

UK electric car drivers must thank the national grid for making the biggest difference to climate change.



There's an unlikely hero in the story about electric cars and their impact on reducing the UK's greenhouse gas emissions.

Unlike next generation electric cars such as the Tesla this hero is neither photogenic nor sexy.

It's the UK's National Grid.

That's because reducing the UK's greenhouse gas emissions from electric cars isn't just about the cars.

It's about the Grid that supplies them with electricity and the good news is that the UK's Grid is modernising and decarbonising fast.

Between 2012 and 2016 the carbon intensity of the Grid has reduced by approximately 40% and is on trend to reduce further in the future.

In the past electricity production has relied heavily on high-carbon sources such as coal and electric vehicles can reduce greenhouse gas emissions only if there's a corresponding shift toward renewable sources of energy.

That's why the fact that the grid is rapidly decarbonising is good news for our planet, our air quality *and* meeting the UK's climate targets.

Conclusion

As the grid continues to decarbonise, the impact of electric car adoption on UK emissions will grow, as 27% of UK emissions come from the transportation sector.

This can only be good news for both drivers of electric cars and the UK's commitment to meet its climate targets by 2050.

Research Insight Factsheet 1

We estimate the carbon footprint of a conventional car in the UK compared to an Electric Vehicle. Based on these findings, we report that EVs are far less carbon-intensive than conventional passenger cars and this is largely due to the carbon intensity of the UK grid.

Estimated annual carbon footprint for a UK passenger car:

Our estimate for the annual carbon footprint of a passenger car is 1.5 tonnes of CO₂. This is based on the average UK passenger car emissions of 121 g/km¹ and the average annual mileage for these cars being 7,800 miles². The calculation for the annual carbon footprint is:

$$\text{Annual average carbon footprint} = 121 \text{ g/km} \times 7,800 \text{ miles}$$

Estimated annual carbon footprint for an EV driven in the UK:

Our estimate for the annual carbon footprint for a Tesla model S AWD - 60D (2017) is 0.76 tonnes of CO₂. This is based on the energy consumption of the Model S of 32 kWh/100 miles, the average annual mileage of a UK car of 7,800 miles, and the UK grid average carbon intensity (including grid losses) of 307 g/kWh*. The calculation for the annual carbon footprint is:

$$\text{Annual average carbon footprint} = 307 \text{ g/kWh} \times 32 \text{ kWh/100 miles} \times 7,800 \text{ miles}$$

The above figures are for the year 2016 and do not account for the energy losses at EV charging stations.

Decarbonisation of the UK grid:

Between 2012 and 2016 the carbon intensity of the UK Grid has reduced by approximately 40% and is on trend to reduce further in the future. This estimate is based on figures reported by the Department for Business, Energy and Industrial Strategy for the electricity consumed³. Coal and Oil use as primary fuels for energy production has decreased markedly, whereas, Wind, Solar and Hydro has increased⁴.

*The latest official figures for the UK grid average carbon intensity reported by this department were for 2016, however, some sources show that the UK grid average for 2018 was 270 g/kWh, illustrating a continuing trend for lower carbon electricity in the UK.

¹<https://www.smmmt.co.uk/wp-content/uploads/sites/2/SMMT-New-Car-Co2-Report-2018-artwork.pdf>

²<https://www.racfoundation.org/motoring-faqs/mobility>

³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726911/2018_methodology_paper_FINAL_v01-00.pdf

⁴https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770773/Energy_Trends_December_2018.pdf