

MOTIV POWER SYSTEMS

Freeing Fleets from Fossil Fuels

People You Can Count On

Charging & EVSE Overview

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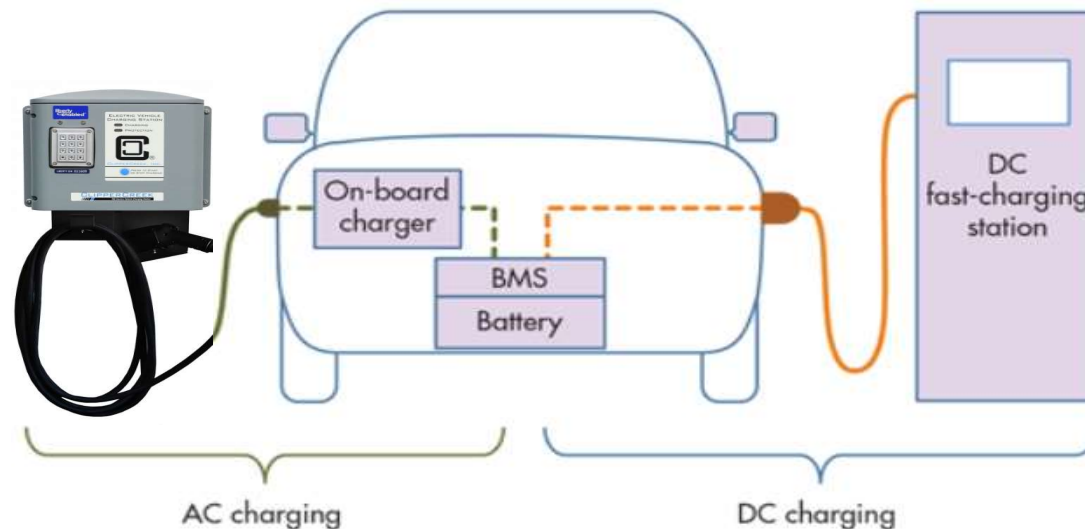
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EV Charging Terminology

- **Electric Vehicle Supply Equipment (EVSE)** refers to all the equipment needed to deliver electrical power from an electricity source to a vehicle. Everything between the mount and the connector on the vehicle
- **Charging/Charge Station** is a general term that refers to the external station that provides power to a vehicle
- **Onboard Charger** refers to the AC-DC converter onboard an electric vehicle, different from charging station
- **J1772** is an SAE standard that defines how an EVSE connects to, communicates with, and ultimately charges an EV. The AC connector defined in this standard is commonly referred to as **J-plug**



Charging Levels

Level 1



Level 1 chargers use standard 120V electrical outlets. 120V circuits are also used by most home electronics.

1.44kW to 1.92kW

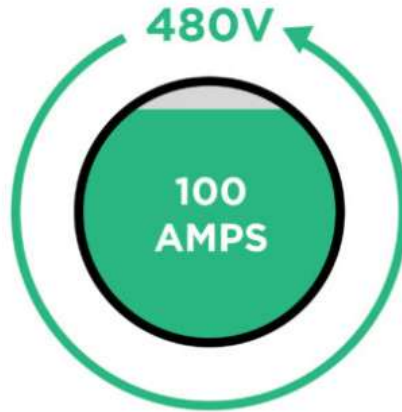
Level 2



Level 2 chargers use 240V electrical circuits. 240V circuits are also used by electric dryers & electric stovetops.

3.1kW to 19.2kW

Level 3



Level 3 direct current fast chargers use ultra high-power 480V circuits at public charging stations.

50+ kW

Level 1 Charging (<2 kW)

- Inefficient for light and medium-duty vehicles

Typical Level 2 Charging (6 – 7 kW)

- Sufficient for passenger cars, but not trucks or buses

High Power Level 2 Charging (up to 19.2 kW)

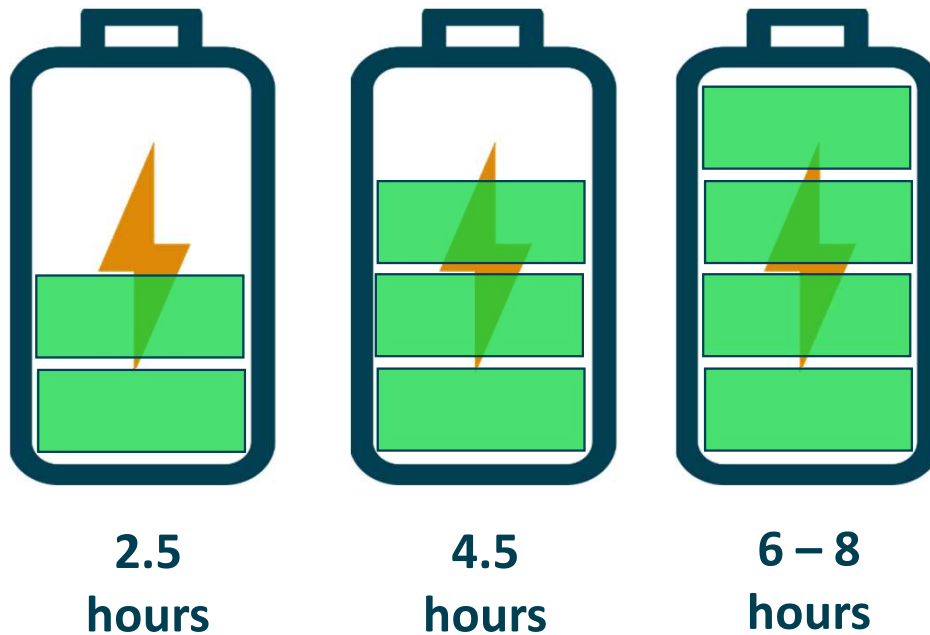
- Good balance between charging speed and cost for **MEDIUM** size buses and trucks (Class 4 - 6)

Level 3 Charging (50 kW or more)

- AKA DC Fast Charging. Better for **LARGE** high-capacity transit buses and trucks. Cost-prohibitive for most **MEDIUM** duty applications
- Note: Not actually “fast”, recharging with DCFC will still take over 2 hours from 0%

Opportunity Charging | High Power Level 2 Example

Strategically scheduled opportunity charging between 0% and 50% can make up to 150 miles possible

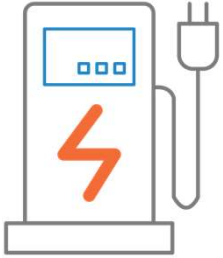


Charging Connectors

- For Level 2 charging, we use the **J1772-2009** (AKA J-plug) connector. Our onboard charger accepts and distributes up to **19.2 kW** input power from charge station.
- For Level 3 (DC Fast) charging, we use the **CCS1 “combo”** connector and can accept & distribute **50 kW** straight to the vehicle’s battery packs!



Charging Stations



We can help assess customer's current charging installation, make recommendations, and assist with implementation. We are an authorized Clipper Creek reseller, but we are happy to suggest other options as needed.

Networked “smart” charging stations are available, and can provide many benefits including:

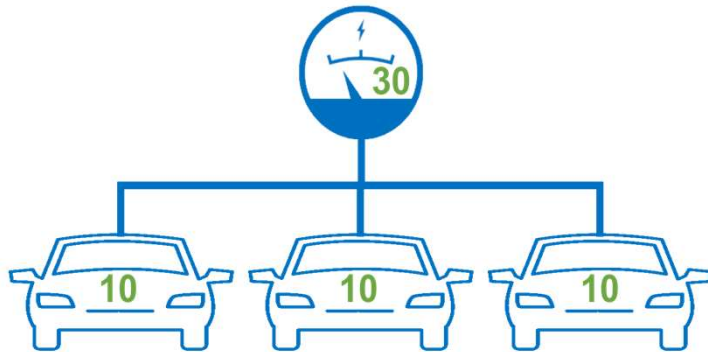
- **Monitoring & Reporting:** View, gather, and report real-time charging status and data
- **Load Balancing/Management:** Intelligent power sharing and balancing to avoid power consumption over a specific threshold, thereby saving money on upgrade and consumption costs
- **Access Control:** Intelligently prevent unwanted users from charging via enabled stations, and monitor who uses what station
- **Automated Demand Response (ADR):** Energy usage management in response to high power prices, as reported by utility. Can be used to generate revenue



Load Management Overview

Peak Shaving

- Electricity prices from the power utility become higher during certain parts of the day due to increased demand
- Smart charging systems can be set up to “shave” your consumption during utility peaks, thus saving you money by avoiding peak demand charges



Load Balancing

- In certain situations, charging installations may be limited by the available power at a site
- To avoid incurring heavy infrastructure upgrade costs, charging system loads can be “balanced” to never exceed the power capability of the facility

Infrastructure Funding Options

PG&E's EV Fleet

Covers 100% TTM costs, includes \$4,000 per-plug BTM incentive, and additional 50% EVSE rebate for sites located in a DAC

SCE's Charge Ready Transport

Covers 100% TTM and up to 80% BTM costs

SDG&E's Power Your Drive for Fleets

Covers 100% TTM and up to 80% BTM costs

LADWP's Charge Up LA

Rebate of \$10,000 per station

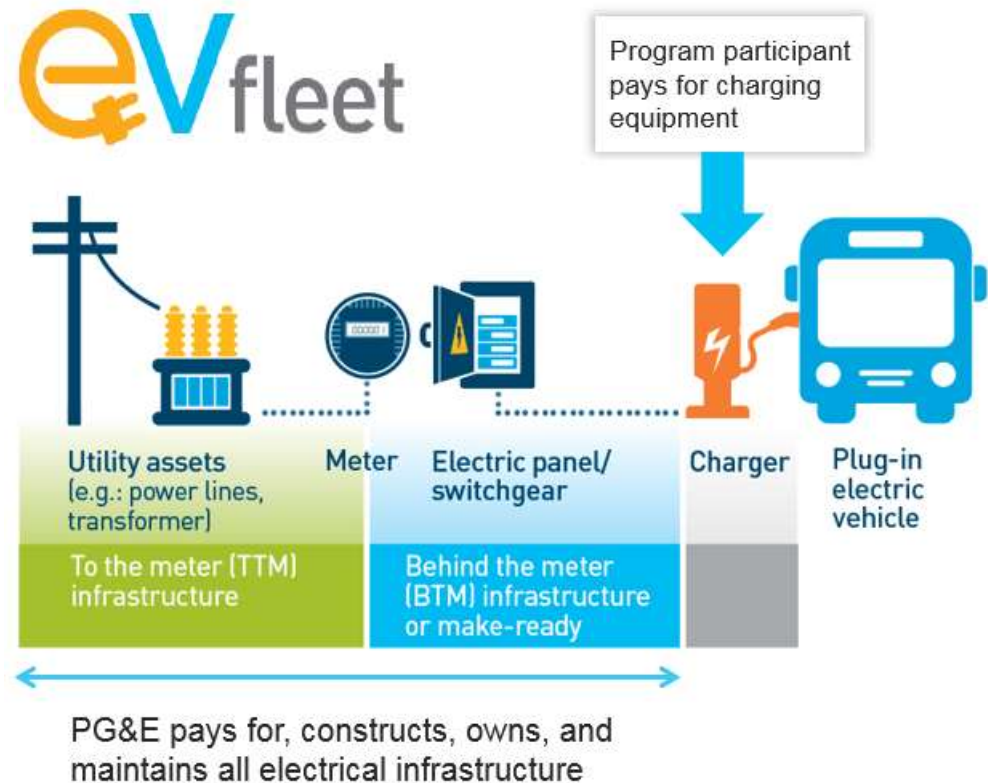
Regional and state programs can be found here:

<https://calevip.org/find-project>

<https://afdc.energy.gov/laws/state>

We are here to help!

Please reach out to your Motiv Grants and Incentive Funding Specialist for application assistance.





Case Study: Bimbo Bakeries Modesto

- 5 delivery vans deployed in 2019-2020
- Motiv “right-sized” EVSE installation to avoid costly infrastructure upgrades.
- Conducted initial site inspections to evaluate available facility power and confirm fit for medium-duty EVs.
- Sourced local electrician to work through installation details and provide a quote.
- Pursued and received HVIP EVSE Voucher Enhancement rebates for customer.
- **Over 10,000 miles with 100% uptime**
- **20 additional trucks to be deployed in 2020**

Thank You



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