

AssetWORKS | FuelFocusEV

ZERO EMISSION FLEET SUCCESS

THE ISSUE WITH THE TRANSPORTATION SECTOR

Since 1990, the United Kingdom (UK) has cut greenhouse gas emissions almost in half with the use of more efficient technologies and alternative fuels. The UK has shown no fear in recent years of building on this success with new net-zero emissions goals and legislation. In 2019, the UK became the first major economy in the world to commit to **net zero emissions by 2050**. One year later, the government announced a ban on the sale of new ICE vehicles, starting with cars in 2030, rigid trucks in 2035, and articulated trucks in 2040.

The transportation sector produces over **22% of emissions** in the UK and is key to reaching the country's 2050 net zero goal. The implementation of new zero emission technologies, however, poses a range of challenges for fleets.

Key Insight: The ban on new internal combustion engine sales will transform the transportation sector.

“The next decade will see the major shift into powertrain transition with EV technology as the dominant trend.”

UNDERSTANDING THE COMBUSTION ENGINE BAN & FUTURE OPTIONS FOR FLEETS

Although many UK fleets are already using alternative fuels, most of these solutions do not meet the government's new and planned emission reduction requirements. The planned UK ban on new internal combustion engine vehicle sales applies to all types of internal combustion vehicles regardless of whether they will be fueled with petroleum or a cleaner burning alternative.

According to current goals and legislation, fleets will be able to continue to operate these vehicles after 2030. The prevention of purchasing new ICE vehicles will start in 2030 for certain vehicle categories. Instead, three new technology options are available to fleets: battery electric, plugin hybrid electric (until 2035) and hydrogen fuel cell vehicles.

Simon West-Oliver, Director of Sales at AssetWorks shares, “The next decade will see the major shift into powertrain transition with EV technology as the dominant trend. We will see the investment in sustainable infrastructure increase to support the recycling of battery tech and the ability for OEMs to support a circular economy”.

Technology	Future Status
Battery Electric	✓
Plugin Hybrid Electric	✓
Hybrid Electric	X
Hydrogen Fuel Cell	✓
Biofuels	X
LPG	X
LNG/CNG	X

What is Allowed

These vehicles will continue to be sold after the combustion engine ban goes into effect:

1. Battery Electric Vehicles

Battery or all-electric vehicles do not use any petroleum fuel. They have large batteries that provide power directly to the electric motors. Battery electric vehicles can be charged at home, work or at many public places at a range of different speeds depending on the charger being used.

Battery electric vehicles do not produce any direct emissions. Although they may be charged from electricity generated by coal or natural gas- they are still cleaner to operate than a petrol vehicle.

2. Plug-in Hybrid Electric Vehicles

Plug-in Hybrid Electric Vehicles (PHEVs) have both a petrol tank and a battery that can be plugged in and charged. PHEVs typically have a short all-electric range. Once the battery is depleted, the vehicle switches to petrol and drives like a conventional car.

PHEVs will eventually be phased out in favor of battery electric and hydrogen fuel cell vehicles. A ban on PHEV sales is planned for 2035.

3. Hydrogen Fuel Cell Vehicles

Hydrogen fuel cell vehicles use electricity, however, instead of plugging into a charger they fuel with hydrogen. Hydrogen is stored inside the vehicle and using a fuel cell is converted into electricity as the vehicle is operated. The fuel cell charges a small battery which powers the electric motors.

Hydrogen fuel cells produce no harmful emissions- only water vapor. Fuel cell vehicles have the same qualities as electric vehicles, but with the advantages of traditional fueling. Hydrogen fueling stations are not yet as common as EV chargers, but more stations and vehicle options are under development. Hydrogen fuel producers are also making progress in reducing the cost of the fuel.

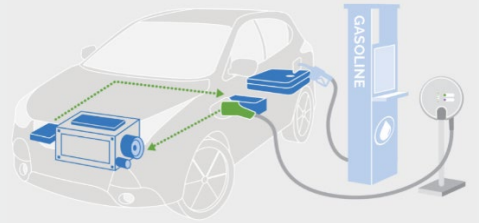


Figure 2 PHEVs have smaller batteries than all-electric vehicles and use a conventional combustion engine and petrol tank to extend their range.

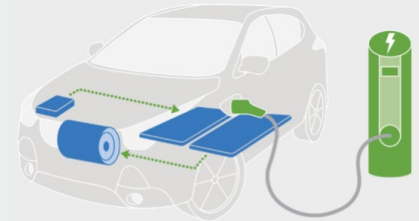


Figure 1 Battery electric vehicles operate on energy stored in large traction batteries.

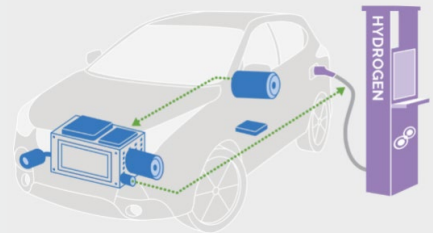


Figure 3 Fuel cell vehicles generate electricity onboard the vehicle using hydrogen and fuel cells.



In September 2021, ethanol content in UK gasoline was doubled to 10% in a move to cut greenhouse gas emissions.

What is Not Allowed

These vehicles would not be allowed under the 2030 combustion engine ban:

1. Ethanol & Biodiesel Vehicles (All blends)

Ethanol is a widely used renewable energy made from fermenting and distilling feedstocks such as corn, barley, and wheat. If mixed with gasoline, octane levels increase, and emissions quality improve. In September 2021, ethanol content in UK gasoline was doubled to 10% in a move to cut greenhouse gas emissions. Biodiesel is another biofuel option used today as well.

Although biofuels play an important role today in reducing greenhouse gas emissions, fleets will be unable to purchase combustion engine vehicles to use biofuels starting in 2030. Fleets will be able to continue using biofuels in existing vehicles, however.

2. Compressed and Liquified Natural Gas Vehicles

Natural gas is a favored alternative to diesel fuel and is popular in medium- and heavy-duty applications because of its performance characteristics. New engine technology has dramatically reduced nitrogen oxide emissions down to below 0.02 g/bhp-hr and the use of renewable natural gas from agricultural sources allows many fleets and fuel producers to claim a negative carbon intensity score.

Nonetheless, because it uses a combustion engine, natural gas vehicles are also subject to the planned ban. They can continue to operate past 2030, but new vehicle purchases will not be permitted under the new measures.

3. Liquified Petroleum Gas (LPG) Vehicles

Propane, also known as liquefied petroleum gas (LPG), is like natural gas in regard to its treatment under the ban. Despite existing infrastructure, alternative sources of LPG, and reduced tailpipe emissions; LPG vehicles will be subject to the ban as well.

4. Methanol and P-Series Vehicles

Methanol and P-Series vehicles are no longer manufactured, however, any fleets that have these vehicles in service may continue to operate them. Hypothetical, future sales after 2030 would be prohibited.



Figure 4 Ethanol is used by all fleets as a part of regularly blended petrol. It is not part of a long-term zero emission strategy.

MANAGING ZERO EMISSION FLEETS

Procurement of zero emission vehicles is not the finish line. Successful battery electric and hydrogen fuel cell fleet operators plan and prepare extensively for changes to their operations including:

- Zero emission vehicle maintenance,
- Charging and hydrogen station maintenance,
- Maintenance facility modifications, and
- How to manage electricity as a fuel.

Core to all these activities is the free flow of data. Just as fleets integrate their petrol dispensers and maintenance shops with enterprise software to track oil changes and related costs; similar solutions must be implemented for new zero emission vehicle operations.

Integrating charging stations, for example, lets fleets track the actual cost to charge their fleet and to manage charging stations assets that require regular preventative maintenance. Combining EV telematics with automated motor pool systems gives fleet managers the ability to prevent vehicles with a low state-of-charge from being assigned to drivers.

Deciding how to integrate EVs and infrastructure is a challenge for many fleets. Often, both the technology and the technology provider are new. Documentation and technical support can also be hard to find; and many vendors are unfamiliar with the unique needs of fleet operators.

Third-party organisations like AssetWorks that are vendor and technology agnostic can be a good resource in pointing out integration opportunities ahead of time and are able to recommend a comprehensive information management approach.

Martin Greaves, Director of Operations at AssetWorks, states “We help businesses manage their fleet operations and as fuels change our support and features also grow to help fleets deploy the most state-of-the-art systems. Integrated fleet management software is key to tracking the costs and impacts of these technologies on the fleet business. We deliver whole life costs for many fleets and will continue to do that irrespective of what fuel they use. So, efficiency with alternative fuels will remain important as the costs will shift, and fleet managers will better need to understand fleet profiling and where less or extra resources are required”.

Key Insight: Fleets need to begin planning the integration of electric vehicles and charging stations before purchasing new equipment.



Figure 6 Charging stations require regular preventative maintenance

“ We help businesses manage their fleet operations and as fuels change our support and features also grow...”

AssetWorks' FuelFocusEV module integrates with chargers to capture usage data and calculate costs...

HOW ASSETWORKS INVESTS IN THE FUTURE

Over the years, AssetWorks has worked with fleet customers to deploy solutions for almost every aspect of fleet management and operations—from supporting procurement to fuel management to maintenance and vehicle decommissioning. As part of a broad and sweeping effort, AssetWorks is working to make sure that each of these products and features is updated to meet the unique needs of zero emission technology ensuring FleetFocus remains the modern tool required for fleet leaders to be competitive in their industry. Here are a few key zero emission features:

Tools to Manage Electricity as a Fuel

The pricing of electricity changes based on time and demand, so software is key to track.

Electricity is a fuel unlike any other. Its cost changes throughout the day and night and is also influenced by a building's total energy usage or demand. AssetWorks' FuelFocusEV module integrates with chargers to capture usage data and calculate costs- including internal department surcharges and taxes or fees. Costs can be segmented by asset class, internal department, asset class or employee for analysis and billing.

AssetWorks does not treat all electricity as the same. Different electricity types can be setup for individual facilities and energy sources including solar and stationary hydrogen fuel cells.

Station Management Assistance

Chargers are a premium asset that needs to be maintained and managed.

FuelFocusEV also allows fleets to see when chargers are out of service. AssetWorks software is key to reducing maintenance issues by also providing a suite of preventative maintenance tools including records of past inspections, condition ratings, and costs throughout the charger's life-cycle.

Hydrogen Fuel Management

The fueling process for hydrogen is conventional.

AssetWorks FleetFocus software has been used since the early 2010s in connection with Hydrogen Fueling Stations. FleetFocus and its sibling product FuelFocus provide a full suite of management options for fleets to track and segment usage by vehicle, driver, internal department, and asset class.



Asset			
Asset ID	EVC001: ELECTRIC VEHICLE CHARGE STATION		
Repair Location	FLEET - SERVICE CENTER		
Condition			
5.00	Age (years)	0	In Sen
EXCELLENT	Expected Rehab	02/01/2027	Expect
	Last Condition Date	02/02/2022	
	Priority	3 - ROUTINE (3 DAYS)	Priority
Recommended Tasks: 0			
Service Requests: 0			
No problems reported for this asset.			
Work Orders: 0			
[Select this Asset] [New Service Request] [New Work Order]			



THE FUTURE OF ZERO EMISSION

Zero emission vehicles and infrastructure are still a new technology, and the industry is rapidly advancing. Increasingly, new technologies and features are being designed with fleets mind.

Advanced Grid Services

Fleets with dozens or more electric vehicles have the potential to store megawatts of electricity and share back to the grid during outages. Vehicle-to-grid technology is still under development and is only being used in demonstrations but has great potential.

With utility approval and the right hardware in place, fleets may be able to generate new revenues by providing grid services such as frequency regulation and by acting as virtual power plants that share power back to the grid during periods of high demand.

Early pilots have demonstrated promising results. Power companies are supportive, and hope to use electric vehicle fleets to enhance the stability and overall sustainability of the grid.

The Hydrogen Revolution

Currently only a handful of fuel cell vehicles are available for sale in the United Kingdom, but that is expected to change. Successful pilots in Asia, the United States and Switzerland support the idea that the technology is finally reaching maturity— not just for cars but HGVs as well. When it does, the hydrogen economy could grow beyond transportation and be worth hundreds of billions of pounds.

Hydrogen fuel cells are the ultimate clean energy technology. Hydrogen fuel cells produce only water vapor as a byproduct. However, the cost of hydrogen and the durability of hydrogen fuel cells are two major roadblocks to full commercialization. For hydrogen fuel cells to replace petroleum and battery electric vehicles, the cost of hydrogen must decrease relative to petroleum, and hydrogen fuel cells must be able to operate longer in rigid trucks in particular before requiring replacement.

WHY YOU SHOULD INVEST IN ASSETWORKS

AssetWorks helps businesses manage their fleet operations— with today's technology as well as tomorrow's. As fuels change, so will the associated costs and impacts on a fleet organisation. We deliver whole life costs for many fleets and will continue to do that irrespective of what fuel is used.

The efficiency with alternative fuels will remain important as the costs shift, and fleet managers will need to understand fleet profiling. Capturing the real costs of any type of fuel will always be important to any fleet when carrying out whole life costs, and we can help you do that. No alternative fuel will be free, and each has its positives and negatives. AssetWorks can act as a consultant as you navigate through industry changes. We ensure your business understands the impacts fuels will have on you through workshops and customer support.



Figure 10 Vehicle to grid pilots around the globe are showing positive results. Frequency regulation, arbitrage and other grid services may generate significant revenues for fleets.

To learn more about how AssetWorks helps fleets switch to zero emissions, visit assetworks.co.uk/fuelfocusev.