ELECTRIC FLEET

Crucial guidance as fleets prepare for the 2030 ban on petrol and diesel

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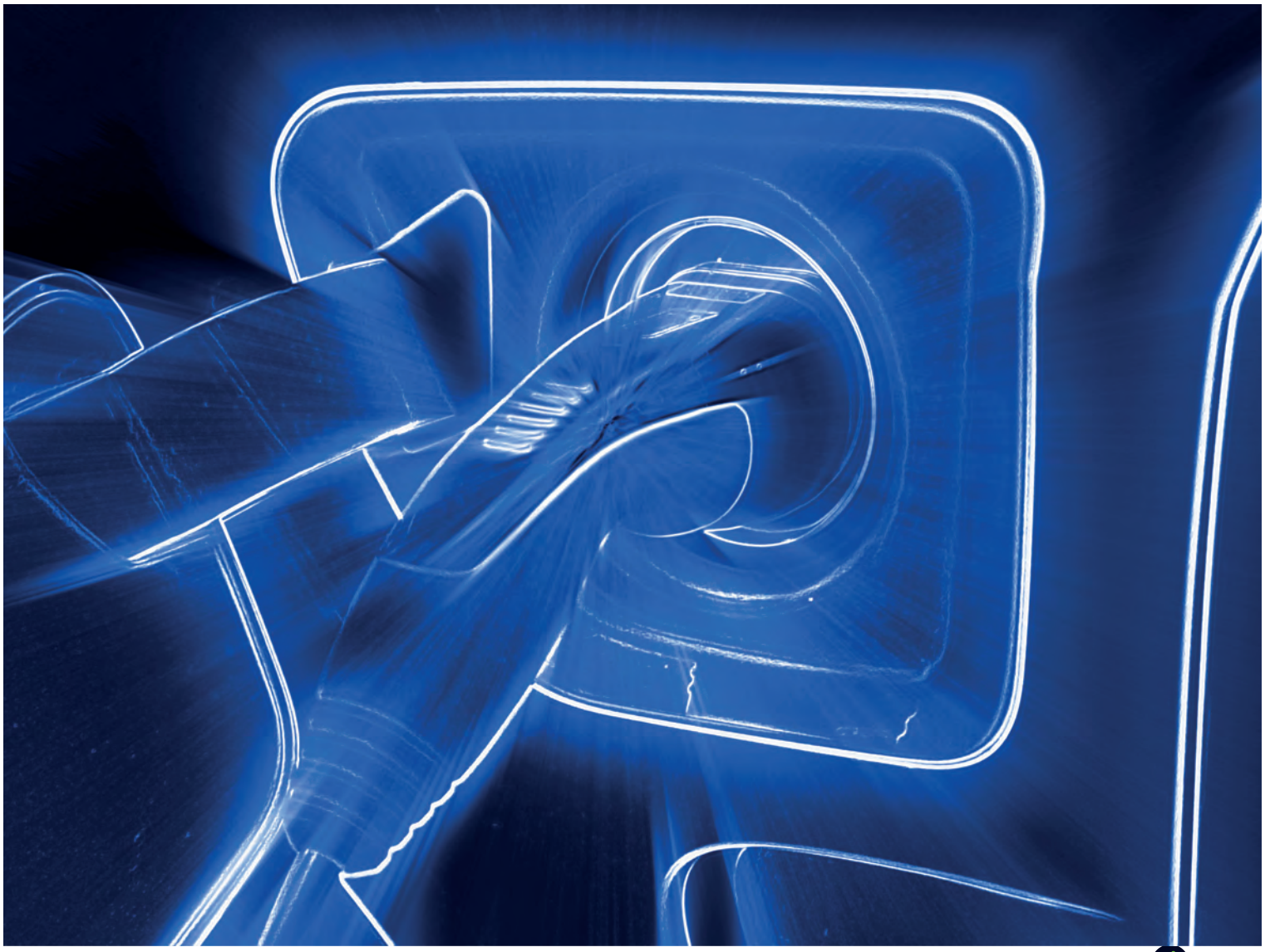

INSIDE

WHAT IS AN ELECTRIC VEHICLE?

As manufacturers consider a variety of ways to use electrification to reduce vehicle CO_2 emissions, *Andrew Ryan* highlights the different technologies

1 BATTERY ELECTRIC VEHICLE (BEV)

How does the technology work? A BEV has the most simple drivetrain out of all EVs, comprising of just two major components: a battery and an electric motor. The battery must be plugged into an external source to be charged.

Strengths/weaknesses: BEVs always produce zero tailpipe emissions and, because of this, are currently subject to a 0% benefit-in-kind (BIK) tax rate. Range used to be a major concern, but mainstream brands are now offering BEVs with ranges up to 270-plus miles. Perhaps the biggest drawback to running an electric car is having to charge it, with constant criticisms that the UK's charging infrastructure needs to be improved to allow widespread adoption of BEVs. The number of BEVs available is increasing rapidly.

Typical examples: Nissan Leaf, Peugeot e-208, Tesla Model 3

2 PLUG-IN HYBRID (PHEV)

How does the technology work? A PHEV features an ICE (internal combustion engine), usually petrol, a battery and an electric motor. PHEVs can be used as pure electric vehicles and be powered by the battery alone until the charge runs out when the car will be solely powered by the internal combustion engine (ICE). PHEVs also have 'auto' modes where the car will automatically switch between the two power sources – or use both at the same time – dependent on the circumstances and how the car is being driven.

Strengths/weaknesses: Current PHEVs tend to have electric-only ranges of up to 40 miles, but are sometime seen as offering the best of both worlds: zero-emission motoring, but also the convenience of an ICE vehicle when covering longer distances.

Typical examples: BMW 330e, Škoda Superb iV

3 EXTENDED RANGE ELECTRIC VEHICLE (EREV)

How does the technology work? An EREV has the same elements as a plug-in hybrid – an ICE, a battery and an electric motor – but uses them differently, producing less CO_2 than a PHEV. The range extender – usually a small petrol engine – is used only to charge a battery which then supplies the vehicle's motor with electricity to drive the wheels. The battery can also be charged from an external source.

Strengths/weaknesses: EREVs are considered to be the next greenest alternative to a BEV, but the technology is not widely available, with no EREV cars on sale in the UK at the moment. Previous examples include the BMW i3 Rex and Vauxhall Ampera, although the next-generation Nissan Qashqai, due next year, will use the technology.

Typical examples: LEVC VN5 van, Ford Transit Custom PHEV

4 HYBRID

How does the technology work? Hybrids have an ICE and an electric motor, and can be powered either directly by the engine, by the motor, or by both working together. The battery in a hybrid is smaller than in a PHEV and cannot be charge from an external power source. Instead, hybrids generate energy through the car's braking system – known as regenerative braking – and by their engines.

Strengths/weaknesses: The main advantages are that they should use less fuel and emit less CO_2 than a petrol or diesel vehicle, and are as convenient to use as they do not need to be charged from an external source. However, they are not as efficient as PHEVs or BEVs and do not qualify for the Government's £3,000 plug-in car grant.

Typical examples: Toyota Prius, Kia Niro

5 MILD HYBRID

How does the technology work? Mild hybrids have both an ICE and an electric motor, but use a battery much smaller – typically 48 volt – than that found in a hybrid. The battery stores energy generated by braking, but the electric motor cannot power the car on its own: it is used to support the engine during acceleration or cruising.

Strengths/weaknesses: Kia says the mild hybrid system in its Sportage increases fuel economy by 5.2% and reduces CO_2 by 15g/km compared with the non-mild-hybrid variant, but they do not offer the same efficiency gains as hybrid technology. Mild hybrids are generally cheaper than full hybrids and, unlike PHEVs or BEVs do not need to be plugged into an external source to charge.

Typical examples: Ford Puma, Kia Sportage

6 FUEL CELL ELECTRIC VEHICLE (FCEV)

How does the technology work? Unlike a BEV or a PHEV which has a battery that needs to be charged from an external source, an FCEV, effectively, has its own power plant on board – the fuel cell. Using a process called reverse electrolysis, the hydrogen, which is carried in the vehicle's fuel tanks, reacts with oxygen from the ambient air to create electrical energy, heat and water. This electricity powers a motor to drive the wheels.

Strengths/weaknesses: FCEVs have no tailpipe emissions except for water but take a fraction of the time to refill: it takes around five minutes to fill an FCEV with enough hydrogen for around 300 miles. However, the refuelling infrastructure in the UK is extremely limited, with just 17 hydrogen stations, while just two FCEV cars are currently available in the UK.

Typical examples: Toyota Mirai, Hyundai Nexo

SPONSOR'S COMMENT

By Adam Hall, Head of Electric Vehicles, Drax

It's little wonder so many businesses are transitioning their fleets to electric vehicles (EVs). Electrification helps companies tackle their sustainability objectives. It generates carbon-emission and cost savings and provides visible Corporate Social Responsibility (CSR) and Environmental, Social and Governance (ESG) commitments.

But, if you're planning to take the journey on your own, you'll soon find that the route to electrification can be a complicated one. To get things rolling, you'll need a business case that shows you can integrate EVs into your existing fleet without adversely affecting operations or costs. And your plan will need to make allowances for ongoing management and optimisation to deliver a return on your investment.

An effective charging infrastructure is crucial. Charging locations, end-user types, charge-speed requirements… the number of factors affecting your infrastructure choices means that the right solution is always bespoke.

One EV model may get the best reviews. But that doesn't necessarily mean it's the vehicle to serve your operational requirements.

The logistics of charge point installations – connection practicalities, the impact of associated power demands on site capacity and the scope for future-proofing – can make or break your electrification investment.

There are more questions still. How do you track the benefits? How will you integrate your existing fleet's telematics with your EV data? Will you be covered for breakdowns and software updates?

Finding answers and foreseeing the bumps in the road is difficult. That's why the support of a dedicated electrification partner can be invaluable in making your EV transition as smooth as possible.

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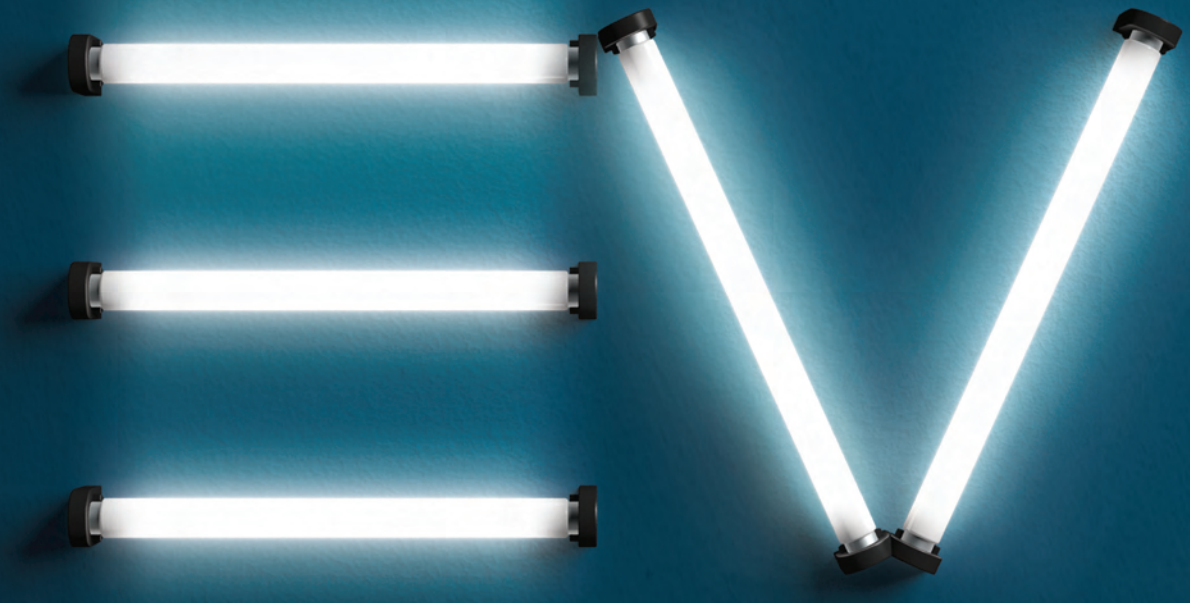

WHY SHOULD ORGANISATIONS USE BEVs?

Reasons an organisation should adopt battery electric vehicles can be boiled down to the three Es: economic, environmental and ethical. *Andrew Ryan* reports

ECONOMIC

Operating battery electric vehicles (BEVs) has the potential to save organisations thousands of pounds per vehicle each year, regardless of whether they are leased or bought outright.

BEVs have traditionally carried a price and leasing premium over petrol or diesel vehicles and although this may not be for long – analysts KPMG predict price parity in 2021 as the technology develops and the cost of raw materials falls – fleet decision-makers are urged to instead consider wholelife costs.

"Even if you have to pay more up front or if your monthly rental is a little higher, the running cost through electricity is much cheaper than petrol or diesel, and there is a reduced service, maintenance and repair (SMR) cost from the fact there are fewer mechanical working parts," says Helen Lees, head of Free2Move Mobility and connected services at Groupe PSA. "That can change the perception of pricing in the customers' minds."

The major cost advantage a BEV currently has over an internal combustion engine (ICE) vehicle is fuel. The cost of electricity to power a BEV for a mile depends on the electricity tariff used and the efficiency of the car, but starts at around 3.5p per mile (ppm) on the average domestic electricity rate of about 14p per kWh. This compares with 10ppm to 14ppm to fuel a typical diesel car.

Organisations which reimburse drivers for business miles using the Government's advisory fuel rates (AFRs) can also make significant savings by switching to BEVs.

EXAMPLE WHOLELIFE COST

Company car comparison 36 months, 60,000 miles (employee private mileage 24,000)							
	P11D	CO_2	Miles/kWh or MPG	Lease cost	NI	Fuel	Total
Nissan Leaf N-Connecta 40kWh	£32,790	0	3	£16,230	£131	£1,200	£17,561
Ford Focus 1.0 125PS Zetec Nav	£21,980	125	51.4	£13,706	£2,625	£3,181	£19,512
BEV saving vs petrol £1,951							

Source: EST/Alphabet

HMRC has an advisory electricity rate for BEVs of 4ppm. This compares with AFRs of between 10ppm and 17ppm for petrol cars and 8ppm and 12ppm for diesel models.

This means an employee driving a BEV for 10,000 miles a year will be reimbursed £400. If they were driving a petrol or diesel car, this figure would be between £800 and £1,700.

Organisations operating BEVs will also make significant savings in service, maintenance and repair (SMR). "Industry data providers suggest that a BEV will achieve an average 25% to 40% saving versus a petrol or diesel car," says Alison Bell, marketing director at Venson Automotive Solutions.

"There are a total of 20 items used in petrol and diesel cars but not in EVs that require inspection, maintenance or replacement over a vehicle's 10-year/150,000-mile life."

These include the alternator, power steering fluid, radiator and assorted pipework, spark plugs, starter motor, thermostat, timing belt and a water pump.

Additionally, BEVs require no oil changes, air filter, transmission fluid, exhaust pipe or radiator hoses.

There are also tax benefits for organisations running BEVs. Current benefit-in-kind (BIK) tax rates mean BEV drivers pay no company car tax in the 2020/21 tax year, 1% in 2021/22 and 2% in 2022/23, 2023/24 and 2024/25.

As the Class 1A National Insurance Contributions (NICs) for company cars is calculated using the BIK rate, organisations will pay no Class 1A NIC on pure electric vehicles in 2020/21, increasing slightly in the following tax years.

In an example provided by EST (see table alongside), this would mean a fleet would save £2,494 in NIC over the three tax years if it operated a Nissan Leaf N-Connecta 40kWh instead of a petrol Ford Focus 1.0 125PS Zetec Nav from the April this year.

"In our experience, many fleets don't consider NIC when comparing vehicles and ➲

the savings with the latest rules make it absolutely essential for calculations to include those savings," says Ian Featherstone, account manager, supply chain, at EST.

In addition, BEVs are fully exempt from vehicle excise duty (VED), as earlier this year the Government announced all zero emission cars will not be incur the VED 'expensive car supplement' until 2025.

This means BEVs costing more than £40,000 no longer face the £320 premium, which had been the only VED zero emission cars had been subject to.

Currently, cars with CO_2 emissions of less than 50g/km are eligible for 100% first year capital allowances, which means those organisations which outright purchase electric cars can deduct its full cost from pre-tax profits. On a car costing around £40,000, this could amount to a tax relief of £7,600 in the first year.

This changes in April next year, when only zero emission cars will be eligible for first year allowances and the main rate of 18% will apply for cars with CO_2 emissions of 1-50g/km.

In step with this, from April 2021 the lease rental allowance, which can be deducted from a company's corporation tax charge, will be 100% up to 50g/km (currently 110g/km) and 85% above that figure.

Also from April 2021, the van benefit charge changes and there will be a nil rate for zero emission vans (currently 80% of the full charge).

A further potential cost-saving fleet decision-makers could consider is that BEVs are exempt from charges relating to the ultra-low emission and clean air zones which are being increasingly adopted in towns and cities across the UK.

ENVIRONMENTAL

Road transport is said to account for 27% of the UK's CO_2 emissions, and switching from internal combustion engine (ICE) vehicles to low-emission electric vehicles (EVs) can reduce an organisation's contribution to this.

They are also seen as a key weapon in the fight to reduce local air pollution – ICE vehicles are a major source of nitrogen oxide (NOx) emissions and particulate matter which are recognised as a serious public health issue.

This is not an issue with EVs when running in full-electric mode, although given EVs are heavier than ICE cars there is an increasing focus on the harmful particulate matter generated from their tyres and brakes.

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Critics point to the pollution created by the power stations which supply electricity to the national grid, but this, too, is changing.

Figures from the Department for Business, Energy and Industrial Strategy show that in Q2 this year, the share of generation from renewables (44.6%) exceeded the share of generation from fossil fuels (35.1%).

Organisations can also switch to renewable energy tariffs to further counter this argument if the EVs are charged at the workplace.

ETHICAL

Organisations should also consider the corporate social responsibility (CSR) element of electric vehicles, especially the staff well-being and broader social benefits element, says energy company EDF.

Many businesses which use BEVs say their employees prefer to drive them instead of ICE vehicles as they are quieter and smoother to operate.

"EVs can encourage sustainable living and are an enjoyable and real-world solution to the challenge of vehicles emissions and air quality," says EDF.

Organisations can also boost their reputation by being seen to be an environmentally-conscious business working to lower their overall carbon footprint.

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HOW DO YOU INCREASE EV UPTAKE?

Opting for an ultra-low emission vehicle can unlock significant savings for company car drivers. *Andrew Ryan* reports

For some environmentally-conscious company car drivers, the prospect of running an electric vehicle (EV) for its green credentials alone will be a compelling argument.

But for others, the key persuader will be the enormous savings they can make by choosing an EV over a petrol or diesel model.

For example, employees opting for a battery electric vehicle (BEV) pay no company car tax in the 2020/21 tax year, while the benefit-in-kind (BIK) rates for a plug-in hybrid begin at 2%, increasing to 14%, dependent on the electric-only range of the vehicle (see full BIK table, P34).

"If you drive a BMW 320d and switch to a Tesla Model 3, how much BIK do you save a year? It's £4,500 take home," says Simon King, director of sustainability, social value and fleet at Mitie.

"So, if I take away your BMW 3 Series and give you a Tesla instead, that's the same as giving you an £8,000 pay rise assuming you are a 40% taxpayer. What's not to like about that?"

The BIK rates for zero emission BEVs will increase to 1% for the 2021/22 tax year, and 2% for the following three years.

Energy Saving Trust (EST) says this means a driver who took delivery of a Nissan Leaf N-Connecta 40kWh instead of a petrol Ford Focus 1.0 125PS Zetec Nav in April this year would save £3,614 in BIK over a three-year replacement cycle.

Drivers would also make significant savings in the cost of fuel. If the employee used their company Leaf for 24,000 personal miles, they would save £1,321 due to the lower cost of powering an EV, says EST, leading to overall savings of £4,935.

This example assumes a petrol price of £1 per litre and an electricity tariff of 16p per kWh.

On top of this, drivers would be exempt from ultra-low emission and clean air zone charges if they enter those areas on personal journeys.

"It's a really great deal for employees," says Ian Featherstone, account manager, supply chain, at EST. "It's no wonder that many leasing companies are reporting a big uptake in pure electric car sales."

Many organisations report that drivers who had opted out of their employer's company car scheme to take cash allowances now want to return to take an EV, not only for the savings, but the convenience.

"We had seen a mass migration to the cash allowance but, from talking to our drivers, most of them didn't want to do that, they like the comfort of a company car, but didn't want to pay the tax," says Matt Hammond, head of fleet at Altrad Services.

"A lot of those employees had company cars for 10, 15 or 20 years and suddenly they've gone out into this big bad world of insurance quotes and running a car and they don't like it, they want to come back again and go electric."

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INCREASING EV UPTAKE

There are a number of ways organisations can encourage EV take-up, such as revising company car choice lists.

"Historically, what we see with a lot of organisations is they looked at car banding predominantly based on lease cost or lease and maintenance," says David Raistrick, senior manager at KPMG in the UK.

"But what we are starting to see with clients is, effectively, a change in how they think about the cost of vehicles."

This sees them adopt a wholelife cost (WLC) model, where the significantly lower tax, fuel and SMR expenses are taken into account, enabling EVs to be offered in many more company car grades.

"WLC can provide access to more prestige or larger vehicles than may otherwise have not been affordable within an employee's grade," says Claire Evans, head of fleet consultancy at Zenith.

Employers should be flexible with the amount drivers can contribute to the car scheme to ensure a range of EVs are available at all grades, she adds.

For example, if the WLC of a Tesla Model 3 Long Range is £600 and a company's WLC entitlement is £500, then without a driver contribution the vehicle would not be available.

"However, if the driver could pay £100 contribution towards the Tesla, they would pay £0 BIK and yet still be in a better total cost position, compared with the average BIK cost of £300-£400 (40% taxpayer) for equivalent petrol and diesel cars within their entitlement," says Evans.

"The driver gets a £200 to £300 a month saving and the opportunity to switch to cleaner technology at no extra cost to the employer."

Despite the cash and convenience benefits increasing the appeal of an electric company car, research consistently finds there are aspects of EV ownership drivers are always worried about: charging and vehicle range, in particular.

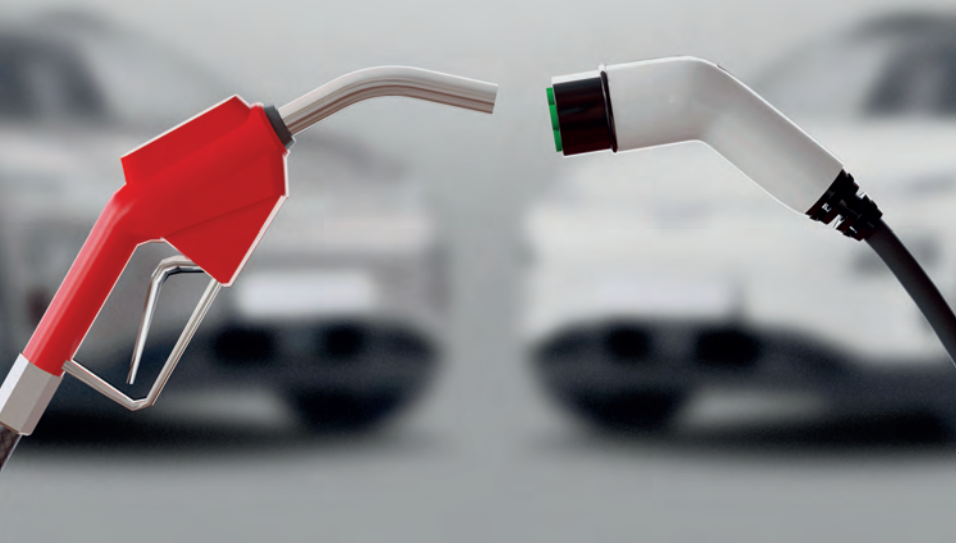
Many fears are unfounded and Evans says can alleviate these by focusing on designing policy and issuing clear communications to help to inform employee choice and remove these perceived barriers.

"Engagement and education are pivotal to successful uptake," she adds. "Successful policies with good uptake offer driver support and education about available vehicles and how to optimise the use of home, work and public charging."

Some organisations arrange roadshows where local dealers or leasing companies take EVs to workplaces so employees can look at the vehicles, drive them and ask experts about them.

BENEFIT-IN-KIND TAX RATES FOR PLUG-IN ELECTRIC CARS

CO_2 (g/km)	Electric range	2020/21	2021/22	2022/23	2023/24	2024/25
0	n/a	0%	1%	2%	2%	2%
1 to 50	>130 miles	2%	2%	2%	2%	2%
1 to 50	70-129 miles	5%	5%	5%	5%	5%
1 to 50	40-69 miles	8%	8%	8%	8%	8%
1 to 50	30-39 miles	12%	12%	12%	12%	12%
1 to 50	<30 miles	14%	14%	14%	14%	14%



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SPONSOR'S COMMENT

By David Savage, Regional Manager, Geotab UK & Ireland

We see a shift in consumer preference, away from internal combustion engine (ICE) vehicles and towards electric drivetrains. This is reflected in the Department for Transport's statistics for new vehicle registrations in Q2 2020.

While diesel vehicle sales fell by 81% compared with the same quarter of 2019 and petrol fell by 72% over the same period, there was a 30% increase in the sales of EVs.

This also marked the first time that more EVs were registered than new diesel cars, with EVs making up 7.8% of all new registrations.

To date, light-duty fleets have most successfully incorporated EVs. Of those, EVs are best positioned to succeed in depot-based fleets, particularly last mile carriers and field service operations. The routes and driving patterns of these vehicles are generally predictable and many operate over moderate distances and return to depot after the shift.

Overall, fleets with high vehicle utilisation rates will be in the best position to make the transition to electric. With every electric mile, you save. Higher utilisation makes fuel costs a greater proportion of the total cost of ownership (TCO) of the vehicle, significantly reducing the comparative cost of an EV compared with ICE vehicles.

Since most fleet managers are likely to make a gradual transition to electric, this leaves them with a potentially challenging middle ground, where they are running some ICE and some EVs.

This can present hurdles when it comes to monitoring and reporting, which can be circumvented by choosing the right telematics platform that spans across all drivetrains, and is able to support your EVs.

Managers can then compare fuel-efficiency (equivalent) and other performance indicators across the entire fleet, while also monitoring EV-specific metrics such as battery state of charge all in one platform.

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The growing importance of electrifying your fleet

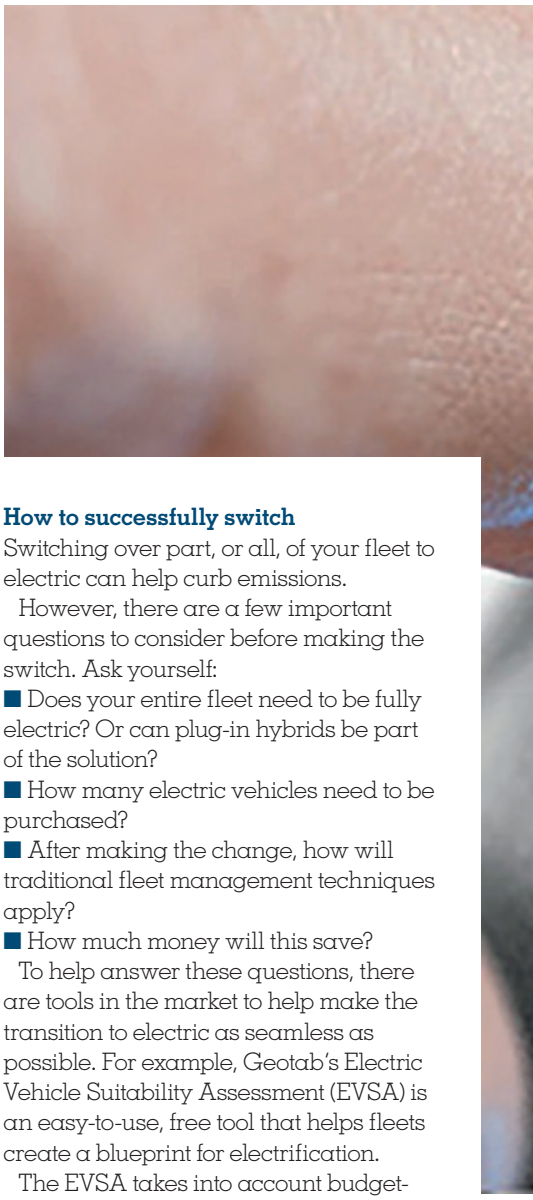
Electric vehicles (EVs) have become increasingly popular across the world in the past few years. And while globally, almost every industry has been disrupted to some level due to the ongoing impacts of the Covid-19 pandemic, EVs have continued to stay important and are playing a key role in meeting net zero carbon and local pollution goals in the UK.

The rise of EV fleet management

Using fleet management tools and software during times like these has also become important. Regardless of how big or small your fleet is, getting ahead of your competition and recognising the power that EVs can bring when combined with telematics will help enable you to become more efficient and save costs.

The UK is a part of Europe's largest markets for electric vehicle sales, with more than 10% of car registrations in 2020 being for hybrid and plug-in vehicles. Alongside this, EVs are also eligible for Government grants and help fleets meet overall sustainability goals. The UK became the first major economy to pass laws to end its contribution to global warming by 2050, which requires all greenhouse gas emissions to be reduced to zero. EVs will play a significant role in helping consumers reduce their carbon footprint while also helping fleets meet Government mandates.

> "With electrification on the rise, it has become increasingly important and easier than ever to reduce carbon emissions and save on fuel costs"



How to successfully switch

Switching over part, or all, of your fleet to electric can help curb emissions.

However, there are a few important questions to consider before making the switch. Ask yourself:

- Does your entire fleet need to be fully electric? Or can plug-in hybrids be part of the solution?
- How many electric vehicles need to be purchased?
- After making the change, how will traditional fleet management techniques apply?
- How much money will this save?

To help answer these questions, there are tools in the market to help make the transition to electric as seamless as possible. For example, Geotab's Electric Vehicle Suitability Assessment (EVSA) is an easy-to-use, free tool that helps fleets create a blueprint for electrification.

The EVSA takes into account budget- and fleet-specific information to help uncover the vehicles in your fleet most suitable for swapping to EVs. It uses vehicle trip data and engine diagnostics to provide EV recommendations that fit each individual vehicle's driving profile.

With insight such as this, fleets can better understand how much their carbon emissions will go down and how much of an impact EVs will have on the operational budget, plus much more.

Three key factors to consider

Before making the switch to electric vehicles, consider these three factors for maximum results.

1. What are your current costs?

Understanding the current costs associated with the vehicles you are looking to replace will help when

choosing an EV. By analysing and understanding your current expenses, it becomes easier to compare that number with possible future costs. Then, it will be easier to determine whether you are breaking even or reducing the overall fleet budget by switching to EVs.

2. Where and how long does your vehicle dwell for?

Knowing the answer will help when implementing an infrastructure strategy and it will help your fleet vehicles fully charge when they are dwelling. It will also help fleet operators understand the range of their EVs. Since each fleet's dwell time and locations are different, it is a good idea to analyse fleet data when planning the infrastructure strategy for your overall EV adoption.

3. What is your maximum range?

This is a important. Knowing the maximum range a vehicle in your fleet completes in one day, will make it easier to choose the EV you require. Whether it is a short- or long-range battery, it is important to take all factors into account when choosing what kind of EV is needed. Analysing the maximum range of distance driven by vehicles will help provide a better understanding of the EVs needed and help with a simple pass or fail gate when making decisions.

Tools such as an EVSA provides businesses with all the information required to answer the questions above by using your own fleet's data. This will help confirm that you are putting the best-fit EVs into your fleet.

What the future looks like

With electrification on the rise, it has become increasingly important and easier than ever to reduce carbon emissions and save on fuel costs.

Having a telematics platform that can help monitor your vehicles, both conventional and electric, will help organisations stay ahead of the competition while also maximising the return on investment.

Having all your information in one place can strengthen your business strategy and empower fleet managers to optimise all available resources.

Geotab offers a fleet management platform along with many EV-related resources to help fleets adapt to the changing world.

Advertisement Feature

How Drax Electric Vehicles drove the benefits of electrification for SES Water

The energy expert's partnership approach fast-tracked SES Water's electric vehicle (EV) trial – and helped extend the utility's electrification investment.

The road to carbon neutral

SES Water – supplier for 700,000 people's water needs – uses as much energy as 13,000 homes. The utility, however, made a significant sustainability commitment by moving to 100% renewable source electricity in 2018.

Alongside its electricity supplier Drax, SES Water identified fleet electrification as the next step in reducing its carbon emissions.

The case for electrification

Drax knew that SES Water would need a compelling business case to secure board-level approval.

Understanding existing fleet usage enabled the energy experts to identify the opportunities and potential of electrification.

An EV suitability assessment gave SES Water the confidence to approve a trial involving the replacement of 10 diesel vans with EVs.

The assessment, based on existing-vehicle telematics data, showed that operations wouldn't be adversely affected. It also provided a comprehensive total-cost comparison.

Impartial insights

Drax isn't aligned to a particular vehicle producer or charging hardware, so based its recommendations purely on detailed market knowledge and its analysis of the existing fleet.

Fleet drivers and stakeholders were also given the chance to try the recommended vehicle – Nissan's eNV200 – for themselves.

To develop tailored charging infrastructure recommendations, factors such as SES Water's vehicle selection, the trial's scale, the intended end-user types and relevant sites' power capacities were considered.

On-site, on hand

When planning the charge-point installations, Drax carried out electrical site surveys to understand connection practicalities and build in future-proofing.

They also organised hardware purchases, scheduled and managed works on-site, and provided a single and consistent point of contact for all SES Water stakeholders.

Delivering the goods

Supporting beyond setup, Drax identified a suitable, EV-only leasing partner, facilitated a smooth EV transition, and made sure that the trial delivered its intended benefits.

Additional partnership benefits included maintenance and servicing cover, the integration of telematics with SES Water's existing function,

The trial resulted in a carbon saving of

43 tonnes of CO_2 per year

and a commitment to 'update, detect and correct' charge-point software.

Electrification expansion

Eager to capitalise on the trial's success, SES Water – with Drax's support – expanded the number of active EVs and connected sites, and boosted charge-point numbers to 42 during 2020.

These investments are helping SES Water accelerate towards its target of full-fleet electrification by 2030. Attitudes are changing internally, too. As the utility's Energy and Carbon Manager, Henrietta Stock says, **"Three years ago EVs weren't on the radar but now people are asking for their next company vehicle to be electric."**

Benefit optimisation

Having helped SES Water maximise driving economies based on telematics findings, Drax is also supporting the utility's preparations for capitalising on new opportunities. For example, a trial focused on home-based charging facilities for fleet drivers is in discussion.

Drax continues to monitor vehicle launches and developments such as vehicle-to-grid charging, which will soon offer revenue streams for EV adopters.

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WHAT'S THE CHARGE?

Ensuring an electric vehicle has enough charge in its battery to carry out necessary journeys is critical, but what options are available? *Andrew Ryan* reports

Analysts say that between 70% and 80% of fleet electric cars are charged at home

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Charging is regularly identified as being one of the biggest concerns both fleet decision-makers and drivers have about operating battery electric vehicles (BEVs).

A BEV with a flat battery is unusable, while fears over an inadequate public charging infrastructure are likely to fuel anxiety over range and increase any mistrust in the technology.

However, the Government and private sector companies are investing tens of millions of pounds in charge points at homes, workplaces and public locations to help ensure a smooth transition to EVs.

Here we look at these three areas and what they mean to fleets.

HOME CHARGING

Analyst KPMG suggests 70% to 80% of fleet electric cars are currently charged at the employees' homes overnight, meaning this is an area fleet decision-makers should take an active interest in.

This rings particularly true for those organisations whose van drivers who take their vehicles home at the end of the working day, as they will need to be able to charge them before setting off for work the following morning.

The Government's Electric Vehicle Homecharge Scheme (EVHS) will provide a grant of up to £350 towards the cost of purchasing a home charging point. To qualify, a person must own, lease, or have ordered a qualifying vehicle (including as a company car) and have dedicated off-street parking at their property.

Through the Energy Saving Trust Scotland, the Scottish Government offers Scottish residents and additional grant of up to £300, on top of EVHS.

Some fleets, such as DPD, pay the remaining cost of the charger.

"That's part of our initiative to get the buy-in for electrifying our fleet," says Olly Craughan, CSR general manager at DPD Group UK.

"Our owner-drivers are self-employed and we see it as an incentive to have a home charger paid for; it is theirs to keep."

WORKPLACE CHARGING

As the uptake of BEVs increases due to favourable benefit-in-kind (BIK) tax bills and increasing vehicle availability, it will become more important for organisations to introduce charge points at workplaces.

To implement a successful scheme, there are a number of factors to consider.

One of the first is how many charge points are needed. To determine this, a company will need to consider the number of EVs operated both currently and in the future, the number of available parking bays and the available budget for the installation.

They also need to consider what speed of charger is required and this will depend largely on the amount of time the vehicle is parked. If it can be charged overnight, for example, a slow charger may be sufficient, but if the turnaround required is faster, a rapid charge point may be needed. Consider also the speed with which the vehicle can draw the charge – it varies considerably and

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Public charging infrastructure needs to improve to encourage greater EV uptake

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battery size is not necessarily a reliable indicator.

The cost of buying and installing charge points varies massively: a 7kW charge point capable of charging two vehicles at the same time can cost from £4,000 to install, while a 150kW unit is upwards of £100,000.

The electricity capacity of the site should also be taken into account. If demand for energy exceeds supply to a site then a substation may need to be installed at significant expense.

The Government does offer financial support towards the upfront cost of the purchase and installation of charge points under its Workplace Charging Scheme.

This contribution is limited to 75% – or £350 per socket – of these costs, up to a maximum of 40 sockets per company. These can be on different sites.

PUBLIC CHARGING

The public charging infrastructure has a key role in the successful uptake of BEVs, whether it is used by motorists for a top-up during longer journeys, or if the driver does not have access to another form of charging, for example.

However, it does come under a lot of fire for being inadequate for current and future needs, but there are signs this is changing.

Department for Transport statistics show that in October there were 19,487 public charging devices available in the UK, an 18% year-on-year increase. Of these, 3,530 were rapid devices.

Huge investment is being made to improve the infrastructure, with the Government, for example, providing £500 million over the next five years, while private sector companies are also spending significant amounts.

Another key area for the public infrastructure is payment. "It's not typically as simple to recharge your EV and pay as it is rolling up to a petrol station," says Aaron Berry, deputy head, energy and infrastructure at the Office for Low Emission Vehicles (OLEV).

"Sometimes you need a special app, sometimes you can't use a credit card. These sorts of issues can be really frustrating for EV users and that's something Government ministers are keen to address."

Solutions are becoming available with Zap-Map, for example, launching a Zap-Pay app which will allow users of a number of charge point providers to pay using a single app.

Also, all rapid charge points installed from spring this year (2020) should provide debit or credit card payment.

Reliability can also an issue, with OLEV saying 7% of chargers can be out of action at any one time.

HOW LONG DOES IT TAKE TO CHARGE A VEHICLE?

This depends on three factors: the speed of the charge point, the size of the vehicle's battery and the speed of its on-board charger.

Charge points tend to be split into three categories:

- **Slow – typically from 2.3kWh to 6kWh, and include domestic 230v household sockets and lamppost chargers. A 3.7kW charger will add up to 15 miles of range per hour.**
- **Fast – typically between 7kW and 25kW. A 7kW charger will add up to 30 miles per hour, while a 22kW unit adds up to 90 miles in the same time.**
- **Rapid – these have been 43kW AC chargers or 50kW DC chargers, but faster options, including 150kW and 350kW, are also becoming available. A 43kW-50kW charger will add up to 90 miles in 30 minutes, compared with a 150kW unit's 200 miles.**

It is not just the speed of the charge point which affects the time it takes to charge a car: the power rating of a vehicle's on-board charger will also determine this.

"You could plug a car into a 150kW rapid charger but if its on-board charger takes 43kW, it would still take the time that a 43kW charger would take," says Rob Anderson, senior fleet specialist at Cenex.

As an example of this, the Hyundai Kona Electric with a 64kWh battery takes nine hours 15 minutes to charge from a 22kW charge point when fitted with 7.2kW on-board charger. If the same vehicle is specced with a 10.5kW on-board charger, this time falls to six hours 50 minutes.

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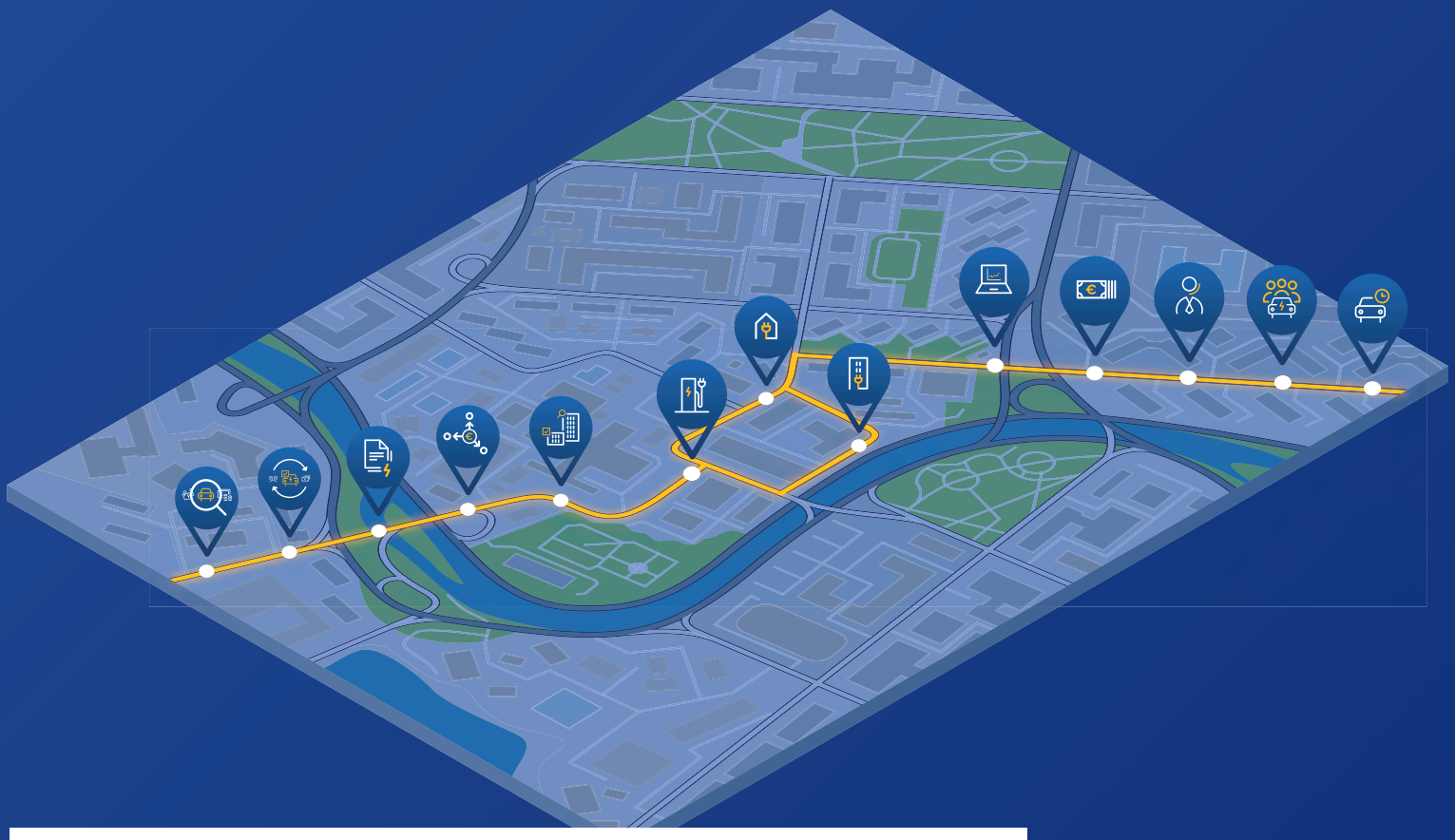

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GIVE IT A SPIN: THE BENEFITS OF ELECTRIC VEHICLES FOR FLEET MANAGERS

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Environmental and economic benefits of EVs are clear, says *Poppy Welch*, head of Go Ultra Low

The Covid-19 pandemic has caused major disruptions to our behaviour, from increased homeworking to changes in how we move around our towns, cities and rural areas.

The fleet industry is no exception, with recent research revealing an increasing desire for company car vehicles from employees.

As mobility habits change, it's important that fleet managers consider how an increase in company car use can align with sustainability targets.

One solution is ensuring that employees are offered electric vehicles (EVs) as company cars and are made aware of the financial and environmental benefits they offer.

EMPLOYEE APPETITE FOR EVs

Employees are likely to be receptive to this, as Go Ultra Low research recently found office workers are keen for their employers to take environmental action, with 69% agreeing that the business they work for could do more for the environment.

Despite these positive findings, 33% admit they are better at taking care of the environment at home rather than at work.

Recognising there is room for improvement in terms of workplace sustainability, electric mobility was an area in which they saw an opportunity to make a positive environmental choice.

Our research found that 70% of employees thought that companies should offer EVs as company cars, with two-thirds (63%) happy to drive an EV.

It's clear that UK office workers want further action from employers and are keen to access the environmental benefits of driving EVs, which improve local air quality as they produce zero tailpipe emissions.

ABOUT THE AUTHOR

For the past five years Poppy Welch has been head of Go Ultra Low, the joint Government and industry campaign to promote the uptake of electric vehicles. Its website can be found at Goultralow.com/fleets-and-businesses

GOING GREEN TO STAY AHEAD

In terms of the finances, EVs are highly cost-competitive for company car drivers. Employees often chose to forgo company cars due to their tax implications. However, in April this year the Government reduced benefit-in-kind (BIK) taxes for fully electric vehicles from 16% to 0%.

EVs also provide cost reductions over the lifetime of ownership. When comparing running costs, an EV can be driven for as little as 1p per mile, compared with 8-10p per mile for even the most fuel-efficient petrol and diesel vehicles.

They also have fewer moving parts than conventionally-fuelled vehicles, providing long-term maintenance savings.

> "THERE IS STILL CONFUSION ON THE SAVINGS EVS OFFER TO BUSINESS FLEETS"

In addition to these day-to-day savings, switching to an EV fleet can save further money for businesses as they incur reduced national insurance contributions (NICs).

Yet, despite these changes having taken place in April, research from LeasePlan UK revealed that half (49%) of HR bosses and senior business leaders thought that an EV salary sacrifice scheme would actually add extra cost to their organisation – showing that there is still confusion on the savings EVs offer to business fleets.

DRIVING FORWARD

The environmental and economic benefits of EVs are clear, while improving vehicle ranges, an ever-growing charge point infrastructure and an increasing number of models available are giving drivers further confidence to switch.

As a result, we've seen a surge in EV demand – registrations of fully electric vehicles in 2020 have risen by 169% so far – showing how the UK is embracing electric mobility.

While it may take some businesses time to transition to a fully electric fleet, they can start by switching a proportion of their vehicles to electric. Only by testing the technology will companies be able to experience both the commercial and reputational dividends EVs offer.

MAKING THE SWITCH

When protecting the bottom line has never been more important, EVs provide financial benefits for employees and businesses alike.

What is more, they also offer fleet managers a more sustainable option at a time when employees are demanding action on the environment.

The Government's announcement to bring forward the ban on the sales of new diesel and petrol cars and vans to 2030 has brought that date sharply into focus for the fleet industry.

But it was already at the forefront of Severn Trent Water's mind as it last year committed to operating an entire fleet of electric vehicles by then.

This is part of its triple carbon pledge, which will also see the water and waste company achieve carbon neutrality and use 100% renewable energy by 2030, well ahead of the Government's 2050 target.

The organisation has already recorded a number of successes – it already generates more than 50% of its energy through its own renewable sources and procures renewable backed electricity for the remainder. But, transitioning the fleet of around 400 cars, 1,500 vans and 150 HGVs and tankers to electric brings its own challenges.

"Before the triple carbon pledge we were trialling electric vehicles (EVs) and charge points, but this (Government announcement) has ramped up our ambitions," says David Gibbin, energy flexibility manager at Severn Trent Water, which is a member of the EV100 group.

One of its first steps was to commission a fleet review from low-emission vehicle consultancy Cenex (see panel, p46), to identify what vehicles were available, the timescales involved in electrifying each vehicle segment and the roadmaps around new technologies.

"That provided some real clarity for us about what was possible now and what areas might be more difficult," says Gibbin.

Severn Trent Water's sustainability report, published earlier this year, outlines some of the actions it will take.

These include buying only electric cars from now on, reaching 100% in use by 2026 in line with its fleet replacement programme, while the company also began purchasing small electric vans for shorter trips this year.

Larger vans – as well as light commercials which can tow – are identified as more of an issue through limited availability, but Severn Trent Water expects greater numbers of suitable models to go on sale in the next few years and plans to buy only electric vans from 2023 onwards.

The organisation will also explore how it

SEVERN TRENT WATER TARGETS ELECTRIC-ONLY FLEET BY 2030

Water and waste company commits to zero carbon future and to use 100% renewable energy. *Andrew Ryan* reports

can weight its fleet towards smaller vans – for example, by carrying less kit – to speed this process.

It has already identified vehicles which could now be changed for EVs and these tend to mainly be the ones which have well-defined routes and are left at Severn Trent Water sites overnight where they can be charged.

"Those are definitely the low hanging fruit, but we have still got an operational base that is very reactive to jobs such as a pipe burst in the middle of a field in the middle of nowhere that requires a lot of tools and equipment," says Gibbin. "They can't go electric yet as we need the vehicle technology, range and payload to improve, so there's a balance for us."

Severn Trent Water's sustainability report says, based on today's outlook, electric options for its HGVs and tankers may not be available by 2030.

"There will have to be a shift in technology to hit the pledge we made for those, but we have identified there'll be some sort of alternative fuel for them which will still fit in with the overall ambition to decarbonise the fleet by 2030," says Gibbin.

Among the low-carbon options Severn Trent Water is investigating are hydrogen and biogas. The organisation may be able to produce the latter from its own operations.

It already generates the equivalent of more than 50% of its energy needs through solar panels, wind turbines and anaerobic digestion, which is a by-process of sewage treatment.

"We have a real opportunity not only to fuel our own vehicles on our sites, but actually fuel them in a green way and there's a push to make the most of this opportunity," says Gibbin.

A key part of Severn Trent Water's fleet electrification is to demonstrate value for money: its sustainability report estimates the EV strategy will begin to deliver wholelife cost benefits

> "THAT (FLEET REVIEW) PROVIDED SOME REAL CLARITY FOR US ABOUT WHAT WAS POSSIBLE NOW AND WHAT AREAS MIGHT BE MORE DIFFICULT"
>
> **DAVID GIBBIN, SEVERN TRENT WATER**

Severn Trent Water plans to buy only electric vans from 2023 onwards to replace its existing diesel vehicles

from 2022, helping to lower operating costs.

"Our finance team has built a cost model that looks at the overall total life cost of the vehicle, breaking down the options we had to build our strategy," says Gibbin.

"That is crucial, really, to say 'yes, we can do this and it is worth us doing it', not only from an environmental perspective, but from a business perspective.

"Ultimately, we're a regulated business, our customer bills go towards us running the company, so we have to be careful to use their money in the most sustainable and cost-effective way."

Severn Trent took on its first electric vans – seven Nissan eNV200s – two years ago to trial and also operates a number of electric all-terrain vehicles (ATVs) on its sites.

At the beginning of November, it expanded its electric fleet with 19 Hyundai Kona Electric models and will take delivery of nine more electric vans before the end of the year to give it 35 EVs.

In May, it announced it had teamed up with EVBox to install 352 chargers at its sites, with this project due to be completed by the end of next year.

As well as being used by operational vehicles, the workplace chargers should encourage grey fleet drivers to switch into EVs as they will help remove any charging anxiety employees may have, says Katherine Hawker, transport manager at Severn Trent Water

"Everybody has the same barriers with EVs – it's always cost, charge and range," she adds.

"If you can provide a charge point at work, that almost takes away one barrier."

While Severn Trent Water's initial uptake of EVs may appear low, Gibbin says the company is using this time wisely.

"Over the next couple of years we'll learn a hell of a lot about charging, and also about the vehicles themselves as we put more out on the fleet to a point where we're ready for the big uptake in our numbers," he adds.

ANALYSING REAL-WORLD DATA IS ESSENTIAL BEFORE RECOMMENDATIONS CAN BE MADE

Cenex's review of Severn Trent Water's fleet identified reductions of 52,000 tonnes of CO_2 emissions and 80,000kg of NOx when the transition to a fleet of low emission vehicles is completed.

"The overall aim of a review is to help a fleet identify which low carbon technology fits which vehicle in which operation," says Rob Anderson, senior fleet specialist at Cenex.

Key to carrying out a review is accurate data. This includes the vehicles currently on the fleet, the mileage they cover, their duty and replacement cycles and fuel use, as well as information such as the weight commercial vehicles carry.

Anderson says Cenex analyses this using data from real-world vehicle trials it has managed and this also covers factors such as whether the vehicle is being operated in urban or rural areas.

A review aims to identify a roadmap of what vehicles can be transitioned to electric and when, as well as outlining what charging infrastructure needs to be installed.

"Some organisations, say, give us two cases: total cost of ownership (TCO) neutrality, or an analysis if money was no object to put the right low emission technology across the entire fleet," says Anderson.

"With TCO neutrality, in some instances you'll get cars and small/medium vans which will make significant TCO savings. Those savings can be used to offset the increased costs of low emission technology in other vehicle segments, so it balances the books."

Anderson recommends fleets run trials to help build acceptance of EVs. "If you are getting two or three vans in for three or four months, share them out so different people can drive them and understand the technology," he adds.

"There's fear, there's uncertainty, there's doubts, but we find most of those can be overcome as soon as people drive an EV and understand the technology."

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Fuel economy and CO_2 results for the Vivaro-e range 100kW (136PS). Mpg (l/100km): N/A. CO_2 emissions: 0g/km. Electric range up to 205 miles (WLTP). Fuel economy and CO_2 results for the Grandland X Hybrid range 165kW – 221kW (225 – 300PS). Combined mpg (l/100km): 192 (1.5) – 204 (1.4). CO_2 emissions: 29 – 31g/km. Electric range: up to 35 miles (WLTP). Fuel economy and CO_2 results for the Mokka-e range 100kW (136PS). Mpg (l/100km): N/A. CO_2 emissions: 0g/km. Electric range up to 201 miles (WLTP)*. Fuel economy and CO_2 results for the Corsa-e range 100kW (136PS). Mpg (l/100km): N/A. CO_2 emissions: 0g/km. Electric range up to 209 miles (WLTP).

*Provisional data. The range and electric consumption figures mentioned comply with the WLTP test procedure, on the basis of which new vehicles are type approved from 1 September 2018. They may vary depending on actual conditions of use and on different factors such as: vehicle load, accessories fitted (post registration), speed, thermal comfort on board the vehicle, driving style and outside temperature. The charging time depends in particular on the power of the charger on board the vehicle, the charging cable and the type and power of the charging station used. Please contact your Vauxhall Retailer for further information. Vauxhall Motors Limited reserves the right to change, amend or withdraw sales allowances and/or amend pricing at any point in time in anticipation of any tariffs, duties taxes or other costs that Vauxhall Motors believes may increase its cost of importation and/or supply of vehicles after the 31 December 2020.

COMING SOON

Matt de Prez looks at the response from manufacturers to growing demand for electrification

ALFA ROMEO

Tonale: Alfa is on the back foot when it comes to electrification. The Tonale compact SUV, due to launch early next year, will be its first plug-in hybrid and is expected to use the same powertrain as the recently launched Jeep Renegade 4XE.

CITROËN

e-C4: It's not the first electric Citroën, but the e-C4 is the brand's first mainstream EV. Priced just shy of £30,000, the SUV-inspired hatch promises a 217-mile range and is fitted with a number of Citroën's Advanced Comfort features. By 2025, the brand will offer an electrified version of every car in its model range.

AUDI

Q4 e-tron: Joining the existing e-Tron SUV, the new Q4 e-tron will be a smaller fully electric model with an expected range of up to 280 miles and prices from £40,000. Audi says it will launch 20 EVs and 10 new plug-in hybrids by 2025.

CUPRA

El-Born, Formentor PHEV: Electrification is a key part of Seat's performance off-shoot brand, Cupra. The el-Born shares a platform with the VW ID3, promising a range of more than 300 miles and a strong focus on driver engagement. The new Formentor crossover will also launch with a plug-in hybrid.

BMW

545e, iX3, i4, iX: The first new electric model to join BMW's line-up in 2021 will be the X3-based iX3. The brand will also launch a new electric version of the 4 Series, known as the i4, as well an X5-sized flagship EV called iX. In addition, the 5 Series will gain a more potent six-cylinder 545e plug-in hybrid. By 2023, the group will offer no fewer than 25 electrified models.

DS

DS9: Armed with a promise of going 'electrified-only' by 2025, DS's new saloon car will be available with a range of plug-in hybrid powertrains shared with other models in the Groupe PSA stable.

FIAT
500: The iconic Fiat 500 is going fully-electric in 2021, with an all-new high-tech model. It offers two battery options with a range of up to 199 miles and is priced from £22,995.

FORD
Mustang Mach-E: Ford may have used a historic name for its new electric SUV, but the rest of the car is thoroughly modern. It will go on sale in 2021, priced from around £40,000. There will be two battery sizes available and rear- or all-wheel drive, giving a range from 260-370 miles.

JAGUAR
XJ, E-Pace and F-Pace PHEV: Jaguar's next electric model will be the XJ luxury saloon. There's no word on specs yet, but we'd expect big power, long range and rapid charging speeds. While there doesn't appear to be any plug-in hybrid versions of the current XE and XF on the horizon, Jaguar is bringing the technology to the E-Pace and F-Pace SUVs.

JEEP
Compass 4XE : Jeep might not be the first brand that comes to mind when thinking about efficiency, but following its plug-in hybrid debut with Renegade, the brand will also introduce the powertrain on its Compass model.

LEXUS
UX300e: Lexus is no stranger to the electric motor, but the UX300e is its first car not to pair one with a combustion engine. The £43,000 SUV offers a range of up to 196 miles and develops 204PS.

MAZDA
MX-30: It might look more like a concept car than a production model, but the MX-30 will shortly arrive in the UK, priced from around £30,000. The modest range of 130 miles will be boosted by the introduction of a range-extender version in about a year's time.

SPONSOR'S COMMENT

By Nicola Austin, senior fleet analyst at Zenith

Reducing emissions and moving to electric vehicles (EVs) is one of the hottest topics and it's not just in fleet, we're also seeing consumer focus switch to electric.

Manufacturers are offering more EV choices, which is great news for fleets looking to fast-track their sustainability targets.

From a driver's perspective, little beats the excitement of a brand-new car, especially when it's electric, with significantly reduced benefit-in-kind (BIK) tax and vehicles packed with innovative technology.

Over the past quarter, one-in-three car orders at Zenith was for an EV.

With the rise of EV, fleet managers are looking for assurance that electric choices will not only meet current and future business travel needs, but will also suit their employees' differing lifestyles.

So, how do you guarantee a successful transition to a cost-effective, attractive and future-ready EV fleet? The key is having access to EV Gurus to provide expert knowledge and support, enabling managers and drivers to navigate the world of EVs.

With their expert knowledge, EV Gurus offer insight into everything from the rapidly developing charging infrastructure to tax and Government initiatives. Drivers typically need support with understanding range and how to charge their EV – a significant shift from current practice of simply driving to a filling station.

By working with Zenith, you and your employees will gain access to our own EV Gurus. We're here to help drive your business forward.

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MERCEDES-BENZ

EQA (pictured), EQB, EQE and EQS: Mercedes-Benz is expanding its range of EQ electric vehicles with six new model additions to its range, the first of which are expected to arrive in dealerships next year. The EQS, a fully-electric version of the new S Class will be the first to launch. It will be followed by the EQE executive saloon plus a pair of related SUV models. An EQA compact SUV and larger EQB will also begin production next year.

AVAILABLE NOW: EV CARS BRAND-BY-BRAND

Make	Model	Price (P11D)	Grant	Range (WLTP)	Fastest charging time (20-80%)
Audi	e-Tron*	from £60,545	£0	176	30 mins
BMW	i3*	from £35,970	£3,000	188	40 mins
Citroën	e-Spacetourer	from £48,426	£3,000	148	20 mins
DS	DS3 Crossback E-Tense	from £33,935	£3,000	200	20 mins
Honda	e	from £30,105	£3,000	136	30 mins
Hyundai	Kona EV*	from £33,095	£3,000	180	30 mins
	Ioniq EV	from £33,895	£3,000	194	40 mins
Jaguar	I-Pace	from £65,140	£0	292	40 mins
Kia	e-Niro*	from £32,540	£3,000	180	40 mins
	Soul	from £37,240	£3,000	280	40 mins
Mercedes-Benz	EQC	from £65,665	£0	259	30 mins
	EQV	from £70,610	£0	213	30 mins
MG	ZS EV	from £28,440	£3,000	163	40 mins
	5 EV	from £27,440	£3,000	214	40 mins
Mini	Hatch Electric	from £27,845	£3,000	144	30 mins
Nissan	Leaf*	from £29,790	£3,000	168	30 mins
Peugeot	e-208	from £28,970	£3,000	211	20 mins
	e-2008	from £32,010	£3,000	206	20 mins
Polestar	P2	from £49,845	£3,000	292	20 mins
Porsche	Taycan*	from £83,580	£0	252	20 mins
Renault	Zoe	from £29,940	£3,000	245	40 mins
Seat	Mii Electric	from £22,745	£3,000	161	40 mins
Smart	ForTwo	from £20,295	£3,000	84	2 hours
	ForFour	from £21,880	£3,000	81	2 hours
Tesla	Model 3*	from £43,435	£3,000	254	20 mins
	Model S*	from £74,925	£0	379	30 mins
	Model X*	from £82,925	£0	314	30 mins
Vauxhall	Corsa E	from £30,610	£3,000	205	20 mins
	Vivaro-e Life	from £37,590	£3,000	144	20 mins
VW	ID3*	from £32,935	£3,000	263	40 mins

** alternative models with longer ranges are available. Range shown is for cheapest version*

ŠKODA

Enyaq: Sharing a platform with the upcoming VW ID.4, the Enyaq SUV will provide more than 300 miles of range and be priced from £33,450. It will be the first of five new Škoda EVs to launch by 2025.

SUZUKI

Across: Suzuki will expand into the plug-in hybrid market for the first time with its Toyota RAV4-based Across SUV. With 300PS, it's the most powerful production Suzuki and, at £45,599, it's also the most expensive.

TESLA

Model Y – The seven-seat Model Y is already on sale in America, with UK sales expected before 2022. It is likely to cost from £35,000 when it arrives on British roads and will have the ability to 'supercharge' 75 miles of range in five minutes.

TOYOTA

Rav4 PHEV – Expanding the already popular Rav4 line-up in 2021 will be a new plug-in hybrid version that promises an electric-only range of 46 miles and has a 300PS power output.

VAUXHALL

Mokka-e: Following the launch of the Corsa-e and Vivaro-e, the Mokka-e will be next all-electric Vauxhall to go on sale. It has a range of 201 miles and shares a base with the recently-launched Peugeot e-2008.

VOLVO

XC40 Recharge: Volvo has already almost entirely electrified its model range, but the XC40 P8 Recharge will be its first all-electric model. It serves up 400PS, with a 260-mile range, for just shy of £60,000.

VW

ID4, Tiguan PHEV, Arteon PHEV: VW will expand its electric-only ID range in 2021 with the new ID4 SUV. Like the smaller ID3, it will be sold with a range of power outputs in rear- and four-wheel drive guises. The brand is also introducing plug-in hybrid engines for the Arteon and Tiguan.

AVAILABLE NOW: PHEV CARS BRAND-BY-BRAND

Make	Model	Price (P11D)	CO_2	EV range	BIK %	Charging time (hrs)
Audi	A3 TFSI e	£33,005	24	41	6	4
	A6 TFSI e	£53,285	35	34	10	2
	A7 TFSI e	£60,235	40	31	10	2
	A8 TFSI e	£85,005	57	29	14	2
	Q5 TFSI e	£49,665	55	26	14	2
	Q7 TFSI e	£65,180	72	28	17	3
BMW	225Xe	£36,420	39	28	12	2
	330e	£39,390	30	37	10	3
	530e	£47,980	35	36	10	3
	745e	£78,410	46	33	10	3
	X1 25e	£38,145	41	31	10	3
	X2 25e	£38,735	39	35	10	3
	X3 30e	£48,450	44	28	12	3
	X5 45e	£64,690	27	54	6	7
Citroën	C5 Aircross Hybrid	£35,315	32	34	10	2
DS	DS7 Crossback E-Tense *	£42,970	32	34	10	2
Ford	Kuga PHEV	£33,370	32	35	10	4
Hyundai	Ioniq PHEV	£30,195	26	39	10	3
Jeep	Renegade 4XE *	£32,545	49	26	12	2
Kia	Niro PHEV	£30,210	31	36	10	3
	Ceed Sportwagon PHEV	£29,940	33	29	12	2
	Xceed PHEV	£30,640	32	30	10	2
Land Rover	Discovery Sport P300e	£45,315	44	38	10	0.5
	RR Evoque P300e	£43,795	44	41	6	0.5
	RR Sport P400e	£72,915	75	30	18	2
	Range Rover P400e	£89,230	78	30	18	2
Mercedes-Benz	A 250 e	£32,925	23	44	6	2
	B 250 e	£35,225	27	42	6	2
	CLA 250 e	£37,395	23	43	6	2
	C300 e	£40,814	33	34	10	2
	C 300 de	£42,960	32	34	10	2
	E 300 e	£46,175	37	34	10	2
	E300 de	£47,425	33	34	10	2
	GLA 250e	£39,940	32	37	10	3
	GLC 300 de	£48,635	49	27	10	2
	GLE 350 de	£61,305	19	66	6	3
MG	HS PHEV	£29,940	43	32	10	3
Mini	Countryman PHEV	£32,925	39	26	12	2
Mitsubishi	Outlander	£35,760	46	28	12	0.5
Peugeot	3008 Hybrid *	£36,545	30	36	10	4
	508 Hybrid	£34,890	29	33	10	4
Porsche	Cayenne Hybrid *	£68,358	89	27	20	4
	Panamera Hybrid *	£83,718	74	32	17	4
Renault	Captur E-Tech	£30,940	34	30	10	3
	Megane E-Tech	£30,940	30	30	10	3
Seat	Leon e-Hybrid	£30,915	27	40	6	4
Škoda	Octavia iV	£30,710	22	43	6	4
	Superb iV	£33,535	28	35	10	4
Toyota	Prius PHEV	£32,645	28	31	10	3
Vauxhall	Grandland X *	£32,335	30	35	10	4
VW	Golf GTE	£35,905	36	32	10	4
	Passat GTE	£36,735	28	36	10	4
Volvo	S60 Recharge	£45,175	38	32	10	3
	V60 Recharge *	£45,175	41	32	10	3
	S90 Recharge	£55,250	42	31	10	3
	V90 Recharge	£55,250	47	31	10	3
	XC40 Recharge *	£39,075	47	28	12	3
	XC60 Recharge *	£50,625	55	29	14	3
	XC90 Recharge	£67,550	63	28	15	3

** alternative models with longer ranges are available. Range shown is for cheapest version*

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Fuel consumption and CO_2 figures for the Volvo XC40 Recharge Plug-in Hybrid T4 R-Design, in MPG (l/100km): WLTP Combined 117.7 – 134.5 (2.4 – 2.1). WLTP CO_2 emissions 55 – 47g/km. WLTP electric energy consumption 3.5 – 4.1 miles/kWh. Equivalent all electric range 26.1 – 27.3 miles. Figures shown are for comparability purposes; only compare fuel consumption, CO_2 and equivalent electric range figures with other cars tested to the same technical procedures. These figures were obtained using a combination of battery power and fuel. The Volvo plug-in hybrid vehicles require mains electricity for charging. These figures may not reflect real life driving results, which will depend upon a number of factors including the accessories fitted (post-registration), variations in weather, driving styles and vehicle load. Preliminary data. Please contact your retailer for latest information.

Glow on charging cable for illustrative purposes only.