

# Transport



## Cars, Vans, Buses & Heavy Goods Vehicles

Transport is currently the sector that is responsible for the most CO<sub>2</sub> emissions, but is showing great promise in combating this issue as electric vans & cars (EVs) aim to displace petrol & diesel. The most expensive item in an EV is the battery and [battery prices are coming down year on year](#). It's expected that in 2022, EVs will be an equivalent price to petrol/diesel vehicles. At that point, sales should go from less than 1% of total global car sales up to 35% by 2040. The total cost of ownership (TCO) of EVs is already below that of petrol/diesel equivalents due to maintenance costs being much lower due to less moving parts and the cost of charging EVs especially from home is substantially cheaper than fuel.

The UK is currently planning to ban petrol/diesel cars by 2035 and may bring this forward, dependent on whether progress is made as expected.

# The Rise of Electric Cars

By 2022 electric vehicles will cost the same as their internal-combustion counterparts. That's the point of liftoff for sales.



Sources: Data compiled by Bloomberg New Energy Finance, Marklines

Bloomberg

## Remaining challenges

1. Range between re-fueling. Some of the higher end models can now reasonably achieve 250 miles but the cheaper models have much lower ranges.
2. The time it takes to re-charge an EV. This can vary from overnight at home to half an hour using a supercharger. Both will be inadequate unless there are more charging stations than there are currently fuel pumps
3. Extent of recharging stations. These are gradually being rolled out and things are improving each year
4. Incompatibility of recharging options. The different EV vendors really need to agree a common standard in terms of shape of charger and power options. Government will need to intervene if the industry cannot resolve this.
5. Lack of trained mechanics
6. Use of Cobalt in batteries. There are 2 problems here:-
  - Cobalt is a comparatively rare element so there won't be enough of it to supply all EV vehicles if everybody has one.
  - Cobalt is mined in Africa often using child labour and causing pollution to the land
7. It could be viewed as a pro or a con, but EV technology is moving so fast that similar to other electronic goods such as a TV, laptop or mobile phone, there's a challenge in that the latest specs are much better than specs of a few years ago making the used EV market less attractive.
8. Waiting times. As there are still a comparatively limited number of models out there, as demand continues to increase, time to supply is a challenge for the new cars.

With points 1 to 3, what should be borne in mind is the extent to which you use a car. For many city dwellers, a range of 300 miles between charges might be the equivalent of a couple of months driving time, so a charging time of half an hour is not a big deal. If you live in the countryside and can charge overnight from home, those factors and point 4 are also not a big deal.

Electric Vehicles work well for cars, vans and buses and potentially heavy goods vehicles (due to them having long wheelbases that could support battery storage).

## What Electric vehicles are there out there?

[EVCompare.io](#) is a good international comparison website (priced in dollars) that provides a Top Trumps style comparison of the electric vehicles out there. The Tesla Model S is typically still considered to be the top end EV whilst the Nissan Leaf is typically considered the most practical replacement for a petrol/diesel

For the UK specific market, What Car, provide a nice review of available models in the accompanying video

## Total Cost of Ownership

Currently, electric vehicles list prices are about 18% more expensive than their petrol/diesel equivalents, so why should you buy an EV today?

1. [Government grant of up to £3000](#) (plus [£350 to add a home charger](#) if you need one)
2. Cost per mile. Here EV's really come in to their own. The CPM for a Nissan Leaf 40kwh model is about 2.4p, whereas for a Ford Fiesta 1.0L it's 14.4p (based on fuel price of £1.27 per litre)
3. Lower road tax - for EVs like the Nissan Leaf which are under £40,000, there's no vehicle excise duty to pay each year currently
4. Lower cost of maintenance - With less moving parts, EVs don't have the high costs of engine & exhaust system maintenance, their equivalent ICEs do.

## Industry solutions

1. Focus on replacing Cobalt as a stabilising agent within the batteries. [Tesla is leading the way on this](#)

2. Work with other automakers on standardising chargers
3. Continue to drive down battery costs and improve times required between recharging
4. Train mechanics to be able to service EVs

#### **Government solutions**

1. Focus on improving the availability of on-street and off-street charging stations (very relevant to people who want EVs and use their car for work)
2. Legislate to require that all chargers be standardised
3. Make the case for EVs by focusing people's attention on the TCO and expected lower purchase costs

#### **eBikes, eScooters & Car Sharing**

These proposals as an additional method to replace some car journeys are discussed in this video from the University of Leeds Climate Solutions department

eBikes could replace medium length journeys where public transport is not available e.g. a trip from the countryside in to town.

eScooters assist for short trips e.g. to get to a public transport hub or to pick up small groceries.

Car sharing clubs can be used by colleagues who live in close proximity to each other

#### **Ships, Aeroplanes & Trains**

Batteries are not really a viable option for ships (which require more power) or for aeroplanes (which would not be able to carry passengers and heavy batteries) In both cases, [green hydrogen](#) is currently looking like the best power option. Many railways are currently electrified but green hydrogen is another potential candidate for trains where electrification is not viable.