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**Manufacturing for Growth
The Changing Face of Automotive**

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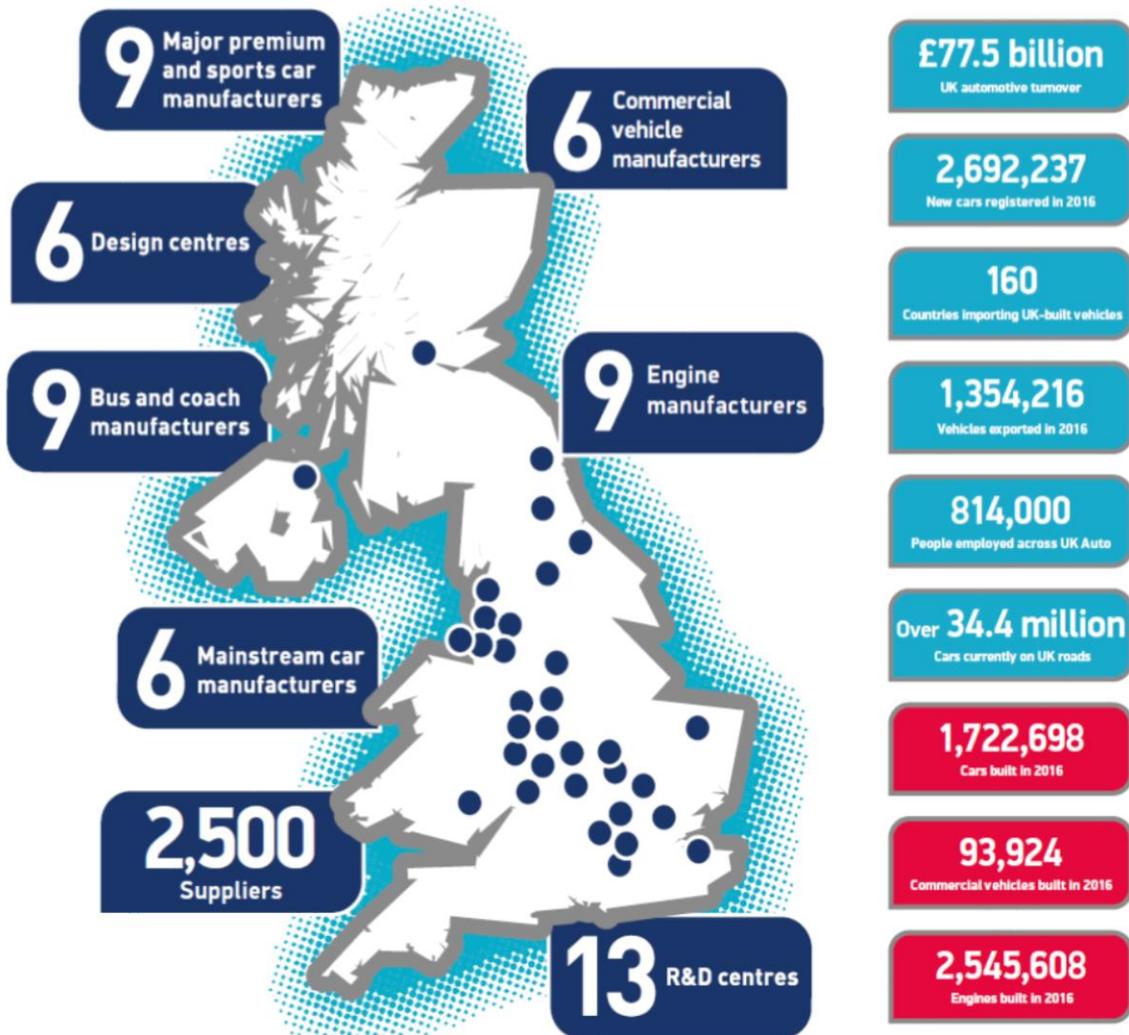
PAST, PRESENT AND FUTURE



Value of the UK Automotive Industry

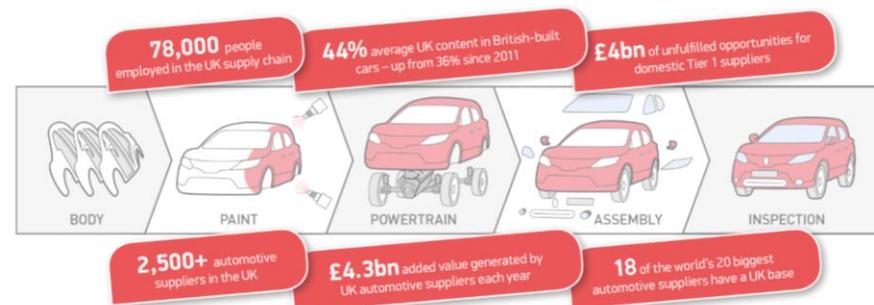
UK AUTOMOTIVE AT A GLANCE

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UK AUTOMOTIVE SUPPLY CHAIN

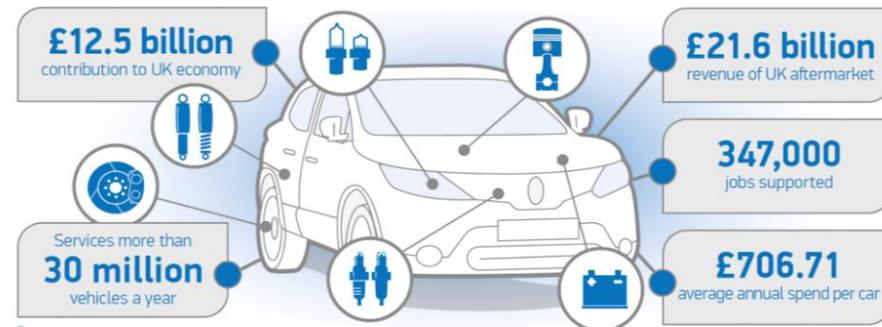
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UK AUTOMOTIVE AFTERMARKET

CONTENTS

The Importance of the Aftermarket to the UK Economy



The Automotive Council was formed in 2009 and is a joint industry and government collaboration to strengthen the UK automotive sector

Automotive Council UK

Approach:



The Automotive Council was formed in 2009. It aims to strengthen and promote sustainable growth of the automotive sector in the UK through enhanced dialogue and co-operation between UK government and automotive industry. Key objectives include:

- Define, enable & deliver the right technologies
- Optimise business environment for the UK automotive sector
- Address skills challenges facing the sector

THE ADVANCED PROPULSION CENTRE IS A 10 YEAR CO-INVESTMENT PARTNERSHIP BETWEEN GOVERNMENT AND INDUSTRY



Department for
Business, Energy
& Industrial Strategy



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FUNDING.
EXPERTISE.
COLLABORATION.

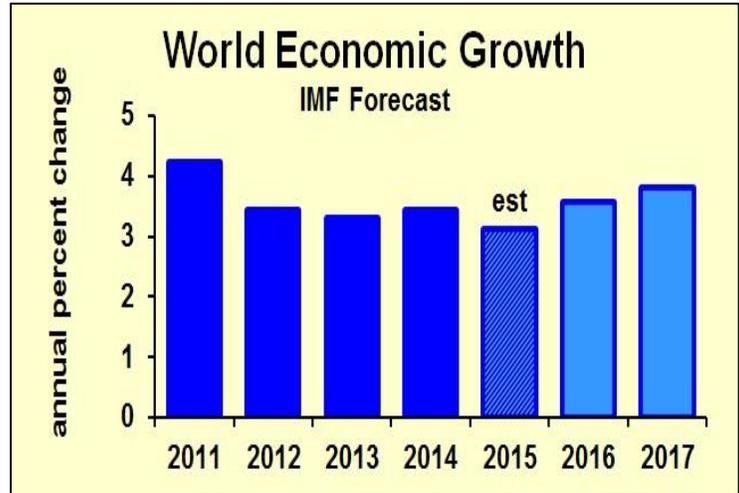
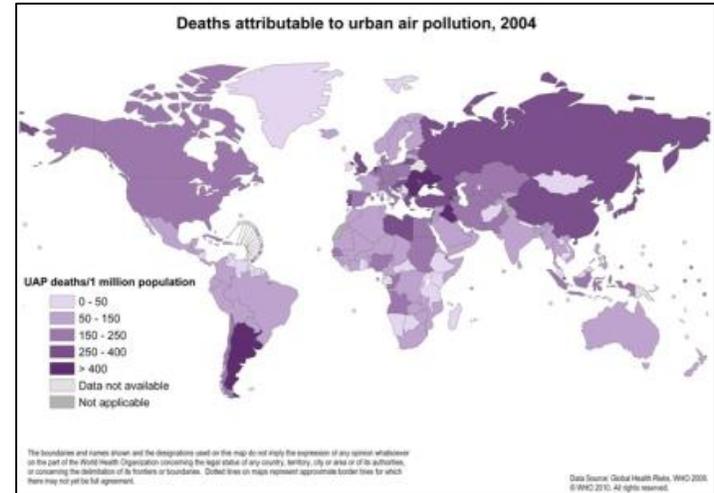
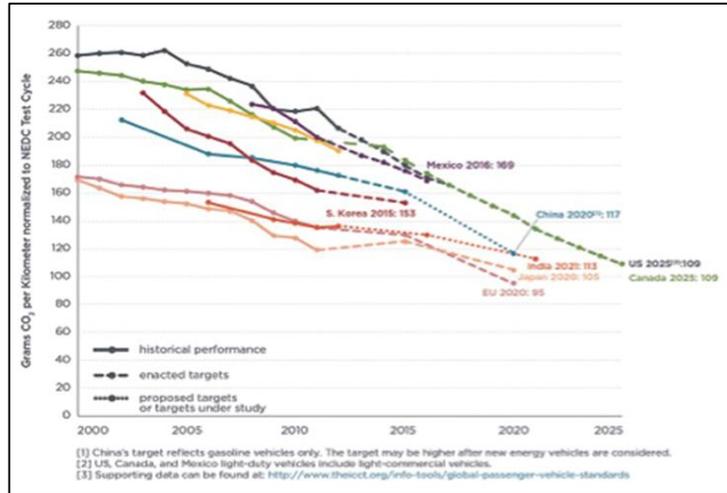


£1 BILLION
IN PROJECT
FUNDING

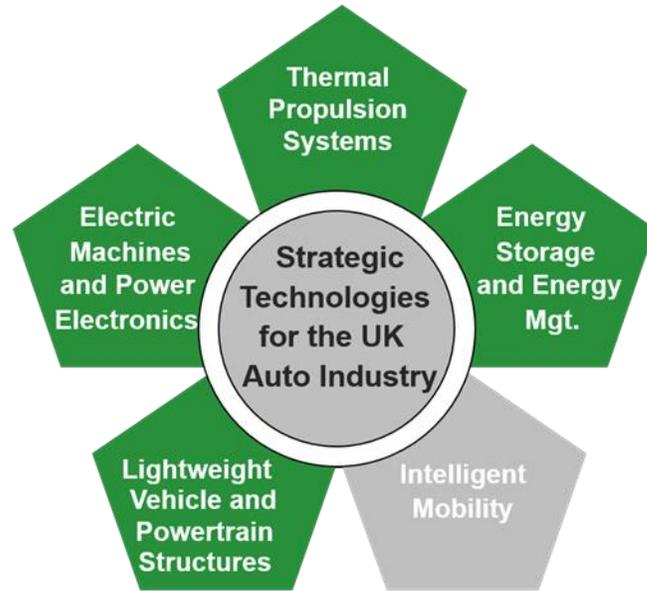


10 YEAR
SUPPORT
INITIATIVE

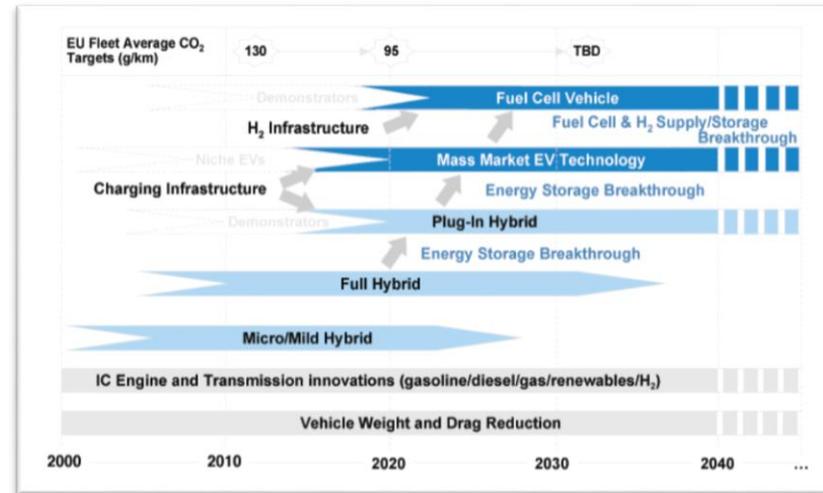
TRENDS AND CHALLENGES



ROAD-MAPPING LOW CARBON TECHNOLOGY TRENDS



2009



The roadmaps are intended to:

- Provide a global view of the key technology trajectories in low carbon propulsion and low emissions
- Provide a common foundation for academia and industry to assess opportunities and threats, and to engage with government on the need for investment and support to address these
- Guide technology developers and provide confidence to their investors regarding industry trajectory

The roadmaps are not intended to:

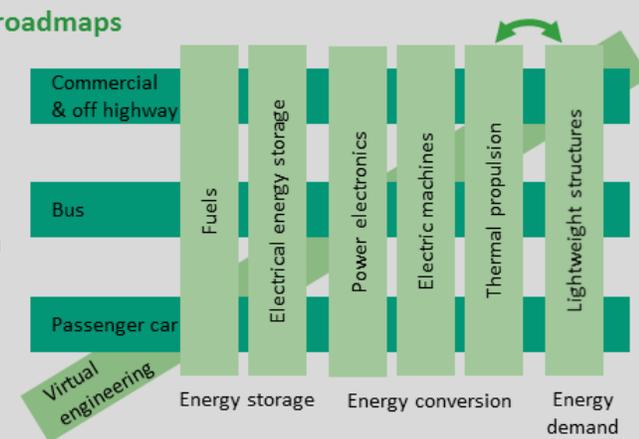
- Assess the UK's capability to deliver on the identified technology streams
- Map out skills, supply chain, financing or policy & regulation requirements. The roadmaps can be used to identify specific needs in these areas separately

Interactions between roadmaps

All technology and product roadmaps interact

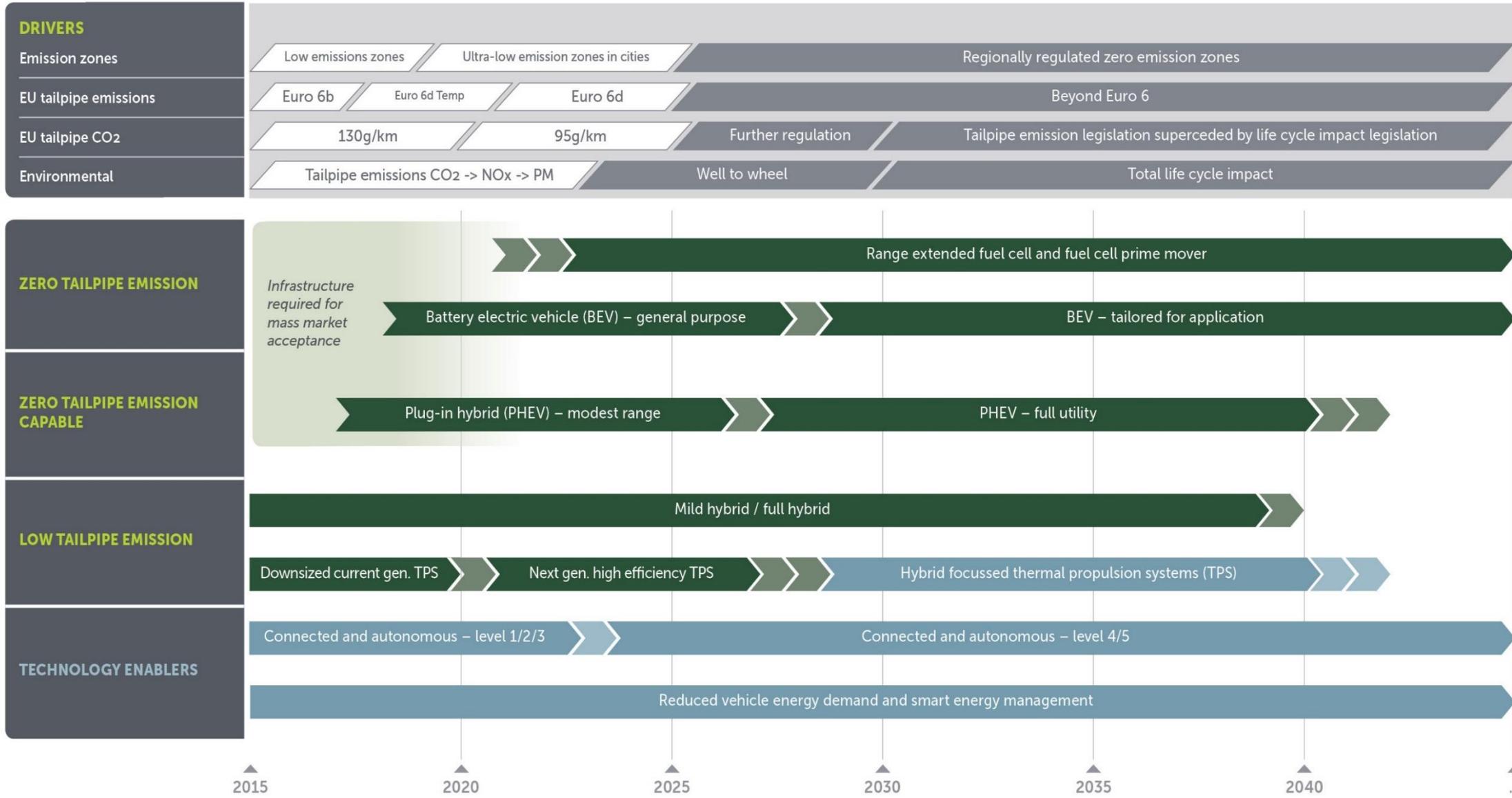
Each roadmap have their strongest interactions with each other identified

The relevance of each roadmap for different vehicle applications are also identified



PRODUCT ROADMAP 2017: PASSENGER CAR

Roadmap developed by the Automotive Council and the Advanced Propulsion Centre



Driver set / Driver predicted

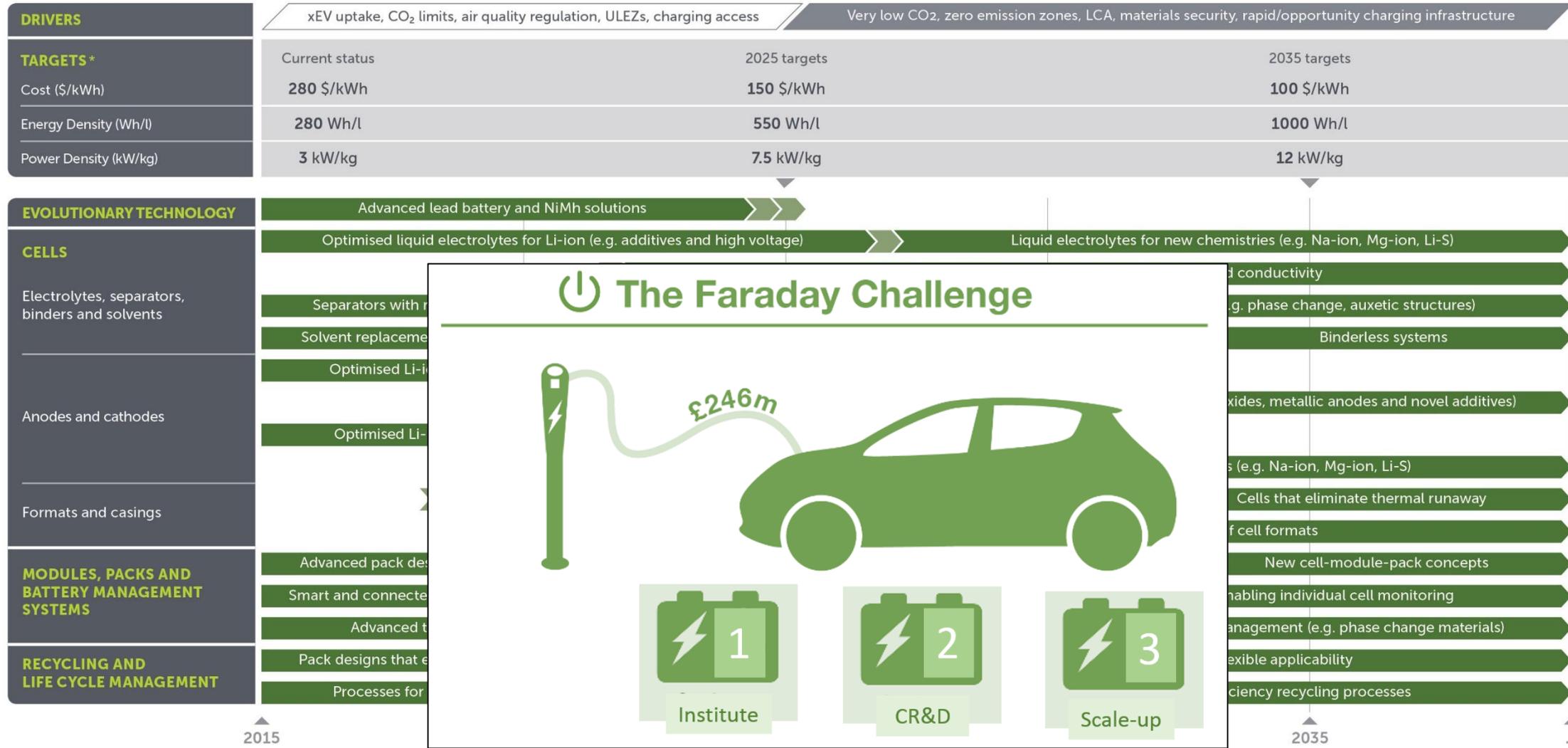
Solid bar represents >1% global marked adoption and is preceded by significant product and process R&D

1 chevron = some uncertainty around timing of mass market adoption or phase out 2 chevrons = considerable uncertainty around timing of mass market adoption or phase out



TECHNOLOGY ROADMAP 2017: ELECTRICAL ENERGY STORAGE

Roadmap developed by the Automotive Council and the Advanced Propulsion Centre



* All targets relate to battery packs.

1 chevron = some uncertainty around timing of mass market adoption or phase out 2 chevrons = considerable uncertainty around timing of mass market adoption or phase out



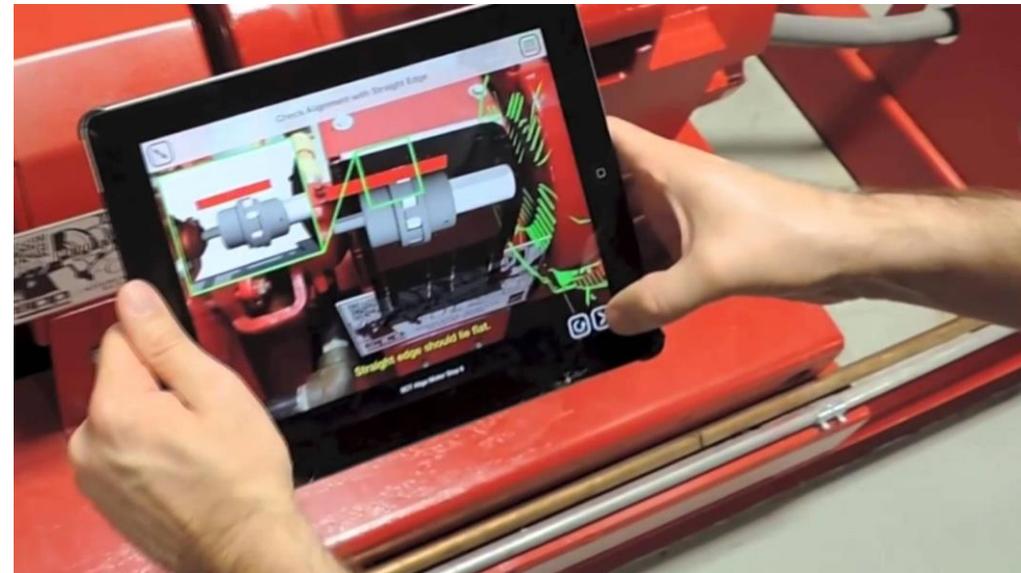
WHAT DOES THIS MEAN FOR MANUFACTURING?



QUALITY COSTS



SOLUTIONS STILL NEED TO BE AVAILBLE



END OF LIFE RECYCLABILITY REQUIREMENTS FOR CARS



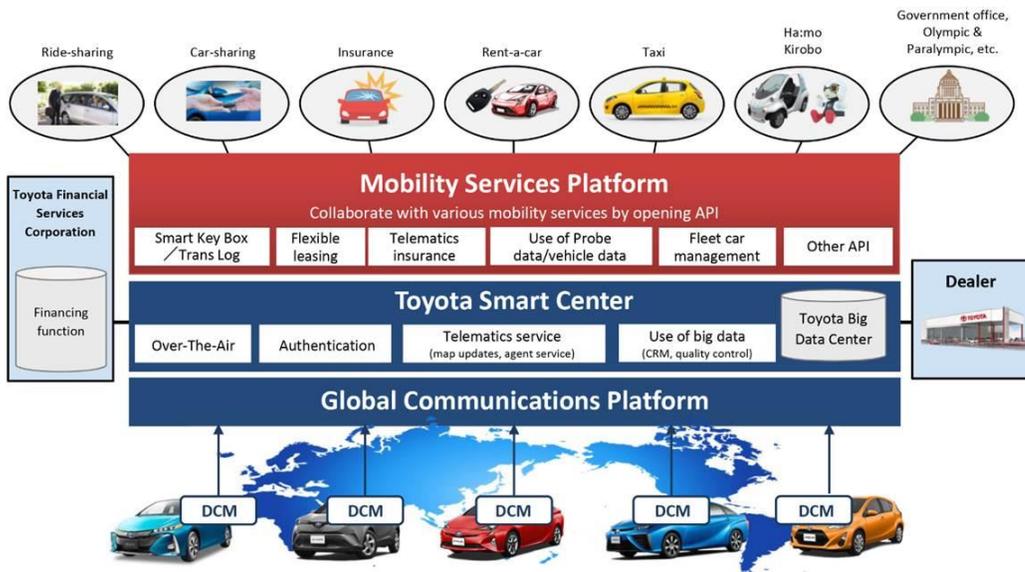
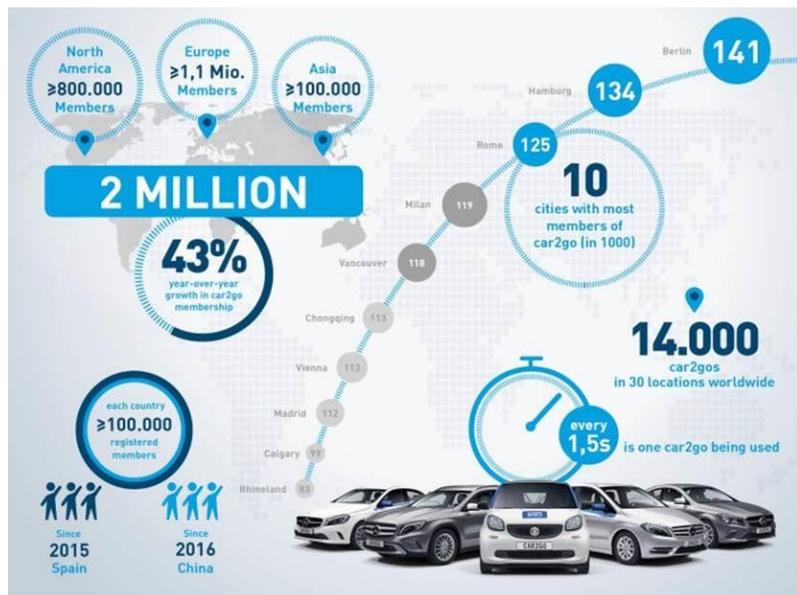
SELLING HORSEPOWER OR POWER MANAGEMENT?



FUTURE CONCEPT VEHICLES - AUTONOMY



TRANSITIONING FROM MOBILITY TO SOLUTION PROVIDERS

TRANSPORTATION OF THE FUTURE; CONVERGENCE OF PROPULSION, AUTONOMY AND ENERGY SYSTEMS ?



Is the opportunity early alignment of manufacturing and service models ??



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Thank you

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