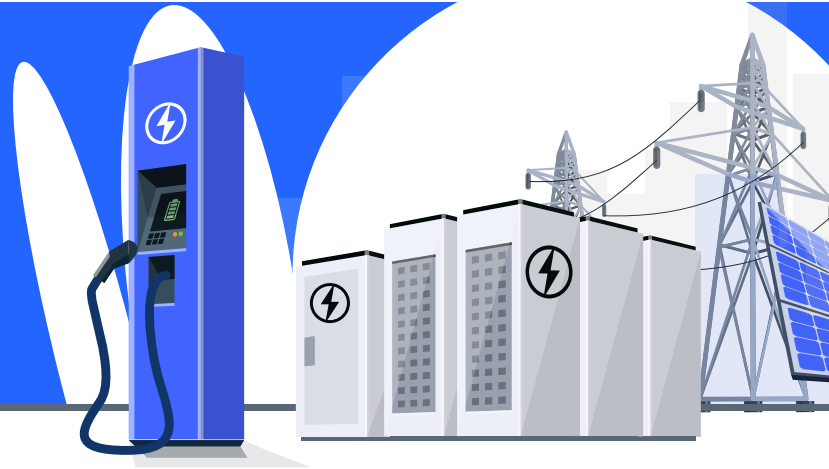


# Six Easy Steps to Successful Charging Infrastructure for Electric Fleets



**The future of sustainable mobility is electric.** The electrification of transportation is happening right now before our eyes, as local, state and federal governments internationally implement new clean fuel standards, or move to ban sales of petroleum and diesel vehicles in the coming decades. This will have a major impact on the composition of fleets, as well as how they are stored, purchased, parked and loaded.

This transition from diesel to electricity is a major catalyst for the improvement of our environment, the sound of our cities (or rather, lack thereof), and our quality of urban air – but also presents a series of challenges for fleet operators. While diesel fleets rely on fossil fuels and pumps to power their operations, the backbone to any electric vehicle fleet is the transfer of electricity from the grid to the vehicles themselves. At first glance, the infrastructure, its associated components and terminology may seem very complex, but it's actually simple to break down.

The following are six easy steps to implement a complete and adequately tailored charging infrastructure solution according to the needs of your operation.

## Step 1

### Customize a Solution to Your Unique Needs.

Before buying any chargers or hardware, your first step should be analysis. Make sure to invite a specialist in electrification infrastructure to come on-site and inspect your location and how it is currently organized. Don't fall into the myth that electric vehicles absolutely need to charge indoors. With the proper equipment and energy management, every electric vehicle, whether light, medium or heavy-duty, can easily charge outdoors safely and reliably.

During this consultation, installation design, site routes and vehicle usage patterns should be taken into consideration to ensure the most cost-effective solution. The energy specialist should configure, customize and design an optimized charging station layout and energy management strategy according to your daily operational needs, and current (or future) electric fleet size. Don't forget, infrastructure needs to be scalable and optimized on day one – even if more electric vehicles will be added to your fleet at a later date. Getting energy infrastructure right at the beginning means that your fleet can start providing a return on investment and clean transportation as soon as it goes online.

## Step 2

### Optimize Your Financials

Every company's goal is to lower their operating costs, even when it comes to operating an electric fleet. Depending on the state or province in which you're operating, there may be grants or purchase incentives available to acquire charging equipment. By simply completing all the paperwork, you may be entitled to receive a generous amount of subsidy that will lower the total cost of your charging infrastructure.

Some companies offer to complete all the paperwork and help manage the application process on your behalf. If you don't have time to manage these hurdles, working with an organization that will seek out grants on your behalf saves time and creates value.

Lastly, make sure to include a software design package that manages fleet charging and energy use. This will ensure that you are avoiding charging during peak periods when the cost of energy is high under Time-of-Use utility rates, as well as other pricing spikes when possible. It also gives you access and visibility to all fleet charging data and activity, providing insight into how your fleet is performing. For any modern fleet manager, this software is critical to minimizing operational costs and maximizing ROI.

## Step 3

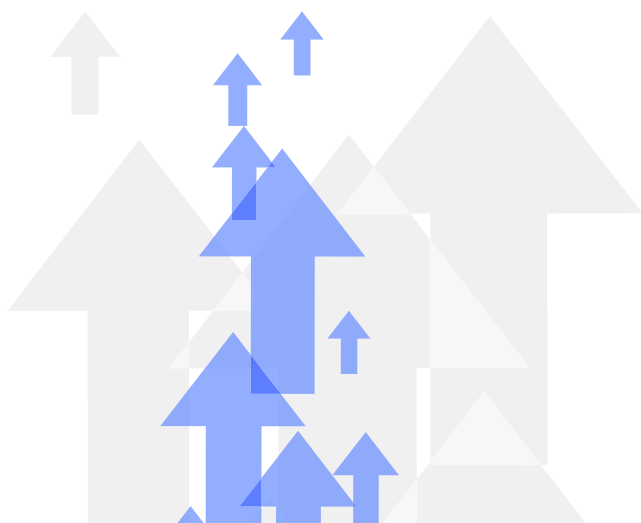
### Choose the Right Charger

A vehicle is only as good as the supporting infrastructure that powers it. When choosing an electric vehicle charger, you will have several options available, ranging from lower speed AC charging to faster DC charging. Even V2G (Vehicle-to-Grid) technology, which can transfer energy both to vehicles as well as back to the grid, can be part of the selection process. The important thing to remember is that there is no magic charger that will do it all. Once again, before choosing one model, make sure it has been tested on your electric vehicle to ensure seamless functionality.

Working with the right partner to develop your charging strategy is key – it ensures full product support, and allows you to do something more complex and still get the charger and associated hardware to fit your fleet's needs. With the myriad of chargers on the market, engaging a specialist that understands the complex needs and energy requirements of your vehicles is an important step in determining what is needed when looking for a charging unit.

Lastly, understanding which type of charger is required, as well as the associated power draw, is a fundamental step in charger selection. There are two types to consider:

→ **Alternating Current (AC) chargers** are perfect for vehicles that already have an on-board charger and are tailored for longer charge time. For vehicles which sit overnight or idle for long periods during the day (for example, over five hours), AC charging is typically adequate.



→ **Direct Current (DC) chargers** operate at higher voltages and can deliver greater amounts of energy over a given timespan, greatly shortening charging intervals. As such, they are perfectly suited for quickly charging during operational hours, with the ability to achieve a full charge in as little as two to four hours (depending on vehicle battery size and state of charge).

Understanding how these chargers will react with each vehicle and sizing them adequately for your business needs is essential. Engaging an energy specialist that is familiar with the most reputable brands and best power outputs for your fleet needs can aid any fleet in selecting a series of chargers that will keep its fleet moving and its costs minimized.

## Step 4

### Understand Your Energy Layout and Consider Alternatives

Having a fleet of electric vehicles can create a significant demand on the power supply of a facility. While electric vehicles are cleaner for the atmosphere and do not consume fossil fuels, they still do consume power. That power also costs money and may also emit its own harmful emissions depending on generation sources in your area.

As a result, you can consider a series of alternative energy sources that can save money, while performing a wide variety of functions inside your facilities at the same time. For example, you can consider having a micro-grid, which will distribute energy collected either from V2G or from a renewable energy source (such as solar panel) and give it back to your vehicle without being connected to the grid. This will again allow you to skip peak energy demand hours when the price of electricity is

high, as well as ensure the use of green energy to charge your electric vehicles. However, merely having a solar installation and an inverter will often achieve the same results, and still allow you to remain tied to the grid. These are simply two options.

Ensure when engaging an energy specialist that you do not limit the conversation to a particular technology, as there is a plethora of options on the market that are designed to provide robust resiliency as well as redundancy in your operations, while providing a return on investment or savings on your monthly utility bill.

Lastly, as an example, understand that energy consumed from the grid might be cheaper at night, but that your operational requirements may only permit daytime charging. Your energy solution should work around your schedule and should contain solutions that minimize energy cost, as well as disruption to your fleet and business model. As a result, solutions like battery storage should also be considered when creating an energy layout.



## Step 5

### Choose the Right Management Software

Even for the most experienced fleet operator, dealing with a fleet of electric vehicles that need to charge at the same time can seem daunting. However, there are multiple energy and fleet management software platforms available on the market today designed to maximize electric charging operations. Many of these platforms are compatible only with a specific charger brand, while others are brand agnostic. Choosing the right one can save time, money and stress on employees in the field.

Likewise, management software can help access energy data, including electricity consumption, and will also make it easier to adapt your charging periods according to peak hours in your region. The goal is to charge your vehicle and be as efficient as possible in order to save on electricity bills – think of it as the equivalent of directly lowering the price of gasoline or diesel fuel.

Lastly, management software can often integrate seamlessly with existing telematics software from many major brands, providing a one stop shop to see the pertinent operational data of a fleet; from energy needs when vehicles are charging, to the wear and tear on a particular vehicle. The result is a comprehensive tool that permits fleet managers to gain detailed insights into their assets and ultimately leads to more cost-effective operations.

## Step 6

### Choose the Right Contractor

Once your infrastructure designs are completed, you have chosen a charger, your energy needs are secure and your software is in place, the last step is to install the system. This means finding a qualified contractor that understands high voltage electricity systems, and has experience working with electric vehicle supply equipment. These are complex pieces of infrastructure, and they often require additional certification from the manufacturer before they can be installed or operated.

Once again, you should work closely with an energy specialist to review a contractor proposal. This will help keep the scope of work confined to only what is needed for your application, and ensure that the energy analysis stays on time and on budget. Lastly, an energy specialist from the vehicle manufacturer can help with any technical issues that may arise prior to project delivery, ranging from the mundane to the complex.

### Summing It All Up

The world of charging infrastructure may look overwhelming from the outside, but the goal is to ensure the best integration possible to maximize your daily operations. Working with informed strategic partners is critical to the success of the electrification of your fleet.

Following these six simple steps for the successful selection and deployment of electric vehicle infrastructure will save time and money, and ensure a smooth transition to zero-emission operations. With strong infrastructure from the beginning, your electrification journey will be smooth and will ensure that your vehicles are operational from day one.

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