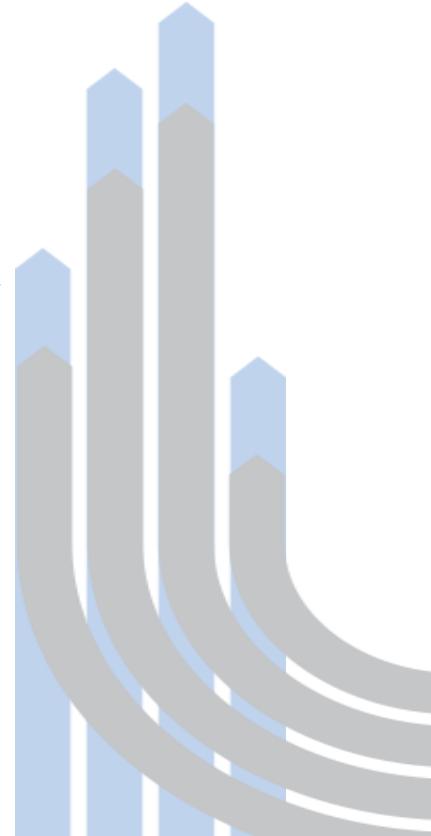


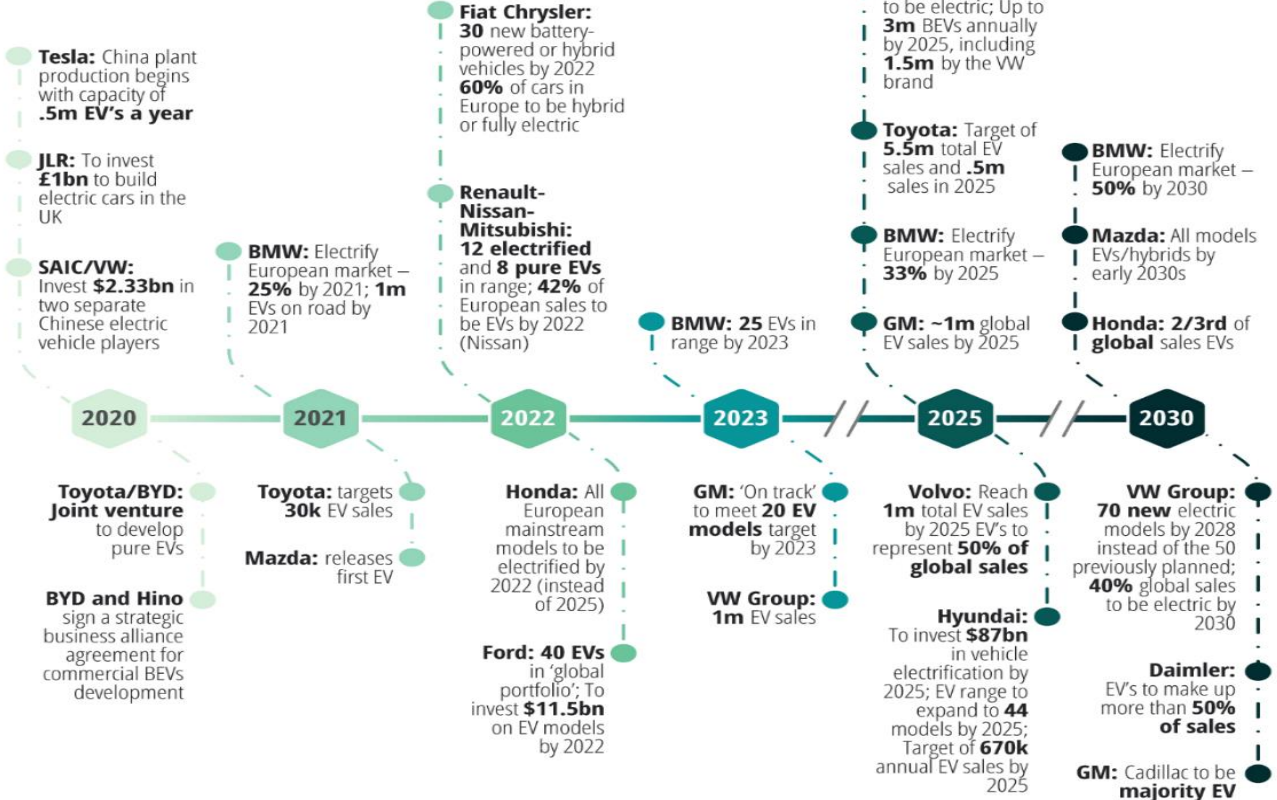
Driving EV uptake to meet the decarbonisation challenge

David Wong
Senior Technology and Innovation Manager

ADEPT National Traffic Managers Conference
7 October 2020



The automotive industry is committed to electrification



Rising to the decarbonisation challenge
requires, among other things,...



...accelerated EV uptake.

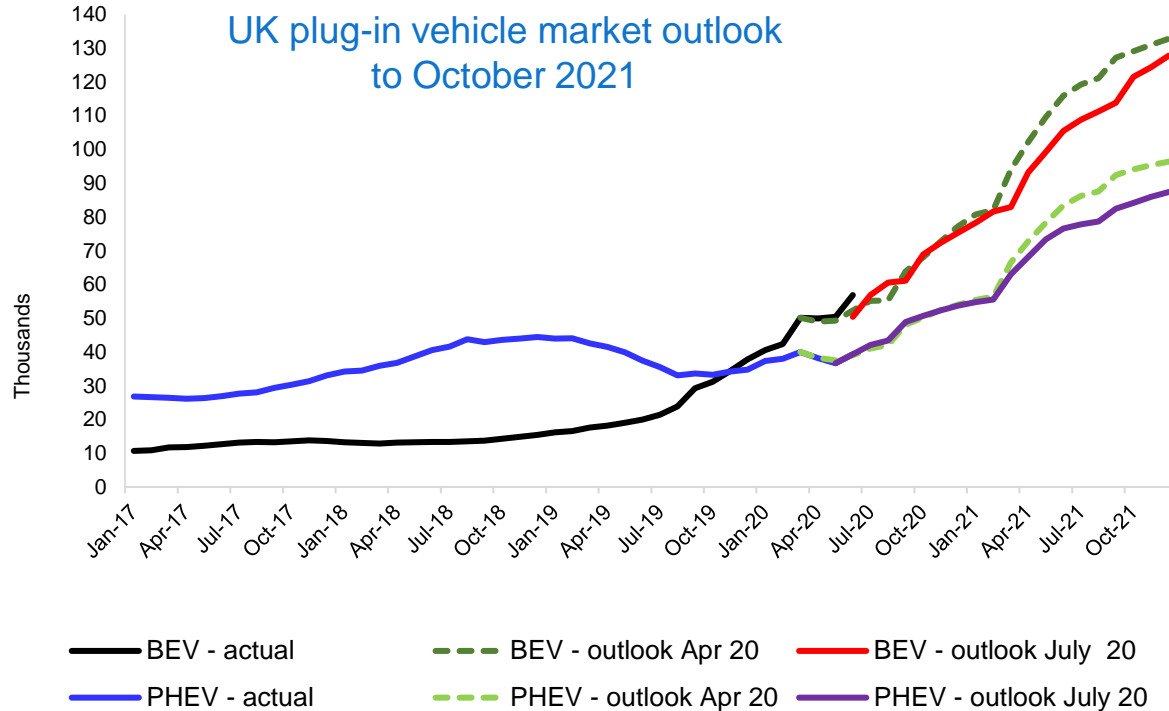
EV registrations are on the rise

Registrations and market share of plug-in vehicles in the UK

	Jan-Jun 2020		Jan-Jun 2019		Full year 2019		Full year 2018		Full year 2017	
	Registrations	Market share	Registrations	Market share	Registrations	Market share	Registrations	Market share	Registrations	Market share
BEVs	30,957	4.7%	11,975	0.9%	37,850	1.6%	15,510	0.7%	13,632	0.5%
PHEVs	19,508	3.0%	15,136	1.2%	34,984	1.5%	44,437	1.9%	35,585	1.4%
Total plug-ins	50,465	7.7%	27,111	2.1%	72,834	3.2%	59,947	2.5%	49,217	1.9%
All cars	653,592	100%	1,269,245	100%	2,311,140	100%	2,367,147	100%	2,540,617	100%

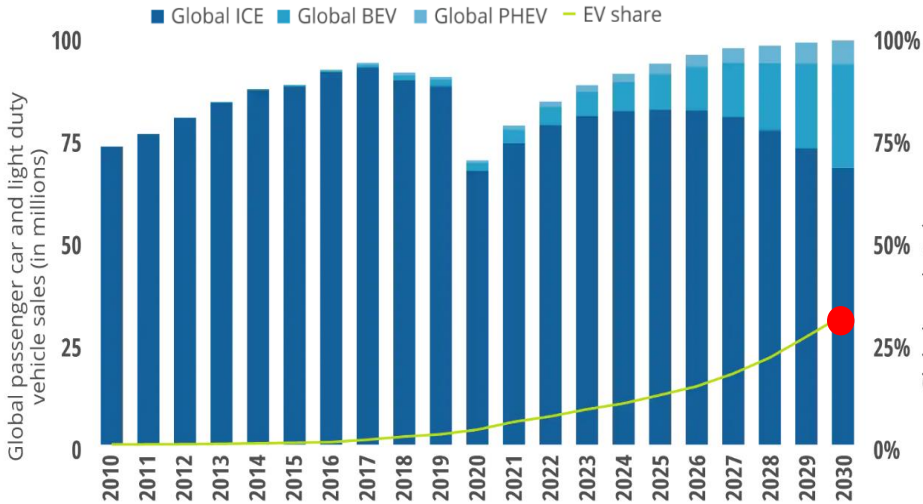
Of the 35,168,259 cars in the UK parc as of 31 December 2019, only 251,028 (0.7%) were plug-in vehicles. BEVs made up only 0.3% of the parc.

And are expected to continue rising



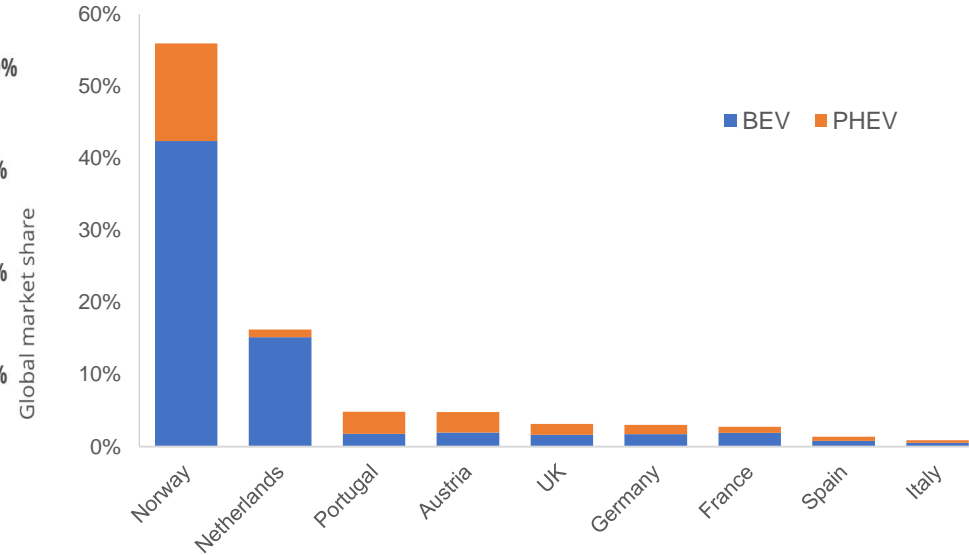
But we need to do better than others

Annual global light duty EV sales and market share projections



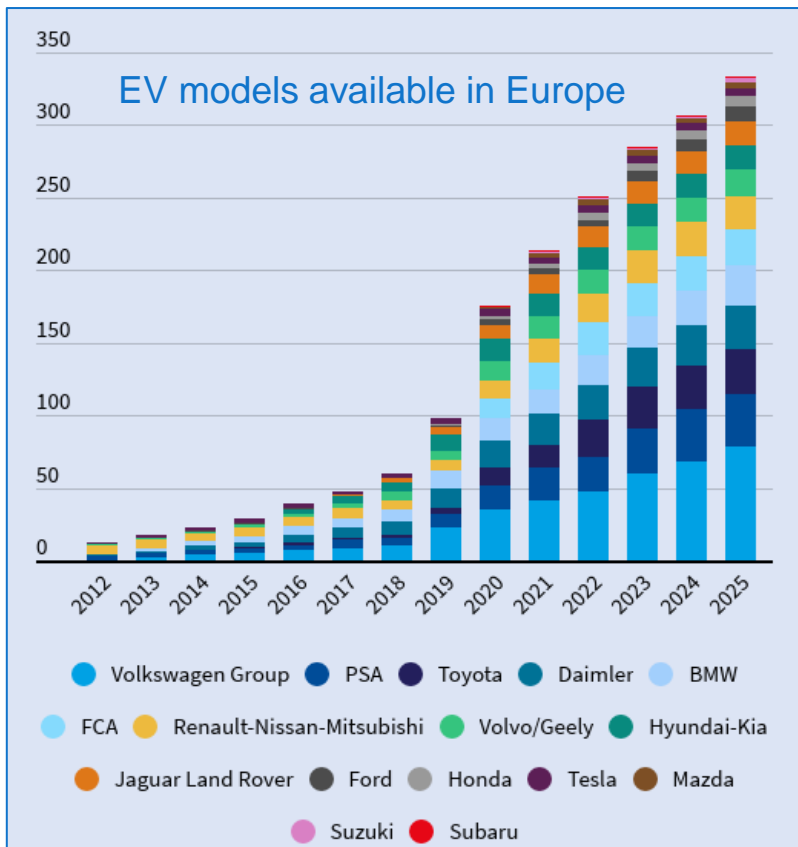
Source: Deloitte analysis using International Energy Agency and IHS data

Plug-in vehicle market share in selected European markets, 2019



Source: SMMT analysis of ACEA data

Make no mistake – the cars are coming



- Whether they get **allocated** to the UK market is another question.
- Unit allocation to national markets is a **competitive** process and is heavily dependent on **local market attractiveness**.
- We need the lion's share of allocation.

Source: Transport & Environment, 2019

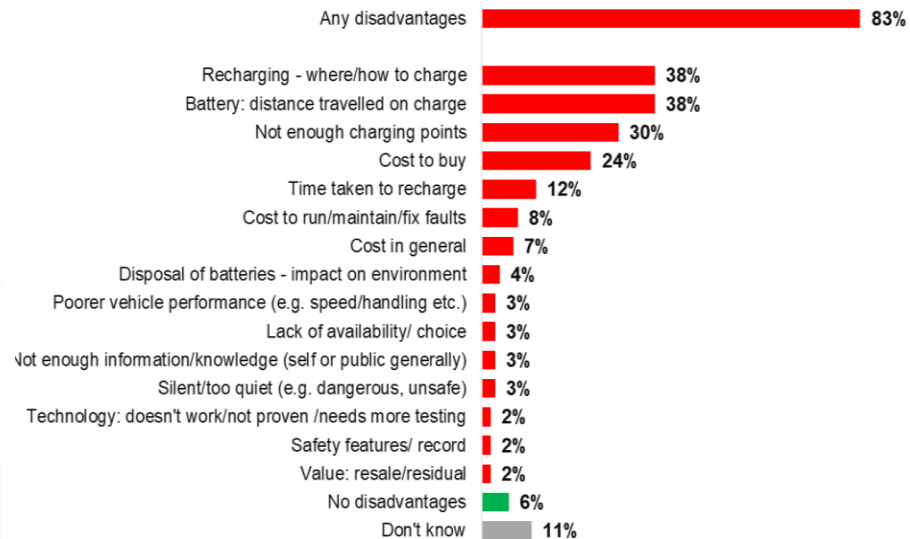
So what's holding back mass market consumer demand?

2020 Global Auto Consumer Study

	FRANCE		GERMANY		ITALY		UK		CHINA		US	
	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020	2018	2020
In your opinion, what is the greatest concern regarding all battery-powered electric vehicles?												
Driving range	31%	28%	35%	33%	4%	27%	26%	22%	25%	22%	24%	25%
Cost/price premium	32%	22%	22%	15%	19%	13%	24%	16%	9%	12%	26%	18%
Time required to charge	11%	15%	11%	14%	18%	16%	13%	16%	12%	15%	10%	14%
Lack of electric vehicle charging infrastructure	16%	22%	20%	25%	44%	32%	22%	33%	18%	20%	22%	29%
Safety concerns with battery technology	4%	11%	5%	10%	7%	10%	6%	12%	22%	31%	8%	13%
Others	6%	2%	7%	3%	8%	2%	9%	1%	14%	0%	10%	1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sample size	1,083	1,266	1,287	3,002	1,048	1,274	965	1,264	1,606	3,019	1,513	3,006

Source: Deloitte Global Auto Consumer Survey, 2020

Perceived disadvantages of electric vehicles



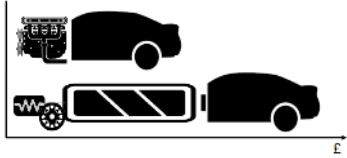
Source: Department for Transport and Kantar, 2019

A toy for the affluent?

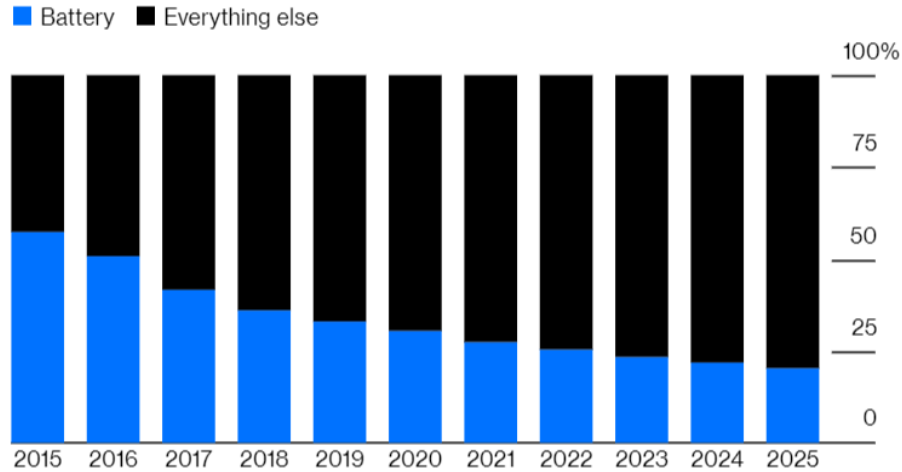


Like for like, EVs are still more expensive than a petrol or diesel car.

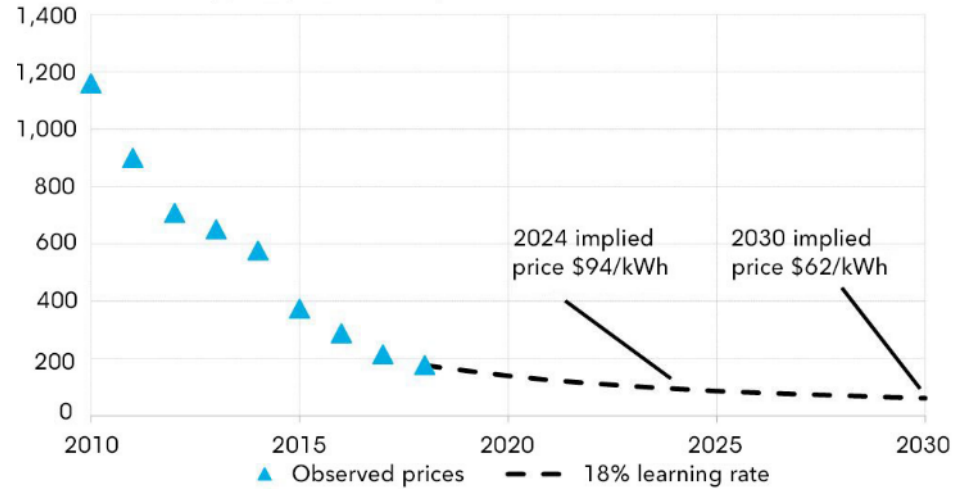
Battery makes up a huge proportion of the cost



EV battery cost for US medium-size car as a percentage of retail price



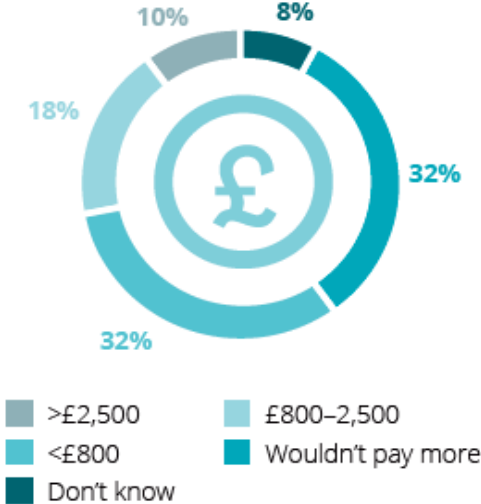
Li-Ion battery pack price (real 2018 US\$/kWh)



Source: Bloomberg New Energy Finance, 2019

Consumers are price sensitive

Consumer willingness to pay extra for an electric vehicle



Source: Deloitte Global Automotive Consumer Study: Europe, 2020



From £20,280



From £31,025



From £16,415



From £27,665

Source: All list prices from Autocar

Even TCO parity is not yet achieved

Illustrative total cost of ownership over three years

	Small car			Family car			SUV		
	ICE	PHEV	BEV	ICE	PHEV	BEV	ICE	PHEV	BEV
Upfront cost									
List price	£16,200	£21,700	£29,600	£23,400	£29,000	£36,100	£37,700	£48,500	£58,600
PiCG			(£3,000)			(£3,000)			
Actual upfront cost [a]	£16,200	£21,700	£26,600	£23,400	£29,000	£33,100	£37,700	£48,500	£58,600
Running costs over 3 years / 30,000 miles									
VED	£475	£310	£0	£475	£310	£0	£1,165	£960	£0
Fuel	£2,919	£1,910	£900	£3,175	£2,038	£900	£3,807	£2,354	£900
Service, repair and maintenance	£1,000	£885	£770	£1,400	£1,239	£1,078	£1,800	£1,593	£1,386
Insurance	£1,815	£1,890	£2,100	£2,055	£2,475	£2,385	£4,380	£5,400	£5,220
Total running costs [b]	£6,209	£4,995	£3,770	£7,105	£6,062	£4,363	£11,152	£10,307	£7,506
Depreciation over 3 years									
Residual value after 3 years	£7,128	£10,416	£11,172	£10,296	£13,920	£13,902	£16,588	£23,280	£24,612
Actual cost of the car, i.e. depreciation [c]	£9,072	£11,284	£15,428	£13,104	£15,080	£19,198	£21,112	£25,220	£33,988
Total cost of ownership									
Nominal total cost of ownership [a + b]	£22,409	£26,695	£30,370	£30,505	£35,062	£37,463	£48,852	£58,807	£66,106
Nominal total cost of ownership: monthly	£622	£742	£844	£847	£974	£1,041	£1,357	£1,634	£1,836
Actual total cost of ownership [b + c]	£15,281	£16,279	£19,198	£20,209	£21,142	£23,561	£32,264	£35,527	£41,494
Actual total cost of ownership: monthly	£424	£452	£533	£561	£587	£654	£896	£987	£1,153

Source: SMMT analysis

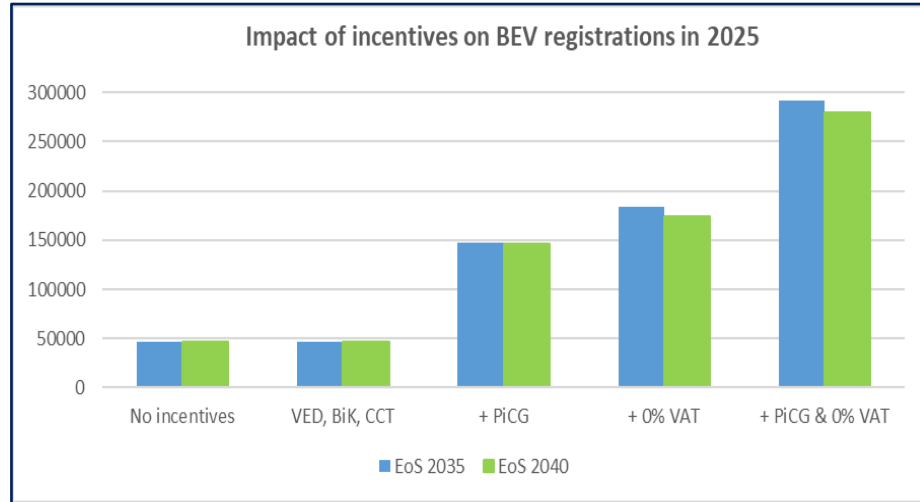
Overcoming the affordability barrier through consumer incentives

We suggest EVs should:


- Continue to be supported through the Plug-in Car Grant (PiCG), which should be extended for a longer time horizon and reintroduced for PHEVs;
- Pay no Value Added Tax (VAT);
- Pay no Vehicle Excise Duty (VED);
- Be subject to 0% Company Car Tax (CCT); and
- Be exempt from the Insurance Premium Tax (IPT).

Assuming end-of-sale 2035, and when compared with no incentives at all:

- PiCG (for BEV + FCEV) **trebles** (214%) BEV registrations by 2025.
- PiCG (for BEV + FCEV) and VAT exemption leads to a **six-fold** (523%) increase in BEV registrations by 2025.
- VAT exemption even without the PiCG still **trebles** (293%) BEV registrations by 2025.



Source: SMMT analysis



Range anxiety – perceived or real –
is still a key barrier.

But for consumers, even perception is reality.

Range anxiety is partly related to
infrastructure inadequacy.

Chargers, chargers everywhere?

A delicate balance: range, weight, affordability, user need

Zap-Stats – 30 September 2020

34264
CONNECTORS

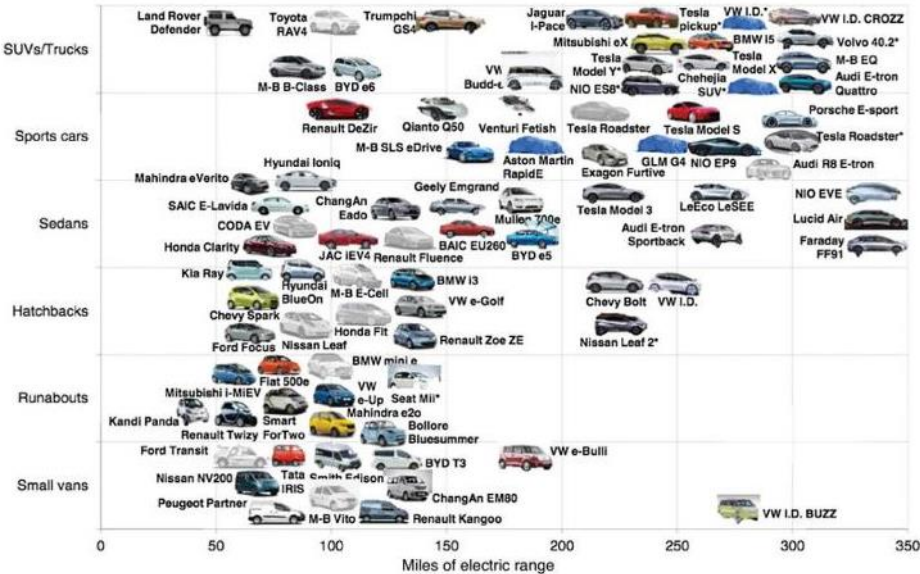
19644
DEVICES

12403
LOCATIONS

410
LAST 30 DAYS

ZAP MAP

- Even though 80% of EV owners have access to home charging, 93% use the **public chargepoint** network.
- The average **reliability** rate of chargepoints was 92%. In the Netherlands, it's 99%.
- More than 30% of population (c.44% in London) don't have **off-street parking**.
- **Ease of access and payment** is crucial. One still needs to have multiple RFID cards.



Source: Bloomberg New Energy Finance

It's not just about ever more chargers, but cars per charger

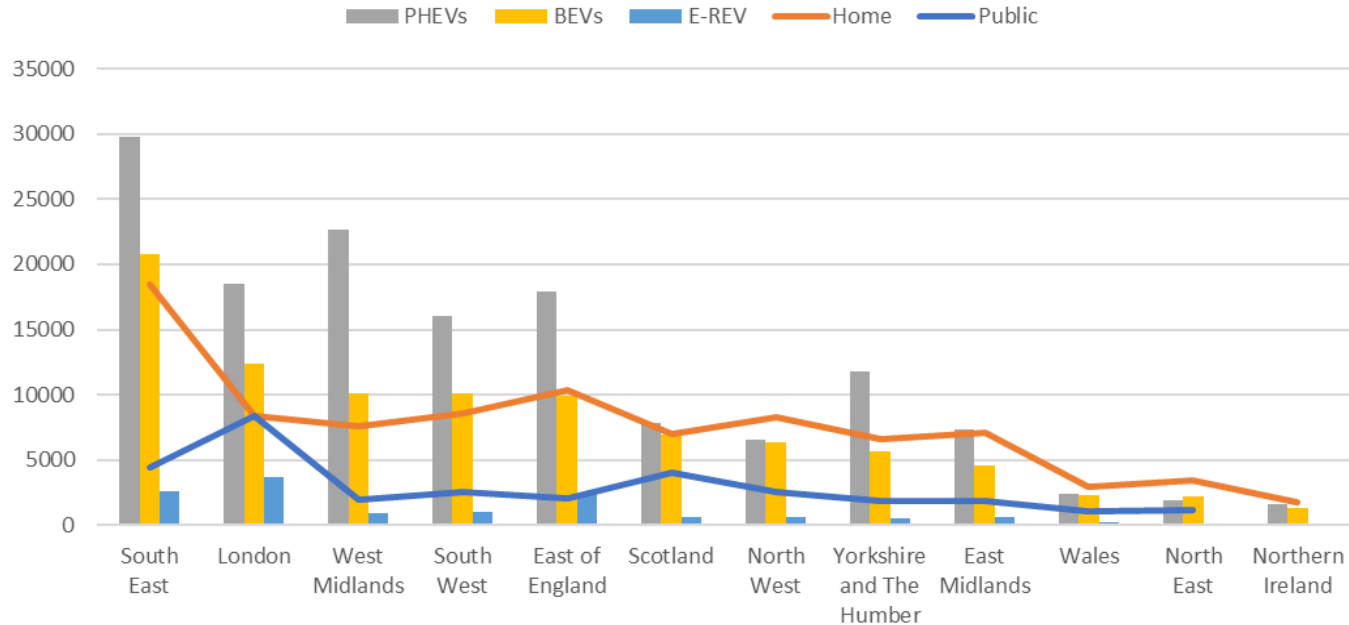
EV stock and publicly accessible chargepoints, 2018 and 2019

	EV stock		Slow/fast chargers				Rapid/ultra-rapid chargers			
			Number of chargers		Cars to charger ratio		Number of chargers		Cars to charger ratio	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Netherlands	214,800	148,500	49,324	35,852	4.4	4.1	829	819	259.1	181.3
Germany	258,800	177,100	34,203	23,112	7.6	7.7	2,860	2,612	90.5	67.8
France	226,800	165,500	27,661	22,736	8.2	7.3	2,040	1,396	111.2	118.5
China	3,349,100	2,306,300	301,238	163,667	11.1	14.1	214,670	111,333	15.6	20.7
UK	259,200	184,000	22,359	14,732	11.6	12.5	4,735	2,692	54.7	68.4
Japan	294,000	255,100	22,536	22,287	13.0	11.5	7,858	7,684	37.4	33.2
Norway	328,600	249,000	15,466	11,145	21.2	22.3	3,970	1,226	82.8	203.1
US	1,450,000	1,123,400	64,265	50,258	22.6	22.4	13,093	4,242	110.7	264.8

Source: SMMT analysis of IEA Global EV Outlook 2020 data.

Misalignment between cars and public chargers

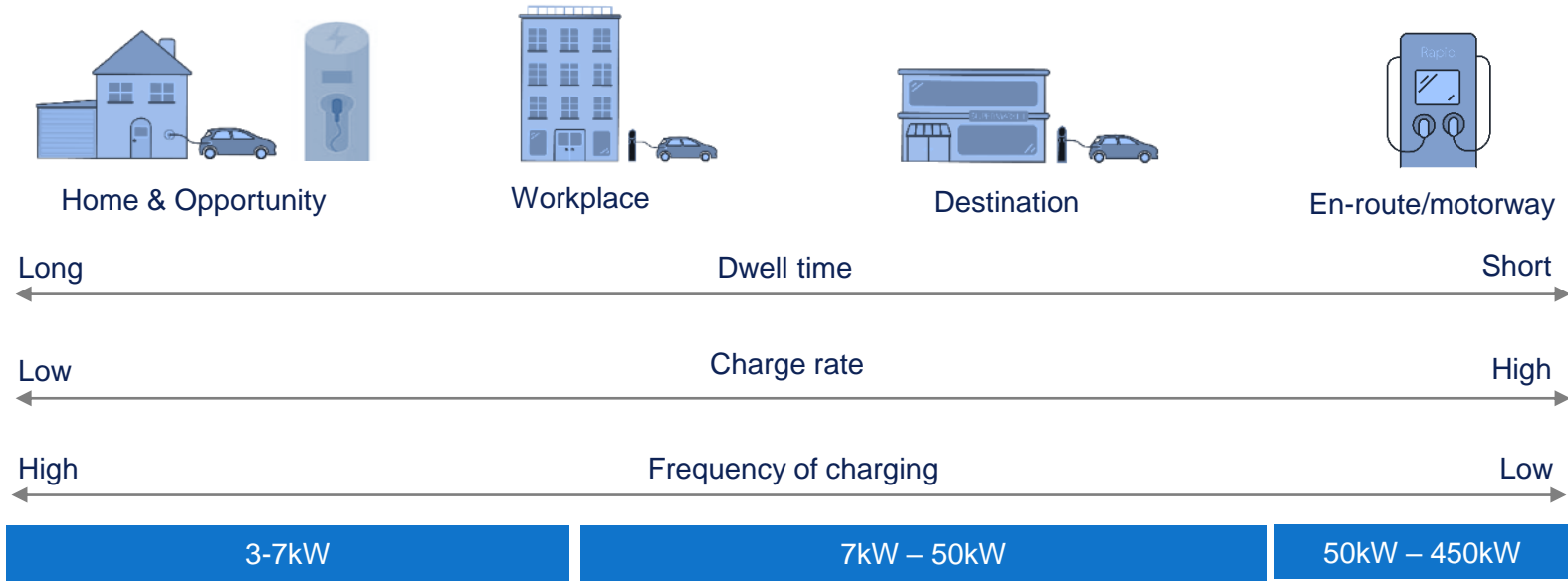
Plug-in vehicle parc and home and public chargepoints, 2019



Source: SMMT analysis using ZapMap and OLEV data.

It's also about the right chargers in the right places

- Faster isn't necessarily better. It's about the right amount of dwell time, hence the need for an optimum mix.
- Infrastructure barrier can be deemed to have been overcome when consumers no longer **perceive** it as a barrier to owning/using EVs.





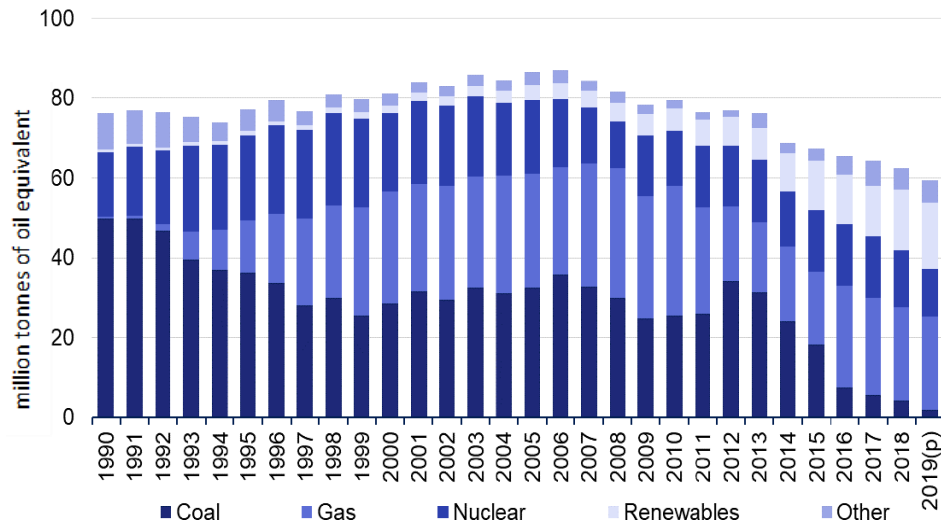
But if we are to truly decarbonise...

...we mustn't forget...

...that the tailpipe isn't the be-all-and-end-all.

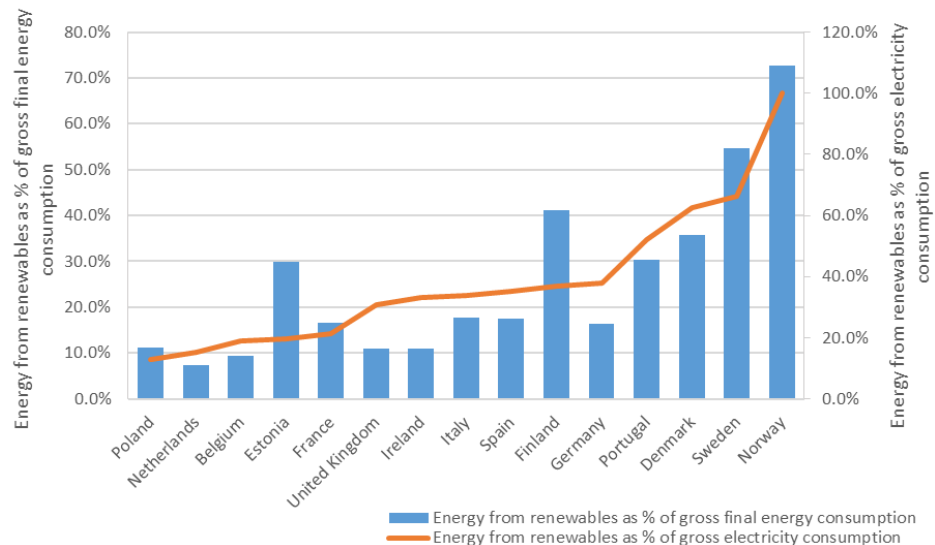
We must ensure the electricity is as clean as the vehicles

Fuel mix for UK electricity generation



Source: Department for Business, Energy and Industrial Strategy and the Office for National Statistics

Share of energy and electricity from renewable sources in gross consumption, 2018



Source: SMMT analysis of Eurostat data

In summary

There's no turning back

The automotive industry is heavily **invested** in electrification.

The cars will be produced

But we must compete with other markets to get the lion's share of **allocation**.

It's the mass market that matters

The pace of EV uptake will depend on **consumer demand** and **supporting conditions**.

Overcoming the 3As is essential

Driving mass market uptake requires addressing the issues of product **affordability**, range **anxiety** and infrastructure **adequacy**.

We're in it together

UK has an opportunity to be both a leading **market** and **production location** of choice for EVs – but we must work together to get it right.

Thank you

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