Electric vehicles

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Contents

What's the story?

The UK government wants to "lead the world in zero emission vehicle technology" by encouraging drivers around the country to go green and choose an ultra low or zero emissions vehicle. Last year, some 46,000 electric vehicles were registered for the first time.

Although the Department for Transport claims 80% of current electric vehicle charging happens at home, drivers who do not have access to off-street parking or who do not own their property still face difficulties charging on the go under the current infrastructure.

While a large number of charging stations are installed privately, the government has been encouraging businesses, home owners and local authorities to install more charging points through various grants and schemes.

Not every local authority has been preparing for the rise in electric and plug in hybrid vehicles though. Only 28 have taken advantage of the government's £2.5m funding pot for the On-street Residential Chargepoint Scheme, which aims to help drivers to charge their vehicle. The full list is available here to follow up with your local authority.

The analysis also comes in the wake of criticism from the Liberal Democrats who revealed that at least a quarter (more than 100) local authorities in England and Wales have no plans to expand on their current electric infrastructure. The Lib Dems' FOI roundup is available to download here.

This story pack and accompanying spreadsheet will show you:

- How many charging locations there are in your local authority
- How many electric and plug-in hybrids vehicles have been licensed in your local authority
- Local authorities with the most and least number of charging locations
- The rate of charging locations per 1,000 electric vehicles registered
- Areas with the furthest average distance between charging locations

- Figures for England, Northern Ireland, Scotland and Wales
- Expert quotes

Background:

Vehicle emissions are one of the biggest contributors to air pollution and climate change and so the government is pushing towards a revolutionary change in how we travel by encouraging drivers to opt for an ultra low or zero emission vehicle.

This comes after the government launched the Road to Zero Strategy in 2018 to “lead the world in zero emission vehicle technology”. As part of the strategy the government said at least half of new cars (and 40% of new vans) should be ultra low emission by 2030.

By 2040, all new cars and vans should also be electric or effectively zero-emission and new petrol and diesel cars will be phased out — but campaigners and MPs have called for a more ambitious 2032 target instead — a target which has already been rejected by the government.

There are still many obstacles faced by electric and plug in hybrid drivers. These include:

1. A lack of standardisation with charging points - there is a mix of connectors, charge points and tariffs
2. Regional networks with drivers requiring different memberships (a card and/or app for access)
3. Finding locations (charging points generally in car parks and in random locations)
4. Occupied charging stations
5. Slow charging times (varies per car model and charging type)

What we did:

We sourced data from the Open Charge Map website to establish how well the UK is served by charging locations. We also obtained vehicle licensing data from the DfT and the DVLA to look at how many electric and plug in hybrid vehicles have been registered to each local authority. To

analyse the distances between charging locations we used the Haversine formula and conducted 49 million calculations to work out the average distance between charging locations.

Our data was sourced from:

- Open Charge Map — a global, open source, public registry of electric vehicle charging locations. The site has been populated and edited by drivers from around the world and includes charging stations from 37 different networks in the UK. This only includes charging stations on both private and public sites and does not include at-home charging.
- Department for Transport and Department for Vehicle Licensing Agency

Our findings:

1. What the UK's electric vehicle charging infrastructure currently looks like:

- By 2018 (Q3) there were 172,198 electric or plug in hybrid cars, LGVs and quadricycles licensed around the UK
- Since 2011, there has been a huge increase in the number of fully electric or hybrid vehicles on the UK's roads — nearly 27 times more electric or plug in hybrid cars, LGVs and quadricycles licensed
- There are some 7,044 identified locations where electric or plug in hybrid vehicles can charge around the UK
- Out of 385 local authorities in the UK:
    - More than a third (153 or 40%) have 10 or less charging locations
    - More than two thirds (266 or 69%) of local authorities have 20 or less charging locations
    - Only three local authorities have more than 100 different charging locations

2. Number of charging locations in local authorities:

- Areas with the highest number of charging locations:
    1. Milton Keynes (138)

2. Westminster (131)
3. Cornwall (115)

- Areas with the fewest number of charging locations:
  1. Merthyr Tydfil (1)
  2. Caerphilly (1)
  3. North Dorset (1)
  4. Hinckley and Bosworth (1)
- No charging stations were identified in: Barrow-in-Furness, Hyndburn, Rossendale, Castle Point, Rochford and Isles of Scilly

3. Rate of charging locations per 1,000 electric vehicles (please see notes):

- Bottom 10 local authorities:

Region/Local Authority	**No. of charging locations**	**No. of licensed fully electric or plug in hybrid cars, LGVs and quadricycles**	**Rate of charging locations per 1,000 vehicles licensed**
Caerphilly	1	104	9.6
Waverley	5	571	8.8
Portsmouth	13	1561	8.3
North Dorset	1	152	6.6
Slough	35	6009	5.8
Hinckley and Bosworth	1	183	5.5
Gloucester	13	2916	4.5
Birmingham	61	15115	4.0

Swindon	16	4588	3.5
Peterborough	21	10022	2.1

- Top 10 local authorities:

Region/Local Authority	**No. of charging locations**	**No. of licensed fully electric or plug in hybrid cars, LGVs and quadricycles**	**Rate of charging locations per 1,000 vehicles licensed**
Na h-Eileanan Siar*	23	24	958.3
Fermanagh and Omagh	32	62	516.1
Highland	85	272	312.5
Derry City and Strabane	25	83	301.2
Shetland Islands*	13	45	288.9
Causeway Coast and Glens	30	112	267.9
Powys	46	177	259.9
Gwynedd	32	125	256.0
Middlesbrough	13	53	245.3
Newry, Mourne	28	115	243.5

and Down			

*Island local authorities

4. Distance:

Please see notes for information on how the distance was calculated

- On average drivers in Wales have the furthest to travel between charging points — approximately 2.83km. This is followed by Scotland (1.80 km), Northern Ireland (1.58 km) and England (1.72 km).

- Only 17 local authorities have more than a 5 km to drive to reach a charging station (this excludes the authorities with only one charging location and authorities which are made up of islands)

- The 10 local authorities with the furthest average distance are:

Region/Local Authority	No. of charging locations	Mean average distance
Craven	4	10.33
West Somerset	4	8.55
Ryedale	6	7.96
Ceredigion	9	7.03
Hambleton	6	6.85
Selby	5	6.42
Highland	85	6.31
Richmondshire	3	6.21
Torridge	8	6.18
Purbeck	3	5.97

England:

- In England there are 5,501 places to charge and 153,105 electric or plug in hybrid cars, LGVs and quadricycles licensed
- Out of 320 local authorities 137, or 42.81% had 10 or less different charging locations
- Areas with the highest number of charging locations:
    1. Milton Keynes (138)
    2. Westminster (131)
    3. Cornwall (115)
- The areas with the fewest number of charging stations are:
    1. Hinckley and Bosworth (1)
    2. North Dorset (1)
    3. Pendle, Wellingborough, Tamworth, Ashfield, Fylde, Gravesham and North East Derbyshire (2)
- Furthest average distance*:
    1. Craven (10.33 km)
    2. West Somerset (8.55 km)
    3. Ryedale (7.95 km)

*Please see notes regarding North Dorset and Hinckley & Bosworth

Northern Ireland:

- In Northern Ireland there are 268 charging stations and 2,352 electric or plug in hybrid cars, LGVs and quadricycles licensed
- Out of 11 local authorities, only 1 area had 10 or fewer charging locations
- Areas with the most charging locations are:
    1. Fermanagh and Omagh (32)
    2. Causeway Coast and Glens (30)
    3. Antrim and Newtownabbey (30)
- Areas with the fewest number of charging locations are:
    1. Lisburn and Castlereagh (10)

2. Ards and North Down (11)
3. Mid and East Antrim (23)

- Furthest average distance:
    1. Fermanagh and Omagh (2.54 km)
    2. Causeway Coast and Glens (2.33 km)
    3. Mid Ulster (1.97 km)

Scotland:

- In Scotland there are 1,006 charging locations and 9,892 electric or plug in hybrid cars, LGVs and quadricycles licensed
- Out of 32 local authorities only 2 had 10 or less different charging locations
- Areas with the most charging locations are:
    1. Highland (85)
    2. Glasgow City (71)
    3. Fife (67)
- Areas with the fewest number of charging locations are:
    1. East Dunbartonshire (10)
    2. Clackmannanshire (10)
    3. Falkirk (10)
- Furthest average distance:
    1. Highland (6.30 km)
    2. Dumfries and Galloway (4.46 km)
    3. Aberdeenshire (3.29 km)

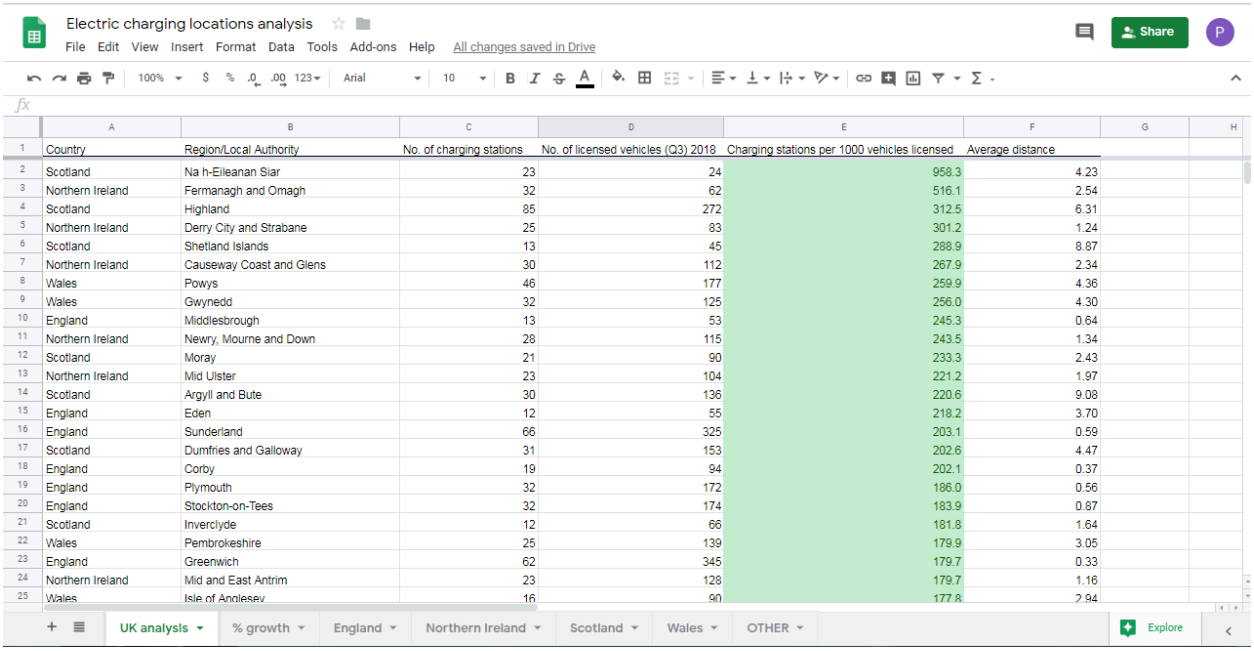
Wales:

- In Wales there are 269 charging locations and 3,515 electric or plug in hybrid cars, LGVs and quadricycles licensed
- Out of 22 local authorities, more than half (13 or 59.09%) had 10 or fewer charging locations
- Areas with the most charging locations are:
    1. Powys (46)
    2. Gwynedd (32)
    3. Pembrokeshire (25)

- Areas with the fewest number of charging locations are:
    1. Caerphilly (1)
    2. Merthyr Tydfil (1)
    3. Vale of Glamorgan, Rhondda Cynon Taf and Torfaen (all have 3 charging stations)
- Furthest average distance*:
    1. Ceredigion (7.02 km)
    2. Flintshire (4.62 km)
    3. Powys (4.35 km)

*Please see notes regarding Caerphilly and Merthyr Tydfil

How to use this data pack:



Country	Region/Local Authority	No. of charging stations	No. of licensed vehicles (Q3) 2018	Charging stations per 1000 vehicles licensed	Average distance
Scotland	Na h-Eileanan Siar	23	24	958.3	4.23
Northern Ireland	Fermanagh and Omagh	32	62	516.1	2.54
Scotland	Highland	85	272	312.5	6.31
Northern Ireland	Derry City and Strabane	25	83	301.2	1.24
Scotland	Shetland Islands	13	45	288.9	8.87
Northern Ireland	Causeway Coast and Glens	30	112	267.9	2.34
Wales	Powys	46	177	259.9	4.36
Wales	Gwynedd	32	125	256.0	4.30
England	Middlesbrough	13	53	245.3	0.64
Northern Ireland	Newry, Mourne and Down	28	115	243.5	1.34
Scotland	Moray	21	90	233.3	2.43
Northern Ireland	Mid Ulster	23	104	221.2	1.97
Scotland	Argyll and Bute	30	136	220.6	9.08
England	Eden	12	55	218.2	3.70
England	Sunderland	66	325	203.1	0.59
Scotland	Dumfries and Galloway	31	153	202.6	4.47
England	Corby	19	94	202.1	0.37
England	Plymouth	32	172	186.0	0.56
England	Stockton-on-Tees	32	174	183.9	0.87
Scotland	Inverclyde	12	66	181.8	1.64
Wales	Pembrokeshire	25	139	179.9	3.05
England	Greenwich	62	345	179.7	0.33
Northern Ireland	Mid and East Antrim	23	128	179.7	1.16
Wales	Isle of Anglesey	16	90	177.8	2.94

1. UK analysis — here you can find out how your local authority ranked

- Column A shows the year of the tax return, 2014-2015 is shown as 2014
- Column E shows the business rates paid in your area

- Column D shows the number of electric or plug in hybrid cars, LGVs and quadricycles licensed in total by (Q3) 2018
- Column E shows the number of charging locations per 1,000 vehicles registered.
    - Rates in the top 20% of the UK are shaded green and areas with the lowest rates (the bottom 20%) are shaded red
    - Areas above average but below the top 20% are shaded blue and areas below average but above the bottom 20% are shaded orange
- Column F shows the average distance in kilometres to a charging point

*To normalise the number of charging locations per 1,000 vehicles write the number as a ratio.

2. % growth — here you can see the percentage growth of electric and hybrid vehicles in your local authority

- Column B shows the number of electric or hybrid cars, LGVs and quadricycles licensed in total in (Q4) 2011, Column C shows the number of vehicles in (Q3) 2018 and Column D shows the % increase in your area
- If the value is 0 in Column C use Columns E, F and G to see the total % increase of electric and hybrid in your area

3. England, Northern Ireland, Scotland and Wales tabs — these will provide data for each individual nation

- At the bottom of each table it will give the grand total for the number of licensed vehicles and number of charging stations.

4. The Other tab shows the number of licensed vehicles in (Q3) 2018 for the local authorities which have no charging stations. These are: Barrow-in-Furness, Hyndburn, Rossendale, Castle Point, Rochford and the Isles of Scilly.

What the experts say:

A Department for Transport spokesperson said:

“Our vision is to have one of the best infrastructure networks in the world for electric vehicles, and we want charge points to be accessible, affordable and secure.

“Our Road to Zero strategy sets out our commitment to massively expand electric vehicle infrastructure, while the £400m public-private Charging Infrastructure Investment Fund will see thousands more charge points installed across the UK. This is part of a £1.5bn programme of investment to put the UK at the forefront of the transition to zero emission vehicles.”

Nicholas Lyes, RAC head of roads policy, said:

“These findings show that despite the Government’s ambitions to accelerate the take-up of cleaner vehicles, charging infrastructure is presently something of a postcode lottery, and patchy at best in some parts of the country.

“RAC research has found the lack of charging infrastructure is one of the three main barriers for electric vehicle take-up, along with range anxiety and high upfront vehicle costs.

“Clearly, we need to improve this access to charge points as a whole, but special attention needs to be given to installing more rapid chargers on the strategic road network as well as adding charging capability at car parks where people spend longer periods, such as at shopping and leisure centre car parks.

“We’d also like to see local authorities work more closely with the Government to find on-street charging solutions. The key is to give drivers the confidence to go electric, which will not happen

quickly unless they are given the right incentives to do so, alongside easy access to reliable charging infrastructure."

The Climate Change Committee said:

"Transport is the most polluting sector of the economy, contributing around a third of total UK greenhouse gas emissions each year. That's a concern if the UK is to meet its legally-binding commitments to tackle climate change: emissions from cars, vans, lorries, trains must come down.

"We welcome many of the initiatives in the Government's Road to Zero strategy, however our detailed assessment shows that there is far more work to do if the Government is to clean up the UK's transport sector in the most cost-effective way. That includes a new vision for how people travel in future to promote cycling, walking and public transport whilst deterring car and van traffic.

"It also means ramping up the number of electric vehicles (EVs) on our roads by 2030, ending the sale of conventional petrol and diesel vehicles by 2035, and addressing long wait times for the supply of EVs. Widespread charging infrastructure is essential too – we welcome commitments to improve the availability of charging points in Road to Zero – but further research is needed to assess their reliability and distribution. Additional measures to reduce emissions from trucks are also needed, including improved logistics and driving techniques which deliver better fuel efficiency.

"Taken together, these measures can begin to reverse the upward trend in transport emissions over recent years, and change the way the UK travels for good."

Bridget Fox, Sustainable Transport Campaigner at Campaign for Better Transport said:

What is The Campaign For Better Transport's view on the findings considering some areas still have limited infrastructure?

"Sadly this is not a surprise. Moving to electric vehicles, as well as reducing overall traffic levels, is vital to tackling air pollution and reducing transport's CO2 emissions, but for many drivers the lack of easy access to charging is a major barrier to making the switch. It's not just about the charging network though; we also need the manufacturers to make EVs more easily available, and fleet buyers to kick start the market by switching to electric sooner rather than later."

How likely is it that the UK will be prepared for the government's 2030 and 2040 targets considering what the current infrastructure is like?

"Without coordinated action at national and local level, with businesses as well as government playing their part, there is a real possibility these targets will not be met; targets which are already weak and fall below the level recommended by the Committee on Climate Change to meet existing Carbon Budgets, let alone the higher ambition required by the Paris Agreement."

What should be done to improve the UK's EV infrastructure and give consumers confidence in buying an electric or plug in hybrid vehicle?

"We need a nationwide fast charging network on motorways and A roads managed by Highways England and in rural areas Government support should help to provide a charging point for every community. There is more being done in towns and cities, but there are practical challenges in providing a public charging network without encroaching on pavements or competing for kerb space with bikes and buses.

"Councils can help by requiring off-street charging points as part of planning applications and by prioritising electric vehicles in car parks. We'd like to see more charging points reserved or prioritised for car clubs, which help people go electric in an affordable way. E-bikes and e-cargo bikes are an important part of the mix and the new funding for e-cargo bikes announced recently is a small step in the right direction, but we need more."

Edmund King, AA president, said:

“Most drivers still see too many barriers to their early adoption of electric vehicles (EVs) despite the Government’s commitment to phase out the sale of new petrol and diesel cars even by 2040.

“The AA argues that many of these perceptions are myths rather than reality and hence broader concerted efforts are required to convince the public of the wide benefits of EVs, but that is unlikely to be achieved by 2032.

“The EV revolution hasn’t perhaps taken off as quickly as we would have liked but we need a firm commitment to a reliable and more extensive charging infrastructure, as well as, future-proofing houses, offices and strategic roads. There are now some exciting EVs on the market and many new and exhilarating models on the horizon. The younger generation in particular are ready to embrace the electric revolution.”

Sources:

- Open Charge
  https://openchargemap.org
- Data on all licensed and registered vehicles, produced by Department for Transport (last updated 13 December 2018)
  https://www.gov.uk/government/statistical-data-sets/all-vehicles-veh01

Notes on data:

1. The charging location is where we have identified the address of a charging station/bay. The station may include more than one charging bay. The address was matched to each local authority through a postcode lookup.

2. The data analysed from Open Charge Map includes a mix of public and private charging stations. It does not include at-home charging points.

3. Open Charge Map includes charge points from 37 different network providers. The full list of network providers is available here. These are often regionalised and drivers must register with the network to use the charging station.

4. The data sourced from Open Charge Map was correct as of 06 February 2019 and included 7,055 charging locations and 17,803 charging points. Three entries have been deleted as they were not in the UK. Five entries could not be matched to a local authority and were therefore listed as Unknown and not included in the final datasets. Jersey and Isle of Man data could not be found on DVLA dataset and were subsequently removed from the final dataset and analysis.

5. Currently there is no centralised, government run mapping database of charging stations (at present Go Ultra Low (a joint communications campaign run by the government and the car industry) uses a charging map from private company Zap Map). The government's National Charge Point Registry is not a mapping service for drivers. The DfT have said they are looking to improve it.

6. The UK findings used the total number of licensed vehicles in each country instead of the local authority calculated totals. This was to avoid missing out vehicles which could not be matched to a local authority/region/country or vehicle under disposal.

7. The DVLA dataset includes fully electric or plug in hybrid cars, light good vehicles (LGV) and quadricycles.

8. The DVLA dataset is a reflection of all the cars licensed to a particular area — obviously all vehicles licensed do not necessarily stay in their local authority all of the time. This also does not necessarily mean the driver of the vehicle lives in that local authority and these vehicles could be part of a fleet registered to one area but driven elsewhere. For example, in 2011 Rushmoor had 757 electric or plug in hybrid vehicles registered in 2011, in this instance the vast majority of these were milk floats. The dataset was the

only government available dataset at the time which could show the number of fully electric or plug in hybrid vehicles licensed to each local authority.

9. If the number of electric vehicles had a value of ‘c’ (confidential/suppressed) in the DVLA dataset this was replaced with a value of 2.

10. The average distances were calculated using the Haversine formula to calculate the distance between two lat-long points. Because we had over 7,000 points, and we needed to identify the distance to the closest point from the remaining 7,000 *other* points, we repeated that Haversine formula 49 million times (7,000 times for each point times 7,000 other points).

    For each point we only stored the shortest (minimum) distance of those 7,000 distances to the other points. That gave us, for each of the 7,000 points, the distance to the nearest point, and the name/location of that nearest point. This was added to the original data. Those distances could now be factored into any calculation. For example, we could take all 7,000 distances and calculate an overall mean or median average. We could also use a pivot table to calculate a mean average distance by local authority (for all points in that authority).

11. To prevent skewed averages Victoria Service Station, Bruntcliffe Road, Morley (LS27 0LF) was removed from the location analysis.

12. North Dorset, Merthyr Tydfil, Caerphilly and Hinckley and Bosworth have been removed from the location analysis to prevent skewed results as they only had 1 charging station identified.

13. Argyll and Bute, Na h-Eileanan Siar, the Shetland Islands and the Orkney Islands are islands therefore the total rate of charging locations and vehicles are distributed across the islands cannot be taken at face value. They are also not included in the location analysis.

14. The image is copyright of the BBC