



An Introduction to Electric Vehicles



Who am I?



Goals of this talk:

- The EV Market
- Types of EV
- Driving an EV
- Cost Savings
- EVs and the Environment
- Charging and Range
- Buying an EV
- Where Can I Test an EV?



Jargon Buster

- EV – Electric Vehicle
- PHEV – Plug-in Hybrid Electric Vehicle
- REX – Range Extender Electric Vehicle
- ICE – Internal Combustion Engine Vehicle
- PICG – Plug-in Car Grant
- kWh – kilo Watt hour



The EV Market

Five years ago

4,000 EVs on UK roads

1 in 900 new cars

9 models on sale

3,000 public charging points

200 rapids

Today

170,000 EVs on UK roads

1 in 50 new cars

50+ models on sale

18,000 public charging points

1,800 rapids

Five years from now

1 million EVs on UK roads

1 in 10 new cars

200+ models on sale

100,000 public charging points

9,000 rapids



Types of EV



Full Electric



Hydrogen



Range Extender



Hybrid



Plug-in Hybrid



Mild Hybrid



Driving an EV

- Much Quieter
- Instant acceleration
- Good handling
- Regenerative braking





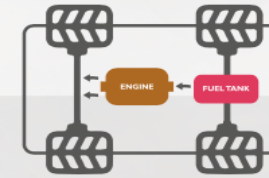
Cost Savings

- Fuel
- Service and maintenance
- Tax
- Congestion Charge

INTERNAL COMBUSTION ENGINE VEHICLE (ICE)

16p per mile*

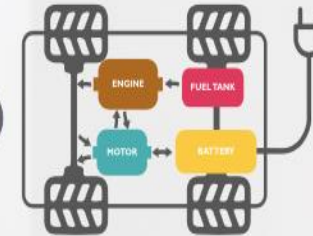
*Based on the average UK vehicle mpg 37.5, and on petrol price of 129p per litre



PLUG-IN HYBRID ELECTRIC VEHICLE (PHEV)

7p per mile*

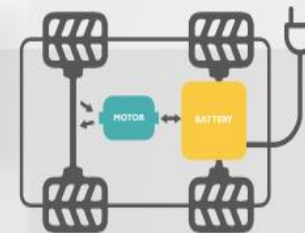
*based on 12.5p per kWh. Dependent on vehicle usage



BATTERY ELECTRIC VEHICLE (BEV)

2p per mile*

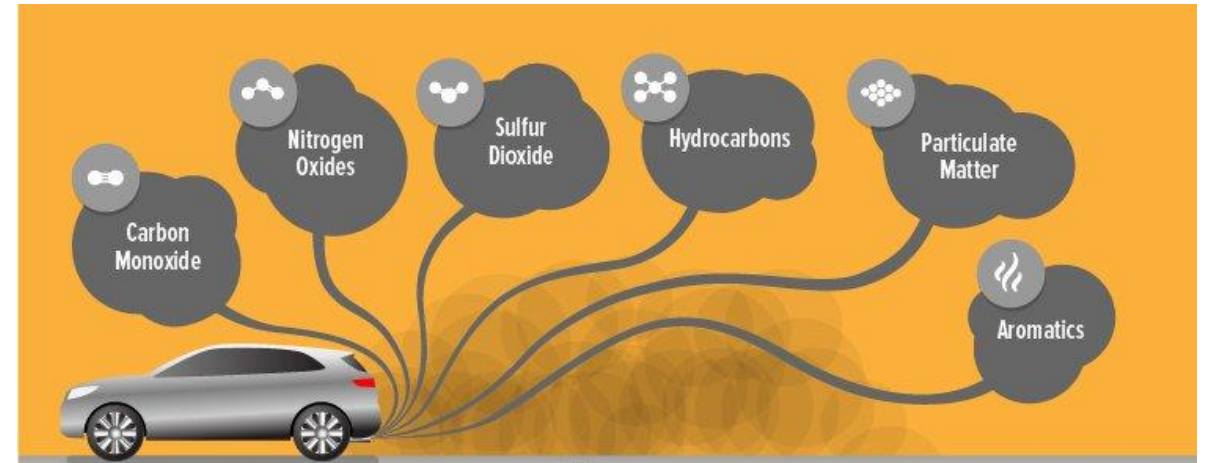
*based on 12.5p per kWh





EVs and the Environment

- No tail-pipe emissions
- Reduced brake dust particles
- Are they greener? – Yes
 - BMW i3 – 27g of CO₂/km assuming average UK electricity mix
 - Average ICE vehicle emits \cong 160g of CO₂/km
 - Batteries?





Charging and Range – ‘Range Anxiety’

- How long do EVs take to charge?
 - Full EV - 80% charge in 30-40 mins
 - PHEV - 2-4 hours
- How far can I go?
 - Full EV - 70 to 260 miles
 - PHEV - 20 to 30 miles
- How much does it cost?
 - Full EV - £5.00*
 - PHEV - £1.40*
 - 150 miles in ICE vehicle = £18.00**
- Where do I charge?



- Slow AC (3 -22 kW)



- Fast AC (3 -22kW)



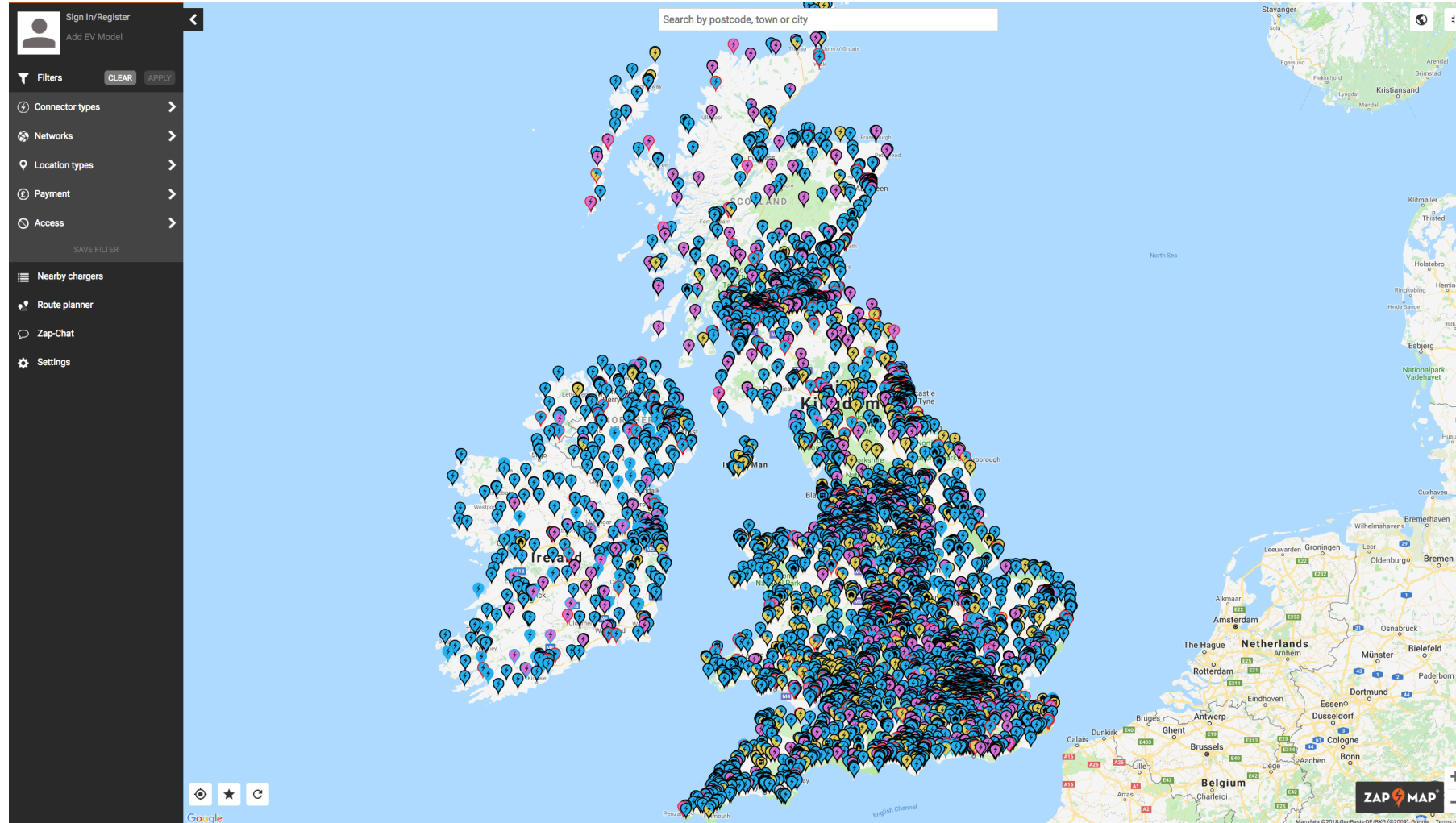
- Rapid AC and DC (43-50kW)

*Figures based on electricity cost of 14p/kw

** Based on information from Go Ultra Low



Map of charging points





Buying an EV

- How expensive are EVs?
 - Renault Zoe
 - Starting from £18,420
 - Second hand from £5000
 - Tesla Model S
 - Starting from £72,350
 - Second hand from £45,000
- Do I get a grant?
 - Up to £3500
 - Up to £500 off a homecharge unit





Where Can I Test an EV?





Thank you

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