



ChargeNY

WORKPLACE CHARGING

Guiding employers through the process of planning, installing, and managing charging infrastructure for electric vehicles



Installing electric vehicle (EV) charging stations at workplaces can benefit employers and employees alike. However, potential challenges include justifying the investment, selecting the right hardware, installing the units, and establishing appropriate usage policies.

This guide provides an overview of the potential benefits of installing charging stations at workplaces and information to help employers through the process of planning, installing, and managing EV charging infrastructure.

SELECT CHARGER TYPES

The optimal type of charging station for a given installation depends on the amount of battery charging needed by the EV drivers, average employee dwell time, and available electrical infrastructure (significant upgrades can be costly). Level 1 charging stations are cost-effective and can provide sufficient charging for most EVs that are parked throughout the workday. A Level 1 installation can be as simple as installing 120-volt outlets at parking spaces so EV drivers can use their own manufacturer-provided Level 1 charging cords. Level 2 charging stations are more commonly used at workplaces, however, because of their ability to fully charge an EV in 3 to 6 hours. Level 2 charging stations may also be networked through a service provider (for a yearly subscription fee), which can allow monitoring capabilities, user authentication, payments, and reservations.

EMPLOYER BENEFITS

Recruit/Retain Employees

EV charging stations can attract and retain desirable employees. EV drivers are typically tech-savvy and highly educated, qualities many employers seek in prospective employees.



New York Power Authority (White Plains)

Increase Company's "Green" Image

Charging stations visibly demonstrate an organization's commitment to sustainable energy consumption and complement other environmentally friendly initiatives. They also provide points toward LEED certifications and could count toward emission reduction and fossil fuels mitigation policies because EV use reduces greenhouse gas emissions. Organizations can also join the U.S. Department of Energy's Workplace Charging Challenge to access informational resources, network with other participants, receive assistance with planning and siting, and be recognized for environmental stewardship.



Level 1

- 120 Volts, typically 15 to 20 Amps
- Adds 4 to 8 miles of electric range per hour of charging
- Hardware cost: \$100 to \$1,000
- Installation cost: \$500 to \$3,000



Level 2

- 240 Volts, typically 30 to 40 Amps
- Adds 10 to 20 miles of electric range per hour of charging
- Hardware cost: \$500 to \$5,000
- Installation cost: \$2,000 to \$10,000



General Electric (Schneider)

DETERMINE QUANTITY OF CHARGING STATIONS

The number of installed EV charging stations should aim to serve existing EV traffic and anticipate additional demand in the near future. Employers can survey current employees to determine how many own an EV, gauge the interest of other employees that may be considering one, and account for potential visitors with EVs. Determining quantity is an important step. Installing too many charging stations will inflate installation costs, and installing too few will create scheduling and access issues and discourage EV use.

In addition, stations left unused for a long period of time may show wear or require maintenance by the time they are needed. Best practices suggest installing charging stations to meet slightly more than the current demand, while planning for the possibility of adding more adjacent EV spaces. To do this during installation, use larger conduit to accommodate future wire runs. If upgrading the electrical panel, include room for more charging station circuits.

IDENTIFY OPTIMAL SITE FOR CHARGING STATIONS

The location of the charging station is important to the project's success. Installation costs are a key driver for station placement, and can easily exceed the cost of station hardware. For example, extended electricity runs through nonpermeable surfaces (e.g., sidewalks or pavement) greatly increase installation expense. An optimal solution is to install charging stations near an electrical panel, for example, in a parking space against the building.

Parking lot management practices, such as pavement cleaning and snow removal, also demand consideration to ensure the charging station does not impede regular maintenance and upkeep, while being kept safe and accessible throughout the year. Placing



Time Warner Cable (Schenectady)

the charging station in a prime location near their entrance may bolster a company's green image and encourage more EV use by employees. However, non-EV drivers may not look favorably on preferential parking for EVs, especially if these spaces often remain unoccupied.

ENSURE ACCESSIBILITY TO CHARGING STATIONS

EV charging spaces and the pedestrian and vehicular routes to them must be safe and accessible to all drivers. EV drivers require additional space for maneuvering around a parking space in order to connect and disconnect from the charging station. Limit tripping hazards to minimize liability concerns, and implement Americans with Disabilities Act (ADA)-compatible designs and space designation. To ensure wheelchair accessibility, an EV charging space would need additional space alongside the vehicle, a break in the curb or tire stop to provide a free path, and a charging station positioned near this break for easy access. Federal accessibility standards do not specifically address EV charging stations, but the design of the spaces and station installation plans should incorporate ADA accessibility requirements.

Additional resources can be found on page 11.

SELECT A CONTRACTOR

EV charging stations should be installed by a licensed electrician. Although any licensed electrician should be able to install an EV charging station using prior knowledge and experience, along with the manufacturer's installation instructions, selecting a licensed electrician that has completed Electric Vehicle Infrastructure Training Program (EVITP) Technical Training may prove beneficial. EVITP is a structured platform for delivering training and certification for the installation of EV charging stations in and around residential, commercial, and public facilities. The EVITP training consists of 24 hours of class time and comprehensively addresses the requirements, regulations, products, and strategies to master successful, expert, and professional customer relations, installation, and maintenance of EV charging infrastructure. The EVITP training highlights Article 625 of the National Electric Code, which specifically applies to EV charging stations, along with other relevant articles involved in the electrical installation process.

PROVIDE ONGOING MAINTENANCE

A networked charging station will provide notifications of system faults or issues that should be promptly addressed, while non-networked stations should be manually inspected on a regular basis to ensure they are working



NYSERDA (Albany)

properly (fault codes should appear on the station's display). The charging station and cord should receive particular attention, including regular cleaning. Charging station cords will not always be neatly coiled on the station, which can present a hazard to pedestrians or lead to station damage if the cord is caught by a vehicle, snowplow, or sweeper. Ensuring the area around the charging station is clean and clear — by using a concrete

pad or pavement to prevent a muddy grass surface and by shoveling the snow away from the station in the winter — is the best way to encourage EV drivers to recoil the cord. Some charging stations have a mechanism to recoil or hold up the cord when not in use, which can be advantageous.



DEVELOP AND POST SIGNAGE

Effective signage helps EV drivers navigate to EV charging station spaces and helps to prevent EV charging spaces from being occupied by a non-EV. Signs in private parking facilities are not required to meet Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) standards, but owners and operators are encouraged to do so because it promotes uniformity and clarity. A blue general service sign should be used to direct users to the charging station (using white arrows) and to identify the EV charging space. Regulatory signs are used to enforce which vehicles are eligible to park in charging station parking spots, as well as the time duration that EVs are permitted to park and/or charge at the station. Trailblazing (special) signs are used to provide drivers and visitors with additional information (e.g., green program description, funding source, tourism or economic development info, sponsorship) and can include any logos, shapes, and colors as part of the signage theme at the site. Another effective strategy for distinguishing the EV charging space is to paint the entire space green or mark the pavement with an EV charging symbol.

NOTIFY THE LOCAL UTILITY

Advance information of a new charging station installation is helpful to the local utility, particularly if numerous charging ports are planned. EV charging is an additional demand that the grid must accommodate, and the local utility must determine whether the local distribution system is sufficient. This is not as big of a concern for workplaces that already have significant electrical demand, but notification of charging station installations is still important to minimize any potential issues.

Additional resources can be found on page 11.

DEVISE POLICIES AND ENFORCEMENT PROCEDURES

Many workplace charging projects successfully serve EV drivers without clearly defined policies in place. However, as EV drivers increase and potentially exceed available charging station capacity, specific policies and procedures such as those described here can ensure optimal and fair charging without the company incurring unnecessary costs to install additional stations.

Access Priority

Most organizations adopt a “first come, first served” policy, which is the simplest to implement. However, alternative prioritization may better accommodate employee schedules and charging requirements. Such solutions include a reservation system, spaces reserved/rented by specific employees, or priority for EVs without a backup gas engine, which may require charging to get home.

Moving Charged Vehicles

Most EVs can reach a full charge in less than the typical eight-hour workday when connected to a Level 2 station. An established method by which an EV driver may request a charging station space occupied by a fully-charged EV, or setting charging time limits (e.g., half-day; morning or afternoon, or a specified 4-hour limit) may be helpful. However, in

a large parking lot that is regularly very full, requiring an EV driver to move their vehicle midday (especially in bad weather) can be a disincentive. Options include reserving nearby parking places to which EVs may move when they have finished charging, or

spacing the charging stations so a connector can be accessed from multiple spaces (i.e., so a fully charged EV can be disconnected and an EV in an adjacent space can then use the charging station without moving either vehicle).

Acceptable Charging Etiquette

Establishing protocols helps users understand when it is appropriate to disconnect an EV that it is fully charged so another EV can use the charging station. Procedures or consequences should be devised and enforced when conventional vehicles are parked in charging station spaces.

POLICIES AND PROCEDURES
HELP ENSURE OPTIMAL
AND FAIR CHARGING



*Price Chopper
(Schenectady)*



MetLife (Oriskany)



*Rochester Institute of
Technology*

Payment Options for Charging Station Use

Many employers offer free EV charging, in part because the cost of electricity for EV charging is minimal and instituting a payment system can be expensive. However, offering free charging can be problematic. Some organizations are not allowed to provide a free perk to a select group of employees. Free charging may also lead to some EV drivers monopolizing the stations because there is no financial incentive for them to charge at home or move their vehicle once fully charged. One approach is to set the cost to use a workplace charging station slightly higher than the cost for an EV driver to charge at home, which would generate funds to cover a portion of the maintenance and networking expenses. This requires a networked station with a service provider, or another mechanism for assigning the electricity use (in kilowatt-hours) to each driver. Hourly pricing encourages EV owners to vacate their space after fully charging, and also requires a networked station. Assigned, paid spaces (full- or half-day) or yearly charging passes do not require networked stations and, as such, can be good solutions for Level 1 stations. However, assigned spacing may require enforcement by company personnel.

Additional resources can be found on page 11.



Buffalo Niagara Medical Campus

EV CHARGING STATION INSTALLATION CHECKLIST

- Gather information from potential users (employee survey).**
- Identify most suitable charging station type and installation location.**
- Comply with the Americans with Disabilities Act.**
- Estimate electrical load, check the facility's available electrical capacity, and inform the local utility.**
- Contact contractor to discuss equipment options, installation process, and verify credentials/experience.**
- Hire contractor (they should take care of all necessary permits).**
- Oversee charging equipment installation (signage and/or pavement markings recommended).**
- Establish EV charging station usage policy.**
- Activate system.**
- Organize media event or press release (optional).**
- Monitor system use and user satisfaction (optional).**

ADDITIONAL RESOURCES

NYSDERDA's ChargeNY website has New York-specific information for charging station hosts, answers to common questions, and links to resources:

nysderda.ny.gov/ChargeNY

Detailed Information

- EV Everywhere Workplace Charging Challenge
energy.gov/eere/vehicles/ev-everywhere-workplace-charging-challenge
- Best Practices for Workplace Charging
calstart.org/Libraries/Publications/Best_Practices_for_Workplace_Charging.sflb.ashx
- Workplace Charging: Why and How?
pevcollaborative.org/sites/all/themes/pev/files/Comm_guide7_122308.pdf
- Plug-In Electric Vehicle Handbook
afdc.energy.gov/uploads/publication/pev_workplace_charging_hosts.pdf
- Site Design for Electric Vehicle Charging Stations
nysderda.ny.gov/-/media/Files/Programs/ChargeNY/Site-Design-for-EV-Charging-Stations.pdf
- Literature Review Summary: Electric Vehicle Supply Equipment Signage Guidance
nysderda.ny.gov/-/media/Files/Programs/ChargeNY/EVSE-Signage-Overview.pdf
- EV Charging for Persons with Disabilities
vacleancities.org/wp-content/uploads/EV-Charging-ADA-Version-1.0s.pdf

Case Studies

- Amping Up California Workplaces: 20 case studies on plug-in EV charging at work
pevcollaborative.org/sites/all/themes/pev/files/WPC_Report4web.pdf
- Electric Vehicle Supply Equipment Cluster Analysis
nysderda.ny.gov/-/media/Files/Programs/ChargeNY/EVSE-Cluster-Analysis.pdf
- Workplace Case Studies in New York
nysderda.ny.gov/Cleantech-and-Innovation/Electric-Vehicles/Case-Studies/Other-Locations

Employee Survey

- Sample Employee Survey for Workplace Charging Planning
advancedenergy.org/portal/ncpev/docs/WPCC_sample_employee_survey_USDOE.pdf

Policy Information

- Workplace Charging: The Goldilocks Approach (Plug In America)
pluginamerica.org/drivers-seat/workplace-charging-goldilocks-approach



New York State Energy Research and Development Authority (NYSERDA), a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975. To learn more about NYSERDA's programs, visit nyserdera.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.



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