eStart

Zero Emission Vehicle Transition Plan

Preparing your fleet for the future

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eStart
Preparing your fleet for
fleet

Benefits of eStart

***sg**fleet*'s eStart Zero Emission Vehicle Transition Plan helps you plan and budget for transitioning to a zero emission vehicle (ZEV) fleet.

Amidst the media buzz about the future of our planet and the need for clean energy, our government is making public commitments to invest in Electric Vehicle Service Equipment (EVSE) as well as zero emission vehicles (ZEVs) for their own fleets.

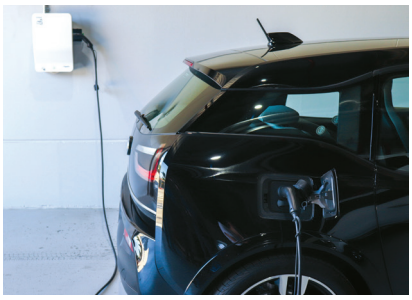
***sg**fleet* has worked with industry bodies, suppliers and manufacturers to understand what is required to help our customers prepare for the addition of ZEVs or hybrids to their current fleets in order to reduce operating costs, lower CO_2 emissions and meet other environmental goals.

As we have explored options for our own fleet across our offices nationwide, we have come to understand the complex and often unique requirements of each individual charging and parking site.

***sg**fleet*'s eStart ZEV Transition Plan offers an end-to-end planning solution that includes assessment of a company's goals, vehicle-by-vehicle review, site inspections, infrastructure upgrades and installation of charging points to help effectively plan and manage budget expectations. Through our deep knowledge of your fleet, we will be able to manage the whole-of-life-vehicle cost and recommend the right vehicle mix to support your goals.

Benefits:

- Support your company's environmental and sustainability goals
- Showcase a commitment to exploring alternative power supplies
- Leverage our understanding of the challenges and pitfalls of site enablement
- Gain clarity on what is required for your unique site enablement, charging points and other infrastructure needs
- Reduce 'fuel' and maintenance costs
- Plan your budget for both strategic and operational future needs
- Be prepared for ZEVs transitioning into a fleet



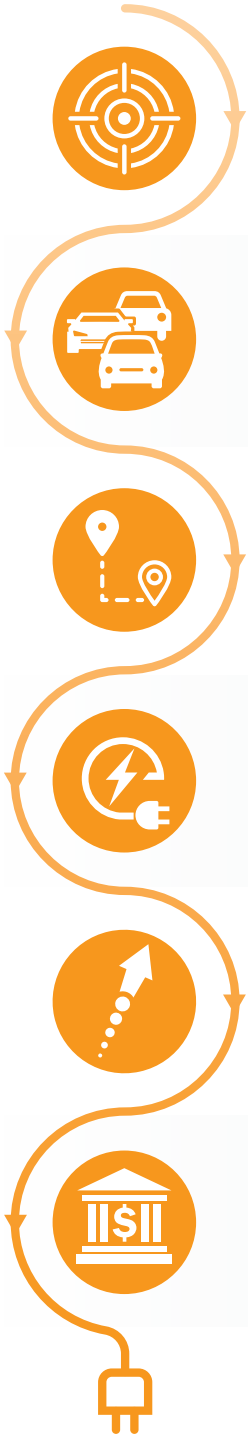
Product overview

Preparing your fleet for the future

The eStart Zero Emission Vehicle Transition Plan supports the transition of your fleet.

eStart is an end-to-end planning solution. Each step in the process builds on the preceding in a structured, logical manner, with options and considerations at every stage to ensure a fit-for-purpose fleet.

Successful implementation starts with getting the fundamentals right. ***sg****fleet* is committed to preparing your fleet for the future.



Customer goals

- Preparation for ZEVs
- Reduction in CO_2 emissions
- Reduction in fuel and maintenance costs
- Reputational / green credentials

Vehicle mix

- Current fleet (against goals)
- Vehicle usage patterns (locations, frequency, distance travelled)
- Vehicle types not suitable for ZEV at this stage
- Future fleet make-up

Site selection

- Where are the vehicles located?
- Where do the vehicles travel to?
- Where do the vehicles need to be charged?
- When will they be charged (at night, during the day)?

Site capability

- Existing electrical infrastructure (supply, load capacity, compliance)
- Proposed charging locations on site
- Building situation - own, rent, duration of rent, etc.

Transition plan

- What are the existing fleet's lease end dates?
- When are the ZEVs available?
- Which sites need to be enabled first?
- Do other leases need to be extended?

Funding support

- Paid for outright (via ***sg****fleet*)
- Funded via own mechanisms
- Leased / funded through ***sg****fleet*

Frequently asked questions

GENERAL TERMS AND DEFINITIONS	
ICE	Internal Combustion Engine - ICEs generate mechanical power by burning a liquid fuel (such as petrol, diesel, or biofuels) or a gaseous fuel (such as compressed natural gas). They are the most common power source currently used in vehicles.
ZEV	Zero Emission Vehicle - ZEVs include BEVs, FCEVs and some PEVs.
BEV	Battery Electric Vehicle - BEVs are powered only by one or more electric motors. They receive electricity by plugging into the grid and store it in batteries. They do not use any type of fuel while driving and produce no tailpipe emissions.
PEV	Plug-in Electric Vehicle - PEVs derive all or part of their power from electricity supplied by the electric grid. They include BEVs and PHEVs.
FCEV	Fuel Cell Electric Vehicle - FCEVs combine hydrogen and oxygen to power an electric motor (rather than using conventional fuels or a battery) and do not produce any tailpipe emissions.
PHEV	Plug-In Hybrid Electric Vehicle - PHEVs use batteries to power an electric motor, plug into the electric grid to charge, and use petrol or other source of fuel to power an ICE or other propulsion source.
HEV	Hybrid Electric Vehicle - HEVs combine an ICE or other propulsion source with batteries, regenerative braking, and an electric motor. They rely on petrol or other source of fuel and are not plugged in to charge. HEV batteries are charged by the ICE or other propulsion source and during regenerative braking.
EVSE	Electric Vehicle Supply Equipment - Vehicle chargers delivering electrical energy from an electricity source to the vehicle.
WLTP	Worldwide Harmonised Light Vehicles Test Procedure - The new standard for testing the levels of fuel consumption, CO_2 emissions and other pollutants of vehicles. WLTP has replaced older test standards for light duty vehicles in most European countries. WLTP is designed to provide more 'real life' consumption and emission figures.
Kilowatt (kW)	Measurement of power output of the motor.
Kilowatt hour (kWh)	Measurement of electricity used in an hour. Manufacturers use kWh to refer to the size of the battery. Generally the higher the number, the more hours the battery will last, allowing for a greater driving range.
AC Charger	A charger that outputs alternating current (AC), which is converted to direct current (DC) within the vehicle via the onboard invertor.
DC Charger	An EVSE that outputs direct current that flows directly into the battery. This is faster than AC charging because it bypasses the onboard invertor.
Alternating Current (AC)	The flow of electricity that 'changes direction'. AC is used in houses and office buildings etc.
Direct Current (DC)	The opposite of alternating current. Rather than 'oscillating' back and forth, electricity flows at a constant rated flow analogous to a water hose.

Frequently asked questions...Continued

What are the key benefits of Zero Emission Vehicles (ZEVs)?

- ZEVs produce no tailpipe emissions
- ZEVs are quiet due to absence of engine noise
- ZEVs may help lower fuel and maintenance costs, reducing the total cost of ownership
- ZEVs have fewer moving parts and don't require oil changes (less waste disposal)
- ZEVs have a higher expected longevity than that of a traditional ICE vehicle, with less to go wrong
- ZEV performance is now at least equal to that of an ICE vehicle
- ZEVs have a smooth drive, with no gear changes and minimal braking and in most scenarios the performance is described as 'exciting and fun'
- ZEV charging costs a fraction of the cost of fuelling an ICE vehicle
- Affordable ZEVs are here now

Are ZEVs really more environmentally friendly than ICE vehicles?

Yes, they can be. ZEVs need to be recharged and must draw that electricity from somewhere. If that electricity supply comes from a coal-burning power plant, the ZEV is still part of a pollution cycle even though it doesn't emit CO_2 from its tailpipe. However, ZEVs can also get electricity from renewable or green energy resources such as hydro-electric or solar power facilities, including home roof top solar.

What is the difference between a ZEV and a plug-in hybrid?

Pure ZEVs operate on electric power only. Plug-in hybrid ZEVs can operate on electric power for about 15-30 miles and can then extend their range by converting to a conventional ICE with the ability to quickly refuel at a traditional petrol station. Plug-in hybrids benefit drivers who travel mostly short distances, while also providing peace of mind with the unlimited range potential of a traditional ICE vehicle.

How much do ZEVs cost?

Affordable ZEVs are here now. Hyundai, Nissan, Renault and several other manufacturers are bringing models to the UK starting at £18,000 for vehicles with a 112 mile range and up to £30,000 for vehicles with a 267 mile range. Prestige and performance brands such as Tesla, Porsche, BMW and Mercedes have models available starting at £30,000.

How far can a typical ZEV travel on a single charge?

It depends on the model of the car, but on average, ZEVs can travel between 110 and 250 miles on a single charge. Most people drive less than 30 miles per day which is well within the range of most ZEVs. For example, a £24,000 Hyundai Ioniq ZEV would need charging once every five days for the average driver. If you want to get a longer range, a Hyundai Kona has a reported range of over 279 miles, while the Tesla Model S can travel up to 367 miles on a single charge.

Are ZEVs reliable and dependable?

ZEVs are as reliable as ICE vehicles. ZEVs have fewer moving parts and in theory fewer points of failure than ICE vehicles.

How often do you need to service a ZEV?

Manufacturers recommend one routine service or vehicle check per year.

What happens if you break down?

As there are few moving parts to a ZEV, the likelihood of a breakdown is minimal unless you run out of power. If that happened, you would simply call ***sg****fleet* roadside assistance as you would do with an ICE vehicle. Alternatively, plug it into the nearest power point.

Are ZEVs as safe as other vehicles?

ZEVs must meet the same safety standards as other cars. They are still rated under the European New Car Assessment Program (ENCAP).

Is it safe to charge an electric car in the rain, or in a storm?

Yes. The traditional belief is that water and electricity don't mix so charging an electric car in the rain might be dangerous. However, both the vehicle manufacturers and EVSE installation specialists have designed and engineered their products to meet the relevant standards.

What is the lifespan of a ZEV battery?

The lifespan depends on the type of battery and its usage patterns. Most vehicles are using lithium-ion batteries, which can last up to 10 years or longer. Most manufacturers are offering an 8-year battery warranty.

Frequently asked questions...Continued

Are the batteries toxic and will they end up in landfill?

The lithium-ion batteries used in most modern zero emission vehicles are recognised as being non-hazardous to the environment. They are also fully recyclable.

Can you tow with a ZEV?

Yes. However, based on the manufacturers' recommendations, at this stage, this is limited to one or two models with very little payload rating. The exception is the Tesla Model X SUV, which can tow up to 2 tonnes.

Is there infrastructure to support ZEV recharging?

There are now more than 30,000 charge points across the UK in over 11,000 locations - that's more public places to charge than petrol stations, with around 10,000 charge points added in 2019 alone. Home-based charging is available anywhere with a traditional 3-pin wall socket, however smart devices are being developed to allow faster charging at affordable prices at home.

What charging options are available?

The type of charge outlet required will depend on how fast you need to charge. A normal home socket will work but it will be slow. If faster charging is required, then a special charger will be needed. As a rule, the price increases in line with the increased speed rate of the charge. ***sg****fleet* can advise on the types of chargers required based on the fleet vehicles' usage patterns, such as time spent stationary and average distances travelled.

How quickly can you charge a ZEV?

The charge time for a ZEV varies based on the model of car and the type of Electric Vehicle Service Equipment (EVSE) you use to charge the vehicle. One thing to keep in mind is the difference between the time for a full charge and a partial charge.

What does this mean? Many cars will advertise that it takes 5-8 hours for a full charge, but it may only take 15-20 minutes for a 60% charge. A full charge could be done overnight, while partial charges could be done anytime to top up the battery. It is expected that vehicle charging might be similar to a mobile phone, where it is occasionally plugged in for a top-up charge while a full charge occurs overnight and takes advantage of off-peak electricity costs.

What are the charging speeds?

Trickle Charging/Mobile Charging is slow overnight charging ideal for a 'top-up' when the battery is close to full, using a traditional 3-pin wall socket, without the need for an installed EVSE.

Fast Charging is typically charging from home or public charging stations during trips or when a quick charge is required using a 7-22kW charger.

Rapid/Ultra-Fast Charging is done in public stations that use DC power to charge your vehicle in a short period.

How much does it cost to charge up a ZEV?

The cost to charge an electric car in the UK varies between home, work and public charging. For a typical electric car with a 60kWh battery and ~200 mile range:

- **Charging at home:** Costs about £8.40 for a full charge.
- **Charging at work:** Many employers will install workplace charging points and typically offer free access throughout the day.
- **Charging at public locations:** Public chargepoints at supermarkets or car parks are often free to use for the duration of your stay.
- **Rapid charging:** Rapid charging points are normally found at motorway service stations and typically cost £6.50 for a 30 min, ~100 mile charge.

How will you manage ZEVs and the electricity cost?

Some ZEV charging stations are capable of receiving and transmitting electricity and usage data. Some providers offer software to see how much electricity has been used, which can then be managed in the same way as for a traditional fuel card. ***sg****fleet* will integrate that information into our online portal Fleetintelligence, ensuring fleet managers can manage the whole-of-life costs of ZEVs.

How much does EVSE installation cost?

The highest cost component of ZEV charging stations is often their installation. Electric service upgrades, trenching, repaving, distance to panels, distribution boards and other factors can significantly impact installation costs. Good planning, supplying only the essentials, and keeping in mind potential future expansion will reduce your short and long-term installation costs. ***sg****fleet* can help you understand your short and medium-term needs and avoid overcapitalisation of infrastructure now.

Identifying charging cables

Charging cables have connectors you plug into the vehicle and/or the charge point. The type of charging connector depends on the vehicle and the power rating of the charge point.

Charging connector type	Power rating	Approx. range per 30 mins of charging	Charging cable features
 UK 3-pin	2.3-3 kW AC Single Phase (Standard Charge)	5 Miles	• Standard UK domestic electricity outlet • Not designed for prolonged use needed to fully charge an electric car • Very slow charging with maximum power output of 3 kW
 Type 1	3-7 kW AC Single Phase (Slow/Fast Charge)	12 Miles	• Only available in single phase • Less common in modern electric cars • Has no locking mechanism when car is connected to supply
 Type 2	3-43 kW AC Single Phase/Three Phase (Fast Charge)	75 Miles	• Is becoming the standard European electric car charging cable connector type • Compatible with both single and three phase electricity supply • Has an in-built locking mechanism when connected to power supply • Tesla has a 120 kW DC version of type 2
 CHAdeMO	50 kW DC Three Phase (Rapid Charge)	85 Miles	• Is the older type of charging cable connector for rapid charging • Is compatible with Japanese vehicle manufacturers • Is the most common rapid connector type due to the popularity of the Nissan Leaf
 Combined Charging System (CCS)	50 kW - 350 kW DC (Rapid Charge)	85-200 Miles	• Is the most versatile rapid charging connector • Likely to become the most popular DC connector standardisation • Enables a higher power rating to support larger ultra-rapids chargers

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For further information on eStart, please email:

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