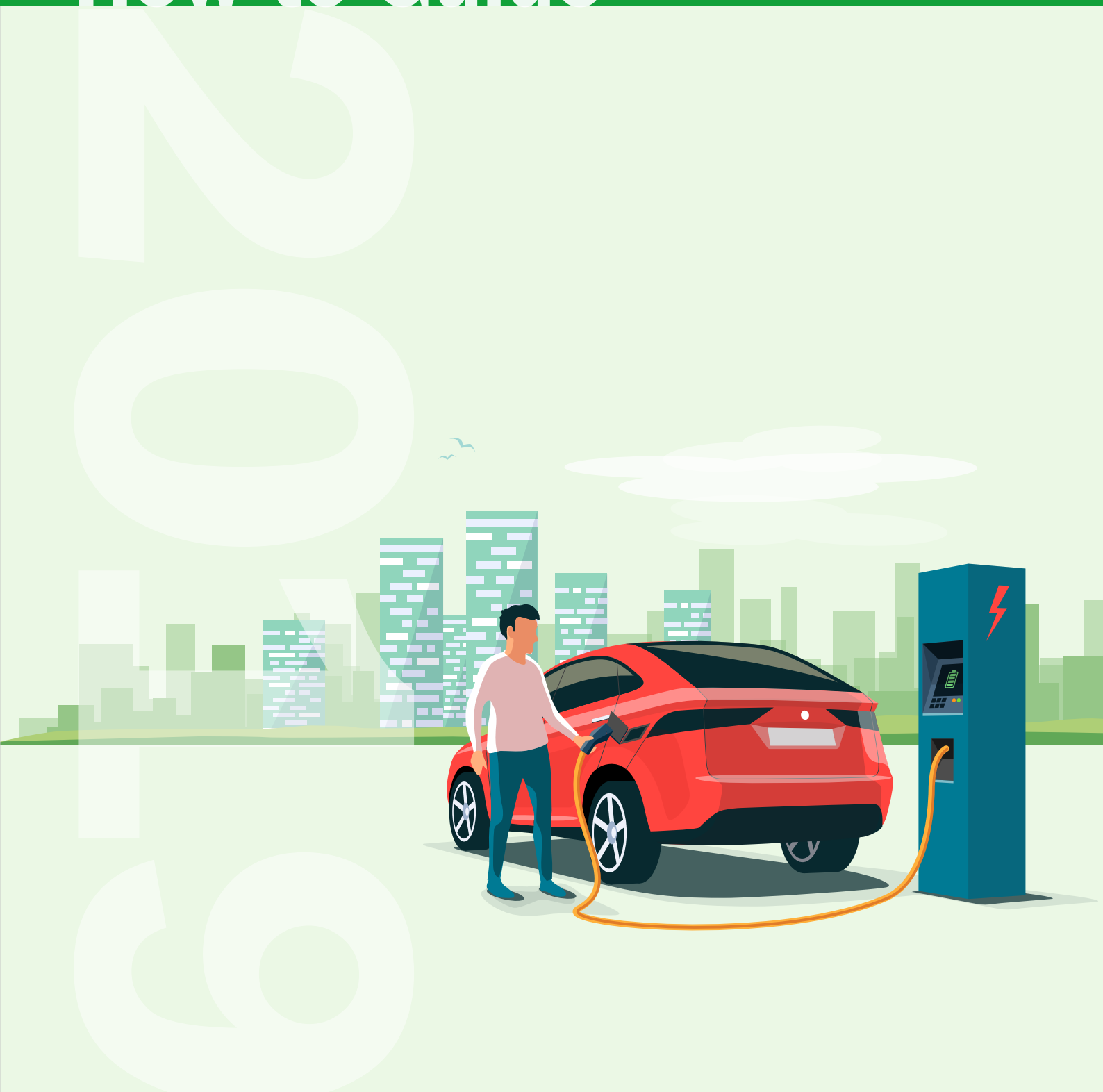


Electric Vehicles: How to Guide



PRP

CORNWALL
NEW ENERGY



European Union
European Regional
Development Fund

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Introduction

Transport accounts for the majority of the UK's greenhouse gas emissions: 26% compared to 25% from energy supplies. The main sources are petrol and diesel cars. Electric vehicles represent an exciting technology to reduce greenhouse gas emissions and minimise local air pollution, which results in an estimated 36,000 deaths per year.

Current international trends indicate that the price of electric vehicles will reach equivalence with internal combustion engine vehicles by the mid-2020s. As a result, it is expected that the sale of EVs will overtake petrol and diesel sales by the late 2030s. The UK Government has set ambitions for all new cars and vans to be effectively zero emissions by 2040; by 2050 almost all vehicles should be zero emission .

An insufficient charging network is one of the biggest barriers to growth of the EV market in the UK. If these targets are to be met, a robust network of public and private charge point infrastructure is required. That is where you come in; as the number of electric vehicle owners grows in the UK, so will the demand for charge points at holiday lets.

The technical details about electric vehicle charging points can be overwhelming. The purpose of this guide is to provide a clear and succinct overview of key considerations, technical details and our recommendations.

Why Install an EV Charge Point?

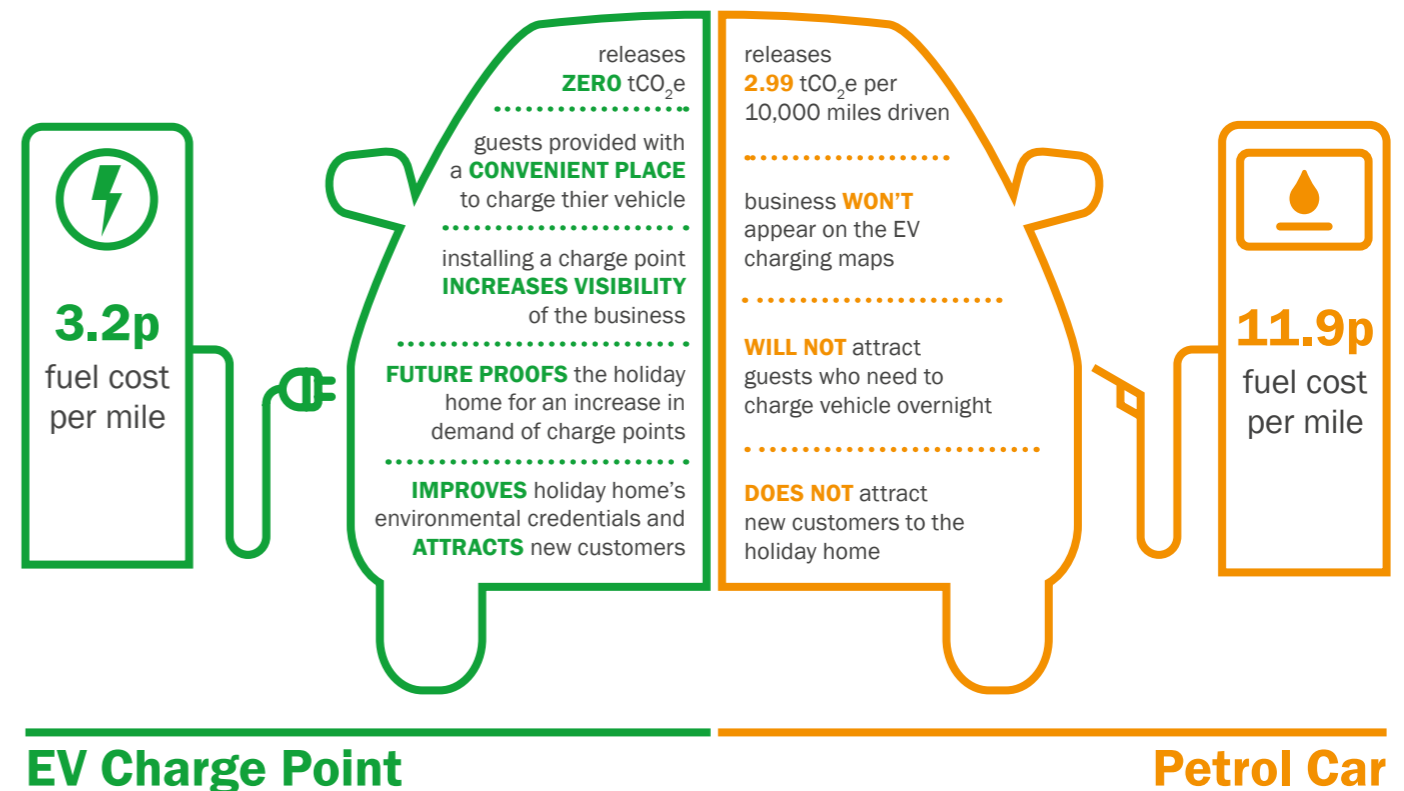
Apart from the growing demand for electric vehicle charge points; there are numerous persuasive reasons to install this technology at your holiday let:

- Differentiate your business and attract more paying guests
- Increase visibility of the business; your site can appear on online EV charging network maps
- Boost your environmental credentials

Cornwall New Energy

This guide has been developed by Cornwall New Energy (CNE). CNE provide free support to businesses in Cornwall and the Isles of Scilly to develop, promote and install renewable energy solutions and low carbon technologies.

Disclaimer: This guide is designed to provide an overview of electric vehicles. Every effort has been made to ensure the accuracy of information in this guide; however, CNE cannot be held liable for any inaccuracy, error or omission.



Key Considerations

There are numerous charge point types available on the market, but to make the most informed decision there are a number of key considerations which should be examined.

WHO WILL BE USING THE CHARGEPOINT?

One of the first considerations should be who will be using the charge point; will it be guests, employees or used by the owner?

WHAT TYPE OF VEHICLE WILL THEY LIKELY OWN?

Will the user have an electric car or could the charge point be used to charge an electric van or larger vehicle?

DO USERS HAVE THEIR OWN CHARGING CABLES?

Or will they expect a cable to be provided with the charge point. Most public charge points provide a cable.

HOW LONG WILL GUESTS BE STAYING?

Will guests always be staying overnight, providing a longer period of time to charge their vehicle, or would some require faster charging times?



Plugging an EV into the Mains

It is strongly recommended that EVs are not charged using a normal home socket on a ring circuit. However, if you are planning to do this, all sockets must be inspected by a qualified electrician to ensure that the wiring can cope with the high electrical draw that an electric vehicle demands. Furthermore, the location of sockets and the electric vehicle charging cable has the potential to create trip hazards, particularly important to note if there are young children likely to be staying in your holiday home. It is recommended that you check with your insurance provider, as plugging into the mains may invalidate your property insurance.

We recommend installing charge point as plugging into a standard socket could present health and safety issues and could cause a power cut if multiple vehicles are charged simultaneously.

Unlike a conventional plug socket, a charge point communicates directly with the vehicle. This makes charging safer and quicker.

Charging Units

Chargepoint Power and Speed

There are three main types of charge points for electric vehicles: slow, fast and rapid. The type of charge point determines the power outlet, and therefore the charging speed, delivered to the electric vehicle.

Standard Charge Points provide power at 3kW and are the slowest charge points; they have charge times of around 14 hours. As a result, they are usually used to charge vehicles overnight. All standard charge points supply AC electricity.

Fast Charge Points are rated between 7 and 22kW, with respective charge times of 6 and 2 hours (dependent on the battery size). Often, a 22kW will charge at 11kW if the capacity is not available or multiple vehicles are charging. A 7kW charger can be installed with a single phase connection, a 22kW charger requires a three phase connection. Typically, fast charge points are found at destinations where the user will leave the vehicle for a few hours.

Rapid Charge Points provide power at 43kW and require a three phase connection. Rapid charge points supply a high power alternating or direct current (AC or DC) and are the fastest way to charge an electric vehicle.

	Standard	Fast	Fast	Rapid
POWER	3kW	7kW	22kW	43kW
CHARGE TIME*	14 hours	6 hours	2 hours	1 hour
WIRING	Single	Single	3-phase	3-phase
CURRENT	13 amp	30 amp	32 amp per phase	60 amp per phase
COST TO INSTALL	£900	£1,000	£2,000	£30-50,000

* Based on 40kW car charging from empty to full

Tethered and Untethered Units

A tethered charge point unit is one which comes with a cable attached, whilst an untethered units requires the user to bring their own cable. All DC chargepoints employ tethered cables.

Tethered units have either a 5 pin connection (Type 1), or a 7 pin one (Type 2). Type 2 is standard for European manufacturers and Tesla.

There are benefits of both types; tethered units provide the user with less hassle and are more secure as the cable cannot be stolen or unplugged.

Untethered units offer more flexibility, allowing users to use their own cables on charge points.

Single or Three Phase?

The electrical current which supplies a building is delivered by either a single or three phase connection. A single phase provides current through two wires and is more suited to lower electricity usage. As a result they are limited to a charging rate of 7kW. Most homes have a single phase connection. A three phase connection delivers current through 3 or 4 wires, and is more suited to higher usage buildings. and rapid or multiple fast chargers.

Smart Charging

Smart chargers allow the owner to easily monitor, understand and control their energy usage. To do this, smart chargers are connected to WiFi and have software installed. Generally, smart chargers are more expensive than 'dumb' chargers, and have added software costs connected. However, they have a number of benefits which would be useful in a holiday home:

- **Energy usage reports** can be viewed on an app or downloaded. This data is useful to assess how much the service is costing your business.
- **Manage charging remotely**, to schedule cars to charge overnight during Economy 7 hours for example.



Costs and Funding

Charge Point Costs

The cost of a charge point unit and the installation varies; it is dependent on the make, model, installer and existing wiring at the property.

The Energy Saving Trust provides approximate estimates of the cost of the charge point unit itself, plus installation:

1. **Standard: £500-£1k (plus £900 to install)***
2. **Fast: £2-3k (plus £1k-£2k to install)***
3. **Rapid: £20-40k (plus £30k-£50 to install)***

**This is an estimate only; for an accurate quote an installer will be required to assess the property; a list of installers is provided at the end of this guide.*

Funding Options

There are a multiple finance options to consider when purchasing an electric vehicle charge point.

Cash Purchase

The simplest funding option is to finance the cost of the charge point unit and installation costs yourself. This can be subsidised by grants in some instances.

Finance Plans

Finance plans offer customers the option to break the full cost of the hardware, installation and any software into smaller payments. More details can be found directly from installers.

Free-to-fit

Some organisations offer free to fit models, whereby the hardware and installation costs are free; the customer often benefits from a revenue share. However, this option requires that customers (and therefore guests staying at the property) are charged for using the service, and that the charger is publicly available. For small holiday lets, this option may not be feasible or attractive.

What is the OLEV Grant?

The Government offers a grant specific for electric vehicle charging points through the Office for Low Emission Vehicles (OLEV). The [OLEV grant](#) provides £500 towards the cost of purchasing and installing a **home charge point**. To qualify, you must have purchased an electric vehicle from the 1st October onwards, have it registered to the chargepoint home address and use an approved OLEV installer.

Charging an EV

The amount it costs to charge an electric vehicle varies; it is dependent on the electricity price, battery size and distance travelled.

Electric vehicles have different size batteries; its capacity is usually expressed in kilowatt hours (kWh). To estimate the cost to charge a vehicle the cost of electricity per kWh is simply multiplied by the battery size.

As a charge point at a holiday home will be used by many guests, all with different vehicles, it is impossible to provide an accurate charging costs. However, estimates of charging a battery from empty to full for three electric vehicle types (Renault Zoe, Hyundai E-Kona and the Tesla Model S) is provided below.

EXAMPLE CAR	RENAULT ZOE	HYUNDAI E-KONA	TESLA MODEL S
RANGE	185 miles	279 miles	350 miles
BATTERY SIZE	40 kWh	64 kWh	100 kWh
COST PER kWh*	15p	15p	15p
FULL CHARGE COST	£6	£9.60	£15.00
COST PER MILE	3.2p	3.4p	4.2p

**Minimum variable day rate for electricity published by BEIS (2018)*

To estimate how much an electric vehicle charging service will cost you, it is important to consider how far guests will be driving and how often they will charging their vehicles.

For example, it is likely that a guest travels quite a distance initially, from their home to the holiday let, requiring a full charge of their electric vehicle. However, for the remainder of their stay they may be using the vehicle for relatively short trips, under 50 miles a day perhaps. In this instance, the electric vehicle will not need to be charged every night.

Next Steps

Marketing your Charge Point

An electric vehicle charge point can differentiate your business, so it is important to ensure your guests and potential guests know about the additional service you are offering.

Adding the service to your holiday let listing is essential to ensure that guests who filter their criteria with the provision of an electric vehicle charge point find your business.

A small logo or graphic can also be a quick and simple way to let guests know about the charge point on your listing or advert. Some examples are shown below.



Installation and Feasibility Checklist

This guide aims to provide an overview of the key considerations that should be made when selecting a charge point, as well as outlining the benefits to your business. The next step is to contact an installer, they will be able to provide further advice and offer a quote for the unit and installation. The following is a list of questions that an installer will likely ask:

1. Does your property have a single or three phase connection?
2. Do you have off-street parking?
3. What is the proximity to the mains supply?
4. What size charge point are you looking to install (likely to be a single 3kW or 7kW charger for a single dwelling)?
5. Would your business benefit from a smart charging device?

It is also recommended that you notify your insurance company about your charge point installation.

List of Recommended Installers



Naked Solar
Call: 01637 697 009



SHAW Electric
Call: 01209 418 157



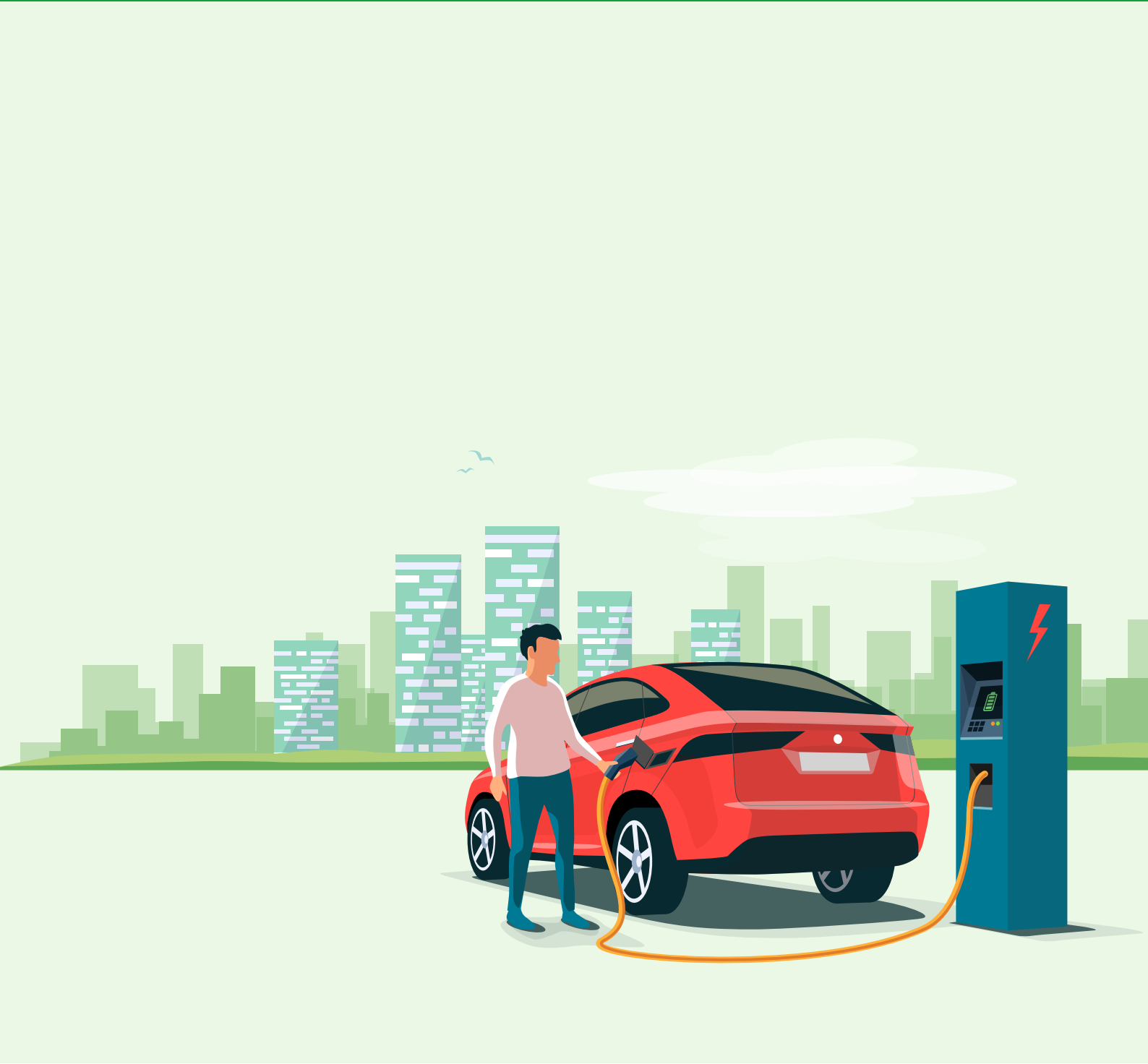
Plug-N-Go
Call: 020 3657 9672



Mr Electric
Call: 01872 553 898



Drivenergy
Call: 0800 242 743



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