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Five things you want to know about transitioning your commercial fleet to EV
(But were afraid to ask)

Understanding and overcoming the challenges to build your EV roadmap.

To meet global government net zero targets, a responsibility to decarbonise sits heavily on vehicles and transportation. For many commercial fleet organisations, this means meeting a baseline target of reducing CO_2 emissions 30% by 2030. Right now, this means seven years to transform an industry that has been inherently linked to the capabilities of internal combustion for over a hundred years.

We asked Campbells Consultancy and director Tim Campbell, independent experts in fleet decarbonisation and electrification to create this simple guide to help you to understand the many complexities around fleet electrification and create a roadmap for this critical change.

"The industry is trying to transform the vehicle's power supply in 120 months what has previously taken 120 years."

Tim Campbell, Campbells Consultancy

Top tips for transitioning your fleet to EV.

1 Understand your current carbon emissions profile and the requirements of your fleet and drivers.

Before you can begin to think about what vehicles are suitable for electrification, you need to audit your fleet and establish a benchmark for today. For example, ask yourself the following:

How much CO_2 do you currently produce? Calculate the annual emissions for each vehicle based on the total miles travelled, as well as the carbon intensity (CO_2 per gallon) you use.

What is your fleet type? What are your vehicle payloads? How many contain refrigeration units or tail lifts? Vehicle weight significantly impacts EV range, so too do any modifications that draw electrical power.

What ranges do your drivers cover? How far your drivers travel is as important as the topography of their routes. For example, more hills means less range. Do drivers take their vehicles home at night, or travel to the depot before their shift starts?

How many branches/depots do you have? More important, how many could you potentially add chargers to? If your business is undergoing a depot consolidation – or planning expansion – you may need to reassess your circumstances.

2 With an electric fleet, your property will be essential. Is it ready to become your 'fuel' station?

When operating with electric vehicles, organisations will need to take main responsibility for charging their vehicles. This is where organisations often encounter many unexpected challenges. These are just a few of the items to consider:

Do you own or lease your current property? Installing a charging station can cost from £1,500 to upwards of £100k for each unit. Does your business want to commit to this investment at a location it does not own? You might want to consider a longer-term contract (or buying property) to justify the outlay in cost.

If you lease, will your landlord allow for the installation of a charging infrastructure? In some locations, installing multiple charging stations might not be viable. Permission may be needed, and leases may need to be altered. The lease may even restrict the building of additional structures.

What if the landlord offers to install the charger? This might seem attractive but should be approached with caution. If you are not closely involved with the installation, they could end up paying out for charging stations that are inappropriate or, worse, completely unusable for your needs.

Can you free up, or create capacity from other areas? Think about other parts of your depot, such as offices, lighting, etc. Can you reduce the amount of power they use to free up additional capacity? Could you be creating additional solar, wind or battery capacity on-site?

“Drivers need to be able to understand the key data, as ranges can differ significantly depending on driving style and this can impact adversely on real world range and therefore increase the TCO.”

Tim Campbell, Campbells Consultancy

3 EV chargers aren’t all the same. Find out the right one for your needs.

Establishing the best charging station for your needs can be complicated. EV chargers are typically classified by their charging capacity, from slow, fast or rapid with the higher the capacity, the faster the charging speed.

You’ll want a charger (or chargers) that align to the size of your fleet, your hours of operation, lengths of dwell times, and your budget. The key thing is to start the conversation as soon as possible – some chargers can take months (or over a year!) to install, once you factor in discussions with landowners and your DNO, or any local engineering groundworks and cabling required for your connection.

What level charger do you need? Slow AC chargers are the equivalent of a single phase household outlet around 2.3kW, fully charging an EV with 75kWh battery in around 35 hours, meaning they aren’t viable for most fleets. Fast charging three phase AC charging stations, like those found in public spaces and many destinations, generally offer between 7-22kW of power, filling EVs somewhere between 10 to 3.5 hours. DC Rapid chargers, like those found at most service stations, can charge a 70kW EV up to 80% in less than 30 minutes, but come with a high installation cost. All above assumes you have a vehicle specification that allows maximum capacities of AC and DC charging rates, but more on that later.

Is the site for your charger suitable? Before installing a charger, you may need a conversation with your DNO to establish site suitability as well as the design needed for an electrical network connection. If there isn’t already available capacity then local upgrades might be needed, such as transformers, overhead lines and cables to cope with the increased demand.

Is the charger you need smart? A dumb charger will continue charging a vehicle all the time it is plugged in until the battery is full and was typical of first generation older chargers. Smart chargers (which are legally required now) allow for the control of charging times (for example, when rates are cheaper), price caps and integration with solar panels. In some cases they can allow for dynamic load balancing, allocating available capacity appropriately to multiple vehicles.
Smart chargers can also integrate with driver apps and your telematics applications for more accurate analysis of your fleet, charging state, battery levels, and so on.

4 Is your choice of charging infrastructure matched to your vehicles?

Different levels of chargers provide different speeds of charging at different levels of capacity. Stations can also supply charging through alternating current (AC) and direct current (DC). Generally, slow and fast chargers use single and three phase AC (delivering 2.3-22kW power), while more expensive rapid chargers provide DC charging, up to 350kW, although there are some AC chargers charging at capacities around 45kW allowing for twin 22kW AC charging.

Adding to the complexity, even though slow and fast charging stations mostly use AC, EVs can only store power in their batteries through DC so to convert the AC power to DC power, electric vehicles have an on-board inverter. The capacity of this inverter dictates the vehicle's maximum charging speed for AC Charging- this is also the case for DC charging as the vehicle will have a limit it can take.

What type of charger do you need for your fleet? AC charging maybe sufficient for a fleet coming back to base in the afternoon and then out in the morning with limited necessary range. Whereas a high range, low dwell time operation may look at DC Charging but that can be too simplistic view. Every operation is different.

Would your fleet benefit from a costly DC charger? While DC chargers can offer faster charging than an AC charger, it might not be the best solution. Constant use of a DC charger could potentially adversely affect the durability of an EV battery.

Can you charge multiple vehicles from a single charging point? Charging points could have a single or twin (double/ dual) sockets, for instance a three phase 22kW double socket could be set to charge either a full 22kW or 11kW to two vehicles.

5 Educate drivers for the transition to EV – they are key to its success.

Where driving behaviour is already monitored, fleet operators have an understanding how their habits can impact diesel truck fuel efficiency. With an EV fleet, optimising the range of each vehicle is paramount. Factor in the need for driver training and getting them familiar with their vehicles to ensure that they know how to make use of their EV in the optimal way.

Understand the differences in driving style. With an EV van or truck, drivers will need to adapt to the smooth delivery of torque and make intelligent use of regenerative braking and power settings. This, along with conserving momentum and avoiding harsh braking, and careful consideration of heating and air conditioning usage, can greatly help to maximise the potential range.

Instil good charging habits. For example, using dwell time and breaks as an opportunity for charging, establishing where they will need to charge on distance runs, and understanding the state of charge and what that means to real world range.

Highlight the benefits to them. Asides from helping to reduce pollution, drivers also report that the lack of engine noise can reduce fatigue and increase concentration. Maintenance needs are also reduced, with fewer parts to potentially go wrong.

Make use of the data. Analysing the data that your EV vehicles and drivers create can further optimise range and business efficiency. Effective route planning, marking public charging points, analysing driver behaviours for continuous driver coaching and recording battery health is important. So too are driver apps to make this information available to them.

Taking your first steps for EV fleet transition: a checklist

Set up a steering group: Transitioning to EV isn't a strategy that can be undertaken alone. You'll probably need to involve interested parties within the company such as distribution, fleet engineers, property, systems, finance, and HR. Often, these people haven't been in the room together, but the scale of the work will require many areas of the business to take on dedicated tasks.

Get all your data in one place: Understanding the status and performance of your fleet will become more important than ever when you transition to EV. Organisations need to be digitised and take a data-driven approach from the ground up, able to merge telematics with an increasingly broad ecosystem of partner data, such as charging applications, into a single UI that provides visibility across them.

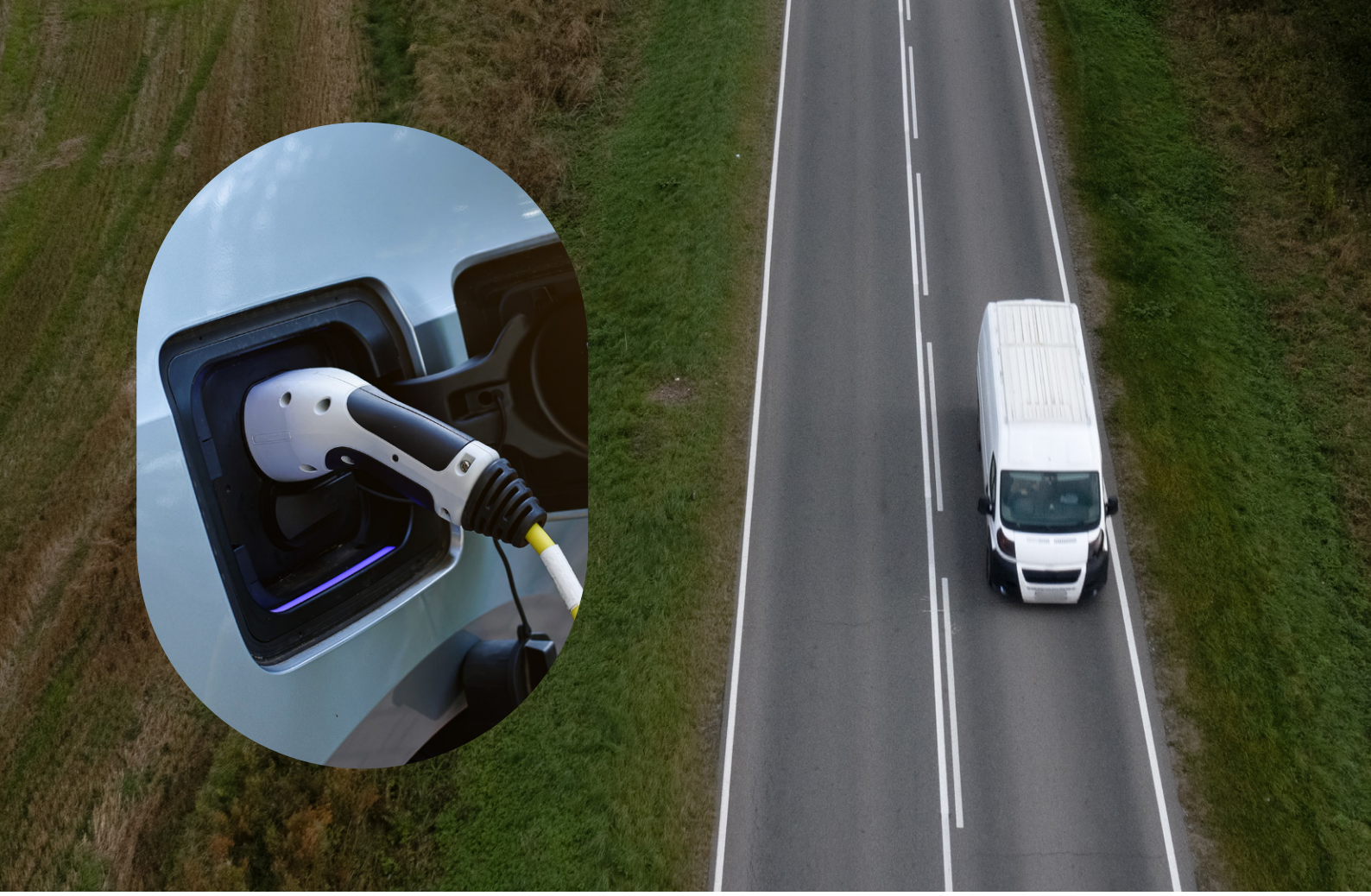
Benchmark everything: Understand your present-day emissions, vehicle fuel efficiency, how far they have travelled, and so on. This will help you identify the journeys that are most easily transferable to EV.

Find the quick wins: With an understanding of your current vehicle turnover rate, identify the vehicles set to be retired over the next few years. These could be ideal candidates to switch to EV.

Take one step at a time: With so many unknowns, and so many volatile variables (not least changing energy prices), don't take on too much too soon. Start with manageable change and build as your understanding develops.

"Start with a depot. Start with a couple of vans for instance and install a charger and build from there. Those that leave everything until the last minute could be in for a shock."

Tim Campbell,
Campbells Consultancy



Prepare now, for the road ahead

There will always be risks and uncertainty when transitioning your commercial fleet to EV, with a huge number of variables to consider. Working with specialists and consultants, as well as charging solutions and telematics partners is a good way to accelerate your electrification process. Together, they can provide data / information that can support you in such areas as design considerations, hardware recommendations, infrastructure installation, data monitoring and more.

As technologies continue to improve, EV ranges increase, and charging infrastructures develop, the viability of your move to EV will only continue to improve. The important thing is to start now, don't wait until it's perfect, it may be too late!

Visit Samsara.com/uk to find out how we can help you transition and manage your fleet of EVs