

SETTING UP AN Energlize-FUNDED ZERO-EMISSION VEHICLE CHARGING STATION

This Quick Guide will answer many of your questions regarding building a charging station for your medium- and heavy-duty (MDHD) electric vehicles (EVs), as you transition your fleet to zero-emission.



PROCESS

- 1 Determine project scope**
- 2 Speak with your electric utility**
- 3 Select an EV charger**
- 4 Identify funding opportunities**
- 5 Build your project team**
- 6 Install your chargers**

1 DETERMINE PROJECT SCOPE

It is best to start small in building a first EV charging station, or electric vehicle supply equipment (EVSE) installation. Ensuring that the pace of the installation's build-out is manageable is key to the project's overall success. It is recommended that a fleet select one or two vehicles, or one or two routes, that have minimal usage as a starting point.

Things to consider include:

- How many vehicles are intended to be transitioned to electric in this initial phase?
- Where is the best location for the charging station for these vehicles?
- When will these vehicles charge? (e.g. will the vehicles be charged overnight?)
- Will the site include distributed energy resources (DERs) or other resilience strategies?
- What are the vehicles' operating schedules?
- Has the project applied for funding or plan to in the near future?
- If funding has been obtained, have the MDHD EV models already been identified?



It is also a good idea, during this initial planning phase, to keep in mind **future expansion possibilities:**



How many total vehicles are in the fleet?



Will the initial charging station location be easily expandable?



Do you have community support for the project?

It is a good idea to have a fleet transition plan in place to outline the overall process for electrifying your fleet; such a plan **should include:**

- A route analysis
- A technology assessment
- A charging strategy
- A phasing plan
- A cost estimate

It is also important, both before and in conjunction with project planning, to engage with the surrounding community, businesses, and environmental justice organizations. Feedback from these stakeholders can help identify and address concerns about the impact of the charging installation build-out on the community. Such engagement might also result in new options for local resources. The most successful charging installation projects generate positive feedback from the community.

Your electrical utility or an electrification consultant can help to determine and develop the fleet transition plan – this is a good time to reach out to them. It is especially important to speak with the electrical utility (see step 2, below) to determine if your installation's power demands can be met.

2

SPEAK WITH YOUR ELECTRIC UTILITY



Your local electrical utility is an essential member of your zero-emissions transition team, and should be included early on in your charging installation planning as long timelines and delays are possible. The utility analysis they will complete, as mentioned in section 1, must be done prior to any construction work so all issues of electrical supply are addressed. You'll want to share with your utility your fleet size, pace of electrification, and timelines determined by your funding source; this information will help the utility determine how to meet your power demands. They can then give you the requirements your equipment will need to meet, as well as let you know your site upgrade costs.

It's important to know that if your project demand exceeds 500kW, additional time and resources for your project may be required. For example, if a project has identified 10 chargers, each with a 60kW capacity, the project will have a 600kW demand (10 x 60kW).

In such a case, it may be determined that upgrades on either the utility side or the customer side of the meter will be needed to meet the power demand (the utility side

includes all equipment between the utility and the meter, but not including the meter; the customer side is all equipment from the meter to the EV charging plug). Such upgrades might include phasing electrification and increasing your site capacity over a certain period. Your utility can explain the necessary upgrades and who is responsible for the associated costs. Utility-side upgrade costs can often be covered by a make-ready program; search online for an EV make-ready program in your project area. There are also customer-side upgrade cost-assistance programs that will assist with costs associated with meter upgrades and permitting.

The range of available loads for any given charging site can vary significantly. Your utility will inform you of the maximum load available for your site; they will work with you to determine your best path forward to ensure the success of your installation build out. Once you have a comprehensive understanding of the available energy load to meet your project's demands, you'll be better able define your project's design.

3 SELECT AN EV CHARGER



Obviously, selecting a charger is a key component of the charging installation's build-out. Construction is directly affected by the number and size of the selected chargers.

Things to consider:



- Number of chargers
- Output rating of chargers
- Charger compatibility with selected EVs
- Charger footprint
- Charger use time (e.g., will the vehicles be charged overnight?)
- AC power supply type (i.e., single phase (1Ph) or three phase (3Ph))

The number of chargers multiplied by the output rating of each charger will equate to project demand, measured in kilowatts (kW); for example, 10 chargers with an output rating of 30kW each would equate to 300 kilowatts (10 x 30kW) of project demand. This demand, in kW, is a measurement easily understood by your electrical utility and will help establish electrical capacity for the installation.

Keep in mind that chargers with smaller output ratings will take less space and have smaller project demand, but will take longer to charge your EVs. The reverse is true for chargers with higher output ratings. Additionally, the choice of the installation's location will depend on when the vehicles will be charged (e.g., whether the vehicles will be charged at an overnight depot or on-route) and the size of the charger and supporting equipment.

It's important to engage both the EV original equipment manufacturer (OEM) and the charger supplier to ensure that the chargers are compatible with the EVs. Additionally,

the project team will want to understand when and how long each vehicle will use each charger and whether multiple vehicle types will use the charger. Using diagrams to understand the charger footprint will allow the project team to incorporate the chargers in the site plans.

Power supply to the project is either AC (alternating current) or DC (direct current). Similarly, chargers supply power to the vehicle in either AC or DC. However, one important side note: AC chargers charge EVs at a slower rate than DC chargers.

4 IDENTIFYING FUNDING OPPORTUNITIES



There are several funding options for charging infrastructure available through [energiize.org](https://www.energiize.org). Visit their website to learn more about these options, the required qualifications, and the process to apply.



5 BUILD YOUR PROJECT TEAM



Your project team should consist of experts and specialists for each phase of your project build-out, and the team should meet regularly to discuss the progress of the project plan and to address any issues that may arise. **The team should consist of:**

- EVSE equipment manufacturer(s)
- EV equipment manufacturer(s)
- Site planning experts (engineering, procurement, and construction (EPC); engineer; electrician*; and/or project manager)
- Networking provider
- Fleet representative
- Utility representative
- Project coordinator



*An Electric Vehicle Infrastructure Training Program (EVITP)-certified electrician is required for EV charging station installations. A list of EVITP-certified electricians can be found in the Resources section, below.

At a minimum, items to be regularly reviewed and discussed **should include:**



As the project progresses, additional topics can be added as needed. Each project will face its own set of unique issues and challenges; a well-constituted team will be able to overcome them and achieve a successful project outcome. One important thing to consider during initial planning meetings is potential future electrification needs – all team members should consider such needs prior to initial build-out and again before subsequent upgrades to the completed initial installation are undertaken.

6 INSTALL YOUR CHARGERS



Once all the prior steps have been accomplished, it's time to start the project construction process. **The factors that need to be considered include:**

- Project supply
- Utility upgrades, if required
- Electric vehicle and charger lead times
- Build permits
- Construction schedule and timelines



The build permit is required before any construction can begin. Determine early on who will be accountable for the permitting process. The general contractor or the electrical contractor typically include permitting as a part of their bid on the project.

Finally, once the charging station construction is complete, the OEM representative and the electrician will commission the site, site commissioning paperwork must be requested, and user training set up. It is recommended that site commissioning and user training be addressed early.

- 1. Alternative Fuels Data Center: Electric Vehicles for Fleets (energy.gov)** – The Alternative Fuel Data Center's for Fleets education module includes additional resources on EVs, charging, planning, installation considerations, and interconnection between challenges and solutions
- 2. California Climate Action Plan by Region** – This map offers project planners access to Climate Action Plans (CAP) by city and county. This resource was commissioned by the California Air Resources Board (CARB).
- 3. California | EVITP** – A list of EVITP-certified contractors in for installing EVSE.
- 4. Electric Power Research Institute (EPRI)** – The EPRI Vetted Product List is a comprehensive list of vetted products for the electric vehicle equipment industry.
- 5. Equity Considerations in Planning | US Department of Transportation** – This site includes a list of methods for meaningful community engagement, including a Community Engagement]Tool box.
- 6. CALSTART Funding Finder tool** – Identifies California MDHD funding opportunities by region.



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