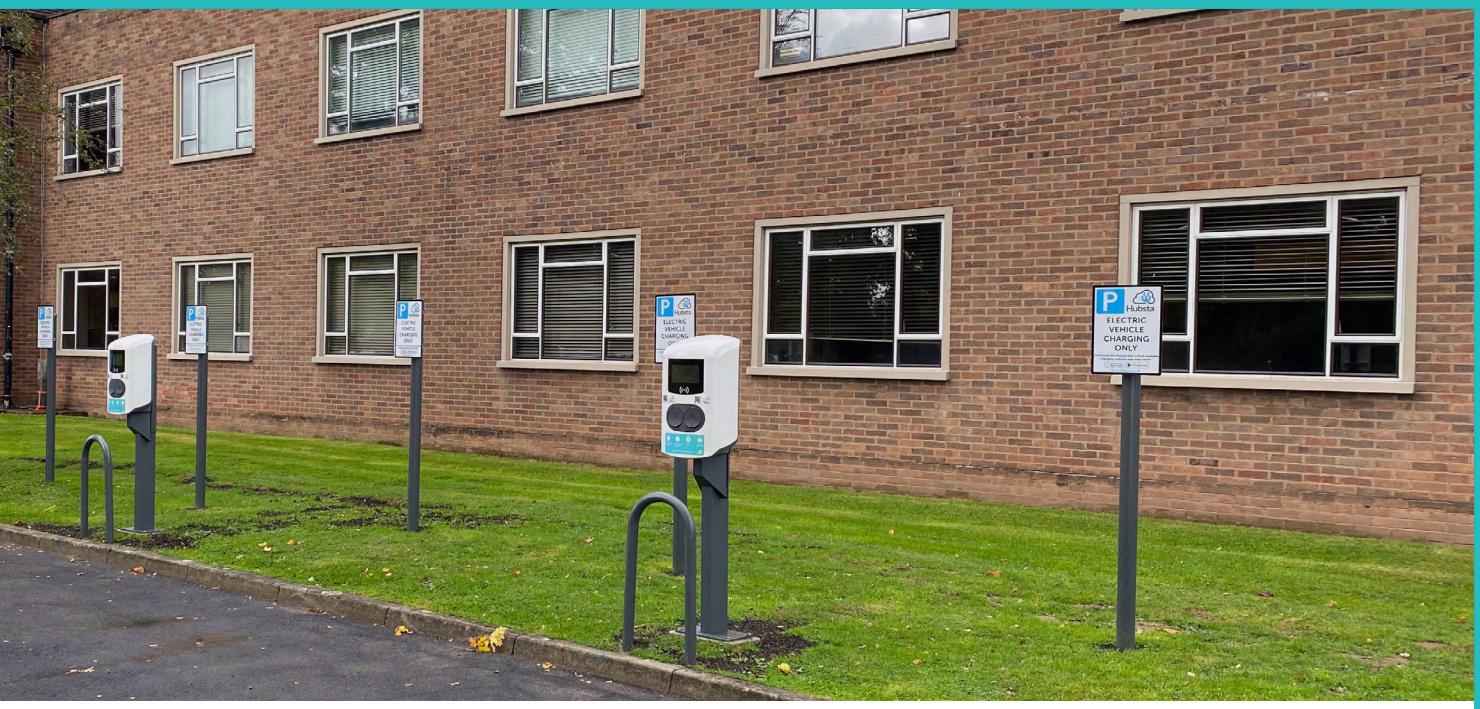
22kW Electric Vehicle Chargepoints



Cost (approx)	£58,000
Cost Breakdown	
Groundworks	£43,500
Chargepoints	£12,500
Smarter system	£1,000
Miscellaneous	£500

Return on deployment

This investment decision was driven by our collective belief that electric vehicles (EVs) and the decarbonisation of transport is very much the right thing to do. Unlike other low carbon technology installed as part of this initiative, for us these EV chargepoints are unlikely to achieve a measurable financial return on investment. Their purpose is to encourage and support our colleagues and customers to transition to the use of EV's, and as such we have no plans to charge for using them. We believe so strongly that EVs are the future of mobility that the hardware and supporting utilities were future proofed to allow us to install more chargepoints in the future.

The UK Government has created a scheme to incentivise switching company cars to either hybrid or pure EVs and a significant number of our fleet has already converted. While this change could be achieved without providing workplace chargepoints, providing them helps. It also helps some of our colleagues make the decision to switch to an EV. As part of our decarbonisation plans, we are also installing PV panels and battery storage, so we aim to utilise our renewable, locally generated energy for our building and EV charging before relying on the wider grid .

Why?

As a company we strongly believe that decarbonising transport will be key to the UK achieving Net Zero targets, and that the adoption of EVs will be central to this. Transport made up 33% of UK CO^2 emissions in 2019. The adoption of EVs, powered by the UK's rapidly decarbonising electricity supply, will enable us to continue to be mobile, whilst minimising damage to the environment.

EA Technology are a technology provider. One of our core commercial offerings is providing insight into the impact of charging EVs on our electricity system. Our customers expect that, if they visit our offices, we will have chargepoints. If they have an EV, they expect to be able to charge it while they visit if necessary. We risked damage to our reputation by not to have a sufficient number of fast chargepoints.

Case Study

Background

EA Technology already had six 7kW EV chargepoints available to staff and visitors, installed on temporary frame that had been part of a test rig for an innovative research project.

We decided that the existing 7kW chargepoints would remain in situ for now (although we plan to relocate them in the future, and replace them with further 22kW devices) and would be supplemented by ten 22kW chargepoints. The consequence of this upgrade is that a typical EV with a battery capacity sufficient to complete approximately 200miles on a single charge would be able to fully charge its battery in less than half a day, as opposed to a full day using the older 7kW chargepoints.

Other reasons to choose to invest in 22kW over 7kW chargepoints included:

- Typical new EV battery sizes are getting bigger
- Some of our colleagues commute relatively long distances, and
- Quicker charges mean more vehicles can charge - essentially two EVs a day if they swap at mid-day as opposed to one EV per day using the 7kW charge points.

What we did

We intend that the new chargepoints that we are installing, as well as the existing chargers will be available to staff and visitor alike. We also wanted to ensure we included sufficient electrical capacity in the new cabling and connections added for these chargepoints so we will be able to add more chargepoints, potentially including rapid chargers in the future. To make sure we had an accurate understanding of the number of chargepoints we should install now, and how many would likely be needed over the next five years we asked our colleagues to fill in a short, anonymous survey. This asked questions like:

- When colleagues obtained their current vehicle?
- What type of engine their current vehicle was powered by?
- How colleagues got to work before lockdown and how this may change in the near future?
- When colleagues are likely to change their current vehicles and the potential engine type of their next vehicle?
- Where will colleagues mainly charge their EVs in the near future – will their charging requirements at the office be because they WANT to use the free chargepoints, or because they will NEED to?

Approximately half our colleagues replied to the survey. If everyone who said they will NEED to charge their vehicles in the future does, then the EV chargers that EA Technology are planning to put in will certainly last for several years to come. However, it may be the case that more people will WANT to charge than not and therefore, charging slots may become limited, which may become necessary for chargepoint use to be managed more proactively or the additional chargepoints to be added.

For over 50 years EA Technology has been a hub of research and development for the electricity industry.

Historically, this has necessitated us having a high-capacity connection agreement to the local electricity network. More recently, our research activities have become more focussed, reducing our electricity usage so we have not utilised the full connection capacity. The original connection agreement has however been maintained and this means that despite adding this large load to existing building usage we didn't need to increase our connection capacity to the electricity network.

It wasn't just necessary to consider whether our connection agreement was sufficient, but also which circuits and locations within the building have sufficient capacity to connect the new charge points to. This meant it was necessary to connect the new chargepoints to a switch room at the rear of the building. Extensive groundworks and high rated armoured cabling were necessary to make this connection adding very significant cost to the undertaking – this accounted for 2/3 of the final expense. To achieve value for money, it was decided to lay the cabling required for the next set of chargepoints that we will want to install while the groundwork team were on site.

EA Technology has a long-term scheme of work planned to make our headquarters building carbon neutral, switching more loads like heating from fossil fuels to renewables. Despite energy efficiency savings, for example by installing LED lighting, this will increase our electricity consumption. So that we can keep our future electricity consumption within our existing network connection agreement we are developing a control system that can manage the various new loads and local generation. The chargepoints that we install would therefore need to be able to provide data to the control system and respond to signals from it– they will be a key 'smart load' that can be reduced if we near our connection limit. We therefore chose a chargepoint system with the functionality to allow us to monitor and control the EV charging load.

As mentioned above, we are keen to provide their staff, customers, and visitors with the ability to charge their EVs for free, however our headquarters building is on a large site occupied by other companies and close to a busy railway station. The chargepoint system that we chose requires users to register with the central provider who then issues a personal access card, or enables access via an application on a smart phone. Reception will have a small number of extra cards for visitors to use. This will allow us to ensure we are only providing free EV charging to authorised users.

Results

The installation was completed, and the new chargepoints signed off for use at the beginning of September 2021. Despite occupancy of the headquarters building still being sporadic because of the ongoing impact of the COVID19 pandemic, by early November 2021 the new chargepoints had been used 45 times to provide enough electricity to drive over 4,000 miles.

Things we would of done differently

The cabling installation that we requested and chargepoint configuration were atypical. While the instructions that we provided were clear, they sometimes didn't get passed on to the people on site carrying out the work. The COVID19 pandemic and other commitments meant the person who made the specifications wasn't always on site when the contractor was carrying out the work.

Discrepancies between our specifications and what was being done by the contractor was not picked up as early as they should. Even if you think you have clearly communicated your scheme in advance to a contractor and they have acknowledged your specification, ensure it is understood by the contractor team on site, especially if there are any 'out of the ordinary' requests.

Next steps

Based on the survey results our new chargepoints will serve the needs of staff and visitors for the next few years. The groundwork, and extra cabling that we have already installed will ensure that new chargepoints can be added cost effectively. Even if new loads increase how much electricity we use, the monitoring and control system, once completed, will ensure we will not exceed our connection agreement although we will not approach this limit for some years.

Useful tips

- Groundwork excavations can result in unexpected discoveries and potential delays. While digging the trench for the new cabling, the team discovered an old, long forgotten underground telecoms chamber. This necessitated a rerouting of the cable trench.
- Consider in advance potential personal safety fears and disability access to both the building and chargepoints. It is usually expedient to install chargepoints close to buildings to reduce groundwork costs. This often means colleagues without EVs are required to park further away from the building than they had previously.This could have implications for people with disabilities and mobility concerns.
- Consider mitigation such as improving lighting or providing alternative locations close to the building access points for colleagues this may impact.
- Use this as an opportunity to check that your building provides enough disability parking spaces.
- When considering where to site EV chargepoints ensure that you consider your neighbours sensibilities. We couldn't have positioned the chargepoints along one of the neighbours' boundaries because of their security protocols.
- Don't underestimate how much internal staff time this type of scheme will require. We've calculated that this activity took about 6 weeks of staff time, including initial discussions, neotiations, reviewing documents and drawings and supervision of on-site activities.

ea technology

Safer, Stronger, Smarter Networks

EA Technology Limited
Capenhurst Technology Park
Capenhurst, Chester CH1 6ES

t +44 (0) 151 339 4181
e sales@eatechnology.com
www.eatechnology.com