ATI **IMPACT** in 2022/23

To achieve Net Zero 2050 in aviation, we must accelerate the development and adoption of ultra-efficient and zero-carbon aircraft alongside enabling technologies. Eighteen months on from the launch of *Destination Zero*, our third technology strategy for UK aerospace, the ATI Programme continues to deliver against these strategic priorities and unlock investment.

This year the ATI welcomed Paul Everitt to the ATI Board as Chair, following the retirement of Stephen Ball. We also said farewell to Simon Weeks and welcomed Jacqueline Castle from Airbus as Chief Technology Officer. The ATI has grown in influence as we continue to engage with partners in the UK and beyond to enable technology development and adoption. We have developed our offer to industry at a time when competition for ATI funding has intensified and, through the ATI Hub, we have strengthened our understanding of, and relationships with, the wider aerospace ecosystem.

Gary Elliott
Chief Executive, ATI

ECONOMIC IMPACT

The ATI Programme has now facilitated over £3.5bn R&D investment to date, reflecting a combination of UK Government and industry funding. It has unlocked investment from over 400 organisations across the UK, including SMEs, academia and large global OEMs. A growing number of startups have also been awarded grant funding, attracted into the sector by Net Zero opportunities.

2022/23 again saw huge demand across the three Strategic Programme batches and autumn NATEP call, with £256m awarded creating a total investment of £418m with industry contributions. For the first time, SMEs made up more than half of ATI Programme project partners, while many more received funding as subcontractors.

Assessing progress against the technology strategy, the ATI identified areas that require investment in upcoming funding batches, that we believe are key to achieving Net Zero 2050 and securing UK competitiveness. We published these Primary Funding Opportunities to highlight where investment through the ATI Programme can accelerate development, capture market share and maintain or grow capability. These opportunities are not exclusive though and we continue to encourage applicants to talk to us before submitting applications.

DEVELOPING THE BEST TECHNOLOGY

The ATI Programme has funded some extraordinary projects over the last nine years and this year two ATI projects were involved in world firsts related to zero emission flight. In February, ZeroAvia successfully completed the world's first flight-test programme for a sub-regional hydrogen-electric aircraft. They conducted a range of critical rig testing, ground-testing and flight-testing of a first-generation hydrogen fuel cell electric powertrain offering zero carbon emissions. Then, in September, a world industry first occurred when a novel fuel injection system enabled the controlled combustion of hydrogen. Led by Rolls-Royce with partner Loughborough University, working with DLR and easyJet, Project HyEST delivered another step towards Net Zero aviation.

Other projects that are having a significant impact across the UK included Rolls-Royce's Ultrafan going on test in Derby, Boeing's investment into manufacturing in South Yorkshire, royal groundbreaking on a new facility at the Whittle Lab in Cambridge, the Airbus innovation centre opening in Bristol and the establishment of Safran's Gloucester site as centre of excellence in landing gear.

STRENGTHENING THE ECOSYSTEM

Helping the aerospace sector to grow and enabling the adoption of the technology we fund is critical to achieving our *Destination Zero strategy.* Our independent research, findings and thought leadership campaigns focus on three strategic themes: ultra-efficient technology, zero-carbon technology and enabling technology adoption.

ATI experts shared insight into technology on panels and interviews, contributed to the update to Sustainable Aviation's decarbonisation roadmap which recognised the benefits of zero-emissions aircraft before 2050, and continued our contributions to the Jet Zero Council. We also published a funding landscape map showing those new to our sector what the funding mechanisms are and how to access them and worked with PwC to identify opportunities for private investment in our sector. To help increase visibility of world-leading capability in the UK, we highlighted how ATI-supported projects are enabling a step change in technology development, advanced manufacturing methods, next generation materials and whole lifecycle efficiency.

To strengthen the ATI's understanding of the supply chain and the regional differences experienced across the UK, we signed Partnership Agreements with the Midlands Aerospace Alliance and the Farnborough Aerospace Consortium. Looking forward, we will sign similar agreements with other trade associations and organisations in UK enabling the ATI to work more closely with the regional supply chains across the nation.

Finally, the ATI launched its first stakeholder survey where we heard from the sector about our impact and the effectiveness of our funding mechanisms. We have committed to running this survey annually and will use it to monitor our performance in supporting the aerospace sector and as a key indicator of our success.

DRIVING INNOVATION

One year on from launching the ATI Hub we have seen fantastic engagement with the aerospace sector and beyond, with 30% of participants in Hub activities interacting with the ATI for the first time. We have delivered targeted innovation support through 36 events including technology and business-focused clinics and workshops and achieved an average satisfaction score of 4.4/5.

The ATI Hub hosted an Innovator Showcase at the Paris Air Show, in partnership with ADS and the Start Me Up Scheme. Ten innovators joined us in Paris and were able to showcase their companies on the international stage. As well as meeting Minister Ghani, the companies were able to expand their network across industry and Government, supported by the ATI team.

This was another first for ATI and we were happy to celebrate and showcase the great depth of the UK supply chain. We will continue to drive innovation by offering more tailored support to startups and SMEs, through more in-person regional events as well as our regular online technology and business innovation support clinics.

In April, we received £1.3m from the Department of Business and Trade to launch our Hydrogen Capability Network (HCN) initiative, with the aim of identifying the capability gaps and engaging with stakeholders across the UK to advance technology development for hydrogen in aerospace, with a specific focus on cryogenics. The HCN project will address key sector requirements around technology test infrastructure, liquid hydrogen supply and storage and liquid hydrogen skills, and provide options regarding how a network would operate to give the UK competitive advantage in developing and manufacturing hydrogen and related aircraft technologies. We have assembled a team from across the sector to work on this important topic which will conclude in early 2024.

Finally, our message to the aerospace sector and those with an interest in helping our industry to reduce its environmental impact: The ATI Programme is open to new applications and our team is ready to support you to deliver the transformative technologies required to reach Net Zero 2050.

Contact us

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ATI **IMPACT** in 2022/23

AEROSPACE TECHNOLOGY INSTITUTE

BATCH 38

£73m grant funding

£125m total forecast R&D activity

5 projects

16 unique partners

BATCH 39

£79m grant funding

£111m total forecast R&D activity

8 projects

24 unique partners

ATI PROGRAMME

2022/23*

(October to September)

£256m grant funding

£418m total forecast R&D activity

32 projects

83 unique partners

BATCH 40

£102m grant funding

£180m total forecast R&D activity

9 projects

39 unique partners

NATEP AUTUMN 22

£2m grant funding

£3m total forecast R&D activity

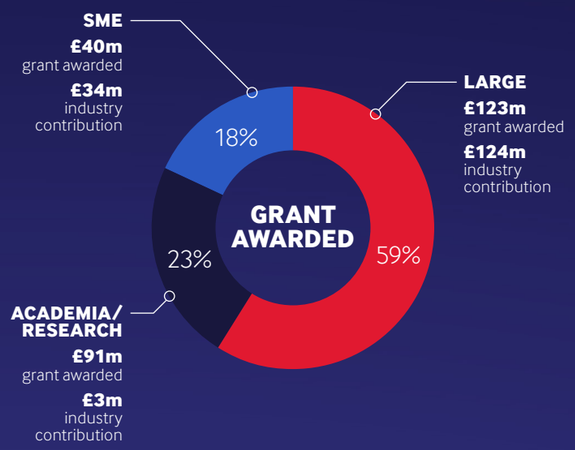
10 projects

23 unique partners

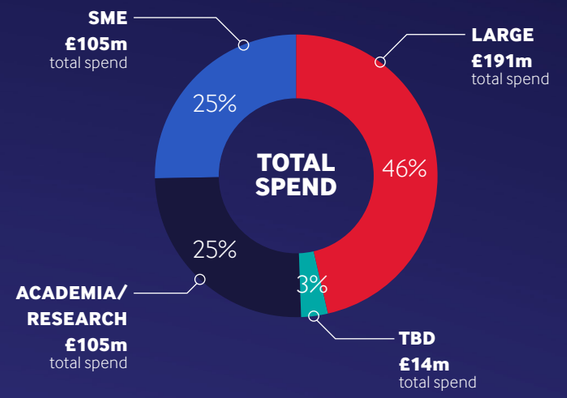
*Taken from FSA Applications, subject to change

GRANTS & DISTRIBUTION*

2022/23 ATI Programme share of forecast R&D spend by project partner (Batches 38, 39 and 40).



Including subcontractors within this spend, SMEs accounted for c.25% of the forecast R&D project activity.



£3.58bn

The ATI Programme has facilitated over £3.5bn of R&D investment, reflecting a combination of UK Government and industry funding.

417

Over 400 projects have been awarded funding, developing technologies from advanced manufacturing techniques to zero-carbon propulsion systems.

438

The ATI Programme has unlocked investment from over 400 organisations across the UK, from startups and SMEs to large global OEMs.

ATI PROGRAMME IMPACT TO DATE

80%

The majority of organisations in receipt of ATI Programme funding are located outside London and the south east.

290

SMEs make up more than half of the organisations who have received grant funding through the ATI Programme

69

Startups form a growing segment of organisations who have received grant funding through the ATI Programme.

Paris Air Show: Showcasing UK innovators
Credit: ATI

ATI Hub: Delivering targeted innovation support for startups and SMEs.
Credit: HVM Catapult

ATI Conference 2022: 20+ exhibitors, 80+ speakers, 300+ industry leaders.
Credit: ATI

Partnership Agreements: Committing to enhanced collaboration for the benefit of the regional aerospace sector.
Credit: Farnborough Aerospace Consortium

"Comprehensive, well structured, informative, engaging and very nice to be able to have some informal conversations and explore possibilities."

"Good to see the leaders of ATI engaging and taking feedback."

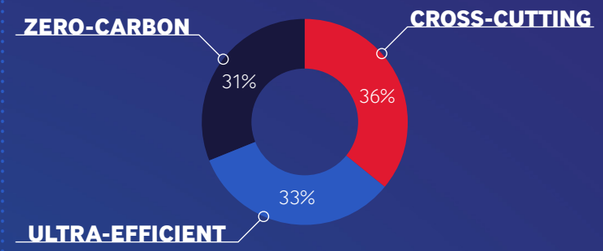
Delegate feedback from Aerospace Innovator Bootcamp, September 2023

"The ATI's Innovator Showcase at the Paris Air Show will likely have the singular greatest commercial impact on our business this year."

ATI Exhibitor, Paris Air Show

STRATEGIC ROADMAPS*

Projects in batches 38, 39 and 40 are delivering against the ultra-efficient, zero-carbon and cross-cutting strategic roadmaps for technology development as set out in *Destination Zero*.



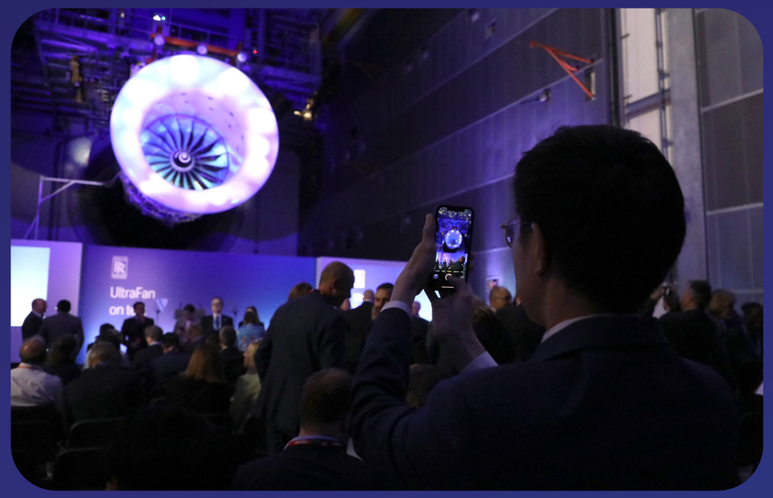
* Taken from FSA Applications and subject to change.

ATI PROJECTS IN **FOCUS**

AEROSPACE TECHNOLOGY INSTITUTE

10% more efficient gas turbine engines

UltraFan – Rolls-Royce led a transformative portfolio of projects to develop and ground test the first demonstrator engine for a new engine architecture offering 10% fuel burn and CO_2 savings compared to the current generation of large civil aerospace gas turbines.



Credit: Rolls-Royce

Regional impact and quadrupling high-value jobs

Product & Process Verification Centre of Excellence (PPV CoE) – Capital investment has enabled AMRC Cymru to support aerospace manufacturers and companies from the wider manufacturing community through data-driven optimisation of production processes.

PPV-linked projects account for ~80% of all projects that go through AMRC Cymru. Examples include development of a ground-breaking large volume metrology system, energy reduction and optimisation of the wing assembly process and enabling 'right first time' assembly through SMART workstations.

The project has secured an increase in high-value jobs from 12 to 50 engineers and the capability has also been rolled out to the wider manufacturing community, particularly in North Wales.

AMRC Cymru with Welsh Government support run an ongoing Digital Enablement programme with SMEs to show them how to harvest, interpret and visualise manufacturing data for both productivity and sustainability purposes.

Investment in critical infrastructure to help accelerate zero-carbon flight

New Whittle Laboratory – The University of Cambridge has launched and established the National Centre for Turbomachinery Aerodynamics.

The centre enables the UK to have a competitive edge in delivering transformative propulsion technologies and targets a technology development process which is 10 times faster, 10 times cheaper and 10 times more precise than state-of-the-art capability around the world.

Credit: University of Cambridge

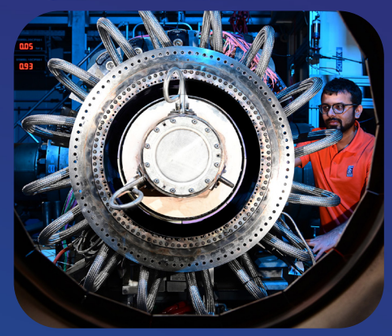
Breaking the boundaries of flight

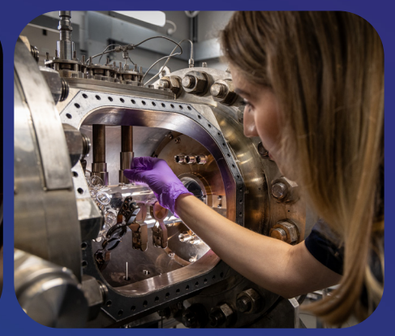
HyFlyer II – ZeroAvia delivered the world's first flight-test programme of a hydrogen-electric aircraft. The critical rig testing, ground testing and flight testing of a first-generation hydrogen fuel cell electric powertrain offering zero carbon emissions will be developed and launched as the ZA600 engine in the Cessna Caravan aircraft.

Credit: ZeroAvia

Leading hydrogen research

HyEST – The world's industry-first achievement of successfully testing hydrogen gas turbine combustion through the design of a novel fuel injection system was achieved by the collaboration between Loughborough University and Rolls-Royce, with support from easyJet and DLR.





Credit: Rolls-Royce

Enhancing UK aerodynamics capability

OPEN – This QinetiQ-led project expanded the 5m Wind Tunnel test offering, prolonged its service life and improved the skills of the test team. It also generated new customers and enabled access for UK academia and industry.

OPEN has made significant achievements in providing the first openly available CRM-HL wind tunnel dataset for use by the global community, the first opportunity for the 5m Wind Tunnel to collaborate with NASA. The project has also helped to secure high-value jobs and initiated collaboration between academia, industry and the experimental and computational communities.

UK leadership in high-performance computing

Aerospace Cloud Services – A collaboration led by SME Zenotech Ltd to further develop and deploy a web services architecture for engineering applications. The system will provide key services in security, support for cloud licensing and dynamic resource allocation.

The project has further developed Zenotech's EPIC platform for using high-performance computing resources within aerospace OEMs and is now in active use.

The product also supports export campaigns through enabling interactive sessions. Zenotech Ltd are in advanced commercial discussions to white-label the software. This project created 5 jobs and increased visibility of the UK as a lead in cloud high-performance computing.