

The Innovation Road Towards Vehicle Efficiency, Circularity and Sustainability

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- DRIVE 35 (Driving Research & Investment in Vehicle Electrification) funding programme
- Automotive Council UK roadmaps 2024
- Innovation Opportunities 2025
- ‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities



ADVANCED
PROPULSION
CENTRE UK

DRIVE35



ENABLING TRANSFORMATION

Automotive Transformation Fund

ACCELERATING SCALE-UP

Scale-up Fund

Feasibility Studies

SUPPORTING INNOVATION

Collaborate

Demonstrate

Mobilise

Automotive Council UK roadmaps 2024 (1)



Two System-level Roadmaps

Mobility of People



- Private
- Shared

Mobility of Goods



- Localised
- Long-haul
- Off-highway (including NRMM)

Six Technology Roadmaps

Hydrogen Fuel Cell and Storage



H₂ Fuel Cell H₂ storage

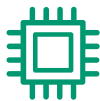
Internal Combustion Engines



Lightweight Vehicle and Powertrain Structures



Power Electronics



Electric Machines



Electrical Energy Storage



Policy and regulations

Energy and infrastructure

Materials and manufacturing

Digitalisation

Automotive Council UK roadmaps 2024 (2)

Executive roadmaps - launched



Narrative reports - launched



Innovation opportunities - 2025

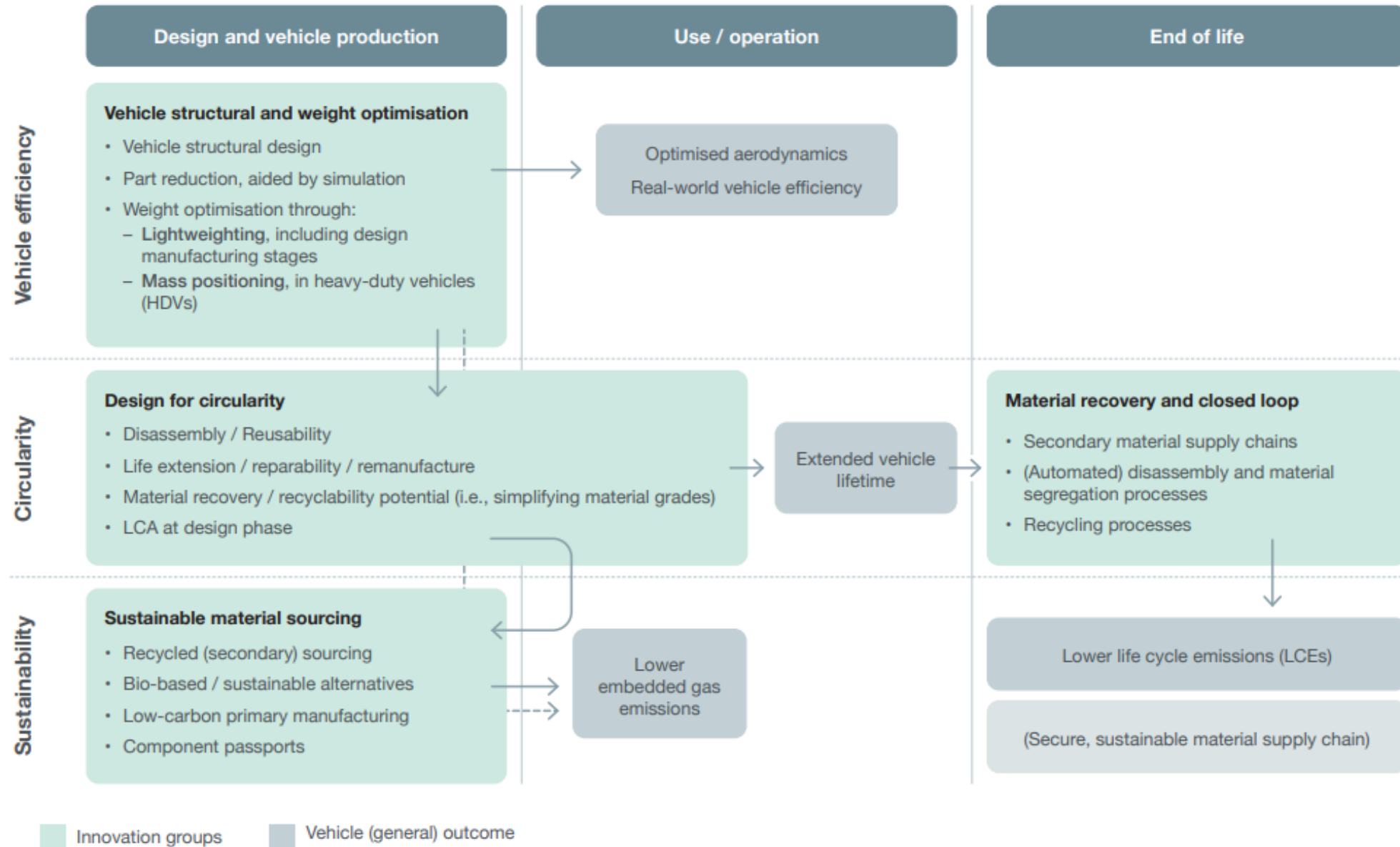


- Innovation Opportunities reports examine key technology priorities and associated supply chain opportunities for the UK automotive industry.
- Highlighted areas where collaboration between industry, government, and research institutions can accelerate commercialisation and encourage investment.
- The reports map trends and drivers up until 2050 which might be at different levels of maturity or market readiness.

‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities (1)

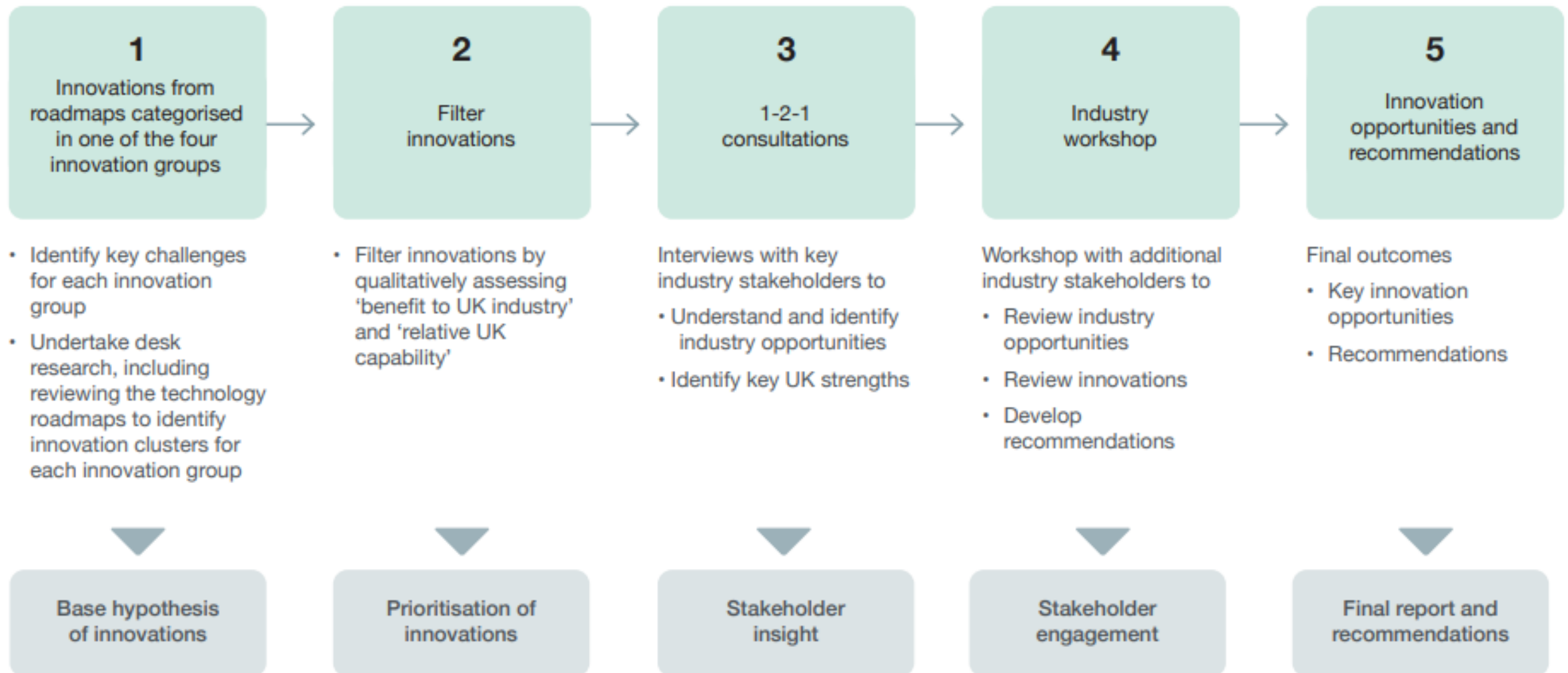
- Deep dive into all themes and sub-themes identified on the roadmaps
- Overview of key focus areas and associated strengths and gaps to guide industry’s direction of travel across the global landscape of a sustainable automotive industry
- Range of metrics to identify innovation opportunities, focussing on benefit and capability, both relative to the UK.
- Four key innovation groups for R&D and innovation as well as scale-up and commercialisation endeavours

‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities (2)



'Vehicle Efficiency, Circularity and Sustainability' Innovation Opportunities (3)

- A five-step process identified key innovation opportunities across the four innovation groups



‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities (4)

- Summary of the key innovation clusters by innovation group with associated timeframe

Innovation group	Key innovation clusters	Market readiness timeframes
Vehicle structural and weight optimisation	<ul style="list-style-type: none">• AI-driven tools• Modular structures• Lightweight materials and processes• Novel joining techniques	<ul style="list-style-type: none">• Short-Medium term• Short-Medium term• Medium-Long term• Short-Medium term
Sustainable material sourcing	<ul style="list-style-type: none">• Sustainable alternatives• Recycling processes• Transparent supply chains	<ul style="list-style-type: none">• Medium-Long term• Medium-Long term• Short-Medium term
Circularity: design for circularity	<ul style="list-style-type: none">• Design for repairability and disassembly• Design for longevity and remanufacture• Tools and standards for circularity	<ul style="list-style-type: none">• Medium-Long term• Medium-Long term• Short-Medium term
Circularity: material recovery and closed-loop processing	<ul style="list-style-type: none">• Disassembly processes• Closed-loop supply chains• High-volume recycling	<ul style="list-style-type: none">• Medium-Long term• Medium-Long term• Medium-Long term

‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities (5)

- A few key insights can be taken away from this study in the UK context

**Co-ordinated cross-industry, sector
and value chain cooperation is required**

Multi-disciplinary approach is needed
to balance vehicle design and material considerations, optimising
for cost and performance, with sustainability and circularity goals

Economics must work for UK to be competitive

Scale-up and capital investment is key

**Digital tool chain and leveraging AI / ML / real-world
data are extremely important**

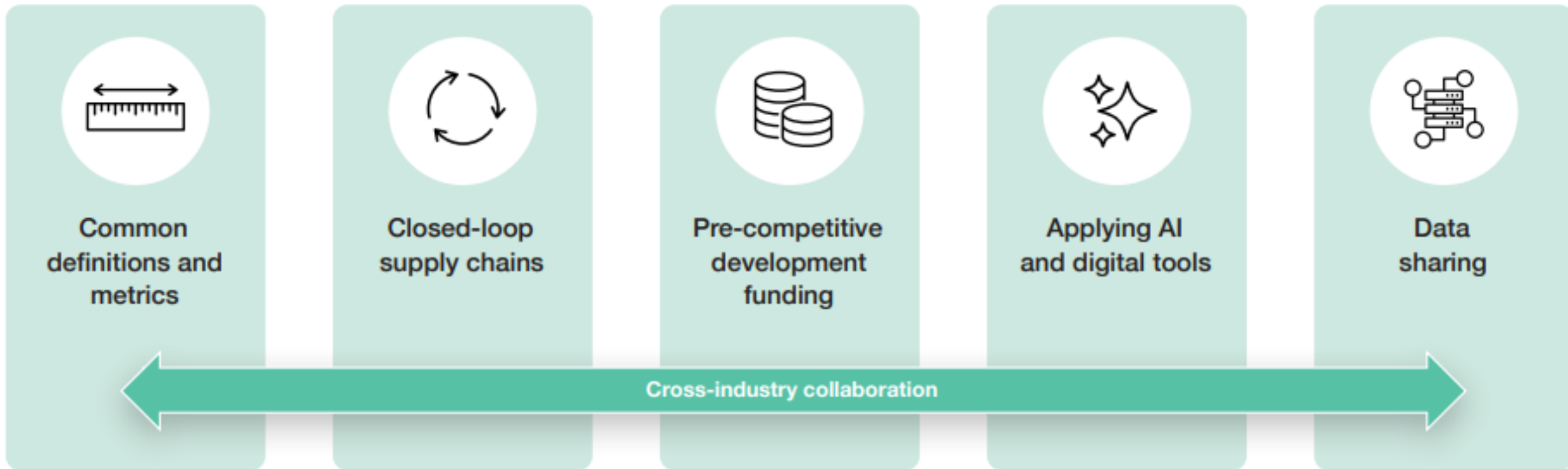
**Engineering targets and sustainability /
circularity factors / considerations need to be linked**

**UK workforce needs to be ready to adopt
innovations and a circularity ‘mindset’**
training and upskilling required to design and
handle new materials and processes

**Common definitions and metrics (KPIs) for measuring
sustainability and circularity are needed**

‘Vehicle Efficiency, Circularity and Sustainability’ Innovation Opportunities (6)

- Actionable high-level recommendations for strategic planning and decision-making in the UK



Thank you

Any questions?

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Roadmaps: QR Code or apcuk.co.uk/knowledge-base/roadmaps