energy saving trust

Sussex Taxis Go Electric!

Members Go Electric sessions 4pm & 7pm, Thursday 24 November 2022

Welcome & overview

Thais Covre Delboni
Horsham District Council

Agenda

- Introduction
- Setting the scene
- Why switch to EVs?
- What is an EV?
- Charging an EV
- Myth busting
- Routes to driving an EV
- Q&A

Energy Saving Trust

- We are an independent organisation, working to address the climate emergency.
- We work with individuals, businesses, communities and governments to save energy and reduce carbon emissions.
- Offices in London, Cardiff, Edinburgh & Belfast
- Today is part of a Department for Transport funded programme offering advice on electric vehicles to you, local authorities and fleets.

Independent

Impartial

Pragmatic

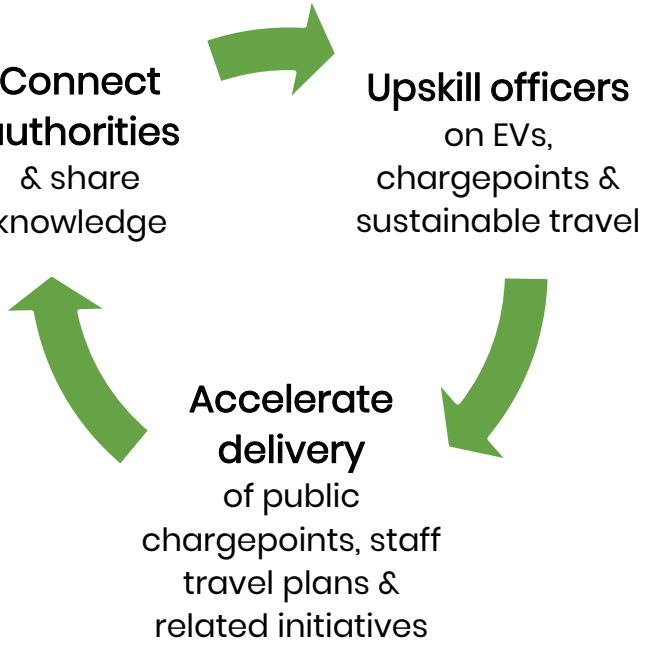
Office for Low Emission Vehicles

Department for Transport

About the Local Government Support Programme

We're here to help you deliver your council's ambitions on decarbonising transport and cleaner air.

- Fully funded by the Department for Transport
- Our support is free and impartial
- Open to all English councils
- 4 Regional Account Managers
- Specialise in EVs and sustainable staff travel
- Projects with 140+ authorities



Department for Transport

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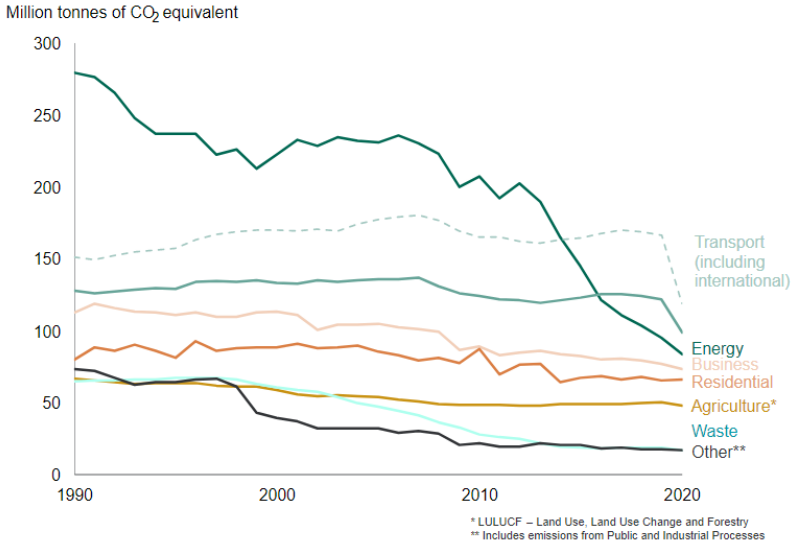
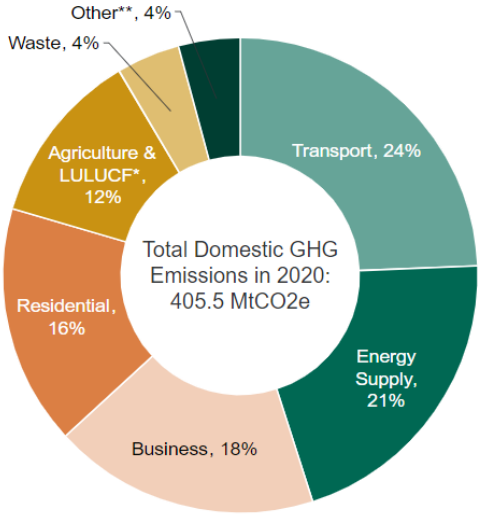
Setting the scene

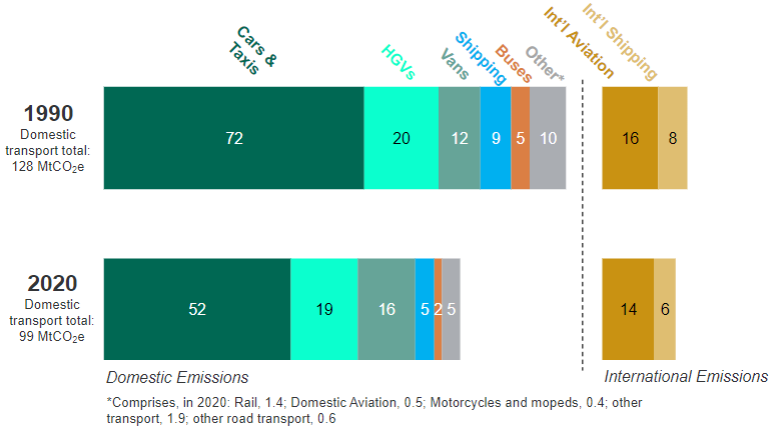
Why switch to EVs?

Why focus on transport?

Transport makes up 24% of the UK's carbon footprint and domestic travel is not decreasing fast enough.

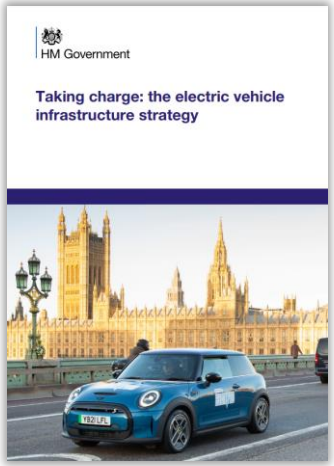


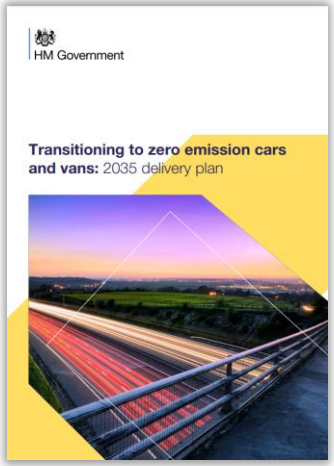




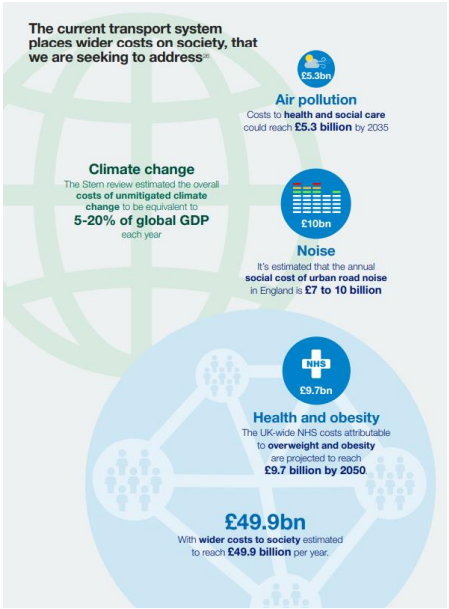
https://www.gov.uk/government/statistics/transport-and-environment-statistics-2022/transport-and-environment-statistics-2022

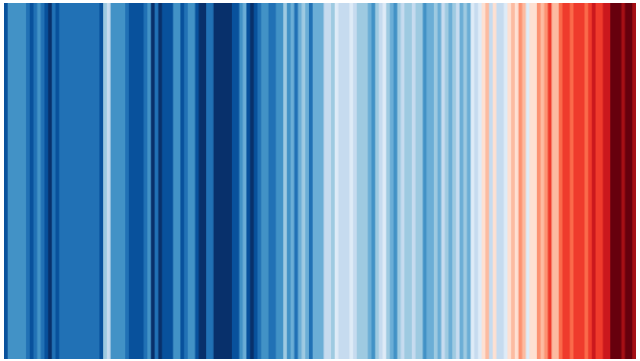
National and regional plans

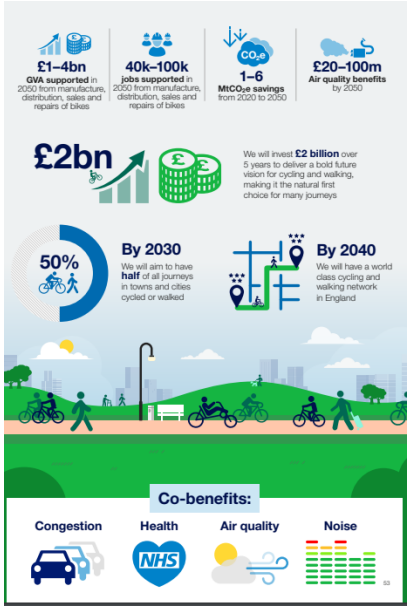




Why the push for electric vehicles?

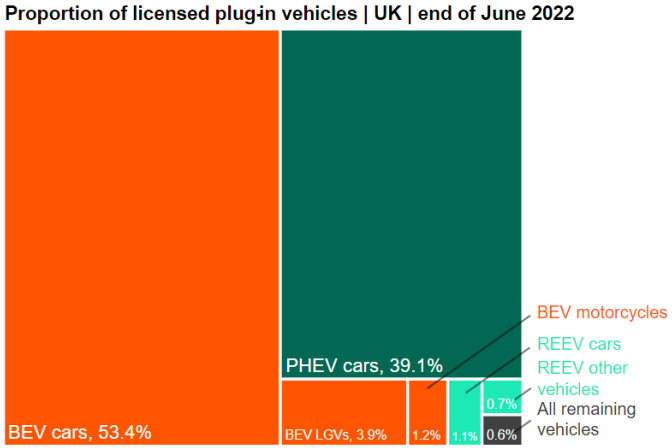






The EV market

- There are now over 922,000 plug-in electric vehicles in the UK
- 492,000 BEVs registered by June 2022
- Nearly one in five new cars sold now has a plug



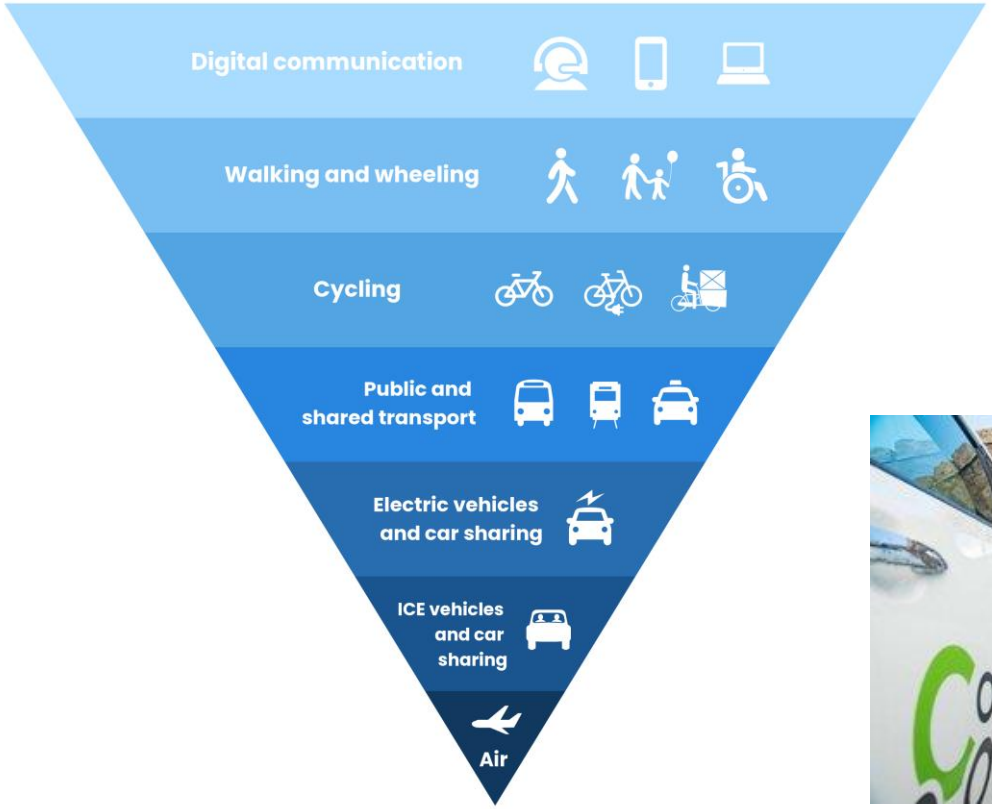
YEAR TO DATE

	YTD 2022	YTD 2021	% change	Mkt share -22	Mkt share -21
Diesel	73,370	124,633	-41.1%	5.5%	8.8%
Petrol	582,793	669,982	-13.0%	43.4%	47.1%
MHEV diesel	61,524	89,673	-31.4%	4.6%	6.3%
MHEV petrol	188,479	172,941	9.0%	14.0%	12.2%
BEV	195,547	141,296	38.4%	14.6%	9.9%
PHEV	82,860	95,422	-13.2%	6.2%	6.7%
HEV	158,139	128,932	22.7%	11.8%	9.1%
TOTAL	**1,342,712**	**1,422,879**	**-5.6%**		

https://www.gov.uk/government/statistics/vehicle-licensing-statistics-april-to-june-2022/vehicle-licensing-statistics-april-to-june-2022#new-vehicle-registrations-overview

https://www.smmt.co.uk/vehicle-data/car-registrations/

EVs are not a silver bullet



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What is an EV?

Plug-in vehicles: BEV vs PHEV

Nissan Leaf

Hyundai Kona

Tesla Model 3

Mini Countryman PHEV

Hyundai IONIQ PHEV

BMW 330e

Battery electric vehicle

- Also known as 100% or pure electric
- Range from 120-300+ miles
- Over 175 BEV models currently on the market
- Significant CO2, NOx and PM emission reductions

Plug in hybrid vehicle

- Internal combustion engine plus battery
- Electric range 20-50 miles
- 80+ models on the market
- New sales banned from 2035

Jargon-busting

kWh – kilowatt hour

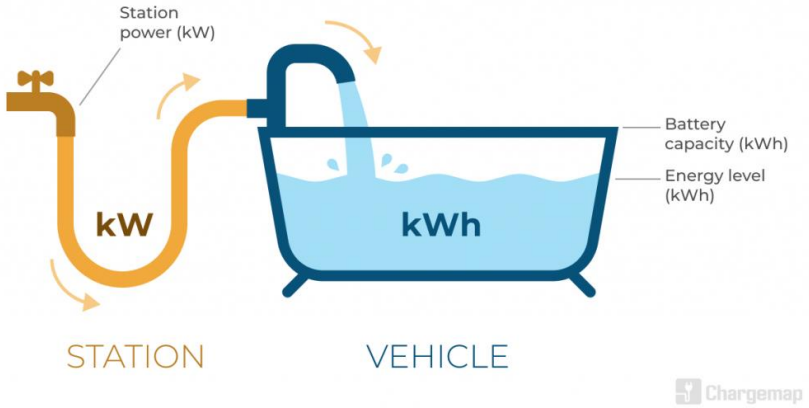
Measure of energy

- EV batteries are usually quoted in kWh
- the amount of energy that a battery can store
- the bigger the kWh, the longer the car's range
- comparable to fuel tank size of a petrol or diesel car

kW – kilowatt

Measure of power

- chargepoints are always rated in kW
- higher kW = faster charge



The Business Case for EVs

- EVs have far fewer moving parts and are therefore cheaper and easier to service and maintain
- Zero road tax (VED) and reduced benefit-in-kind on company cars
- Penalty free access to congestion zones, low emission zones and clean air zones
- Lower cost per mile than an average petrol or diesel vehicle:

At home (51p/kWh):	**On a public fast charger (42p/kWh):**	**On a public rapid charger (64p/kWh):**
Recharge from 0-100% would cost £25.65	Recharge from 0-100% would cost £21.00	Recharge from 0-100% would cost £32.00
12p per mile	9p per mile	15p per mile

Compared with an average fuel cost of **17p/mile for petrol** and **16p/mile for diesel** for an equivalent vehicle

Based on the Peugeot e-208 50kWh electric vehicle, with a WLTP range of 217 miles on a full charge.

Vehicle running cost comparison

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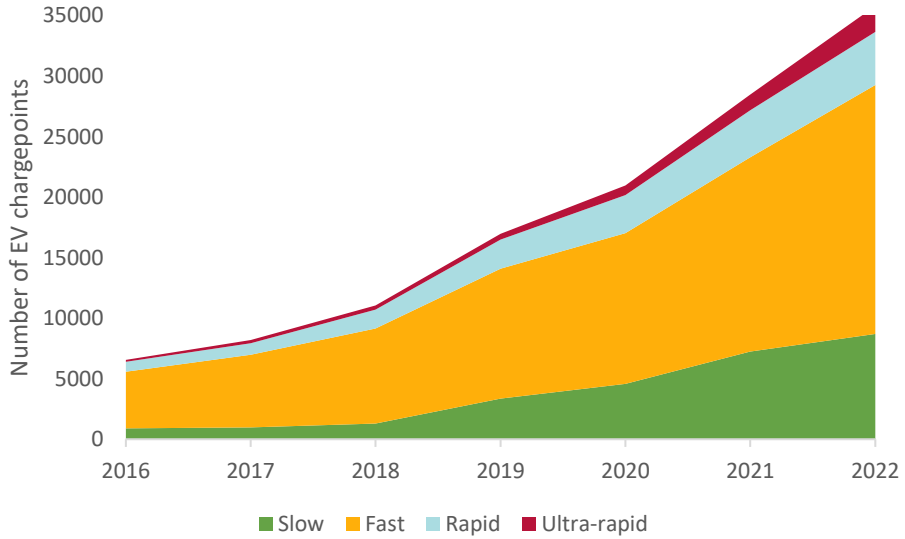
	2018 Vauxhall Corsa (Petrol)	Vauxhall e-Corsa (50kWh)
Tailpipe CO2 emissions	115 g/km	0 g/km
Annual fuel/electricity costs	£2,268	£956
1st year VED	£180	£0
1st year costs (fuel +VED)	£2,448	£956
1st year cost saving		**£1,492**
6 year cost saving		**£8,825**

- Fuel costs based on UK average in June 22 (180p) obtained from http://www.theaa.com/driving-advice/driving-costs/fuel-prices
  - Current fuel prices for Petrol 180p and Diesel 190p
- Electric vehicle fuel cost based on end of 2021 UK average electricity costs, which were 18.9p per kWh – However noted that a domestic energy cap is currently 28p kWh in April 2022

Charging

What about charging?

As of October 2022, there are **35,778** public EV charging points



By 2030 the UK target is **300,000 – 700,000** chargepoints nationally

https://www.zap-map.com/statistics/#points

Progress to targets

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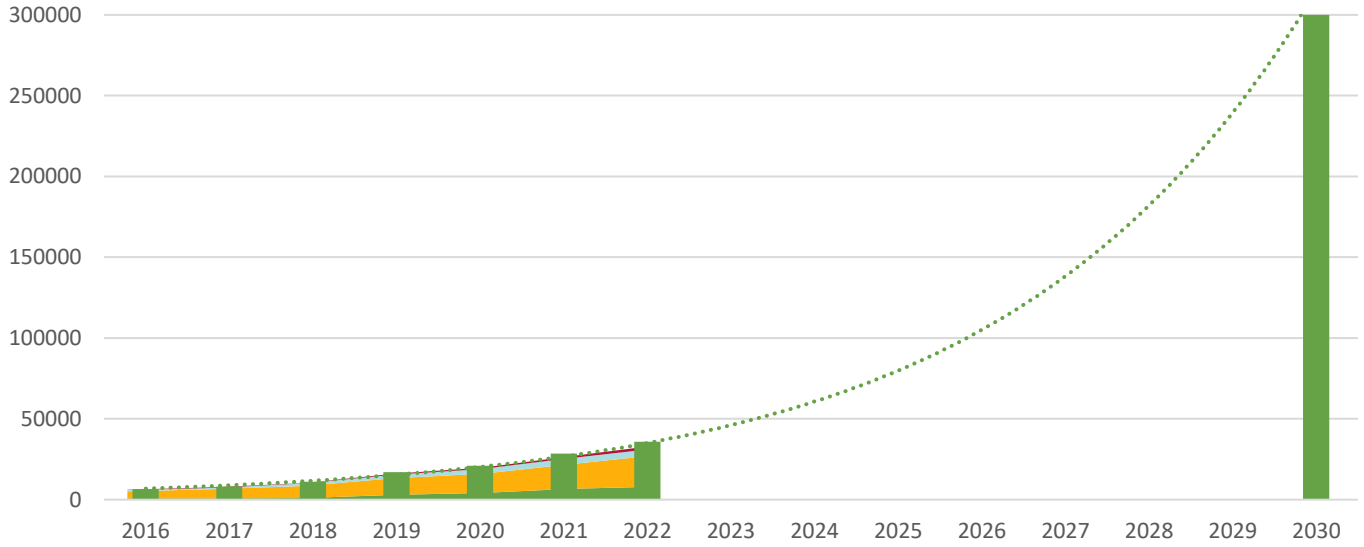

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https://www.zap-map.com/statistics/#points

Public chargepoints – Residential and Destination Charging

- **Power:** 5*/7 kW – 22 kW
- **Rate: 7 kW** - takes **3 hours** to add **100 miles**
  22 kW – takes **1 hour** to add **100 miles**
- There are increasing numbers of solutions that provide convenient and cost-effective home charging options for residents without off-street parking
- Found on-street or in car parks
- Some have a dedicated EV bay
- Suited to longer dwell times – residential, shopping centres, visitor attractions
- Payment by App or RFID card

“Rapid” Charging

- **Power:** 43 kW (AC) or 50 kW (DC)
- **Rate:** Takes approx. **45 minutes** to add **100 miles** to the battery
- Tethered cables
- Found in car parks, charging hubs, motorway service stations
- Cost more to use but offer convenience

			
	Nissan Leaf (24kWh - 120 Miles)	**Kia e-Niro** (64kWh - 282 Miles)	**Tesla Model S** (100kWh – 375 Miles)
0-80%	30 minutes	1 hour	1.5 – 2 hours

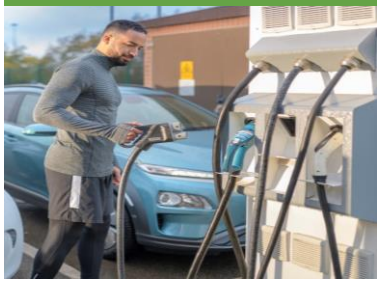
Right chargepoint, right location

Slow (10-12hr)	Fast (4-6hr)	Rapid (<1hr)	Ultra Rapid (15 mins)
2.3 – 3.7 kW	7 - 22 kW	Up to 50 kW	120-350 kW

Home charging

Destination

En route



Urban Charging hub 150 kW

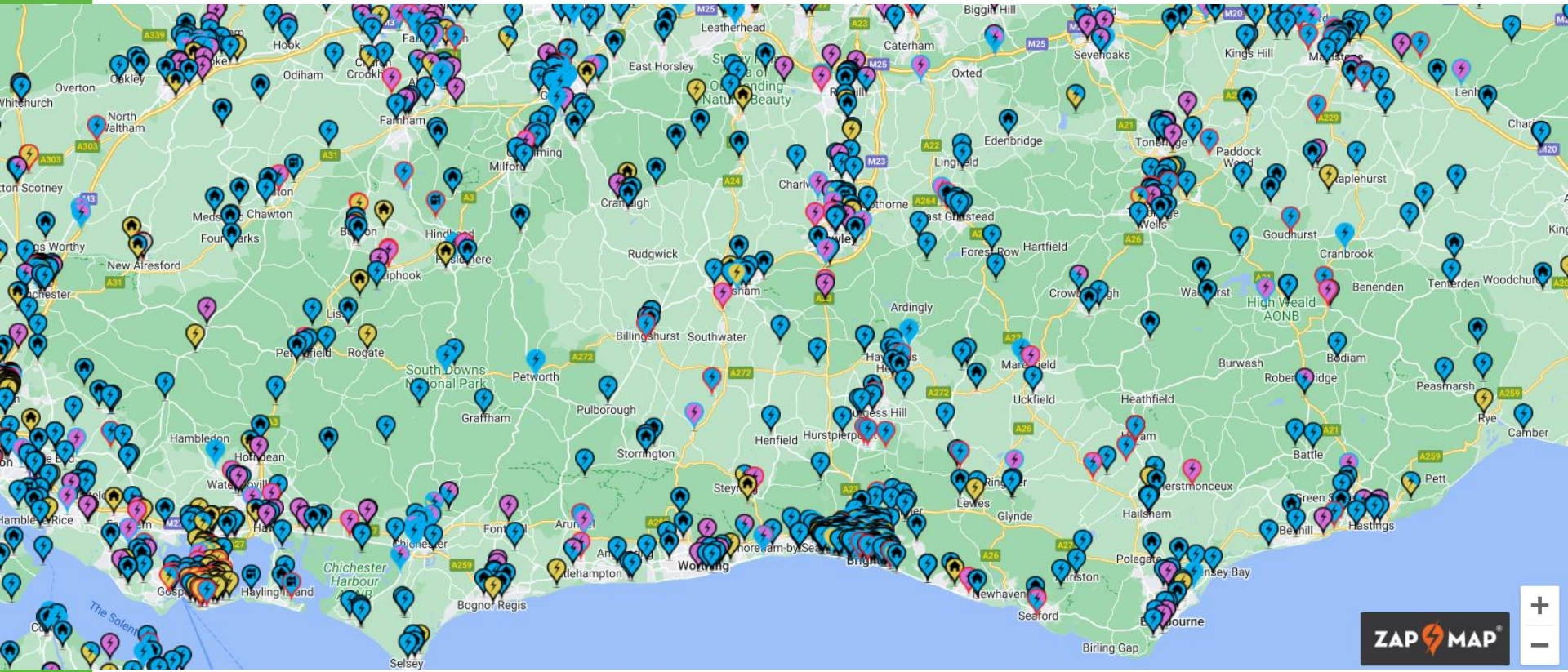
Lamp-column

On-street residential

Destination

‘Electric forecourt’ 350 kW

Finding a chargepoint



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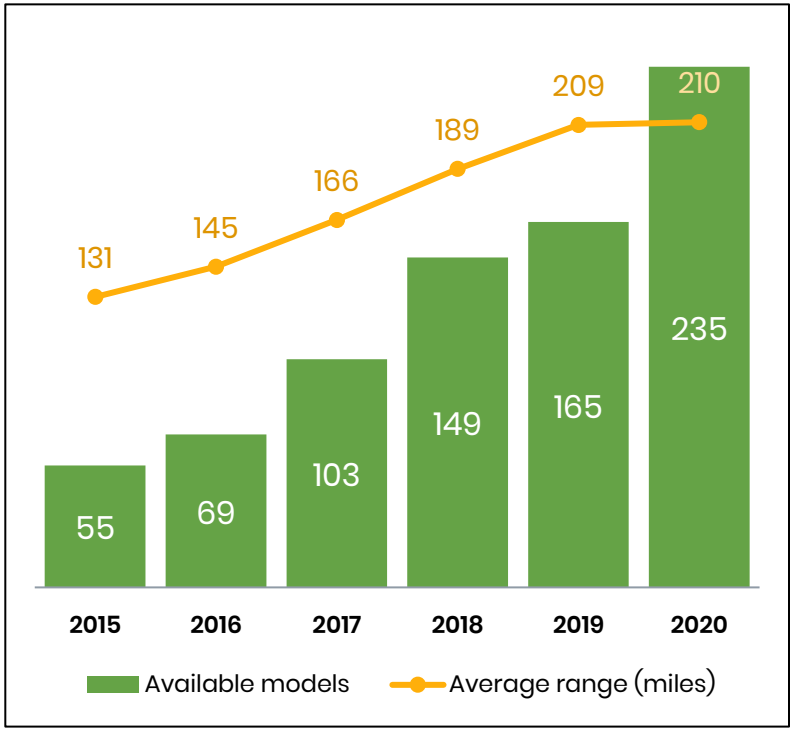
Myth busting

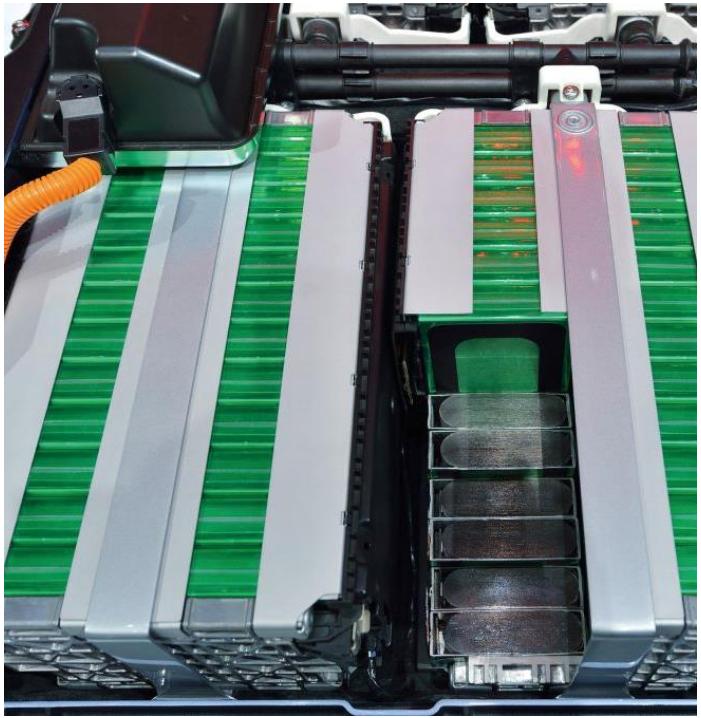
EV Range – Is it an issue?

- New EVs now typically have a range of **at least 200 miles**
- **Battery performance** can be impacted by a number of factors:
  - use/driving style
  - extremes of temperature
  - charging type, however, is less of an issue
- **Now more than 35,000 chargepoints** across the UK
- By 2023, the Government aims to have **at least 6 high powered chargepoints** at motorway service areas in England.



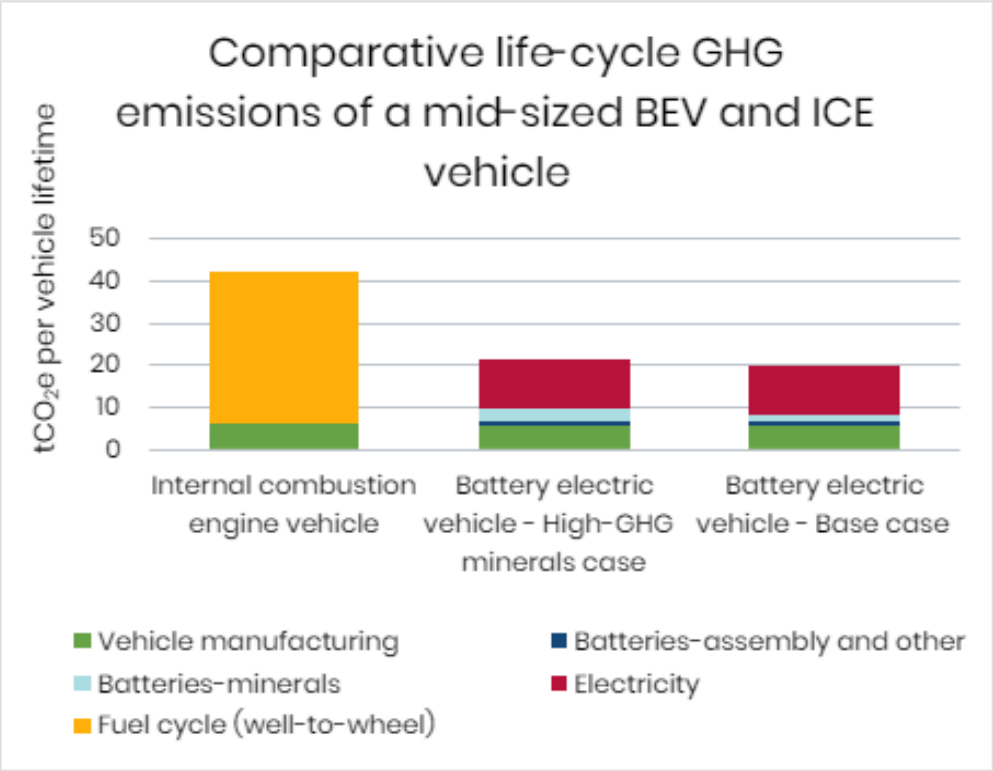
Number of plug-in car models available globally and their average range, 2015-2020. Data from IEA.

Batteries for Electric Vehicles



- Rarely need to replace a whole battery
- Warranties available to cover battery performance
- End of life EV batteries can be used for energy storage
- Growing industry focused on battery repurposing and recycling
- Manufacturers are increasingly cautious about their supply chains
- Reducing manufacturing emissions, mainly through streamlining processes

Carbon emissions from EVs



Source: IEA

- The life cycle emissions associated with a BEV is half of that of an internal combustion engine vehicle
- Emissions from battery production can vary across different countries
- As renewable electricity generation increases further, emissions will fall
- Many chargepoint networks use renewable energy tariffs

Business case for electrification

Electrification brings instant 60-70% carbon savings

- Zero tailpipe emissions = Improves local Air Quality
- Quieter and smoother driving experience – EV drivers are less stressed
- Higher upfront purchase cost but lower running costs
- Penalty free access to congestion zones, low emission zones and clean air zones
- Lower servicing and maintenance costs
- Zero road tax (VED) and reduced benefit-in-kind on company cars
- Increasing choice of models at lower price points

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Your route to driving an EV

Buying a new EV

Electric Vehicle Database

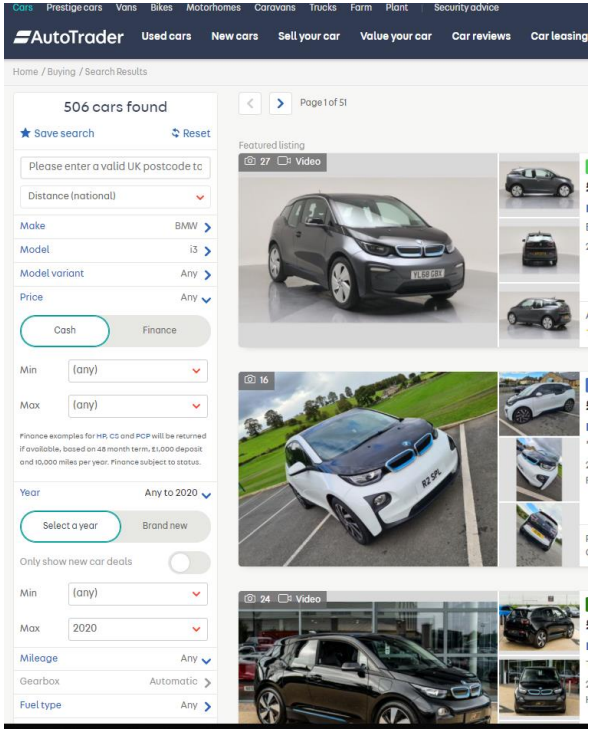
Get researching

Look for an EV Approved retailer

- Sales and aftersales staff will be properly trained in all things EV
- Provide accurate info on details such as warranties
- Correct facilities and equipment to service EVs
- On-site charging provision
- Opportunity to test drive EVs (extended test-drives often available)

EVA
Electric Vehicle Approved

Alternative routes to driving an EV



Lease/subscription service

- All new EVs available on finance
- Lease companies are increasingly understanding the reduced risk due to lower maintenance costs

Buying a used EV

- 700,000+ plug-in vehicles on the road in the UK, 64,000 sold in the 1st quarter of 2022 alone = growing used market
- Check specification and consider the range you need/battery size – charging cables included?
- Check battery lease
- Increasing knowledge and number EV specialist dealerships

Car club membership

- Opportunity to 'try before you buy'?
- Multiple options in many areas with a range of EVs available

Workplace Charging Grant Scheme

- Available to businesses, charities, and local authorities – including schools
- 75% of the total cost of installation, up to a maximum of £350 per socket installed.
- Maximum of 40 sockets across all sites for each applicant.
- Requires dedicated off-street parking for staff, visitors or fleet use.
- You do not require any ULEVs to apply.

EV Infrastructure Grant for Staff and Fleets

- Funding for infrastructure required for chargepoints *and* EVCP themselves
- Specifically for organisations of 249 employees or less
- Organisations can apply for max 5 grants of up to £15,000
- Each grant must provide a minimum of 5 parking spaces provisioned with charging infrastructure
- More info here: EV infrastructure grant for staff and fleets: customer guidance - GOV.UK (www.gov.uk)

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Q+A

Glossary

Battery Electric Vehicle (BEV)	A car that runs purely on electric power, stored in an on-board battery that is charged from mains electricity (typically at a dedicated chargepoint).
Plug-in hybrid electric vehicle (PHEV)	A car with a combination of a traditional internal combustion engine and a rechargeable battery, allowing for either pure electric-powered driving or extended range from a combination of the petrol engine and electric motor.
Plug-in vehicle (PiV)	A blanket term for any vehicle with a plug socket, including BEVs and PHEVs.
Ultra Low Emission Vehicle (ULEV)	A car that has official tailpipe carbon dioxide emissions of less than 75g/km, and is therefore eligible for grants and benefits from the UK government.
Full Hybrid or "Self-Charging" Hybrid	A 100% fossil fuelled hybrid car. The most common is the Toyota Prius. A small battery is charged through regenerative braking that generates some electric power in combination with a combustion engine, but the car's energy originates from petrol. The electric motor can only power the car itself for short periods at low speeds.
Kilowatt	A measure of one thousand watts of electrical power.
Kilowatt hour (kWh)	A unit of energy equivalent to the energy transferred in one hour by one thousand watts of power. Electric car batteries are typically measured in kilowatt hours. 1 kilowatt hour is typically 3-4 miles of range in a BEV.
Smart charging	A catch-all term for a series of functions that a Wi-Fi connected chargepoint can perform. Typically this refers to things like load balancing, energy monitoring and "managed charging", i.e. shifting charging periods away from periods of high grid demand and/or low grid supply and to periods of low grid demand and/or high grid supply.
Range	Range refers to the distance an electric or hybrid vehicle can travel before the battery needs to be recharged.

Source: https://pod-point.com/guides/driver/ev-dictionary