

EV Charging: What Businesses Need to Know

There's a global revolution happening in transportation. With electricity set to become the main fuel for all kinds of vehicles in the coming years, businesses want to know how it will affect them. This five-part guide helps you understand the differences between EV charging solutions so you can choose the right one for your company.

PART

1 OF 5

Know Your Audience

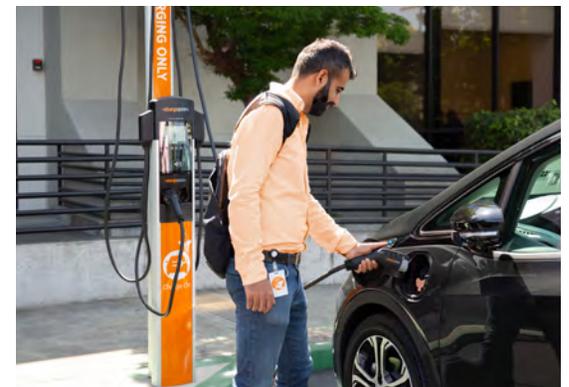
To make the most of EV charging for your business, you need to know who you want to attract to your business and what they need from you. Part 1 of 5 in this guide introduces EV charging, discusses some common reasons for driving electric and shows how to provide a great EV charging experience for drivers.



Driving Electric Is Different

Driving an EV is unlike driving a traditional vehicle. EVs are quieter, more efficient and require less time and maintenance than their gasoline-powered counterparts. EV drivers also develop different fueling behaviors. Rather than making an out-of-the-way or inconvenient stop to gas up, most EV drivers “top up” their batteries while they’re at home, at work or around town.

As the number of EVs on the road continues to grow, workplaces, multi-family residences, retail stores and other businesses are attracting drivers by offering them the charging spots they need to keep their batteries topped up. Because EVs are still relatively new, businesses often need guidance while navigating this uncharted territory. Read on to discover why every day more people are choosing to drive electric and what their expectations are for the best charging experience.



Meet the Drivers

From the tech-savvy Tesla fanatic to the money-saving LEAF driver, everyone has a different reason for driving electric. More EV models mean that more and more people can find the right electric car for their needs. Research¹ shows that most people choose to drive electric for four main reasons, exemplified by these folks:



Sally Saver

Charging an EV usually costs half as much² as getting gas (or even less), so driving electric can save \$13,000³ over the life of an EV. Plus, EVs don't need oil changes, are less expensive to maintain than internal combustion engine (ICE) vehicles and may be eligible for tax credits and rebates.



Eco Eric

Driving electric cuts greenhouse gas emissions in half—or more, depending on how electricity is generated where drivers live. This reduces emissions and clears the air. Many drivers are also interested in EVs to achieve energy independence and rely on locally produced power.



Fiona Future

Techies want their cars to have the latest whiz-bang features, from cutting edge software to falcon wing doors. Instant torque makes EVs fun to drive, and a quiet cabin lets drivers hear their entertainment systems like never before.



Carl Commuter

An EV means you never have to make a separate stop to refuel, saving trips to the station and time spent in line. Many states also offer high-occupancy vehicle (HOV) carpool lane access to EV drivers, which can seriously cut down on commute times.

No matter why people drive electric, offering charging can attract EV drivers to your business and help you build and maintain relationships with them over time.

¹Center for Sustainable Energy (2016), California Air Resources Board Clean Vehicle Rebate Project, EV Consumer Survey Dashboard.

²ChargePoint network data.

³Union of Concerned Scientists.

What EV Drivers Need: Ensuring the Best Charging Experience

As with traditional vehicles, many factors affect EV range. Actual driving patterns, such as frequent stops and starts or different types of geographies can all consume more energy.⁴ Hot or cold weather can reduce range because it takes energy to keep batteries at the correct operating temperature. Lights, heat, air conditioning and other accessories may also affect range.

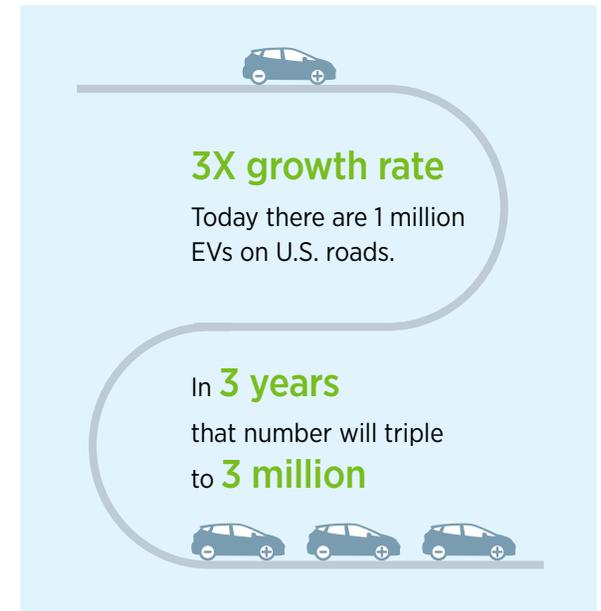
EV drivers love the convenience of charging their cars while they're doing something else (such



as working, sleeping, dining or shopping). Workplace EV charging helps businesses attract and retain top employees and retail establishments benefit by appealing to customers who stay longer and spend more money.

Because so many different factors can affect the range of a vehicle, drivers typically want to get as much charge as they can whenever they plug in. They also want to be able to count on charging when they need it. To help drivers maximize range and charge efficiently and reliably, organizations must make the right decision about which type of EV charging solutions to offer and how to communicate effectively to drivers.

Next up, we'll discuss the best charging option for most EV drivers.



⁴"Influence of driving patterns on life cycle cost and emissions of hybrid and plug-in EVs," Energy Policy 2013.

PART
2 OF **5**

You Had Me at “More Customers” with Level 2 Charging

This part of the guide gives an overview of the types of EV charging that can be used to attract your customers who drive electric.



Level 1 Versus Level 2 Charging

One of the first decisions any organization needs to make when evaluating EV charging is whether to install Level 1 or Level 2 charging stations. The chart on the right summarizes the differences between the two types, which largely boil down to speed.

Considerations	Level 1 Charging	Level 2 Charging
Electrical and Power Specifications	120 Volt, 20 Amp circuit 1.4 kW	208-240 Volt, 40 Amp circuit ² 6.2-7.6 kW ³
Estimated Miles of Range Added Per Hour (RPH) of Charging ⁴	4-6	20-25
Time to Fully Charge an EV with a 100-mile Battery	17-25 hours to charge an EV with a 100-mile battery	4-5 hours to fully charge an EV with a 100-mile battery
EVs Supported	All	All
Drivers Served per Station per Day	1	3-4 or more

Choose Level 2 for Faster Charging

For most businesses, Level 2 charging, which adds up to 25 miles of Range Per Hour (RPH), offers an important benefit: faster turnover. Because they charge much more rapidly than Level 1 stations, Level 2 solutions can recharge many more vehicles over the course of a day, serving more employees or attracting more customers. When one vehicle is fully charged, another can take its place.

No matter how long drivers stay, they'll get more range—and more satisfaction—from a

Level 2 solution. Retailers who plan to offer EV charging to attract customers especially want to consider overall satisfaction when investing in a charging solution.

Level 2 charging is economical to deploy, easy to manage and attractive to drivers, making it a good fit for fleets, workplaces, retail businesses, multi-family residences or any other business in need of a future-proof, cost-effective EV charging solution.



Level 1 Isn't Well Suited for the Long Term

Level 1 charging stations can often be found at locations where vehicles will be parked for several days, such as an airport. Although the slow rate of Level 1 charging might be sufficient for long-term parking situations, there are other issues. Because Level 1 charging stations are predominantly standalone, non-networked units, they can't be monitored remotely. With no way for drivers to know if their EV was unplugged (or stopped charging for some other reason), they could return from a long trip to find a dead battery or one that lacks sufficient range to get them home. Talk about the ultimate in bad driver experience!

Most EV drivers will choose to park and shop where they'll receive the fastest charge, so there's little incentive for them to frequent or return to businesses that offer slower Level 1 stations.



How Slow Can You Go?

The table comparing Level 1 and Level 2 charging highlights the primary limitation of Level 1 charging stations (and the one that's most frustrating for drivers): a much slower charging rate. In fact, Level 1 charging might not be sufficient to fully charge many of today's popular EVs, forcing drivers to make uncomfortable compromises such as slowing down or turning off the radio and air conditioning just to make it to their destination—if they can get there at all.

Level 2 solutions can charge up to six times faster than Level 1 stations, giving EV drivers a quick boost in range and the confidence to know they'll be able to get where they're going, whether it's to and from work to running errands around town.

If faster is better, doesn't it make sense to offer the fastest charging experience available? In the next section, we'll discuss why the fastest level of charging, DC fast, isn't always the right solution for every business.



Level 1



Level 2

Level 2 Charging Stations



CT4021



CPF25

PART
3 OF 5

The Need for Speed—DC Fast Charging

Let's go over what DC fast charging is, covering its distinct features and benefits. Ultimately, choosing whether to offer Level 2 or DC fast charging depends on your location and type of business.



Level 2



DC Fast

What Is DC Fast Charging?

Whether they're on a long road trip or simply pressed for time, EV drivers may desire a faster charging option. DC fast can deliver 100 miles of Range Per Hour (RPH) or more, charging many EVs to 80 percent in 20-30 minutes. Most DC fast charging stations offer a variety of power levels to achieve faster charging speeds (in general, the higher the power level, the faster the charge). However, not all EVs—especially older models—come with a DC fast charging port. Also, because their batteries are generally smaller, most plug-in hybrids (PHEVs) only support Level 1 and 2 charging.

DC fast charging is especially useful for those on long road trips, making it a good option for municipalities or commercial properties seeking to attract new and more customers. It may also be suitable for retail establishments such as restaurants or convenience stores located near busy highways or interstates. Shorter dwell times mean DC fast stations can be used by more customers each day, helping to offset the higher costs of installation and operation.



AC vs DC: What's Different?

Most power outlets use AC, or alternating current. Batteries use DC, or direct current, to charge.

Level 2 Charging

Level 2 charging delivers AC power to the car, which the vehicle converts to DC using an on-board converter. This is one reason it's a little slower.

DC Fast Charging

With DC fast charging, the conversion from AC to DC power happens in the charging station, not in the EV. This allows stations to supply DC power directly to the battery and charge vehicles much faster.

DC Fast Charging Works on the Road

Attractively priced models with long-range batteries such as the Chevy Bolt and Tesla Model 3 are increasing demand for EVs and making long-distance travel more convenient than ever before. Fast charging centers minimize stops on long road trips and help meet other driver needs by being located at regular intervals near amenities such as restaurants, retail shops and Wi-Fi hotspots. On extended journeys, drivers want to refuel and get back on the road as quickly as possible, making DC fast charging a must-have along U.S. Interstates and major roadways across North America and Europe.

Who Uses DC Fast Charging?

While certain EV models can make use of DC fast charging, especially long-range EVs, it is more commonly used by heavy-duty fleet vehicles such as municipal buses and service trucks. These vehicles usually have predictable routes, and the depots where they're parked can usually accommodate DC fast charging solutions. Because they're economical to operate and help cities reduce pollution and noise, heavy-duty fleet vehicles with high-capacity batteries are at the forefront of e-mobility. DC fast charging may benefit other types of fleets as well, including delivery, rental car and ridesharing fleets.

Now that you know about the available charging speeds, let's take a look at the advantages of networked EV charging solutions.



Connector Types

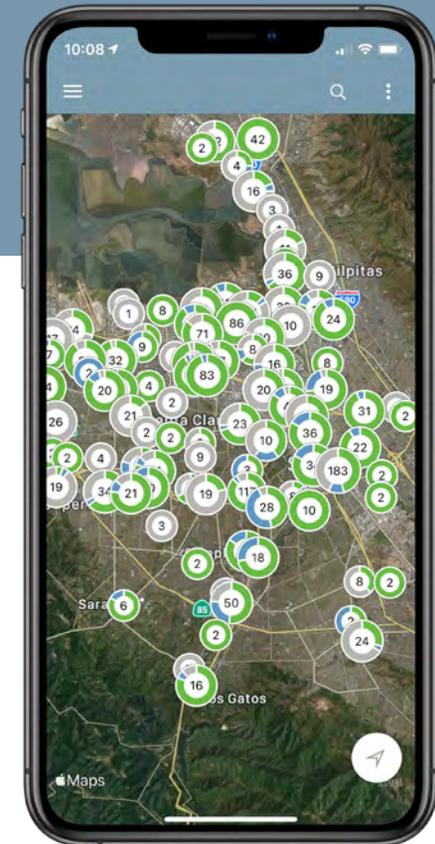


PART

4 OF 5

Get Smart with Networked Charging

In this fourth section, we explain what networked charging is and why it makes EV charging easy for you and more convenient for your drivers.



What Is Networked Charging?

As with most technology these days, from smart-phones and personal assistants to thermostats and lightbulbs, EV charging stations can be connected via a network. Networked solutions allow you to manage your stations remotely, implement new features automatically and gather data about how your EV charging spots are being used and by whom. Networked solutions also provide a much better driver experience than standalone stations. Using a mobile app, users can easily find EV charging stations and lets them know which spots are available. Drivers can also receive updates on

their charging status, find out if there are any fees to charge (and, if so, how much) and even get in a virtual line at busy locations.

Standalone stations have a lot of drawbacks, but perhaps the biggest (and most unforgivable) is that they're simply not easy for drivers to find. That, along with the complete lack of analytics and reporting features, should disqualify non-networked EV charging stations from serious consideration for most businesses.

The Benefits of Networked Charging

Although non-networked charging station hardware is less expensive initially, these stations have many limitations that make them more costly in the long run. They simply can't perform important functions such as those listed below, which are easy to accomplish with networked solutions.

Improve the Driver Experience: In today's connected world, drivers expect to use apps to interact with things around them. When it comes to EV charging, this means an app that not only makes it easy to locate stations, but also shows key information like station availability, pricing, charging status and updates about charging activity.

Personalize Charging: EV charging apps can recommend networked stations that are compatible with a driver's EV, remember favorite charging spots and track charging behavior at home or around town.

Enable Access Controls: Depending on the use case, EV charging providers may want to control access to charging. For example, limiting charging to employees only or shutting down stations for security and liability reasons when a business is closed.

Promote EV Etiquette: Adding fees for charging, especially after a certain period of time, is a proven way to motivate drivers to move their vehicles when they're done charging making room for other drivers and maximizing the use of your stations.

Simplify Operations: Charging stations are almost always located far away from the people who manage them. With a networked EV charging solution, it's easy to manage them remotely.

Generate Reports: Businesses that want to maximize the value of their stations can use reports from networked charging. These reports cover station utilization, energy use, greenhouse gas (GHG) emissions avoided and more, providing the data needed to justify investments and prepare growth plans. They also make it easy to measure sustainability goals, and, in some cases, make those businesses more likely to receive grants or incentives.

Power Management: Power Management makes it possible for organizations to meet driver demand and charge more EVs without making major infrastructure updates. Power Management software, which dynamically shares existing power across more charging spots, allows more vehicles to charge with less of an investment. Each vehicle may charge at a slightly slower rate, but a larger number of vehicles get to charge, so you can serve more drivers.



Networked Level 2 Charging Stations Are the Right Choice Now and in the Future

When purchasing EV charging solutions, it pays to look ahead. Networked solutions future-proof your investment, helping you avoid costly infrastructure expenses down the road. Automatic updates mean drivers always have the latest enhancements and that you have the most up-to-date analytics and reporting features. With Power Management, you can easily and efficiently regulate your energy

needs to serve more drivers and avoid expensive utility demand charges. Unlike standalone stations, which will inevitably need to be replaced as technology advances, Level 2 and above networked solutions grow along with your business.

Discover how to make a smart EV charging investment in part 5.

“Having internet-connected charging stations has been instrumental for us to track energy consumption and utilization for grant compliance and internal fleet metrics.”

—

Phillip Kobernick,
Logistics Services Manager,
Alameda County



PART
5 OF 5

Show Me the Money

The past four parts of this guide explained EV drivers, the benefits of Level 2 and DC fast charging and the advantages of networked charging. But what about the total cost of an EV charging solution? Let's take a look at ways to fund your initial EV charging investment and manage costs in the long run.



Understanding Hardware, Installation and Operating Costs

Level 1 stations cost less because they lack the features of Level 2 solutions. However, because they share similar labor and materials costs, the price of installation tends to be roughly the same for both types. If multiple stations are installed at one time, Level 1 can actually end up costing more. Why? Because each Level 1 station requires a dedicated electrical circuit, while many Level 2 stations allow electrical circuits to be shared.

And, because Level 1 stations aren't networked, the price paid in inefficiency, downtime and ongoing hassles also tends to be much higher. If there's a

problem with a Level 1 station, managers must rely on drivers to notify them. Verification requires a physical inspection and often an electrician must be sent out for a second opinion—all tasks that could have been done remotely with a networked solution.

Alternately, if a Level 1 station fails, drivers have no way of knowing it's down until they pull up to it. It's an incredibly frustrating experience and, unfortunately for businesses, drivers tend to take out their disappointment on providers rather than on the equipment itself.

Controlling Energy Costs

Energy costs don't have to be a barrier to providing EV charging to your employees, customers, residents or fleets. With a networked solution, you can easily monitor energy usage in real-time, set a power ceiling to avoid expensive utility demand charges and even install additional charging spots beyond your location's rated electrical capacity. [Power Management](#) lets you intelligently share existing power between several stations to charge more vehicles using

less electricity. A networked solution also delivers automated reports on energy use, costs and greenhouse gas (GHG) emissions avoided, helping you to comply with government regulations and achieve your organization's sustainability goals.

Networked Level 2 solutions are the best choice for meeting most driver and business needs, especially when DC fast charging isn't a cost-effective option.



Aaron Stash,
Manager of Environmental Strategy
and Sustainability,
United Airlines

ChargePoint Is Committed to Serving Businesses

With 74% of drivers concluding that EVs are the future of driving⁶ and every major automaker (as well as a few new ones) introducing or planning to introduce new plug-in electric models in the coming years, one thing is clear: the debate is over—transportation is going electric. ChargePoint is so passionate about creating that new fueling network, we’ve committed to installing 2.5 million charging spots by 2025.

By being a part of the new e-mobility revolution, you’ll show your customers, employees or residents that your brand is devoted to a sustainable future. Today, many states and municipalities already mandate new construction be EV-ready, so you’ll be ahead of your competitors as well.

With ChargePoint as a service, ChargePoint’s easy-to-use and affordable subscription pricing model, there’s no better time to invest in tomorrow. To find out how ChargePoint can help you with your EV charging solution. We’re here to help.

For More Information

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- 🖱 Visit chargepoint.com

50% of Fortune’s “100 Best Companies to Work For” is a ChargePoint Customer

“We noticed that the number of EV drivers increased after we started offering workplace charging because it enabled people to commute using their EVs. They are able to come in earlier due to HOV lane access and maximize time both at work as well as with their families. It also helped us achieve our LEED certifications and enhance our green image.”

— Ted Ludwick, Amazon Lab126



⁶The State of Electric Vehicles in America, Volvo Car USA survey: <https://www.media.volvocars.com/us/en-us/corporate/volvo-reports>