Getting the most out of Alternative Fuel Vehicles

A guide for driving AFVs

Getting the most out of Alternative Fuel Vehicles

Evaluating the suitability of an alternative fuel vehicle and placing an order for one are just the beginning of the process of familiarisation. Once the vehicle is delivered, the driver can begin to appreciate how the driving experience differs to that of a conventional car.

While those new to AFVs will need to adapt their driving style to get the best out of their new vehicle, they're also likely to have some new technology to get to grips with. Some of this technology is only found on vehicles with some form of electrification, but other new features are shared across modern petrol and diesel models too.

We'll look first at how operating an AFV can differ to driving a conventional vehicle and then look at some of the emerging technologies.

Operating an AFV

Getting the most out of an AFV is likely to take a little practice, but there are some relatively simple rules that will help any driver to get started. While these rules will make the biggest difference to drivers of pure electric vehicles and plug-in hybrids, they will also help any hybrid driver maximise fuel efficiency and enhance enjoyment of their car.

Watch for the torque

Unlike ICE powered vehicles, electric cars and hybrids can access the full twist action of their electric motors from a standstill - this means very rapid acceleration from junctions and traffic lights. While this can be very handy in the cut and thrust of urban driving, it can take the unwary by surprise if they are not used to it.

Be aware of the lack of engine noise

While almost silent operation is one of the things many people love about their electric vehicle, it is useful to be aware that pedestrians and other roads users might not react in the way you're expecting. Pedestrians in particular rely on their hearing a surprising amount when crossing roads, so extra vigilance is required when driving a vehicle with no discernible engine noise.

Conserve momentum

This is the number one driving tip for increasing the efficiency of any vehicle, including AFVs. Reading the road ahead and observing and anticipating the actions of other road users allows a driver to reduce harsh acceleration and braking.

This not only reduces energy consumption but also maximises the opportunity for regenerative braking (see tip opposite).

Maximise regenerative braking

This is a key piece of technology on most BEVs, HEVs and PHEVs, which converts some of their motion (kinetic) energy back into electricity to recharge the vehicle's batteries.

Regenerative braking uses the vehicle's electric motor as a brake rather than the normal friction brakes. This means that when a driver lifts their foot from the accelerator pedal, or they press the brake pedal, the electric motor is reversed and acts as a generator, this applies a reverse force to the driven wheels and slows the vehicle. The electrical energy generated charges the batteries.

If you need to brake sharply the vehicle's friction brakes come into play and this means that energy is lost to the atmosphere as heat, reducing overall energy efficiency.

Different models use different amounts of brake regeneration and many allow the driver to adjust the level through a range of driving modes. This allows drivers to get used to the new sensation of engine braking being applied as soon as the accelerator is lifted.

Keep speeds down

High speeds increase energy consumption in electric vehicles more than they increase fuel consumption in conventional vehicles. For most conventional vehicles, the most efficient speed is around 40 to 50 mph; for vehicles using battery power the most efficient speed is significantly lower than this. This makes running on battery power particularly efficient in urban settings.

Know the driving modes and features of your AFV

Many BEVs, HEVs and PHEVs have a number of driving modes which use energy more or less efficiently. Most will have an ECO mode that reduces responsiveness to aggressive accelerator use and maximises regenerative breaking. In some vehicles this also reduces the power drawn by ancillaries such as heaters.

Some PHEVs also have a feature that allows drivers to choose when they use battery power or conventional fuel. This enables the driver to select the most efficient form of power for their journey type, for example selecting battery power alone for low speed city driving.

Use ancillaries with care

Equipment such as heating and air conditioning can increase energy usage by more than 10% and reduce electric journey range considerably. The heating system in a conventional car uses waste heat from the engine whereas an electric vehicle has to generate the heat from the battery. Some models of EV can pre-heat the car using mains electricity while the vehicle is charging but obviously this adds to charging costs.

Air conditioning is less of a drain on batteries than heating but at lower speeds it is more energy efficient to open the window than run the cooling system.

Plan longer journeys with recharge stops in mind

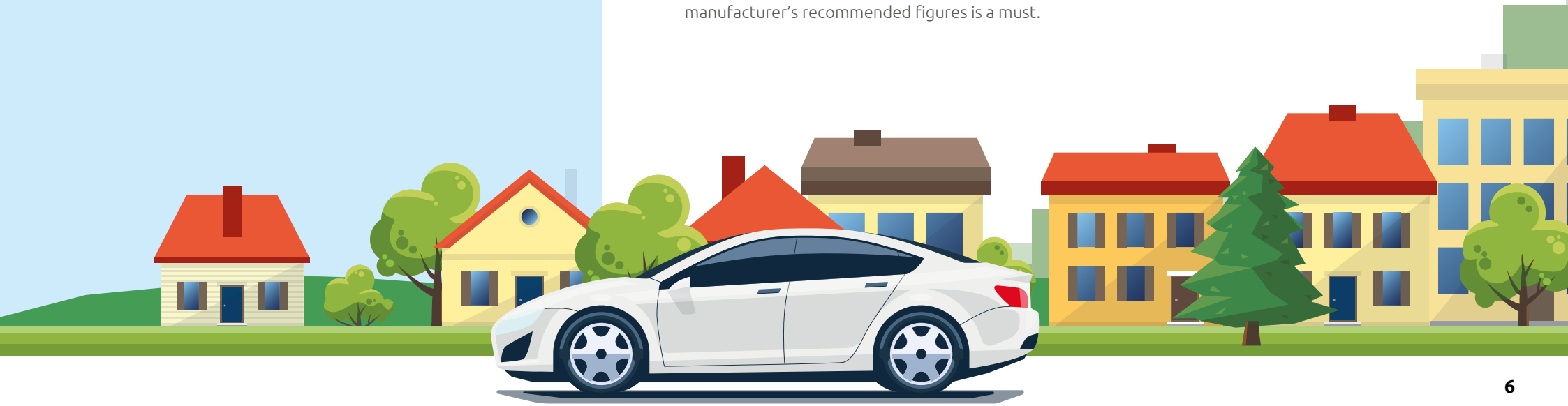
If you're planning to take your BEV or PHEV on a journey that extends beyond the range of the batteries, try to plan stops that allow you to recharge. For BEVs this will ensure that you've enough power to get to your destination and for PHEVs it will ensure that you use as little fuel as possible. There are numerous online tools and apps that will help you to plan for longer journeys, and many AFVs have satnav systems that know where public charging stations are available and allow you to select a route with these included.

Other tips for extending AFV range

Wind resistance can make a big difference to the efficiency of any car. Most pure electric vehicles are designed to have extremely low drag to maximise their range, and anything you do to interfere with their slippery shape will impact this. Perhaps the biggest offender here is the roof rack. Studies have shown that these can reduce the fuel efficiency of any vehicle by as much as 25%, so it's wise to remove these for any trips where they are not absolutely necessary.

The other enemy of efficiency is weight and electric vehicles and hybrids already have to contend with moving their heavy battery packs around. By making sure that you're not transporting anything that isn't required in the boot, or scattered around the cabin, you can make a surprising difference to the overall weight of the vehicle and its efficiency. Many manufacturers have stopped providing spare wheels or even space savers for this reason. Other regular offenders are golf clubs, pushchairs and prams and large containers of liquids such as screen wash.

While many cars now come with low tyre pressure warning systems, these are not designed to let you know if the pressure has dropped slightly below the optimum. Even slightly under-inflated tyres can make a big dent in overall efficiency – this is particularly the case for low-rolling resistance tyres which are often fitted to AFVs to help increase range. Regularly checking tyre pressures against the manufacturer's recommended figures is a must.



The connected car

Many modern cars, whether they're conventionally fuelled or otherwise, have a range of technologies that allow them to be connected to mobile devices and, in some cases, directly to the internet. This allows a wide range of services to be accessed by the driver. Similar technology also allows drivers to control key vehicle systems remotely.

Mobile / car interfaces

At the most basic end of the spectrum lie interfaces that allow limited features of a smartphone to be displayed and controlled via the vehicle's infotainment screen. The most widely used are Apple CarPlay and Android Auto. These integrate the phone functions with the car's stereo, allow access to music and can utilise the navigation functions of the mobile device. They also provide the ability to dictate text messages and have inbound messages read aloud.

The real beauty of these interfaces is that they provide a seamless link between the devices that we all carry and the services accessed in the car, meaning no new applications to learn and ready access to all of our day-to-day information and functionality.

In-car wifi and online services

While many drivers with children will have experimented with mobile phone tethering, or purchasing a 3G or 4G wifi dongle to allow passengers to get online, more and more vehicles are being fitted with their own, integrated online capabilities.

This means having a separate SIM card that will plug directly into the car's infotainment system. This not only turns the car into a 4G hotspot but also allows the driver, as well as other on-board systems, to access online services such as search facilities, social media, traffic data, weather reports, fuel prices, parking availability and music streaming.

Such integrated systems also allow for the provision of emergency assistance. If you're involved in a serious collision, the car can automatically alert the emergency services and provide your exact location using GPS coordinates. In a similar way, if you suffer a breakdown, simply pressing the 'help' button will connect you with your breakdown service provider.

Car remote control systems

These use mobile technology to control key functions of the car remotely from virtually any device. They enable motorists to monitor key information about the vehicle and operate certain systems without being in, or even near, the car. Common monitoring capabilities include charge (or fuel) levels, key fluid levels, maintenance schedules and whether the vehicle is locked or unlocked.

The ability to remotely lock or unlock the car is also being taken advantage of by companies such as Amazon with their new Amazon Key app. This allows delivery drivers to access the boot of a parked vehicle, meaning parcels can be securely delivered even when you're not at home. This service is only available in the US currently, and on a limited number of models, but is expected to roll out more broadly soon.

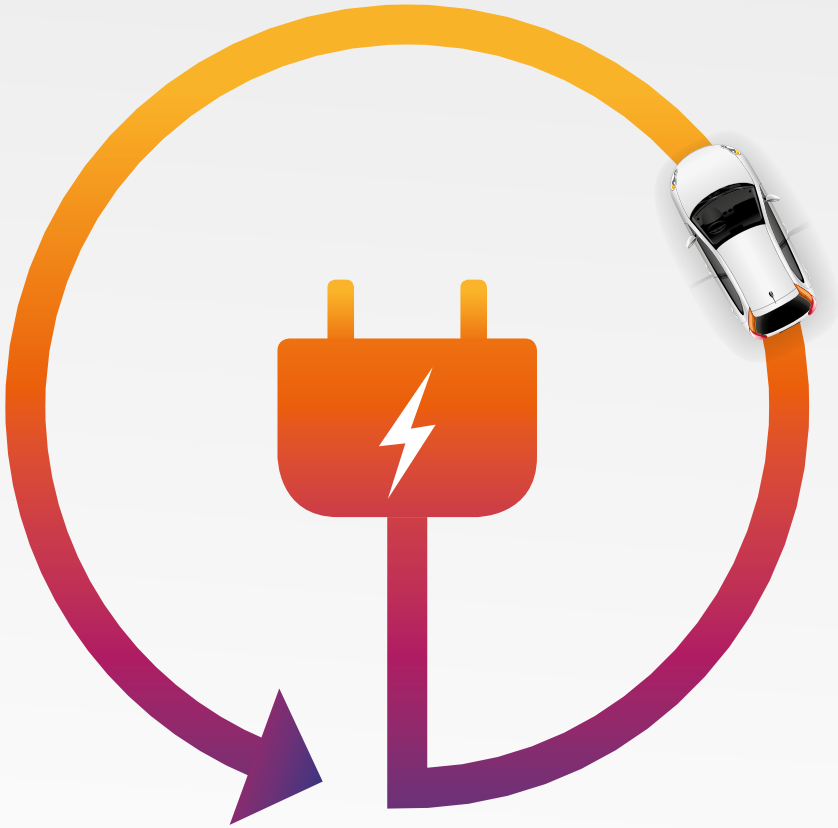
The systems also commonly allow the vehicle to be tracked remotely if it is stolen or moved – this also provides a handy reminder of where you have parked if you're in an area you don't know well.

Vehicle to grid technology

Another way that electric vehicles will become more connected is through the emergence of 'vehicle to grid' technology. Also referred to as 'V2G', these systems enable energy stored in an electric vehicle's battery pack to be fed back into the national electricity grid to increase the supply of energy at times of peak demand. It takes 'smart charging', where vehicles only take charge from the grid if there's sufficient capacity for household demands, to a new level.

By making home chargers work 'two-way', homeowners can sell the energy stored in their electric cars back to the grid when demand is high and at a premium price – potentially subsidising the cost of the energy used to charge the car. When you consider that around 90% of cars are parked at any time it could mean a huge amount of potential energy when electric vehicles become more widespread. If a household is able to generate its own electricity (through solar panels for example) the car's batteries can also be used to store any excess energy generated, potentially making the system self-sufficient.

While there aren't currently any 'two-way' chargers on the market in the UK, they are likely to start to become available within the next 12 months.



Summary

Electrification, whether used alone or in conjunction with conventional fuels is the future of motoring. Thousands of early-adopters are already enjoying the benefits and AFV vehicles are becoming more accessible and relevant as everyday transport all the time.

For fleets, the decision to include AFVs will always be based on whether they are able to assist in meeting the mobility objectives of the organisation. As their range of abilities expand and costs fall, more decision-makers are evaluating when to begin making the switch. For expert advice on AFVs and how they could benefit your fleet contact CLM on www.clm.co.uk.

About CLM

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