

Automotive industry in the United Kingdom

Iain Lindsay, OBE
HM Ambassador to Hungary



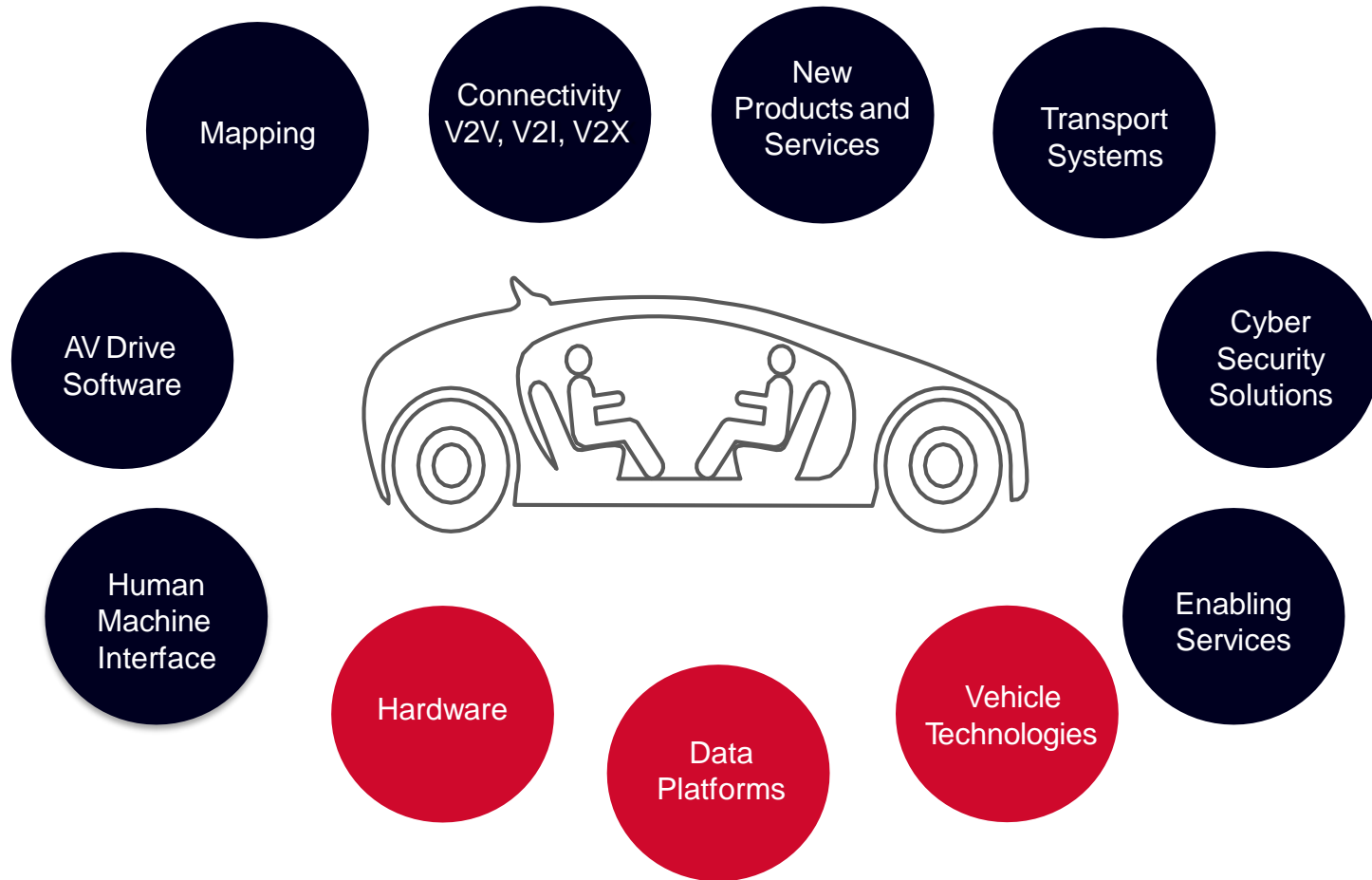
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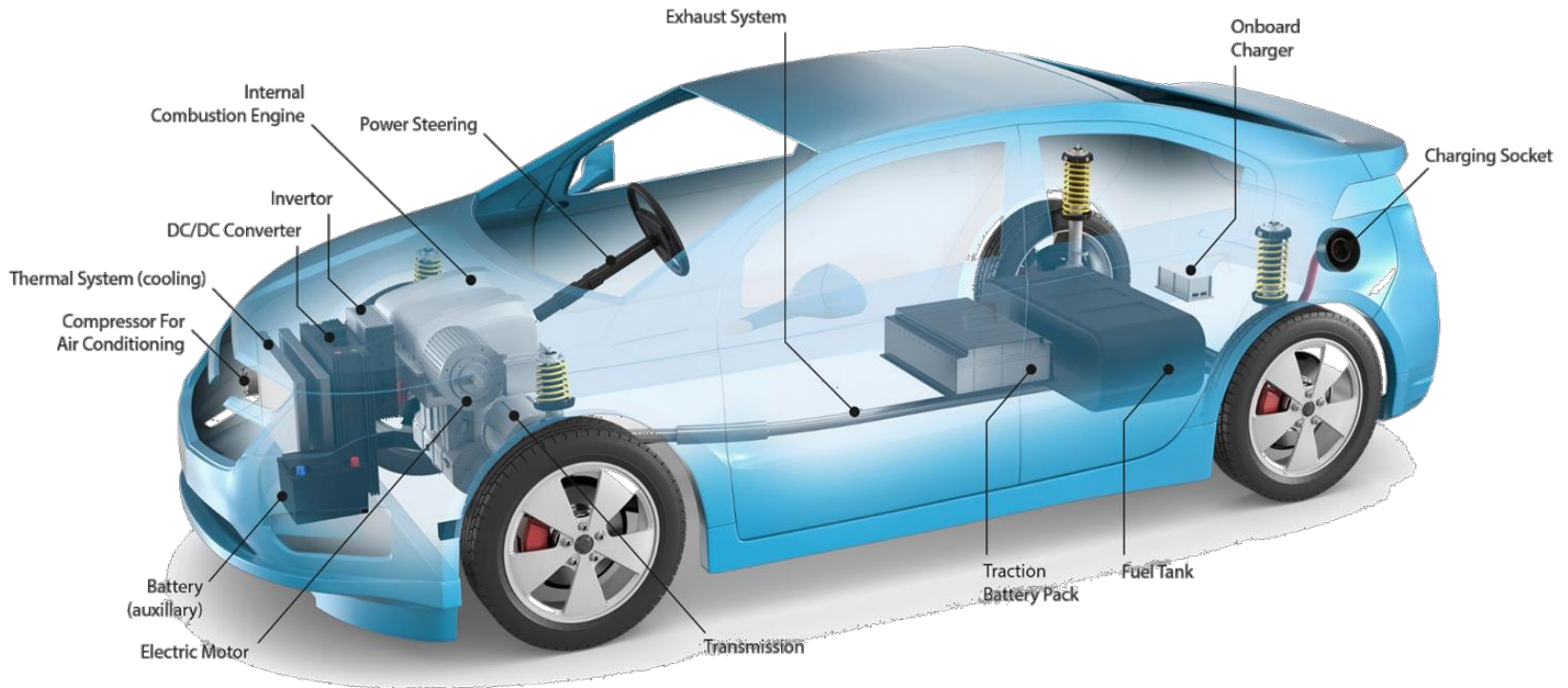
The Automotive Value Chain is Changing



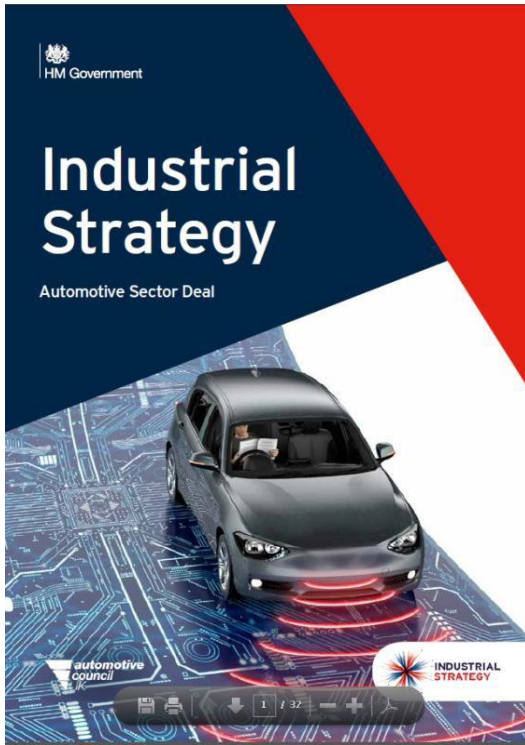
Success is dependant on a comprehensive approach



Electric Vehicles New Supply Opportunities



UK Automotive Sector Strategy and Deal



AI & Data Economy

We will put the UK at the forefront of the artificial intelligence and data revolution



Clean Growth

We will maximise the advantages for UK industry from the global shift to clean growth



Future of Mobility

We will become a world leader in the way people, goods and services move



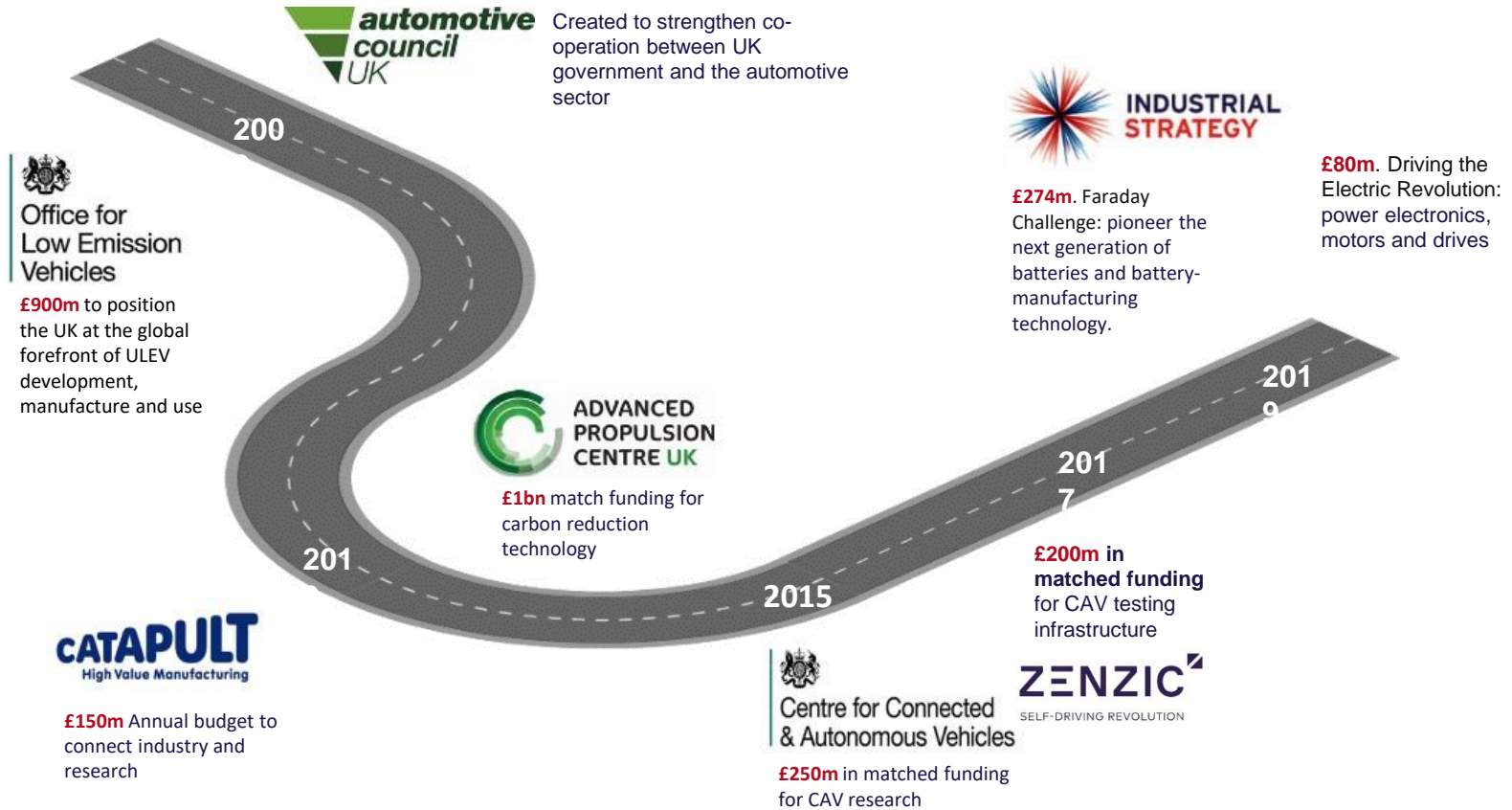
Ageing Society

We will harness the power of innovation to help meet the needs of an ageing society

The government wants to see fully self-driving cars on the UK roads by 2021



Overall circa £2.5bn to automotive by the govt.





R&D Strategy for Automotive - Three Priorities

Low Carbon Propulsion

- UK invented lithium-ion battery at Oxford University in 1980s
 - All cars in UK to be hybrid or full electric by 2040
 - Britain to be a world leader in battery development/manufacture
-



Lightweight materials and structures

- JLR is the most intensive aluminum car manufacturer in world
 - UK developed carbon fibre for automotive in 1981
 - New lighter battery packs under development
-



Connected and Autonomous Vehicles

- Most progressive testing environment of any major country
- European leader in IT and AI
- Open data approach by public sector for MaaS





HVM Catapults – getting research to market

Providing research facilities and expertise to business

The network of High-Value Manufacturing (HVM) Catapults was established to bridge the gap between business and academia. There are seven HVM Catapults: six of which have experience in automotive (the seventh being the Nuclear Catapult).

The Manufacturing Technology Centre (MTC) Coventry

The MTC specialises in manufacturing technologies and processes including automation technologies for the automotive sector. A key focus is to improve production efficiency via digital manufacturing. <http://www.the-mtc.org/>

The Centre for Process Innovation (CPI) Wilton

The CPI is a leader in printable electronic technology, enabling manufacturers to embed displays, lighting and touch sensors onto a car's curved surfaces. The Centre also provides expertise in flexible printed sensors to measure pressure, temperature and movement, and to monitor structural integrity. <https://www.uk-cpi.com/>

National Composites Centre (NCC), Bristol

£200m investment in capabilities and 350 specialist composite engineers, designers and technicians make the NCC a world-leading centre of innovation in composite technology. <https://www.nccuk.com/>

Advanced Manufacturing Research Centre (AMRC), Sheffield

The AMRC focuses on advanced machining and materials research for high-value manufacturing sectors. Their Factory 2050 is the UK's first factory dedicated to conducting collaborative research into reconfigurable digitally assisted assembly. <https://www.amrc.co.uk/>

Advanced Forming Research Centre (AFRC), Glasgow

The AFRC is the UK's leading institution for forming and forging. It covers the full product development cycle from materials characterisation to product testing. <https://www.strath.ac.uk/research/advancedformingresearchcentre/>

WMG (formerly Warwick Manufacturing Group), Warwick

WMG is the automotive battery technology centre for the UK. It has scale up facilities for developing both new types of battery cells and new designs of battery packs. WMG is also the co-host (with Culham, Oxford) of the £65 million Faraday Institution, which drives fundamental research in developing and applying battery technologies. https://warwick.ac.uk/fac/sci/wmg/research/advanced_propulsion_systems/

Case Study: Collaboration leads to McLaren expansion

In 2019 the £50m McLaren Composites Technology Centre opened at the AMRC, enabling McLaren to make its own carbon-fibre bodyshells. It is the result of extensive co-operation with the AMRC to develop new production technologies and puts McLaren at the forefront of automotive carbon-fibre manufacturing.

Other automotive-related Catapults and institutions

National Automotive Innovation Centre (NAIC), Warwick

At 33,000m² the NAIC is the largest research centre of its kind in Europe with 1,000 staff working across design, engineering and research, as well as future engineers on degree programmes. NAIC enables industry to work side-by-side with academics on research into advanced powertrain, chassis, body, and simulation and visualisation

<https://warwick.ac.uk/fac/sci/wmg/naic>

Connected Places Catapult (CPC), Milton Keynes and London

The CPC focuses on growing businesses with innovations in mobility services and the built environment that enable new levels of physical, digital and social connectedness. It connects the disparate parts of the market to help innovators navigate the complexity of creating new commercial opportunities in this complex environment

<https://cp.catapult.org.uk/>

Compound Semiconductor Applications Catapult (CSA), Newport

Compound semiconductors combine two or more elements to create capabilities that cannot be achieved with conventional silicon devices, delivering major performance improvements in power, speed, latency and signal quality. This makes them ideal to use in areas such as power electronics and motors for electrified vehicles,

<https://csa.catapult.org.uk/>

Centre of Excellence for Sustainable Advanced Manufacturing (CESAM), Sunderland

Due to open at the end of 2019, CESAM is located next to the Nissan factory on the International Advanced Manufacturing Park. It will enable North East-based companies to de-risk innovation and overcome barriers to adoption. It will form collaborative projects, which access expertise in the catapult network and beyond, and will have a particular focus on motors and drives for electric vehicles.





UK Automotive R&D Centres

Automotive Research Funding Hubs

1	APC - Advanced Propulsion Centre	Coventry	Low Carbon Propulsion & Lightweighting
2	C-CAV - Centre for Connected & Autonomous Vehicles	London	CAV Development
3	Innovate UK	Swindon	Materials Technology

Commercial Engineering Centres /Technology Parks

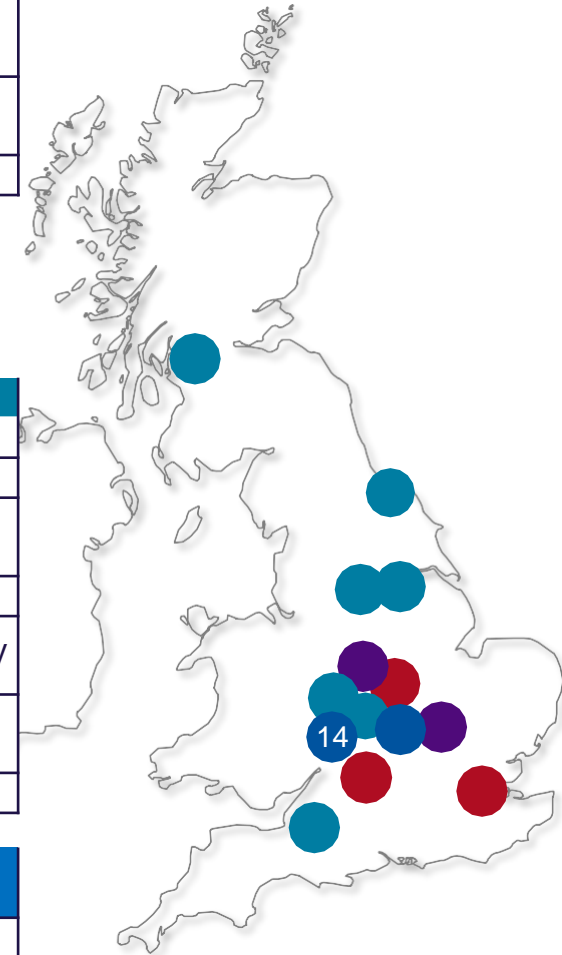
4	Horiba MIRA	Nuneaton
5	Millbrook	Millbrook

High Value Manufacturing Catapults

6	AFRC - Advanced Forming Research Centre	Strathclyde	Metal Forming
7	CPI - Centre for Process Innovation	Wilton	Printed Electronics
8	AMRC - Advanced Manufacturing Research Centre	Sheffield	Castings, Integrated Manufacturing
9	MTC - Manufacturing Technology Centre	Coventry	Intelligent Automation
10	WMG - Warwick Manufacturing Group	Warwick	EV's, Batteries & CAV
11	NAMRC	Sheffield	Nuclear AMRC
12	NCC - National Composites Centre	Bristol	Composites

Other

13	TSC - Transport Systems Catapult	Milton Keynes	Intelligent Mobility
14	NAIC – National Automotive Innovation Centre	University of Warwick	Innovative R&D for greener, smarter, lighter transport





Motorsport the laboratory for future technologies

The advantage of a strong motorsport cluster

Motorsport Valley in the UK is the undisputed leader in global motorsport. Six out of 10 Formula 1 teams are based here, it is the home of Formula E, and is the leading international supplier to racing series around the world. Competition drives innovation and these companies invest around 30% of revenues in R&D, an investment that also reaps benefits for automotive companies working in the UK.

Engineering Skills

Over 25,000 highly skilled engineers work in Motorsport Valley and 30 UK universities and over 140 colleges are now teaching motorsport helping to safeguard the future of these skills.

Technology transfer

The technology of racing cars and road cars is converging – for example, the hybrid engines/batteries of Formula 1 cars are pioneering advances in hybrid road cars. Many motorsports companies are now focusing on road car technology, as they see the growing opportunity to shape the future of road cars. This includes Formula 1 operations such as McLaren Advanced Technologies and Williams Advanced Engineering, as well as examples from other branches of motorsport, such as Prodrive, RML and Delta Motorsport.

Case study: Formula E accelerates battery development



Formula E, for electric racing cars, is the world's fastest growing motor racing series. Started in 2014, its UK suppliers provided the world's most power-dense batteries. In the following four years, the UK battery supplier doubled the range of what was already the world's most advanced electric vehicle battery.

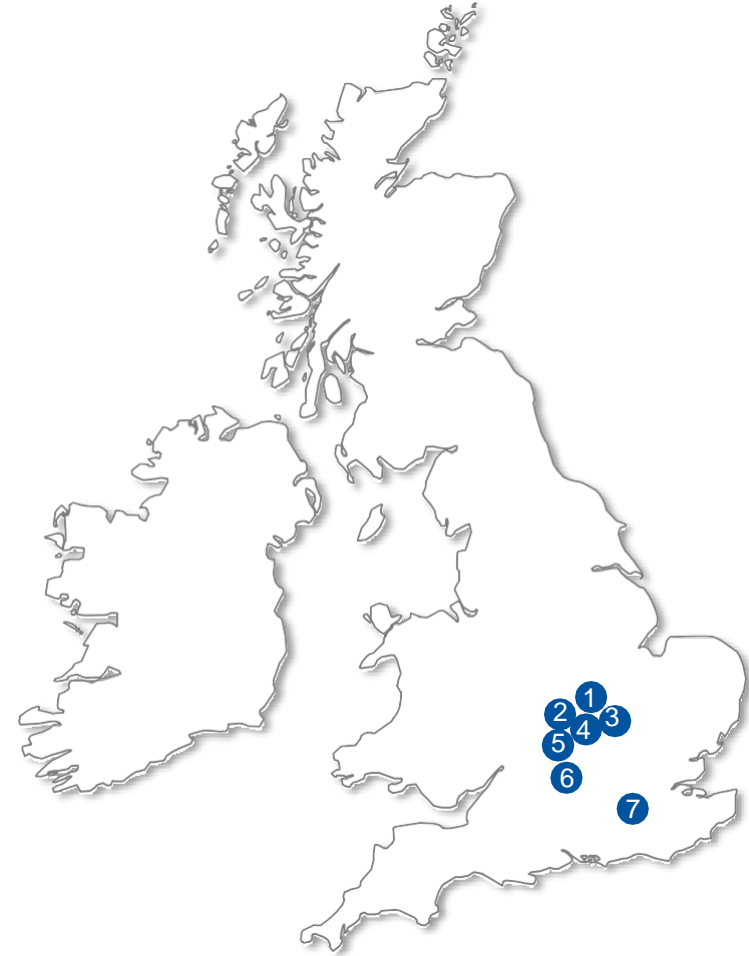
The technology behind these batteries is now going into production through Hyperbat, a joint-venture between Williams Advanced Engineering (part of Williams Formula 1) and Unipart, a UK Tier One.



UK Automotive Industry – Motorsport Valley



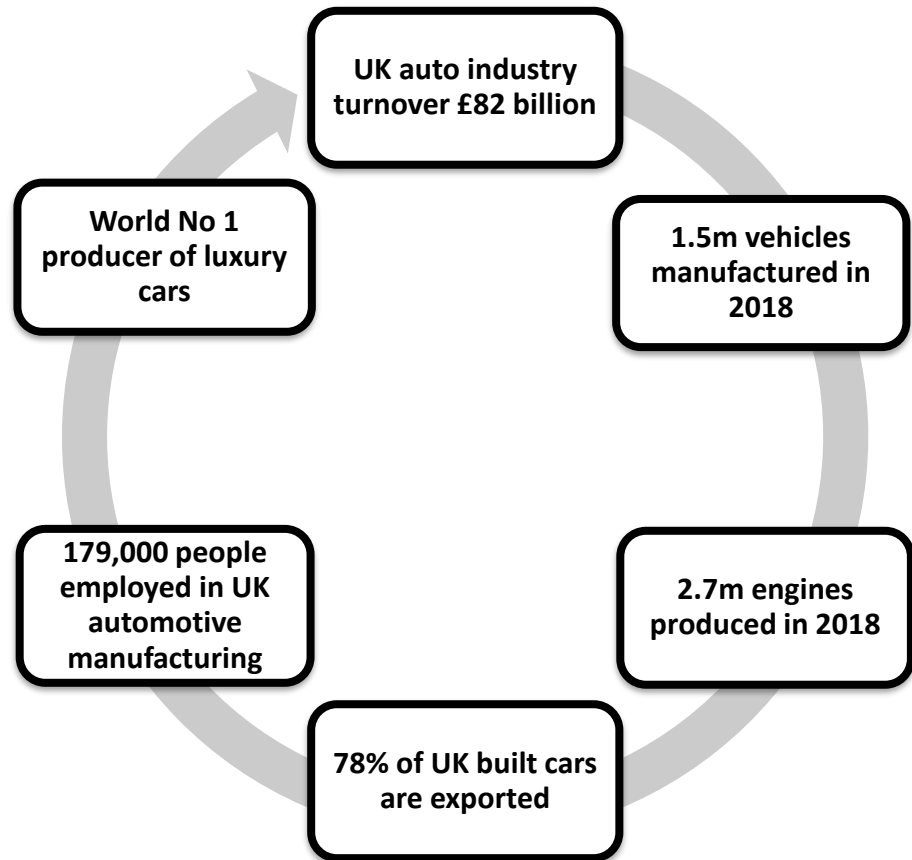
#	F1 Team	HQ Location
1		Silverstone
2		Banbury
3		Milton Keynes
4		Brackley
5		Enstone
6		Grove
7	McLAREN HONDA	Woking



- Turnover of £9bn, R&D spend of £2.25bn
- 4,500 companies, 25,000 engineers, 87% of companies export
- 6 of 10 Formula 1 teams have a UK HQ, plus home of Formula-e

UK Automotive Industry – An Overview

- A highly competitive economy (World No. 8, World Economic Forum)
- The most flexible labour force in Europe and the best country in Europe for industry/university co-operation (Automotive Council survey, 2018)
- Four of the Top 10 research universities in the world
- World's largest motorsport cluster
- World-class cluster of automotive engineering consultancies
- Number 2 in Europe for automotive productivity
- Lowest labour costs in Western Europe
- Major government investment into automotive (over £2 billion plus) with spending priorities guided by the industry
- World's largest manufacturer of luxury and specialist cars
- First European manufacturer of both electric vehicles and battery packs





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