Aerospace Challenges in Large Volume Metrology

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LUMINAR Large Volume Metrology Workshop May 18 2016

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Introduction to ATI

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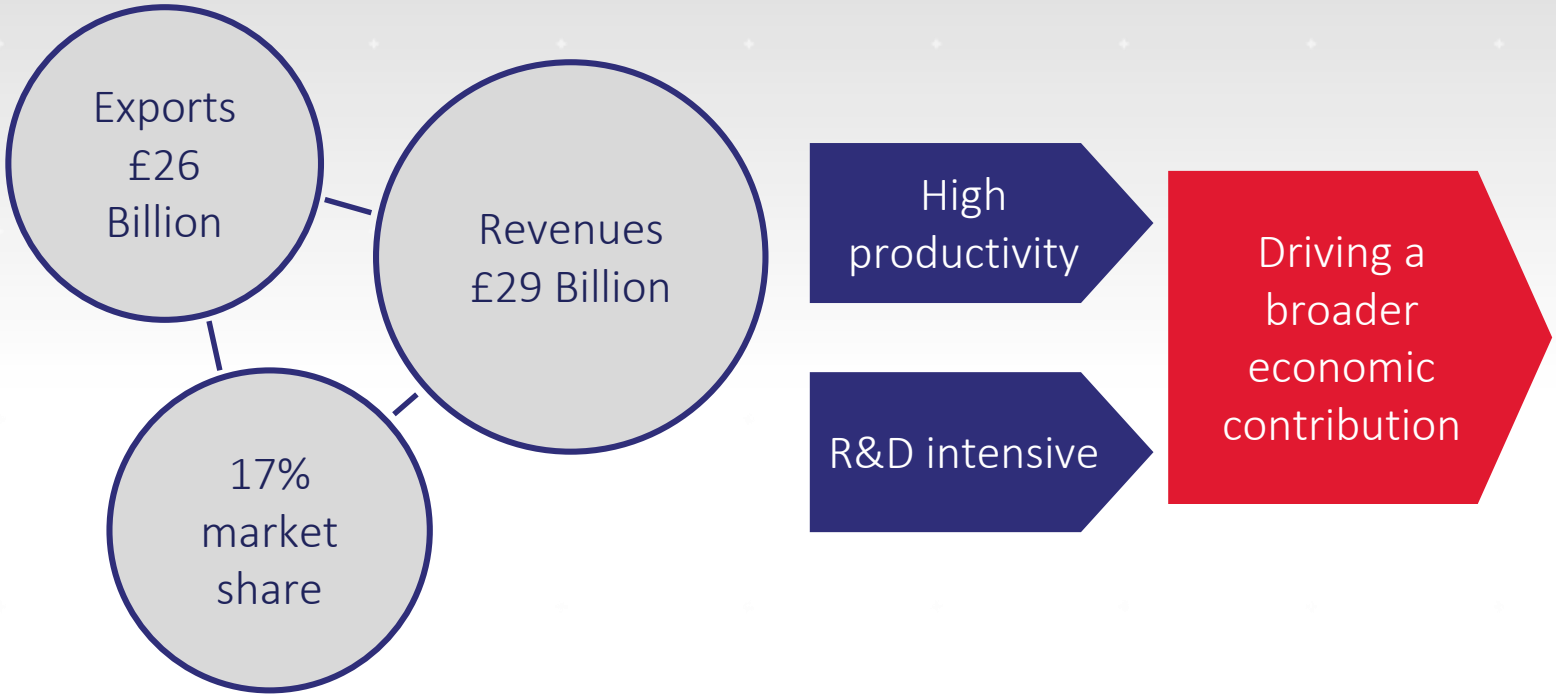
Delivering broader UK economic impact

UK civil aerospace facts 2015



Source: ADS 2015 Industry facts and figures

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Aerospace Growth Partnership set the course for continued success, leading to ATI

2012

Global opportunity & strategic areas:

- Skills
- Supply chain
- Technology
- Access to finance
- Engagement

2013

Mechanisms

- NATEP
- MSc Bursaries
- ATI & £2.1bn

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2014

Company established

- CEO/Chair by Q2
- EMT in September
- ~10 staff

January 2015

Technology strategy framework

- Coherent market-aligned
- Focused on economic impact
- Initial technology themes

July 2015

- 1st published strategy
- Institute embedded in strategic leadership of programme
- ~25 staff

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The ATI

- The Aerospace Technology Institute (ATI) is the objective convenor and voice of the UK's aerospace technology community
- We define the national aerospace technology strategy
- We work closely with Government and industry to direct joint funding into aerospace R&T projects that align with the strategy
- The Comprehensive Spending Review of November 2015 extended the joint funding available to £3.9 billion over 13 years (to 2026).

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Our mission & goals

Through strategic investment in differentiating technologies, secure the full economic potential of the UK aerospace sector

Technology investment

Providing technology leadership and maximising economic impact of R&T for UK aerospace

Provide Technology Leadership

Define a UK aerospace technology strategy that challenges industry, and create opportunities for advanced technology programmes to drive the growth of the UK aerospace sector

Maximise funding Impact

Drive the UK's aerospace R&T programme to maximise impact and embed benefits

Institute impact

Leveraging the Institute to add value in the sector

Convene strategic partnerships

Engage with a broad spectrum of stakeholders to challenge existing thinking, energise the UK aerospace sector and unlock new value

Elevate UK's international technology profile

Promote the advanced capabilities of UK aerospace technology and increase the UK's influence within European programmes and beyond

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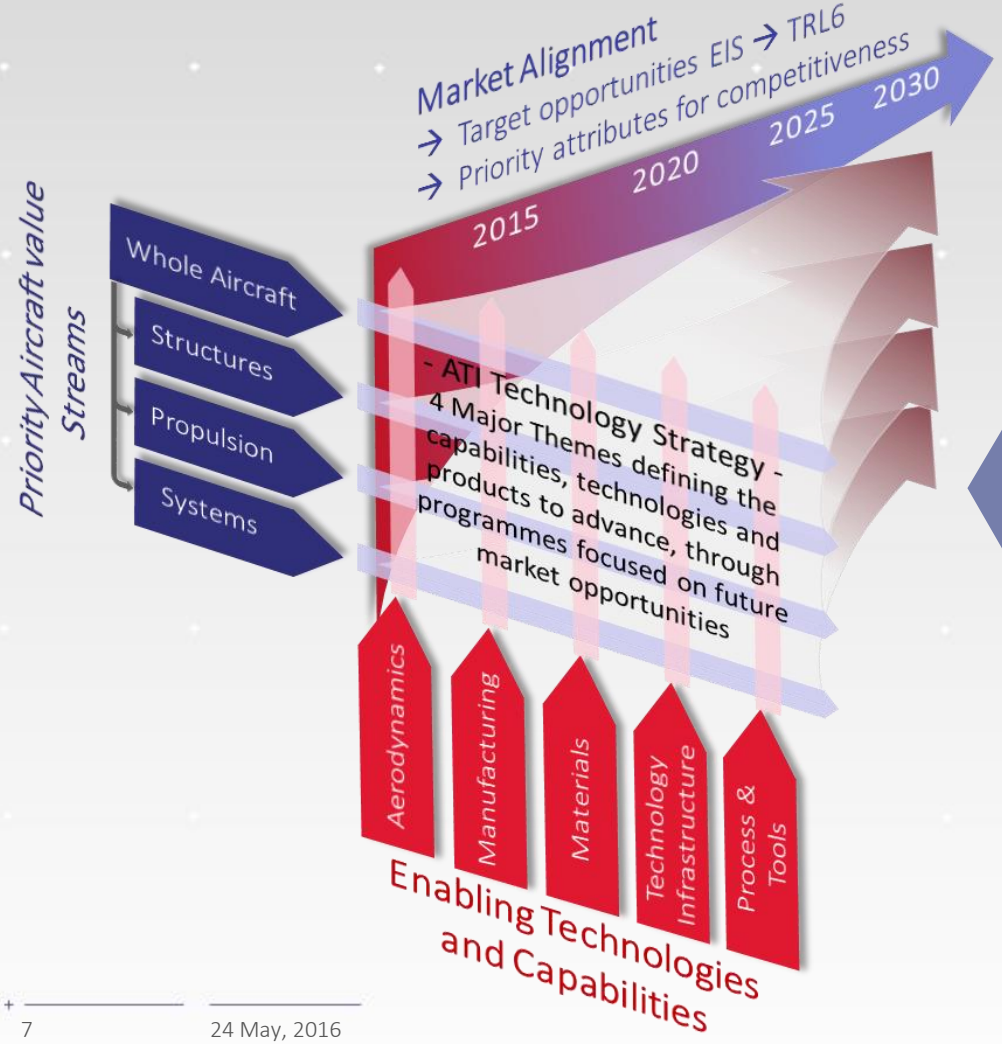
The UK aerospace technology strategy



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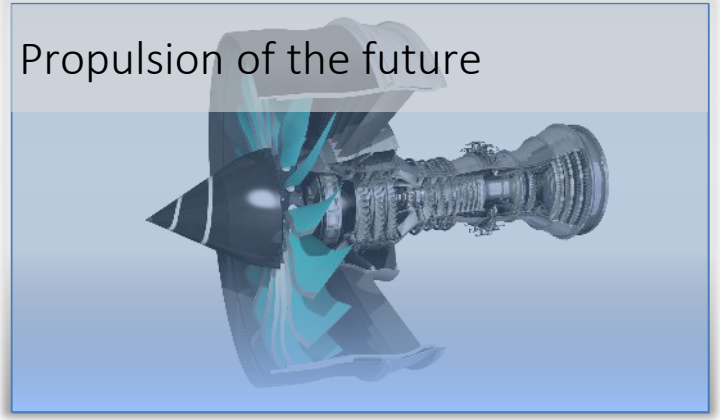
ATI Technology Strategy
Delivered through four technology themes

Aircraft of the future

Aerostructures of the future

Propulsion of the future



Smart, connected and more electric aircraft

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Large Volume Metrology

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Aerospace considerations for metrology

Conventional Manufacturing Processes	• Operating at scale with high yield • Adaptive manufacturing
Disruptive Manufacturing Processes	• Advanced composites manufacture • *Net* and near net-shape manufacture • Advanced coatings
Design & Modelling	• Integration of design and manufacturing parametric models • Product verification
Digital information & systems development	• Component 'eDNA'
Integrating solutions	• Full range metrology from large structural components through to electronics • Metrology solutions for fast make and rapid prototyping

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Large Volume Metrology challenges

- Environmental regulations for reduced aircraft emissions are driving new manufacturing technologies through new aircraft designs
- There are many high value aircraft components with significant metrology challenges such as Next generation aero-engine discs and shafts and Wings
- Increasing accuracy requirements for machining and assembly operations of high value components
- Product assurance in conventional manufacturing processes can benefit from metrology solutions
- High yield requirements and manufacturing rate ramp up require well managed process control

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Large Volume Metrology challenges

- Adaptive manufacturing links subtractive manufacturing processes to advanced metrology, on-machine sensors, NDE and CNC solutions
- Metrology solutions to enable integration of design and manufacturing parametric models
- Metrology for product verification driving new technologies in instrumentation and performance.
- Integration of instrument and process development through metrology modelling

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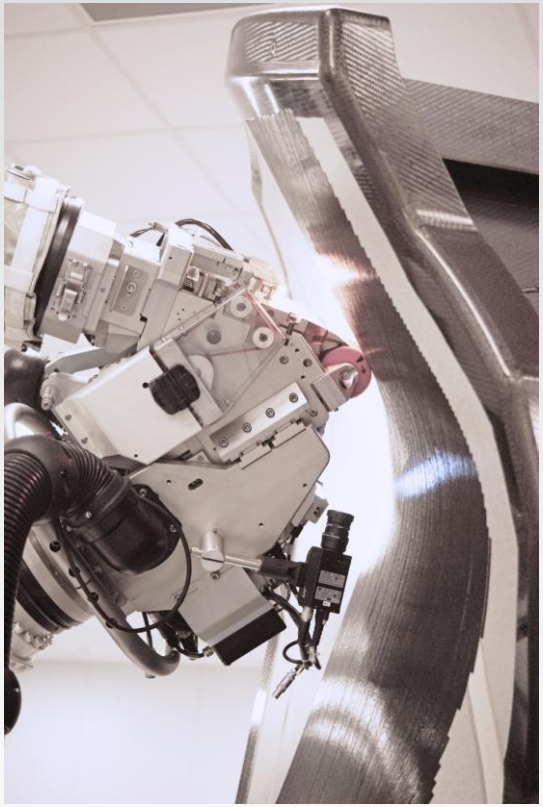
Large Volume Metrology opportunities

- Digital information and systems development driving metrology solutions to provide a comprehensive electronic description of all facets of a component
- Real time, portable, affordable metrology solutions to enable fast make and rapid prototyping
- Enhanced on-machine metrology to improve safety in an increasingly automated workspace
- In-component metrology solutions to achieve rate requirements with volume flexibility at affordable cost levels
- In-component sensors and metrology solutions to reduce supply chain recurring and fixed costs
- Integrated advanced metrology solutions to enable in-service, flexible (non-shop) repair technology.
- Metrology solutions for all materials to deliver reduced through life repair costs.



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Large Volume Metrology solutions

- Advanced metrology solutions embedded in the supply chain
- Improved inspectability and automation of inspection
- In-component sensors and metrology solutions
- “Smart Dust” sensor nets, permanent and temporary
- Metrology implementation at factory level to enable energy efficient product lifecycle process on product and factory during manufacturing and assembly process

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Any questions?

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