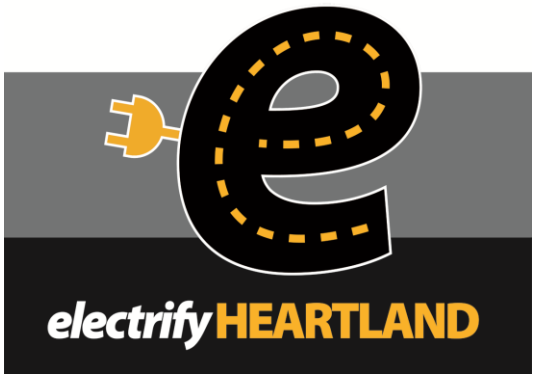
Electrify Heartland Plan

Appendix L: EVSE Site Host Considerations



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With: Black & Veatch

Metropolitan ENERGY CENTER

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BLACK & VEATCH

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Electrify Heartland Plan

Electrify Heartland Project Abstract

Electrify Heartland is an electric vehicle planning project managed by Metropolitan Energy Center. It is a product of the Greater Kansas City Plug-In Readiness Initiative, co-chaired by Kansas City Regional Clean Cities Coalition. Our goal is to produce a regional plan to prepare public resources and secure the economic and environmental benefits of plug-in vehicles within targeted metro areas with estimated 2.7M population. The targeted metro areas include Kansas City, MO & KS; Jefferson City, MO, Wichita, KS; Salina, KS; Lawrence, KS; and Topeka, KS. (14 Counties: Cass, Clay, Cole, Douglas, Jackson, Johnson, Leavenworth, Miami, Platte, Ray, Saline, Sedgwick, Shawnee, Wyandotte).

Electrify Heartland Steering Committee

Team	Organization	Name
Charging Stations	Initiatives	Troy Carlson
Charging Stations	LilyPadEV	Larry Kinder
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Vehicle & Fleet	University of Missouri at Kansas City	Henry Marsh

Exhibit i-i. Electrify Heartland Steering Committee Members

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Appendix L: EVSE Site Host Considerations

Synopsis:

This appendix to the Electrify Heartland Plan describes important considerations for EVSE hosts before ordering or installing charging equipment.

Section Authors:

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White Paper
How to Choose an Electric Vehicle Charging Station for Commercial Locations

Background:

You are probably reading this white paper because you are considering installing charging stations at your commercial location(s) and are having difficulty deciding on what station(s) to use. Because plug-in vehicles are showing up in cities in ever increasing numbers, the need for public charging stations is growing. Unlike products with which most people are familiar, relatively few people are familiar with electric vehicle charging stations, and thus don't have the background with which to make an informed decision when choosing a one. This paper will give you some insight on how to choose a charging station. So let's get started!

The Dilemma:

Choosing a charging station isn't an easy decision; there are many different brands, with differing capabilities, at different price points. If you purchase a charging station with more capabilities than you need, you may have spent more money than required. If you purchase charging stations with fewer capabilities than you need, then you've spent money for something that didn't solve your problem. Furthermore, the cost of installation can be as much or more than the charging station itself, so you must carefully balance the desirability of an installation location vs. the cost to install at that location. You must also decide who will install and maintain your charging station.

A Quick Definition – Networked and Non-Networked:

Charging station come in two basic varieties: networked and non-networked. Both can equally charge all of the plug-in vehicles coming from the auto manufacturers. However there are differences in capabilities and cost.

Networked stations have more capabilities, and as you might expect can cost more. They connect to the internet via mobile phone technology (or sometimes via Wi-Fi or Ethernet). They have capabilities like the ability to charge a fee to drivers for usage of a station, the ability for an administrator to log on to a web portal to set the fee for usage, see usage statistics, allow reservations, see how much energy has been dispensed, see how much greenhouse gas has been prevented, perform remote trouble shooting, and to check if the charging station(s) are in good working order. These stations cost more to purchase initially and typically have annual network subscription fees as well as transaction fees for the owner each time a driver is charged for using the station.

Non-Networked stations don't connect to the internet, have fewer bells and whistles, and as you might expect they cost less. They charge vehicles just as well as networked stations do. They dispense electricity to the vehicles but don't allow anything beyond that, such as the ability to charge a fee for usage, or remote access to check on usage statistics, or to see if the station is in working order. There are no annual network subscription fees, nor are there any transaction fees each time a drivers uses the station.

→ ***One of your major decisions is whether you will purchase a networked or non-networked station. The information below will help you make that decision.***

Why do you want a Charging Station?

Let's start with the business reasons why you want to install charging stations. Your answers to these questions will determine if you need a charging station that enables you to charge a fee to the driver for use of the station.

For example you may want to:

- Attract new customers to your location, thus increasing incremental sales of your normal products.
- Attract EV drivers so you can create a new revenue stream by charging EV drivers to use the stations
- Enhance your green image in the community
- Gain an advantage over your competitors who do not offer EV charging
- Enhance your leadership position in the community by advocating for and supporting things which benefit the environment.
- Provide a free (or paid) amenity for your employees
- Provide another perk (free charging) for your loyalty card customers
- Track usage of the charging station
- Minimize your costs while providing amenities

➔ ***Generally, if you want to charge a fee for usage of the station, you will want a networked station.***

How will you manage and report on usage of your Charging Stations?

Once you've installed charging station, as a good shepherd of your organization's assets, you'll need to manage those assets. Will your charging stations, all be located where someone can keep an eye on them to see how much they get utilized, whether they've been damaged, or if they are in good working order? Or will you want someone to be able to monitor your charging stations remotely to find this information? Will you want usage reports to see how much energy your charging stations have dispensed, or how much time they are in use? Do you not need these functions?

➔ ***If you can keep an eye on your stations manually and don't need reporting or billing capabilities you can probably purchase a non- networked station. If you need remote monitoring and usage reports, then you will need a networked station.***

Where will you install your Charging Stations?

BEST is relative. Where is the BEST place to install your charging stations? You might think that the best place to install stations would be in the most highly visible locations, right by the front entrance to your facility. Perhaps, but you may want to consider these factors:

Cost to Install: The cost to install a charging station is closely related to how far it is from the power panel from which power will be run. Running conduit, pulling wires, going through walls, trenching/boring underground can all get expensive. So the closer the charging station is to power, the less the installation cost will be. However, If the location closest to power is way out in the far reaches of the parking lot, your EV drivers may not be very happy with that location. So when deciding where to install, work with the company doing your installation to help

balance the desirability and visibility of the location with the cost to install. Only then can you make the decision best for your organization.

Don't annoy the gasoline drivers: You may annoy gasoline drivers if you take the 'best parking places in the lot' and dedicate them for EV charging, especially if the charging stations aren't used all the time. The gas drivers then get annoyed because they see a prime parking spot that is empty and they can't park there. If this happens often, you may lose some good will from your gas drivers.

Expansion capabilities: Most likely you will install one or two charging stations in your parking facility to start with. But one of these days, as plug-in vehicles become common, you'll need to install more charging stations. Choosing an installation location where you can expand with more charging stations into neighboring parking places can result in an "EV Parking Section" of your parking lot in the future.

Start small, grow with demand: Unless you have a very special circumstance, start with a relatively small number of charging stations at any particular location, at least 1, maybe 2 or 3. You can then increase charging stations up to 10 or 20 or more as the demand increases at that location. One thing you should do now though, is to plan for the electrical expansion. If you are running power from your power panel to the first location, make sure you install a large enough conduit that can support several more stations, so you don't have to run more conduit again. Alternatively, you could run a single (albeit large) circuit out to a sub panel that you install in the parking lot by where the charging stations will be installed. That way, as you increase the number of stations, you only have to add breakers to the sub panel and short conduit/wiring installation runs to each new station.

➔ ***We often recommend installing charging stations in locations that are "second best". Not the prime parking locations right by the front door, but instead, the good parking locations that are still near the front door. These location are usually still highly visible and don't annoy the gasoline drivers. Then when you need to add more stations later because usage has increased, you can expand towards the prime locations by the front door. Of course always make sure you investigate installation costs before you commit to a location.***

What to look for in your charging station provider:

Ah, the age old question…who ya gonna call? Ghost Busters probably isn't qualified to help you choose specific charging stations or install or maintain them for you. Neither are many others. There are however many reputable, qualified, experienced companies that can help you make your final determination about what brand and model of charging station to purchase, and who you can trust to do a quality job installing it for you.

A quick Google search can help you find sources of charging stations and installers.

Be sure to look for a company that:

- is unbiased and can recommend the best charging station for your situation
- has demonstrated, successful experience selling and installing charging stations
- thoroughly understands the issues and tradeoffs in cost and capabilities in the charging station options
- thoroughly understands the installation issues that may arise
- will be there to provide you customer support after the sale and installation
- provides a warranty

➔ ***If you have questions about selecting charging stations, where or how many to install, or are looking for a charging station provider, feel free to call LilyPad EV. We are an experienced provider of electric vehicle charging stations and have been helping people with charging stations since 2009. We have experience working with municipalities, counties, private companies, educational institutions, and utility companies. Additionally we carry multiple brands of charging stations, both networked and non-networked, so we can make the best recommendation for your situation.***

Now you must decide:

Charging Station: Based on the above discussion, you can probably now determine if you need a networked or non-networked station. Here are the three basic questions:

1. Do you want to charge drivers a fee to use the station?
2. Do you want to be able to log in to a portal on the internet to manage your charging station assets and for example see how much your charging stations are used, how much electricity they have dispensed, or if they are in good working order?
3. Are these features worth the extra cost?

If you answered yes to these then you probably should get a networked station. If you answered no to the questions and don't expect these requirements to change, then a non-networked station may be for you.

Installation Location: Based on the above discussion about considering cost of where to install a charging station, you probably now have a pretty good idea of some options of where you want charging stations to be installed.

Charging Station Provider: Perhaps the most important decision you will face is picking your charging station provider. Make sure they are reputable, unbiased, and experienced.

Notes:

- Non-networked charging stations can run from $900 to $3000
- Networked charging stations can cost from $3000 to $8000
- Installation costs are about the same for networked and non-networked charging stations, when the networked charging station communicates via cell phone technology.
- Each charging port on a charging station generally requires 208V-240V dedicated 40 amp circuits. A single port station would thus require one circuit. A dual port station would require two circuits.
- Installation costs vary widely and depend on where the charging station is to be installed and how far/difficult it is to get to the source of power. Installation cost for a charging station may range from $1000, to perhaps an average of $6000 and higher for more complex installations.
- Charging stations can have several different mounting styles: pedestal, wall, or pole mount. Pedestal (also known as bollard) mount stations will mount on the ground and will typically be bolted into a concrete base. Wall mount stations will typically bolt to a wall, and pole mount stations will typically strap to a light pole. When you are choosing your installation location and your brand of charging station, be sure the mounting style you will need is available from brand of charging station you choose.
- This white paper applies to Level 2 charging stations only. Contact us for similar information on Fast DC charging stations.