



Industry
Outlook
Conference

Session Two

Electric Vehicles

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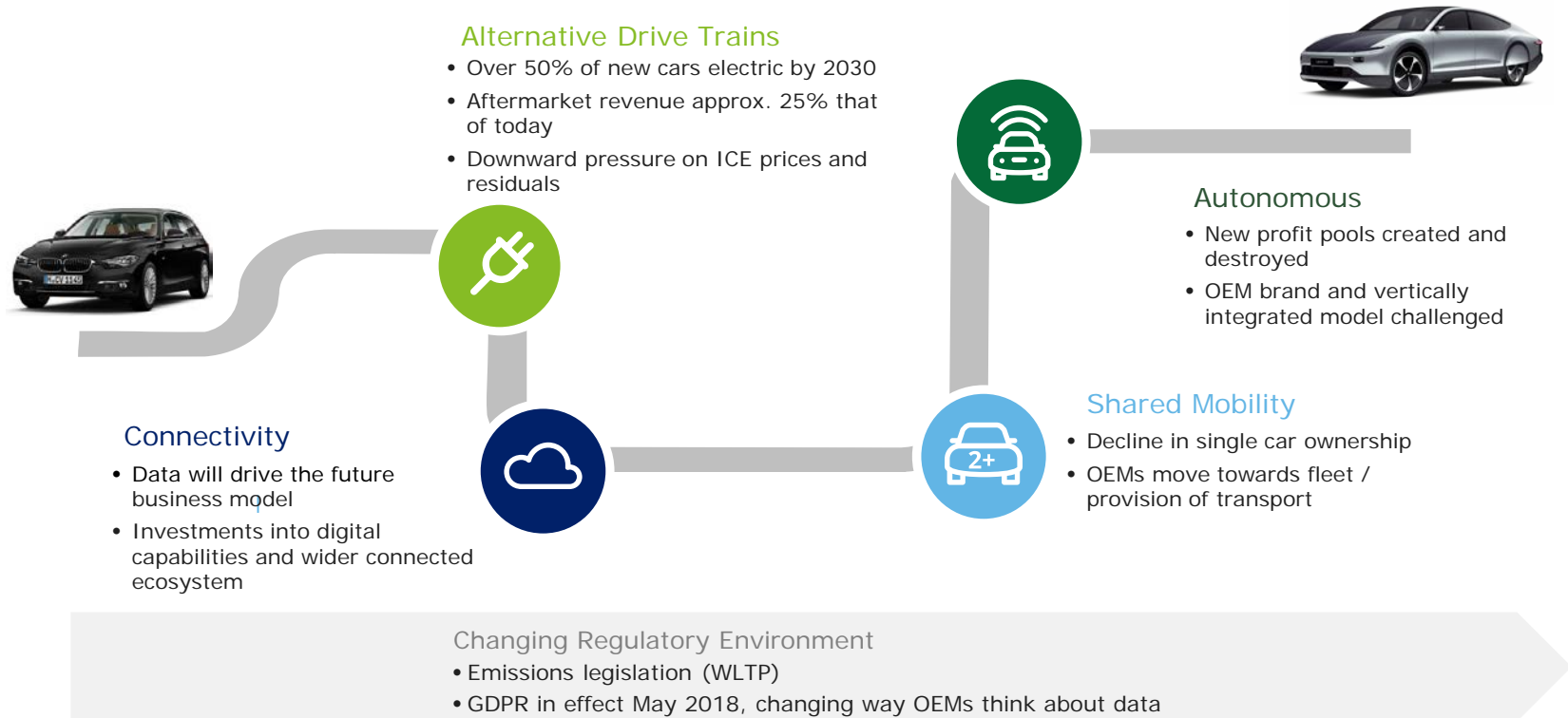
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The rise of EVs in the UK – Are we at a tipping point?

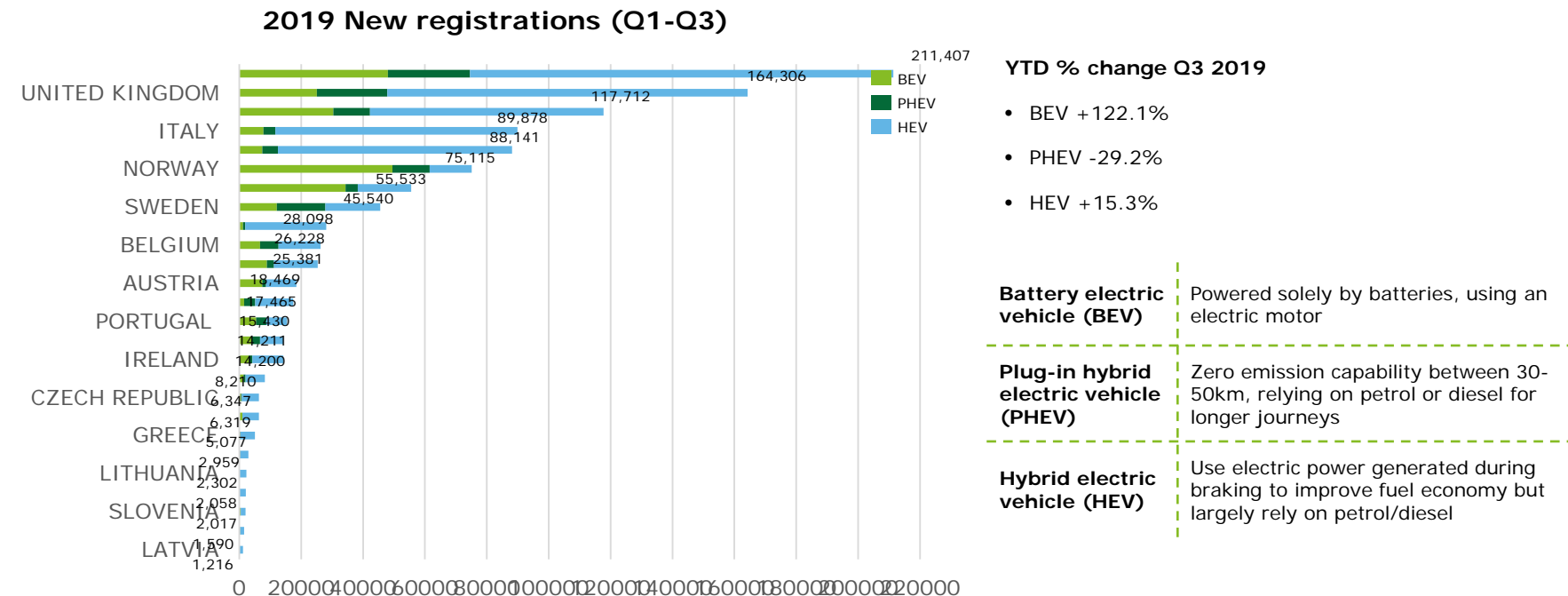
How the Automotive market is being disrupted

The automotive industry is in the midst of historic change – with fundamental readjustments to the entire automotive value chain inevitable



EV sales in Europe

In the UK, the growth rate of Battery Electric Vehicles is doubling month on month, with Hybrid's also continuing to grow. This trend is being repeated across Europe



Note: BEV= Battery electric vehicles, PHEV=Plug-in hybrid electric vehicles, HEV=Hybrid electric vehicles, (HEV) = full hybrids + mild hybrids

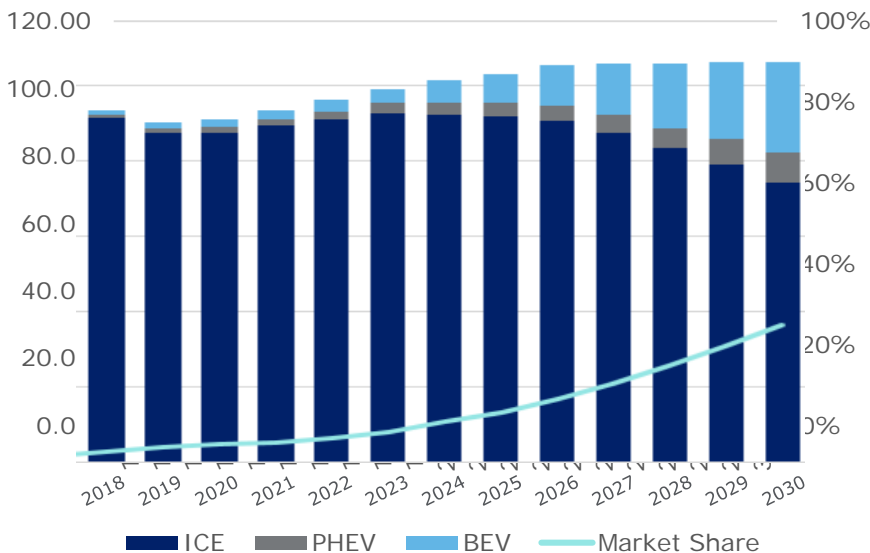
Excluded the data of Czech, Lithuania, Romania with NA data.

Source: ACEA, SMMT

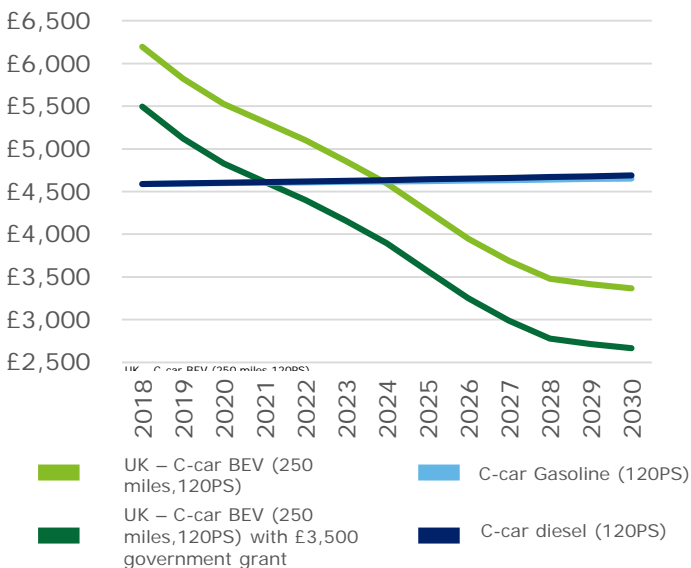
Future BEV sales forecast

We predict the take up of BEVs to continue to grow exponentially, with a tipping point in 2021/2022 as TCO reaches parity with ICO, which will help drive the increase of EV market share to 30% by 2030

Annual Global Passenger Car and Light Duty Vehicle Sales



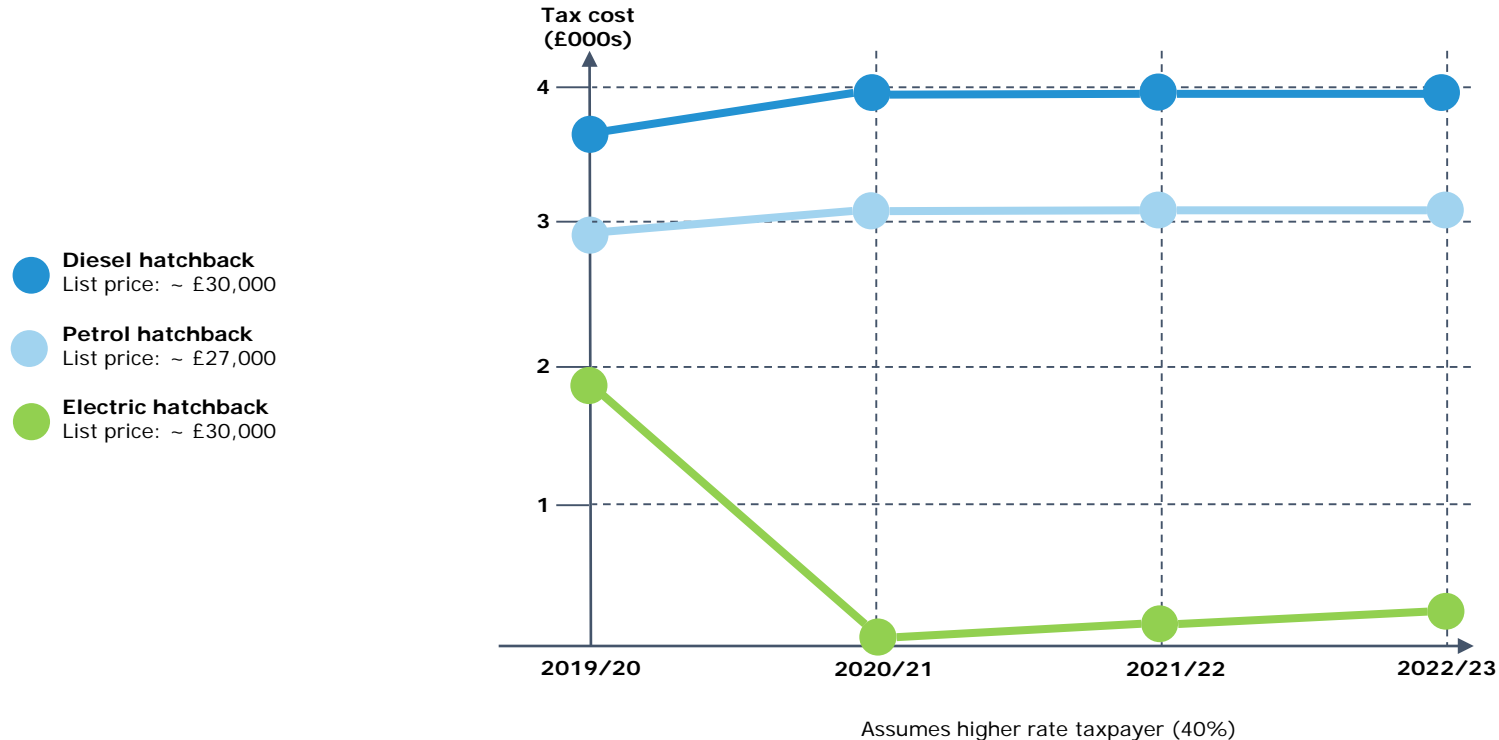
Annual Cost of Ownership in the UK



Assumptions: Cost of ownership is based on 5-year average for volume brand C-segment car, assuming 7,900 annual miles (average UK driver)

New tax incentives to drive increase of BEV and Hybrid

More immediately, we expect the introduction of new company car tax rules and rates in April to drive a significant increase of the take-up of BEVs as a company car



UK EV pipeline

From the supply side, 2021 will see almost 30 new BEVs released in the UK, with major brands starting to move their portfolio to electric. 2021 will also see new OEMs begin to enter the UK market

Brand releases

Not Exhaustive

37 UK EV releases have been confirmed
→ 28 in 2020

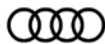
New entrants account for 8 of these releases

The fast-growing SUV segment leads, accounting for **more than a third** of new EVs

Prices are varied, from:
→ <25K (5 models)
→ <40K (13 models)
→ <50K (4 models)
→ 50K+ (12 models)



- **Mini Electric** (supermini)
→ 2020
- **iX3** (SUV)
→ 2020
- **i4** (city car)
→ 2021
- **iNext** (SUV)
→ 2021



- **Audi Q4 e-tron** (SUV)
→ 2020
- **Audi e-tron GT** (coupé)
→ 2021
- **Skoda Citigo-e IV** (city car)
→ 2020
- **Skoda Vision IV** (SUV)
→ 2020



- **e-Up!** (city car)
→ 2020
- **ID.3** (city car)
→ 2020
- **SEAT Mii** (city car)
→ 2020
- **SEAT el-Born** (city car)
→ 2020



- **Porsche Taycan** (supercar)
→ 2020



- **500e** (hatchback)
→ 2020



- **DS3 E-Tense** (SUV)
→ 2020
- **e208** (supermini)
→ 2020
- **e2008** (SUV)
→ 2020
- **Vauxhall Corsa-e** (supermini)
→ 2020
- **Masserati Alfieri** (coupe)
→ 2020



- **ZE50** (city car)
→ 2020



- **Honda e** (city car)
→ 2020
- **Mercedes EQA** (hatchback)
→ 2020



- **Jaguar XJ** (saloon car)
→ 2020



- **Kia Soul EV** (SUV)
→ 2020



- **Mustang Mach-E** (SUV)
→ 2020



- **MX-30** (SUV)
→ 2020



- **Model 3** (SUV)
→ 2020
- **Model Y** (SUV)
→ 2021
- **Roadster** (supercar)
→ 2021
- **Cybertruck** (-)
→ 2022



- **Byton M-Byte** (SUV)
→ 2021



- **Volvo XC50 Recharge** (SUV)
→ 2020
- **Polestar 2** (compact exec)
→ 2020



- **Lucid Air** (sedan)
→ 2022



- **C_Two** (hypercar)
→ 2020



- **Battista** (hypercar)
→ 2020



- **Lexus UX 300e** (SUV)
→ 2021

Charging Infrastructure

However, EV Infrastructure is lagging behind expected demand with significant public and private investment required to develop the required charging network

Infrastructure investment required

£1.6BN investment

2018



- EV's represent 2% of all vehicles sold
- Currently **16,500 public charge points** (90% slow charge)
- UK Government has currently committed **£300 Million** in developing infrastructure

2030



- Government target – EV's represent 30% of all vehicles in circulation ~ 11.5M
- **28,000 charge points required** (40-45% fast / super fast)
- **£1.6BN** required investment



Challenges

- Public charging points are essential to overcome **range anxiety**
- At current EV volumes, **charging is not profitable**
- Ultra-fast charging places significant **strain on the national grid**, but is essential to ensure rapid EV uptake



Funding models

- **Public funded incentive model** – Public funding to reduce private costs (purchasing and installation)
- **Utility model** – Electricity distribution companies finance EV infrastructure and recover cost through electricity tariffs.
- **Integrated charging model** – Private companies partner with EV charging providers to host charging points on their premises



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David Watts

Senior Consultant, Arval UK

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PLUGGED IN FLEETS

A QUICK OUTLOOK

DAVID WATTS
December 5th 2019



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What's the average

<https://ev-database.uk/cheatsheet/range-electric-car>



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Global Plug-in Vehicle Growth is Accelerating

1st Million:
20 Years

2nd Million:
18 Months

3rd Million:
8 Months

2018:
2,018,247
vehicles

2019 H1:
1,134,000
vehicles



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UK Car Registrations

Year to date					
	YTD 2019	YTD 2018	% change	Mkt share -19	Mkt share -18
Diesel	515,054	653,736	-21.2%	25.7%	31.7%
Petrol	1,306,948	1,278,625	2.2%	65.2%	61.9%
BEV	28,259	12,555	125.1%	1.4%	0.6%
PHEV	25,892	35,317	-26.7%	1.3%	1.7%
HEV	85,871	73,734	16.5%	4.3%	3.6%
MHEV diesel	22,741	2,537	796.4%	1.1%	0.1%
MHEV petrol	20,757	7,915	162.2%	1.0%	0.4%
TOTAL	2,005,522	2,064,419	-2.9%		



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Fleet is not leading the way



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The Automotive Industry
is going to change more
in the next 5 years than
in the last 50



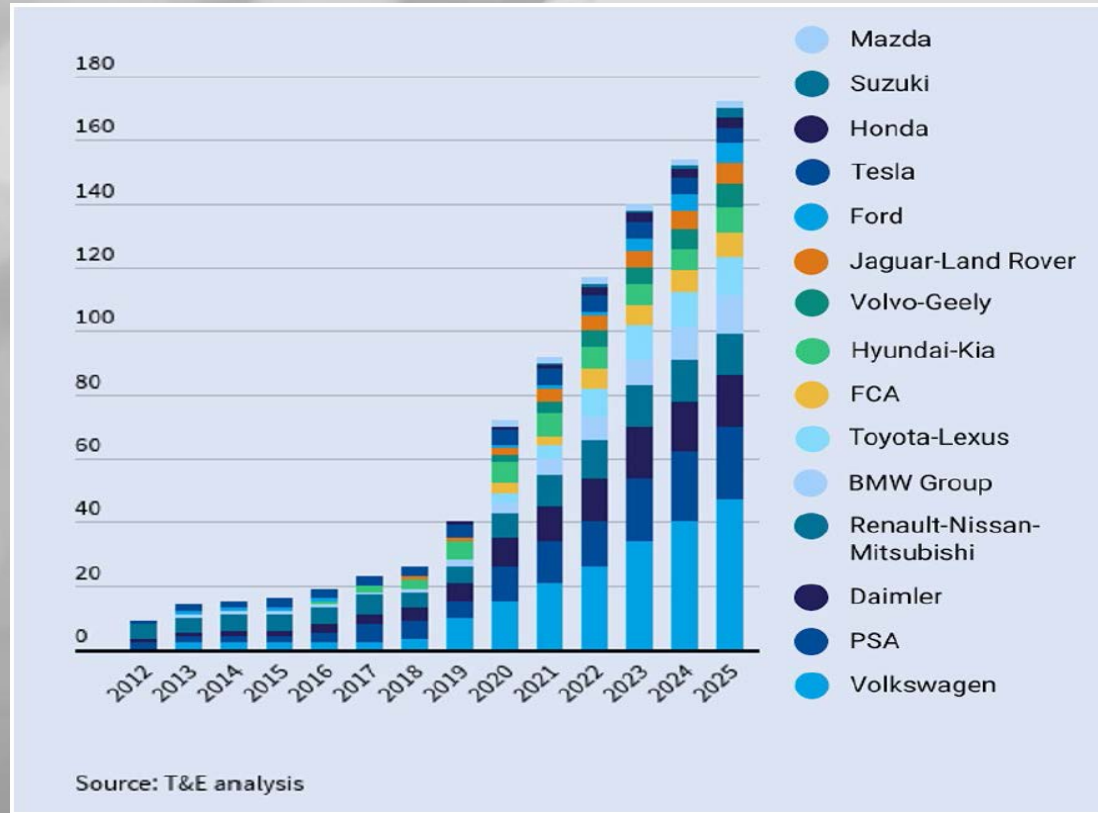
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Real Tax Incentive



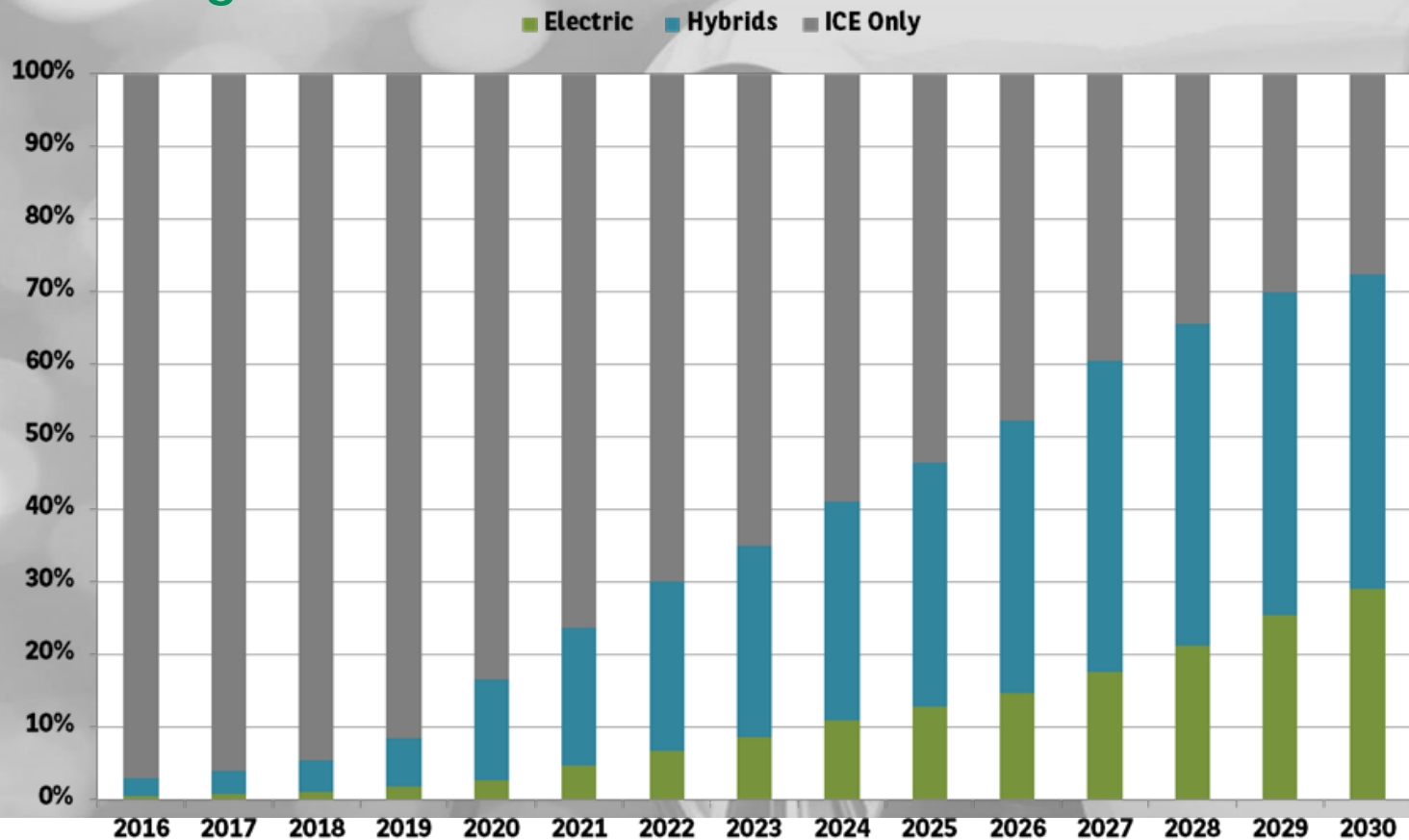
Number of BEV models coming to the European market



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European Registrations Forecast (LMC Automotive)



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Short term change in vehicle expectations

Brand



Premium



Volume

Segment



BMW X5



Jaguar iPace



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- Tax drives behaviour
- Senior Management engagement will push company policy
- The fleet model mix will change in the short term
- Price parity with ICE will be here in 3 - 5 years
- EVs on fleet will snowball



Thank you



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Dr Giulia Privitera

Low Carbon Technologies Delivery Manager, UK
Power Networks

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Driving Change

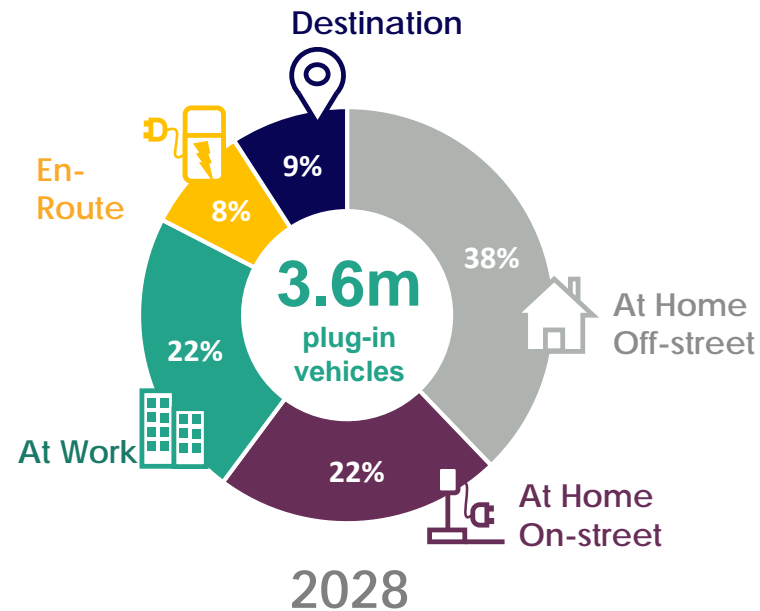
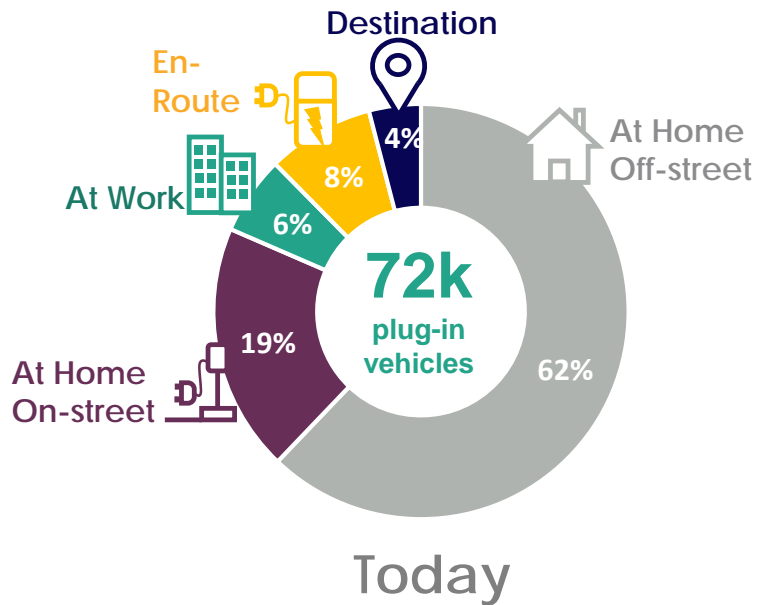
How we are enabling the transition to commercial electric vehicles

Dr Giulia Privitera

05 December 2019



Understanding charging segments



Our EV strategy

Enabling the decarbonisation of transport and improving air quality

Appropriate
investment tools

Customer
experience

Network
readiness



Commercial Solutions

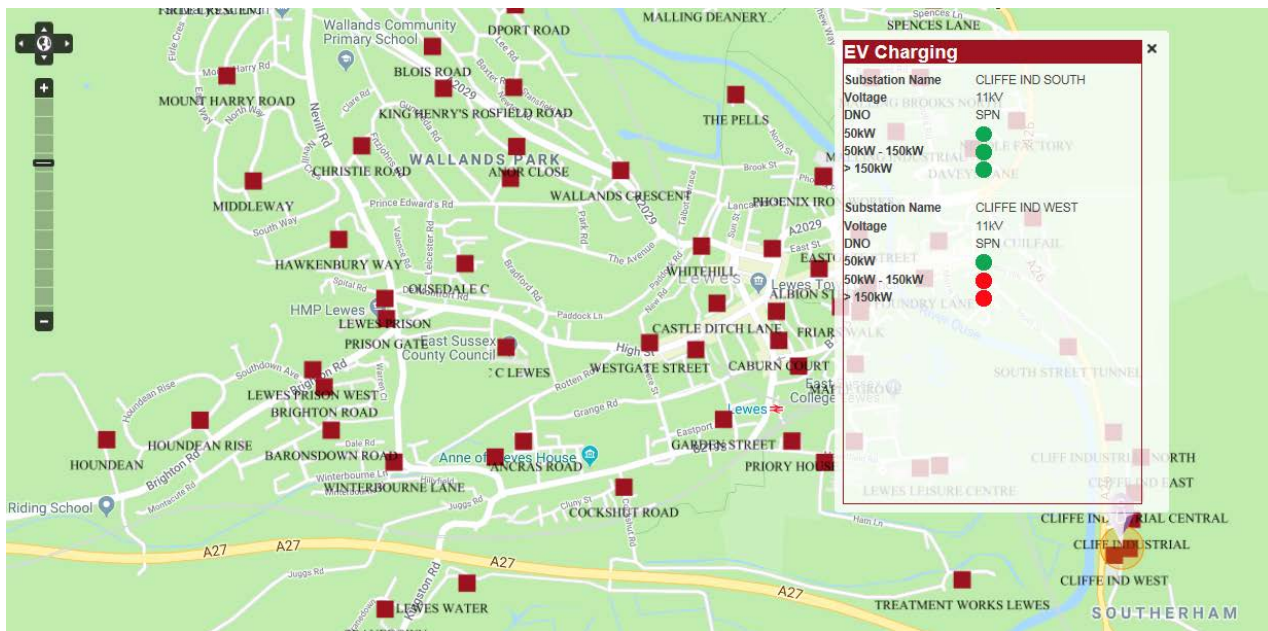


Enablers



Technical Solutions

Sharing data



Substation EV heat map (Industrial Park, Lewes, East Sussex)

Accelerating fleet transition

Home Charging



Depot Charging



Mixed Charging



Photo: Casey Gutteridge/Uber/PA/CC BY-SA 3.0

centrica



HITACHI
Inspire the Next



Scottish & Southern
Electricity Networks

Uber

The questions we are answering

How do we quantify and minimise the network impact of commercial EVs?

What is the value proposition for smart solutions for EV fleets and PHV operators?

What infrastructure (network, charging and IT) is needed to enable the EV Transition?

Outputs & benefits



The world's largest **dataset** on commercial EV usage and charging



A solution for home charging of commercial EVs, with separate billing & flex aggregation



A suite of tools, e.g. **depot planning model**, allowing an easier switch to EV



'**Profiled Connection**' enabling more efficient use of network capacity



By 2030, Optimise Prime will deliver savings of:

£207m

through optimised connection cost and deferred reinforcement

Deploy smart

Stakeholders informed our position on smart charging



Office for
Low Emission
Vehicles



octopusenergy



SMMT
DRIVING THE
MOTOR INDUSTRY



Imperial College
London



Driving Change

UK Power Networks

Facilitating Electric Vehicles



Shift – Smart charging trials

To investigate how DNO can support the **market** to manage smart charging

Flexibility
Procurement



Capacity
based pricing

octopus
energy

Time of Use
DUoS

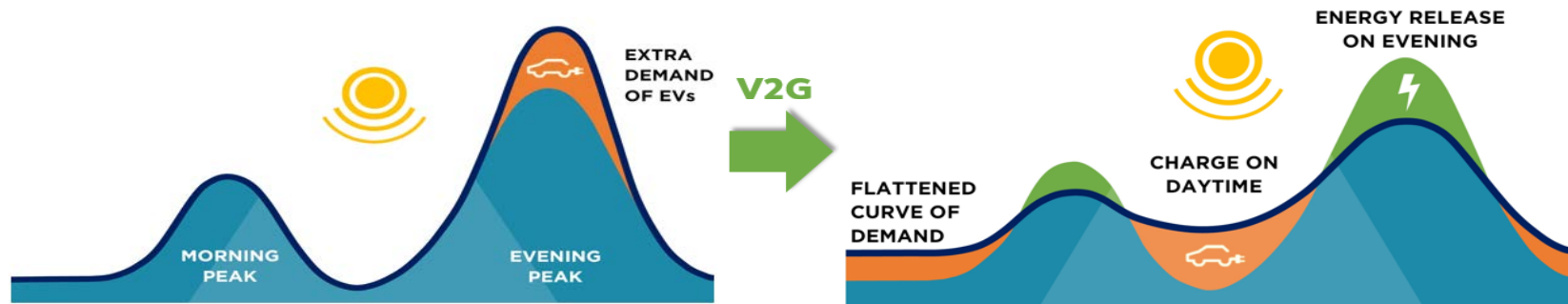


Market trials (2019-20)

Interim solutions (2021-23)

Industry-wide solutions (2023+)

TransPower – V2G portfolio



e4future



1,000 fleet chargers

Bus2Grid



30 e-bus garage

V2Street



upside

Research & Development

PowerLoop

octopus

135 domestic chargers

Sciurus



Advisor

Commercial Fleets 'at work'

Public 'on route'

Residential 'at home'

Conclusions

Investing time and money to ensure we're ready for EVs

Data and innovation are key in the EV transition

Developing a suite of solutions to enable the transition

Thank you

