selecting a cheaper technology because it doesn’t seem necessary now may translate into a loss of business opportunity in just a couple of years given how fast this market is evolving.
- Position your enterprise to capitalize on revenue streams that EV charging may provide by ensuring that enabling hardware and software technologies are adopted. Examples of this include EV charger OS and partnerships with broad digital ecosystems that can work as enablers for that purpose (see Market Guide for Turnkey Electric Vehicle Charging Solutions).

## Acronym Key and Glossary Terms

| | |
|---|---|
| A turnkey electric vehicle (EV) charging solution | An end-to-end package delivering site assessment, design, installation, asset management and maintenance capabilities. It includes charging hardware, software, transaction or payment interfaces and, in some cases, on-site electricity generation (like a photovoltaic array) and energy storage. It allows enterprises to effortlessly commission and run their infrastructure through a third party. Solutions can also include financing tools and particular business models that make it easier for enterprises to acquire and manage that infrastructure. |

## Evidence

[1] Open Charge Point Protocol 2.0.1, Open Charge Alliance.

[2] ISO 15118-1:2019 — Road Vehicles — Vehicle to Grid Communication Interface — Part 1: General Information and Use-Case Definition, International Organization for Standardization (ISO).

[3] Megawatt Charging System (MCS), CharIN.

[4] Passenger Mobility Statistics, Eurostat.

[5] Highway Statistics Series, U.S. Department of Transportation.

[6] Companies With 100 or More Employees Must Lower Carbon Emissions, Business.gov.nl.

[7] ChargePoint as a Service, ChargePoint.

## Note 1: Representative Vendor Selection

The vendors mentioned in this guide are not an exhaustive list but rather examples of providers that offer a comprehensive solution in terms of EV charging. This doesn't mean they produce all aspects of this solution, but they package it together and offer it as a turnkey solution. This means vendors that offer at least EV charger hardware, software, EPC and site maintenance. However, the ideal turnkey EV charging solution provider should go much beyond that. In addition, we preferred to include vendors that also have a broad international reach and that also have their company seat in different parts of the world.

## Note 2: Gartner's Initial Market Coverage

This Market Guide provides Gartner's initial coverage of the market and focuses on the market definition, rationale for the market and market dynamics.

## Note 3: Enterprises That May Look to Install EV Charging Infrastructure

Enterprises that may look to install EV charging infrastructure include:

- Facilities management companies
- Commercial landlords
- Fleet operators
- Enterprises providing support for employees/net-zero pledges
- Retail companies, such as malls or grocery stores, with large areas of car parking
- Businesses with revenue-diversification strategies
- Gas stations
- Energy companies
- Governments

## Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

Quick Answer: IIJA Presents EV Charging Opportunities and Challenges

Market Guide for Energy Management and Optimization Systems

Guide to New Business Models in the Electric Vehicle Ecosystem

Emerging Technologies and Trends Impact Radar: Electrified Vehicles

Industry Insights: Top 2021 Automotive Market Trends

Hype Cycle for Connected, Electric and Autonomous Vehicles, 2021

Emerging Technologies: Venture Capital Growth Insights for Electrified Vehicles and Mobility Services

## Table 1: Representative Vendors in Turnkey EV Charging Solutions

| *Vendor* | *Product, Service or Solution Name* |
|---|---|
| Blink Charging | EV Charging Solutions |
| bp pulse | bp Chargemaster |
| Centrica Business Solutions | EV enablementCommercial EV solutions |
| ChargePoint | ChargePoint as a Service |
| EVBox | EVBox Care |
| EV Connect | EV Charging Management Solutions |
| EVgo | EVgo Fleet Solutions |
| Pod Point | Pod Point Fleet EV Charging |
| Schneider Electric | EVlink Field Services |
| SemaConnect | Charging as a Service |
| Siemens | Fleet Charging Management |
| Tata Power | EV Charging Solutions |

Source: Gartner (April 2022)