



*Greater efficiency supports patient care.*

## Preparing for Electric Vehicles in Parking Plan

*All ECM content was independently developed and reviewed to be vendor, product and service provider neutral.*

### Description

Best practices for incorporating electric vehicle charging stations in your facility's parking area to support staff, patients and visitors who drive plug-in electric vehicles (PEVs). Considerations include type of PEV charging station, payment for use, funding and the expected use rate. Planning for PEVs requires facility-wide effort, planning, infrastructure, policies and support services.

### Project Talking Points

- Understanding the cost of installation and commissioning for PEV charge stations.
- Evaluating the impact of electric and hybrid vehicles on your current parking lot setup, including the need for an electric source.
- Deciding the number of PEV charging stations based on your health care facility's size.
- Evaluating options for PEV charging stations based on benefits like charging times, accessibility, and government and utility incentives.
- Evaluating the need for PEV charging stations and deciding whether to charge fees or offer stations as a convenience.
- Looking into health care facilities that have successfully installed PEV charging stations in their parking lots.

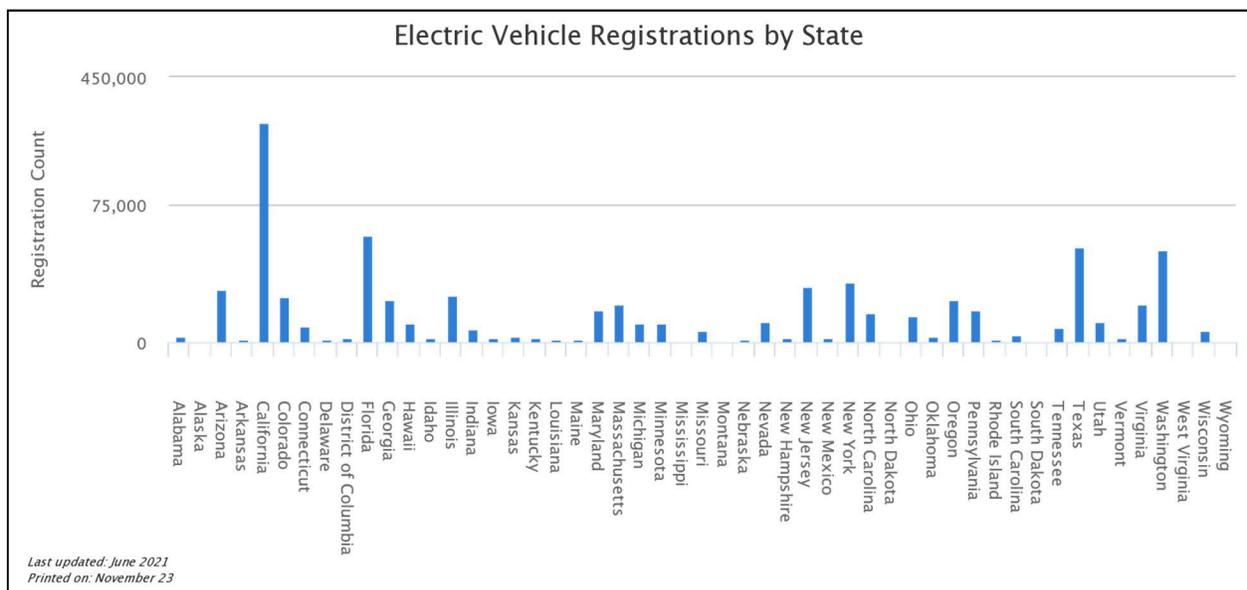
### Benefits

- **Cost benefits:** [Reporting](#) shows that electric vehicles produce greater savings over time than traditional gas vehicles when evaluating the fuel savings, lower depreciation rates and reduction in maintenance and repair. Many states, local communities and energy companies offer electric vehicle (EV) infrastructure tax credits on top of the Alternative Fuel Vehicle Refueling Property Tax Credit.
- **Environmental benefits:** The health care sector is one of the largest energy users in the U.S., and climate change plays a significant role in the health of the public and the environment. Promoting the electrification of vehicles reduces greenhouse gases (GHGs) over time as electricity continues to move to renewable and low-emissions sources.

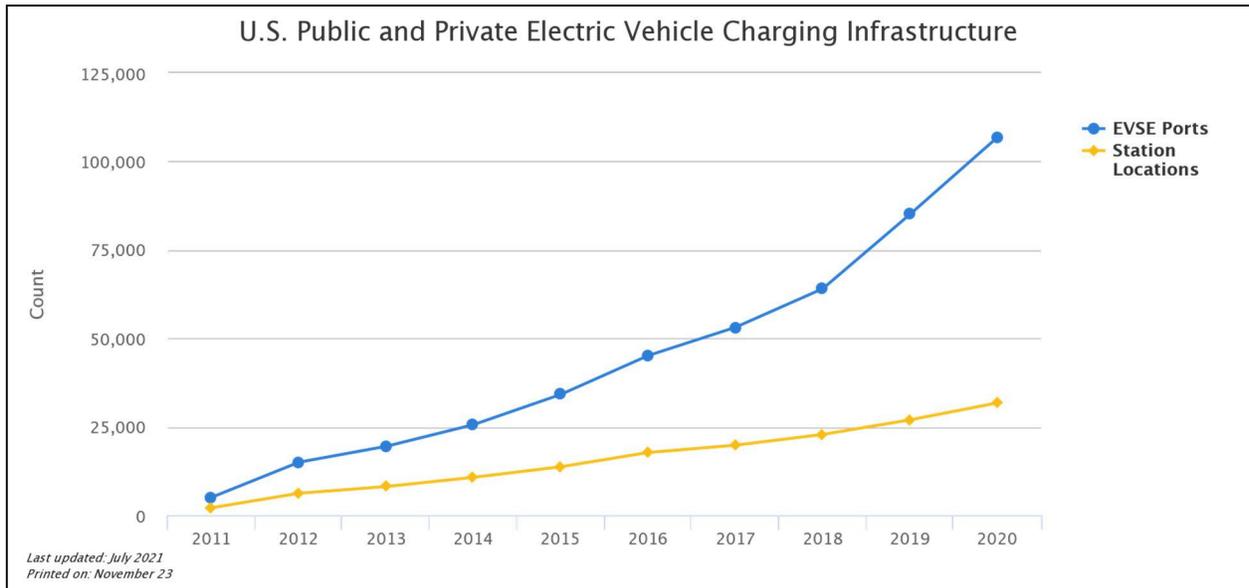
- Social and health benefits:** Providing PEV charging stations in health care parking lots and garages improves air quality around the facility, promotes driving electric vehicles, reduces the organization’s carbon footprint and shows care for patients, visitors and staff. If offered as a convenience, PEV stations can improve the staff, patient and visitor experience at your health care facility. Driving EVs lowers the amount of GHGs in the environment. Increased CO<sub>2</sub> levels contribute to respiratory issues in communities across the country. It is imperative for hospitals to do their part to mitigate this potential impact on their local community.

## **Purchasing Considerations**

- The Department of Energy has [committed](#) to ensuring that by 2030, 50% of vehicles sold are zero emission and to achieving net-zero emissions economy-wide by 2050. These goals should be considered when determining the growing need and capacity for PEV stations at your facility. [Automakers are expected to launch 240 new EV models between 2022-25.](#)
- PEV charging stations vary in price. Conduct a cost-benefit analysis to figure out what fits within your budget. Costs to consider include equipment, installation, and operation and maintenance (including electricity, demand charges and any annual charging network fees).
- Consider if EV charging will be offered as a convenience or for a fee. If you intend on charging, consider purchasing charging ports that accept payments through a mobile app or at the station directly.
- An electric source will need to be available in your parking lot to service charging ports.



“Vehicle registration counts EVs by state as of December 31, 2020. California has the greatest number of EVs, approximately 42% of EVs nationwide. Florida has the second highest count, followed by Texas.” [Source: The U.S. Department of Energy Alternative Fuels Data Center](#)



“This chart shows the growth of U.S. public and private EV charging infrastructure since 2011. The number of electric vehicle supply equipment (EVSE) [ports](#) has grown consistently, and the number of EV charging [station locations](#) has also increased steadily. The National Renewable Energy Laboratory started tracking the two figures separately in 2014. Between 2015 and 2019, the number of charging stations nearly doubled. In 2020 alone, the number of charging stations grew by 18%.” [Source: The U.S. Department of Energy Alternative Fuels Data Center](#)

<b>Level 1 Charging</b> 2 to 5 miles of range per 1 hour of charging	<b>Level 2 Charging</b> 10 to 20 miles of range per 1 hour of charging	<b>DC Fast Charging</b> 60 to 80 miles of range per 20 minutes of charging
 <p>J1772 connector</p> <p><b>Alternating Current (AC)</b> Level 1 equipment (often referred to simply as Level 1) provides charging through a 120 volt (V) AC plug. Most, if not all, PEVs will come with a Level 1 cordset, so no additional charging equipment is required. On one end of the cord is a standard <b>NEMA</b> connector (for example, a NEMA 5-15, which is a common three-prong household plug), and on the other end is an SAE J1772 standard connector (often referred to simply as J1772, shown in the above image). The J1772 connector plugs into the car's J1772 charge port, and the NEMA connector plugs into a standard <b>NEMA</b> wall outlet. Note that Tesla vehicles have a unique connector. All Tesla vehicles come with a J1772 adapter, which allows them to use non-Tesla charging equipment.</p> <p>Level 1 charging is typically used when there is only a 120 V outlet available, such as while charging at home, but can easily provide charging for all of a driver's needs. For example, 8 hours of charging at 120 V can replenish about 40 miles of electric range for a mid-size PEV. As of 2020, <a href="#">less than 5% of public EVSE ports in the United States were Level 1.</a></p>	 <p>J1772 connector</p> <p>AC Level 2 equipment (often referred to simply as Level 2) offers charging through 240 V (typical in residential applications) or 208 V (typical in commercial applications) electrical service. Most homes have 240 V service available, and because Level 2 equipment can charge a typical PEV battery overnight, PEV owners commonly install it for <a href="#">home charging</a>. Level 2 equipment is also commonly used for <a href="#">public and workplace charging</a>. This charging option can operate at up to 80 amperes (Amp) and 19.2 kW. However, most residential Level 2 equipment operates at lower power. Many of these units operate at up to 30 Amps, delivering 7.2 kW of power. These units require a dedicated 40-Amp circuit. As of 2020, <a href="#">over 80% of public EVSE ports in the United States were Level 2.</a></p> <p>Level 2 charging equipment uses the same J1772 connector that Level 1 equipment uses. All commercially available PEVs have the ability to charge using Level 1 and Level 2 charging equipment.</p> <p>Tesla vehicles have a unique connector that works for all their charging options, including their Level 2 Destination Chargers and chargers for home. All Tesla vehicles come with a J1772 adapter, which allows them to use non-Tesla charging equipment.</p>	   <p>CCS connector    CHAdeMO connector    Tesla connector</p> <p><b>Direct-current (DC)</b> fast charging equipment (typically 208/480 V AC three-phase input) enables rapid charging along heavy traffic corridors at installed stations. As of 2020, <a href="#">over 15% of public EVSE ports in the United States were DC fast chargers</a>. There are three types of DC fast charging systems, depending on the type of charge port on the vehicle: SAE Combined Charging System (CCS), CHAdeMO, and Tesla.</p> <p>The <b>CCS</b> connector (also known as J1772 combo) is unique because a driver can use the same charge port when charging with Level 1, Level 2, or DC fast equipment. The only difference is that the DC fast charging connector has two additional bottom pins.</p> <p>The <b>CHAdeMO</b> connector is the most common of the three connector types.</p> <p><b>Tesla</b> vehicles have a unique connector that works for all their charging levels including their fast charging option, called a Supercharger. Although Tesla vehicles do not have a CHAdeMO charge port and do not come with a CHAdeMO adapter, Tesla does sell an adapter.</p>

**Types of electric vehicle supply equipment (EVSE).** [Source: The U.S. Department of Energy Alternative Fuels Data Center](#)

### **How-To**

1. Engage all stakeholders needed to get approval for the installation and investment in PEV charging stations. This could include C-suite, facilities staff, finance and/or third-party consultants.
2. Determine which department or team is going to handle the planning for installing PEV charging stations in your parking lot.
3. Determine the appropriate number of PEV charging stations based on your patient population and staff size. The appropriate number of stations and need for an energy feed to your parking lot can impact which location is selected.

4. Research grants and funding in your area that could support your project and aid in your cost-benefit analysis when presenting to leadership.
5. Determine the type of PEV charging stations that would be best suited for your system.
  - Equipment costs may vary based on factors such as application, location, charging level and type.
  - Use this [provider list](#) to find EV supply equipment.
6. Contact EVSE product manufacturers and PEV charging station providers to determine the price and timeline for installation.
7. Determine whether the charging stations will be offered as a convenience or for a fee. If the latter, identify if fees will be paid by mobile phone app or directly at the station.
8. Once installed, track consumption metrics and the number of uses of the PEV charging stations.
9. Create signage for your facility to inform staff and visitors that PEV charging stations are available in your parking lot and where.
10. Share the news of PEV charging stations with the public to show the success of your project and commitment to sustainability.

## **Resources**

- [Hackensack Meridian Health System](#) case study.
  - First health care system in New Jersey to install EV charging stations by partnering with Volta Charging.
  - Project kicked off by installing 21 stations across three of Hackensack Meridian Health's major medical centers: Hackensack University Medical Center, JFK Medical Center and Jersey Shore University Medical Center.
  - Director of sustainability at the health system predicts this effort will reduce their carbon impact by 23 metric tons a year per property and 4,623 metric tons across all properties.
- [EVSE product manufacturers.](#)
- [US Federal Tax Credit: Alternative Fuel Vehicle Refueling Property Credit.](#)
- [Plug-In Electric Vehicle Readiness.](#)
- [Developing Infrastructure to Charge Plug-In Electric Vehicles.](#)

## **Energy Conservation Measure Descriptors**

- Energy
- Electric Vehicles

### Category List:

- Sustainable Upgrades

### ECM Attributes:

- System Upgrades

### Department:

- Engineering/Facilities Management

©2023 The American Society for Health Care Engineering (ASHE) of the American Hospital Association

Disclaimer: The information provided may not apply to a reader's specific situation and is not a substitute for application of the reader's own independent judgment or the advice of a competent professional. ASHE does not make any guaranty or warranty as to the accuracy or completeness of any information contained in this document. ASHE and the authors disclaim liability for personal injury, property damage, or other damages of any kind, whether special, indirect, consequential, or compensatory, that may result directly or indirectly from use of or reliance on this document.

ALL RIGHTS RESERVED. No part of the presented material may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher.