Better power for a changing world

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Customer Strategy & Marketing

11 November 2015

Trusted to deliver excellence

Rolls-Royce

We are a power systems and services Group

Rolls-Royce

Better power for a changing world

Our vision is to deliver better power for a changing world

A changing world

- Growing population and global growth creating demand for more power
- Greater affluence leading to greater mobility
- Climate change driving demand for lower emissions

Better power

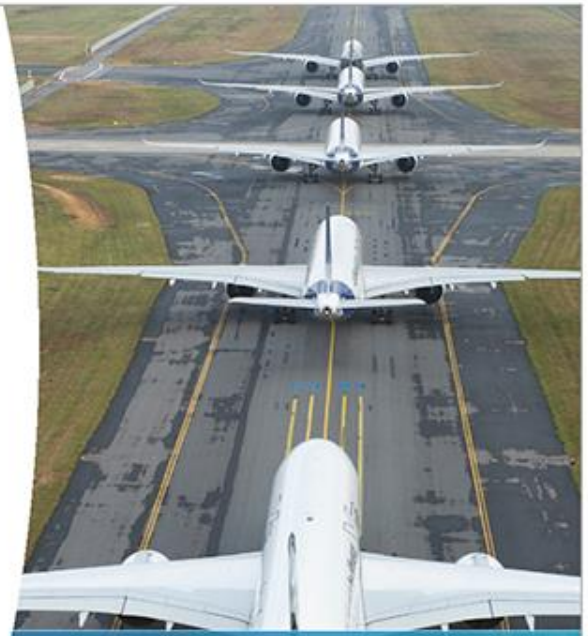
- Cleaner and more sustainable energy
- More fuel-efficient systems on land, at sea and in the air
- Helping customers to do more using less

Leading innovation

- **£1.2 billion** invested in research and development annually
- **More patents** filed annually than any other UK company
- **15,500** engineers
- **31** university technology partnerships

Leading technology

- **Trent XWB**
  World's most efficient large aero engine
- **MTU PowerPacks**
  Among the most advanced in the rail industry, meeting all the latest EU regulations on emissions
- **UT-Design series**
  Global benchmark for offshore oil industry: wave-piercing hull to improve efficiency and reduce fuel consumption



Trent XWB

In service on the Airbus A350 XWB.
Over 1,500 engines on order.

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Civil Large Engine portfolio

RB211-524G/H & -T

Boeing 747-400
Boeing 767-300ER

RB211-535E4

Boeing 757-200
Boeing 757-300

Trent 700

Airbus A330-200
Airbus A330-300 (including Regional)
Airbus A330-200F
Airbus A330-MRTT

Trent 800

Boeing 777-200
Boeing 777-200ER
Boeing 777-300

Trent 500

Airbus A340-500
Airbus A340-600

Trent 900

Airbus A380-800

Trent 1000

Boeing 787-8
Boeing 787-9
Boeing 787-10

Trent XWB

Airbus A350-900
Airbus A350-1000

Trent 7000

Airbus A330-800neo
Airbus A330-900neo

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Trent XWB-97 Flying Test Bed (05/11/2015)

Civil Aerospace

Overview

- 13,000 engines in service powering 35 aircraft types
- Leading engine supplier in widebody aircraft and large corporate jet markets
- Trent engine on most major new twin-aisle aircraft programmes

Growth drivers

- Continuous investment in applied R&D allows us to maintain strong market position
- Requirement for quieter, more fuel-efficient engines which reduce emissions
- Increasing demand for travel in emerging markets and requirement for more fuel-efficient aircraft

Market outlook

- Global market for equipment and services estimated at $1,900 billion over next 20 years
- Growth in engine deliveries drives $650 billion services market over next 20 years
- More than 90% of Trent engines covered by long-term service agreements

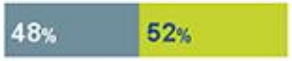
Revenue
£6,837m

Profit
£942m

Revenue by market

- Large engines
- Small & medium engines

Revenue mix



- Original equipment
- Customer services

Advance and UltraFan™

Our civil aero engine designs of the future will incorporate new CTi carbon and titanium fan blades to deliver significant weight savings.

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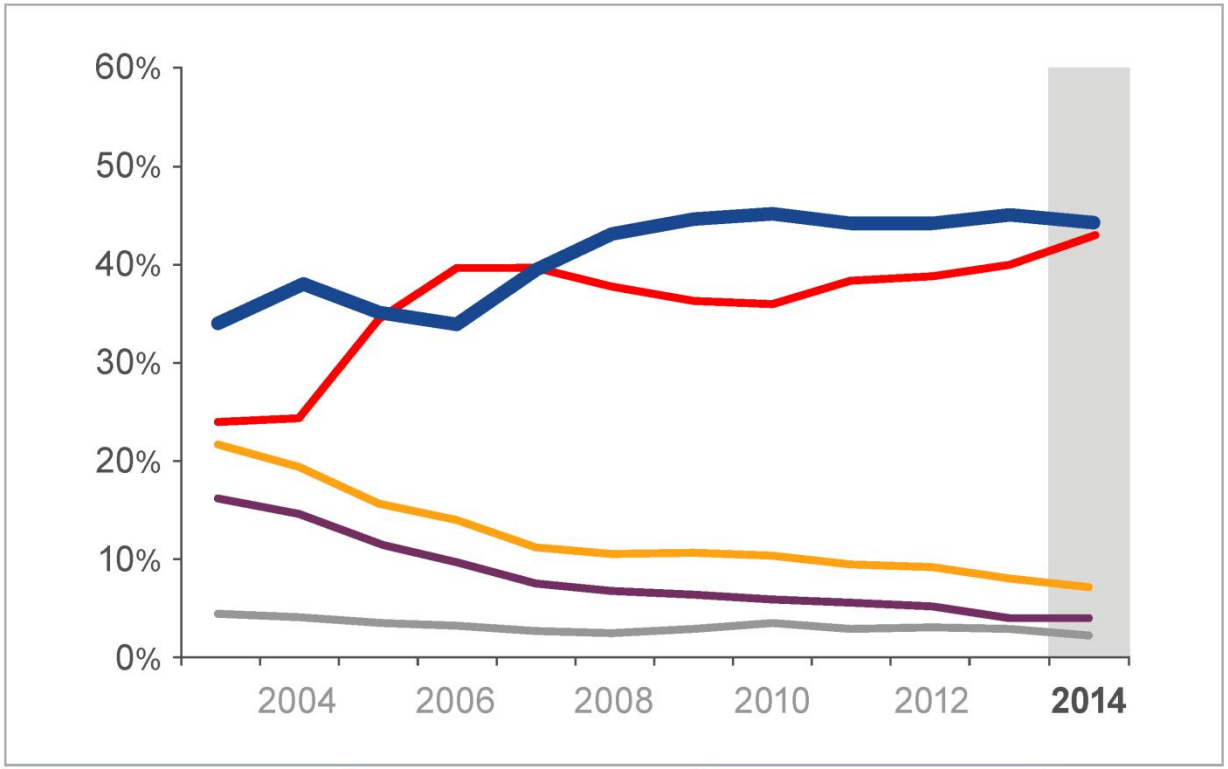
Modern widebody market share*



Rolls-Royce	General Electric	Pratt and Whitney	CFM	EA
44%	43%	7%	4%	2%

*A330, A340, A350, A380, 747-8, 777, 787

Data correct at March 2015

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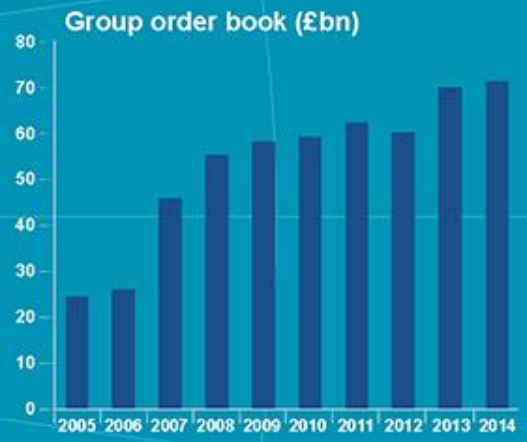
Confidence in the future

Growth markets

The fundamentals of the business are strong. We have the technology and the skills to remain at the forefront of markets that will grow over the long term

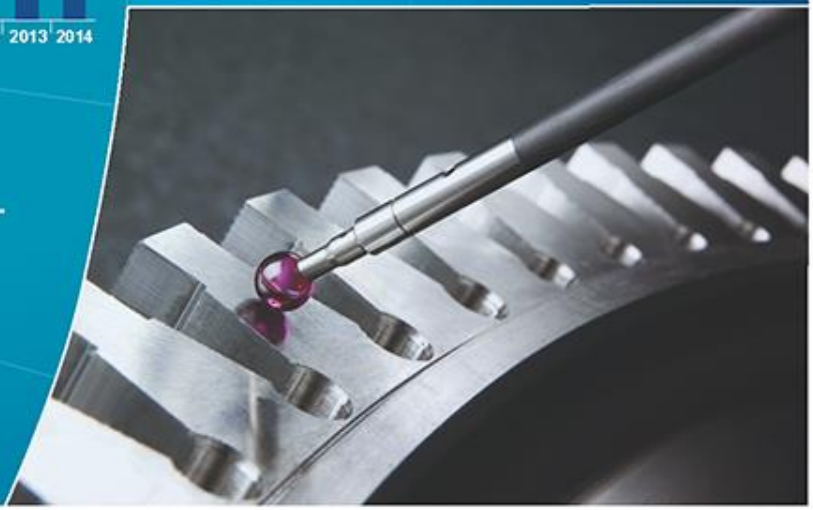


Strong order book

Original equipment and long-term service contracts give us visibility of revenues and demonstrate future growth potential of the business

R&D commitment

Investing more than £1 billion per year in innovation and technology to address new markets and meet current and future customer needs



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World-leading product evolution

Technology EIS Readiness	2020+	2025+
Bypass Ratio	11+	15+
Overall Pressure Ratio	60+	70+
Efficiency relative to Trent 700	20%+	25%+

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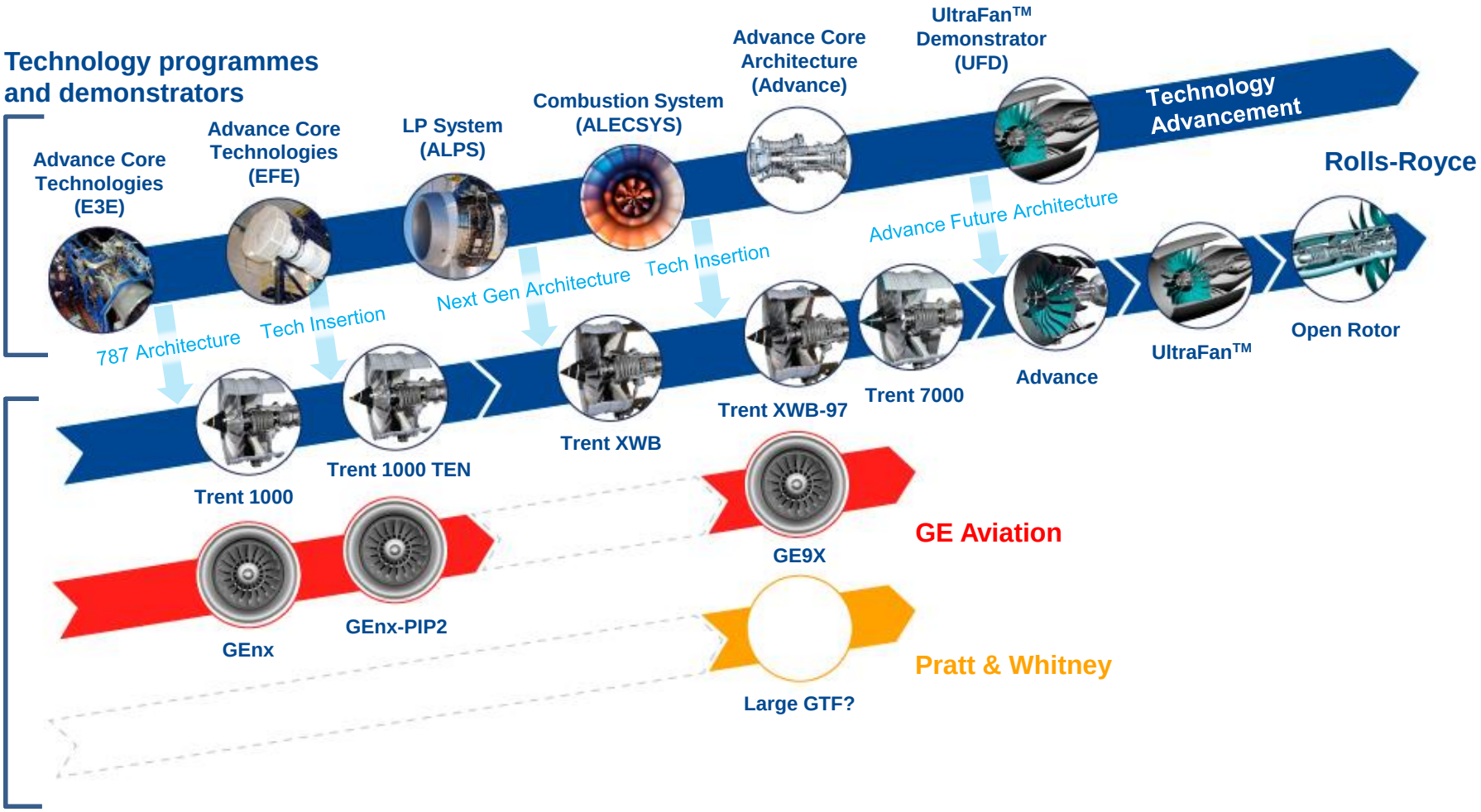
Our leading technology baseline



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Trent XWB

Fastest-selling widebody engine ever

Entry into service 2014

The world's most efficient large aero engine

Proven performance

Airbus A350-900
Airbus A350-1000

Incorporating the **latest technology**

Thrust 84,000lb - 97,000lb

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Trent XWB market status

TRENTXWB

Airbus A350-1000

Operators				
Aer Lingus	American Airlines	FINNAIR	Lufthansa	Vietnam Airlines
AEROFLOT Russian Airlines	ASIANA AIRLINES	GRUPO SYNERGY	QATAR AIRWAYS	VIP customer
AFRIQIYAH	BRITISH AIRWAYS	HONGKONG AIRLINES 香港航空	SAS	Yemenia اليمنية
AIR CARAÏBES	CATHAY PACIFIC	IBERIA	SINGAPORE AIRLINES	
AIR CHINA 中国国際航空公司	CHINA AIRLINES	JAPAN AIRLINES	SriLankan Airlines	
Air Asia	DELTA	KUWAIT AIRWAYS	TAP PORTUGAL	
AIRFRANCE KLM	Ethiopian The New Spirit of Africa	LAN TAM	THAI	
AIR MAURITIUS	ETIHAD AIRWAYS	LIBYAN AIRLINES	UNITED	

Lessors / owners				
AERCAP	AIR LEASE CORPORATION	ALAFCO	AWAS	CIT

782 firm aircraft with **40** customers, **181** A350-1000

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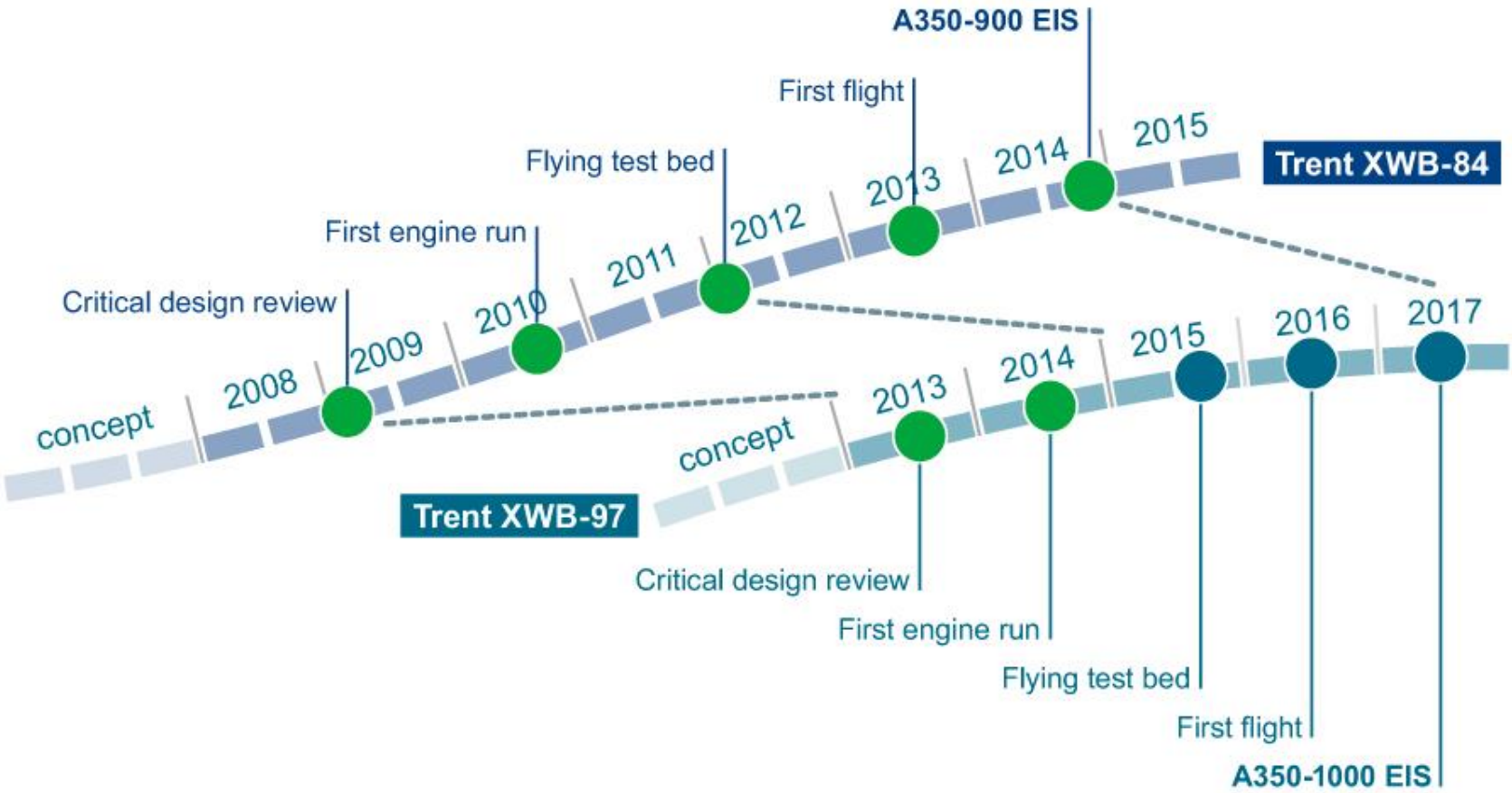
Trent XWB industrialisation



Parallel programmes, huge synergies

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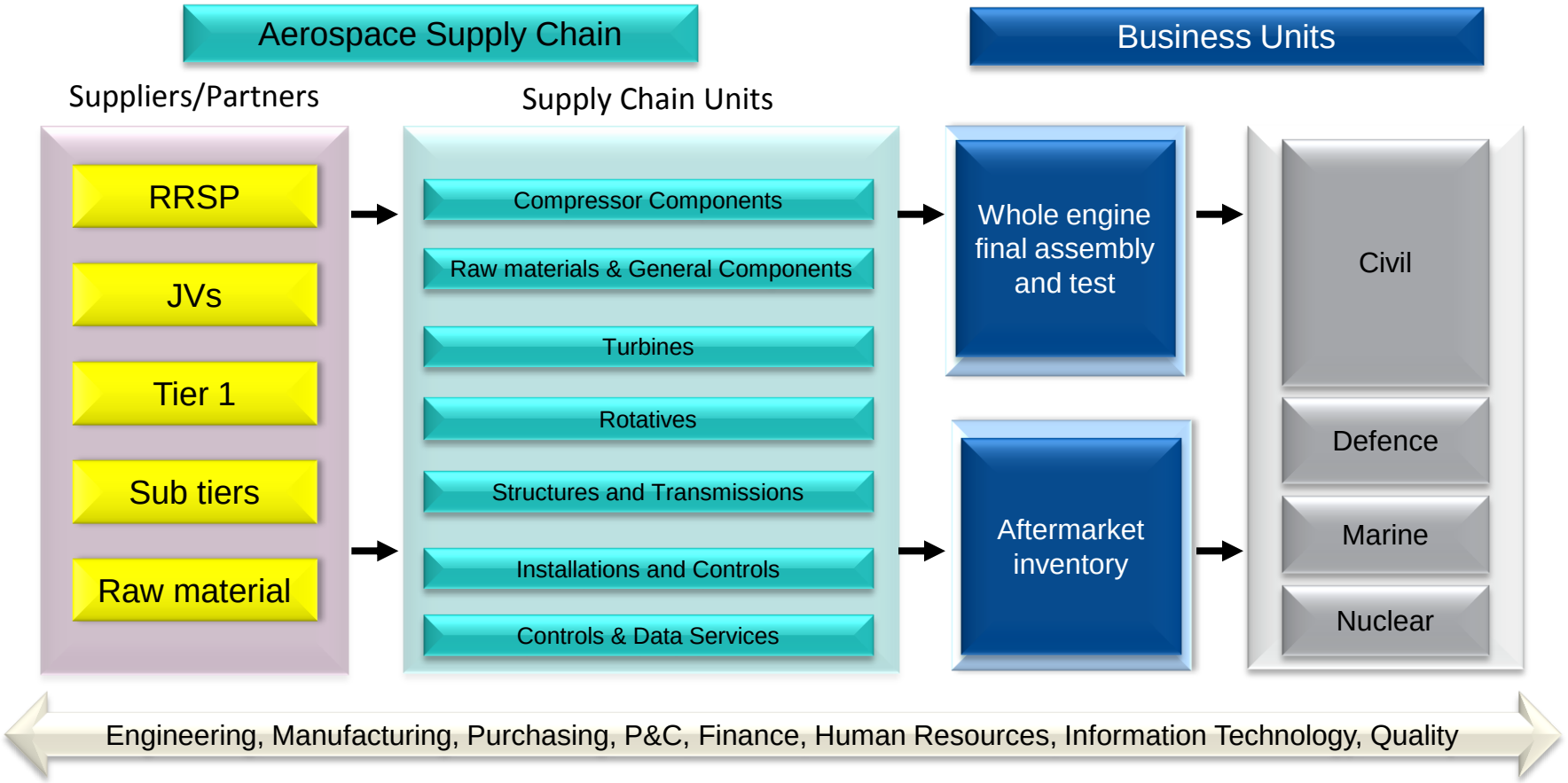
Supply chain value stream



Deliverables – Quality, Cost, Delivery, NPI, Product and Process Technology

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The challenges

Increasing requirements

- Seamless Implementation

New technologies

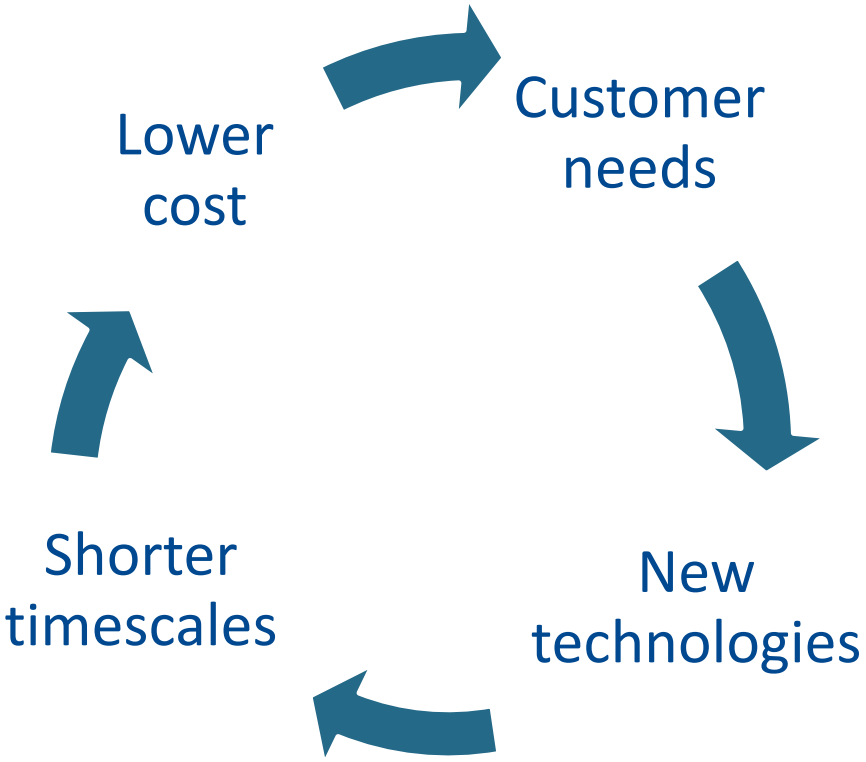
- 3D printing, intelligent Manufacturing

Shorter timescales

- Design, Make, Test, Certify

Lower cost

- £1bn+ investment for new engine programme
- 18,000 components needed to make a jet engine



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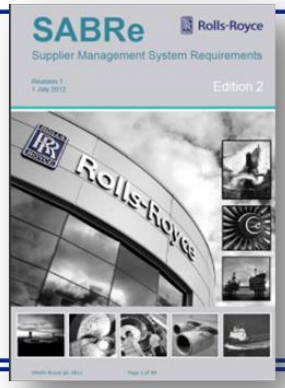
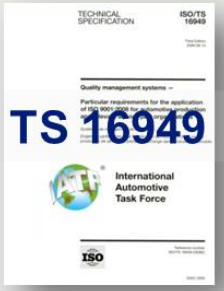
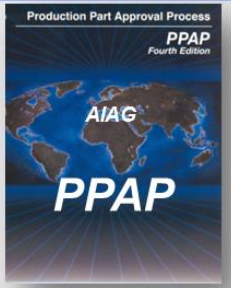
Relationship with SABRe & the Industry



SABRe is the supply facing element of the Rolls-Royce Management System

	A	B	C
	General Requirements	Product & Process Readiness	PPAP
Bench Marks			
Scope	*Site/Facility/ Organisation Standards*	*Standards for NPI /change activities & management*	*Production Product Approval*
	Business level	*Product / Production Process level*	

For Reference: AIAG is the Automotive Industry Action Group

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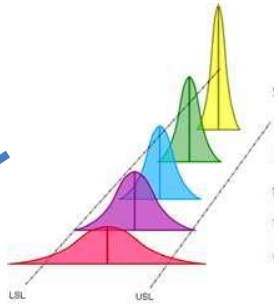
Requirements

Quality
Right First Time

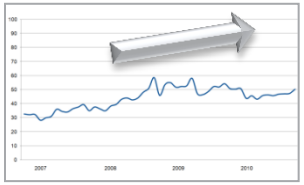


Technology
World-class products & capabilities

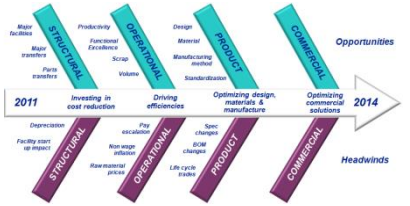
Supplier Engagement

Management
Strategic investments

Delivery
Drive to 100%



Cost
Year-on-year cost down



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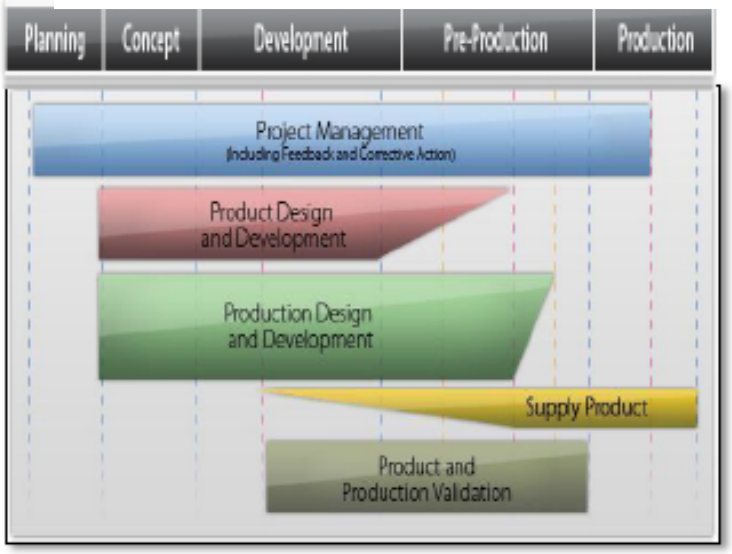
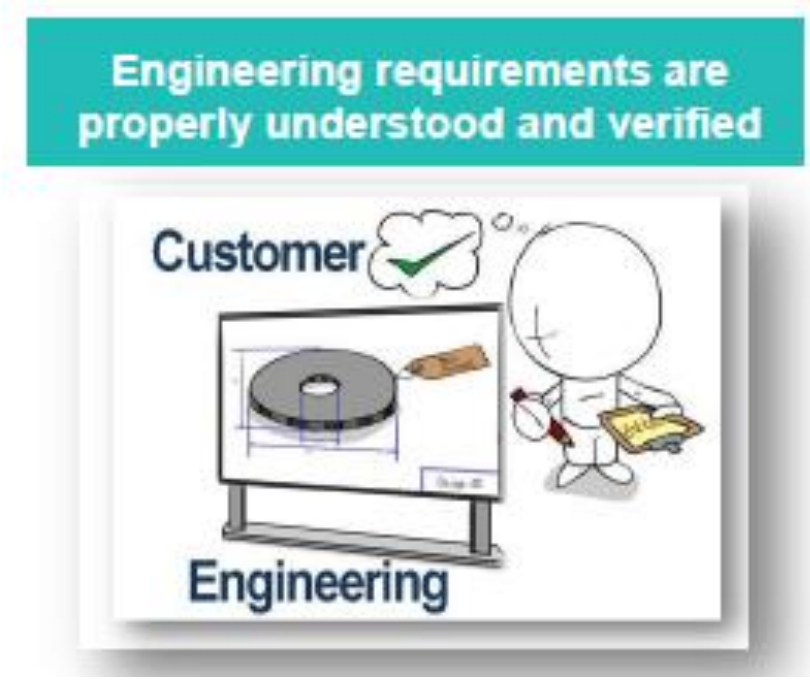
Integrated Product and Production Readiness



- ✓ *One macro level process*
- ✓ *Stages (start to finish), each having clear purpose that support product AND production*
- ✓ *Milestones that provide clear check points*
- ✓ *Themes that readiness tasks are aligned to*
- ✓ *Clear responsibly for all team members*

Production Product Approval Process

Once the IPPR questions have been answered, evidence is gathered through PPAP



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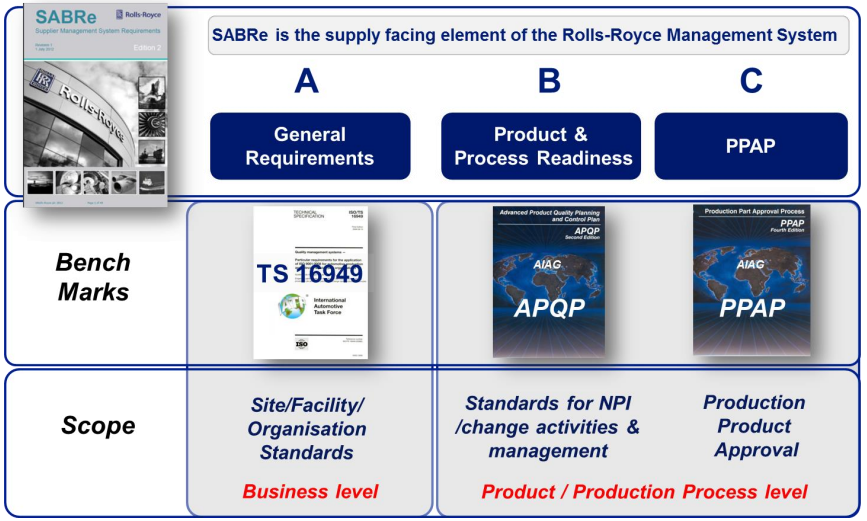
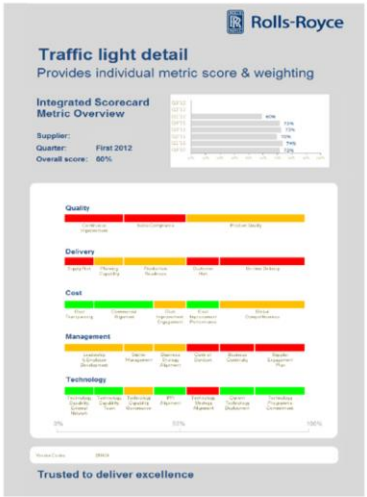
Supply Chain Management

- Global Supplier Code of Conduct
- Supply Continuity
- Supplier Capacity Development
- Supplier Selection





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Relationship with SABRe & the industry

United Technologies
AgustaWestland
MBDA
SNECMA
GKN Aerospace Engine Systems
Bell Helicopter
Rockwell Collins

Airbus
GE Avio
Meggitt Control Systems
United Aircraft Corporation
Parker Hannifin Corp
Israel Aerospace Industries
Mitsubishi Heavy Industries Ltd

Honeywell Aerospace
BAE Systems
Rolls-Royce
Aerojet
General Electric Aviation
Cabiran (1991) Ltd.

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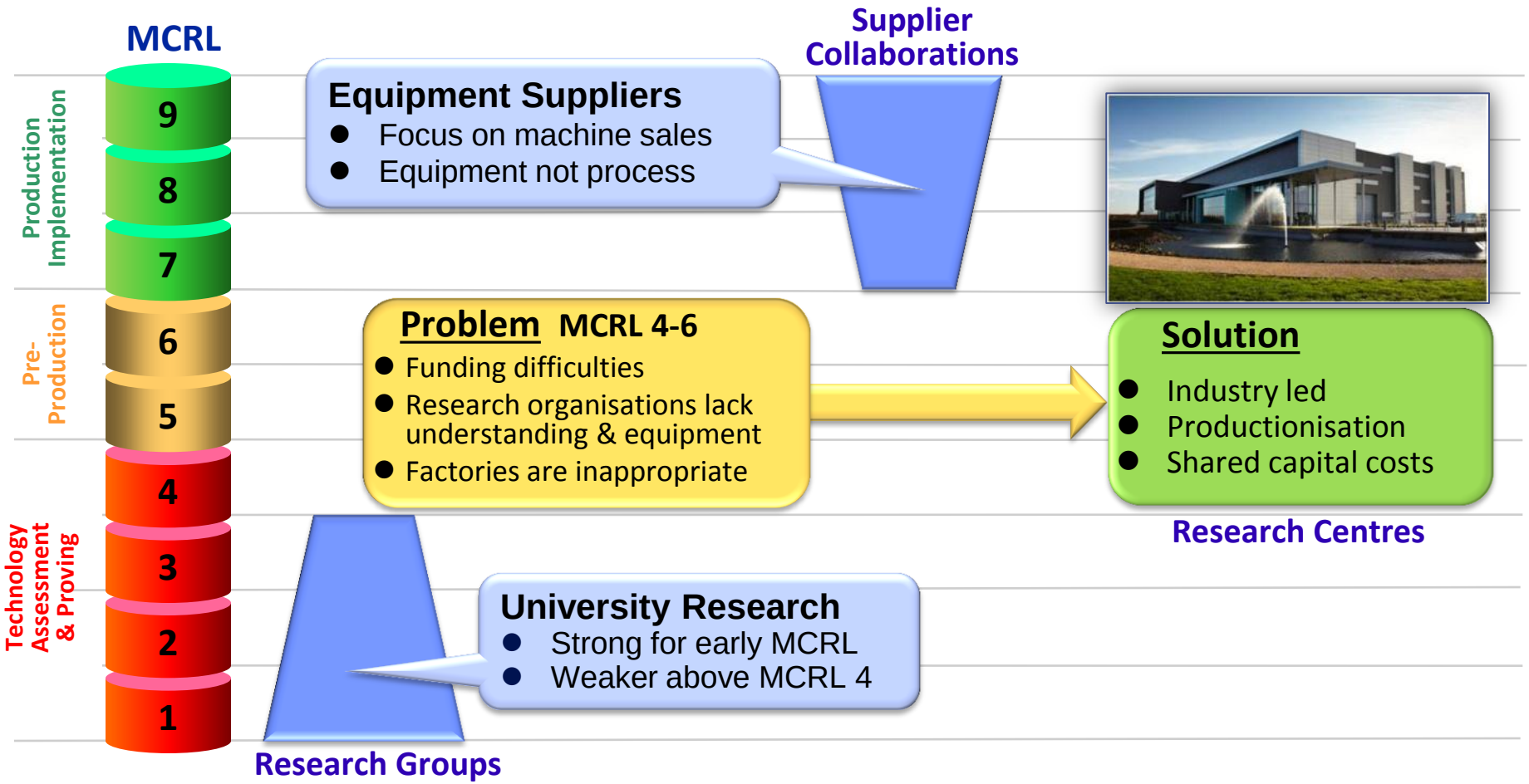
Mind the gap



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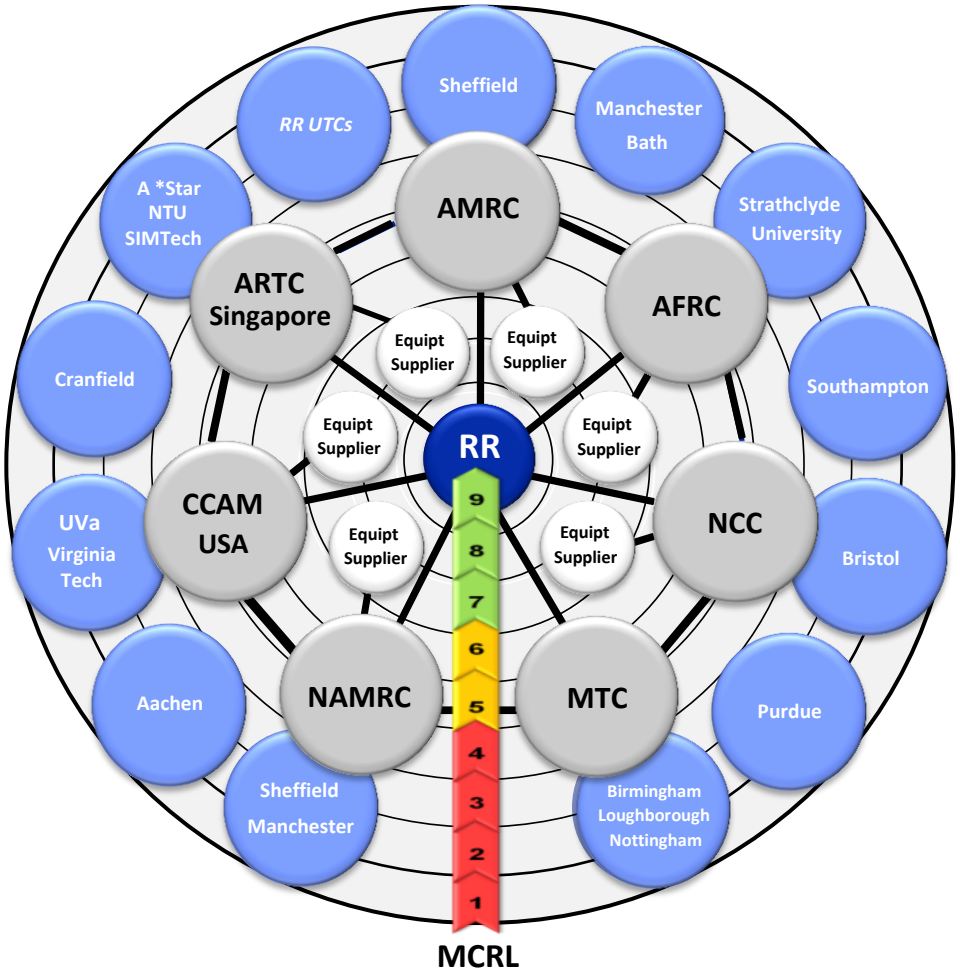
How it all fits together



Advanced Manufacturing Research Centre

Advanced Forming Research Centre

Manufacturing Technology Centre

Advanced Remanufacturing & Technology Centre

Network of Manufacturing Research Centres

	Now	+ 5 Years
Investment	£300M	> £600M
Members	230	> 500
Staff	600	> 1200
Floor (m2)	50,000	> 100,000
Research Turnover	£65M	> £130M

National Composites Centre

Commonwealth Centre for Advanced Manufacturing

Nuclear – Advanced Manufacturing Research Centre

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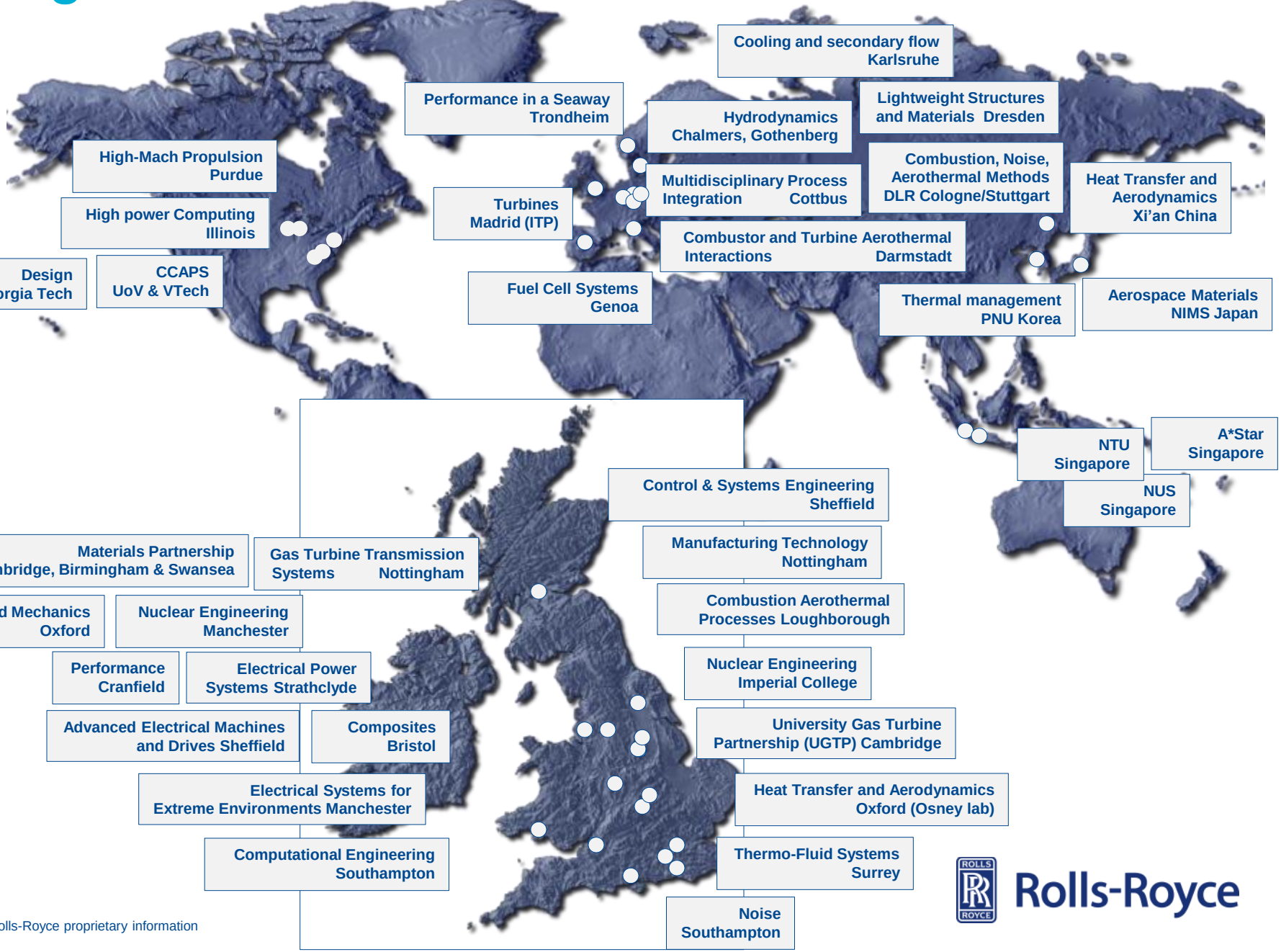
Our global research network



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World leaders

Production Leader

World-class products start with world-class people

Ady Elks

Next generation

Designing the future today

Lara Small

Outstanding achievement

An apprenticeship in excellence

Aiden Rogers

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Summary

- Supply chain management may not be all that different to other industries

- **Critical:**
  - Planning, planning, planning
  - Finding the right make/buy balance
  - Relationship with the Supply Chain:
    - Partnership
    - Trust

The bigger picture

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