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# THE BMW GUIDE

TO ALTERNATIVE FUELS





# INTRODUCTION

The market for alternatively fuelled cars has expanded dramatically in recent years, and there are now many available with different systems. These include 100% battery-electric vehicles (BEV), plug-in hybrids (PHEV), traditional hybrids and, to a lesser extent, hydrogen fuel cell cars.

Each has its own advantages and disadvantages, with all generally classed as ultra-low emission vehicles. Government incentives have aligned with the requirement for lower carbon emissions, and there are grant schemes available to assist the acquisition of the new generation of electrified cars. Choosing

the right vehicles for your business can offer significant savings and also enable a more efficient fleet. This BMW Group Guide to Alternative Fuels explains what complementary mobility technologies are available, how they work and the benefits they could bring to your fleet.

While we have made every effort to ensure the information in this document is accurate, BMW (UK) Ltd can accept no liability for your reliance on any information contained in it. You should seek your own independent advice in relation to any Government grant or accounting matters referred to in this document. Information correct at date of publication, December 2021. **UK model specifications may vary.**



# GOVERNMENT GRANTS AND INCENTIVES

## Government Plug-in Grant

Plug-in Grants are available only to Government-approved cars costing less than £32,000\* with CO<sub>2</sub> emissions of up to 50g/km and a zero emission range of at least 70 miles. The grant is set at a maximum of £1,500 per car.

Grants are also available for motorcycles, mopeds, vans, taxis and large vans and trucks (see panel, right). Click **here** for more information and details of Government-approved vehicles that are eligible for the grants.

The grants are administered by the Office for Zero Emission Vehicles (OZEV), and the process of application is managed by the vehicle manufacturer and its retailer network rather than the purchaser.

\*For private, business, fleet or demonstration models the purchase price of the vehicle is the price paid by the customer, including discount, not the recommended retail price. Purchase price includes: number plates, vehicle excise duty, VAT and excludes any optional extras, delivery charges and first registration fee.

## Electric Vehicle Homecharge Scheme (EVHS)

The EVHS provides grant funding of up to 75% of the cost of installing an electric vehicle chargepoint at a domestic property across the UK, capped at £350 including VAT.

The Grant covers one OZEV-approved homecharge unit per eligible electric or plug-in vehicle, and up to two eligible vehicles per household. The unit must be installed by an OZEV-approved chargepoint installer and you must be named as the primary user of the vehicle.

To qualify for the EVHS grant you must have off-street parking, such as a driveway or garage, and have purchased an eligible vehicle from 1 October 2016 onwards.

For further information on the Electric Vehicle Homecharge Scheme can be accessed click **here**. To find out if your vehicle qualifies for the EVHS grant, click **here**.

- > **Cars** – Government-approved cars priced below £32,000\* with zero CO<sub>2</sub> tailpipe emissions while driving benefit from a maximum grant of £1,500.
- > **Motorcycles** – motorcycles with zero CO<sub>2</sub> tailpipe emissions while riding and a range of at least 31 miles benefit from a maximum grant of £500.
- > **Mopeds** – mopeds or scooters with zero CO<sub>2</sub> tailpipe emissions while riding and a range of at least 19 miles benefit from a maximum grant of £150.
- > **Taxis** – taxis with CO<sub>2</sub> emissions of less than 50g/km and a zero-emission range of at least 70 miles benefit from a maximum grant of £7,500.
- > **Vans** – N1 vans under 2.5 tonnes GVW with CO<sub>2</sub> emissions of less than 50g/km and a zero-emission range of at least 60 miles benefit from a maximum grant of £2,500, or £5,000 for vans between 2.5t and 3.5t.
- > **Large vans and trucks** – vehicles with zero CO<sub>2</sub> tailpipe emissions range of at least 60 miles, benefit from a maximum grant of £16,000 (N2 - 3.5t-12t GVW) or £25,000 (N3 - 12t + GVW). Volume limits apply.

For more on low-emission vehicles on the Office for Zero Emissions website, click **here**





# BENEFIT-IN-KIND TAX

## Benefit-in-kind (BIK) tax

A new two-tier benefit-in-kind (BIK) tax system was introduced in April 2020 – one tier for those driving a company car registered before 6 April 2020, and one for those driving a company car registered after 6 April 2020 (see tables, right).

The appropriate percentages for BIK tax depend on the car's CO<sub>2</sub> emissions and its all-electric zero emission range.

For cars with zero CO<sub>2</sub> tailpipe emissions – as well as new cars with CO<sub>2</sub> tailpipe emissions of 1-50g/km and a minimum all-electric range of 130 miles – the BIK tax rate is set at 1% in 2021/22, rising to 2% in 2022/23, where rates remain frozen until 2024/25.

## BIK TAX BANDS FOR LOW-EMISSION CARS

### Cars registered before 6 April 2020

CO <sub>2</sub> tailpipe emissions (g/km)	All-electric range (miles)	BIK tax 2021/22 (%)	BIK tax 2022/23* (%)
0	All	1	2
1-50	Over 130	2	2
1-50	70-129	5	5
1-50	40-69	8	8
1-50	30-39	12	12
1-50	Up to 30	14	14

\* Rates frozen at this level until 2024/25

### Cars registered after 6 April 2020

CO <sub>2</sub> tailpipe emissions (g/km)	All-electric range (miles)	BIK tax 2021/22 (%)	BIK tax 2022/23* (%)
0	All	1	2
1-50	Over 130	1	2
1-50	70-129	4	5
1-50	40-69	7	8
1-50	30-39	11	12
1-50	Up to 30	13	14





# PRACTICAL CONSIDERATIONS

## Fuel duty

Fuel duty is paid on each litre of road fuel purchased (or per kilogram in the case of gases). Therefore the fuel efficiency of a vehicle, the way a vehicle is driven and the distance driven will determine the total amount of duty paid. Electricity is not subject to fuel duty, so battery electric vehicles (BEV) are duty-exempt.

## Government Advisory Fuel Reimbursement Rates (AFR)

AFR petrol reimbursement rates apply to petrol hybrids and AFR diesel reimbursement applies to diesel hybrids. There is no HMRC-set AFR equivalent for electric vehicles because electricity is not considered a fuel for the purposes of Fuel Benefit Charge (FBC) legislation.

## Fuel Benefit Charge (FBC)

As electricity is not considered a fuel, there is currently no fuel benefit charge. This means that if an employer allows an employee with a company or personally owned car to top up the battery of their battery-electric vehicle (BEV) or plug-in hybrid electric vehicle (PHEV) at work, this does not constitute a fuel benefit and no tax is payable.

## Enhanced capital allowances (ECA)

Eligibility for enhanced capital allowances (ECA) for cars is based on CO<sub>2</sub> emissions while driving. If a car has zero emissions of CO<sub>2</sub> while driving, it qualifies for a 100% first-year capital allowance (FYA) in 2021/22, but the vehicle must be a new registration.

Cars with CO<sub>2</sub> emissions of 1-50g/km qualify for an 18% allowance while those with CO<sub>2</sub> emissions exceeding 51g/km qualify for a 6% allowance. Leased cars are not eligible for the 100% FYA.

## 130% 'super deduction'

A 130% first-year allowance, announced in Budget 2021 and effective from 1 April 2021 to 31 March 2023, applies to expenditure on new main pool items, such as vans and electric charging equipment but excluding company cars. The 'super deduction' allows companies to cut their tax bill by up to 25p for every £1 invested. Businesses can also take advantage of a 50% first-year allowance for qualifying special rate expenditure.





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# PRACTICAL CONSIDERATIONS (CONTINUED)

### Vehicle Excise Duty (VED)

VED exemption in 2021/22 applies only to cars with zero CO<sub>2</sub> tailpipe emissions costing £40,000 or less, with an exception made for cars over £40,000 with zero CO<sub>2</sub> emissions. Cars costing over £40,000 (except those with zero CO<sub>2</sub> emissions) attract an additional £335 a year for five years from the second year. For details of 2021/22 VED rates, see the table (right).

### VAT

Vehicles are subject to standard levels of VAT (20%) regardless of their emissions of CO<sub>2</sub>, but electricity has varying treatment. Electricity that is supplied for domestic, non-business and charity use attracts 5% VAT, while electricity that is supplied for business use is subject to VAT at 20%.

Petrol, diesel and hydrogen are considered to be road fuels and therefore also attract the standard level of 20% VAT while electricity that is used to recharge a wholly battery-electric vehicle (BEV) or plug-in hybrid vehicle (PHEV) at home attracts VAT at 5%.

Electricity for low-emission vehicles that are recharged at work attract 20% VAT. Hydrogen used to refuel fuel cell electric vehicles (FCEV) also attracts VAT at 20%.

### VED rates 2021/22

VED Band	CO <sub>2</sub> emissions (g/km)	First year rate (£)	First year rate (diesels) (£)*	Standard rate Yr2 on (under £40,000) (£)	Standard rate Yr2 on (over £40,000) (£)**
A	0	0	0	0	0
B	1-50	10	25	155	490
C	51-75	25	115	155	490
D	76-90	115	140	155	490
E	91-100	140	160	155	490
F	101-110	160	180	155	490
G	111-130	180	220	155	490
H	131-150	220	555	155	490
I	151-170	555	895	155	490
J	171-190	898	1,345	155	490
K	191-225	1,345	1,910	155	490
L	226-255	1,910	2,245	155	490
M	Over 255	2,245	2,245	155	490

\* Applies to diesel vehicles that do not meet the Real Driving Emissions Step 2 (RDE2) standard. Alternative fuel vehicles, including hybrids, bio-ethanol and LPG, pay £150 a year. \*\* Cars with a list price over £40,000, except those with zero CO<sub>2</sub> tailpipe emissions, pay an additional rate of £335 on top of the standard for five years following the first year rate, after which the rate reverts to the standard rate. 2021/22 rates apply from 1 April 2021



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# ALTERNATIVE FUEL VEHICLE COMPARISONS

Driveline	Plug-in hybrid (PHEV) Eg BMW 530e (Parallel Hybrid)	Battery Electric vehicle (BEV) Eg BMW i3
Description	A petrol or diesel engine works with a battery powered electric motor. Both power units can be used together or individually, and the combustion engine can charge the battery.	A car which carries a battery to power an electric motor that drives the wheels. It is charged by plugging it into an electricity supply.
Government Plug-in Grant eligibility	No. Only cars with CO <sub>2</sub> emissions of less than 50g/km and a zero-emission range of at least 70 miles qualify for the grant, subject to Government approval and a price cap of £32,000*. Currently no PHEVs qualify. Click <b>here</b> for a list of grant-eligible vehicles. Click the Government grants and incentives tab above for details.	Yes. BEVs with zero CO <sub>2</sub> emissions and a range of at least 70 miles qualify for the maximum grant of £1,500, subject to Government approval and a price cap of £32,000*. Click <b>here</b> for a list of grant-eligible vehicles. Click the Government grants and incentives tab above for details.
BIK tax and VED implications	A new two-tier BIK tax system came into force on 6 April 2020 with different rules for cars already registered at that date and new cars registered since. PHEVs benefit from reduced BIK tax dependent on CO <sub>2</sub> emissions and all-electric range. VED applies according to emissions. Click the BIK tax tab above for details. In 2021/22, for Government-approved cars with CO <sub>2</sub> emissions of 1-50g/km, the distance they can cover with zero tailpipe emissions affects BIK tax liabilities.	A new two-tier BIK tax system came into force on 6 April 2020 with different rules for cars already registered at that date and new cars registered since. In 2021/22, drivers of Government-approved BEVs are subject to BIK tax at 1% regardless of registration date, rising to 2% in 2022/23. These rates are then frozen until 2024/25. Click the BIK tax tab above for details. As BEVs are classified with zero CO <sub>2</sub> emissions, they are exempt from VED in 2021/22.
London Congestion Charge exemption	No. From 25 October 2021, the cleaner vehicle discount changed so that only battery electric or hydrogen fuel cell vehicles are eligible. From 25 December 2025, the cleaner vehicle discount will be discontinued. From this date, all vehicle owners, unless in receipt of another discount or exemption, will need to pay to enter the Congestion Charge zone during charging hours. Taxis and Private Hire Vehicles are exempt from the charge if actively licensed with London Taxi and Private Hire (TPH). To find out if your car qualifies for exemption or a discount, click <b>here</b> .	Yes. Government-approved BEVs are classified with zero CO <sub>2</sub> emissions and so qualify for Transport for London's 100% cleaner vehicle discount. From 25 December 2025, the cleaner vehicle discount will be discontinued. From this date, all vehicle owners, unless in receipt of another discount or exemption, will need to pay to enter the Congestion Charge zone during charging hours. Taxis and Private Hire Vehicles are exempt from the charge if actively licensed with London Taxi and Private Hire (TPH). To find out if your car qualifies for exemption or a discount, click <b>here</b> .
Refuelling	Recharging or conventional refuelling – the combustion engine drives the car and also charges the battery. PHEVs can top up with fuel or recharge.	Recharging only. There are over 18,000 UK public charge points in over 10,000 locations, of which 2,500 are rapid chargers. Tax advantages apply to new and existing cars.
Advantages	Capable of electric running for longer than a traditional hybrid. Significant BIK tax advantages available and eligible for reduced rates of VED. Drivetrain eliminates 'range anxiety', while the combustion engine and electric motors together offer increased power.	Near silent running, smooth acceleration, improved battery life and fast-charging capability gives longer range. Electricity is cheaper than petrol or diesel and generates zero tailpipe emissions. BEVs are exempt from VED in 2021/22 and drivers pay BIK tax at just 1%.
Disadvantages	Not eligible for the Government Plug-in Car Grant. Fuel cost savings may take longer to realise than with a battery electric vehicle (BEV).	Longer journeys may require planning with access to rapid charging en route but, although availability can be infrequent, the chargepoint network is rapidly improving.
Summary	PHEVs are seeing increasing popularity with the BIK tax rule changes in April 2020. Established choice for fleet operators and drivers. Much improved battery technology gives more zero emission mileage with associated tax advantages, while better performance is available from the blend of plug-in charge and conventional fuel.	Range anxiety is less of an issue with the latest BEVs and they are exempt from VED in 2021/22. BIK tax is payable at 1%, rising to 2% in April 2022, but then frozen until 2024/25. Advantages include strong performance, quiet running, low operating costs and exemption from congestion charging, ULEZ and low emission zones.

\*For private, business, fleet or demonstration models the purchase price of the vehicle is the price paid by the customer, including discount, not the recommended retail price. Purchase price includes: number plates, vehicle excise duty, VAT and excludes any optional extras, delivery charges and first registration fee



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# ALTERNATIVE FUEL VEHICLE COMPARISONS (CONTINUED)

Driveline	Electric range-extended vehicle (EREV) Eg BMW i3 with range extender (Series Hybrid)	Fuel cell electric vehicle (FCEV) Eg Toyota Mirai
Description	A vehicle driven by an electric motor, but also fitted with a small internal combustion engine which recharges the battery but does not drive the wheels.	A vehicle fuelled by hydrogen and oxygen in a fuel cell stack which generates electricity to drive the car using an electric motor, with water vapour the only exhaust emission.
Government Plug-in Grant eligibility	Yes, but as no EREVs are currently in production the grant currently is of no consequence. Used vehicle purchases only but EREVs are classified with zero CO <sub>2</sub> emissions.	Yes. FCEVs are classified with zero CO <sub>2</sub> emissions and so qualify for the maximum grant of £1,500, subject to a price cap of £32,000* and Government approval. Click <b>here</b> for a list of eligible vehicles. Click the Government grants and incentives tab above for details.
BIK tax and VED implications	A new two-tier BIK tax system came into force on 6 April 2020 with different rules for cars already registered at that date and new cars registered since. In 2021/22, drivers of Government-approved EREVs are subject to BIK tax at 1% regardless of registration date, rising to 2% in 2022/23. These rates are frozen until 2024/25. As EREVs are classified with zero CO <sub>2</sub> emissions, they are exempt from VED in 2021/22.	A new two-tier BIK tax system came into force on 6 April 2020 with different rules for cars already registered at that date and new cars registered since. In 2021/22, drivers of Government-approved FCEVs are subject to BIK tax at 1% regardless of registration date, rising to 2% in 2022/23. These rates are frozen until 2024/25. Click the BIK tax tab above for details.
London Congestion Charge exemption	Yes. EREVs are classified with zero CO <sub>2</sub> emissions and so qualify for Transport for London's 100% cleaner vehicle discount. From 25 December 2025, the cleaner vehicle discount will be discontinued. From this date, all vehicle owners, unless in receipt of another discount or exemption, will need to pay to enter the Congestion Charge zone during charging hours. Taxis and Private Hire Vehicles are exempt from the charge if actively licensed with London Taxi and Private Hire (TPH). To find out if your car qualifies for exemption or a discount, click <b>here</b> .	Yes. FCEVs are classified with zero CO <sub>2</sub> emissions and so qualify for Transport for London's 100% cleaner vehicle discount. From 25 December 2025, the cleaner vehicle discount will be discontinued. From this date, all vehicle owners, unless in receipt of another discount or exemption, will need to pay to enter the Congestion Charge zone during charging hours. Taxis and Private Hire Vehicles are exempt from the charge if actively licensed with London Taxi and Private Hire (TPH). To find out if your car qualifies for exemption or a discount, click <b>here</b> .
Refuelling	Recharging and conventional refuelling.	Hydrogen refuelling only. There are very few hydrogen refuelling stations at present in the UK, with most located near London, and no established network yet.
Advantages	Less 'range anxiety' than a BEV as the combustion engine is refuelled conventionally to charge the battery, although with improved battery technology range is becoming less of an issue. EREVs are exempt from VED in 2021/22 but drivers pay BIK tax at 1% in 2021/22 and 2% in 2022/23, frozen at this level until 2024/25.	Ultra-clean operation and silence on the road. Hydrogen is abundant and refuelling is quick. Performance is similar to a conventional car with a range of around 300 miles before refuelling is needed. Drivers of FCEVs are subject to BIK tax at 1% in 2021/22 and 2% in 2022/23, frozen at this level until 2024/25. FCEVs are exempt from VED in 2021/2.
Disadvantages	Much improved technology in battery electric vehicles (BEVs) has made EREVs less attractive. Fuel economy when the combustion engine is running can be disappointing, extra weight can compromise handling and fuel tanks for the range extender motor often tend to be small.	Expensive to buy and, at present, impractical as there is no established refuelling network in the UK. Hydrogen requires large storage tanks in the car that impact on interior space.
Summary	With improvements in battery technology and range benefiting BEVs, manufacturers have moved away from range extender technology. But EREVs have no range anxiety issues and are classed as zero-emission so drivers of cars already registered are exempt from VED in 2021/22 and BIK tax is payable at just 1%.	In its infancy as a practical mobility solution but with potential. Infrastructure is needed to make it viable, but production and current purchase costs make it prohibitively expensive for most users.

\*For private, business, fleet or demonstration models the purchase price of the vehicle is the price paid by the customer, including discount, not the recommended retail price. Purchase price includes: number plates, vehicle excise duty, VAT and excludes any optional extras, delivery charges and first registration fee





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# ALTERNATIVE FUEL VEHICLE COMPARISONS (CONTINUED)

Driveline	TRADITIONAL HYBRID Eg Toyota Prius non Plug-in (Parallel Hybrid)
Description	A vehicle with a combination of a petrol or diesel engine and an electric motor to reduce fuel consumption and emissions.
Government Plug-in Grant eligibility	No. Only Government-approved cars with CO <sub>2</sub> emissions of less than 50g/km and a zero-emission range of at least 70 miles qualify for the grant. Click the Government grants and incentives tab above for details. Click <b>here</b> for a list of eligible vehicles.
BIK tax and VED implications	Traditional hybrids have reduced CO <sub>2</sub> emissions, but are more in line with the best petrol and diesel cars for BIK tax and fuel-efficiency. VED applies according to emissions.
London Congestion Charge exemption	No. From 25 October 2021, the cleaner vehicle discount changed so that only battery electric or hydrogen fuel cell vehicles are eligible. Hybrid Taxis and Private Hire Vehicles are exempt from the charge if actively licensed with London Taxi and Private Hire (TPH). To find out if your car qualifies for exemption or a discount, click <b>here</b> .
Refuelling	Traditional refuelling only.
Advantages	Can be less expensive to buy than a 100% electric car or plug-in hybrid. Does not require plugging in and is refuelled like a conventional car. Several manufacturers offer traditional hybrids and the technology is now well understood after over 20 years on the market.
Disadvantages	Electric assistance to the combustion engine makes it attractive in town and for short distances, while BIK tax can be reduced compared with conventional cars. Long-range motorway economy can be worse than for a conventionally powered non-hybrid that doesn't carry a hybrid's weight burden.
Summary	Traditional hybrids have been accepted as an alternative to diesel by some fleets, particularly those based in urban areas.