Group Financial Highlights *†

Free cash flow Δ
£568m
2017: £259m

Full year payment to shareholders
11.7p
2017: 11.7p

Underlying revenue
£15,067m
2017: £13,671m ‡

Reported revenue
£15,729m
2017: £14,747m †

Underlying operating profit
£616m
2017: £306m ‡

Reported operating (loss)/profit
£(1,161)m
2017: £366m ‡

Underlying profit before tax
£466m
2017: £199m ‡

Reported (loss)/profit before tax
£(2,947)m
2017: £3,898m ‡

Underlying earnings per share
16.0p
2017: 2.3p ‡

Reported earnings per share
(129.2)p
2017: 184.4p ‡

Net funds/(debt) ø
£611m
2017: £(305)m

* All figures in the narrative of the Strategic Report are underlying unless otherwise stated. The explanation of underlying and the reconciliation to the reported figures is in note 2 to the Consolidated Financial Statements on page 129.
† All references to organic change in the Strategic Report are at constant translational currency and excluding M&A.
‡ Following the adoption of IFRS 15 *Revenue from Contracts with Customers* in 2018, the 2017 figures have been restated – see note 27 to the Consolidated Financial Statements.
Δ Free cash flow is defined in note 26 on page 168.
ø Net funds/(debt) is defined on page 111.

Contents

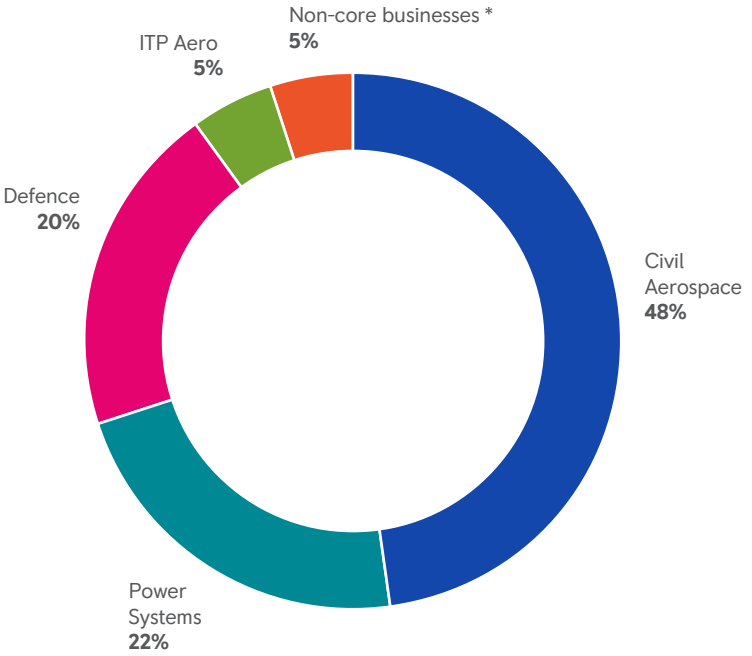
Forward-looking statements

This Annual Report contains forward-looking statements. Any statements that express forecasts, expectations and projections are not guarantees of future performance and guidance may be updated from time to time. This report is intended to provide information to shareholders, and is not designed to be relied upon by any other party or for any other purpose, and the Company and its Directors accept no liability to any other person other than that required under English law. Latest information will be made available on the Group's website. By their nature, these statements involve risk and uncertainty, and a number of factors could cause material differences to the actual results or developments.

GROUP AT A GLANCE

Rolls-Royce pioneers cutting-edge technologies that deliver clean, safe and competitive solutions to meet our planet's vital power needs.

Underlying revenue mix in 2018



Free cash flow

£568m

Underlying revenue

£15,067m

Reported revenue

£15,729m

Underlying operating profit

£616m

Reported operating loss

£(1,161)m

Read more in our Business Review on pages 24 to 40.

Order backlog **

£63.1bn

Patents approved for filing

892

Gross R&D expenditure

£1.4bn

Countries

50

Employees (year average)

54,500

* see page 40 for definition of non-core businesses.
** see page 14 for definition of order backlog.

Our core businesses in 2018

Civil Aerospace

Civil Aerospace is a major manufacturer of aero engines for the large commercial aircraft, regional jet and business aviation markets. The business uses engineering expertise, in-depth knowledge and capabilities to provide through-life support solutions for its customers.

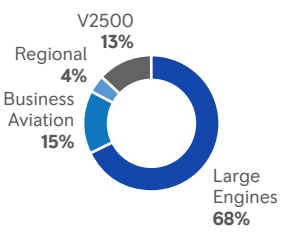
Underlying revenue

£7,378m

Underlying operating loss

£(162)m

Underlying revenue mix



See page 24

Power Systems

Power Systems is a leading provider of high-speed and medium-speed reciprocating engines and complete propulsion systems. It serves the marine, defence, power generation and industrial markets and includes civil nuclear operations that supply safety-critical systems.

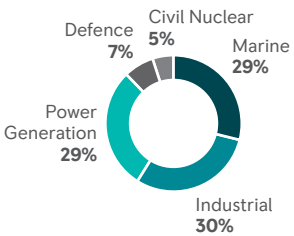
Underlying revenue

£3,484m

Underlying operating profit

£317m

Underlying revenue mix



See page 30

Defence

Defence is a market leader in aero engines for military transport and patrol aircraft with strong positions in combat and helicopter applications. It has significant scale in naval and is the technical authority for through-life support of the nuclear power plant for the Royal Navy's submarine fleet.

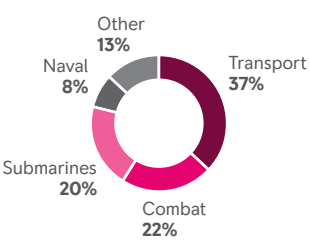
Underlying revenue

£3,124m

Underlying operating profit

£427m

Underlying revenue mix



See page 34

ITP Aero

ITP Aero is a global leader in aero-engine design, manufacture and maintenance. Alongside the development, manufacturing, assembly and testing of engines, it provides MRO services for regional airlines, business aviation, helicopters, industrial and defence applications.

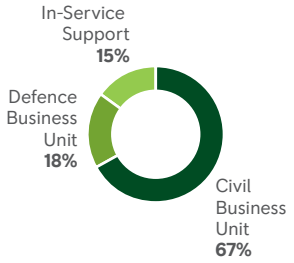
Underlying revenue

£779m

Underlying operating profit

£67m

Underlying revenue mix



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CHAIRMAN'S STATEMENT

The underlying strength of our business model is increasingly apparent. We are focused on generating strong returns and the cash flow that will allow us to compete even more effectively in what continue to be attractive growth markets. Our long-term goal is to be the world's leading industrial technology company. We have the potential to achieve that.

In my statement last year I talked about the momentum that was building in our Company after a challenging period. This momentum has continued and there were some notable achievements and advances in the year, despite a significant, unanticipated operational setback in our Civil Aerospace business.

The underlying strength of our business model is increasingly apparent. After a period of heavy investment, we are now focused on generating strong returns and the cash flow that will allow us to compete even more effectively in what continue to be attractive growth markets. Our long-term goal is to be the world's leading industrial technology company. We have the potential to achieve that.

2018 Overview

We entered the year with a determination to improve our efficiency and operating performance and a refined vision and strategy (see page 10). We embarked on an ambitious restructuring programme and increased the focus of the Group by rationalising our portfolio and simplifying our corporate structure. This is an ongoing task, and pace of implementation has been uneven, but the signs of progress are clear. Your Board and management team absolutely recognise the need to improve our operational competitiveness and performance, particularly in our Civil Aerospace business.

Strategically we have sustained our investments in the technologies that will ensure our long-term competitiveness and innovation ambitions (see page 41). Advanced materials and electric and hybrid technologies will be as crucial to our success as artificial intelligence and digitalisation.

IAN DAVIS
CHAIRMAN

The successful development and adoption of digital technologies across the whole of our Group will be fundamental to both improved cost efficiency and quality, and also to our long-term growth platforms. I am particularly excited about some of our achievements in this area – for example the establishment of R² Data Labs and creation of a digital ecosystem through partnerships with start-ups and academia.

I would like to highlight the exceptional performance of Power Systems. The business has made the most of strong end markets, but additionally has made some innovative breakthroughs in services and new technologies such as hybrid power for trains. We are also seeing tangible examples of technology transfer between Power Systems and our other businesses, particularly in aftermarket services, a crucial component of the Rolls-Royce business model.

We have had setbacks, however, the most significant of which has been operational issues with our in-service fleet, particularly with our Trent 1000 engine. This has caused pain for us and even more importantly for many of our customers. In the end, businesses are there for their customers and we very much regret the disruption caused. This has been an area of continuing focus and oversight by the Board. That said, I would like to draw attention to the heroic efforts of our engineering and customer support teams (and indeed to those of our partner customers) in addressing the issues, while maintaining their absolute dedication to ensuring product safety – our most important priority.

At the time of writing we do not have clarity on the UK's withdrawal from the European Union. During 2018 we took steps to prepare for different potential outcomes with a particular focus on supply chain continuity and retaining essential capabilities. The potential risks and impacts considered by our Brexit steering group is included in the Principal Risks section in this report (see page 50) and the risks relating to Brexit were also included in our viability assessment (see page 55).

Stakeholder trust and confidence

Building credibility and trust with stakeholders is a priority. We held another Capital Markets event with our investors in 2018, at which we clarified our financial metrics and performance and provided a detailed review of our Power Systems business and of the organisational and cultural changes we are planning.

We specified our targets and ambitions for cash flow – our priority near-term financial objective – but also introduced a new measure: cash return on invested capital (CROIC). This will be a primary long-term financial measure and the basis for capital allocation decisions.

We have continued also to focus on engaging with our employees. I talk more about this in the Corporate Governance section (see page 67). Irene Dorner has been designated as Employee Champion on the Board and she has geographic support in this role from Beverly Goulet in North America. All Directors are encouraged, and expected, to visit our operations across the world and to engage with employees on these trips at open invitation Meet the Board events. This helps us to understand the culture of the Company as well as to hear employees' concerns and exciting ideas directly. Such visits also help us observe progress on key topics such as diversity and safety awareness. At the same time, it helps demystify the Board and, hopefully, makes us more human and accessible.

We continue to engage actively with governments and social organisations to understand our broader impact on issues such as the environment.

We have always pursued the goal of cleaner, safer and more competitive power, and we recognise our role and responsibility in enabling the transition to a low carbon world. We understand our obligations and are keen to partner and collaborate to find solutions while delivering on our core business purpose.

> "Strategically we have sustained our investments in the technologies that will ensure our long-term competitiveness and innovation ambitions."

Shareholder payments

Although we are emerging from a very significant investment cycle, the needs of the business are substantial. Steps have been taken in 2018 to further strengthen the balance sheet. However, it is sustainable free cash flow from within our business upon which we must base our shareholder payment strategy and we still have work to do in order to deliver that.

It is proposed that the final payment for 2018 is unchanged from 2017 at 7.1 pence per share. Taken together with the interim payment, this brings the full-year payment to 11.7 pence per share. As with past payments, the distribution will be in the form of C Shares.

Our performance has improved significantly from the position in which we found ourselves three years ago and it remains our stated objective, in the long term, to progressively rebuild payments to shareholders to an appropriate level, subject to the cash needs of the business. This reflects the Board's long-standing confidence in the strong cash generation potential of Rolls-Royce, as we build our share of the widebody engine market and benefit from the consequent increase in services revenue.

Board developments

During the year we announced the appointment of Nick Luff as a Non-Executive Director. He joined the Board following the AGM and is a member of the Audit Committee and Safety & Ethics Committee as well as the Nominations & Governance Committee. A chartered accountant and chief financial officer of RELX Group, he brings to your Board additional financial and accounting acumen. He also has expertise and experience in cyber security and is active in the oversight of this key activity – and risk – for the Group.

Looking forward

Our medium-term prospects remain bright and the long-term growth opportunities are significant. Our immediate focus is on improved financial and operational performance so that we have a sound and credible financial platform for productive long-term investment into rapidly growing markets. Our technology platforms – in gas turbines, in micro-grids and in electrical propulsion – will be fundamental to this.

We have further work to do on restructuring and on improving our internal processes and controls, and shifting the culture remains an important priority as Warren talks about in his statement.

I would like to conclude by thanking all my colleagues and co-workers at Rolls-Royce for their dedication and hard work in challenging circumstances. Their pride in the Company, and the determination to improve and develop, are one of our greatest assets.

Ian Davis
Chairman

CHIEF EXECUTIVE'S REVIEW

Our goal was to make 2018 a breakthrough year for Rolls-Royce and real progress has been made in realising that ambition. We are seeing the crucial behavioural changes we need to build momentum and sustain these positive changes.

Progress in 2018

At the start of the year I made clear that our goal was to make 2018 a breakthrough year for Rolls-Royce and real progress has been made in realising that ambition. We have taken significant strategic steps, with the simplification of our Group and subsequent launch of a more fundamental restructuring positioning us for success. We are now starting to see the crucial cultural and behavioural breakthrough Rolls-Royce requires to build real momentum and sustain the positive change seen in 2018 for the long term, in support of our aspiration to be the world's leading industrial technology company.

Underlying financial results were ahead of expectations with strong growth from Civil Aerospace and Power Systems and a steady performance in Defence and ITP Aero. We reported good growth in underlying revenues and delivered a material improvement in underlying profit and free cash flow – another step along the journey towards free cash flow of at least £1bn by 2020. During the year we extended that financial horizon, with a mid-term ambition for free cash flow per share to exceed £1, in line with our ongoing drive to increase openness and transparency with investors. The message is clear: after a decade of significant investment we are committed to delivering improved returns while continuing to invest in the innovation needed to realise our long-term aspiration.

While we achieved a number of important operational and technical milestones during the year, we faced the challenge of in-service issues with the Trent 1000 which caused significant disruption for a number of our customers, which we sincerely regret. Given the advanced nature of the engineering requirements of aerospace products, such in-service issues can occur in our industry and it is the behaviour of our Company in dealing with them which will be

WARREN EAST
CHIEF EXECUTIVE

remembered by customers. We are recognising a significant exceptional charge within our financial figures for 2018 as a result of the abnormal cost of our contribution to dealing with customer disruption, but we are managing the issues and good progress was made in the year on long-term solutions (see page 24).

Our colleagues in Civil Aerospace have worked tirelessly to minimise disruption: designing new parts and inspection techniques and gaining the necessary regulatory approvals; increasing blade manufacturing; and growing maintenance capacity. I have been particularly encouraged by the attitude of the wider business to this challenge. Everyone has rallied round and taken the necessary mitigating actions in order to accommodate the additional costs that we incurred during the year. As a whole organisation we responded and delivered, and that is a real breakthrough.

Consistent with the announcement from Airbus in early 2019 that A380 deliveries will end in 2021, we will deliver our final tranche of Trent 900 engines over the next two years. The financial impact of this has been reflected as an exceptional item. We look forward to maintaining the in-service Trent 900 fleet for many years to come.

Strategic and cultural change

We entered the year with a clear, refreshed vision to pioneer cutting-edge technologies that deliver clean, safe and competitive solutions to meet our planet's vital power needs (see page 10). Following that vision, the year began with the further simplification of the Group from five operating businesses to three core units – Civil Aerospace, Power Systems and Defence – enabling us to act with much greater pace in meeting the needs of our customers. Creating a Defence operation with increased scale, for instance, will present us with further opportunities in the future. ITP Aero, acquired in 2017, remains a separate business unit within the Group.

We also took the decision to carry out a strategic review of our Commercial Marine operations, resulting in the sale of the business, due to complete in the first half of 2019. The team in Marine has responded admirably to a significant downturn in the offshore oil & gas market to reduce its cost base, while simultaneously carving out an industry-leading position in ship intelligence and autonomous shipping. We believe, however, that its future will be better served under new ownership. This business has been reclassified within assets held for sale. During the year we sold L'Orange, which supplies fuel injection technology; enabling Power Systems to focus on other long-term, high-growth opportunities and the Group to allocate our capital to core technologies.

These strategic changes enabled us to embark upon a 24-month programme of fundamental restructuring, to create smaller and more cost-effective corporate and support functions and reduce management layers and complexity (see page 08). We expect the proposed restructuring will lead to the reduction of around 4,600 roles by mid-2020. By the end of the year our non-manufacturing headcount had reduced by around 1,300. It is never an easy decision to reduce our workforce, but we must fundamentally change the way we work.

We are replacing a heavily-centralised control culture with empowered businesses, operating within a framework, in a leaner structure with much clearer accountabilities. We have reduced the size of our head office to focus solely on corporate governance, strategy and ensuring that we fulfil our corporate responsibilities as a publicly-listed company. From the start of this year, our businesses are being supported by a Group Business Services (GBS) organisation, which pools our professional and transactional services; and an Innovation Hub, which draws together skillsets and expertise which have common application across the Group including digital capabilities, future technologies and strategic insight. This activity will foster quicker decision-making but must be accompanied by the appropriate behavioural change; only then will this breakthrough be sustained into the long term.

The move to more empowered businesses removed the requirement for a Group Chief Operating Officer role and the Executive Team is now firmly focused on driving the required cultural change across the Group. We are embedding the behaviours that we need from our people through our care framework (see page 44), starting with the newly created Enterprise Leadership Group (ELG), consisting of the top senior managers from across the Group. Formed in 2018, the ELG gathered together for the first time early in 2019 and their level of energy was palpable – a clear signal that senior leaders are highly engaged. Crucially, there is a fundamental understanding that they are, first and foremost, leaders of the whole enterprise, not solely of a business or function. That enterprise-first mentality is vital to create the collaborative and agile organisation we need to become the world's leading industrial technology company.

Delivery on 2018 priorities

At the beginning of the year, we set out four key priorities:

Priority 1: Customers

Our simplification and restructuring will shift our centre of gravity much closer to our customers and during the year we delivered on many of our promises to them. We joined Airbus and Qatar Airways to celebrate the delivery of the first Airbus A350-1000 to enter service, the first aircraft to be powered by our Trent XWB-97 engines; welcomed the delivery of the first A350 to mainland China; and saw the handover of the first A330neo, powered by our Trent 7000, to launch customer TAP Air Portugal. Civil Aerospace deals signed during the year included Trent XWB engine and long-term TotalCare service agreements with China Eastern Airlines and Turkish Airlines. During the year, the Trent XWB passed two important milestones as the fleet recorded two million flying hours just days after the 500th engine was delivered to Airbus. The Trent 700 fleet, meanwhile, passed two even greater milestones as the fleet recorded 50 million flying hours and the 2000th engine delivery. We also announced our first launch customers for LessorCare, designed to meet the aftermarket needs of aircraft lessors, and subsequently added LifeKey, which gives customers greater control over their assets.

2018 priorities

Customers	Technology	Resilience	Financial progress
mitigate impact to rectify in-service issues, ramp up large engine production, grow service capabilities	focus through product digitalisation, electrification and revitalisation	through adaptability with a spotlight on safety, diversity & inclusion, and the highest ethical standards	delivering improving free cash flow, strengthening balance sheet, more disciplined capital allocation

During the year, we launched a new engine family for business aviation, with the introduction of the Pearl, and the first engine – the Pearl 15 – will be the sole engine for Bombardier's latest business jets (see page 28).

We were selected by the UK Government to play a pivotal role in Team Tempest, providing power and propulsion for the new UK combat fighter programme; scored a significant victory with our first partnership on a major military programme with Boeing Defense, powering the US Navy's new MQ-25 Stingray aircraft; and, following a concerted effort over the past few years to get our performance back on track, 2018 saw us deliver on all our promises to the Astute and Dreadnought submarine build programmes.

We signed memoranda of understanding for hybrid rail PowerPacks in Germany, Ireland and the UK (see page 31) and increased the number of long-term service agreements with customers of Power Systems, increasing our opportunities in the aftermarket and further replicating the model we pioneered in Civil Aerospace.

For some of our customers, however, the year was marred by the in-service issues with the Trent 1000 (see page 26). Coupled with challenges within our external supply chain, the increased load placed on our test capacity by the Trent 1000 issue meant delays in deliveries of the Trent 7000 at the end of the year. Overall we delivered fewer Trent engines during the year than we anticipated, a situation which we have been working hard to address in early 2019. We also had delivery issues in our Defence and Power Systems businesses.

Priority 2: Technology

During the year we made encouraging progress on existing programmes, new demonstrators and future technologies. We are making excellent progress on our new UltraFan demonstrator (see page 41), which is not only the foundation upon which our future large civil aero engines will be based but provides underlying technologies that will support other areas of our Group. We made encouraging progress in our strategy to champion electrification: developing programmes to demonstrate small-scale full-electric and hybrid-electric flight (see page 09) and launching our own micro-grids offering (see page 32); and in our strategy to reinvent our business with new digital technologies, R² Data Labs – our data innovation team – delivered significant incremental value during the year for us and our customers by using new techniques and technologies. Our Digital Academy trained hundreds of employees in data innovation. As evidence of the scale of progress made in 2018, we had 892 patents approved for filing, a new record, with two-thirds related to new technologies for UltraFan, electrical and digital.

Priority 3: Resilience

During the year, we established and introduced a new simple leadership framework of behaviours and values and this will be used as a performance measure for managers this year. We successfully rolled out our new Zero Harm programme and accompanying Life Saving Rules, and continued to make progress on our health and safety medium-term goals, though unfortunately our progress has been slower than we would have liked.

We continue to make progress towards our 2020 diversity targets during the year, actively recruiting from groups typically under-represented in our sector, particularly women (see page 46). As part of our restructuring and simplification work, we have made a good start on the simplification of our management system, removing thousands of spreadsheets and reducing processes although much remains to be done in 2019 to simplify how we work.

Priority 4: Financial progress

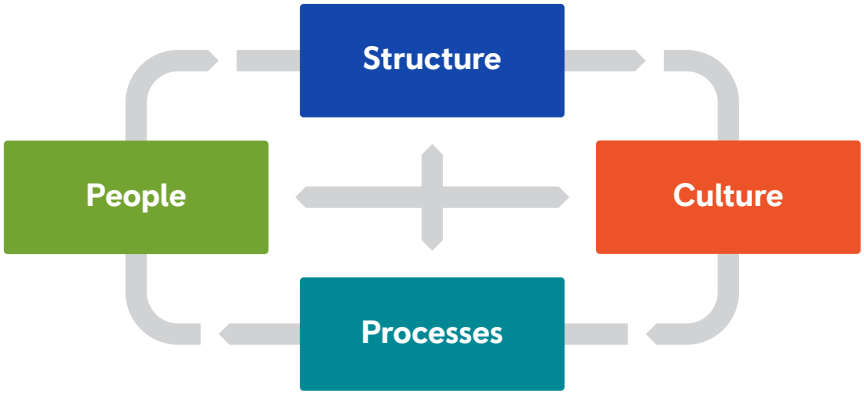
Our underlying results for 2018 were ahead of expectations (see page 18), as we benefited from increased engine flying hours and higher volumes of shop visits in Civil Aerospace; growth across most of our

OUR FUNDAMENTAL RESTRUCTURING

A significant step towards making 2018 a breakthrough year came in June with the launch of our fundamental restructuring. The 24-month programme will create an organisation that will better enable us to maximise the economic value of the very significant investments Rolls-Royce has made over the past decade; realise the growth potential embedded in our business; and seize the opportunities we see across all our markets.

We are addressing four areas: structure, culture, processes and people. They are highly interconnected and it is only by simultaneously attacking all four that we can bring about lasting change. This means looking at both reducing activity and enhancing capability.

The restructuring will create a simpler, healthier and more dynamic organisation with clearer accountabilities, greater productivity and quicker decision-making.



Creating empowered businesses, operating within a clear framework and supported by a Group Business Services organisation, will lead to a reduction in our indirect workforce.

The restructuring is being led through workstreams sponsored and owned by Executive Team members. We have challenged inefficiencies: for instance, we explored over 18,000 different job types, identifying over 2,000 activities that we can stop or significantly change. We are reducing the number of layers in the organisation and increasing the spans – the number of direct reports held by managers – closer to best practice.

end markets in Power Systems coupled with an increasing focus on growing services revenue; and Defence kept a tight control on costs, while seeking new opportunities. ITP Aero performed solidly. We achieved a modest reduction in the loss we make on widebody engine sales, though our efforts were impacted by the need to reallocate engineering resource to address in-service issues. Our cash performance was particularly strong and represents an important step in the right direction.

2019 priorities and longer-term outlook

We have established a firm foundation in 2018 on which to build the success of Rolls-Royce for the longer term. In the coming year, we will continue to focus on meeting our commitments to customers, especially in terms of fixing the current in-service issues and achieving our delivery targets.

We must continue to invest in the technologies that we need, not only to further improve our current products, but position ourselves for future growth. We must further increase diversity within our business and continue the trajectory we have established over the past few years to create real momentum behind the behavioural changes that we began in 2018. Too often, our business has looked on cost reduction measures as a short-term fix and costs have crept back into the business. We must not allow that to happen again so that we can take a further significant step towards our free cash flow ambitions. We must continue to attack costs, driving the restructuring at pace – not least because prolonged uncertainty places unwelcome strain on our people. Our longer-term outlook remains very positive. We have invested significantly over the past decade to build a commanding position in our core growth market of civil aerospace. Since 2010, we have invested significantly in cutting-edge research and development, world-class factories and modern facilities. We have launched six new civil engines including the world's fastest-ever selling civil large engine, the Trent XWB, and amassed orders for around 2,300 aero engines for widebody aircraft. As a result of our innovation and investment, we are well positioned to become the world leader in large aircraft engines.

Our restructuring will help us maximise the economic value of our past investments, realise the growth potential embedded in our business and seize the opportunities we see across all our markets. In order to make that sustainable, however, we must embed behavioural change throughout the organisation. In short, what we must achieve in 2019 is to build beyond the breakthrough seen in 2018.

Building beyond the breakthrough in 2019

2019 priorities

Customers	Technology	People & culture	Financial
– Increase production volume – Expand service network – Mitigate disruption from in-service issues	– Revitalise service – Develop new engine architecture – Advance electrification projects	– Build a resilient business – Continue restructuring programme – Further simplify processes – Diversity & inclusion	– Continue improving free cash flow – Further strengthen balance sheet – Enhance capital allocation discipline

BLUE SKY THINKING

An exciting new market in aerospace for electric vertical take-off and landing (EVTOL) vehicles is being opened up by a combination of new electrical and autonomous technologies and external factors including an increasingly urban population and humanity's never-ending desire to move more quickly from A to B.

During 2018, Rolls-Royce unveiled a concept EVTOL design that could be adapted for personal transport, public transport, logistics and military applications. It could take to the skies as soon as the early 2020s. It builds upon experience we gained by providing hybrid-electric propulsion for trains, naval vessels and other applications. Any commercial introduction would involve working with strategic partners.

The initial concept vehicle uses gas turbine technology to generate electricity. In this hybrid-EVTOL configuration it could carry four or five passengers at speeds up to 250mph for approximately 500 miles.

OUR VISION AND STRATEGY

We are one of the world's leading industrial technology companies. As pioneers, we must continuously innovate to provide the best solutions. This requires us to anticipate the opportunities and challenges our customers will face.

Our vision

Pioneering the power that matters

Rolls-Royce pioneers cutting-edge technologies that deliver clean, safe and competitive solutions to meet our planet's vital power needs.

Our strategy

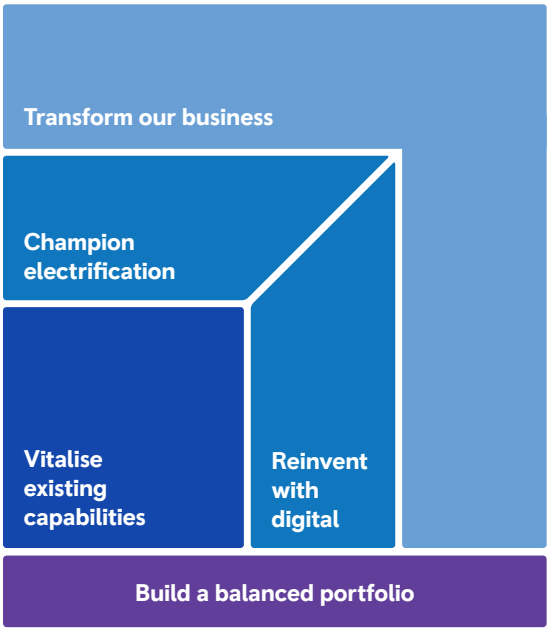
Our strategy reflects three horizons:

Horizon 1 Maintain and defend core businesses

Horizon 2 Nurture emerging businesses

Horizon 3 Create genuinely new businesses

At the same time we need to manage the transition of technologies, capabilities, resources and value across business horizons.



Our progress in 2018

Horizon 1

Vitalise existing capabilities

We are developing next generation technologies to sustain and grow our current competitiveness; investing in our existing thermo-mechanical products to ensure that they provide clean, safe and competitive solutions for our customers.

Over a 12-month period ending in 2018, Civil Aerospace put an unprecedented three new large engines into service: the Trent 1000 TEN on the Boeing 787-10, the Trent XWB-97 on the Airbus A350-1000 and the Trent 7000 on the Airbus A330neo. We also launched a new business jet engine, the Pearl 15, and have made strong progress with its testing regime ahead of its entry into service on the Bombardier Global 5500 and 6500.

We continued to progress our next generation widebody engine programme by running the Advance3 demonstrator at full power for the first time. This includes a new engine core that will sit at the heart of our UltraFan demonstrator. We tested UltraFan's new lean-burn and low-emissions combustion system and signed a collaboration agreement with Airbus for the integration of the UltraFan demonstrator for flight testing.

Within Power Systems, we launched new liquid fuel and gas engines; our Chinese joint venture MTU Yuchai Power unveiled its first engine; and in India we signed an agreement to create another engine manufacturing joint venture.

In Defence, Rolls-Royce engines were selected by Boeing to power the US Navy's new MQ-25 Stingray aircraft, which will provide unmanned, carrier-based air-to-air refuelling. Each MQ-25 aircraft will be powered by a single Rolls-Royce AE 3007N engine – the latest variant of the AE family.

Horizon 2

Champion electrification

We are investing in new power solutions for our long-term success. We are building on our strong heritage in thermo-mechanical engineering to produce state-of-the-art electro-mechanical and hybrid power systems. We already successfully combine our engines in hybrid systems for trains (see page 31), naval vessels and micro-grids (see page 32) and are now taking that expertise into the air.

We are developing hybrid propulsion solutions, built around existing gas turbine engines such as the M250, for a range of civil aviation applications including personal mobility vehicles (see page 09) and larger passenger aircraft. Rolls-Royce Electrical is increasingly working with partners ranging from existing airframers such as Airbus, with whom we are partnering on the E-Fan X hybrid-electric demonstrator aircraft programme, to newer entrants including Aston Martin. Many of these technologies are likely to have potential within Defence, which is already testing electrical generators embedded within military engines.

Alongside hybrid-electric flight, we are exploring all-electric aviation, leading a project known as Accelerating the Electrification of Flight (ACCEL) to explore the use of a high-power electrical system in a demonstrator aircraft; and new technologies that could provide solutions to the challenge of energy storage.

Reinvent with digital

We are using digital technologies across our activities to generate new insights, new solutions and new opportunities. We are creating digital versions of products,

processes and facilities – known as digital twins – to improve our performance and further enhance our service to customers.

At the start of the year, we launched R² Data Labs, to act as a data innovation catalyst within the business. It exists to deliver untapped value from data, acting as a development hub for new services, and a data innovation community with hundreds of employees undertaking projects within our businesses. It is also an agent for behavioural change, using data innovation sprints – short, focused bursts of activity – to solve issues and create value.

During the year, we built up a digital ecosystem, sealing partnerships with leading technology start-up accelerators and partnering with The Alan Turing Institute in the UK, Germany's Hasso Plattner Institute and Singapore's Defence Science and Technology Agency (DSTA).

New digital opportunities unlocked across the Group in 2018 included: helping airline customers use data to reduce delays and cancellations; reducing fuel costs by understanding taxiing fuel consumption, diversion flight planning and even drinking water requirements; and developing an algorithm to collect comprehensive weather data for every airport around the world. This information improves engine maintenance planning by allowing for the removal of distorting factors – such as humidity – from engine health monitoring readings, which could otherwise lead to unnecessary maintenance visits.

In Defence, data science is now being used to streamline maintenance schedules and significantly reduce disruption to customer operations. At the same time new digital products and services from Power Systems are increasing returns from the aftermarket.

Horizon 3

Transform our business

We are advancing new opportunities that could capture substantial growth and value for the Group in the future. In addition to emerging opportunities linked to our current activities, electrification and digitalisation offer the potential for completely new markets and business models. For example, in Civil Aerospace, the electrification of aircraft may transform the movement of people and freight. Similarly in Power Systems, the digitalisation of customer relationships may allow micro-grids to be funded directly by offering power as a service.

Rolls-Royce is seeking to act as a disruptor, rather than an incumbent. We believe that the competitive marketplaces where we operate will increasingly be shaped by new entrants and aggressive innovators from other industries. To help us participate in this process, we have established Rolls-Royce ventures to invest in and collaborate with new technology start-ups.

Build a balanced portfolio

We actively manage our portfolio of activities to ensure that technologies, capabilities, resources and value are effectively and efficiently allocated across the Group.

As part of this process, we focus on key activities that are aligned with our strategy and our business model. During the year, this led to the disposal of L'Orange and the announcement of the disposal of our Commercial Marine business.

TRENDS SHAPING OUR MARKETS

We believe three key trends will define the world's future power needs:

- the growing demand for cleaner, safer and more competitive power;
- electrification; and
- digitalisation.

As we move to a low carbon global economy, our engines will become part of broader, hybrid-electrical systems with lower emissions and environmental impacts. We will increasingly act as a systems integrator, combining our traditional mechanical expertise with electrical technology. To provide lifelong performance for our customers, we will use the huge power of digitalisation and create new insights using new technologies including artificial intelligence.

Global economic power and rising prosperity will increase demand for travel, trade and energy. Consensus forecasts are for air traffic (revenue passenger kilometres) to achieve a compound annual growth rate of approximately 4.5% over the next 20 years.

BUSINESS MODEL

Our resources

Brand
Our brand enables us to sustain relationships, secure business and attract talent.

People and culture
Our success is a result of the commitment, skills and ingenuity of our employees and their determination to be 'Trusted to Deliver Excellence'.

Technology
Our technology enables us to meet emerging customer needs.

Engineering capability
Our engineering expertise enables us to embed cutting-edge technologies into outstanding products.

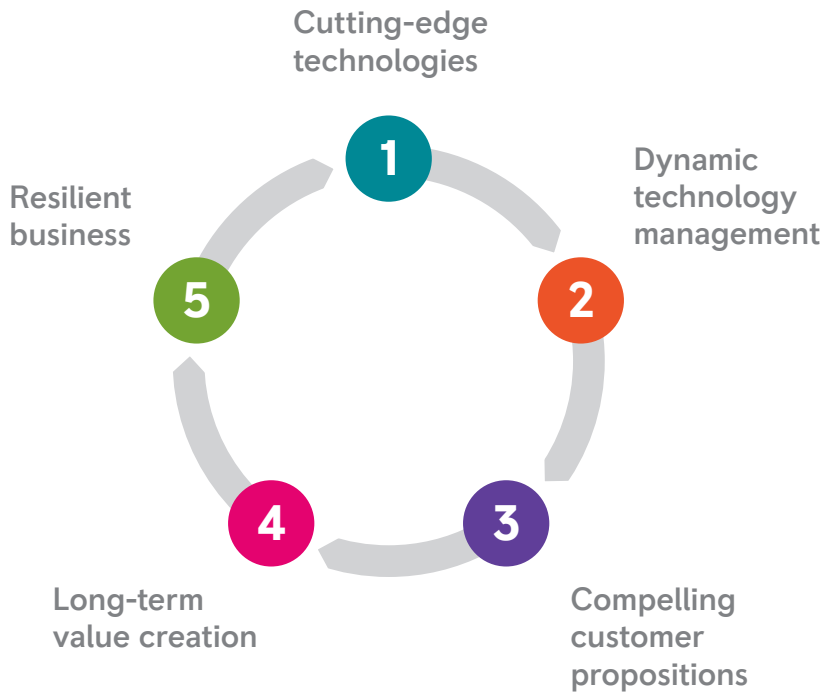
Advanced manufacturing capability
Our manufacturing processes enable us to embed advanced technologies in our products quickly and efficiently.

Service capability
Our service orientation enables our customers to focus on their core activities.

Partners
Our partners enable us to collaborate in technology, manufacturing and services.

Financial strength
Our financial strength enables us to pursue long-term cutting-edge technologies and to support our customers throughout the entire product lifecycle.

Rolls-Royce is one of the world's leading industrial technology companies. We provide power solutions for our customers which combine three elements: advanced technologies; system solutions; and system life. These are delivered as part of a virtuous cycle which begins with the development of cutting-edge technologies. We optimise the value of our power solutions throughout their lives.



Our competitive advantage comes from:

Cutting-edge technologies

We apply cutting-edge technologies to provide cleaner, safer and more competitive power. Our technologies ensure that our customers have power that meets their emerging needs.

System solutions

We package technologies into systems that provide complete solutions for our customers. Our solutions mean that our customers have power from a single, trusted partner.

System life

We care about the performance of our solutions throughout their lives. Our through-life capabilities maximise availability and enable us to meet changing customer needs.

1 Cutting-edge technologies

Cutting-edge technology allows us to meet emerging customer needs. We pursue new technologies that will help us deliver clean, safe, competitive solutions.

We identify the key horizon technologies that will generate a competitive advantage for Rolls-Royce in the long term.

Link to risks A B F

2 Dynamic technology management

Our future technological world is complex with many exciting new challenges across everything we do. We respond to this with broader and deeper collaboration with others, and with a more dynamic approach to ensure that our technology brings the most value to our customers and our business.

We are inclusive in the pursuit, co-operative in the application and aggressive in the commoditisation of technology.

Link to risks A B D F G I

3 Compelling customer propositions

Our customer relationships are our greatest strength. We offer our customers a combination of advanced technology, in a complete systems solution, optimised throughout its life.

We create combinations of technology, systems and aftermarket performance that make our customers more competitive.

Link to risks A B C D F G

4 Long-term value creation

Our activities are complex and global. We share best practice across the Group and assess where and how activities can offer the best value.

Link to risks A B D G

5 Resilient business

Our activities have a major impact on our planet, the global economy and on communities. To ensure that we are free to operate and invest for the long term, we are thoughtful and careful about the business we undertake, our financial resources and our wider impact.

We build balance in our activities, strength in our balance sheet and behave sustainably.

Link to risks C D E F H I J

Value creation for our stakeholders in 2018

Customers
We develop product solutions that improve our customers' competitiveness.

Gross R&D expenditure
£1.4bn

Investors
We generate attractive returns for investors over the long term.

Total shareholder return
3.4%

Employees
We create an environment where each employee is able to be at their best.

Invested in training and development
£27.1m

Partners
We create partnerships based on collaboration where each partner benefits from the relationship.

Spend with external suppliers
£10.1bn

Communities
We improve the communities that we impact locally, nationally and globally.

Hours of employee time volunteered
91,000

Governing bodies and regulators
We aim to create trusted relationships with governing bodies and regulators, meeting all legal and regulatory commitments and requirements.

Stakeholder engagement page 66

Our power solutions create revenue from:

- original equipment
- maintenance, repair and overhaul
- additional products and services

Our intimate knowledge of our customers and our products enables us to optimise the value of our power solutions throughout their lives. We share this value with our customers by offering power as a service.

Revenue recognition page 115

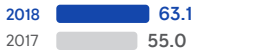
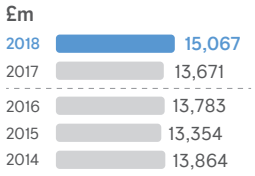
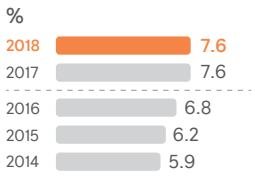
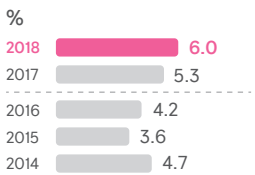
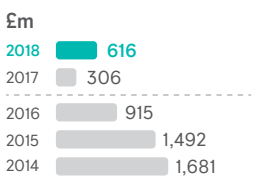
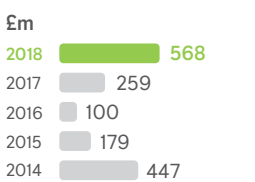
Link to principal risks

- A Strategic transformation
- B Competitive environment
- C Cyber threat
- D Major product programme delivery
- E Business continuity
- F Safety
- G Talent and capability
- H Market and financial shock
- I Compliance
- J Political risk

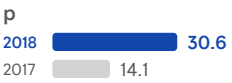
Principal Risks page 50

KEY PERFORMANCE INDICATORS

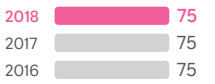
Financial key performance indicators

Description	Why we measure it	How we have performed	
Order backlog [1] △ £63.1bn	We measure our order backlog as an indicator of future business.	We had a 15% increase in Group order backlog, primarily driven by Civil Aerospace with ANA TotalCare signed on the Trent 1000, Trent 7000 inclusion and new orders on the Trent XWB. Significant growth in Power Systems of 29% and 17% growth in Defence.	
Underlying revenue △ £15,067m	Monitoring of revenue provides a measure of business growth. [2]	Underlying revenue rose 8% organically, with 15% growth in Power Systems, reflecting strength across almost all end-markets. Civil Aerospace revenue was up 12% led by strong growth in services. Defence revenues were broadly stable year-on-year.	
Self-funded R&D as a proportion of underlying revenue △ 7.6%	This measure reflects the need to generate current returns as well as to invest for the future. [3]	Disciplined control of spend kept R&D stable as a percentage of sales, with self-funded R&D increasing to £1.14bn. This was primarily due to expenditure within Civil Aerospace, focused on new engines coming into service, progress on next generation technologies, and business jet development programmes.	
Capital expenditure as a proportion of underlying revenue △ 6.0%	To deliver on its commitments to customers, the Group invests significant amounts in its infrastructure. [4]	Capital expenditure rose 70 basis points as a proportion of revenue, reaching £905m in absolute terms. This reflects investment in capacity across our large engine manufacturing footprint as we ready ourselves for future growth, and investment in Defence as part of our commitment to the next generation submarines programmes.	
Underlying operating profit △ £616m	This measure reflects the Group's underlying economic performance taking account of its hedging strategies. [5]	Organic growth of £253m, driven by strong revenue growth in Civil Aerospace and Power Systems, our focus on reducing costs and higher capitalised R&D. This was achieved despite significantly higher contract accounting adjustments in the year.	
Free cash flow £568m	In a business requiring significant investment, we monitor cash flow to ensure that profitability is converted into cash generation, both for future investment and as a return to shareholders. [6]	Free cash flow more than doubled, driven by working capital management, material growth in engine flying hour receipts and increased customer deposits. This was partly offset by higher capital and R&D spend and increased costs to resolve Civil Aerospace Trent 1000 in-service issues.	

New financial key performance indicators for 2018

Description	Why we measure it	How we have performed	
Cash flow per share 30.6p	Cash flow per share ensures alignment with shareholder interests and is a key measure of the economic performance of the business. [7]	Significant increase, reflecting strong improvement in free cash flow and a modest increase in share count as a result of shares issued for the purchase of ITP Aero.	
Cash return on invested capital (CROIC) 12%	In a capital-intensive industry, CROIC is a key measure of the efficiency of our capital invested to generate cash flow. [8]	The modest decline reflected increased cash generation from our in-service engine fleet, which was offset by higher Trent 1000 in-service costs and growing levels of R&D and capital investments in recent years.	

Non-financial key performance indicators †

Description	Why we measure it	How we have performed	
Customer delivery 83%	To deliver on our commitments to our customers we measure the percentage of on-time deliveries to our customers including new equipment, spare parts, equipment repair and overhaul. This is tracked Group-wide in our scheduling and order fulfilment system.	This year we fell short of both our 2018 target of 92% and previous year's achievement. This was due to a shortfall in widebody build and invoiced deliveries, most evident on the Trent 7000. The shortfall was due to the significant ramp-up in new engine programmes and parts supply constraints.	
Employee engagement 75	This is measured through our employee opinion survey which produces a composite sustainable engagement score. The targets are based on absolute scores for six key questions within the overall survey.	Our employee engagement score was 75 in 2018, which was the same as the previous two years but fell short of our target by one point. The score was maintained during a period of significant transformation and restructuring within the organisation.	

Notes

Δ Following the adoption of IFRS 15 in 2018, the 2017 figures have been restated.
† These non-financial performance indicators are linked to our remuneration structure.

Reconciliation to statutory results are included in the notes as referenced below:

1 Following the adoption of IFRS 15 in 2018, unrecognised revenue in accordance with IFRS 15 is disclosed in note 2 to the Consolidated Financial Statements. Order backlog, also known as unrecognised revenue, measures the amount of revenue on current contracts that is expected to be recognised in future periods and hence is measuring a similar, but not identical indicator to the order book previously shown. To avoid presenting two different measures of a similar indicator, from 2018 we will use the IFRS 15 measure and have renamed it 'order backlog' to distinguish it. In 2017 and earlier, we measured the order book at our long-term planning exchange rate (LTPR) and list prices and included both firm and announced orders. In Civil Aerospace, it is common for a customer to take options for future orders in addition to firm orders placed. Such options are excluded from the order backlog. In Defence, long-term programmes are often ordered for only one year at a time. In such circumstances, even though there may be no alternative engine choice available to the customer, only the contracted business was included in the order backlog. We only included the first seven years' revenue from long-term aftermarket contracts.
2 Underlying revenue is used as it reflects the impact of our foreign exchange (FX) hedging policy by valuing foreign currency revenue at the actual exchange rates achieved as a result of settling FX contracts in the year. This provides a clearer measure of the year-on-year performance. See more in note 2 on page 124.
3 We measure R&D as the self-funded expenditure before both amounts capitalised in the year and amortisation of previously capitalised balances. We expect to spend approximately 5% of underlying revenue on R&D although this proportion will fluctuate depending on the stage of development of current programmes. We expect this proportion will reduce modestly over the medium term.
4 All proposed investments are subject to rigorous review to ensure that they are consistent with forecast activity and will provide value for money. We measure annual capital expenditure as the cash purchases of property, plant and equipment acquired during the period; over the medium-term we expect a proportion of around 4%.
5 In particular: (a) revenue and costs denominated in US dollars and euros are presented on the basis of the exchange rates achieved based on our FX hedge book; (b) similar adjustments are made in respect of commodity derivatives; and (c) consequential adjustments are made to reflect the impact of exchange rates on trading assets and liabilities, and long-term contracts, on a consistent basis.
6 We measure free cash flow as the movement in net funds during the year, before movements arising from payments to shareholders, acquisitions and disposals, and FX. This excludes cash cost of the 2018 restructuring plan.
7 We calculate cash flow per share using free cash flow (as defined above) and the average number of shares in issue during the year, consistent with EPS calculations. See note 6 on page 134.
8 CROIC is calculated as cash flow divided by invested capital. We measure free cash flow (as per note 26) which is then adjusted to remove R&D, PPE & software capital expenditure, certification costs, other intangibles, and working capital (excluding change in the net LTSA balance in Civil Aerospace) and operating lease payments. Invested capital is defined as the sum of 15 years net R&D investment, PPE and software at cost, certification costs, other intangibles (excluding M&A and goodwill), and working capital (excluding net LTSA balance in Civil Aerospace) and operating leases.

FINANCIAL REVIEW

Rolls-Royce delivered strong growth in 2018 profit and cash flow. This, together with the execution on our portfolio reshaping, saw a strengthening of our balance sheet. We made a good start with our restructuring plan. I am confident of delivering further progress in 2019 as we move towards making our mid-term financial ambitions a reality.

STEPHEN DAINTITH
CHIEF FINANCIAL OFFICER

Overview 2018

Rolls-Royce delivered a strong financial performance in 2018, with a material improvement in free cash flow, good growth in underlying operating profit and a strengthening of our balance sheet. These were achieved despite the operational and financial disruption caused by in-service issues with the Trent 1000. I was particularly pleased with how our invigorated management team embraced the challenges we faced on the Trent 1000, moving decisively to embed a number of mitigating actions across the Group to control costs and deliver our results, while allowing us to continue to invest for the long term.

In 2018, we incurred £431m of cash costs on Trent 1000 in-service issues. Although we are making good progress on technical fixes for the engine, a related £790m exceptional charge was taken for the full year. This reflects the abnormal portion of costs to resolve the Trent 1000 in-service issues, which fall outside the scope of our normal TotalCare costs. We expect cash costs within Civil Aerospace for these issues of around £450m in 2019, before declining by at least £100m in 2020 and stepping down materially thereafter.

We made good progress on our restructuring plan in the year. A reduction in headcount of around 1,300 was delivered in 2018 across a variety of overhead and engineering functions. Finance is embracing its own role in the drive to transform our organisation and progress was made in simplifying our processes and reducing headcount.

A £317m exceptional restructuring charge was taken in 2018, of which £223m related to our Group-wide restructuring programme announced in 2018. Cash costs incurred in 2018 were £70m. In total we continue to expect around £500m of total cash costs to be incurred on implementation of our restructuring programme, with a target to deliver around £400m of run-rate cost savings from the end of 2020.

In early 2019, Airbus announced it will cease delivery of the A380 in 2021. This decision to shorten the programme has led to us taking an exceptional item of £186m in 2018.

We achieved significant progress in 2018 focusing our portfolio and improving our balance sheet. In June we completed the disposal of L'Orange for €673m. In July, we announced the sale of Commercial Marine for a total value of £500m with expected net proceeds of around £350m to £400m. Year-end balance sheet net funds improved by £916m, moving from £305m net debt to a £611m net cash position. We remain committed to further improving our balance sheet strength with a focus on improving cash generation. We aim to maintain a strong investment-grade credit rating, while also focusing on returning shareholder payments to a more appropriate level.

At our 2018 Capital Markets event, I set out the three fundamental drivers we are pursuing to improve cash flow and returns. Progress was made in 2018 on all of these:

- in Civil Aerospace we made further positive steps in reducing OE cash deficits on widebody engines, which fell by 13% to £1.4m;
- large engine aftermarket cash margin improved materially led by the 14% growth in large engine flying hours driving up aftermarket cash receipts, which more than outstripped higher shop visit costs; and
- we remain focused on reducing commercial and administrative (C&A) costs and bringing down R&D and capital expenditure as a percentage of sales. C&A costs in our core businesses fell £18m, with further improvements targeted as we deliver further restructuring benefits.

2019 outlook

We are confident and committed to delivering further progress in 2019. We expect revenue to grow by a mid-single digit percentage, with underlying operating profit of around £700m +/- £100m.

Free cash flow should increase further to around £700m +/- £100m, as we deliver another positive step along our journey towards our mid-term ambitions.

"We are committed to generating significantly improved cash flow and returns"

Longer-term outlook

As we exit a period of significant investment in Civil Aerospace and our restructuring plan delivers benefits, we are committed to generating significantly improved returns. To do this, we must focus on: further reducing the OE cash deficit per widebody engine; increasing our aftermarket cash margins; being more disciplined in the allocation of our R&D and capital expenditure; and reducing our C&A costs growth. The restructuring programme is a key enabler to delivering such reductions in our fixed costs. Our mid-term ambition is to deliver free cash flow per share of over £1 and to generate annual cash flow return on invested capital of at least 15% through the cycle.

FINANCE TRANSFORMATION

We have made good progress on our finance transformation in 2018, embracing the drive to transform by simplifying our reporting and forecasting processes, improving our efficiency and reducing headcount and costs.

We are standardising our processes and improving the quality of data to free-up time to focus on insight and analysis, helping us to drive business performance.

Through our Finance Academy, we are investing in building our people's capabilities to support our new organisation. Investment in new systems is helping us to further improve finance efficiency.

Over time, this transformation will eliminate and automate more activity, and by leveraging Group Business Services, our new shared services environment, we will ensure that routine activities are optimised.

Core trading summary

The income statement table below and all commentary relate to the underlying [1] performance of our core [2] businesses and percentage or absolute change figures in this document are on an organic basis, unless otherwise stated.

Summary income statement – Core businesses

£m	2018	2017 [3]	Change	Organic change [4]
Underlying revenue	**14,336**	**12,786**	**+12%**	**+10%**
Underlying OE revenue	7,184	6,244	+15%	+10%
Underlying services revenue	7,152	6,542	+9%	+9%
Underlying gross profit	**2,256**	**1,998**	**+13%**	**+4%**
Gross margin %	*15.7%*	*15.6%*	*+10bps*	*-80bps*
Commercial and administration costs	(991)	(955)	+4%	-2%
Restructuring	(14)	(16)	-13%	-25%
Research and development charge	(650)	(724)	-10%	-14%
Joint ventures and associates	32	14	+129%	+150%
Underlying operating profit	**633**	**317**	**+100%**	**+71%**
Underlying operating margin	***4.4%***	***2.5%***	***+190bps***	***+140bps***
Financing costs	(150)	(106)	+42%	+38%
Underlying profit before tax	**483**	**211**	**272**	**184**
Tax	(152)	(131)	+16%	+11%
Underlying effective tax rate	31.5%	62.1%		
Underlying profit for the year	**331**	**80**	**251**	**170**
Underlying earnings per share	**17.4p**	**4.4p**	**+13.0p**	**+8.7p**

[1] Underlying: for definition see note 2 on page 124.
[2] Core includes: Civil Aerospace, Power Systems, Defence and ITP Aero and excludes L'Orange and Commercial Marine.
[3] All prior year comparatives have been restated for IFRS 15: see note 1 on page 113 and note 27 on page 169.
[4] Organic change at constant translational currency (constant currency) by applying 2017 average rates to 2018 numbers and excluding M&A, specifically ITP Aero and L'Orange.

Underlying revenue up 10%

Underlying revenue rose 10% to £14,336m reflecting growth in both OE revenue (10%) and services (9%), led by Civil Aerospace and Power Systems. Civil Aerospace revenue increased 12%, reflecting OE growth of 8% driven by large engine pricing improvements and higher volumes of spare engines to support our growing in-service fleet. Services revenue in Civil Aerospace rose 15%, reflecting growth in LTSA shop visits and higher spare parts sales. Power Systems delivered excellent revenue growth of 15% with strength across almost all of its end markets, driving double-digit growth in both OE (18%) and services (10%). Defence revenue remained stable with a modest increase in OE, offset by reduced services revenue, reflecting phasing of work on UK submarines.

Underlying gross profit up 4%

Underlying gross profit was up 4% to £2,256m with gross margins of 15.7%. Civil Aerospace gross profit was stable with good progress on reducing widebody OE engine losses and increased spare engine volumes, offset by higher negative LTSA contract accounting adjustments. Before these contract accounting adjustments, Civil Aerospace gross margins were up 100bps. Power Systems recorded lower gross margins due to product mix, despite the increased volumes. Defence gross margins were modestly weaker due to lower OE combat volumes and lower margins on submarine services revenue in the year.

Self-funded R&D cash spend up 8%; income statement charge down 14%

Gross R&D expenditure grew to £1,378m. After funding from customers and other third parties, core self-funded cash R&D spend rose 8% to £1,106m, primarily driven by: investment in new engine technologies in Civil Aerospace, specifically the UltraFan and on our new business aviation engine family; higher spend on the Trent 1000; and future programmes in Defence. Capitalisation of R&D rose from £347m to £498m reflecting the full-year impact of our revised R&D policy application as outlined at our 2017 full-year results (see note 1). Overall, the R&D charge to the income statement reduced by £102m to £650m.

C&A costs down 2%

C&A costs were 2% lower at £(991)m, reflecting the beneficial effect of reductions in non-manufacturing headcount across the Group. C&A costs as a percentage of revenue fell to 6.9% in 2018 (2017: 7.5%). Over the mid term, our ambition is to reduce C&A costs to around 5%.

Underlying operating profit up £224m

Underlying operating profit saw a material improvement of £224m on prior year to £633m, reflecting 20% growth in Power Systems to £317m, due to strong volume growth and a £189m improvement in Civil Aerospace, reflecting a number of factors:

- further progress in reducing OE unit losses in large engines, which fell by 13%;
- increased sales of spare engines and spare parts, and higher LTSA shop visit volumes;
- offset to an extent by a material increase in LTSA negative contract accounting adjustments of £276m, up £127m versus 2017; and
- £188m higher net R&D capitalisation.

Financing costs

Financing costs increased from £106m in 2017 to £150m in 2018, partly due to the inclusion of ITP Aero, which was absent from our 2017 results. Within financing, net interest payable increased to £72m (2017: £53m) driven by higher interest rates, and the carry cost associated with pre-funding our 2019 debt maturities as part of Brexit mitigation planning. This was partially offset by interest received on the L'Orange disposal proceeds.

Other underlying financing costs were £78m in 2018 (2017: £54m). The increase reflects the inclusion of ITP Aero, increased charges related to discounting of provisions and higher other financing charges.

Taxation

Core underlying taxation was £152m (2017: £131m), an underlying rate of 31.5% compared with 62.1% in 2017. The 2018 core underlying tax charge has not increased in line with profits mainly due to reductions in US tax rates and the benefit of tax credits. The reduction in the 2018 core underlying tax rate compared to the prior year is primarily driven by the increase in the core underlying profit in 2018 together with the lower US tax rate and benefit of tax credits. The rate remains high due to the impact of UK losses and the mix of profits arising in other countries with higher tax rates, predominantly the US and Germany.

Trent 1000 in-service impact

A full-year exceptional charge of £790m has been recorded to cover the full anticipated costs of the Trent 1000 in-service issues over 2017 to 2022 that are considered abnormal in nature. These abnormal costs fall outside the scope of our normal LTSA costs and largely comprise our contribution to additional customer disruption costs. This charge is an increase of £236m compared to the £554m recorded at the half year. While strong progress has been made in reducing shop visit costs compared to our prior estimates, this has been counter-balanced by an increased level of customer disruption driven by the higher than previously anticipated aircraft on ground (AOG) levels. This change in the mix of costs has driven the higher exceptional charge. The total multi-year cash impact of Trent 1000 in-service issues is now expected to be £100m higher than our prior estimates over 2017 to 2022, of which £431m has been incurred in 2018.

The treatment of such a charge as exceptional reflects a number of factors, primarily:

- the unprecedented nature of the issues with the Trent 1000 – a fleet-wide issue of an unusual and abnormal scale, impacting multiple airline customers and resulting in a significant level of AOG; and
- the fact that this technical issue has resulted in a number of separate airworthiness directives and non-modification service bulletins – a highly abnormal situation for Rolls-Royce.

The costs which have been included in the exceptional charge cover those which we would not typically incur, such as contributing to additional customer disruption costs. The total exceptional charge represents around 55% of the total estimated cash costs from 2017 to 2022. The remaining charge will be recognised over time through our normal contract accounting margins.

The total cash impact on Civil Aerospace from the Trent 1000 in-service issues in 2018 was £431m (2017: £119m). In 2019, we expect the impact to be around £450m, before declining by at least £100m in 2020 and reducing materially thereafter. All technical changes are expected to be fully embodied into the Trent 1000 fleet by 2022.

Costs to mitigate in-service issues on the Trent 900 in 2018 were £14m. Given their smaller scale, these costs will be included within our normal operational costs going forwards and not split out.

Trent 900 cancellation impact

Following the announcement by Airbus on 14 February 2019 of its plan to cease delivery of the A380 in 2021, we have assessed the impact on our Trent 900 programme and associated customers and suppliers. We have recorded an exceptional item of £186m in our 2018 results which relates to onerous contracts, tooling write-offs and the acceleration of depreciation and amortisation on associated Trent 900 programme assets.

Exceptional restructuring charge

An exceptional restructuring charge of £317m was recognised in the year (2017: £104m), of which £223m relates to the cost of our Group-wide restructuring plan as announced in early 2018. Positive progress has been made so far and we have achieved a gross reduction in headcount of around 2,000 during the year with a net reduction of around 1,300. The total expected cash cost to implement this restructuring programme remains around £500m and should be completed by the end of 2020. The remainder of the exceptional charge taken in 2018 relates to restructuring programmes that were already in place in Power Systems and Defence, reflecting actions to remove cost and improve operational efficiency.

Order backlog: unrecognised revenue under IFRS 15

IFRS 15 requires the disclosure of unrecognised revenue, the amount of revenue from our customer contracts that has not yet been traded. For OE, the policy is prescriptive, including only firm purchase orders and pricing net of any discounts. The IFRS 15 disclosure includes the entirety of any contracted aftermarket revenue.

Total unrecognised revenue at the year end under IFRS 15 was £63.1bn (2017: £55.0bn). This new disclosure replaces the valuation of the order book that we have previously published and which was prepared on a different basis.

IFRS 16

IFRS 16 is effective for the year beginning 1 January 2019 and requires the total commitments of all leases (both finance and operating leases) to be recognised on the balance sheet. In broad terms, the impact of the standard will be:

- on our balance sheet we will record an additional lease liability of £2.1bn and leased assets of £1.8bn;
- in the income statement the impact on operating profit is expected to be a £40-50m benefit as rental payments are now replaced with depreciation on the leased assets. However, higher finance costs relating to the lease liability will result in a potential £10-15m reduction in overall underlying profit before tax compared with the previous basis of accounting for leases; and
- there will be no cash flow impact.

Capital allocation strategy/KPIs

As we outlined at our 2018 Capital Markets event, a disciplined approach to capital allocation and sustaining a healthy balance sheet will play a major part in improving our long-term returns. To support this we have introduced a new key performance indicator, cash return on invested capital (CROIC), to focus on both cash generation and asset efficiency. In 2018, we generated a CROIC of 12% (2017: 13%). The modest decline reflected increased cash generation from our growing in-service engine fleet which was offset by higher Trent 1000 in-service costs and growing levels of R&D and capital investments in recent years. Our mid-term ambition is to generate a CROIC of at least 15% through the business cycle.

We also re-iterated our focus on free cash flow by introducing a cash flow per share (CPS) KPI. In 2018, core CPS improved materially to 34.5p (2017: 17.3p). We maintain our mid-term ambition of at least £1 of free cash flow per share. With improved cash generation, we aim to maintain a strong investment-grade credit rating and ultimately return to single A-grade status.

Group trading summary

Group results include core and non-core businesses. Group underlying revenue rose 8% to £15,067m, primarily driven by growth in Civil Aerospace and Power Systems, offsetting a 16% decline in non-core revenue. Group underlying operating profit improved by £253m to £616m as a result of improved gross profit and lower expensed R&D.

Group funds flow

Free cash flow

Group free cash flow improved materially by £309m to £568m, well ahead of the £259m in 2017, driven by improved trading performance, increased engine flying hour receipts in Civil Aerospace and active working capital management across the Group. This was achieved despite increased capital and R&D expenditure reflecting ongoing investment in bringing new Civil Aerospace large engines to the market and supporting our growing in-service fleet. As expected, Trent 1000 in-service cash costs were materially higher in 2018 at £431m, an increase of £312m versus 2017. Given the one-off nature of the restructuring announced in early 2018, the £70m cash costs relating to this restructuring programme are not included in Group underlying free cash flow.

Expenditure on property, plant and equipment and intangibles

The combined £1,585m investment is broadly aligned with our capital additions in the year and reflects our ongoing investment in capacity and capability projects to modernise facilities in the US, investment in systems and software applications and the capitalisation of R&D.

Working capital change

Positive contribution to cash flow from working capital in 2018 of £581m, reflecting:

- higher payables due to increased trading activity in Civil Aerospace and Power Systems. Progress on standardising supplier payment terms, around £400m benefit in 2018;
- receivables broadly neutral as volume-related growth in receivables was offset by an improvement in overdue payment collection; and
- partly offset by an increase in inventory driven by volume growth in Power Systems and the production challenges Civil Aerospace encountered in 2018.

Active working capital management includes the management of trade receivables and the provision of a supply chain finance scheme to our suppliers. The most significant driver of our underlying working capital improvement in 2018 related to standardisation of supplier payment terms, which positively impacted cash flow by around £400m.

Movement in Civil Aerospace net LTSA balance

The LTSA balance represents deferred revenue and is a core part of our business model where we receive payments from our customers in respect of our long-term service and overhaul agreements. In 2018, there was an increase of £944m, reflecting strong engine flying hour growth and associated cash receipts from customers in advance of incurring costs for engine servicing activity in Civil Aerospace. The movement in year also reflected the negative contract accounting adjustments and foreign exchange.

Summary funds flow statement [1]

£m	Full year to 31 December 2018	2017	Change
Opening net (debt)/funds	(305)	(225)	
Closing net funds/(debt)	611	(305)	
Change in net funds/(debt)	916	(80)	
Underlying profit before tax	466	199	267
Depreciation and amortisation	756	652	104
Capital expenditure (PPE)	(905)	(730)	(175)
Expenditure on intangible assets	(680)	(647)	(33)
Working capital change	581	(219)	800
Civil Aerospace net LTSA balance change	944	1,379	(435)
Other	(405)	(186)	(219)
Trading cash flow	757	448	309
Contributions to defined benefit pensions in excess of underlying PBT charge	59	(9)	68
Taxation paid	(248)	(180)	(68)
Group free cash flow	568	259	309
Of which: Core free cash flow	*641*	*318*	*323*
Shareholder payments	(219)	(214)	(5)
Disposals and acquisitions	583	211	372
Exceptional group restructuring	(70)	–	(70)
Payment of financial penalties	–	(286)	286
Foreign exchange	54	(59)	113
Other	–	9	(9)
Change in net funds/(debt)	916	(80)	996

[1] The derivation of the summary funds flow statement above from the reported cash flow statement and the definition of free cash flow is included in note 26 to the Consolidated Financial Statements on page 167.

Pensions
The improvement to pension funding largely relates to the UK, as contributions agreed at the 31 March 2017 statutory valuation came into effect from 1 January 2018. In addition, we agreed to make cash contributions quarterly in arrears from 1 January 2018 (previously monthly in arrears) and benefited from a one-off cash saving in 2018. We expect to contribute around £145m in respect of the benefits accruing in 2018 (2017: £117m).

Taxation
Cash tax was higher in 2018 due to higher profits and increased payments in Germany partly offset by the benefit of the US rate reduction.

Shareholder payments
The increase relates to the higher number of shares in issue resulting from the acquisition of ITP Aero and a dividend to a non-controlling interest of £3m.

Acquisitions and disposals
L'Orange (a subsidiary of Power Systems), was sold on 1 June 2018. The inflow in 2017 relates to the funds held by ITP Aero on acquisition.

Payment of financial penalties
Following the agreements reached with investigating authorities in January 2017, a payment schedule was agreed and £286m of penalties were paid in the UK, US and Brazil in 2017. As part of that schedule, no payments were due in 2018 and further UK payments of £100m, £130m and £148m (plus interest) will be made in 2019, 2020 and 2021 respectively.

Balance sheet

Summary balance sheet

		31 December 2017			
£m	31 Dec 2018 Core	Exc. L'Orange and Commercial Marine	L'Orange and Commercial Marine	Total	Change excluding L'Orange and Commercial Marine
Intangible assets	5,295	4,998	567	5,565	297
Property, plant and equipment	4,929	4,468	190	4,658	461
Joint ventures and associates	412	375	–	375	37
Contract assets and liabilities	(7,073)	(5,766)	–	(5,766)	(1,307)
Working capital [1]	(1,255)	(1,050)	83	(967)	(205)
Provisions	(1,917)	(891)	(52)	(943)	(1,026)
Net funds/(debt) [2]	611	(305)	–	(305)	916
Net financial assets and liabilities [2]	(4,117)	(2,643)	–	(2,643)	(1,474)
Net post-retirement scheme surpluses/(deficits)	641	793	(55)	738	(152)
Tax	1,026	193	(5)	188	833
Held for sale (Commercial Marine)	374	506	(499)	7	(132)
Other net assets and liabilities	22	22	4	26	–
Net (liabilities)/assets	(1,052)	700	233	933	(1,752)
Other items					
US$ hedge book (US$bn)	36.8			38.5	
Civil Aerospace LTSA asset	1,097			1,027	
Civil Aerospace LTSA liability	(5,584)			(4,570)	
Civil Aerospace net LTSA liability [3]	(4,487)			(3,543)	

[1] Net working capital includes inventories and trade receivables and payables and similar assets and liabilities.
[2] Net funds/(debt) includes **£293m** (2017: £227m) of the fair value of financial instruments which are held to hedge the fair value of borrowings.
[3] In August 2018, we reported a net Civil Aerospace net LTSA creditor of £(3,559)m at 31 December 2017. Since then we further reviewed the classification of balances resulting in a change of £16m being reflected in the balance of £(3,543)m.

Excluding L'Orange and Commercial Marine key drivers of balance sheet movements were:

Intangible assets
The net increase of £297m includes additions of £680m, primarily driven by R&D capitalisation of £498m, largely relating to Civil Aerospace, together with further investment in software applications of £110m. These were partially offset by an impairment charge of £184m, primarily relating to the write-off of Commercial Marine goodwill, and £381m of amortisation in the year.

Property, plant and equipment
PPE increased by £461m. Capital additions of £974m in the year were driven by investments in Civil Aerospace to support growth. We made a number of investments to increase the capacity and capability across our businesses, including addressing Trent 1000 in-service issues in Civil Aerospace, upgrade of our Indianapolis facility in Defence and technical equipment and specialised tooling in Power Systems. We also expanded our lease engine pool to support our growing in-service widebody engine fleet. Depreciation of £523m was charged in the year.

Investments in joint ventures and associates
There was no material change in our investment in joint ventures and associates year-on-year.

Contract assets and liabilities
This represents deferred revenue and is a core part of our business model where we receive payments from our customers in respect of our long-term service and overhaul agreements. The balance increased by £(1,307)m, of which £(944)m related to Civil Aerospace. This was driven

by strong engine flying hour growth and associated cash receipts from customers in advance of engine servicing activity, and the £276m contract accounting catch-up adjustment recorded in 2018. The remainder of the increase reflected growth in deposits.

Working capital
For discussion of the movement in working capital, see the explanation on page 20 within funds flow.

Provisions
Provisions increased by £1.0bn to £1.9bn. This reflected a £1.6bn charge (the majority of which relates to the exceptional items recorded in 2018), net of £0.6bn utilisation of provisions in the year. Approximately £1bn of the closing balance relates to current provisions.

Net funds
Net funds improved from a net debt position of £305m in 2017 to a net cash position of £611m. The change reflected receipt of £573m net proceeds from the disposal of L'Orange and £568m of free cash flow generation offset by payments to shareholders of £219m.

Net financial assets and liabilities
These items principally relate to the fair value of foreign exchange, commodity and interest rate contracts. There was a reduction of £1,474m, primarily relating to an adverse mark-to-market movement on the foreign exchange hedge book of £2,122m, offset by settled contracts of £684m.

Net post-retirement scheme surpluses
There was a decrease in the surplus of £152m, with a reduction of £182m in UK schemes and a £30m increase in overseas schemes. The reduction in the UK surplus was primarily the result of changes in demographic assumptions plus additional Guaranteed Minimum Pension liabilities recognised following the Lloyds Bank High Court decision, which led to an exceptional charge of £121m.

US$ hedge book
The US$ hedge book at $36.8bn remained broadly stable as contracts settled were replaced with new contracts.

Group reported results
The changes resulting from underlying trading are described on pages 18 to 20.

Consistent with past practice and IFRS, we provide both reported and underlying figures. As the Group does not generally hedge account for forecast transactions in accordance with IFRS 9 *Financial Instruments*, we believe underlying figures are more representative of the trading performance by excluding the impact of year-end mark-to-market adjustments. In particular, the USD:GBP hedge book has a significant impact on the reported results. In 2018, the USD:GBP rate fell from 1.35 to 1.28 while the EUR:GBP fell from 1.13 to 1.12. The adjustments between the underlying income statement and the reported income statement are set out in note 2 to the Consolidated Financial Statements. This basis of presentation has been applied consistently.

Reconciliation between underlying and reported results

Year to 31 December £m		Revenue		(Loss)/profit before financing		Financing		(Loss)/profit before tax	
		2018	2017	2018	2017	2018	2017	2018	2017
Underlying		**15,067**	13,671	**616**	306	**(150)**	(107)	**466**	199
1	Revenue recognised at exchange rate on date of transaction	**781**	1,076	**–**	–	**–**	–	**–**	–
2	Mark-to-market adjustments on derivatives	**–**	–	**(1)**	24	**(2,144)**	2,648	**(2,145)**	2,672
1	Related foreign exchange adjustments	**–**	–	**(23)**	294	**163**	196	**140**	490
3	Trent 1000 exceptional charge	**–**	–	**(790)**	–	**(15)**	–	**(805)**	–
3	Trent 900 exceptional item	**(119)**	–	**(186)**	–	**–**	–	**(186)**	–
3	Exceptional restructuring charge	**–**	–	**(317)**	(104)	**–**	–	**(317)**	(104)
4	Effects of acquisition accounting	**–**	–	**(175)**	(129)	**(8)**	–	**(183)**	(129)
5	ITP acquisition	**–**	–	**–**	785	**–**	–	**–**	785
6	Disposal of L'Orange	**–**	–	**358**	–	**–**	–	**358**	–
7	Impairments of Commercial Marine	**–**	–	**(155)**	–	**–**	–	**(155)**	–
8	Pension equalisation	**–**	–	**(121)**	–	**–**	–	**(121)**	–
Other		**–**	–	**(9)**	(25)	**10**	10	**1**	(15)
Reported		**15,729**	14,747	**(803)**	1,151	**(2,144)**	2,747	**(2,947)**	3,898

The most significant items included in the reported income statement, but not in underlying are summarised below.

1. The impact of measuring revenue and costs at spot rates rather than achieved hedge rates increased revenue by £781m (2017: £1,076m) and reduced profit before financing by £(23)m (2017: increased by £294m). Adjustments to profit before financing include the loss on derivatives settled during the year of £219m (2017: £453m) and the impact of valuation of assets and liabilities using the year-end exchange rate rather than the underlying hedge book rate.
2. There was a mark-to-market loss on the Group's hedge book of £(2,144)m (2017: gain of £2,648m). These reflect the large hedge book held by the Group (e.g. USD $37bn); and the weakening of sterling, against the US dollar (1.35 to 1.28) in 2018. At each period end, our foreign exchange hedge book is included in the balance sheet at fair value (mark-to-market) and the movement in the year included in reported financing costs.
3. As described on page 124, the exceptional items are excluded from the underlying results. This includes the exceptional items in respect of the Trent 1000, Trent 900 and restructuring costs. These have been explained on page 19.
4. The effects of acquisition accounting were £183m (2017: £129m) and principally relate to the amortisation of intangible assets arising on the acquisition of Power Systems in 2013 and ITP Aero at the end of 2017.
5. ITP Aero was acquired on 19 December 2017 and gave rise to a bargain purchase of £303m and a revaluation of the existing stake of £482m.
6. The disposal of L'Orange in June 2018 gave rise to a gain of £358m.
7. As described on page 40, the sale of the Commercial Marine business was announced on 6 July. It has been classified as held for sale, and written down to its expected disposal value, resulting in a loss of £155m.
8. Following a High Court judgement in October 2018, the estimated costs of equalising UK pension benefits for men and women have been recognised as a past-service charge.

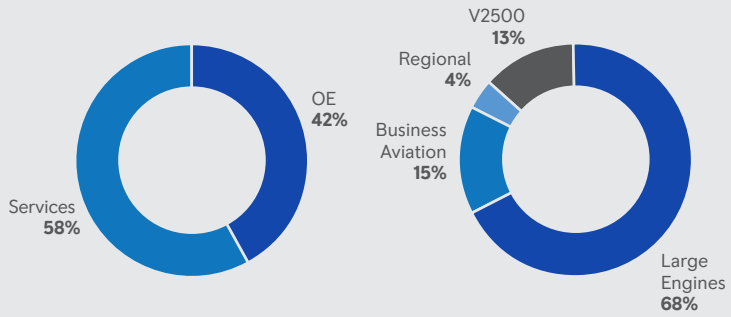
Tax effecting these adjustments resulted in a tax credit of £715m (2017: charge £360m).

BUSINESS REVIEW

Civil Aerospace

Civil Aerospace is a major manufacturer of aero engines for the large commercial aircraft, regional jet and business aviation markets. The business uses its engineering expertise, in-depth knowledge and capabilities to provide through-life support solutions for its customers.

Underlying revenue mix



Underlying revenue
£7,378m
2017: £6,598m

Underlying operating loss
£(162)m
2017: £(343)m

Order backlog
£52.3bn
2017: £45.7bn

35
types of commercial aircraft powered by Rolls-Royce engines

13,000
engines in service around the world

Trading cash flow
£201m
2017: £38m

Key highlights

- Underlying revenue growth of 12% driven by increased service activity, higher spare engine volumes and improved OE pricing
- Underlying operating loss halved to £(162)m reflecting reduced installed OE losses, higher spare engine volumes, strong servicing activity, and increased net R&D capitalisation of £188m, offsetting £127m increase in negative LTSA contract accounting adjustments
- Trading cash flow improved from £38m to £201m led by 14% growth in widebody engine flying hours and 13% reduction in average installed OE unit deficit to £(1.4)m. This was despite a £312m increase in cash costs for the Trent 1000 and higher major LTSA shop visits (up from 240 to 286). Trent 1000: 99.9% despatch reliability, accumulated 6.7 million flying hours
- Good progress introducing technical fixes on the Trent 1000 with introduction of new design for IPC blade in Package C engines and agreement to move from a hard life on the Trent 1000 TEN to an inspection regime. AOGs remained at a high level in the second half of 2018; 34 AOGs at the end of the year (2017: 18). Expect a significant improvement in AOGs over the course of 2019 reflecting the improvement in fleet health
- Milestone programme achievements; Trent 1000 TEN entered into service; launched first of a new family of engines for business aviation with the Pearl 15; Trent XWB-97 entered into service on the Airbus A350-1000; Trent 7000 entered into service on the A330neo with TAP Portugal
- Trent XWB-84; 99.9% despatch reliability, achieved 3 million flying hours, OE deficit down 32%

Civil Aerospace overview 2018

Civil Aerospace recorded good progress in 2018 with further growth in our widebody installed fleet to 4,757 engines, generating increased engine flying hour cash receipts. It was a year of milestone achievements in new engine programmes with the entry into service of the Trent 1000 TEN on the Boeing 787-10, launch of the first of a new family of engines for business aviation with the Pearl 15, entry into service of the Trent XWB-97 on the Airbus A350-1000 and the Trent 7000 on the A330neo. While another relatively quiet year for orders, we expect this to pick up in the next few years driven by replacement cycles of both medium and large widebody aircraft. Good progress has been made introducing technical fixes on the Trent 1000 where the fleet health is expected to improve through 2019.

Financial overview

Underlying revenue

Underlying revenue increased 12% to £7,378m, reflecting growth in OE, up 8% to £3,119m, and 15% growth in services to £4,259m. OE growth was led by large engines (up 14%) driven by improved widebody engine pricing and higher sales volumes of spare engines to support the growing in-service fleet. Revenue growth from increased sales of spare engines to joint ventures contributed £112m to revenue growth. 2018 large engine OE deliveries include initial sales of Trent XWB-97 for the Airbus A350-1000, and Trent 7000 for the A330neo, both of which entered into service in the year.

Large engine service revenue increased 15% to £2,666m (2017: £2,327m) driven by increased LTSA shop visit volumes, with major refurbishments up 19% and check & repair volumes up 60%. The growth in check and repair activity was driven by Trent 1000 part durability issues. The increase in major refurbishments reflected our maturing in-service fleet, with engines that entered service in the early part of this decade, largely Trent 700s, reaching their first refurbishment. Sales of spare parts not covered by LTSAs also increased year-on-year.

Financial overview

£m	2018	2017	Change	Organic change
Engine deliveries (volume)	**686**	**683**	**–**	**–**
Underlying revenue	**7,378**	**6,598**	**+12%**	**+12%**
Underlying OE revenue	3,119	2,890	+8%	+8%
Underlying services revenue	4,259	3,708	+15%	+15%
Underlying gross profit	**493**	**473**	**+4%**	**+5%**
Gross margin %	6.7%	7.2%	-50bps	-40bps
Commercial and administrative	(336)	(362)	-7%	-7%
Restructuring	(8)	(11)	-27%	-27%
Research and development charge	(332)	(454)	-27%	-27%
Joint ventures and associates	21	11	+91%	+109%
Underlying operating loss	**(162)**	**(343)**	**181**	**189**
Underlying operating margin %	**-2.2%**	**-5.2%**	**+300bps**	**+310bps**

Underlying revenue

£m	2018	2017	Change	Organic change
Original Equipment	**3,119**	**2,890**	**+8%**	**+8%**
Large engines	**2,373**	2,089	+14%	+14%
Business aviation	**620**	582	+7%	+6%
V2500	**126**	219	-42%	-42%
Services	**4,259**	**3,708**	**+15%**	**+15%**
Large engines	**2,666**	2,327	+15%	+15%
Business aviation	**464**	396	+17%	+18%
Regional	**292**	277	+5%	+7%
V2500	**837**	708	+18%	+18%

Metrics

	2018	2017
Large engine deliveries	**469**	483
Average loss per widebody OE	**(1.4)**	(1.6)
Large engine in-service fleet	**4,757**	4,409
Large engine invoiced flying hours	**14.3m**	12.6m
Large engine LTSA major refurbs	**286**	240
Large engine LTSA check & repair	**569**	356
Total service revenue growth	**+15%**	n/a

Within business aviation, OE sales were 6% higher reflecting increased demand from airframers. The 18% growth in service revenue reflected a combination of increased servicing activity and a positive contract accounting adjustment which benefitted revenue. The 7% increase in regional aviation revenue was driven by higher sales of spare parts. On the V2500, OE revenue was 42% lower, reflecting production slowdown on the Airbus A320ceo. The 18% increase in V2500 service revenue to £837m was driven by increased servicing and higher spare part sales together with a modest increase in the payment for flying hours.

Underlying operating loss

The underlying operating loss halved to £(162)m. Gross profit increased 5% to £493m with a slight deterioration in gross margin to 6.7%. Reduced installed OE losses, higher profit from increased spare engine sales and strong demand for time & materials activity drove increased gross profit. These were offset by a material negative impact from long-term contract assumption changes. Before these contract accounting adjustments Civil Aerospace gross margins were up 100bps. Under long-term accounting, variations in revenue or cost assumptions, up or down, can lead to adjustments, positive or negative, for profits that have already been recognised over the life of a programme to date; with

IFRS 15 leading to much greater volatility for such adjustments than under the previous revenue recognition standard. In 2018 there was a negative contract accounting impact of £(276)m (2017: £(149)m) which comprised three components:

- lifecycle cost benefits of £38m primarily reflecting lower servicing costs for business aviation;
- technical costs of £(80)m to reflect the reassessed costs of technical issues across various engine programmes including rectifying manufacturing quality issues on Trent 900 turbine blades; and
- higher operational costs of £(234)m reflected the latest information around future aircraft utilisation patterns and the resultant effects on shop visit cost with particular impact from mature programmes where small changes impact a significant portion of the profitability already recognised on the contract.

Self-funded R&D rose by £66m to £787m, reflecting increased investment in the new family of engines for business aviation and next generation technology, including the UltraFan demonstrator. This was more than offset by an increase in net R&D capitalisation of £188m reflecting the technical maturity across a number of programmes. It also reflected the policy application change, applied from half year 2017 that aligns with European peers and best practice. Overall the expensed R&D charge reduced from £(454)m in 2017 to £(332)m in 2018. C&A costs were 7% lower year-on-year reflecting reductions in headcount driven by our restructuring programme. The increase in profit from joint ventures and associates to £21m (2017: £11m) reflected higher shop visit volumes in joint venture overhaul bases, partly offset by ITP Aero no longer being reported as a joint venture.

Contract accounting adjustments

£m	2018	2017
Lifecycle cost benefits	**38**	17
Technical costs	**(80)**	(98)
Operational costs	**(234)**	(68)
Total contract accounting adjustments	**(276)**	(149)

Trading cash flow

Civil Aerospace trading cash flow improved £163m to £201m despite a £312m increase in cash costs on Trent 1000 in-service issues, £133m higher capital expenditure, largely on engines to support the in-service fleet and £66m higher self-funded R&D. These were more than offset by increased flying hour receipts from our growing in-service fleet, a 13% reduction in average widebody OE unit deficits, and higher volumes of spare engines.

Actions to improve working capital, included around £400m benefit from standardisation of supplier payment terms and good cash collection from a number of customers. These more than offset the growth in inventory and an outflow of OE concessions of £150m led by the changing delivery mix of our widebody engine programmes.

Trent 1000 in-service update

Since 2016, we have been undertaking a proactive maintenance programme on the Trent 1000 to address the lower than expected durability of a small number of parts. On 7 March 2018, with our full year 2017 results, we provided further detail as we progressed our understanding of the

TRENT XWB POWERS LONGEST FLIGHT

The Trent XWB, which powers the Airbus A350 family, continued its highly successful performance during 2018. The world's most efficient large aero engine powered the world's longest commercial flight. Passengers on board the Singapore Airlines Airbus A350-900 ULR flight from Singapore to New York, flew over 10,000 miles, passed through 12 time zones and experienced two nights and one short day during the 18 hour flight.

This success followed two important milestones reached during the year. The 500th Trent XWB was delivered, evidence of our continued ramp-up in production. As the fleet has continued to grow, the entire Trent XWB fleet then passed the two million flying hours milestone, recording dispatch reliability of 99.9%.

The Trent XWB is the sixth Trent engine and in 2018 we celebrated 30 years since the Rolls-Royce Board approved the start of the whole Trent programme.

technical issues impacting compressor rotor blades, and intermediate and high pressure turbine blades within the Trent 1000 engine. Subsequent to that we announced the decision to undertake more frequent inspections of the compressors of our fleet of 386 Trent 1000 Package C engines. A similar durability issue was also identified on a small number of high-life Package B engines and we agreed with the regulatory authorities to carry out a one-off inspection followed by a regular inspection regime which we have managed as part of our ongoing maintenance programme for the fleet of 166 Package B engines. Both announcements were followed by EASA and the FAA issuing airworthiness directives related to repeat inspection requirements for Package B and Package C compressors.

The Trent 1000 in-service engine issues have caused significant disruption for a number of our customers, which we sincerely regret. We continue to work hard to remedy this situation and have made further good progress on the implementation of long-term solutions during the year. We have significantly increased our Trent 1000 MRO capacity, sought ways to reduce engine shop visit turnaround times and have added approximately 50% more turbine blade production capacity since the start of the year. We recently confirmed that we have gained certification for a redesigned intermediate compressor rotor blade for Trent 1000 Package C engines, with a redesign for the Trent 1000 Package B engine to follow. In addition, we have obtained approval from the authorities to move from the current hard life for the Trent 1000 TEN on the intermediate compressor rotor drum to an inspection regime. We are also in the process of developing a redesigned blade for the Trent 1000 TEN and Trent 7000. We introduced a new intermediate pressure turbine blade with an improved protective coating to defend against sulphidation, and in relation to the high pressure turbine blades (which had impaired durability), a new blade design was made available from October 2018. Improvement in the fleet health of the Trent 1000 is expected to be most clearly seen through a declining level of AOG as we progress through 2019.

The total cash impact on Civil Aerospace from the Trent 1000 in-service issues in 2018 was £431m (2017: £119m). In 2019, we expect the impact to be around £450m, before declining by at least £100m in 2020 and stepping down materially thereafter. All technical changes are expected to be fully embodied into the Trent 1000 fleet by 2022. Costs to mitigate in-service issues on the Trent 900 in 2018 were £14m. Given their smaller scale, these costs will be included within our normal operational costs going forwards and not split out.

Operational and strategic review

Long term demand for passenger aircraft remains strong, driven by the global expansion of an increasingly mobile middle-class. We expect this to drive continued strong widebody airframe demand, with an increased focus on newer, more fuel-efficient aircraft which our engines power. The progress made by our three newest widebody engines supports our strong market position in new widebody aircraft. In March we powered the entry into service of the Boeing 787-10 Dreamliner with delivery of the first Trent 1000 TEN powered 787-10 to Singapore Airlines. February saw us join Airbus and Qatar Airways to celebrate entry into service of the A350-1000, powered by our Trent XWB-97 engine. In November we celebrated the delivery of the first A330neo aircraft to enter service with TAP Portugal, which is powered by the Trent 7000 engine. We also powered the first flight of two new aircraft, the Beluga XL transporter with the Trent 700 engine and Bombardier's latest business jet with the newly certified Pearl 15.

In 2018 we delivered 469 widebody engines, and shipped a further 11 engines to airframer OEMs. This is lower than our original projections and reflects a combination of industry wide supply chain challenges and our own early stage production ramp-up challenges on the new Trent 7000 engine. We have continued to make progress reducing large engine OE unit losses, down by 13% to £1.4m per engine. A key contributor was the 32% reduction in the Trent XWB-84 average OE loss.

Our in-service large engine fleet grew by 8% in the year to 4,757 engines with widebody engine flying hours increasing 14%, driven by growth in our Trent 700, Trent 1000 and Trent XWB fleets. The Trent 700 fleet, which represents 34% of our in-service fleet with over 1,600 installed engines in service, celebrated its 2,000th delivery in December and has now flown over 50 million flying hours. This has become the engine of choice for Airbus A330ceo customers. Our Trent XWB-84 engine, which represents 9% of our in-service widebody fleet, has now achieved over three million flying hours and in 2018 powered the world's longest commercial flight. As the world's fastest-selling widebody engine with around 1,300 engines on order and excellent reliability, our Trent XWB engines will be a key driver of the continued growth in our share of the passenger widebody market.

At 2,288 engines our current total widebody order book supports continued growth in market share and in our installed base, delivering strong service revenues for decades.

In October Delta TechOps, based in Atlanta, US, joined our expanded service network for widebody engines when it began operations as a Trent authorised maintenance centre to carry out services on the Trent 1000, Trent 7000 and Trent XWB engines. We also took steps during the year to increase our engine testing capacity, signing a lease with American Airlines for a testbed in Texas, US and entering into an agreement with Thai Airways International to support maturity testing. Work continues to progress well on the construction of a new testbed in Derby, UK for the next generation of engines.

We continue to see positive signs of recovery in the business aviation market and are well placed to respond with our new family of Pearl engines, launched earlier this year with the Pearl 15 to power the new Bombardier Global 5500 and Global 6500 aircraft. This supports our strategy of regaining market share in this sector and reaffirms our position as the top engine supplier in the long range, large cabin sector of the market. We also announced the expansion of our global network of authorised service centres for our business jet customers.

We have made excellent progress on our future technology programmes. As part of the continued development of our new UltraFan demonstrator, we ran our Advance3 demonstrator at full power for the first time and successfully started icing tests on our new lean burn and low emission combustion system (ALECSys). The UltraFan programme is not only the foundation for our future large civil aero engines but also provides underlying technologies that will support other areas of our business.

PEARL SET TO SHINE IN THE BUSINESS JET MARKET

During the year, we proudly unveiled the first member of a new engine family for the next generation of business jets. The Pearl 15 is the first of the planned Pearl engine family for business aviation and marks the sixth new civil aerospace engine introduced by Rolls-Royce in the past decade.

The Pearl engine combines innovative technologies derived from the Advance2 technology demonstrator programme with proven features from the Rolls-Royce BR700, today's leading engine family in business aviation. The Pearl 15 will be the sole engine for Bombardier's latest business jets, the Global 5500 aircraft and the Global 6500 aircraft, strengthening our leading position in business aviation.

Alongside its luxury connotations, the name Pearl continues the Rolls-Royce tradition of naming engines after rivers: there are Pearl rivers in China and the US, both key markets for business aviation.

Encouraging progress was also made in our strategy to champion electrification. We are developing programmes to demonstrate small scale full-electric and hybrid-electric flight. We continue to design and deliver new digital services for our customers under the banner of our IntelligentEngine vision. With the support of our newly-established R² Data Labs team we are able to combine our pioneering technology with advancements in the digital arena to deliver greater reliability, efficiency and value.

We continued to develop our service proposition for our aircraft lessor customers and have introduced LessorCare. We now have 15 customers covering around half of our leased widebody fleet. LessorCare provides faster and easier access to lessor services, whilst maximising returns on investment. Subsequently, we added LifeKey, which gives customers greater control over their assets by offering greater visibility, accessibility, portability and liquidity.

Civil Aerospace outlook

Our current widebody order book supports the continued growth of our large engine installed base, which in turn will drive ongoing engine flying hour growth. Revenue and profit improvements will be led by continued reduction in OE deficits and increased servicing activity. In 2019 we expect these dynamics to deliver around 10% revenue growth and operating profits to be closer to break-even. We expect cash costs for the Trent 1000 in-service issues to be around £450m in 2019. Given the smaller scale of the Trent 900 in-service costs, these will no longer be reported separately.

THE FUTURE OF ENGINE MAINTENANCE

We have teamed up with robotics partners including Harvard University and University of Nottingham to explore how robots could revolutionise the future of engine maintenance. 'Inspect' robots could be embedded within an engine to improve monitoring; 'snake' robots could work their way into it for inspections; or tiny collaborative 'swarm' robots could fix it.

Operating environment

Rolls-Royce key differentiators

Our continued development of advanced world-leading technology, culture of partnership with customers and innovation in services are attributes that Civil Aerospace customers really value and are difficult to imitate. These differentiators will maintain the business' position at the forefront of the civil aerospace industry.

Market dynamics

- The slow-down in new aircraft orders highlighted in 2017 has continued through 2018 across all regions. These market conditions were to be expected after the high levels of order placement over the past few years, as airlines absorb the increased capacity. There has been a slowdown in overall growth in air travel; however, it remains robust and higher than historical averages.
- Demand growth for air travel in all regions has remained resilient to recent geopolitical uncertainties, and historically growth has recovered quickly following major economic shocks. A broad consensus forecasts that air traffic (revenue passenger kilometres) will grow by approximately 4.5% compound annual growth rate over the next 20 years.
- The business jet market is seeing order intakes improve on US demand, growth elsewhere is more tentative with some concern over the prospects for world trade.

Opportunities

- The business has a strong and growing market position on widebody aircraft produced by the world's two major aircraft manufacturers: Airbus and Boeing. The current share of the widebody engine market is 36% of the installed passenger fleet and is expected to approach 50% early in the next decade.
- The increasing size of the installed base delivers significant services growth opportunities. 90% of the current Rolls-Royce widebody fleet is covered by TotalCare service agreements.
- The business continues to invest in technologies to enhance the existing and near-future product portfolio. In parallel, a number of engine demonstrators with embedded electrical generators have been successfully run; and work on innovative hybrid aircraft demonstrator projects is ongoing.
- The launch of the Pearl family of engines and the winning of its first application with Bombardier reinforces and secures our long-term position in the business jet sector.
- China's COMAC and Russia's UAC joint venture, the China Russia Commercial Aircraft International Corporation (CRAIC) has been formally incorporated. CRAIC plans to develop the CR929, a long-haul widebody aircraft. Rolls-Royce is actively exploring this opportunity.

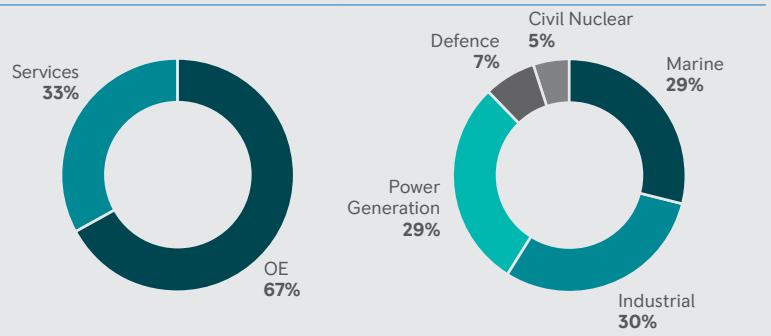
Business risks

- If our products do not achieve their required technical attributes and maturity, then product performance, customer satisfaction, unit costs and aftermarket costs may be impacted and could result in financial and reputational damage.
- If a major product failure in service is experienced, then this could result in loss of life and significant financial and reputational damage.
- If an external event or severe economic downturn significantly reduces air travel and thereby reduces engine flying hours and demand for aircraft, then financial performance may be impacted.
- If aircraft manufacturer customers significantly delay their production rates or we cannot ramp up capacity to deliver planned production and services, then financial performance may be impacted.
- If our internal or external supply chain is not sufficiently resilient to events that affect our operations, then this could result in significant financial and reputational damage. We have taken appropriate mitigating actions against the potential risks relating to Brexit (see page 50).
- If the business experiences significant pricing pressure from increased competitor challenge in key markets, then financial performance may be impacted.
- If there are significant changes to the regulatory environment for the airline industry, then the market position of the Civil Aerospace business may be impacted.

Power Systems

Power Systems is a leading provider of high-speed and medium-speed reciprocating engines and complete propulsion systems. It serves the marine, defence, power generation and industrial markets and includes civil nuclear operations that supply safety-critical systems to approximately half the world's nuclear power plants.

Underlying revenue mix



Underlying revenue

£3,484m

2017: £3,008m

Underlying operating profit

£317m

2017: £261m

Order backlog

£3.1bn

2017: £2.4bn

>20,000

reciprocating engines sold per year

>1,200

development, production, service and dealership locations

200

reactors in 20 countries where Rolls-Royce nuclear technology is installed

Key highlights

- Underlying revenue increased by 15% driven by 18% growth in OE, with some pre-buy ahead of emission regulation changes, and 10% growth in services; reflecting strong performance across key market segments
- Underlying operating profit improved 20% driven by higher volumes
- Order intake growth of more than 20% reflecting strength across a diverse range of end markets
- Continued focus on service growth with ValueCare agreements gaining momentum
- New power generation products developed for data centre applications and micro-grids to help meet increasingly stringent environmental regulations

Power Systems overview 2018

Power Systems made excellent progress in 2018 driven by strong demand in key markets and ongoing actions taken by our new leadership, with an increased focus on manufacturing efficiency. Our significant installed base of engines across a broad range of end markets, new lifecycle service solutions, increased digital penetration, and greater R&D discipline, underpin our confidence for the future.

Financial overview

Commentary excludes L'Orange which has been treated as non-core following its disposal in June 2018.

Financial overview

£m	2018	2017	Change	Organic change
Underlying revenue	**3,484**	**3,008**	**+16%**	**+15%**
Underlying OE revenue	2,322	1,956	+19%	+18%
Underlying services revenue	1,162	1,052	+10%	+10%
Underlying gross profit	**882**	**797**	**+11%**	**+10%**
Gross margin %	25.3%	26.5%	-120bps	-120bps
Commercial and administrative	(377)	(350)	+8%	+7%
Restructuring	(1)	(1)	–	–
Research and development charge	(188)	(181)	+4%	+3%
Joint ventures and associates	1	(4)	n/a	n/a
Underlying operating profit	**317**	**261**	**+21%**	**+20%**
Underlying operating margin %	**9.1%**	**8.7%**	**+40bps**	**+40bps**

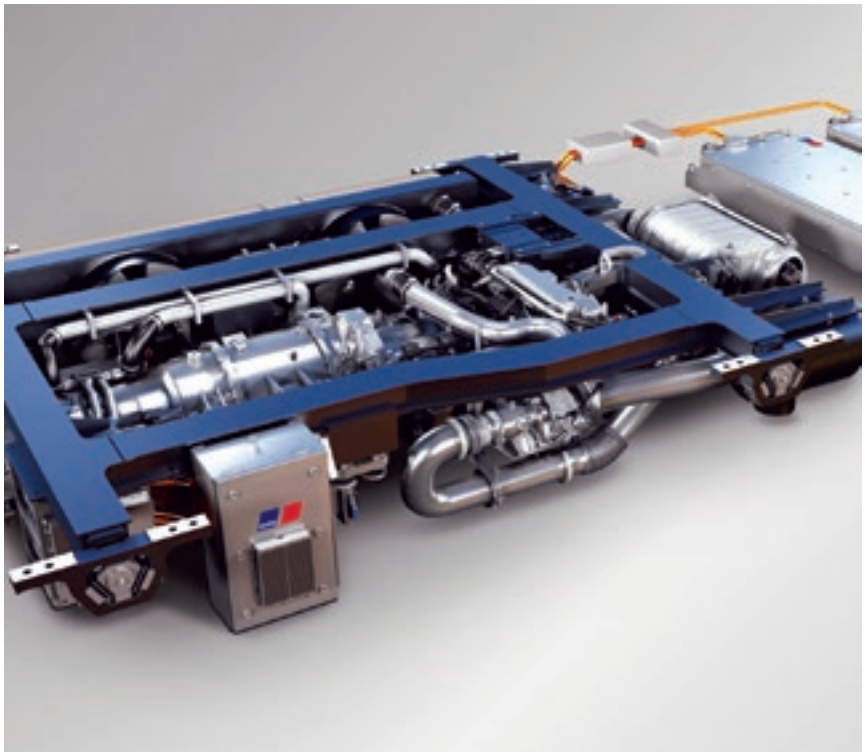
Underlying revenue

Underlying revenue of £3,484m increased by 15%. OE revenue rose by 18% driven by strong demand across a broad range of end markets. Key contributors were commodity related markets, emissions regulatory led demand in construction and agricultural sectors and increased governmental project volumes. In power generation the strong demand for diesel and gas systems was partly offset by the tough comparison base following high levels of Chinese demand in 2017.

Services revenue increased by 10%, primarily due to improved commodity markets driving higher engine running hours and increasing demand for spare parts. The growth in major maintenance activities, in particular with ferry operators, as well as the growth in service activity in the Middle East also contributed to the growth. Good revenue growth on long-term service contracts reflected our earlier success in securing new contracts in rail and marine markets.

Underlying operating profit

Overall underlying operating profit rose 20% to £317m, led by increased sales volumes. Gross profit rose £78m reflecting this volume growth albeit product mix changes saw gross margin decline 120bps to 25.3% as a result of strong growth in lower margin construction and agricultural activity. C&A costs of £(377)m were 7% higher year-on-year due to pay escalation and strategic investments. The 3% increase in our R&D charge reflected increases in investment in future engine platforms and progress on our electrification strategy and automation engineering capabilities.



LAYING THE TRACKS FOR QUIETER, CLEANER RAIL TRAVEL

Power Systems has a long heritage of innovation on the world's railways. Now, our hybrid-electric PowerPacks are writing a new chapter of environmentally-friendly, quieter and more efficient rail travel.

The MTU Hybrid PowerPack combines the advantages of diesel and battery-powered rail traction. It helps reduce emissions, increase fuel efficiency and improve the lives of people who live near stations as it runs more quietly than conventional trains. It also represents a more economic way of moving to lower carbon rail transport than full electrification as it does not require the installation of overhead power lines.

During the year, we announced letters of intent with seven partners in the UK, Ireland and Germany for the future delivery of several hundred MTU Hybrid PowerPacks.

SMALL-SCALE, BIG POTENTIAL

Renewable energy projects often face the challenge of maintaining a reliable energy supply when weather conditions are unfavourable. Small-scale, autonomous electricity networks – or micro-grids – that combine co-generation plants, diesel or gas powered gensets and renewable sources, with batteries and a control system, can provide a real solution.

During the year Power Systems launched turnkey micro-grids and began construction of a micro-grid validation centre in Friedrichshafen, Germany, enabling customers to see just what such a system can deliver. As a micro-grid provides security of supply, it can help to boost the take-up of renewable energy and further assist in the global transition to a low carbon economy.

Operational and strategic review

Conditions across Power Systems' diverse end-markets remained robust throughout 2018. Recovery in the mining and onshore oil & gas industries, where we saw increased utilisation after several challenging years, drove strong aftermarket service demand. Increasingly stringent diesel engine emissions regulations drove some pre-buy in 2018, ahead of regulation changes that will take effect in 2019. The exponential growth in data usage and subsequent expansion of data centres drove increasing demand for back-up power solutions with Power Systems' products. The combination of rising energy demand in developing countries and the expansion of renewable energy sources led to an increase in demand for our flexible power solutions and products such as micro-grid, hybridisation, gasification, electrification and energy storage.

We have made investments, both organic and inorganic, and formed new partnerships to support our strategy to become an integrated solutions provider. Customers are focusing on lifecycle performance, energy optionality and responsiveness and have an increasing requirement for digital capabilities. As an example, we launched turnkey micro-grid solutions and took a strategic stake in the Berlin-based start-up Qinous to develop energy storage and further micro-grid capability.

We continue to make progress increasing our focus on service solutions. Lifecycle service contracts such as ValueCare agreements continue to gain momentum with several new contracts signed during the year. The increased number of long-term service agreements with customers of Power Systems expands our aftermarket opportunities and follows the successful model pioneered in Civil Aerospace.

Demand for civil nuclear energy remains strong, particularly in those nations where clean energy policies are focused on finding solutions with attractive economics. This plays well to our SMR solution, starting in the UK with further export potential in the longer term.

Order intake remained strong with more than 20% year-on-year growth driven by the recovery of key markets, including mining, yachts and onshore oil & gas, the latter being supported by higher oil prices. Power generation orders continued to grow with an increasing number of data centre projects. We secured the first letters of intent for hybrid rail systems with Porterbrook and Irish Rail for the MTU Hybrid PowerPack. This powerpack is an eco-friendly drive system combining the best of diesel and battery-powered rail traction. It will deliver up to 33% lower fuel consumption and CO_2 emissions, a fall in noise levels around railway stations of as much as 75% and significantly lower operating costs.

In the second half of the year a new operations strategy was launched that focuses on footprint efficiency and production flexibility. In addition, digital solutions introduced into our facilities have led to efficiency gains.

Future growth was underpinned by the introduction of a number of new products during the year. In power generation major product launches included the S4000 L64 PowerGen gas engine and the S4000 PowerGen diesel engine. Increasingly stringent emissions regulation led to the launch of the S1000–S1500 EU Stage V Diesel Engines for agriculture, commodity and industrial applications. The new generation S4000 marine diesel engine was launched meeting the latest emission legislations and was commissioned by US ferry operator WETA.

R&D continues to focus on gas strategies power generation applications, a new generation of automation systems and strengthening our electrical design competence. In 2018 we focused our engineering resources to reflect new requirements for systems solutions and expanded globally with the enlargement of our India R&D facility. Work is being carried out on a number of forward-looking technology development concepts, including the use of alternative fuels and fuel cells.

Power Systems outlook

As we enter 2019 our confidence for the year ahead is underpinned by significantly improved order coverage than at this point last year. After the strong pre-buy effect in 2018, revenue growth is expected to moderate to mid single-digit growth supported by continued tightening of emission regulations, increasing data storage requirements and the growth of lifecycle solutions. Operating margins are expected to increase by around 100bps and we remain on track to realise our mid-teens operating margin ambition in the mid-term.

Operating environment

Rolls-Royce key differentiators

Technology leadership and a reputation for market-leading performance and system approach, new product innovation, full lifecycle service solutions and high levels of customisation in collaboration with customers will maintain a strong market position for Power Systems.

Market dynamics

- Almost all OE markets continued to improve in 2018, with the exception of the offshore marine markets. There is strong demand in mining and onshore oil & gas markets.
- Increased utilisation in resource industries, especially oil & gas and mining, is driving aftermarket service demand after several years of challenging market conditions.
- There continues to be increasingly stringent government regulation in most markets with regards to emissions from diesel engines.
- The industry is increasingly focused on service solutions, electric and hybrid power solutions as well as renewable energy solutions and digital capabilities; this is stimulating organic and inorganic investments and accelerating acquisitions and partnerships.
- Power Systems is experiencing increasing competition in its core markets as existing competitors launch new engine series and new players emerge with new technologies, for example battery container offerings from adjacent industries such as automotive.
- The civil nuclear market has strengthened in areas with set energy policy and financing mechanisms but weakened in areas where GHG reductions are not being prioritised.

Opportunities

- Rising energy demand in developing countries in combination with expansion of renewable energy sources will increase the demand for flexible power solutions and products beyond combustion engines (for example, micro-grid, hybridisation, electrification, energy storage and gasification).
- There is continued growth forecast in emerging markets, for example China and India, where domestic partnerships including local value creation will continue to be important.
- Tightening emission regulations in several regions will require clean diesel solutions where the business is well positioned (for example S4000 engine).
- Exponentially growing data usage requires rapid expansion of data centres and infrastructure and therefore corresponding back-up power solutions, Power Systems power generation systems are in particular demand due to their reliability.
- Increased utilisation in recovering resource markets due to wear and tear of existing fleets is leading to emerging services opportunities.
- Nuclear energy demand remains significant across developed nations, with the need for attractive economics and ability to finance dominating customer requirements. Our SMR technology is well placed to meet these requirements, with opportunities in the UK, Eastern Europe, the Middle East and Canada.

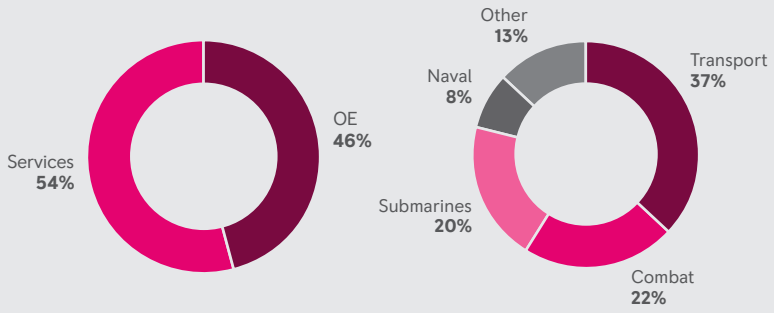
Business risks

- If electrical storage technologies develop faster than anticipated, then these may substitute Rolls-Royce products and/or affect margins.
- If other players in the industry consolidate, then they may generate synergies or capabilities that outpace the ability of the business to get new products and services to market.
- If new disruptive service models, for example 3D printing of spare parts or new digital service models, are offered by competitors, then we may lose attractiveness and competitive edge.
- If the industry fails to tackle the current supply chain constraints, then the market demand cannot be met as anticipated.
- If nuclear energy is reduced in priority by certain countries for political or economic reasons, then the civil nuclear market will suffer.
- If there is not clarity on UK energy policy and the willingness of UK Government to support SMR development, then continued investment may be called into question.

Defence

Defence is a market leader in aero engines for military transport and patrol aircraft with strong positions in combat and helicopter applications. It has significant scale in naval markets across the world and is the technical authority for the through-life support of the nuclear power plant for the Royal Navy's submarine fleet.

Underlying revenue mix



Underlying revenue

£3,124m

2017: £3,180m

Underlying operating profit

£427m

2017: £454m

Order backlog

£6.8bn

2017: £5.8bn

16,000

engines in service around the world

150

customers in over 100 countries

>50

years powering the UK's nuclear submarine fleet

Key highlights

- Underlying revenue broadly flat with modest increase in OE offset by reduced service revenues
- Underlying operating profit down £16m due to higher R&D spend reflecting our focus on future technology development, partly offset by lower C&A costs
- Strong year for new order intake with £3.9bn of customer orders and 1.3 book-to-bill ratio; notable orders included a further production contract for the F-35 LiftSystem and EJ200 engines for Qatar
- MT30 engine continued to prove its success in the Naval market; selection on Japan's 30FFM frigate programme; negotiations progressing to secure further exports
- Confirmed as one of four partner companies on Tempest, UK combat demonstrator programme

Defence overview 2018

Defence had a solid year, with good progress on the full integration of defence aerospace, naval marine and submarines into one business and delivering on our 2018 facility modernisation plans. OE revenues increased, driven in part by demand for transport engines. Service revenue declined reflecting lower activity in submarines. Underlying operating profit was lower due to increased R&D on ongoing future technology development partly offset by reduced C&A cost. As we look to the year ahead, our stable outlook is underpinned by strong order intake achieved in 2018.

Financial overview

Underlying revenue

Underlying revenue of £3,124m was broadly flat compared to the prior year. OE revenue, 6% higher year-on-year, was driven by increased demand for transport engines such as the Multi-Role Tanker Transport (MRTT) aircraft and an OE contract for the UK's Dreadnought submarine programme. This was partly offset by reduced combat volumes after the completion of the Oman EJ200 production contract in 2017. Service revenue was 4% lower, as increased LTSA revenues on EJ200 and Adour were offset by lower service revenue due to the phasing of work on UK submarines.

Financial overview

£m	2018	2017	Change	Organic change
Underlying revenue	**3,124**	**3,180**	**-2%**	**+0%**
Underlying OE revenue	1,452	1,398	+4%	+6%
Underlying services revenue	1,672	1,782	-6%	-4%
Underlying gross profit	**690**	**728**	**-5%**	**-3%**
Gross margin %	22.1%	22.9%	-80bps	-80bps
Commercial and administrative	(170)	(188)	-10%	-9%
Restructuring	(3)	(4)	-25%	-25%
Research and development charge	(100)	(89)	+12%	+13%
Joint ventures and associates	10	7	+43%	+43%
Underlying operating profit	**427**	**454**	**-6%**	**-4%**
Underlying operating margin %	**13.7%**	**14.3%**	**-60bps**	**-50bps**

Underlying operating profit

Underlying operating profit of £427m was £16m lower than the prior year. Gross profit of £690m fell 3%, driven by lower OE combat volumes and lower margins on a bridging contract for submarines services following the introduction of single source contract regulations (SSCR). This was partially offset by increased sales of MRTT engines and improved LTSA margins driven by customer settlements and higher AE engine volume.

An increase in R&D spend of £11m largely reflected ongoing future technology development. C&A costs were £17m lower as a result of actions taken across the business to manage discretionary spend.

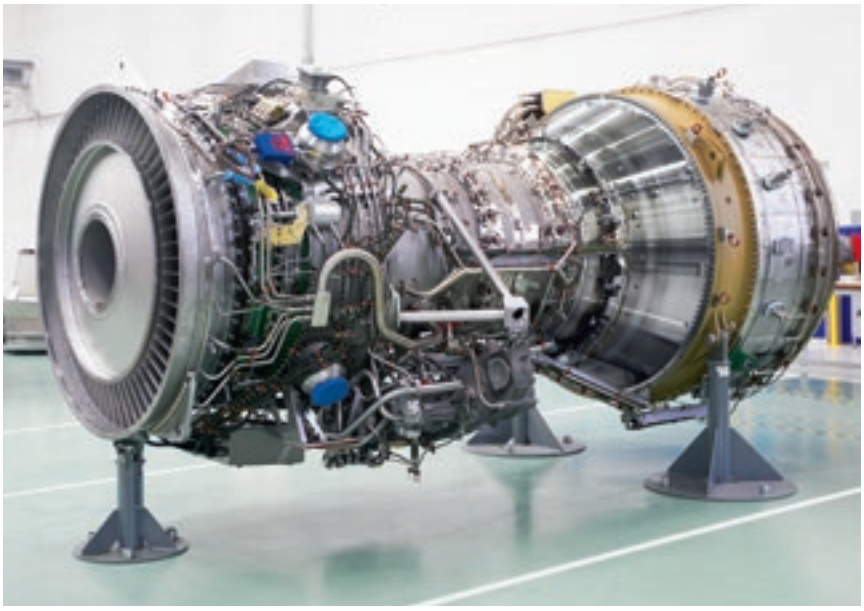
Operational and strategic review

Overall, our Defence markets remain stable. The United States continues to be our largest addressable market, where we have a particularly strong position in the transport and patrol segment. While annual US Department of Defense budgets can fluctuate from year to year, we expect modest growth over the long term. The UK and Europe remain important markets for us; the political environment in these markets typically leads to large defence programmes being developed by a consortium of two or more companies, a trend we expect to continue. In Asia and the Middle East, indigenisation and regional threat levels have led to areas of higher growth.

BRINGING DEFENCE TOGETHER

The Royal Navy's new carrier strike force showcases the combined capability of the newly integrated Rolls-Royce Defence business. Four months after the UK's first F-35B Lightning II aircraft arrived at RAF Marham, the new Queen Elizabeth (QE) class aircraft carrier conducted its first flight operations. Twin Rolls-Royce MT30 engines powered the ship into position while the Rolls-Royce LiftSystem enabled the F-35B to perform the first ever shipborne rolling vertical landing. This manoeuvre allows the jet to land with a heavier load, removing the need to jettison fuel or weapons.

Once fully deployed, the QE class carriers will be the heart of a potent carrier strike capability group, supported by escort frigates, destroyers and nuclear-powered Astute-class submarines – all reliant on Rolls-Royce propulsion systems.



MT30 POWERS AHEAD IN JAPAN

The MT30 marine gas turbine continued its success during 2018 with Japan becoming the fifth navy to select the engine – which is derived from Trent aero-engine technology. The Japan Maritime Self Defence Force (JMSDF) selected the MT30 to power a new class of frigates, the 30FFM.

The power and performance of the MT30 provides shipbuilders and system designers with new options and the ability to futureproof their latest naval platforms. It also provides the additional benefit of low on-board maintenance requirements while retaining its high power throughout its life. The world's navies are demanding more power and for Japan the MT30 will deliver a power rating in excess of 40 megawatts – enough to power a small town.

Operationally, Defence completed the implementation of its simplified five-layer organisation as part of the Group's wider restructuring programme. This has streamlined Defence programmes and services activities and created aligned functional support.

Defence achieved its 2018 facility modernisation milestones in Indianapolis which included the relocation of over half of manufacturing operations into new facilities. The business also successfully started the transition of a substantial element of AE transport overhaul capability to Standard Aero, progressing towards a 2019 exit of the Oakland, US repair and overhaul facility. Together, these transformations will enable our Defence business to be more responsive to our customer needs while focusing our capital allocation on future products and technology.

2018 was a strong year for new order intake with Defence capturing £3.9bn of customer orders, a 1.3 book-to-bill ratio. Accordingly, our Defence order backlog grew 17% in the year to £6.8bn.

In aerospace, notable orders included; an additional production contract for the F-35 LiftSystem and EJ200 engines for Typhoon from Qatar. In addition, the first deliveries of the Trent 700 powered Airbus A330 MRTT were made to France, Singapore and the Republic of Korea.

In maritime, we secured contracts in submarines representing orders for decommissioning, development and sustainment activity in the near-term. Our MT30 engine continued to prove its success in the naval market, including a further application secured this year with the selection for Japan's 30FFM frigate programme and with negotiations progressing to secure further exports.

In services, the US Department of Defense renewed around £0.9bn of contracts to support in-service fleets across our transport, combat and trainer markets and Saudi Arabia renewed the RB199 support contract for its Tornado fleet.

In terms of new technology and R&D, Defence continues to make good progress towards securing a substantive role in delivering a new combat engine through our position as one of four partner companies on Team Tempest, a UK programme aimed at maintaining the nation's position as a leader in combat capability. Furthermore, our AE 3007 engine was selected to power the US Navy's MQ-25 Stingray, a new unmanned tanker aircraft. The UK Government has further underpinned the Dreadnought submarine programme for which our Defence business will supply the nuclear power capability.

Defence outlook

The Defence order backlog remains strong with a healthy number of new orders received in 2018 giving us confidence in our medium-term outlook. In 2019, revenue is expected to remain stable with operating margins around 100bps lower as we increase investment in new platforms to position us for the next generation opportunities in transport and combat end markets.

FROM DREADNOUGHT TO DREADNOUGHT

The year 2018 marked 60 years since the signing of the mutual defence agreement between the US and the UK, which heralded the involvement of Rolls-Royce in nuclear propulsion and led to the launch of the first Royal Navy nuclear submarine, HMS Dreadnought.

In a fitting tribute to this milestone, the Dreadnought Alliance was launched during 2018, which will see a second submarine named Dreadnought enter into service in the early 2030s. Powered by a new design of propulsion plant, PWR3, the next Dreadnought will further extend Operation Resilience, the Royal Navy's continuous at-sea deterrence capability, which in 2019 will celebrate its 50th year.

Operating environment

Rolls-Royce key differentiators

Advanced technology, innovation, and collaboration with partners and customers are unique hallmarks of Defence. These differentiators ensure successful delivery of products and services tailored to customers' evolving needs.

Market dynamics

- Long-term defence investment is tied to economic growth while threat levels and politics drive near-term spend; the business expects to see modest growth across the globe in the coming years.
- While higher-growth areas exist in Asia and the Middle East, driven by indigenisation and regional threats, the US represents nearly half of addressable defence spend globally.
- Programme wins are generally long-term and as a result barriers to entry are high, which leads to entrenched competitors and aggressive competition for new opportunities.

Opportunities

- There is strong interest in electrification across land, sea, and air platforms; the business is exploring more electric and hybrid-electric propulsion technologies as well as power generation for high-energy systems.
- Combat propulsion remains the largest market segment, with opportunities for current products (LiftSystem and EJ200), UK investment in future combat air technologies (Tempest), and new international and next generation programmes (Turkey TF-X).
- In transport, Defence is well positioned for various next-generation opportunities, as demonstrated by the recent win of the US Navy MQ-25A program.
- Building on success as preferred gas turbine provider on Korean FFX Batch III and Australian SEA 5000 programmes, Defence is well positioned to capture other large maritime opportunities with the MT30.
- There is strong service growth potential via technology insertion, and emerging service opportunities using digital technology and data analytics to generate new solutions.

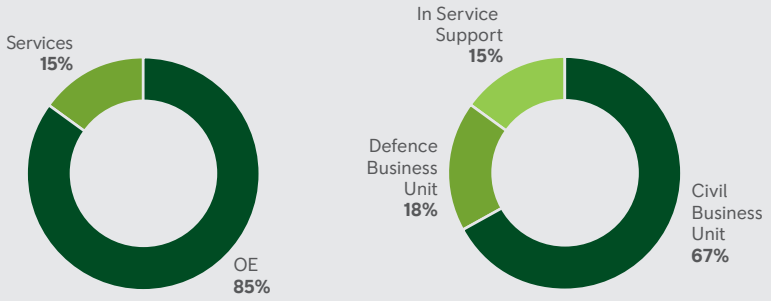
Business risks

- If a major product failure in service is experienced, then this may result in loss of life and significant financial and reputational damage.
- If global defence spending experiences a significant downturn, then financial performance would be impacted.
- If we do not continue to invest in improving the performance and cost of Rolls-Royce products, then market share may be lost.
- If the business suffers a major disruption in its supply chain, then delivery schedules would be delayed, damaging financial performance and reputation. We have taken appropriate mitigating actions against the potential risks relating to Brexit (see page 50).
- If new applications are not secured, then the business may have to increase investment or accept erosion in capabilities.
- If electrification and digitalisation technology proceeds at a faster rate than expected, then the business may not be positioned to fully capitalise on this potential growth.

ITP Aero

ITP Aero is a global leader in aero engine design, manufacture and maintenance. Alongside the development, manufacturing, assembly and testing of engines, it provides MRO services for regional airlines, business aviation, helicopters, industrial and defence applications.

Underlying revenue mix



Key highlights

- Underlying revenue increased by 6% primarily driven by higher civil aerospace OE deliveries
- Operating profit broadly flat; lower gross profit; offset by lower C&A cost and R&D costs
- Good progress on footprint expansion plans

Underlying revenue

£779m

2017: £725m

Underlying operating profit

£67m

2017: £65m

Order backlog

£0.9bn

2017: £1.1bn

16

facilities in six countries (India, Malta, Mexico, Spain, UK and US)

7

Trent engine programmes in which ITP Aero is a risk and revenue sharing partner

>575

engines and modules serviced by ITP Aero per year

ITP Aero overview 2018

ITP Aero delivered good growth in 2018 driven by its exposure to civil aerospace growth programmes. Capacity was increased to support this, with 5% higher headcount. Underlying operating profit rose by 3% despite the impact of the share of Trent 1000 in-service issues shared with ITP Aero. We are well positioned to deliver further good growth, supported by long-term demand for growth in air travel and our exposure to growing civil aero engine programmes.

Financial overview

Underlying revenue

Underlying revenue grew 6% to £779m led by progress in civil aerospace OE revenues, which saw good growth from increased volumes across Rolls-Royce and Pratt & Whitney programmes as well as improved pricing. This more than offset lower defence OE revenues, driven by a reduction in EJ200 and TP400 delivery volumes. Services revenues were lower, with weaker aftermarket revenues on certain civil aerospace programmes which more than offset a significant improvement in defence aftermarket.

Underlying operating profit

Underlying operating profit was 3% higher primarily driven by higher gross margins in civil OE, reflecting better pricing and good progress reducing unit costs. Operating profit growth was delivered despite a profit headwind from the impact of the share of Trent 1000 in-service issues that were allocated to ITP Aero. Gross margins in defence were lower due to reduced EJ200 engine volumes.

Financial overview

£m	2018	2017 *	Change	Organic change
Underlying revenue	**779**	**725**	**+7%**	**+6%**
Underlying OE revenue	666	554	+20%	+19%
Underlying services revenue	113	171	-34%	-35%
Underlying gross profit	**156**	**159**	**-2%**	**-3%**
Gross margin %	20.0%	21.9%	-190bps	-200bps
Commercial and administrative	(57)	(61)	-7%	-8%
Restructuring	(2)	–	–	–
Research and development charge	(30)	(33)	-9%	-12%
Underlying operating profit	**67**	**65**	**+3%**	**+3%**
Underlying operating margin %	**8.6%**	**9.0%**	**-40bps**	**-30bps**

* ITP Aero was acquired on 19 December 2017. Prior year comparatives are unaudited and are presented for comparison purposes only

Operational and strategic review

The long-term trends driving demand growth in passenger aircraft remain strong. Our business continues to expect strong demand for aero engines across both narrow and widebody aircraft, with an increased focus on newer, more fuel efficient aircraft types. This, coupled with our presence on newly launched platforms that are currently ramping up, provides a solid base for ongoing growth in our civil aerospace business.

The production ramp-up in the year on growth programmes from both Rolls-Royce and Pratt & Whitney was supported by 8% capacity growth. To cater for further ongoing growth, we made good progress in 2018 on our capital investment plans, with the expansion of production facilities in Spain and Mexico to support development of new products. Actions taken to improve manufacturing cost efficiency delivered good progress in unit cost reduction, particularly across our civil engine programmes.

We made significant progress on the industrial plans included within our ITP Aero 2020 strategic plan, announcing an investment of €14.2 million (2018-2021) in new facilities in Derio, Spain, focused on the design and manufacturing of engine external parts. This new plant will be operational by late spring 2019. Our newly built castings facility in Sestao, Spain is now fully operational.

Significant milestones in 2018 included delivery of the 600th low pressure turbine for the Trent XWB-84; delivery of the last EJ200 Tranche 3A engine to the Spanish Air Force; and more than 575 engines and modules serviced across plants in Spain, US and Malta. We continue to execute our R&T plan with good progress on UltraFan turbine technology development and a strengthening of the Centro de Fabricación Aeronautica Avanzada (CFAA) in Biscay, Spain with a large number of development programmes.

ITP Aero outlook

Our exposure to growing civil aerospace platforms supports our expectation of around 10% revenue growth in 2019 with a stable operating margin.

PARTNERING ON THE TRENT XWB-97

ITP Aero has a long heritage supporting Rolls-Royce as a risk and revenue sharing partner. In 2013, ITP Aero started work on the low pressure turbine for the high-thrust variant of the Trent XWB, the Trent XWB-97. That work involved an in-depth analysis of the aerodynamic efficiency of the earlier variant, the Trent XWB-84. As a result of this work, ITP Aero achieved a decrease in fuel consumption per pound of thrust on the Trent XWB-97, which celebrated its entry into service in 2018.

NON-CORE BUSINESSES

Non-core businesses primarily comprise L'Orange, sold on 1 June 2018, and Commercial Marine, the proposed disposal of which was announced on 6 July 2018.

L'Orange

In April, we announced an agreement to sell L'Orange, a wholly owned subsidiary of Rolls-Royce Power Systems, to Woodward, Inc., a designer, manufacturer and service provider of control system solutions and components for aerospace and industrial markets. The deal completed in June. L'Orange supplies fuel injection technology for engines that power a wide range of industrial applications including marine power and propulsion systems, special-application vehicles and power generation. L'Orange remains an important partner and supplier for Power Systems through a long-term supply agreement, with an initial term of 15 years.

L'Orange financial overview

£m	2018 (5 months)	2017
Underlying revenue	89	212
Underlying operating profit	21	55

Commercial Marine

In January, we announced plans to consolidate our naval marine and submarines operations within our existing Defence business and that we would be evaluating strategic options for our Commercial Marine operation. Since 2015 our Marine business has responded to weak demand for products and services for the offshore oil & gas market, which significantly impacted its profitability. It has divested non-core businesses, consolidated its sites and reduced its workforce. At the same time, the business has been investing in new facilities and new technologies and become an industry leader in the fields of ship intelligence and autonomous vessels.

In July, we announced an agreement to sell the business to KONGSBERG, the provider of systems and solutions to clients within the oil & gas industry, merchant marine, defence and aerospace sectors. KONGSBERG will, through a trading arrangement, continue to have access to products from Bergen Engines, which remains part of Power Systems. The deal is expected to complete during 2019.

Commercial Marine financial overview

£m	2018	2017
Underlying revenue	726	810
Underlying operating profit	(35)	(60)

TECHNOLOGY

Rolls-Royce develops products which are underpinned by cutting-edge technologies and we are continuing to invest to maintain our competitive edge, both today and in the future.

During 2018 we increased our momentum on technologies to protect the competitiveness of our core products; on digital technologies to drive productivity across manufacturing, design and services; and on developing electrification technologies to prepare for the third generation of aviation.

We made substantial progress on our UltraFan demonstrator, which will offer 25% fuel efficiency improvement over the first generation of Trent engines. The underlying gas turbine technologies will also support our military and business jet customers. Progress included:

- the Advance3 core at the heart of the UltraFan demonstrator achieved full power on test and performed in-line with expectations;
- the power gearbox, which transmits the UltraFan's propulsive power to the large fan, has achieved over 250 hours on test, having proven its capability to run at 70,000 horsepower; and
- engine testing of the lean burn combustion system has so far shown around half the NOx emissions at cruise compared to today's levels.

We also welcomed the UK Government's announcement of the Tempest programme to revitalise sovereign capability in combat aviation. We supported advanced concept activity with testing of the embedded high-power electrical machines required to power a modern sixth-generation fighter.

In dealing with the in-service issues with the Trent 1000, we accelerated the implementation of capabilities in advanced manufacturing to increase turbine blade output by 75%, and developed new near-wing overhaul techniques to approximately halve engine turnaround time from 30 days.

The ACCEL programme will create an all-electric plane that will fly at over 300mph.

Our global network of 31 University Technology Centres and seven Advanced Manufacturing Research Centres continued to deliver world-class applied research. This ranged from materials modelling developed in the UK – which will enable extending the service life of certain critical parts – to increased efficiency axi-centrifugal compressor technologies validated in the US, and smart manufacturing and visual corrosion inspection technology developed in Singapore. In total we support around 500 PhD students through our relationships with universities.

We supported our strategic goal of championing electrification with the formation of Rolls-Royce Electrical, a self-contained capability group, to advance technologies and new solutions. It had a number of notable successes:

- established a number of technology demonstration programmes to position us to support the future of hybrid-electric flight for regional aviation (E-Fan X) and urban air mobility (EVTOL);
- progressed the development of power-dense electrical technologies for kW and MW power in hybrid systems. Our 2.5MW power generation system is currently in the build stage while our M250-based hybrid-electric system has completed ground testing;
- received a UK research grant for the ACCEL programme to demonstrate all-electric flight technologies; and
- signed customer letters of intent to develop our first series hybrid-electric system for marine yachts and to retrofit over 140 diesel railcars as part of the ongoing hybridisation of rail travel and based on the successful demonstration of MTU PowerPacks.

We also retained a dedicated team to work on SMRs and we are in discussions with the UK Government to develop these as an affordable zero carbon electricity solution.

As a result of our focus on new technologies, 2018 saw us deliver 892 patents approved for filing, aided by a series of focused workshops and engaging our global population of engineers through our innovation portal, which now has more than 26,000 users.

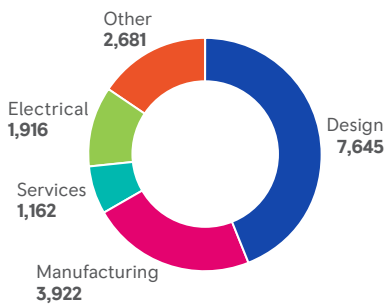
Key facts

892
Patents approved for filing

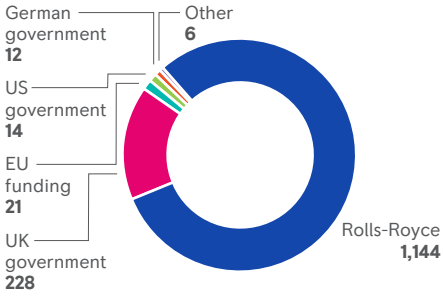
17,326
Number of engineers across the Group

£1.4bn
Gross R&D expenditure

Number of engineers (at 31 Dec 2018)



2018 Gross R&D expenditure (£m)



ENVIRONMENT

As a leading industrial technology company we have an irrefutable role in enabling the transition to a low carbon global economy. We are committed to utilising our engineering skills and technology capabilities to enable and accelerate this.

Our approach

We believe that the successful management of climate change will depend upon a structured transition to a low carbon economy, driven by the development of sustainable power solutions.

During 2018, our executive-level environment & sustainability committee reviewed our governance, strategy and policies in relation to our environmental impacts. Our environmental commitments are embedded within our governance framework and operational procedures, including Our Code and associated Group policies. We have also begun developing dedicated scenarios to understand the potential opportunities and risks associated with climate change.

AS GOOD AS NEW, SEVEN MILLION MILES LATER

Our TotalCare model helps us to reduce waste and optimise resource efficiency, whilst enabling our customers to maximise the availability of their engines. Through TotalCare we are able to extend the service intervals between engine overhauls by around 25%, with engines typically flying up to seven million miles between shop visits. By keeping engines flying for longer there is less demand for new products and components that require complex materials and are expensive and resource intensive to manufacture.

Products and technology

We recognise the significant environmental impacts of the markets in which we operate, and as a result have a long-standing commitment to minimising the impacts of our products and services. The technologies we are developing will contribute significantly to decarbonising global transport and the built environment.

In 2018, we spent £1.4bn on R&D to develop the technology we embed in our products and services. Over two-thirds of our R&D expenditure is dedicated to improving the environmental performance of our products. This helps ensure that each generation of product has a better environmental performance than the last.

We are making good progress towards achieving the industry level ACARE goals for civil aviation, including reducing CO_2 emissions per passenger kilometre by 75% by 2050. With significant forecasted growth in passenger demand it is critical that we continue to develop new engine technologies that meet customer's expectations for efficiency. Our Trent 7000, which entered service this year, builds upon the industry-leading performance of the Trent XWB to deliver 10% better fuel efficiency than the engine it is designed to replace.

We recognise that electrification and hybrid solutions will deliver a step-change in emissions performance. We are leading the development of electric flight through our R&D projects, including EVTOL and E-Fan X. To support this, we are investing in our electrical capabilities, including launching focused graduate and apprentice development programmes.

Our Power Systems business is the leading provider of hybrid rail applications, which can enable fast, quiet and efficient rail transportation without the need for major infrastructure change. Our micro-grid technologies support wider uptake of renewable energy solutions, such as wind and solar, by providing battery and control solutions. These can mitigate challenges associated with storing renewable energy.

Operations and facilities

Managing the environmental impacts of our operations and facilities are a key part of being a responsible and resilient business. We seek to consider the environmental impact of major business decisions, including property developments, to reduce our exposure to the physical and transitional risks of climate change.

We apply circular economy principles across our operations. Each year, we use over 30,000 tonnes of high-value metal alloys in our manufacturing and production. Through our revert programme of closed-loop recycling, we seek to recover and reuse materials wherever reasonably possible to reduce the cost and environmental impacts associated with manufacturing. We have continued to make progress in maturing our waste management practices during 2018, and are working in partnership with waste management specialists and research bodies to identify alternatives to landfill.

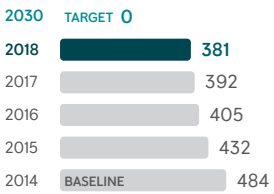
We continue to invest in low carbon and renewable technologies, including completion of a ground source heat pump thermal storage project in Bristol, UK in 2018. Following the early achievement of our 2020 energy reduction target in 2017, we are extending this with a longer-term target to reduce energy consumption by a further 20% by 2025.

TARGETING ZERO EMISSIONS BY 2030

We recognise the significance of climate change and the global commitments made to reduce greenhouse gas (GHG) emissions. We are replacing our existing GHG target with a longer-term ambition to achieve zero emissions from our operations and facilities by 2030. This science-based target, aligned to the GHG emissions reduction pathways required to limit global temperature rise to 1.5°C, will drive further investment in low carbon and renewable energy solutions across our global footprint, and reduce our vulnerability to volatile energy prices.

Absolute GHG emissions ($ktCO_2e$)

381 $ktCO_2e$

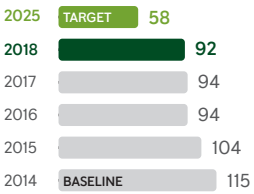


Target: Achieve zero scope 1 + 2 GHG emissions by 2030 [1,2,3,4]

The GHG emissions associated with our global operations and facilities has reduced by 21% since 2014. This has been achieved through significant investment in renewable and low carbon energy installations, including solar and energy storage.

Energy consumption (MWh/£m)

92 MWh/£m

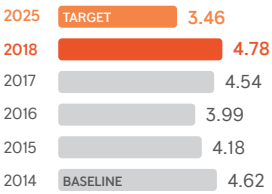


Target: Reduce energy consumption by 50% by 2025 [1,2,3,4]

We continue to invest in renewable and energy efficient technologies, such as upgrading lighting and heating, to reduce our energy use. Our consumption has reduced by 20% from 2014, and we are on track to meet our longer-term target.

Total solid and liquid waste (t/£m)

4.78 t/£m

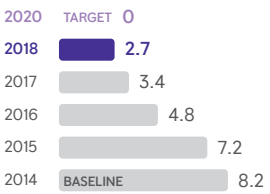


Target: Reduce solid and liquid waste by 25% by 2025 [1,2,3]

Our total waste generation has increased slightly as we have improved our data reporting processes and accuracy. We continue to identify opportunities to minimise the generation of waste at source in our manufacturing.

Waste to landfill (000 tonnes)

2.7 kilotonnes



Target: Achieve zero waste to landfill by 2020 [1,2]

The amount of waste sent to landfill from our operations has reduced by 67% since 2014. This has been achieved through continued investment in waste management improvements and the use of innovative alternatives to landfill.

1 External assurance over the STEM, energy, GHG, and TRI rate data provided by Bureau Veritas. See page 197 for its sustainability assurance statement.
2 Data has been reported in accordance with our basis of reporting, available at www.rolls-royce.com/sustainability. Data for prior years has been restated to reflect the disposal of L'Orange and the acquisition of ITP Aero. Data associated with ITP Aero is included in the GHG, energy and total waste targets for 2017 and 2018 only.
3 Emissions associated with product test and development, critical to ensuring product safety, and power generation are excluded from our GHG target. Statutory GHG emissions data, including emissions from these sources, are detailed on page 203. Our energy and total waste reduction targets are normalised by revenue.
4 We have extended our previous energy consumption reduction target with a new target to 2025, the baseline year remains 2014. We have replaced our GHG emissions reduction target with a new target to 2030.

OUR PEOPLE

It is through our people that we fulfil our potential, achieve our vision and execute our strategy. We are committed to creating an environment where all of our people can be at their best.

Our people framework

We introduced our people framework in 2017, consisting of five constituents to deliver our vision and strategy. The core competencies and growing capabilities are determined by our existing and future strategic and operational needs, whilst our values and behaviours drive our culture and conduct throughout the Group.

Care
Creating a working environment where each of us is able to be at our best.

Growing capabilities
Key capabilities needed to secure emerging opportunities:
- systems integration
- electrical engineering
- data sciences

Growing behaviours
Key behaviours needed to secure emerging opportunities:
- embrace agility
- be bold
- pursue collaboration
- seek simplicity

Core competencies
Key competencies needed to safeguard our current competitiveness:
- engineering pre-eminence
- programme management
- business acumen

Core values
Key values needed to safeguard our current competitiveness:
- trusted to deliver excellence
- act with integrity
- operate safely

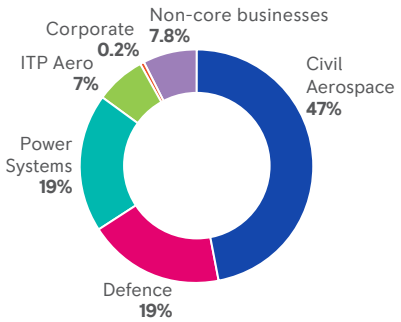
Restructuring and cultural change

We continue to make progress with our fundamental restructuring programme. From the beginning of 2019, our core businesses have been supported by a Group Business Services organisation, which pools our professional and transactional services into one entity. It will act and feel like a customer service provider. During the latter half of 2018, our head office reduced dramatically to focus on corporate governance and Group strategy, as well as our corporate responsibilities. We have also created an Innovation Hub, which draws together skillsets and expertise which have common application across the businesses, including digital capabilities and future technologies.

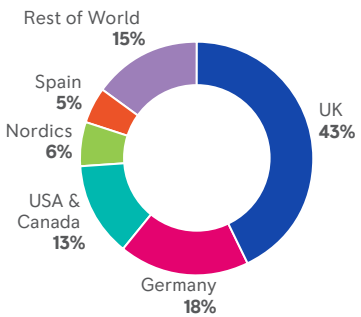
Through these changes we are reducing our non-manufacturing headcount. It is never an easy decision to reduce our workforce, but we must create a commercial organisation that is as world-leading as our technologies. Over the 24 months starting in mid-2018, we expect the fundamental restructuring to lead to the reduction of around 4,600 roles. In 2018, we saw a reduction of around 1,300 roles, taking our non-manufacturing related headcount to 27,800. The programme is expected to gain further momentum through 2019 with full implementation of headcount reductions and structural changes by mid-2020.

From its outset, the restructuring was designed as more than just a cost-saving exercise of reducing our headcount. It is a simultaneous and strategic change of our structure, our culture, our processes and our people; transforming Rolls-Royce to be the world's leading industrial technology company. It is nothing less than setting ourselves up for success for this century. There are elements of our current culture, especially our employees' pride and sense of purpose, that we need to preserve and enhance. However, there are other aspects of our current culture that need changing. We will do this by embedding our values and behaviours throughout the organisation so that every employee can enjoy the same standard of care no matter where they work. Particular areas of focus will be centred around anti-bullying and harassment, safety and wellbeing.

54,500 employees total



Employees in 50 countries



Leadership

Embedding our values and behaviours and culture change hinges upon strong leadership. We have renewed our Executive Team and will continue to refresh our Enterprise Leadership Group, comprising our senior leadership, throughout 2019. This group has reduced by more than a third compared to the previous senior leadership team, with 30% of the new group being promoted internally, placed in a new role or brought in from outside the organisation. We continue to concentrate on increasing the diversity of our leadership population, including making progress towards our 2020 target.

We have been working hard to ensure that the expectations of our leaders and the accountability deriving from their positions within the Company are clear. The way we assess, reward and promote our leaders is increasingly linked to how they embody and cast the shadow of these values and behaviours in their teams and beyond.

To support these leaders, we are completely refreshing our approach to leadership learning not only to embed the new expectations, but also so that our leaders have a licence to operate before they move to the next level of leadership – or become a leader in the first place. Linked closely to this leadership learning programme is a refresh of our talent management system to ensure we have the right leaders and to encompass strengthened activities such as succession planning, spotting potential and structuring our talent groups.

Employee development

Investing in people is a core component of our talent attraction and retention programmes. During 2018 we invested £27.1m in employee learning and development, delivering over one million hours of employee training.

This year, for the first time, employees were required to complete all mandatory training to be eligible for certain reward outcomes. Mandatory training includes courses linked to our code of conduct (Our Code) and Group policies. Our broader learning programmes include HSE, product safety, ethics and leadership development; 70% of our courses are now taken digitally as we seek to develop a more agile culture.

Our approach to performance enablement is based on providing regular, less formal feedback and coaching. Dedicated training and toolkits are available to support managers with this and to enable some great performance conversations across the organisation.

Career framework

In 2018 we began work to launch a new career framework, which is a refreshed approach to the way we manage careers at Rolls-Royce. This streamlined framework contains broader job levels and removes the complexity associated with multiple layers of management. It should enable our employees to move between roles within the Group with more ease and greater opportunity to broaden their experiences. In 2018, 1,340 employees were promoted internally and our employee turnover rate decreased to 7.6% (2017: 9.3%).

Key facts

15.5%
Female employee population

91,000
Hours of employee time volunteered

£27.1m
Invested in learning and development

A STRONG AND DIVERSE FUTURE TALENT PIPELINE

A strong pipeline of future talent and diverse experience is critical to our ongoing success.

In 2018, 319 graduates and 450 apprentices joined the Group into dedicated early career development programmes; 62% of these graduates joined engineering development programmes. These include new dedicated programmes for electrical systems engineering and digital and technology solutions. Other development programmes include programme management, human resources and procurement. These provide a vital pipeline of talent into our functions.

This year, 32% of graduates recruited were female, supporting our target of achieving a 30% female population on our graduate programmes by 2020; 21% of apprentices recruited were female.

Employee engagement

We provide a variety of channels to communicate and engage with, and listen to, our employees and their representatives.

We encourage participation and engagement throughout the organisation, through both formal and informal channels, including our intranet, newsletters and employee magazines. Team briefings and employee forums allow employees to discuss key developments and business performance, and to contribute their views.

We consult and work closely with elected employee representatives through well-established frameworks, including our European Works Council.

Our annual employee engagement survey helps provide a measure of success for our engagement activities. This year, 57% of our in-scope employees participated in the survey. The 2018 results highlighted strong belief in our Company vision and values. Our sustainable employee engagement score remained stable for the third year running, despite the ongoing restructuring programme.

Our incentive schemes and all-employee share programmes enable everyone to share in our success.

For more information on the Board's stakeholder engagement see Corporate Governance section, page 67.

Diversity and inclusion

We are committed to building an inclusive culture and diverse workforce. We believe that a culture of inclusion is paramount to creating an environment where all our people can be at their best.

Our employee resource groups (ERGs) support this by connecting people with shared characteristics or experiences. We have 18 ERGs globally, including our PRISM and Propel with Pride groups for LGBT+ employees; women and gender diversity groups; and faith and ethnicity based groups. Additional support networks are also available in key geographies, such as working parents, veterans and disabilities groups.

Diversity continues to be a significant challenge for the engineering sector as a whole, but we are making progress as an organisation. We are committed to increasing the number of women at all levels, and have made good progress towards our 2020 diversity targets during the year. We are actively recruiting from groups typically under-represented in our sector, particularly women and minority ethnic groups. To support the number of women in senior manager positions we have introduced 50:50 shortlists and have partnered with the FT 125 Women's Forum in the UK.

Through our community investment and education outreach programmes we aim to engage young people from diverse backgrounds in STEM subjects at an early age. Our activities are focused on promoting the opportunities that education and career choices in STEM can offer.

We continue to work with organisations such as Women in Science and Engineering, Women in IT, Women in Finance and Women in Nuclear to boost our visibility amongst potential female talent. We support initiatives driven by these organisations and others, and sponsor awards such as Female Undergraduate of the Year and Young Woman Engineer of the Year to celebrate success and showcase role models in the engineering sector.

Our global diversity and inclusion and anti-discrimination policies ensure that all employees, regardless of gender, race, religion, physical ability or any other characteristic, are treated with dignity and respect, and feel safe and empowered to work without fear of bullying and harassment. At the end of 2018 we launched a global anti-bullying campaign, championed by our Chief People Officer. This will continue into 2019 and will focus on encouraging employees to recognise and challenge inappropriate behaviours.

We give full and fair consideration to all employment applications from people with disabilities and support disabled employees in the workplace, helping them to make the best use of their skills and expertise to reach their full potential.

For Board members by gender see page 59.

For Board diversity, see pages 73 and 74.

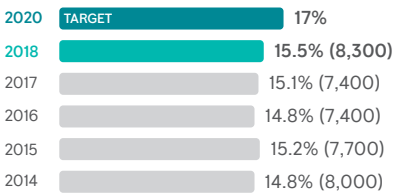
Progress against our 2020 diversity targets

In 2017 we launched a diversity and inclusion strategy with global targets to increase female participation at all levels by 2020. These are supported by local targets in key regions where we face specific diversity challenges associated with ethnicity, nationality and age.

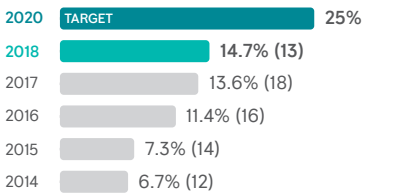
Our inclusiveness score is measured by a subset of our employee engagement survey, including questions related to whether people feel they can be themselves at work and are treated with fairness and respect.

Inclusiveness score

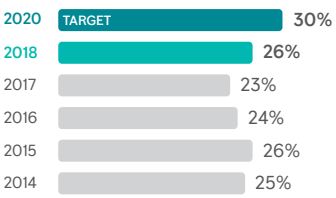
Female employee population [1]



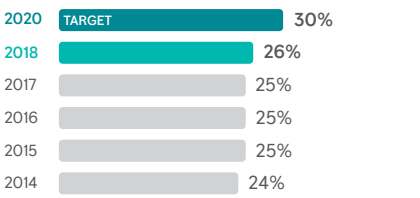
Female senior manager population [2]



Female graduate population [3]



Female high potentials population [3]



[1] Employee headcount data is calculated as the average number of full time equivalents throughout the year. Certain joint ventures are classified as joint operations. As a result, 1,000 employees associated with joint operations are included within our overall headcount, however we do not collect diversity information from these employees, therefore they are omitted from this data.
[2] Senior management population for 2018 is calculated as Executive Team and ELG population (2018 total: 88), prior years data refers to the senior leadership team that has been replaced by the ELG through restructuring.
[3] The graduate and high potentials targets refer to the number of employees on development programmes as at 31 December each year.

INSPIRING TOMORROW'S PIONEERS

We recognise the need to inspire young people in STEM subjects at an early age, to enable them to make informed career and education choices. In 2018, we reached 1.6 million people through our STEM activities and programmes, and are now 92% towards our target to reach 6 million people by 2020 [1]. We are extending this target with a longer-term ambition to inspire 25 million of tomorrow's pioneers by 2030.

During the year we invested £7m in broader community engagement activities, including £3.8m in cash contributions and 91,000 hours in employee time.

Health and safety

We believe that a safe and healthy workplace is a better place for our people, our customers and our business. Our health and safety performance is fundamental to our success and is integral to creating an environment where everyone can be at their best.

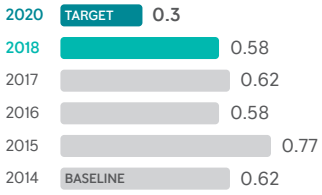
Operate safely is one of our core values and we are committed to promoting a Zero Harm culture.

To support this, we have introduced a suite of Life Saving Rules, a clear set of simple guidelines that focus on our most frequent safety incidents and high-hazard activities. These rules, accompanied by training and communications, are aimed at supporting our people in prioritising their personal safety, and the safety of those around them, in their daily decisions.

Throughout the ongoing Group-wide restructuring we have concentrated on building greater leadership accountability for HSE risk. To support this, we have launched dedicated training and toolkits for our management population, supporting them in recognising and understanding HSE risk and the control systems we have in place.

During 2018 we initiated a programme of comprehensive safety reviews at some of our major and high-hazard sites. From these reviews we have identified and prioritised a series of improvement actions.

TRI rate (per 100 employees) [1,2]



These risk-based improvement programmes have contributed to a 6% improvement in our total reportable injury (TRI) rate since 2014. This improvement rate is lower than anticipated when our 2020 target was first introduced, primarily due to changes within the Group structure including the disposal of L'Orange and inclusion of ITP Aero data in our reporting for 2017 and 2018. The continued promotion of a safety-conscious culture, as well as increased maturity of our HSE reporting, has led to increases in the reporting of restricted work cases that has impacted our overall TRI rate.

We remain committed to reducing our injury rate and minimising the exposure of our people to potential harm, and are pleased to have made significant progress following particularly poor performance in 2015. Our TRI rate for 2018 was 0.58 per 100 employees [1].

For more information on our safety performance see the Safety & Ethics Committee report, pages 96–101.

Employee wellbeing

Supporting employee wellbeing is particularly important during times of change. Our approach to wellbeing aims to create a work environment which is supportive of wellbeing, to remove barriers to healthy behaviour, and to motivate employees to lead healthy lifestyles at work.

During the year we have concentrated on increasing awareness of employee wellbeing, particularly mental health, at all levels of the organisation. This included encouraging employees to make personal commitments to improving their individual wellbeing. We have a comprehensive range of support and guidance materials available to employees, including resilience toolkits, manager guides and online training. In key regions, employees can access dedicated support for work and non-work related mental health challenges through our employee assistance programmes. This year, we have piloted mental health champions in the UK, and now have 190 trained volunteers who can act as a first point of call for employees who may need support. We have also introduced dedicated mental health first aid training.

We continue to build upon our site-based wellbeing programme. This recognises sites that have taken steps to enable employees in making healthier choices, for example introducing flexible workplace arrangements, healthier catering options, or onsite exercise facilities. To date, 68% of sites have achieved a LiveWell award.

[1] External assurance over STEM, energy, GHG and TRI rate data provided by Bureau Veritas. See page 197 for the sustainability assurance statement.
[2] The TRI rate for prior years has been restated to reflect the disposal of L'Orange and the acquisition of ITP Aero. ITP Aero data is included for years 2017 and 2018 only.

ETHICS AND COMPLIANCE

We work hard to create an environment where everyone in Rolls-Royce can work safely, act with integrity, and deliver excellence. This helps ensure that we are a company that people want to work for and want to work with. It helps to keep us strong, sustainable and resilient as a business.

We continue to meet the requirements of the DPAs entered into in 2017, including reporting progress made with our ethics and compliance programme. During the year we published an enhanced code of conduct (Our Code), as well as a suite of consolidated Group policies. Our Code focuses on our new values and behaviours, and brings together our commitments to adhere to the highest standards and to supporting our people to be at their best. Our Code applies to all employees, wherever they are located.

We have a zero tolerance approach to misconduct of any kind, and will take disciplinary action, up to and including dismissal, in the event of a breach. In 2018, 59 employees (2017: 65 employees) left the Group for reasons related to breaches of Our Code.

Our Code sets out the behaviours and principles we expect each of our people to demonstrate. It also provides guidance on how to apply these principles in our daily activities through real life examples. Our Code can be accessed online or as a mobile app, as well as in booklet form. In 2018, 99% of managers certified their commitment to adhere to these principles; 98% of employees completed our ethics training. We flow these commitments to our suppliers through our Supplier Code of Conduct, which was also reviewed during the year. All suppliers are contracted to adhere to this, or to a mutually agreed alternative.

OUR VALUES

Our values and behaviours drive our culture and conduct throughout the Group. Our values, Our Code and associated Group policies support employees in doing the right thing, making the right decisions and working in the right way.

Trusted to deliver excellence

Operate safely

Act with integrity

Anti-bribery and corruption

Our Code and anti-bribery and corruption policies are clear in our commitment not to tolerate bribery or corruption of any form. During 2018, we continued to take steps to strengthen our anti-bribery and corruption compliance, including updating our policies and continuing our monitoring and assurance work.

Our due diligence is dependent on the level of risk that a particular third party presents, and may include verification visits, screening, interviews and obtaining reports from specialist providers. This year we have conducted a number of external audits on some of our highest-risk third parties. We also conduct extensive due diligence before entering into joint ventures, and are working with our existing joint ventures to enhance their own ethics and compliance programmes.

Those employees who have a higher likelihood of exposure to potential bribery and corruption, due for example to their work location or role type, are required to complete dedicated training. This year's training focused on gifts and hospitality.

Human rights

We are committed to maintaining the highest ethical standards, and to maintaining and improving global policies and processes to avoid any potential complicity in human rights violations related to our operations or supply chain.

This commitment, including our position on forced labour, involuntary labour, child labour, and human trafficking, is embedded within Our Code, as well as our Global Human Rights policy and Supplier Code of Conduct. Human rights due diligence is embedded within our operating systems and processes, including recruitment and procurement processes.

More information on our approach can be found in our anti-slavery and human trafficking statement, available at www.rolls-royce.com.

For more information see Safety & Ethics Committee Report, pages 96 to 101.

NON-FINANCIAL INFORMATION STATEMENT

The EU Non-Financial Reporting Directive applies to the Group for the first time this year and the following chart summarises where you can find further information on each of the key areas of disclosure that the directive requires. Further disclosures, including our Group policies and non-financial targets and performance data, can be found in the sustainability section at www.rolls-royce.com.

Environmental, social and employee related matters

- As a leading industrial technology company we have an irrefutable role in enabling the transition to a low carbon global economy. We are committed to utilising our engineering skills and technological capabilities to enable and accelerate this. See page 42
- Our place in communities around the world is important and we have built close ties with local communities. In addition, our activities to inspire young people in STEM subjects at an early age is important to enable them to make informed career choices. See page 47.
- It is through our people that we fulfil our potential, achieve our vision and execute our strategy. We are committed to creating an environment where all of our people can be at their best, with the right values and competencies for today, and the right capabilities and behaviours for the future. See page 44.

Business model, policies, principal risks and KPIs

- Our business model provides an insight into the key resources and relationships that support the generation and preservation of value within Rolls-Royce. See page 12. We believe that stakeholder engagement remains vital to building a sustainable business and in 2018 the Board reviewed the engagement across the Group. See page 66.
- We develop Group policies that are applicable across our global operations to address material issues pertinent to our operations and activities. These are publicly available in English. Group policies are translated and made available to employees in local languages that reflect our key geographies.
- Principal risks are identified by the Group and a robust risk assessment of each one is carried out by the Board or one of its committees. See page 50.
- Non-financial key performance indicators allow us to assess progress against objectives and monitor the development and performance of specific areas of the business. These are set out on page 15 and metrics specific to environment and people can be found on pages 43 and 46 respectively.

Human rights and anti-bribery related matters

- We are committed to maintaining the highest ethical standards and to maintaining and improving global policies and processes to avoid any potential complicity in human rights violations related to our operations or supply chain. See page 48 together with our anti-slavery and human trafficking statement at www.rolls-royce.com.
- We work hard to create an environment where everyone in Rolls-Royce can work safely, act with integrity, and deliver excellence. Our Code and anti-bribery and corruption policies are clear in our commitment to not tolerate bribery or corruption of any form. See page 48.

Diversity policy and approach

- We are committed to building an inclusive culture and diverse workforce. We believe that a culture of inclusion is paramount to creating an environment where all our people can be at their best. However, diversity continues to be a significant challenge for the engineering sector as a whole but we are making progress as an organisation.
- In 2017 we launched a diversity and inclusion strategy with global targets – see page 46.
- The Board reviews its diversity policy annually to ensure it is at least aligned with best practice and any proposed changes are appropriate for the Group. See pages 73 and 74 and www.rolls-royce.com.

PRINCIPAL RISKS

Risk management

The Board is responsible for the Group's risk management system (RMS) and internal control systems.

Our RMS is designed to identify and manage, rather than eliminate, the risk of failure to achieve business objectives and to provide reasonable, but not absolute, assurance against material misstatement or loss.

We continue to build risk management into the way we work to help us to make better decisions. It is implemented through a mandated Group-wide risk management policy, including our process, software tools and governance structures. Our risk policy is supported by training and a team of experts. Businesses and functions are accountable for identifying and managing risks in line with this policy.

The Executive Team recently refreshed their principal risks, based on the new organisation structure, strategy and Group priorities.

Business continuity plans are in place to mitigate continuity risks and there has continued to be regular testing of the adequacy of these plans through exercises at every level of our incident management framework.

Joint ventures constitute a large part of the Group's activities. Responsibility for risk and internal controls in joint ventures lies with the managers of those operations. Through Board representation, we seek to align the approach to risk and internal controls with that of the Group. Management and internal audit regularly review the activities of these joint ventures.

Improvements to our risk management system

During the past year we have continued to build and enhance our RMS, specifically:

- embedding the improvements to our risk appetite framework, with key early warning metrics being introduced;
- launching a refreshed and simplified suite of Group policies, which set the tone by confirming that managing risk effectively is critical to the ongoing success and resilience of the Group;
- introducing a risk assurance programme assessing how effectively the Group-wide RMS has been implemented and providing visibility of where further improvement is needed;
- strengthening focus on assessment and treatment of our safety, compliance and business continuity risks at our remote locations;
- improving our horizon scanning, by uncovering previously hidden risks which commonly arise from external factors, incorrect assumptions or a lack of clear accountability;
- evaluating climate change scenarios; and
- increasing the number of exercises of our incident management framework, focused on our principal risks.

In 2019, we plan further enhancements to all of these areas, including placing greater focus on emerging risks and near misses, launching an improved training offering promoting a culture of risk management, increased digital support and integrated testing of contingency plans. These improvements will also support changes recommended in the FRC's recently revised Code, together with the revised Guidance on Board Effectiveness.

Principal risks

The Executive Team has refreshed the principal risks (pages 51 to 54) that we need to manage to deliver our strategic objectives. Responsibility for oversight of all the refreshed principal risks have been allocated to the Board itself or one of its committees to ensure there is appropriate monitoring and challenge.

We continued the deep dives we introduced last year and all principal risks, including their mitigation plans and controls, have been reviewed by the Board or one of its committees. The following changes were made to our principal risks for 2019:

- added Strategic Transformation to recognise the significance and extent of the organisational and cultural changes required to achieve our vision, improve our financial returns and meet our stakeholders' expectations;
- expanded Safety to reflect our expectations of having a safe and healthy place of work and the increasing importance of sustaining the environment that we live and operate in;
- re-named IT Vulnerability as Cyber Threat to better reflect the nature of this risk, placing more emphasis on the potential threat of cyber-attacks to our products as well as the additional controls we have introduced; and
- Disruptive Technologies and Business Models is a key risk relating to our competitiveness and this has been brought under the re-named principal risk of Competitive Environment (replacing Competitive Position).

Political risk

Our Brexit steering group has continued to assess potential impacts of the UK leaving the EU, including uncertainties related to our principal risks. We have continued to brief the UK Government, other governments, and regulatory agencies on our Brexit-related issues.

While we wait for clarity on the Brexit process, we have identified and implemented contingency plans to minimise interruption to our service to customers as a result of Brexit. These contingency plans include: building inventory and relocating some inventory to mainland Europe; increasing our options for logistics movements; assessing our suppliers' readiness and liaising with higher-risk suppliers; and transferring our EASA Design Organisation Approval to Rolls-Royce Deutschland Ltd & Co KG. We update our people regularly on key Brexit issues and the steps we are taking, and are supporting EU nationals in the UK and UK nationals in the EU on steps they may need to take to retain the right to work. We will keep our contingency measures under review during the Brexit process and the Board is regularly updated on our risk mitigation activities.

Management of principal risks

Our risk framework ensures that risks are identified, managed and communicated throughout the Group.

Building beyond the breakthrough in 2019

2019 priorities

1 Customers
- Increase production volume
- Expand service network
- Mitigate disruption from in-service issues

2 Technology
- Revitalise service
- Develop new engine architecture
- Advance electrification projects

3 People & culture
- Build a resilient business
- Continue restructuring programme
- Further simplify processes
- Diversity & inclusion

4 Financial progress
- Continue improving free cash flow
- Further strengthen balance sheet
- Enhance capital allocation discipline

Change in risk level from 2018

↑ Increased
↓ Decreased
<> Static

PRINCIPAL RISK OR UNCERTAINTY	HOW WE MANAGE IT	KEY CONTROLS	CHANGE	PRIORITY
STRATEGIC TRANSFORMATION Failure to deliver our strategic transformation, including changing our behaviours could result in: missed opportunities; dissatisfied customers; disengaged employees; ineffective use of our scarce resources; and increasing the likelihood of other principal risks occurring. This could lead to a business that is overly dependent on a small number of products and customers; failure to achieve our vision; non-delivery of financial targets and not meeting investor expectations.	– Implementing a new organisational operating model. – Focusing on behaviours to drive cultural change. – Simplifying the processes in our Rolls-Royce Management System, whilst ensuring we comply with our legal, contractual and regulatory requirements. – Horizon scanning and scenario planning. – Investing in products with lower emissions, reducing our impact on climate change. – Employee innovation portal. This principal risk is subject to review by the Board and the Safety & Ethics Committee.	– Executive Team – Gated reviews	New for 2019	1 2 3 4
COMPETITIVE ENVIRONMENT The presence of competitors in the majority of our markets means that the Group is susceptible to significant price pressure for original equipment or services. Our main competitors have access to significant government funding programmes as well as the ability to invest heavily in technology and industrial capability. Disruptive technologies or new entrants with alternative business models could also reduce our ability to sustainably win future business, achieve operating results and realise future growth opportunities.	– Horizon scanning for emerging technology and other competitive threats, including patent searches. – Establishing our Innovation Hub to invest in innovation, manufacturing and production, and ensure continuing governance of technology programmes. – Enhancing our capabilities to access, invest in and develop key technologies and innovative service offerings which differentiate us competitively. – Improving the quality, delivery and durability of our products and services through investment in innovation, manufacturing and production capabilities. – Forming strategic partnerships and conducting joint research programmes with our partners. – Driving down cost to improve margins. – Protecting credit lines. – Strengthening our balance sheet to enable access to cost-effective sources of third party funding. This principal risk is subject to review by the Board.	– Financial performance review – Strategic planning process – Investment review committee – Science & Technology Committee – Digital strategy leadership committee	<>	1 2 4

PRINCIPAL RISK OR UNCERTAINTY	HOW WE MANAGE IT	KEY CONTROLS	CHANGE	PRIORITY
CYBER THREAT An attempt to cause harm to the Group, its customers, suppliers and partners through the unauthorised access, manipulation, corruption, or destruction of data, systems or products through cyber space.	– Implementing defence in depth through deployment of multiple layers of software and processes including web gateways, filtering, firewalls, intrusion, advanced persistent threat detectors and integrated reporting. – Running security and network operations centres. – Actively sharing cyber security information through industry, government and security forums. – Information and product assurance processes. – Training and awareness to improve cyber security culture. This principal risk is subject to review by the Audit Committee.	– Digital strategy leadership committee – IT executive – Product cyber security working groups in high risk areas – Information assurance and engineering processes – Crisis management team	<>	1 2 3
MAJOR PRODUCT PROGRAMME DELIVERY Failure to deliver a major programme on time, within budget, to technical specification or falling significantly short of customer expectations, or not delivering the planned business benefits, would have potentially significant adverse financial and reputational consequences, including the risk of impairment of the carrying value of the Group's intangible assets and the impact of potential litigation.	– Major programmes are subject to Board approval. – Reviewing major programmes at levels and frequencies appropriate to their criticality and performance, against key financial and non-financial deliverables and potential risks throughout the programmes lifecycle. – Investing in facilities and people to manage the level of disruption to our customers from Trent 1000 in-service issues and developing longer-term solutions to these issues. – Conducting technical audits at pre-defined points which are performed by a team that is independent from the programme. – Requiring programmes to address the actions arising from reviews and audits and monitoring and controlling progress through to closure. – Applying knowledge management principles to provide benefit to current and future programmes. This principal risk is subject to review by the Board.	– Rolls-Royce Management System – Operational performance review – Project audit and risk assurance reviews – Gated business and technical reviews – Quality compliance audit – Quality committee	<>	1 2 4
BUSINESS CONTINUITY The major disruption of the Group's operations, which results in our failure to meet agreed customer commitments and damages our prospects of winning future orders. Disruption could be caused by a range of events, for example: extreme weather or natural hazards (e.g. earthquakes, floods); political events; financial insolvency of a critical supplier; scarcity of materials; loss of data; and fire or infectious disease. The consequences of these events could have adverse impact on our people, our internal facilities or our external supply chain.	– Sustaining investment in adequate capacity, modern equipment and facilities, dual sources of supply and researching alternative materials. – Promoting and developing resilience within our external supplier partners. – Providing a supplier finance programme in partnership with banks to enable our suppliers to benefit from the Rolls-Royce credit rating and access funds at low interest rates (in 2018, 155 suppliers used the programme). – Building a resilient culture through flexible and collaborative working, using our single group-wide incident management framework. – Developing, maintaining and regularly exercising effective business continuity and crisis management plans to prepare our people to respond quickly and confidently to any business disruption. – Sharing lessons learned identified through exercises or incidents. – Scanning the horizon to provide awareness of emerging risks/potential incidents. This principal risk is subject to review by the Audit Committee.	– Incident management framework – Business continuity readiness assessment – External supplier audits and robust contractual agreements – Training and exercising in incident response and recovery – Environment & sustainability committee	<>	1 3 4

PRINCIPAL RISK OR UNCERTAINTY	HOW WE MANAGE IT	KEY CONTROLS	CHANGE	PRIORITY
SAFETY Failure to meet the expectations of: i) our customers to provide safe products which also minimise the impact on the environment during their production or use; or ii) people who work for or with us to provide a safe and healthy place of work which minimises the impact on the environment; would adversely affect our reputation and long-term sustainability.	We manage product safety by: — Ensuring clear accountability for safety and a culture that puts safety first. — Applying our engineering design and validation process from initial design, through production and into service to reduce the safety risks so far as is reasonably practicable; always ensuring that we meet or better the relevant company, legal, regulatory and industry requirements. — Operating a safety management system, governed by the product safety assurance board, and subject to continual improvement based on review of existing and emerging threats, experience, and industry best practice. — Ensuring that our products and those of our suppliers conform to their specification. — Ensuring that everyone receives appropriate product safety awareness training. We manage people's safety and wellbeing by: — Ensuring clear accountability for HSE and a culture that puts operating safely first. — Refreshing our global HSE policy and introducing our Zero Harm programme. — Operating an HSE management system, including reporting, investigating and learning lessons from incidents. — Driving sustainable use of resources. This principal is subject to review by the Safety & Ethics Committee.	For the safety of our products: — Company product safety assurance committee — Business product safety committee — Quality compliance audit — Engineering technical audit — Crisis management team For people's safety and wellbeing: — HSE management system — HSE accountability framework — HSE committee — Crisis management team — Environment & sustainability committee	<>	1 2 3
TALENT AND CAPABILITY Inability to identify, attract, retain and apply the critical capabilities and skills needed in appropriate numbers to effectively organise, deploy and incentivise our people would threaten the delivery of our strategies, business plans and projects.	— Attracting, rewarding and retaining the right people with the right skills globally and locally in a planned and targeted way, including regular benchmarking of remuneration. — Developing and enhancing organisational, leadership, technical and functional capability to deliver global programmes. — Continuing a strong focus on individual development and succession planning, recognising the changing nature of careers and expectations of work. — Proactively monitoring retirement in key areas and actively managing the development and career paths of our people with a special focus on employees with the highest potential. — Embedding a lean, agile, high-performance culture where everyone can be at their best that tightly aligns Group strategy with individual and team objectives. — Incentivising and effectively deploying the critical capabilities, skills and people needed to deliver our strategic priorities, plans and projects whilst implementing the Group's major programme to transform its business, to be resilient and to act with pace and simplicity. — Tracking engagement through regular employee opinion surveys and a commitment to drive year-on-year improvement to employee engagement. This principal risk is subject to review by the Nominations & Governance Committee.	— Remuneration Committee — Executive Team — Enterprise Leadership Group — People leadership team	<>	1 2 3 4

PRINCIPAL RISK OR UNCERTAINTY	HOW WE MANAGE IT	KEY CONTROLS	CHANGE	PRIORITY
MARKET AND FINANCIAL SHOCK The Group is exposed to a number of market risks, some of which are of a macro-economic nature (for example, foreign currency, oil price, rates) and some of which are more specific to the Group (for example, liquidity and credit risks, reduction in air travel or disruption to other customer operations). Significant extraneous market events could also materially damage the Group's competitiveness and/or creditworthiness. This would affect operational results or the outcomes of financial transactions.	– Maintaining a strong balance sheet, through managing cash balances and debt levels. – Providing financial flexibility by maintaining high levels of liquidity and an investment grade credit rating. – Sustaining a balanced portfolio through earning revenue both from the sale of original equipment and aftermarket services, providing a broad product range and addressing diverse markets that have differing business cycles. – Deciding where and what currencies to source in, and where and how much credit risk is extended or taken. The Group has a number of treasury policies that are designed to hedge residual risks using financial derivatives (foreign exchange, interest rates and commodity price risk). – Review debt financing and hedging in light of volatility in external financial markets caused by external events, such as Brexit or other geopolitical changes. This principal risk is subject to review by the Audit Committee.	– Financial performance review – Financial risk committee – Operational performance review – Group finance, treasury and tax teams	<>	4
COMPLIANCE Non-compliance by the Group with legislation, the terms of the DPAs or other regulatory requirements in the heavily regulated environment in which it operates (for example, export controls; use of controlled chemicals and substances; anti-bribery and corruption; environmental regulations; and tax and customs legislation). This could affect our ability to conduct business in certain jurisdictions and would expose the Group to potential: reputational damage; financial penalties; debarment from government contracts for a period of time; and suspension of export privileges (including export credit financing), each of which could have a material adverse effect.	– Taking an uncompromising approach to compliance. – Operating an extensive compliance programme. Global mandatory policies, processes and training are disseminated throughout the Group and are updated from time to time to ensure their continued relevance, and to ensure that they are complied with, both in spirit and to the letter. – Regular reviews of the strength of relevant teams including the ethics, anti-bribery and corruption, compliance, tax, sustainability and export control teams. – A legal team is in place to manage any ongoing regulatory investigations. – Engaging with all relevant external regulatory authorities. – Implementing a comprehensive REACH compliance programme. This includes ensuring that we and our supply chain are covered by REACH authorisations for a number of chemicals needed for our products, establishing appropriate data systems and processes and working with our suppliers, customers and trade associations. This principal risk is subject to review by the Safety & Ethics Committee.	– Governance framework – Compliance and export control teams – Governance team – Legal team	<>	3 4
POLITICAL RISK Geopolitical factors that lead to an unfavourable business climate and significant tensions between major trading parties or blocs which could impact the Group's operations. Examples include: changes in key political relationships; explicit trade protectionism, differing tax or regulatory regimes, potential for conflict or broader political issues; and heightened political tensions.	– Where possible, diversifying our global operations to avoid excessive concentration of risks in particular areas. – The Group's businesses, strategic marketing network and global government relations teams proactively monitoring local situations. – We develop and maintain relationships with governments and stakeholders and proactively influence policy, regulation and legislation where it affects us. – Steering committee to co-ordinate activities across the Group and minimise the impact of Brexit. This principal risk is subject to review by the Board.	– Global government relations network – Group tax and export control teams – Strategic planning process – Brexit steering committee	↑	1 2 3 4

GOING CONCERN AND VIABILITY STATEMENTS

Introduction

Rolls-Royce operates an annual planning process. Our plans and risks to their achievement are reviewed by the Board and once approved are cascaded throughout the Group and are used as the basis for monitoring our performance, incentivising employees and providing external guidance to our shareholders.

The processes for identifying and managing the principal risks are described on page 50. As also described there, the risk management process, and the going concern and viability statements, are designed to provide reasonable, but not absolute, assurance.

Going concern

The going concern assessment considers whether it is appropriate to prepare the financial statements on a going concern basis. The Board has also considered the net liability position at 31 December 2018 and the going concern status of the Group's material subsidiaries.

As described on page 199, the Group meets its funding requirements through a mixture of shareholders' funds, bank borrowings, bonds and notes. At 31 December 2018, the Group had borrowing facilities of £6.9bn and total liquidity of £7.5bn, including cash and cash equivalents of £5bn and undrawn facilities of £2.5bn. £858m of the facilities mature in 2019.

The Group's forecasts and projections, taking into account reasonably possible changes in trading performance, show that the Group has sufficient financial resources. The Directors have reasonable expectations that the Company and the Group are well placed to manage business risks and to continue in operational existence for the foreseeable future (which accounting standards require to be at least a year from the date of this report) and have not identified any material uncertainties to the Company's and the Group's ability to do so.

On the basis described above, the Directors consider it appropriate to adopt the going concern basis in preparing the Consolidated Financial Statements (in accordance with the Guidance on Risk Management, Internal Control and Related Financial and Business Reporting published by the FRC in September 2014).

Viability

The viability assessment considers solvency and liquidity over a longer period than the going concern assessment. Consistent with previous years, we have assessed our viability over a five-year period. Inevitably, the degree of certainty reduces over this longer period.

In making the assessment, severe but plausible scenarios have been considered that estimate the potential impact of the principal risks arising over the assessment period, for example: the loss of a key element of the supply chain; the impact on aircraft travel of a global pandemic; worsening or new in-service issues on new Civil Aerospace programmes; or, the impact of a political risk such as Brexit on the Group (see page 50 for further information on the process we are taking to manage the risks related to Brexit).

The scenarios assume an appropriate management response to the specific event, but not broader mitigating actions which could be undertaken, which have been considered separately. The cash flow impacts of these scenarios were overlaid on the five-year forecast to assess how the Group's liquidity and solvency would be affected. Reverse stress testing has also been performed to assess the severity of scenario that would have to occur to exceed headroom, including a scenario where existing borrowing facilities could not be refinanced as they mature.

The assessment took account of the Group's current funding, forecast requirements and existing committed borrowing facilities.

On the basis described above, the Board confirms that it has a reasonable expectation that the Company will be able to continue in operation and meet its liabilities as they fall due over the next five years.

In making this statement, the Directors have made the following key assumptions:

- That maturing facilities will be refinanced. The Group currently has access to global debt markets and expects to be able to refinance these facilities on commercially acceptable terms. The Group's medium and long-term financing plans are designed to allow for periods of adverse conditions in world capital markets but not a prolonged (say 12 month) period where debt markets were effectively closed to the Group.
- That in the event of one or more risks occurring, which has a particularly severe effect on the Group, all potential actions, such as constraining capital spending and reducing or suspending payments to shareholders, would be taken on a timely basis. The Group believes it has the early warning mechanisms to identify the need for such actions and the ability to implement them on a timely basis if necessary.
- That implausible scenarios, whether involving multiple risks occurring at the same time or the impact of individual risks occurring that cannot be mitigated by management actions to the degree assumed, do not occur.

Signed on behalf of the Board

Warren East
Chief Executive

28 February 2019