Fleet
Electrification Guidebook

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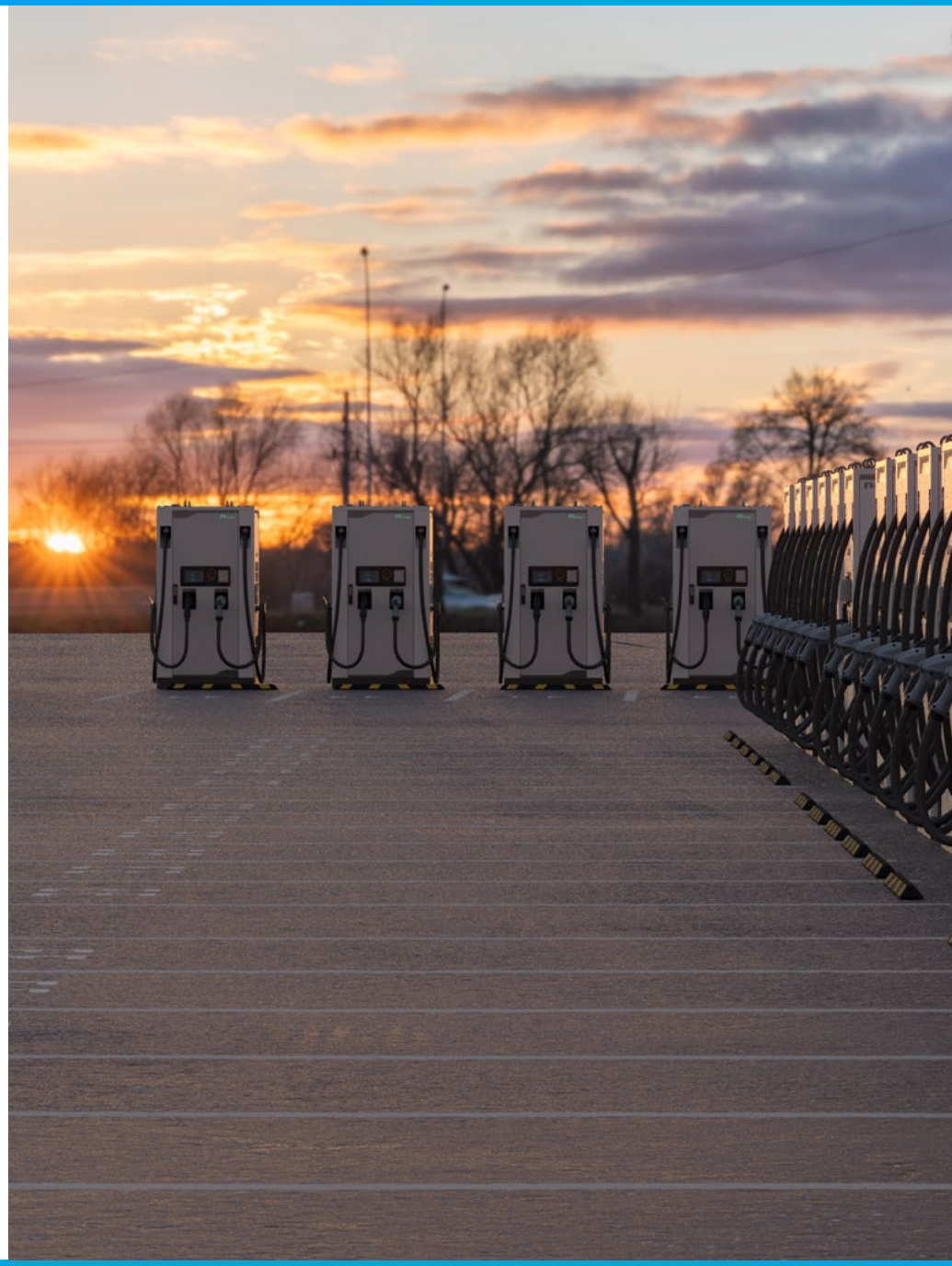

How to Use This Guide:

This guide serves to assist fleets embarking on their electrification journey. From selecting the right vehicle and charger to setting up your infrastructure and maintaining your operations, this guide can serve as a blueprint for fleets ranging from light-duty passenger vehicles to Class 8 trucks.

Fleet Electrification Guidebook

Introduction

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Introduction

Transitioning your fleet to electric vehicles (EVs) can deliver significant benefits—lower operating costs over time, reduced emissions, and alignment with global sustainability goals. This guidebook is designed to assist fleet managers, operators, and decision-makers in navigating the electrification process, particularly for medium- and heavy-duty fleets.

This Fleet Electrification Guidebook focuses on four key steps:

- **Choosing the Right Electric Vehicles:** Select EVs that fit your fleet's needs, backed by tools like PG&E's **EV Fleet Savings Calculator**.
- **Selecting the Right EV Chargers:** Match chargers to your vehicles and operations for maximum efficiency.
- **Setting Up Your Charging Infrastructure:** Design and deploy a system that powers your fleet reliably and makes it more affordable, with support from a variety of funding programs while keeping your project on track.
- **Maintenance, Training & Operations:** Ensure your new fleet is operating smoothly and that your staff is trained for the new maintenance reality of working with EVs

These steps provide practical insights at every stage: from assessing site power capacity and identifying cost-saving opportunities to integrating advanced technologies like vehicle-to-grid (V2G) systems. Serving fleets across various regions and industries—whether transit agencies, delivery operators, or small businesses—this guide distills expertise into a clear, actionable roadmap. For those in Northern and Central California, **PG&E's EV Advisory Services** offers personalized, no-cost support until December 2026.

Ready to Get Started?

Contact **EV Advisory Services** for personalized support or dive into the chapters ahead. Let's power your fleet's future together.

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Choosing the Right Electric Vehicles

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Choosing the Right Electric Vehicles

Selecting the right electric vehicles (EVs) for your fleet is one of the first steps of your fleet's electrification journey. This impacts operational efficiency, overall cost savings, EV charger selection, and more. By assessing your fleet's needs and operational profile, you can identify EVs that align with your requirements and long-term objectives. This chapter guides you through key considerations to evaluate EV options and understand your total cost of ownership.

Getting Started: Defining Your Fleet's Current Needs and Future Goals

Asking the right questions early on helps make sure that your vehicle choices meet your immediate and future needs. Below are key considerations to guide your planning.

Factor	Questions to Ask	Why It Matters
Goals	• What are your main electrification goals: cost savings, emissions reduction, regulatory compliance, or operational efficiency? • Do you have specific timelines tied to regulations or internal targets to meet?	Aligning vehicle selection with goals ensures strategic investment and compliance with any state or local regulations.
Current Fleet	• Do you own or lease your vehicles? • How many vehicles are in your fleet? What is the make, model, mileage, and engine model year? • Where and for how long do vehicles park (dwell time)? Do you own or lease your facility? • What are your operational requirements (e.g., range, payload, duty cycles)? • Do you operate any specialized vehicles that perform specific functions or duty cycles?	Understanding your fleet's size, ownership model, and usage patterns helps identify which vehicles may be prime candidates for electrification.
Experience	• Do you operate any EVs currently? • Have you test-driven EVs or explored specific models? • Are you familiar with the electric models available from your current OEMs or dealership?	Prior experience can streamline decision-making and highlight practical needs or gaps.
Concerns	• What initial questions do you or your team have about electrification (e.g., range anxiety, upfront costs)?	Addressing concerns upfront mitigates risks and builds confidence in the transition.

Next Steps

- Document answers to these questions to create a basic electrification profile.
- Engage with PG&E's **EV Advisory Services** team for a personalized consultation to refine your goals. **To get started, complete the EV Advisory Services application.**

Evaluating Electric Vehicle Options

Choosing the right EVs for your fleet means matching operational needs with available models. This section expands on several key factors:

Factor	Details	Considerations
Compatibility & Interoperability	Ensure vehicles work with planned EV chargers (e.g., CCS, NACS) and software systems.	Verify with vehicle and EV charger manufacturers. For example, a CCS-compatible EV ensures flexibility with Level 2 or DCFC chargers.
Vehicle Range & Battery Performance	Compare your daily range needs to manufacturers' specs. Factor in battery degradation (5-10% over 5 years) and variables like weather, terrain, or heavy payload that can reduce range.	A 150-mile range might drop to 120 miles in cold weather. Test vehicles in your exact conditions during any pilot programs and ask your OEM about your exact operational requirements.
Electric Vehicle Model Availability	Are there EV models available for the exact type of vehicle you need to perform your operations?	Vehicles have different features and intended uses. A refuse truck needs high torque and payload capacity, unlike a delivery van focused on range.
Availability & Lead Time	Check vehicle stock and delivery timelines from manufacturers or local dealers.	Plan purchases early and always be sure to ask your dealer or sales representative for the latest in lead times for the vehicle you'd like to purchase.
Dealer & Service Support	Confirm your dealer offers test drives and can regularly service and support EVs.	A growing number of dealerships are "EV-certified" which means they are able to service EVs and have stock parts on-hand which reduces downtime.

Next Steps

Discover the right vehicles for your fleet by make, type, and range at **PG&E's Electric Vehicle Catalog**.

Prioritize Vehicles for Transition

Very few fleets can "switch" all vehicles to EVs at once. Some fleets are replacing vehicles as they reach the end of their lifecycle, while others are adding EVs alongside existing vehicles. Prioritizing the right vehicles to replace first can minimize disruption and help maximize cost savings.

Looking at fuel consumption is helpful, vehicles with high fuel costs have the potential to save the most as EVs. Vehicle age and maintenance matter too; older units with high maintenance costs may be ready for replacement, especially if they qualify for funding programs that require vehicle scrappage. Usage patterns help—vehicles with predictable, return-to-base routes under 150 miles daily are often a good fit for electrification. Telematics data help spotlight high-idle or low-mileage units. Highly specialized, super-heavy duty, and long-haul vehicles are difficult to electrify now.

Criteria	Impact	Questions
Fuel Consumption	High fuel costs can mean more savings.	Which vehicles use the most fuel?
Age & Maintenance	Older units are often costlier to keep.	Which have high repair bills or might qualify for funding programs that require scrappage?
Usage Patterns	Predictable (and shorter) routes can be easier for EV charging.	Which vehicles have return-to-base routes under 150 miles a day?
Telematics	Vehicle data can highlight possible units to transition.	Does idle time or mileage favor EVs?

Analyze Total Cost of Ownership

Cost savings is a driver for many decisions and EVs can provide cost savings over time, even with higher upfront prices. Total Cost of Ownership compares all costs—purchase, fuel, maintenance, and more—to reveal the full picture over time.

Total Cost of Ownership Component	Description	EV vs. Diesel
Upfront Costs	Purchase price, chargers & related infrastructure, taxes	While upfront costs are typically higher for EVs, these can be offset by available funding and incentives
Fuel/Energy	Electricity vs. traditional fuels	Electricity as a fuel source offers significantly lower costs compared to diesel and eliminates the need for onsite refueling
Maintenance	Repairs, parts, service	Electric vehicles have lower maintenance costs due to fewer moving parts and less frequent service requirements
Incentives	Grants, credits, rebates, vouchers	Multiple federal, state, local, and utility incentive programs can help reduce the upfront cost of EVs, whereas diesel vehicles have minimal incentives available
Residual Value	Resale potential	The resale potential for electric commercial vehicles remains strong, supported by increasing adoption rates year over year.

Next Step:

Utilize **PG&E's EV Fleet Total Cost of Ownership Tool** to model your Total Cost of Ownership specifically for your fleet's needs.

Prepare Your Team

Electrification changes day-to-day operations, so it's essential to prepare your team:

- **Train Drivers:** Ensure drivers know how to charge vehicles, plan for range, and optimize routes.
- **Certify Maintenance Staff:** Maintenance personnel will need EV-specific training, especially for high-voltage systems.
- **Update Procedures:** Adjust schedules, safety protocols, and manuals for EV operations and charging needs.
- **Engage Stakeholders:** Involve leadership, facilities, HR, and finance early for a coordinated transition.
- **Communicate Benefits:** Regularly share progress, cost savings, and success stories to keep your team engaged and motivated.

Preparing your team up front helps guarantee a smooth transition to electric vehicles and long-term operational success.

Looking for More Resources?

PG&E's EV Advisory Services connects you to resources and tools to ensure you have the data and guidance needed. Refer to the **Additional Resources** at the end of this guidebook for a list of vehicle catalogs and resources.

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Selecting the Right EV Chargers

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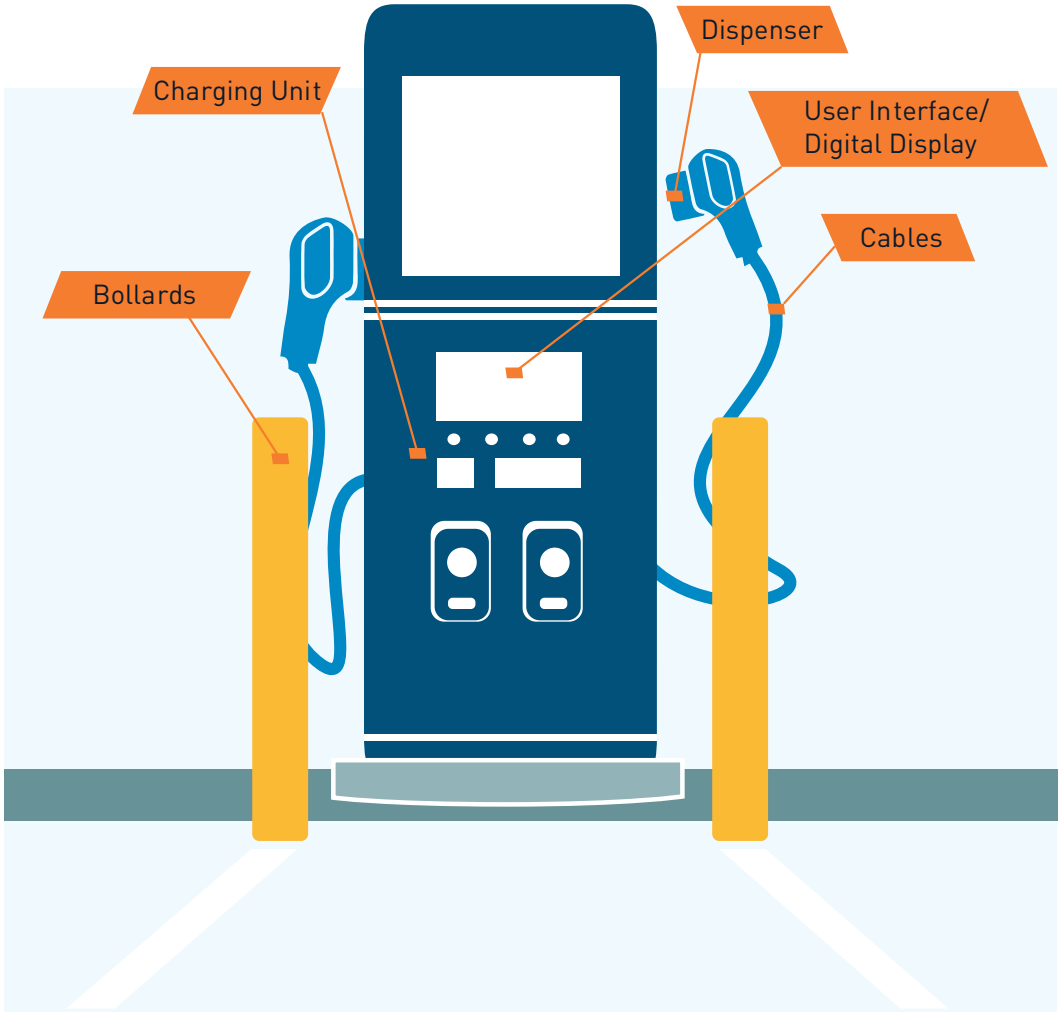
Selecting the Right EV Chargers

There are a wide variety of EV chargers, also called Electric Vehicle Supply Equipment (EVSE), on the market with varying power levels, sizes, and software add-ons to maximize the operating experience. But every EV charger is not for every fleet. Selecting the right EV charger ensures compatibility with your vehicles, optimal energy use for your fleet, and overall efficient fleet operations. With proper upfront planning, a fleet can find the charging system that is the right fit for their needs.

Key Components of EV Charger

- **Charging Unit:** The heart of the EV charging station. The most commonly recognized component.
- **Dispenser:** The physical interface that links the vehicle and charging unit and transfers current between them.
- **Cables:** Transmits current from the charging unit to the dispenser. Cable thickness and length depends on the maximum amount of current to be transferred.
- **PDU (Power Distribution Unit):** The EV charging station's central nervous system. These units can be combined with the charging unit but most commonly exist as separate components.
- **User Interface/Digital Display:** Optional component. Usually, a screen that provides information to users. In some cases operators will use a mobile app.
- **Mount:** Can be pad mounted, wall mounted, or mounted directly on the concrete.

Anatomy of an EVSE



Charger Power Levels

Although there are various types of EV chargers, all chargers are classified under three categories: Level 1, Level 2 and Level 3. Each category has predetermined power levels that correspond to typical use cases or vehicle types.

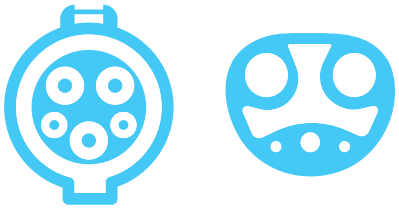
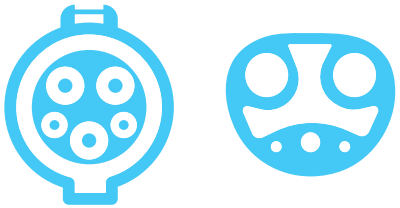
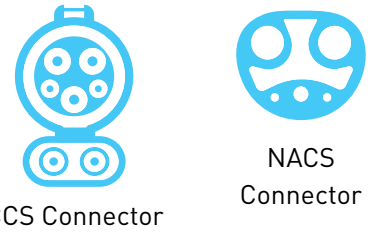
Fleets can identify the level of the charger they need based on the vehicle type and the length of time available to charge between shifts, also known as dwell time. A PG&E Advisor can help identify what charger type is best for your fleet based on fleet needs, available power, and cost considerations.

Category	Description	Typical Use Case	Charge Time	Cost
Level 1	• The lowest speed charging equipment • Plugs in to standard 120-volt AC outlet	• Home charging • Used for vehicles with very long dwell times • Not common for medium- and heavy-duty fleets but may be used for forklifts and other off-road equipment	• Requires the longest charging time as it distributes electricity to vehicles at a rate of approximately 2-5 miles of range per hour	$
Level 2	• Most commonly deployed EV charger type with AC supply • Provides enough power to charge most vehicles during a regular dwell window (approximately 6 hours or longer)	• Home charging with higher capacity • Fleet charging with multiple chargers • Public parking lot charging • School bus fleet charging • Workplace charging • Sites with limited power capacity	• Charging vehicles overnight or during longer periods of non-operation for 6 hours or more • Approximately 12-30 miles of range per hour	$$
Level 3	• Also called DCFC or in some cases fast charging or super charging • Fastest charging available • Most expensive to install, requiring the most infrastructure to install • Highest operating cost and cost for electricity	• Vehicles with short dwell times • Heavy-duty vehicles with large batteries • "En route" fast charging • Public parking lot charging • Highway corridors	• Approximately 30-480 miles of range per hour	$$$

Charger Dispenser Types

Each level of charging has standard dispenser plug type(s) that support the transfer of a specified range of current or power. However, not all vehicles use the same plug types. When selecting a charger level, plug compatibility with the vehicle must always be considered. In some cases, a fleet may select an EV charger that can accommodate multiple plug types to support a fleet with a broad range of vehicle types. Recent industry trends have shown a consolidation around several leading contenders for plug types, but at the time of publication there are still several options to consider. NACS is an emerging charging standard that has gained popularity in recent years, and is increasingly becoming the industry standard.

Charging Plugs

Level 1 Charging	Level 2 Charging	DC Fast Charging (Level 3)
1 – 2 kW Output 2 – 5 Miles per Hour of Charging	7 kW – 19 kW Output 12-30 Miles per Hour of Charging	30 – 350 kW 30-480 Miles per Hour of Charging
 SAE J1772 Standard Connector NACS Connector	 SAE J1772 Standard Connector NACS Connector	 CCS Connector NACS Connector CHAdeMO Connector MCS Connector

Plug-in Interfaces

There are many different plug-in interfaces based on various standards (e.g., SAE J1772, SAE Combo CCS). In addition, some EV manufacturers have adopted their own proprietary standards.

Choosing the Right Power Level

The best way to select or confirm a charger power level is to calculate your fleet's power needs.

Calculating the minimum power needed requires operational information such as the number of miles traveled daily, vehicle energy consumption use per mile (as per vehicle manufacturer specifications) and the dwell time or available charging hours. Once these data points are collected from your historical fleet usage and the electric vehicle specification sheet, they can be applied to the following equation:

Minimum power (kW) = Daily miles ÷ energy consumption ÷ dwell time × 1.20

Just like MPG for gas vehicles, EVs list energy consumption (miles per kWh). PGE's **Fuel Savings Calculator** and **Vehicle Catalog** can help you estimate your power needs.

Example: Delivery Fleet

As an example, let's consider a delivery fleet that is thinking about converting their small delivery trucks from diesel to electric vehicles.

The selected electric delivery truck drives **1.60 miles per kWh of battery capacity** and the truck normally **travels 120 miles per day**. The truck **returns to the depot at 4pm each day** and **departs the depot at 4am**. The calculation for minimum power (kW) is:

Daily miles = 120

Energy consumption (miles per kWh) = 1.60

Charging Hours = 12 (4pm-4am)

120 miles ÷ 1.60 miles per kWh ÷ 12 hours × 1.20 = 7.5 kW

Since 7.5 kW is higher than the max power level of a Level 1 charger, the best options for this fleet of delivery trucks would be Level 2 or greater. A Level 3 EV charger could be utilized but does not make sense given the high charger costs and long vehicle dwell times available.

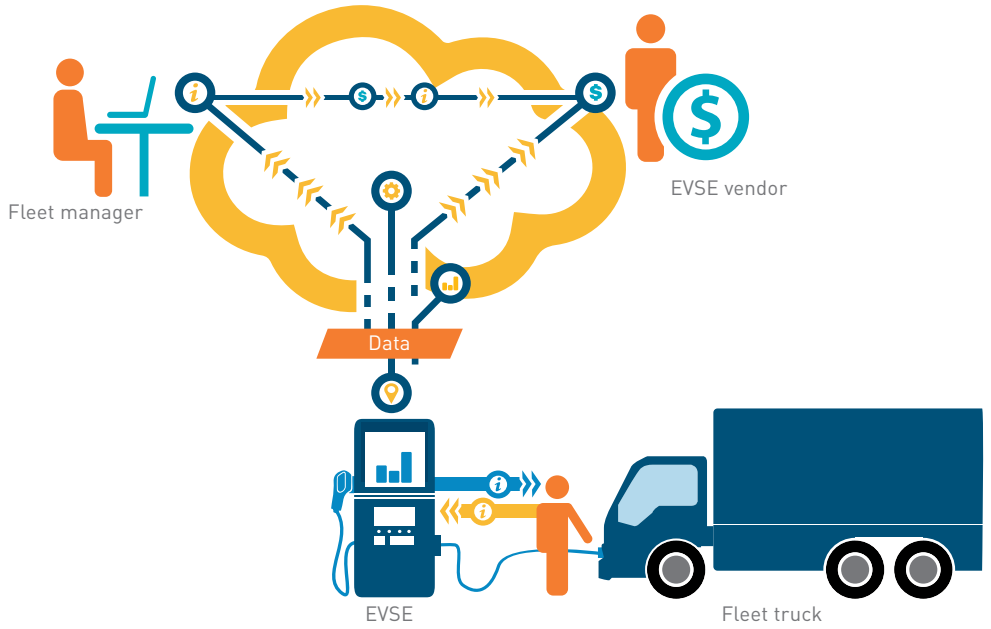
The final decision will be dependent on the amount of power available at the site, number of chargers desired, budget and other operational factors.

The Role of Software and Charging

Most Level 1 and some Level 2 and 3 chargers do not require additional software to function or come with embedded software for basic operations. However, there is a wide range of charging and vehicle software that can be added to your charging system to make EV charging easier, more manageable, and scalable.

How to select EV charging software:

- **Compatibility:** Identify a system that is compatible with your EV charger and any existing fleet planning software you use and don't want to replace. Chargers that use **Open Charge Point Protocol (OCPP)** are compatible with the largest quantities of software and networks. EVSE that only use proprietary communications protocols are likely to only communicate with the EVSE's vendor's network of services and are more restrictive.
- **Hard-Wired or Wireless:** The majority of EV chargers are capable of being controlled via a networking service, an internet-based service that allows an EVSE owner to analyze basic activity data from one or more EVSE. Keep in mind that wireless networking will require Wi-Fi or cellular service. Reliability of the service and contingency plans should be considered.
- **Operational Needs:** Identify key features needed to manage your EV fleet and work with your charger manufacturer or project engineer to identify software that meets your needs. Key features may include:
  - **Vehicle Tracking:** GPS mapping of vehicles in real time. Identifies if vehicles are operating properly, location in reference to scheduled route, and the SOC (state-of-charge) for each vehicle.
  - **Payment Management:** Some fleets may open their charging facilities to the public during off hours and when chargers are available. Payment management systems can collect payments via credit card or membership.
  - **Energy Management:** Tracks energy usage and may be programmed to avoid peak charging times, reducing grid load and saving money by charging during off-peek hours.



Networked EVSE allow fleet managers to collect a small set of data from their EVSE. Cloud-based services can enable fleet managers, EVSE vendors, and EVSE users to share data and manage charging behavior via a wireless connection.

Questions to Consider When Selecting an EV Charger:

- Is this EV charger compatible with your vehicles? Does it have the right plug? Does it have the right rating and output?
- Is the EV charger on PG&E's **Approved Product List**? Is the EV charger eligible for other funding programs?
- Is this EV charger capable of managing your energy use to minimize your cost of electricity (load management) or does it require a third party load management provider if that functionality is desired?
- Is the EV charger Open Charge Point Protocol (OCPP) compliant? (This will ensure that you can use the same charger with different software providers)
- What kind of training, service, warranties and support does the EV charger manufacturer or supplier offer?
- Is this charger compatible with your electrical service (phase and voltage)?
- What additional equipment is needed to operate this charging equipment (controllers, network modules, etc.)?

Exploring V2X

Some chargers are bi-directional, which means they can move power from your vehicle's battery back to your panel. This can be useful for the following applications:

- You can use your EV as a backup power source for your building in case of an outage.
- You can export electricity back onto the grid and potentially earn revenue from PG&E.

This is called "vehicle-to-everything" or V2X.

If you are considering V2X, you will need to make sure that both your vehicles and your chargers are capable of bi-directional power flow. Most chargers can only move power one way (from your panel to the charger). You will also need to make sure your charger meets minimum safety requirements. Reach out to your Advisor to learn more.

Looking for More Resources?

PG&E's EV Advisory Services connects you to resources and tools to ensure you have the data and guidance needed. Refer to the **Additional Resources** for a list of vehicle catalogs and resources.

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Setting Up Your Charging Infrastructure

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Setting Up Your Charging Infrastructure

Building the charging infrastructure for your electric vehicle (EV) fleet is where planning meets action. Done right, it ensures your fleet stays powered, operational, and cost-effective—without the headaches of trial and error. Whether you're charging a handful of delivery vans or a full transit fleet, this chapter walks you through the essentials: confirming power availability, designing a site-specific setup, and deploying chargers with minimal disruption. Early coordination with PG&E is key— our EV Advisory Services team helps you assess capacity, navigate utility processes, and tap into programs to keep your project on track. From verifying your site's power limits to installing the right chargers, this section delivers a clear, actionable roadmap to get your infrastructure up and running efficiently.

Confirming Power Needs and Limitations

Early engagement with PG&E is essential to identify the optimal setup and power needs for your fleet's charging infrastructure.

Utility Responsibility: Determine the maximum amount of power that can be supplied to the site right now and in the future. Work with the site owner to identify the optimal location for the transformer and the meter.

Customer Responsibility: All design and installation after the meter must remain within the power limit provided by the utility. The customer provides the plan to the utility for review as part of an application process.

Charging System

The charging infrastructure pulls power from the utility grid via a transformer and meter that is connected to your chargers.

Utility assets (e.g., power lines, transformer) | Meter | Electric panel/ switchgear | Charger | Plug-in electric vehicle

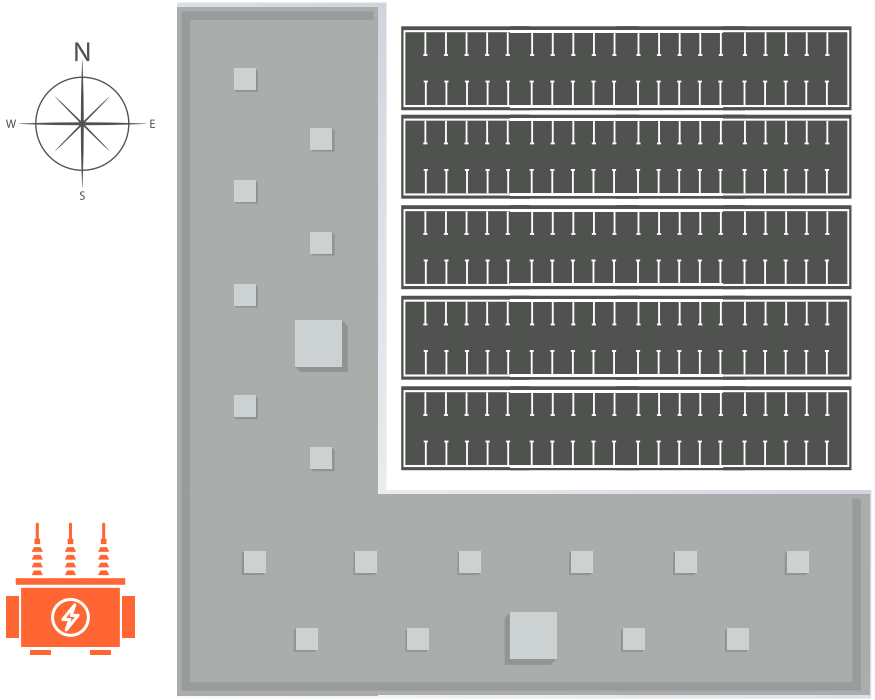
To-the-meter (TTM) infrastructure	Behind-the-meter (BTM) infrastructure	EV supply equipment (EVSE)
PG&E pays for, constructs, owns and maintains electrical infrastructure to the meter panel	Customer pays for, constructs, owns and maintains infrastructure from meter to the charger	

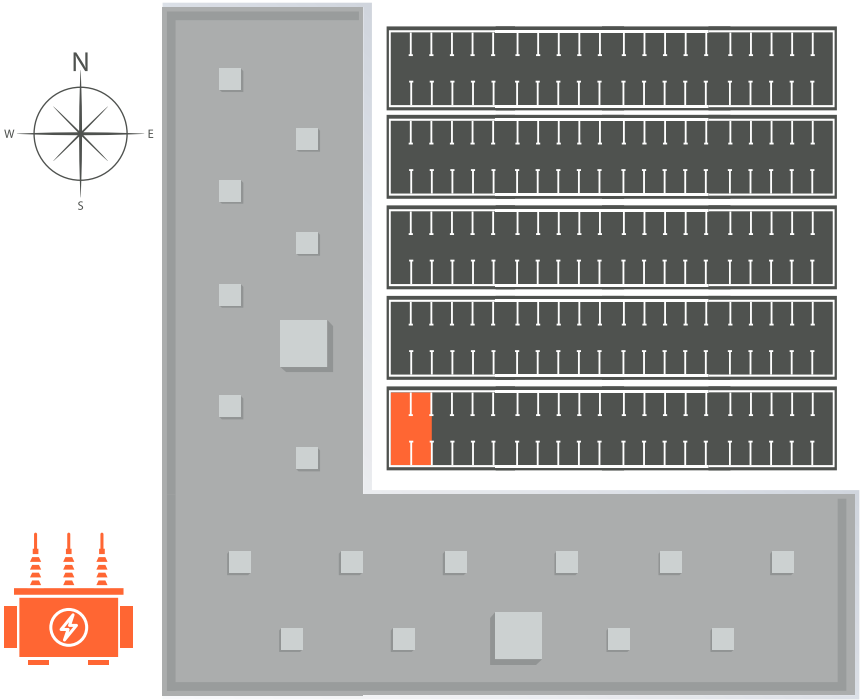
Planning Your Site Configuration and Setup

Every site is different and contains operational constraints, physical limitations and has budget requirements. All of these factors affect where and how EV chargers are located on a site.

Example: Site Plan for a Package Facility

A package delivery fleet is installing EV chargers for five (5) make ready spaces. The site owner and electrician engaged the utility early in the project planning and was notified that the transformer and meter will be installed behind the building (on the west side of the building).

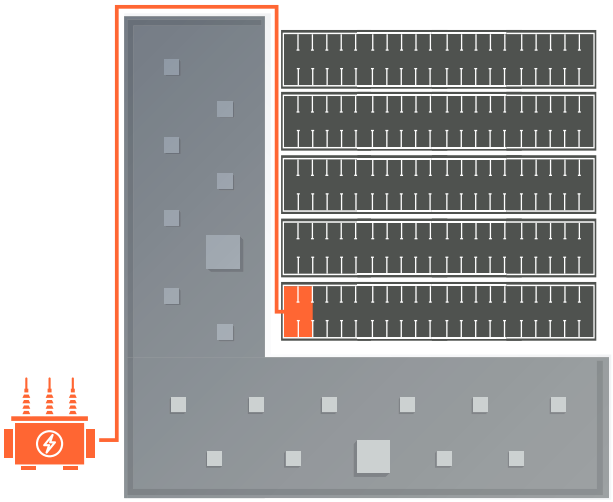




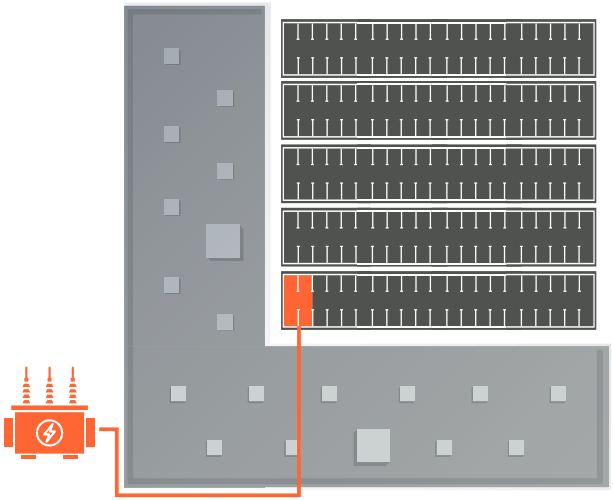
The building owner prefers the chargers installed on the northeast side of the building.

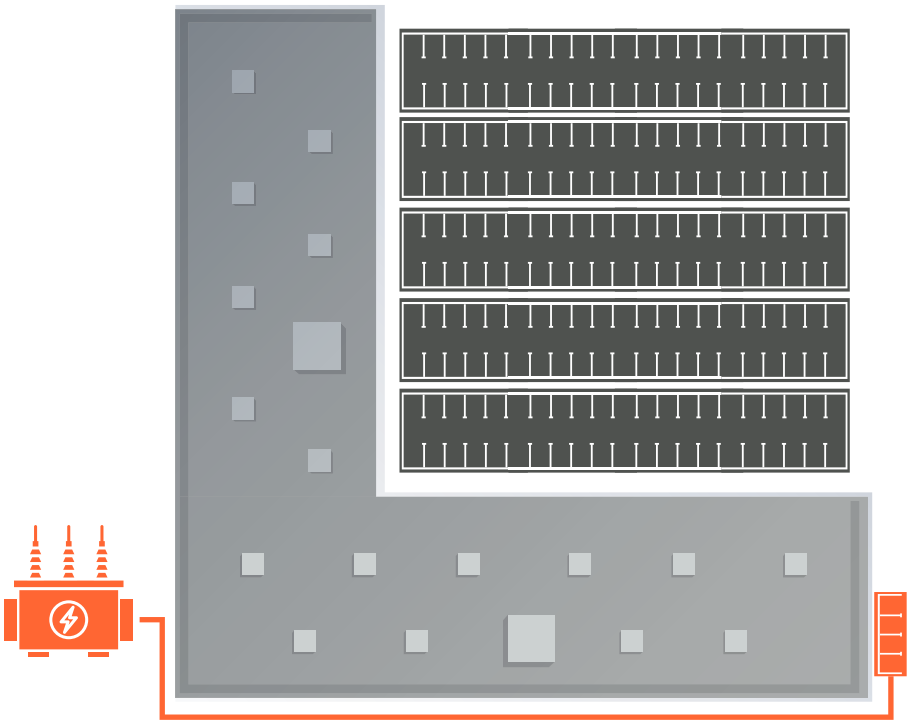
The electrician mapped the optimal pathways for the conduit installation around or through the building (Option 1 & 2). The estimated cost for the length (LF) of conduit, trenching and/or building penetrations required to deliver power to the owner's preferred location exceeded the maximum budgeted amount for the work. As an alternate the electrician proposed a location that is less than the budgeted amount (Option 3):

Conduit Installation Option 1: Conduit pathway 1 to meet owner selected location.



Conduit Installation Option 2: Conduit pathway 2 to meet owner selected location.





Conduit Installation Option 3: Electrician proposed conduit pathway

The site owner identified that the location is not acceptable since trucks must be loaded at the southeast doors. As a remedy, the site owner and electrician agreed to install the charging 50 feet from the southwest doors (Option 4). The contractor will also install a concrete island where the chargers will be set and protected by bollards.

Setting Up Your Charging Infrastructure

Now that the final location of the charger stations is identified (Option 4), the site owner will work with the project engineer to confirm operational requirements such as dwell time, available charging schedule, vehicle type, battery capacity, software, etc.

The project manager will utilize the dwell time, schedule, site power capacity and vehicle type to select the type and number of chargers, calculate needs, finalize the site design and complete the corresponding application with PG&E.

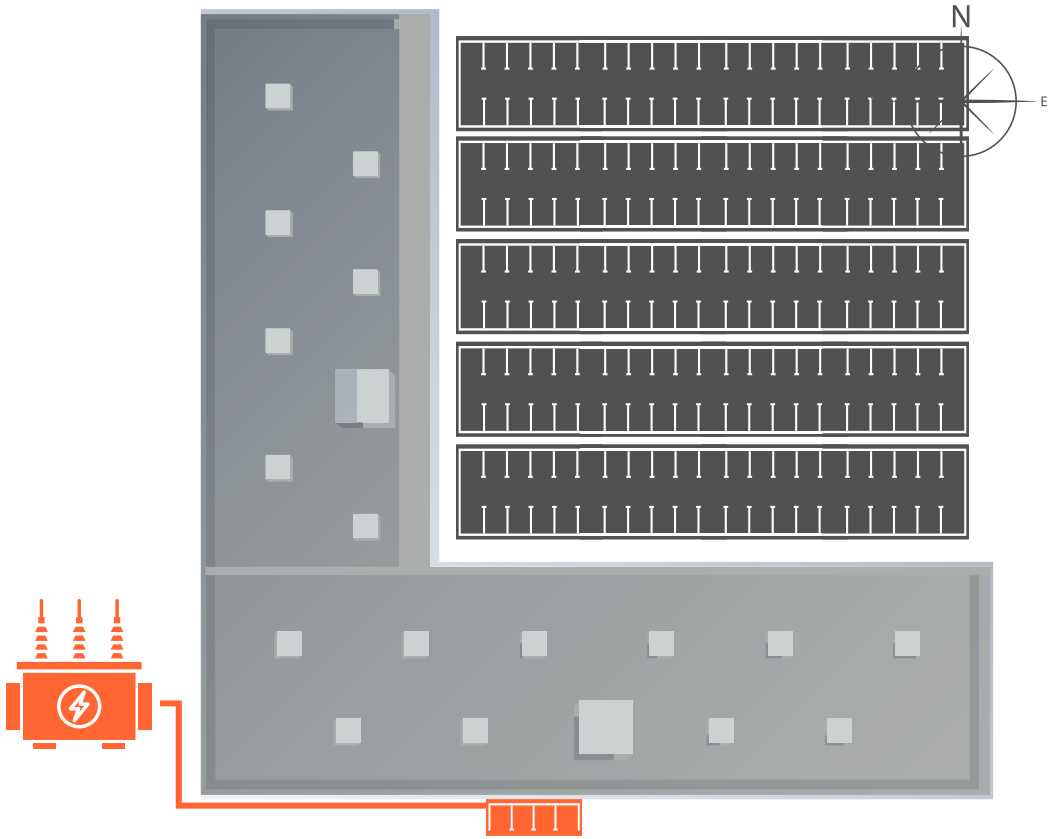
In this example, the project manager determined that the project will consist of (3) Level 2 chargers and (1) Level 3 DCFC charger.

Key Takeaways:

1. **Communicate Early and Often:** Engage the utility and all relevant stakeholders including the site owner, electrician, and project manager from the start. Early communication helps ensure smooth planning and installation of EV charging infrastructure.

2. **Be Flexible and Plan for the Future:** Evaluate site constraints, operational needs, and budget limitations up front. Choose charging locations that balance cost-efficiency with operational functionality. Accommodate future expansion by including additional make-ready spaces in your design.

3. **Collaborate to Find the Best Solution:** Work together to identify solutions that meet immediate requirements such as installing Level 2 and DC fast chargers while enabling practical, long-term growth.



Conduit Installation Option 4: Final charger location and conduit pathway.

Setting Up Your Charging Infrastructure

Checklist for Infrastructure Application

Step 1	Customer finalizes the number and power level of the chargers to be installed
Step 2	Customer determines site location for chargers and related equipment
Step 3	Customer hires a qualified electrical engineer to design their behind-the-meter (BTM) infrastructure
Step 4	Customer submits an application to PG&E for electrical service (EV Fleet Program or Rule 29)
Step 5	PG&E reviews design and plan, conducts a capacity pre-assessment, and determines the scope of the utility infrastructure
Step 6	PG&E issues a contract to the customer outlining the project scope
Step 7	Customer returns signed contract to PG&E
Step 8	Customer constructs the BTM infrastructure using qualified contractors
Step 9	PG&E inspects the customer's work
Step 10	PG&E schedules and constructs the to-the-meter (TTM) infrastructure
Step 11	Site is energized and ready for operation

Installation Tips

All projects experience a unique set of challenges to completing them on time and on budget. However, proper planning and mitigation strategies can minimize risk to the project.

Consider these steps as early as possible:

- Begin developing a fleet transition plan
- Select a qualified and licensed engineer for project design
- Coordinate with PG&E and consider utility programs early
- Include the electrician and/or contractors performing the work in key decision making meetings. They bring a unique perspective and will help identify key pitfalls to avoid on a site.
- Employ software to support load management and fleet management. Ensure compatibility before final design.
- Consider how the site currently operates when selecting position of charging, this includes turn radius, loading and unloading, length of charging cables and orientation of parking spaces
- Always embed maintenance and product care into the charger design. Product care can include housekeeping pads, cable management, collision protection, screen protection, etc.
- Determine if maintenance will be performed in-house or by a third party early in the process. Encourage maintenance staff to participate in commissioning and training activities.

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Maintenance and Operations

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Maintenance & Operations

Training is essential to extend the life of the charging and vehicle systems on site. Training begins as part of the project construction process and continues through the life of the EV chargers and vehicles.

Site owners can work with their engineers, manufacturers and other members of the project team to develop training programs for:

- **Fleet Owner:** Warranty information, life cycle of chargers, maintenance and operations requirements
- **Vehicle Operators:** Proper charging techniques, vehicle positioning, cleaning, protecting components, point of contact for repairs
- **Site Maintenance Team:** Protecting the site and components, cleaning, troubleshooting, maintenance protocols
- **Charger Maintenance Team:** Hardware, software, troubleshooting, onsite repairs, parts protocols, performing software updates, manufacturer manuals and contacts

Vehicle and EVSE Training Resources:

For more customized resources tailored to your specific vehicle and EV Chargers, check with your vehicle and equipment manufacturers who often offer specialized training programs for customers.

- **Ask your vehicle manufacturer** for resources, including hands-on or virtual training, and online courses. Ask about training opportunities for technicians, drivers, and staff on practices to increase battery life through regenerative braking, EV charging best practices, and safety considerations.
- **Consult your EV charger manufacturer** for similar training resources, available in-person or virtually, live or pre-recorded.
- **Check with your local dealership** to see if locations offer dedicated EV training resources or workshops.
- **Consult local trade tech colleges** for specialized programs or courses on electrification training, available at degree or certification levels.

EVSE Maintenance Best Practices:

Incorporating best practices in everyday operations can support the overall maintenance program. A few practices include:

- Turn off power to EVSE before conducting maintenance
- Routinely inspect cords, plugs and cord storage device for wear and tear or misuse
- Clean plugs regularly or at the sign of build-up of grit or grime
- Inspect cooling device filters for buildup
- Regularly inspect area around EV charger for hazardous conditions like damaged concrete, barrier damage, flooding, etc.
- Review data reports for inconsistent activities or signs of errors
- Compare EVSE data to your utility bills to confirm equipment is functioning as intended

Fleet Management and Digital Solutions

Software solutions are often paired with Level 2 and Level 3 chargers. Although not required, EV charger owners may find it advantageous to acquire supporting software systems to manage the EV chargers and/or fleet. Software packages offer features such as:

- Cloud based access to chargers
- Charger station health and indicator monitoring
- Remote diagnostics for EV charger issues
- Usage and power consumption calculation
- User payment capture (as applicable)
- Energy management
- Operational maintenance reminders and guidance
- Load management to prevent charging at peak hours and/or above allocated levels.

What is Charge Management Software (CMS)?

Can be used when a site is not able to provide enough power to support the desired number of EV chargers or the power level of the chargers or to reduce operational costs by shifting charging to lower-cost periods of the day.

Example: Load Management Software

An owner would like to install four (4) 350 kWh Level 3 (DCFC) chargers. However, the site can only supply 1,000 kW (1MW). Instead of eliminating one (1) DCFC charger or waiting until more power is available, the owner can install Load Management Software that limits the consumption of all four (4) chargers to 1,000 kW instead of the chargers' full capacity of 1,400 kW.

Dynamic charge management software can leverage vehicle information (state of charge, next shift, etc.) to make informed decisions on how to spread the 1,000 kWh of power across the four (4) EV chargers to ensure vehicles are charged by the time they are needed. If more power becomes available, the load management setpoints can be changed or removed to match the new site power capacity.

Charging software can be paired with fleet management software to create a single point of access to maintain both charging and fleet systems. When combined, fleet management software can provide a greater level of control to maximize the output of equipment and vehicles.

Some examples of what charging software can do includes:

- Showing vehicle SOC (state-of-charge)
- Utilizing SOC to determine order of charging
- Charging scheduling
- Troubleshooting and performing vehicle diagnostics
- Issuing maintenance or repair requests
- Tracking various vehicle types in one system (EV, alternative fuels, standard fuels, etc.)
- Tracking different types of charging stations in one software
- Facilitating expansion of EV fleet with a limited number of chargers by maximizing charger usage

Your charger manufacturer and electrical engineer can provide further guidance on the options that are available for your fleet and assist in developing charging designs that will maximize these features.

Purchasing Electricity for Your Fleet

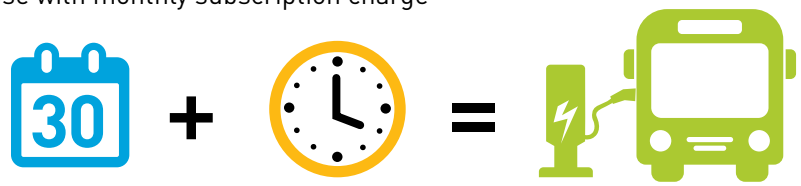
PG&E offers two EV rates for business customers with on-site EV charging

The rate plans help you meet your EV charging needs, while keeping fuel costs lower than gasoline or diesel alternatives. Both plans combine a customizable monthly subscription charge with a time-of-use rate to help you save money.

These rate plans are specifically designed for customers with separately metered EV charging at locations such as workplaces, multi-unit dwellings, and retail as well as sites with fleets and public fast charging stations.

How business "EV rates" work

Time-of-use with monthly subscription charge



Monthly subscription charge | Time-of-use rate | Business EV rate

PG&E Offers Two Energy Rate Plans for Businesses with EV Charging

Helping fleets save up to 40% on the cost of fuel compared to diesel.

Business Low Use EV Rate BEV1	Business High Use EV Rate BEV2
Best suited for:	**Best suited for:**
• EV charging installations up to and including 100 kilowatts (kW) • Smaller workplaces and multi-unit dwellings	• EV charging installations of 100 kilowatts (kW) or above • Sites with fleets and public fast-charging stations

Monthly subscription charge

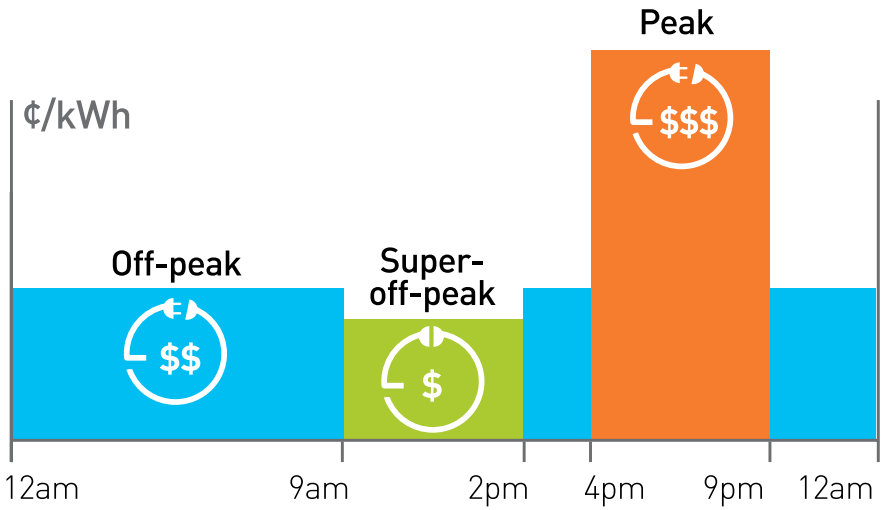
The monthly subscription charge reflects the maximum amount of power (kilowatts or kW) you expect to draw each month. You can adjust your subscription level throughout the month as often as needed – until the last day of each billing cycle – to avoid overage fees.

BEV1
purchased in blocks of 10kW

BEV2
purchased in blocks of 50kW

Time-of-Use Rate

In addition to your monthly subscription charge, you are charged a volumetric rate (kilowatt-hours or kWh) based on how much energy you use and when you use it. Charging is the most affordable midday when PG&E has higher levels of renewable energy generation. Time-of-use periods are consistent year-round with no seasonality.



Overage fees

- At the end of your billing cycle, if your actual consumption (kW) exceeds your subscription level, you will be charged an overage fee of two times the cost of one kW for each kW over your subscription level.

Grace period

- To help you determine the best subscription level, you have a grace period with no overage fees for three billing cycles when you first enroll or add more EV charging installations. If you incur overage fees on your third and final grace period billing cycle, your subscription level will be automatically adjusted to cover your overage amount. You will also need to stay on this auto-adjusted subscription level for your next three billing cycles, after which you may modify your subscription level without limitation.

Next Steps:

Please refer to the **Business EV Tariff (PDF)** to see the most up-to-date subscription charges and energy rates.

Opportunities to Reduce EV Charging Costs

In general, charging your vehicles during off-peak periods (overnight starting at 9pm until 4pm the next day) will reduce your overall energy costs. You can achieve further cost savings through proper load management, where energy is metered out at a consistent rate for the entire duration of the charging window to lower your monthly subscription charge.

Business EV rate calculator

Calculate your monthly fueling costs with the dynamic **Business EV rate calculator tool**. This tool allows you to estimate monthly fueling costs, toggle between rate options, see how costs change depending on subscription level, set your charging schedule, and more.

Example: Site Plan for a Package Facility

You have 10 vehicles and 10 chargers with a maximum power draw of 50kW each. Your vehicles consume 150 kWh of energy per day. You plug in your vehicles to charge at 5pm at max output from your charger until the batteries are full.

TOU RATE STRUCTURE

You are billed under the BEV2 rate plan with three rate periods: Off-Peak ($0.18/kWh), Super Off-Peak ($0.16/kWh) and Peak ($0.40/kWh). Last month, your fleet consumed 33,000 kWh during the Peak period (began charging at 5pm and finished charging when all batteries were full). Your energy charge would be as follows:

33,000 kWh × $0.40/kWh = **$13,200 total energy charge**

TOTAL SUBSCRIPTION CHARGE

Now consider you are subject to a Subscription Charge of $95.56 per 50kW block. Last month, your fleet had a maximum demand on the grid of 500 kW (all chargers operating at max output). To calculate your total subscription charge, determine the number of blocks you need and multiply it by the subscription charge.

500 kW→ 10 blocks (50kW each) × $95.56 = **$956 total subscription charge**

TOTAL CHARGE

$13,200 Energy charge + $956 Subscription charge = **$14,156 total charge**

How load management can reduce your cost of power:

Load management allows you to shift your time of charging and spread your power use over longer periods of time to reduce both your TOU rate and your subscription charges. In this example, you could begin charging your vehicles at 9pm when the Off Peak period starts, and spread your charging over an 8 hour period (from 9pm to 5am) since the vehicles are idle overnight. This reduces your maximum demand to roughly 188kW (10 chargers × 150kWh per vehicle per day ÷ 8 hour charging window).

New energy charge: 33,000 kWh × $0.18/kWh = **$5,940**

New subscription charge: 188kW = 4 blocks (50kW each) × $95.56 = **$382**

New total: $5,940 (energy) + $382 (subscription) **= $6,322 (was $14,156)**

This is a savings of 55% per month!

Learn More:

To learn more about the Business EV Rate, visit

www.pge.com/BusinessEVRate

Energy Management Best Practices

The previous sections described ways that using specific charging periods, dedicated meters and networked or cloud-based services can optimize a fleet's transition to EVs in a cost-effective, operationally feasible manner. Additional energy management best practices include energy storage and an emergency preparedness plan.

Energy Storage

Energy storage refers to any technology that can store electrical energy over a period of time. A steady power reserve can be valuable to fleets to reduce demand charge spikes, avoid energy charges during peak periods or mitigate issues from an unreliable power supply. In these scenarios, the energy storage resource typically draws power from a separate source or at a time when electricity prices are low. A fleet can then use that prepaid power when prices are high or electricity is not available. This behavior reduces the fleet's exposure to volatile prices and operations interruptions.

Batteries are the most common form of energy storage technology, and they are available in a range of capacities, physical sizes and chemistries. Depending on your basic load profile, EVSE installations and level of power supply, energy storage may be a useful option to explore.

Resiliency Planning

The ultimate goal of any charging project is to maximize charger up-time, the time the chargers are in operation. One way to support this goal is to identify opportunities for resiliency during the site assessment. Resilient charging sites limit impacts to chargers and adapt when power is lost or reduced. During the inspection, identify and avoid areas of the site where flooding or pooling of water occurs and areas that can be used for additional support equipment such as large batteries.

In addition to resiliency from site design, resiliency can be embedded into operational design. Some operational and maintenance resiliency techniques include:

- Temporary/emergency charging, from stationary or portable batteries
- Developed protocol for planned outages (charge in advance)
- Designating a responsible party who receives and communicates information from PG&E including PG&E alerts

Operational considerations in advance of an emergency power outage:

- What operations are critical?
- How much energy do you need to support critical charging?

Emergency Preparedness

While the electric grid is reliable, disruptions can occur. An emergency preparedness plan can minimize the impact of an outage. Answer the four questions below to ensure your fleet is sufficiently prepared:

- **How much energy do you need?** An emergency such as a natural disaster may halt your operations for several days, so you might not need 100 percent of your typical capacity.
- **How will you get enough energy?** Energy storage and on-site generation are two options to keep your fleet charged.
- **Are any of your operations critical?** You might be able to get redundant feeds from your electric company to maintain essential operations.
- **How likely is an outage?** To help you plan, consult with your electric company about the reliability of your area's electricity.

PG&E has energy storage and generation incentives to help. For more information, visit pge.com/sgip.

Fleet Electrification Guidebook

Additional Resources

Table of Contents

Additional Resources

This section compiles key tools, guides, and programs to support your fleet electrification journey. Prioritized resources from PG&E's existing EV Fleet Guidebook are highlighted, supplemented by valuable references from broader EV Advisory Services materials. Use these to explore vehicle options, secure funding, and plan infrastructure—tailored to fleets of all sizes and stages.

Resource Name	Resource Description
PG&E Fleets Vehicle Catalog	Provides information on how to electrify your fleet, funding opportunities, fleet savings calculator and direct access to PG&E advisors to kick start your project.
Approved Product List	Provides list of approved equipment, cost calculators and EV basics (Hosted by Southern California Edison)
U.S. Department of Energy (DOE) Alternative Fuels Data Center	Provides comprehensive information on EV charging stations, including a station locator, equipment specifications, and planning tools. Ideal for finding public charging options and understanding charger types.
Alternative Fuels Data Center: Alternative Fueling Station Locator	Locate public chargers and hydrogen stations for Class 2b-8 trucks
California Energy Commission (CEC) EV Charging Infrastructure Resources	Offers California-specific resources on EV infrastructure, including funding programs, technical standards, and statewide electrification goals. A key resource for local fleet operators.
California Electric Vehicle Infrastructure Project (CALeVIP)	Provides incentives and guidance for EV charger installation in California. Includes equipment recommendations, eligibility details, and application support for cost savings.
HVIP Eligible Vehicles - Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project | California HVIP	Catalog of zero-emission vehicles eligible for California's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) funding. Downloadable as PDF/CSV
Resources | California Air Resources Board	Covers EV technology, charging levels, and deployment insights

Additional Resources

Resource Name	Resource Description
Infrastructure Insite	Guides infrastructure development with equipment recommendations, cost estimates, and timelines.
Alternative Fuels Data Center: Alternative Fuels and Advanced Vehicles	Searchable database for alternative fuel vehicle and infrastructure funding in California
Global Commercial Drive To Zero Program — Zero-Emission Technology Inventory (ZETI)	Global database of commercially available zero-emission vehicles and equipment, ideal for identifying options by region and timeline.
Natural Resources Defense Council (NRDC) – Electric Vehicle Charging Explained	A beginner-friendly guide to EV charging basics, including charger types, costs, and environmental benefits. Useful for customers new to electrification.
Public electric vehicle charging infrastructure playbook · Joint Office of Energy and Transportation	Interactive guide for planning and building charging infrastructure
United States Environmental Protection Agency (EPA) – Plug-in Electric Vehicle Charging: The Basics	Covers the essentials of EV charging, including equipment types and environmental impacts. A concise resource for understanding foundational concepts.
Dashboard for Rapid Vehicle Electrification: DRVE Tool - Electrification Coalition	Offers practical guides, case studies, and policy insights for fleet electrification and charging infrastructure deployment. Excellent for real-world examples.
Veloz – Electric For All Charging Resources	A nonprofit initiative providing educational resources on EV charging, including videos, FAQs, and best practices. Accessible for non-technical audiences.
Carbon-Free Transportation - RMI	Provides in-depth analysis and strategies for fleet charging, focusing on cost optimization and scalability. Ideal for large fleet operators.
Fleet Electrification Step 15: Support Drivers in Operating ZEVs and Using EVSE | Department of Energy	Teaches efficient charging procedures (e.g., off-peak charging) to maximize savings and optimize energy use.

Additional Resources

Resource Name	Resource Description
Alternative Fuels Data Center: Electric Vehicle Maintenance	Offers general EV maintenance insights and resource guides to support best practices and asset protection.
Alternative Fuels Data Center: Electric Vehicle Safety Training Resources for First and Second Responders	Focuses on EV safety protocols for first responders, although is helpful for staff to mitigate risks and operate EVs safely (e.g., fire safety basics).
US Department of Energy: Electric Vehicle Fire Primer for Fleet Managers	Provides an overview of EV fire causes, precautionary measures, and additional resources.
EV Fleets Pro Academy + Resource Centre | Electric Autonomy	Provides general EV fleet guidance, supporting drivers with operational tips and managers with high-level fleet management strategies. NOTE: Designed for Canadian commercial operators however, practical information provided here is useful for U.S. based fleets.