The Aerospace Technology Institute

An Aerospace Growth Partnership (AGP) initiative

Aerospace Technology Institute

Industrial Priorities – Challenges in Joining



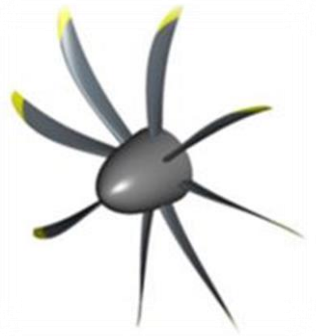




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ATI Structure – Value Streams and Enablers





Market focus

→ Target **opportunities**

→ Priority **attributes** for competitiveness

2015 2020 2025 2030

Priority Aircraft value Streams

- Whole Aircraft
- Structures
- Propulsion
- Systems

- ATI Technology Strategy -
Defining the combination of capabilities, technologies and products to advance, through programmes focused on future market opportunities





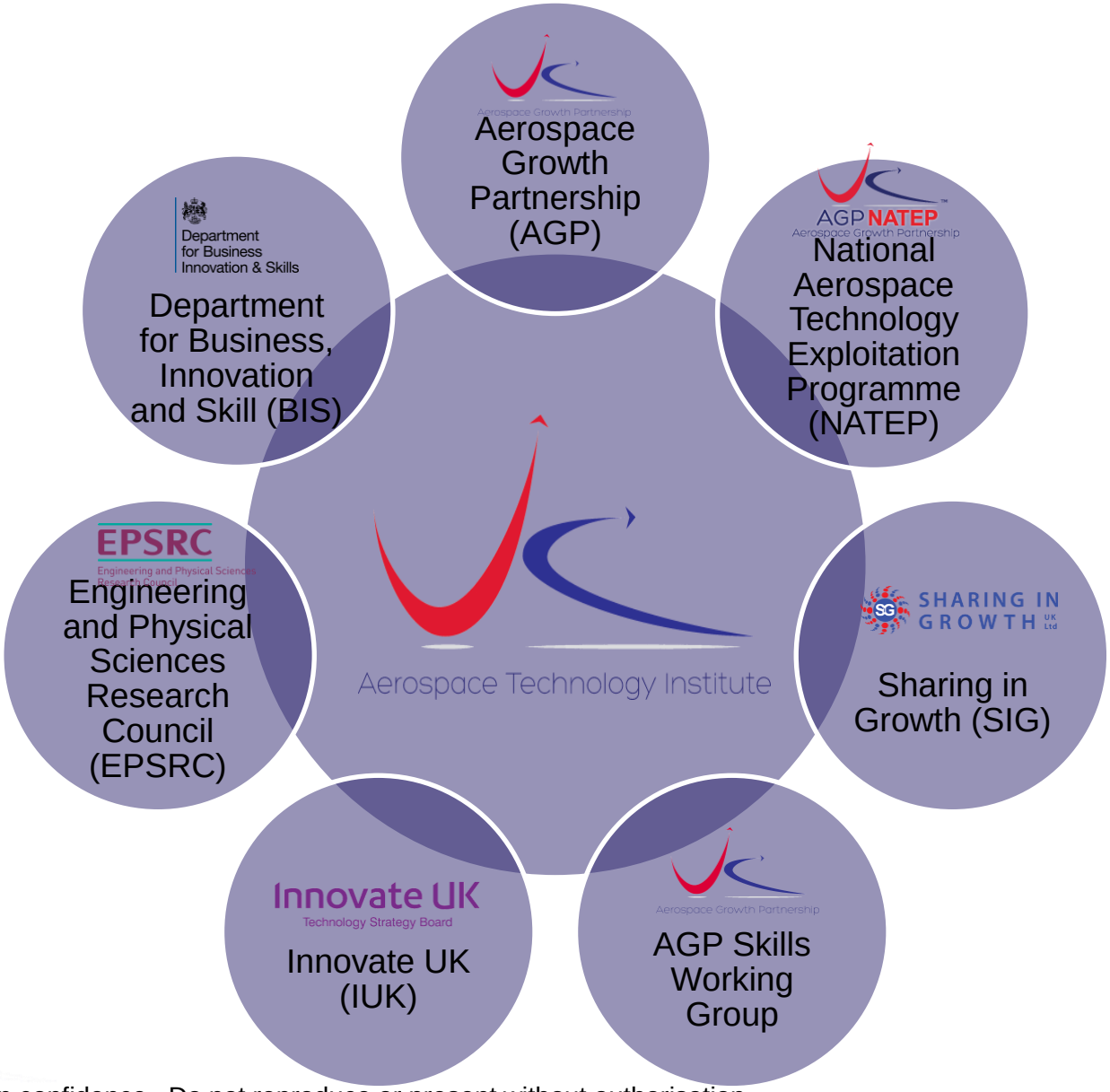


Aerodynamics
Manufacturing
Materials
Technology Infrastructure
Process & Tools

Enabling Technologies and Capabilities

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The Institute in Context



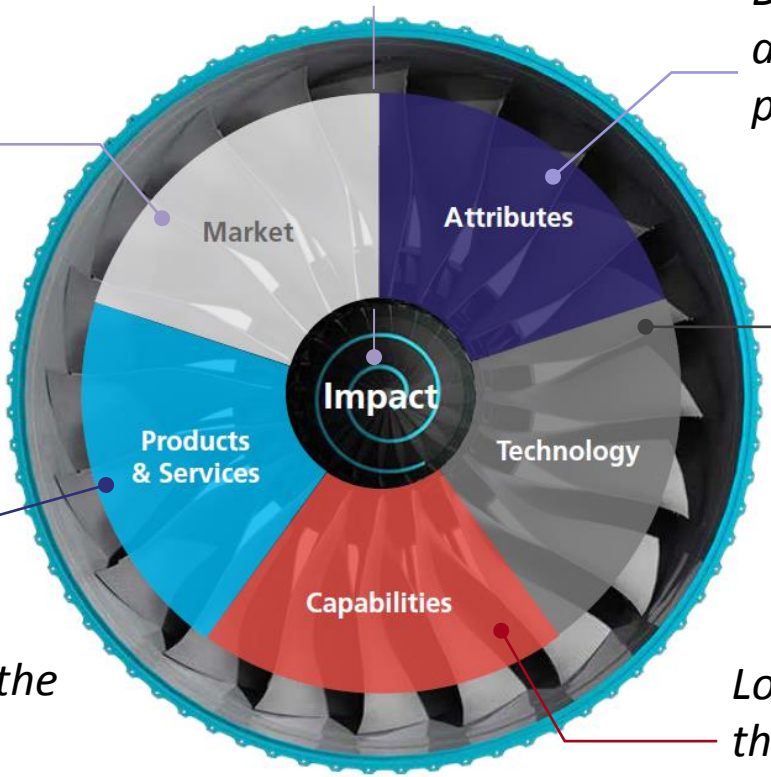
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Principles setting the foundation for the investment strategy – a 'virtuous circle'

Maximising economic return from R&T investment

Understanding present and future scenarios, changing dynamics and potential routes to market

Describing the product and service performance factors



Determining which technologies are needed and by when

Focusing on product value streams where the UK has an advantage

Looking for ways to evolve the product development "capability system

ATI - a national technology strategy
Manufacturing Value Stream



Challenge	Perceived Solution(s) – Joining
Optimisation of the composite and metallic manufacturing processes	➢ Fastener removal from component interfaces ➢ Metal to composite / metal adhesion ➢ Large complex structures with verified bonds ➢ Repair techniques with verified bonding
Industrialised automation for welding – at the right cost	➢ Removal of hand welding for large complex structures ➢ Precise joining at micro level with high yield (electronics)
Environmental compliance	➢ Removal or replacement of non REACh compliant materials from the supply chain
Integrated design solutions to enable lowest cost, lowest weight, highest functionality components	➢ Awareness of appropriate joining technologies into design solution packages, including relevant multi-physics models

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ATI – a national technology strategy
Manufacturing Value Stream



Challenge	Perceived Solution(s) – Joining
Automated, reliable joint inspection	➢ Automated Visual Inspection, integrated processes industrially certified (e.g. CT tomography, X-ray, etc)
On-platform repair capability	➢ In-situ, localised high integrity welding for metals, composites and thermoplastics, e.g. keyhole laser welding ➢ In situ, large area high integrity joining for organic, inorganic and matrix composite materials
Fast make prototype fabrications	➢ Adaptable joining solutions with minimised lead times and standard material requirements
Industrialised high integrity friction and laser welding	➢ Adaptive control with advanced metrology for aerospace materials, including hybrids ➢ Large scale, high volume dissimilar alloy fusion
Industrialised high integrity brazing	➢ New braze material solutions validated, including multi-physics modelling

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Vision

Our vision is to sustain and grow an internationally competitive Aerospace sector through investment in technologies consistent with aircraft updates, new aircraft and the sector's strengths.

Mission

Establish an independent institute capable of creating and embedding a challenging technology strategy for the UK's aerospace industry and through £2.1 billion of secured R&D investment maintain and grow the UK's competitive position – ultimately safeguarding and enabling new opportunities for UK aerospace jobs and economic value creation.







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