

# Battery Tech Expo 2023

## APC: 2023 Update & Opportunities

**Dan Bunting**  
Head of Business Development  
Advanced Propulsion Centre

## The UK is leading the charge towards a net - zero future



- The UK is the first major economy to commit to a net-zero target.
- As part of the 10 Point Plan for a Green Industrial Revolution, the UK will invest £12bn by 2030.
- The UK is ending sales of new petrol and diesel engine vehicles in 2030. All new cars and vans will be zero emission by 2035.
- The UK is accelerating electrification, investing over £6bn across infrastructure, manufacturing and R&D.

# APC: Playing a unique role since 2013



## Offering expertise and cutting-edge knowledge

With a combined experience over many years



## Identifying where investment will be most effective

Mapping the future development opportunities in low-carbon technologies



## Leverage expertise

Bringing together government, industry and academia to deliver game changing research and insight



## Building project consortia

Combining the knowledge and innovation of manufacturers, SMEs and academia



## Ensuring match-funding support is well spent

Using a comprehensive and competitive process to identify the strongest prospects



## Supporting key low-carbon initiatives

Accelerating additional development in battery and autonomous vehicle technology



# Delivering substantial impact



**188+**  
low-carbon  
projects

**400+**  
project partners



**50,000+**  
Jobs created /  
safeguarded



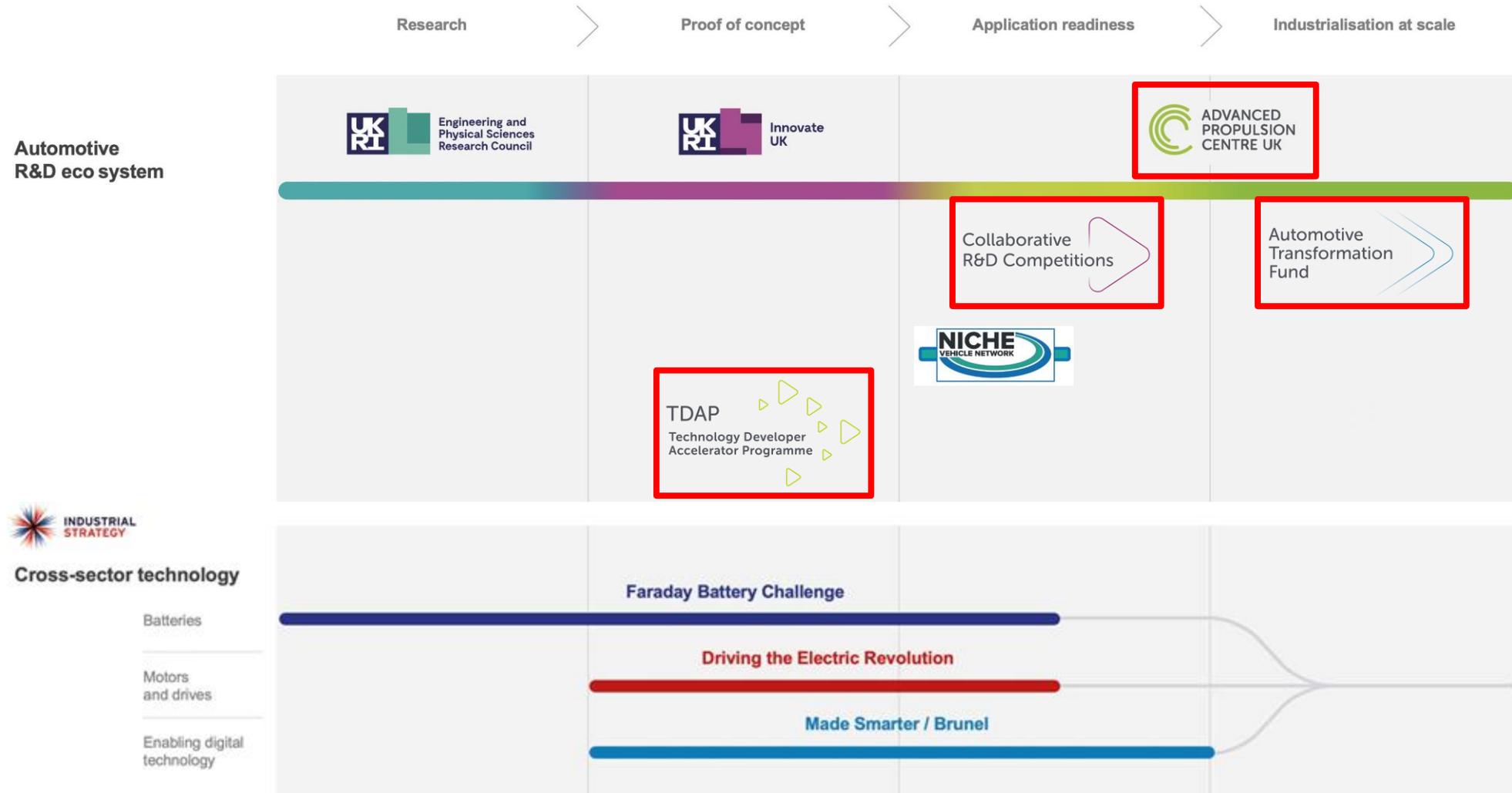
**312 million+**  
tonnes of  
CO<sub>2</sub> savings



**1 million+**  
vehicles use  
APC-funded technology

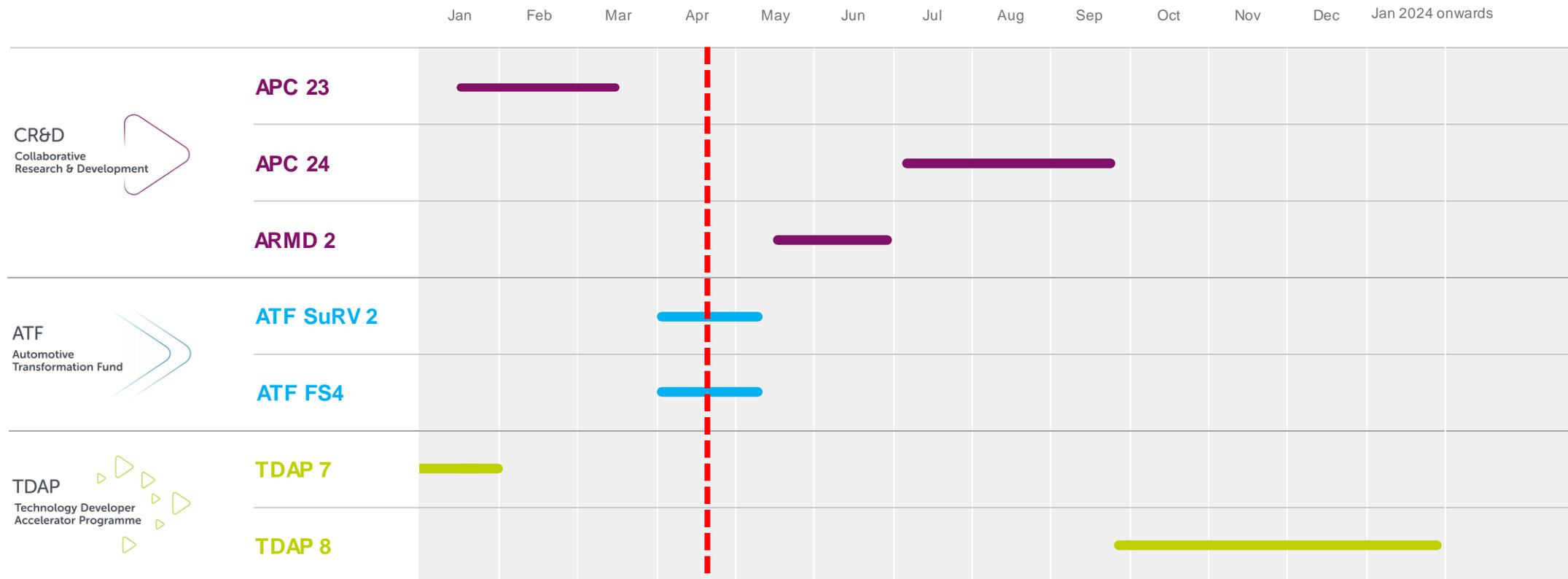


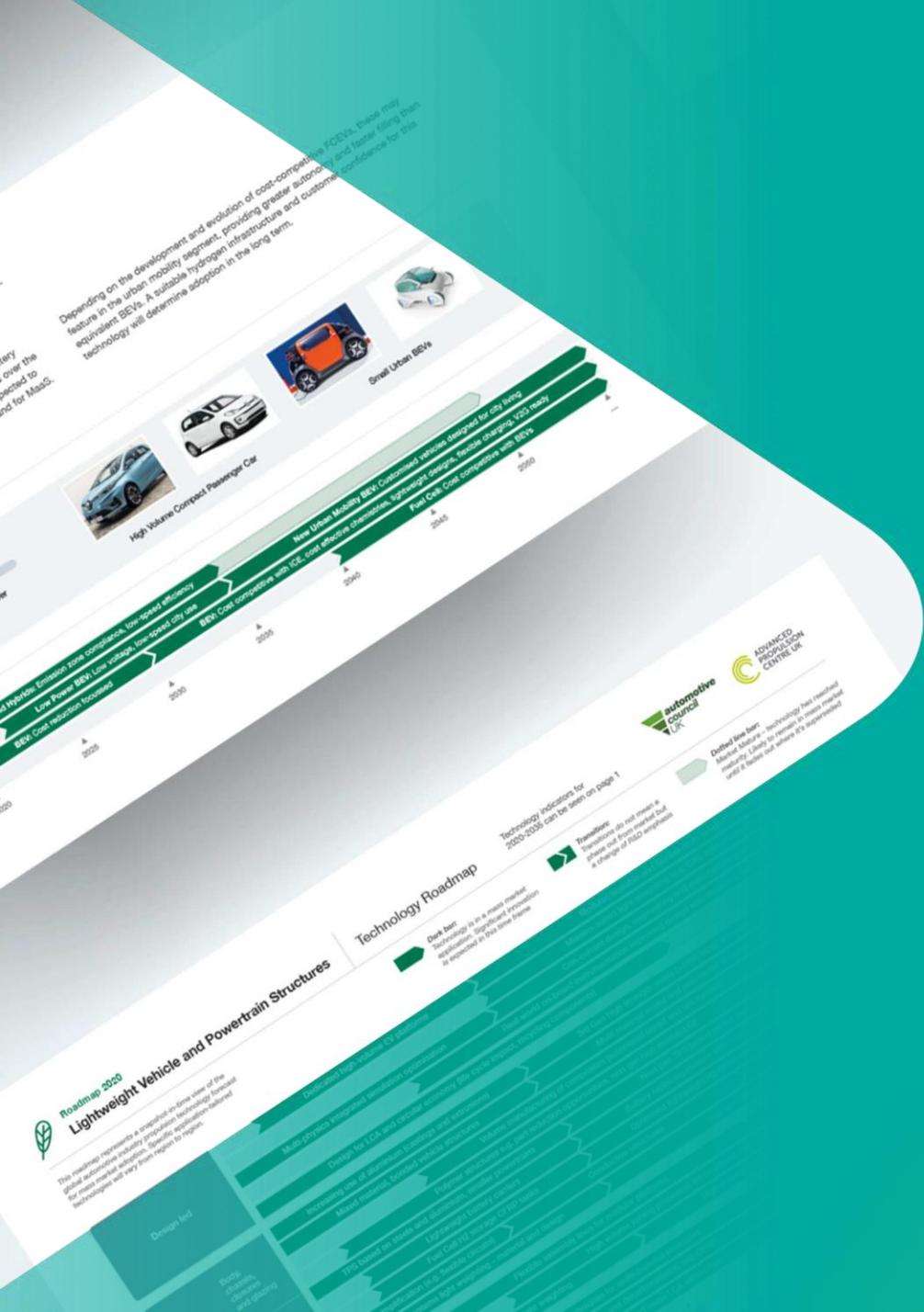
# UK Automotive Funding landscape



# APC 2023 Funding timeline

Key dates for funding competitions





# Technology Trends

## *Insights, Foresights, Impacts*

# Roadmaps covering key areas on the road to net zero – 2023 Refresh!

## Product Roadmaps



Light Duty vehicles < 3.5t



Heavy Goods >3.5t  
and Off-highway vehicles



Bus and Coach

### Mapping the road ahead

- Providing a global view of the key technology trajectories in low-carbon propulsion and low emissions.
- Guiding technology developers and provide confidence to their investors regarding industry trajectory.
- Kick-starting conversations around opportunities and threats on the road to net zero transport.
- Created by the APC on behalf of the Automotive Council.

## Technology Roadmaps



Electrical energy storage



Electric machines



Power electronics



Fuel cells



Lightweight vehicle  
and powertrain structures



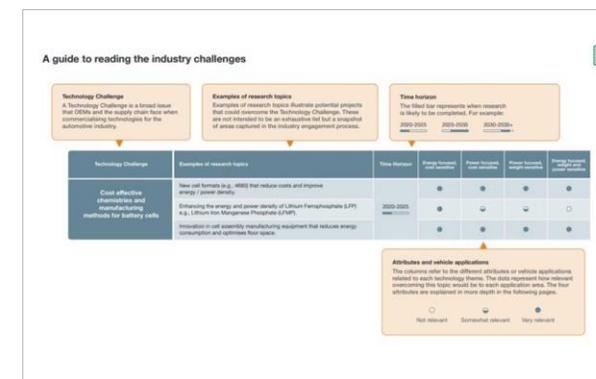
Thermal propulsion systems

# Delivering strategic insights

## Industry Challenges Reports

Developed by a consensus process, the Industry Challenges present the technical barriers to commercialising automotive powertrain technology in the short, medium and long term.

- Recommendations are provided on how this content can be taken forward by industry, academia and government



## UK supply chain opportunities

APC has published numerous supply chain opportunity reports for the UK.

- Strategic UK opportunities in passenger car electrification
- Building a robust magnet supply chain for the UK
- Automotive batteries – UK supply chain opportunities



# £24 billion+ of electrification opportunity in the UK



**£2bn**  
Electric machines

Magnet manufacturing  
Electrical steel  
Electrical machine assembly and testing



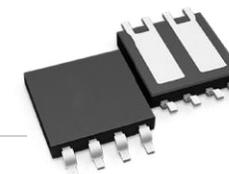
**£12bn**  
Batteries



Cathode materials refining  
Cathode manufacturing  
Anode manufacturing  
Electrolyte manufacturing  
Cell assembly  
Battery pack components



**£10bn**  
Power electronics



Semiconductors  
Sensors  
High-performance passive components



Strategic UK opportunities in passenger car electrification published by the APC

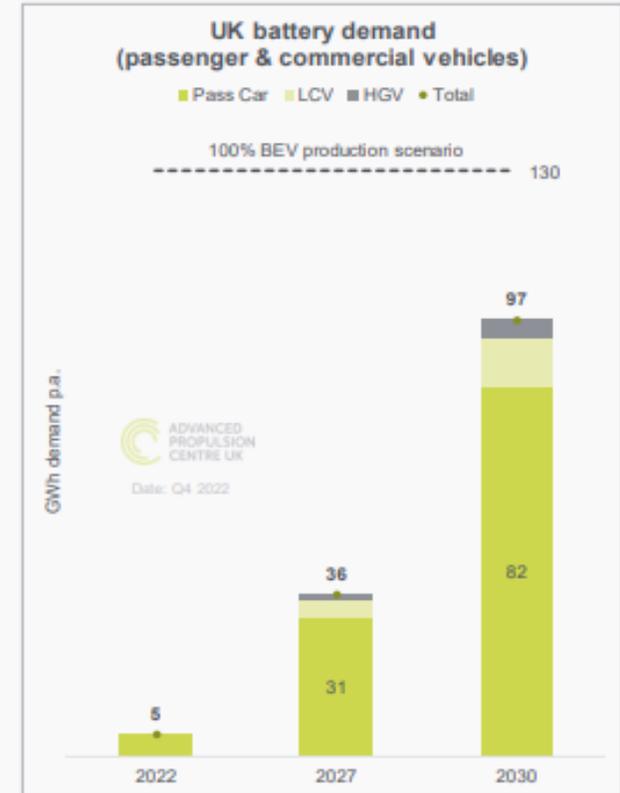
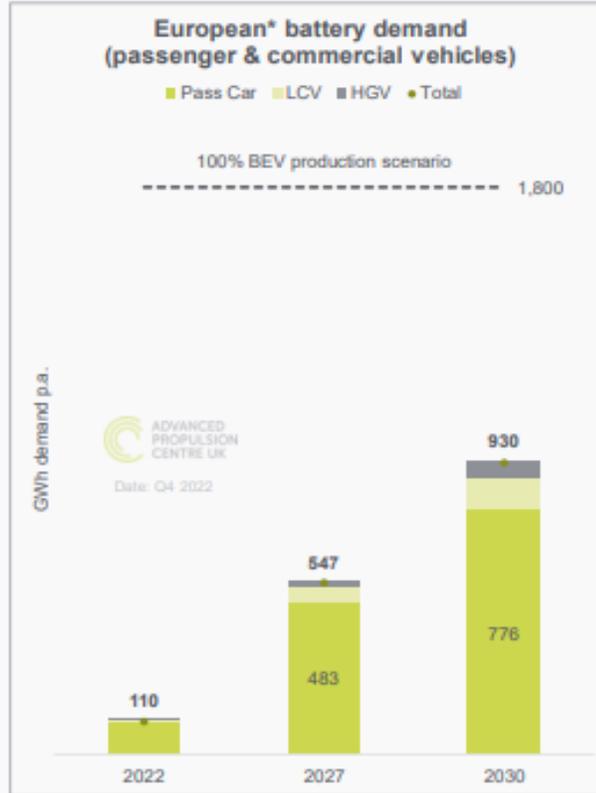
[Download report](#)

# Battery demand forecast

LDVs and HGVs

## Q4 2022 notes

- HGV demand reworked in this forecast and increases the battery demand in UK
- Global battery demand in 2030 boosted by stronger demand in the US and Europe



Source: APC Demand Databases using S&P Global AutoTechInsight (Mar, 2023), Rho Motion data (Mar, 2023), BNEF (Mar, 2023), LMC (Mar, 2023)  
Note: LCV = Light Commercial Vehicles < 3.5t, buses not included. \*European forecast includes non-EU countries such as Turkey



## Collaborative Research & Development (CR&D)

# Significantly boost the success of your next R&D project



## Our CR&D programme aims to:

- Fund late-stage R&D projects to support growth in advanced low-carbon propulsion technologies.
- Support the UK to create long-term jobs, skills and reduce CO<sub>2</sub>.
- Build connections with specialist partners to add new expertise and collaboration to your project team.
- Support and guidance provided during the funding application process through to the end of your project.
- Access to the latest industry insights.
- Raise the external profile of the project to wider stakeholders.

**£2.5 – 20 million**  
grant funding

50% minimum match-funded  
18 - 42 months duration

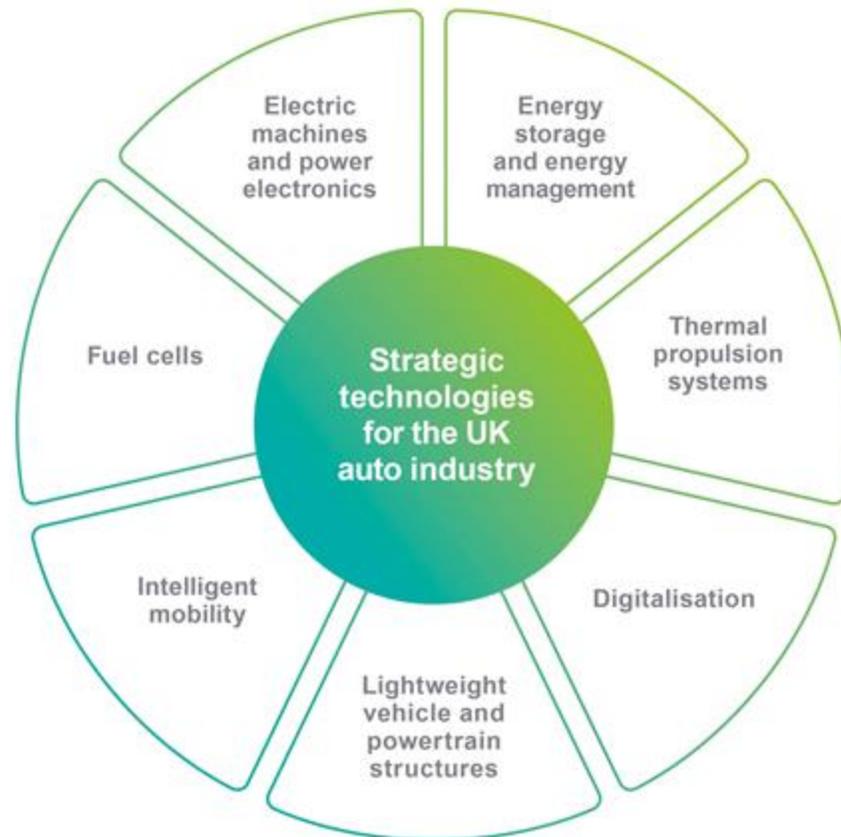


On vehicle for  
On and Off-Highway



OEM or Tier1 lead  
and involving SMEs

# Technologies we're investing in

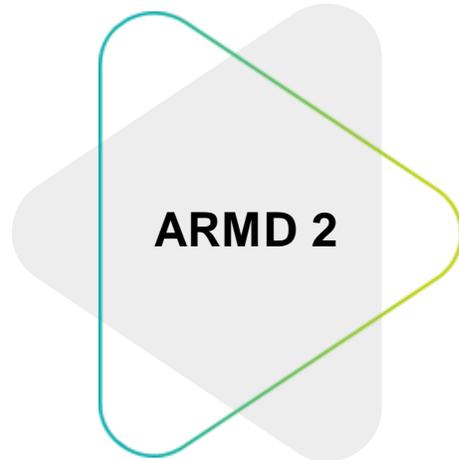


Grant support

Electric machines and power electronics	<b>£183m</b>
<b>Energy storage and energy management</b>	<b>£134m</b>
Thermal propulsion systems	<b>£89m</b>
Digitalisation	<b>£82m</b>
Lightweight vehicles and powertrain structures	<b>£82m</b>
Fuel Cells	<b>£46m</b>

# CR&D Funding timeline

Key 2023 dates for R&D funding competitions



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Applications open: 17 May 2023  
Applications close: 28 June 2023



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Applications open: 03 July 2023  
Applications close: 20 Sept 2023

# Collaborative R&D – Battery Project Case Study

## BMW – HP-LiSD

- Development of high-power lithium-ion storage device.
- Batteries developed with a lightweight module design.
- Aims to improve power-to-weight ratio in current hybrid lithium-ion batteries.
- Technology will be utilised in future luxury and high-performance vehicles.
- £23.9 million total project value, receiving £12.1 million funding through the APC.



### Project consortium



BMW Motorsport Ltd (lead partner)  
McLaren Automotive Ltd  
Delta COSWORTH  
University of Warwick





## Automotive Transformation Fund (ATF)

# Scale-up production with the Automotive Transformation Fund

## Launched in June 2020, ATF aims to:

- Secure the transformation to electrification of the UK automotive sector at pace
- Ensure that the UK retains its technological leadership position through this transformation
- Support the sector's strong export performance



# Building up the UK supply chain by supporting a wide range of technologies



**Batteries**



Electric machines



Power electronics



Fuel cells



Upstream supply chains

# Scale-up production with the Automotive Transformation Fund



## Feasibility studies (FS4)

providing funding to assess viability for UK projects

- Economic and technical compatibility
- Feasibility studies leading to industrial investment



## Capital investment (EOI)

supporting industrialisation at scale

- Factory equipment
- Land and buildings
- Set-up costs



## R&D (SuRV2)

leading to product or process scale-up

Complements ongoing R&D project support programmes through regular APC competitions

Enquiries to: [atf@apcuk.co.uk](mailto:atf@apcuk.co.uk)

# ATF Funding Highlights



## Feasibility studies

- 69 studies supported
- £35.8 million funding for studies into areas such as **battery anode and cathode production**, fuel cell stack assembly and UK-sourced critical materials.



## Capital investment

- **Gigafactories: Envision AESC**
- Motors & Drives: Ford e-drive facility & Pensana rare earth refinery.
- Fuel Cells: Johnson Matthey gigafactory for hydrogen fuel cell components.



## R&D – SuRV (Scale-up Readiness Validation)

- 22 projects from 35 UK-based companies
- £25 million funding for projects covering **batteries**, critical materials, recycling, fuel cells, motors & drives and power electronics.

## Open Now: Scale up Readiness Validation 2 (SuRV2) competition

### Need help scaling up your manufacturing process?

- Support to validate readiness for scale up of processes and pilot manufacturing in the UK.
- Opportunity for UK registered businesses with existing R&D projects to apply for a grant from £750k to £2m
- Accelerates project progress and helps businesses take a key step in the industrialisation phase.

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### Key dates

Competition open: 3 April 2023

Virtual briefing event: 5 April 2023

**Application deadline: 11 May 2023**

### Find out more

[apcuk.co.uk/automotive-transformation-fund/](https://apcuk.co.uk/automotive-transformation-fund/)



## Open Now: Feasibility Studies (FS4) Competition

### Need help to progress your R&D project?

- Funding support to produce decision-ready business cases for projects developing large-scale UK manufacturing facilities.
- Apply for a grant up to the value of £350,000.
- Support to aid future investment decisions in technologies including batteries and cells, electric motors and drives, power electronics, fuel cells, on-vehicle hydrogen storage and their upstream supply chains.

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### Find out more

[apcuk.co.uk/automotive-transformation-fund/](https://apcuk.co.uk/automotive-transformation-fund/)





## Technology Developer Accelerator Programme (TDAP)

## TDAP: Accelerating early-stage technology developers

### TDAP is a unique, tailored package of support for clean-mobility start-ups and SMEs

- Structured early-stage, cohort-based accelerator
- £170k grant support – APC do not take equity stake
- Independent expert automotive industry consultancy, mentoring and support
- Automotive industry networking



UK-based  
start-ups /  
SMEs

Funding for Tech Development  
Expert Auto Business Support

- Improved TRL -  
- Accelerated route to market -  
- Partner/customer engagement -  
- Investment ready -

## Programme traction and impact



Pilot + 6 cohorts supported with £9 million grant



91 companies engaged  
40 completed and 21 live



23 academic spinouts supported



Received highest ever interest for 2022 intake: 136 EOIs for 13 places



Businesses **rate the programme 8.9/10** and report a credibility boost through APC process



Businesses report acceleration of route to market by average **19 months**



Over **£220 million** private investment raised post TDAP



Businesses increase headcount by average **50% during TDAP** and forecast over **1000 new FTE** in 5 years

## TDAP focus areas



### Participants work with the APC's delivery partners to:

- Understand the best application fit for their technology
- Identify their target market and develop their route to market strategy
- Understand and articulate their value proposition
- Develop their IP strategy
- Understand their potential business model
- Develop a financial and investor plan
- Develop their leadership and new venture-building skills
- Develop their PR & communications strategy
- Undertake a validation project to test their product and their business assumptions



Questions?

Enquiries to: [info@apcuk.co.uk](mailto:info@apcuk.co.uk)