

## Installing EV charging for staff and customers

### Frequently Asked Questions

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For any questions and/or suggestions for improvements to this guide, please email [tmaltese@theclimategroup.org](mailto:tmaltese@theclimategroup.org)

### Why does EV charging matter?

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Electric vehicles offer a major solution to address the greenhouse gas emissions and air pollution caused by road transport. With over 3 million electric vehicles (EVs) on the road worldwide<sup>1</sup>, and increasing commitments from governments and automakers to accelerate their uptake, the transition to electrified road transport is rapidly gaining pace. Bloomberg New Energy Finance expects 54% of new car sales in 2030 to be electric, with EVs accounting for a third of the global light-duty vehicle fleet<sup>2</sup>.

Easy access to EV charging is a crucial factor in the decision to buy an electric vehicle. Building out charging infrastructure in line with growing demand is crucial for enabling the full-scale uptake of electric vehicles and cleaner, healthier environments for everyone.

### Why should companies get involved?

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After home charging, the ability to plug in in vehicles at work and at destinations such as supermarkets, malls and restaurants are the two most important opportunities that enable the day to day use of electric vehicles<sup>3</sup>.

By installing EV charging for their staff and customers, companies can reduce their own extended carbon footprint as well make a major contribution to building out EV infrastructure at the places where it matters most.

### What is the business case for installing EV charging?

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- **Environmental impact:** Transport is one of the largest, and fastest growing, sources of greenhouse gas emissions. By installing EV charging infrastructure, companies make an active contribution to curbing those emissions as well as reducing dangerous air pollution in their communities.
- **Green credentials:** The installation of EV charging is increasingly recognized as a key area of engagement within environmental certificates such as the US LEED scheme.
- **Brand identify:** Both staff and customers increasingly care about the environment<sup>4</sup>. EV charging infrastructure offers companies an opportunity to demonstrate their climate commitment and engage their stakeholders around an exciting new technology in a very practical and visible way.

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<sup>1</sup> <https://twitter.com/ZEVAlliance/status/947162630820569088>

<sup>2</sup> <https://about.bnef.com/blog/electric-vehicles-accelerate-54-new-car-sales-2040/>

<sup>3</sup> [https://www.afdc.energy.gov/fuels/electricity\\_infrastructure.html](https://www.afdc.energy.gov/fuels/electricity_infrastructure.html)

<sup>4</sup> <https://www.unilever.com/news/Press-releases/2017/report-shows-a-third-of-consumers-prefer-sustainable-brands.html>



- **Attracting staff:** With an average cost of as little as \$0.60 or \$1.50/ day<sup>5</sup>, free EV charging is an extremely affordable perk to offer as part of an attractive benefits package for employees, allowing companies to be at the forefront of enabling staff to adopt new technologies at the same time.
- **Attracting customers:** Research shows EV drivers have higher dwell times than other customers and that offering EV charging generates additional revenue for retailers<sup>6</sup>. Given early EV adopters generally have a higher income than the median household<sup>7</sup>, availability of charging can also be a factor appealing to this specific customer segment.
- **First mover benefits:** A range of subsidies are currently made available for EV charging installations by governments at all levels to build the initial infrastructure, allowing early movers to significantly reduce their investment cost by tapping into public funding. Charging infrastructure providers, too, are looking to establish their market presence and often willing to negotiate special partnership conditions.

### What type of charging do we need?

Generally, EV charging can be divided into three categories:

Type	Power rating	Range added
Level I	1.4 kW/HR	3-5 miles per hour
Level II	3.3-10 kW/HR	12-40 miles per hour
Level III (DC Fast Charging)	25-150 kW/HR	35-100+ miles per hour

The choice depends on the requirements of the user and the time they will typically have available to charge.

#### For workplace charging:

- Level II charging is generally the most prevalent as a cost-effective way to give employees reasonable charging levels within a few hours.
- The significantly more expensive level III fast charging is primarily required where staff are continuously on the road and it is essential that they are able to recharge within a very short period of time.
- Level I charging is comparatively slow, but can be a valid solution where staff typically spend their day in the office and just need their vehicle charged at the end of the work day. In those cases, companies may find it cost effective to spend their resources on equipping a larger

<sup>5</sup> <https://www.pca.state.mn.us/sites/default/files/charging-while-you-work-guide.pdf> - Forth calculations for level 1 / level 2 charging respectively

<sup>6</sup> <https://www.chargepoint.com/files/casestudies/cs-retail.pdf>

<sup>7</sup> <http://bit.ly/McKinsey-EVs-Europe>



number of parking lots with slow charging so that vehicles can stay charging in the same place all day and competition for chargers is avoided<sup>8</sup>.

- Quite often, companies also use a combination of solutions, for example offering level II charging as a standard and keeping a small number of fast chargers available for more urgent needs.

**For customer charging:**

- The durations of stays for customers will generally be more limited, but they will also use these occasions primarily to top up rather than needing to recharge their entire battery.
- Level II charging is currently the most common solution, especially where charging is offered for free.
- Level III charging may likewise be a valuable service especially to customers who cannot charge at home or at work. Due to the higher price of the technology, this would likely only be viable to offer as a paid for service and may become more economically viable as the number of EV users, and thus the likely frequency of use for fast chargers, increases.

For both work place and customer charging, a cost-effective solution should be based on real rather than perceived needs (also see below). A good charging infrastructure provider will be able to provide an overview of the available solutions and their comparative benefits and costs.

**How many charging points do we need?**

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- As a general rule, multiple charging points will be required to build “range confidence” for staff and customers and avoid conflicts between users.
- Given the range of potential use requirements, there is no fixed rule of thumb for calculating the number of posts required. Market research will be the best way to understand likely needs. Retailers may want to survey their local area to analyze the current market for EVs and expected demand growth. For employers, a staff survey is a good way to understand employee needs as well as build early awareness and support for the project.
- One thing to keep in mind from the outset is expected growth: as employees are 20 times more likely to drive an electric vehicle if they are offered workplace charging<sup>9</sup>, demand is likely to increase over time.
- It is also useful to take into account existing and upcoming regulation. For, example, building regulation may increasingly require a certain quota of EV charging points in parking lots. On the other hand, grid regulators may impose certain requirements for the installation of larger numbers of fast chargers to avoid strains on the grid.
- As a general rule, the main cost of installing charging infrastructure is in the background work rather than the equipment itself. It is recommended to plan for extensions and put in extra electrical conduit from the outset so that further stations can be added without the cost of digging up the ground multiple times.

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<sup>8</sup>[https://www.afdc.energy.gov/uploads/publication/WPCC\\_L1ChargingAtTheWorkplace\\_0716.pdf](https://www.afdc.energy.gov/uploads/publication/WPCC_L1ChargingAtTheWorkplace_0716.pdf)

<sup>9</sup>[https://betterbuildingssolutioncenter.energy.gov/sites/default/files/Thurs\\_How%20to%20Drive%20Change%20with%20Workplace%20Charging.pdf](https://betterbuildingssolutioncenter.energy.gov/sites/default/files/Thurs_How%20to%20Drive%20Change%20with%20Workplace%20Charging.pdf)



## What does “smart charging” mean?

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“Smart charging” is an umbrella term for a range of intelligent functionalities that help to manage charging stations in the most efficient way. These technologies will play an increasing role as growing numbers of stations and users need to be coordinated in the future, and it is well worth taking such requirements into consideration from the outset.

Benefits of smart charging include:

- **Grid management:** Left unmanaged, larger numbers especially of fast chargers, can put a significant strain on the electricity grid. Smart charging allows slowing down or delaying charging activity within set parameters to help balance the load and avoid peaks, so that costly grid reinforcements are avoided.
- **Cost savings:** Smart solutions help use charging infrastructure in optimal ways and, for example, benefit from cheaper off-peak electricity tariffs, allowing for significant savings.
- **Payments:** Smart chargers allow companies to charge employees and guests for charging, apply different types of rate differentiations and manage payments through a central system.
- **Remote access:** Smart charging points have remote monitoring and management functionalities, enabling fleet managers to more easily keep control.
- **Smart data:** Smart chargers integrate energy usage and consumption data with EV charging, and provide full insights and reports on how drivers are using the stations;
- **Turn-over:** Smart charging allows management of queues where limited charge-points are available, for example by notifying drivers when vehicles are fully charged;
- **Integration with broader networks:** Smart charging allows stations to be recognized and integrated into broader networks, for example where companies wish to make their chargers available to the general public and easy to find on charging apps.

Each charging infrastructure provider will have its own, slightly different way, of offering these functionalities. In considering solutions, companies may want to start at lower levels, but keep the opportunities to upgrade later in mind.

When installing networked chargers, it is highly recommended to choose open-source solutions so that companies are able to switch charging provider later while maintaining the same hardware.



## How much does the installation of EV charging cost?

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Generally, it is important to keep in mind that the largest cost tends to be the time invested to establish a strategy as well as any background work required (depending on the size of the installation and the chosen location), rather than the cost of the charging equipment itself.

According to the Electric Power Research Institute<sup>10</sup>, for Level 2 commercial EVSE units, the installation cost breakdown is approximately:

- Labor: 55 - 60%
- Materials: 30 - 35%
- Permits: 5%
- Tax: 5%

Although these may vary significantly, a number of strategies have proven useful to companies for minimizing overall cost:

- **Government grants and rebates:** Governments at national, sub-national and city levels are increasingly looking to promote the roll out of EV charging infrastructure and offering financial support for their installation (see annex for some helpful links).
- **Getting stations for free:** Companies looking to develop larger scale work-place charging programs may be able to negotiate preferential conditions with their service provider.
- **Locating existing electrical infrastructure:** Underground construction work tends to be the largest cost factor, so companies may want to start by identifying existing infrastructure they can build on.
- **Take advantage of opportunistic construction projects:** Alternatively, companies can take advantage of other planned construction work to lay underground electrical conduit at the same time.
- **Run extra conduit:** For the same reason, it is recommended to plan ahead and lay extra electrical conduit beyond the immediate requirements so that stations can be added without further digging as demand increases.
- **Cap cost of installation:** To manage installation costs, companies may want to assign an initial fixed budget for installations.
- **Have installation projects shovel ready:** Further installations can already be planned and prepared so they are immediately deployable if further budget becomes available or resources are left at the end of the financial year.
- **Co-locate stations:** Where appropriate, adjacent businesses may wish to share the charging stations and split installation and management costs.

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<sup>10</sup><http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=00000003002000577>

### Should we charge for the service?

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Most companies initially offer EV charging for free, primarily looking to develop their environmental credentials and attract staff and customers rather than trying to earn income for the service itself.

However, as the number of EV users grows, some have found it useful to introduce fees to offset the basic electricity and maintenance cost. More importantly, fees can provide an important signal to ensure stations are used by those who need them most, and that drivers move their cars to free up the slot once their vehicle is fully charged.

A range of different models are possible, from a fixed monthly usage fee to a staggered rate that increases after an initial charging time.

Benchmarking against similar types of companies and/or alternative local charging options may be helpful in determining the right price level.

### Are there any legislative restrictions around charging installation that I need to be aware of?

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Companies offering workplace charging may need to check local regulations around the taxation of benefits to ensure there is no conflict. For example, electricity for charging was initially often considered a benefit in kind, although such provisions have by now been removed in many places to facilitate workplace charging.

### What if my company doesn't own its premises?

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As electric vehicle use increases, the availability of EV charging will become an attractive factor for a broad range of tenants. Many landlords may be amenable to a well-presented argument, especially when considering factors such as the available sources of financial support and potential for legislative pressure to install charging further down the line.

A joint request with other tenants within the same premises may be an effective approach to start a conversation.

In devising an EV charging strategy, it is also important to consider at a multi-year time horizon. A number of companies are successfully implementing policies that include EV charging as an item of negotiation whenever leasing contracts are renewed.



## How do I build internal support within my company?

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- **Staff survey:** As indicated above, a staff survey will be a helpful way to get a detailed picture of existing and future need. It will also help identify a group of existing EV champions who will benefit from the new installation and naturally act as internal ambassadors for the idea.
- **Executive sponsor:** A board member or senior manager who drives an EV or is personally supportive of the agenda can be an important internal advocate and help move relevant decisions forward.
- **EV test drives:** Test drives provide a relaxed setting for employees to test vehicles outside of a sales environment, overcoming the challenge individual customers may face in locating vehicles and the lack of information sometimes available from car dealers<sup>11</sup>.

## About EV100

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This FAQ has been put together as supporting material for the members of the EV100 initiative and any other companies interested in EV leadership.

EV100 is a corporate leadership initiative led by The Climate Group, bringing together global companies committed to driving the transition to electro-mobility. Companies joining make a public commitment to transition their vehicle use to EVs and/or install appropriate charging infrastructure at their premises by 2030.

Through EV100, companies can showcase their electric transport leadership and help peers reduce electric vehicle investment costs through best practice sharing. The campaign drives engagement and dialogue between governments and other stakeholders to collaboratively address the remaining barriers to EV uptake and infrastructure roll-out.

For further information, please visit [www.theclimategroup.org/ev100](http://www.theclimategroup.org/ev100)

## EV100 webinar series

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This FAQ was put together as an outcome of the following EV100 webinars, run to share best practices around corporate EV leadership.

- Installing EV charging for staff and customers – experiences from HP Inc. and IKEA ([click to access the recording](#))
- EV Charging 101 – Overview over key practical aspects ([click to access the recording](#))

Recording of all webinars, as well as announcements of further sessions, can be found here: <https://www.theclimategroup.org/ev100-webinars>

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<sup>11</sup> <http://www.reach-strategies.org/2017/02/16/why-we-talk-about-electric-vehicle-test-drives/>



## Additional useful resources

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### Grants and other financial incentives:

- United States:
  - [Energy.gov](#) – Overview on tax credits and other financial incentives
  - [Plug In America](#) – Overview on State and Federal incentives
- Canada:
  - [Electric Mobility Canada](#) – Overview on EVSE installation incentives
  - [Electric Mobility Canada](#) – Overview on EV purchase incentives
- UK:
  - [Gov.uk](#) – Overview on grants and financial incentives
- EU:
  - [European Alternative Fuels Observatory](#) – overview on incentives and legislation by country

### Technical guidance and support:

- US Department of Energy - [Workplace charging for Plug-In Electric Vehicles](#): by following this link, you can access more useful material on this topic, such as the following comprehensive resources:
  - [Plug-In Electric Vehicles Handbook for Workplace Charging Hosts](#)
  - [Plug-In Electric Vehicles Handbook for Fleet Managers](#)
  - [Level 1 Electric Vehicle Charging Stations at the Workplace](#)
  - [Costs Associated with Non-Residential Electric Vehicle Supply Equipment](#)
  - [Sample Employee Survey for Workplace Charging Planning](#)
- [Forth](#) – American non-profit operating in the electric transportation space, Forth provides direct guidance to companies on how to transition fleets and install workplace charging:
  - [Go Electric at Work](#)
- [Energy Saving Trust](#) – Leading organization providing technical guidance to UK companies interested in improving their vehicles efficiency, with a particular focus on the adoption of plug-in vehicles:
  - [Guide to chargepoint infrastructure for business users](#)

