

Creating a world
fit for the future



Ricardo plc Interim Results Presentation

Half year ended 31 December 2019
Presented February 2020

ricardo.com

Highlights

Financial Overview

Strategy & Market Overview

Operating Segments

Highlights

for the half year ended 31 December 2019



- Good half year performance with order intake up 3% and underlying PBT up 5% on HY 2018/19
- Strong growth in Energy & Environment (E&E) and Defense, together with our newly acquired Rail and E&E businesses in Australia, has more than offset continuing pressures in the global automotive sector, underlining the importance of our strategy of diversification
- Acquired businesses integrated and performing well



Order intake
£209m
+3%

H1 2018/19: £202m

Order book
£319m
+£5m

June 2019: £314m

Underlying PBT
£16.0m
+5%

H1 2018/19: £15.3m

“As we start the second half of the year, we have seen increased headwinds in the automotive sector which we anticipate will lead to suppressed order intake in our US, EMEA and China Auto businesses. The Coronavirus outbreak at the start of H2 has already had an operationally disruptive impact on our Auto and Rail operations in China and we anticipate continuing disruption to client engagement, project delivery and business development in the coming months in mainland China and surrounding countries. Based on the issues highlighted above we are anticipating a material impact to our forecast second half profits and thus full year.”

Agenda



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Operating Segments

Key indicators



Revenue

£193m

+3%

H1 2018/19: £188m

Underlying operating profit margin^{(1) (2)}

9.3%

+0.5ppts

H1 2018/19: 8.8%

Underlying PBT⁽¹⁾

£16.0m

+5%

H1 2018/19: £15.3m

Underlying basic earnings per share⁽¹⁾

23.0p

+4%

H1 2018/19: 22.1p

Underlying operating cash conversion⁽³⁾

81%

H1 2018/19: 86%

Net debt

£(74)m

June 2019: £(47)m

Dividend

6.24p

+4%

H1 2018/19: 6.00p

Headcount

3,058

+3%

H1 2018/19: 2,972

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

(2) Current year includes the impact of IFRS 16, excluding this underlying operating profit margin would be 9.0%.

(3) Cash from operations, adjusted for the cash impact of specific adjusting items, divided by EBITDA.

Income statement



£m	Half year ended 31 December		H1 2019/20 v H1 2018/19
	2019 Underlying ⁽¹⁾	2018 Underlying ⁽¹⁾	% change
Revenue	192.9	188.1	3%
Gross profit	66.3	64.3	3%
Administration costs	(48.3)	(47.7)	1%
Operating profit ⁽²⁾	18.0	16.6	8%
Net finance costs ⁽²⁾	(2.0)	(1.3)	54%
Profit before tax	16.0	15.3	5%
Taxation charge	(3.6)	(3.4)	6%
Profit for the period	12.4	11.9	4%

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

(2) Current year includes the impact of IFRS 16, excluding this underlying operating profit would be £17.4m and net finance costs would be £(1.4)m.

A full income statement including specific adjusting items is included in the Appendix.

Segmental results



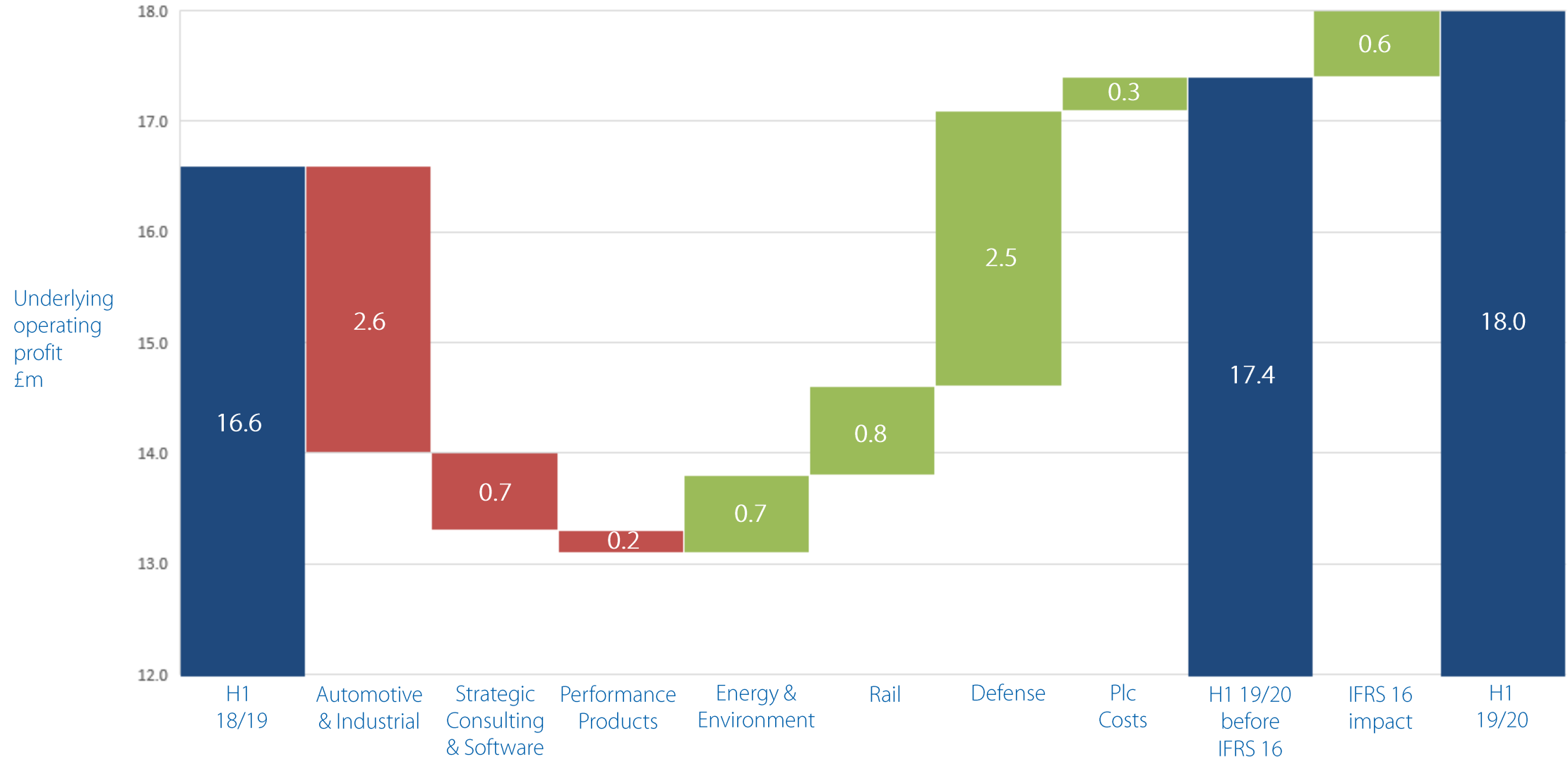
Half year ended 31 December

£m	Revenue earned		Underlying operating profit ⁽¹⁾		Underlying operating profit ⁽¹⁾ margin	
	2019	2018	2019	2018	2019	2018
Energy & Environment	23.6	20.9	2.8	2.1	11.9%	10.0%
Rail	38.9	34.1	2.7	1.9	6.9%	5.6%
Automotive & Industrial	59.0	67.2	4.8	7.4	8.1%	11.0%
Defense	17.6	8.8	2.9	0.4	16.5%	4.5%
Performance Products	43.2	45.9	4.1	4.3	9.5%	9.4%
Strategic Consulting & Software	10.6	11.2	1.4	2.1	13.2%	18.8%
Plc Costs			(1.3)	(1.6)		
Total before IFRS 16	192.9	188.1	17.4	16.6	9.0%	8.8%
Impact of IFRS 16 ⁽²⁾			0.6			
Total	192.9	188.1	18.0	16.6	9.3%	8.8%

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

(2) Segmental results for 2019 incorporating the impact of IFRS 16 are included in the Appendix.

Good performance in E&E and Defense, together with acquisitions, more than offset a weak global Automotive market



Cash flow

Half year ended
31 December



£m	2019	2018
EBITDA	26.6	22.3
Share based payments, Fair value gains & losses on derivatives, Profit on disposal	0.5	(1.2)
Working capital (increase)/decrease	(3.3)	0.2
Pension charge and funding	(2.3)	(2.2)
Cash from operations	21.5	19.1
Cash conversion %	81%	86%
Net finance costs	(2.0)	(1.1)
Tax paid	(4.7)	(2.6)
Capital expenditure	(8.4)	(6.2)
Principal element of lease payments	(2.3)	-
Dividends	(8.3)	(7.9)
Purchase of own shares, Cash flow hedges, FX	(1.1)	(0.3)
Cash inflow/(outflow) before acq'n & restructuring related costs	(5.3)	1.0
Acquisition and restructuring related costs	(21.1)	(2.4)
Cash outflow ⁽¹⁾	(26.4)	(1.4)
Opening Cash Balance	(47.4)	(26.1)
Closing Cash Balance	(73.8)	(27.5)

(1) Cash outflow net of movement in borrowings.

Agenda



Highlights

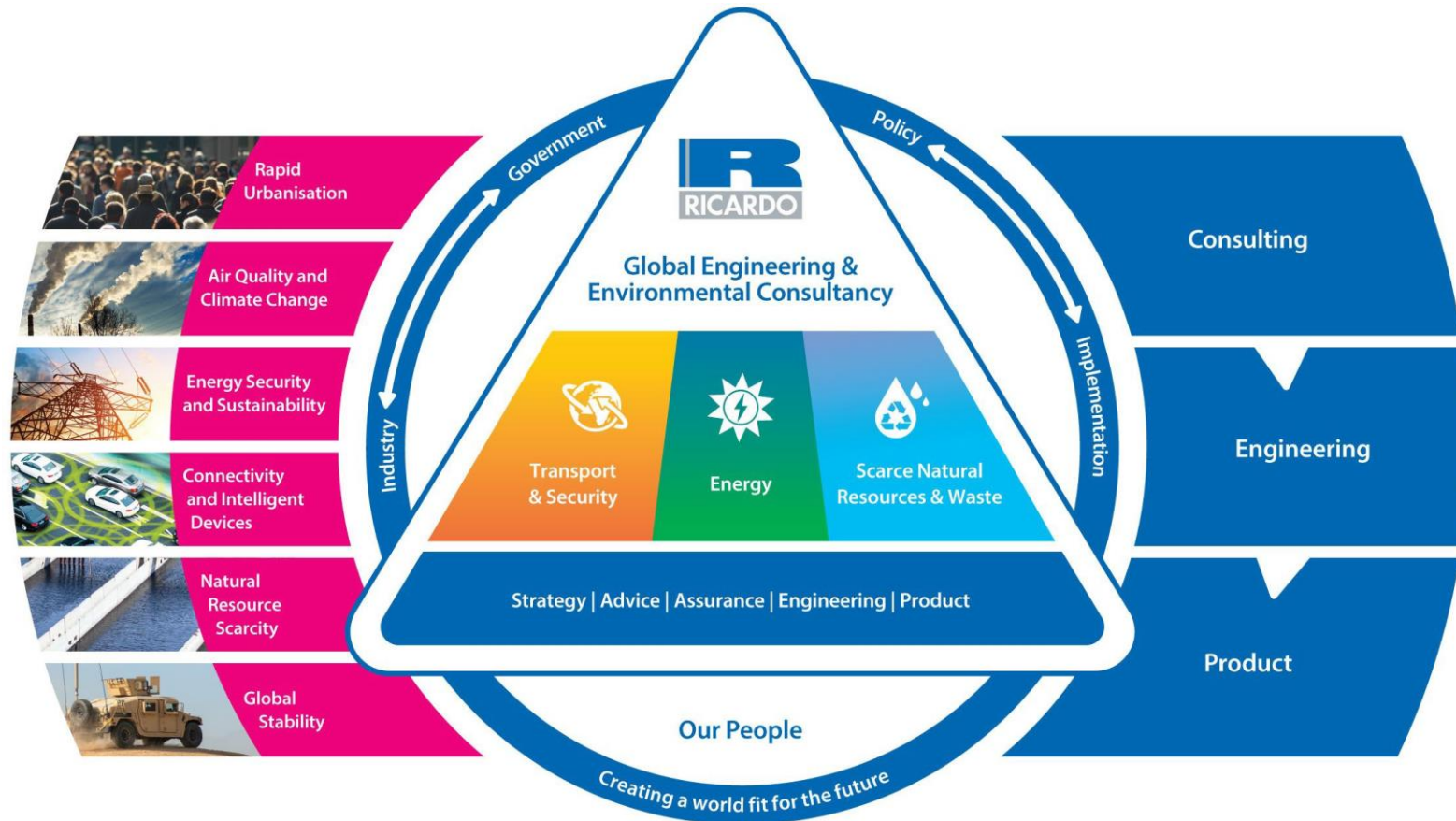
Financial Overview

Strategy & Market Overview

Operating Segments

Our ambition is to create a world fit for the future,

meeting the challenges within the markets of Transport & Security, Energy, and Scarce Natural Resources & Waste



Our strategy is for growth and risk mitigation, with no dependency on any single geography, sector or client

Creating a world fit for the future – not only what we deliver but how we deliver it

What we offer to clients – creating a world where everyone can live sustainably



Breathe Clean Air



Access Clean Water



Use Clean Energy



Travel Safely and Sustainably



Conserve Resources

Looking at how we operate (practicing what we preach – developing the operational message)



Operate safely



Use Water Wisely



Use Clean Energy



Travel Safely and Sustainably



Operate Efficiently

Diverse, agile and flexible business model, navigating a volatile market and economic backdrop

- CO₂ reduction and local urban emissions remain priorities - development and adoption of electrified transport and infrastructure
- Public and government action on environmental, plastic, water, waste & recycling agendas
- Investment in public transport and infrastructure to improve inter- and intra-urban mobility in developed and developing economies
- US defence spend at high levels - new technologies, life extension, and cyber protection
- H1 Brexit uncertainty, very weak Automotive backdrop and slowing China economy (H2 Coronavirus)



Coronavirus response

- Initial response focussed on the well-being of our employees, maximising working from home and self-isolation. We are minimising business travel to and from China
- Closure of our and the majority of our customers' Chinese sites
- Our Shanghai, Hangzhou and Hong Kong offices opened on 24 February following a period of closure, but our Beijing, Chongqing and Changchun offices remain closed
- Resulting slow down in both order intake and the progress of ongoing projects
- We are also regularly assessing the supply chain for our Defense and Performance Products businesses

- It is not possible at this time to fully assess how extensive the impact on the current financial year will be, however we anticipate the impact to our second half profits will be material



Update on ABS retrofit programme

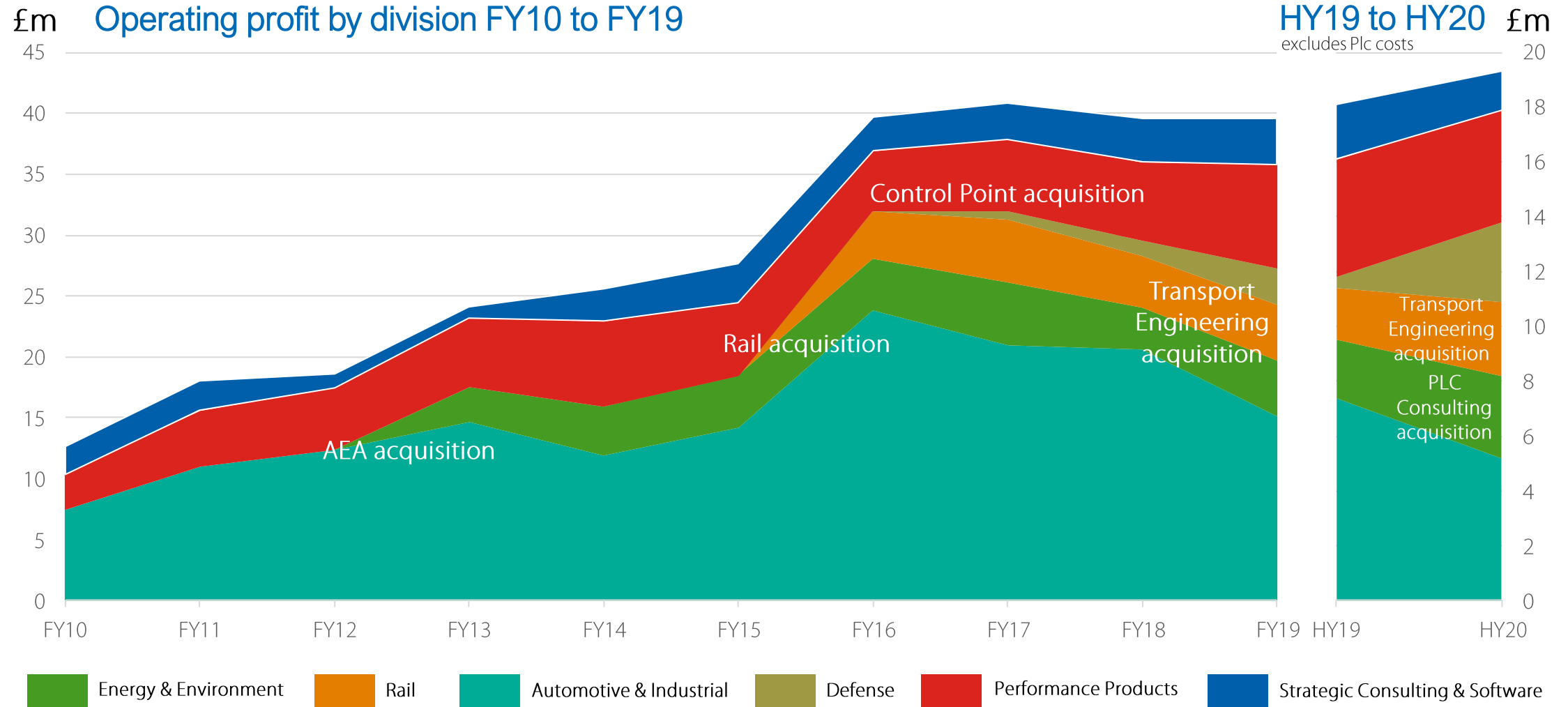


- [President's FY21 Defense budget](#) published in February 2020 and in the public domain
- ABS/ESC installation to HMMWV fielded fleet included as part of “modification of in service equipment”
- Ricardo National Stock Number referenced
- The budget specifies the following in respect of FY21 (page 171):
 - Quantity 5,421
 - HMMWV ABS/ESC Retrofit kits \$71.7m
 - Installation \$22m
 - \$40m for HMMWV Ambulance upgrades including 871 ABS/ESC Retrofit kits
- Budget has been passed to Congress for consideration, review and potential amendment. This includes review by the House and Senate Armed Services Committees and the House and Senate Defense Appropriations subcommittees
- Budget is expected to be finalised and approved in October 2020
- Contract awards follow budget approval



The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement

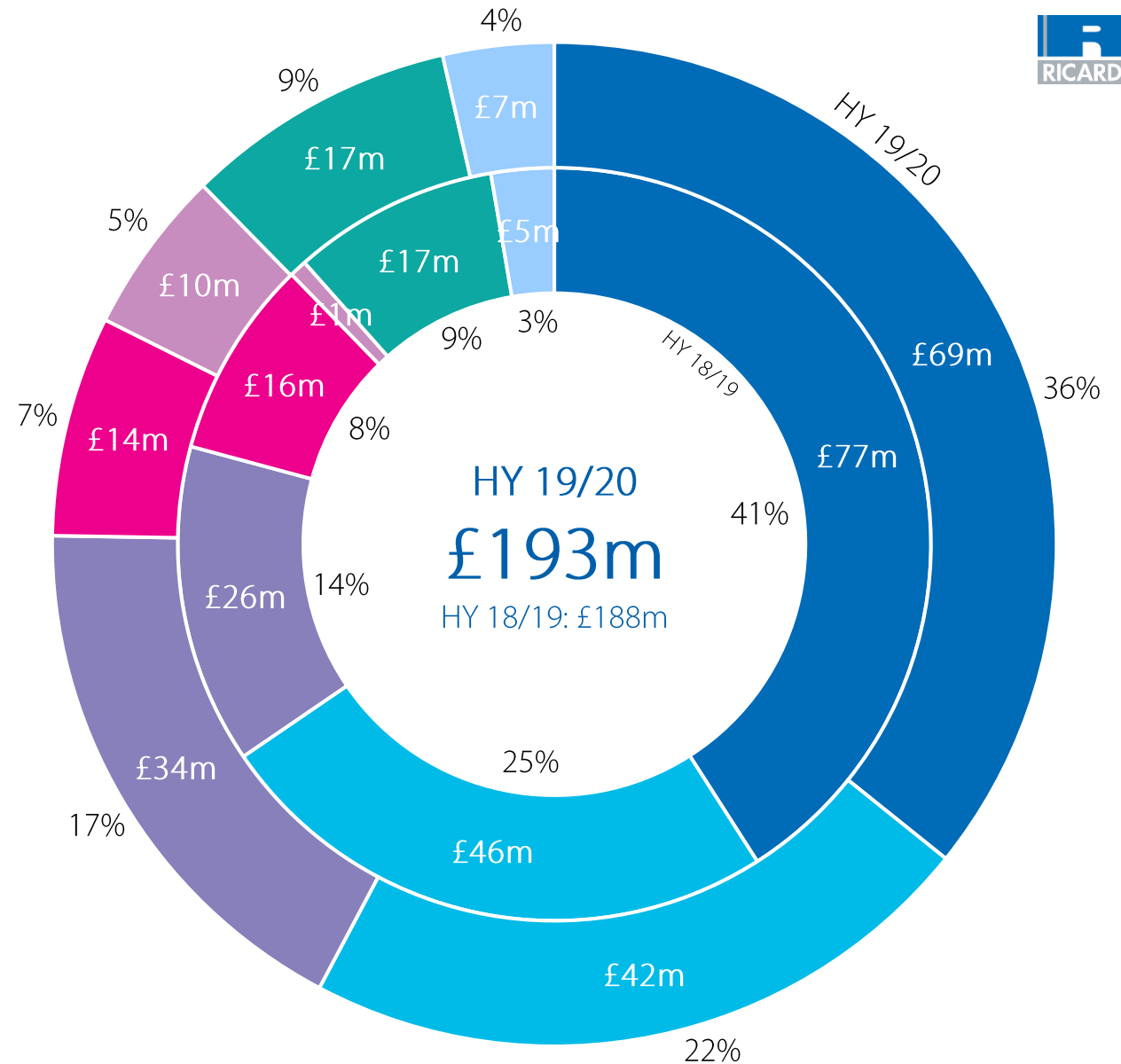
Strategic Objectives: Creating resilience in the business



A continued good balance of revenue from across the globe demonstrated by the expansion into Australia

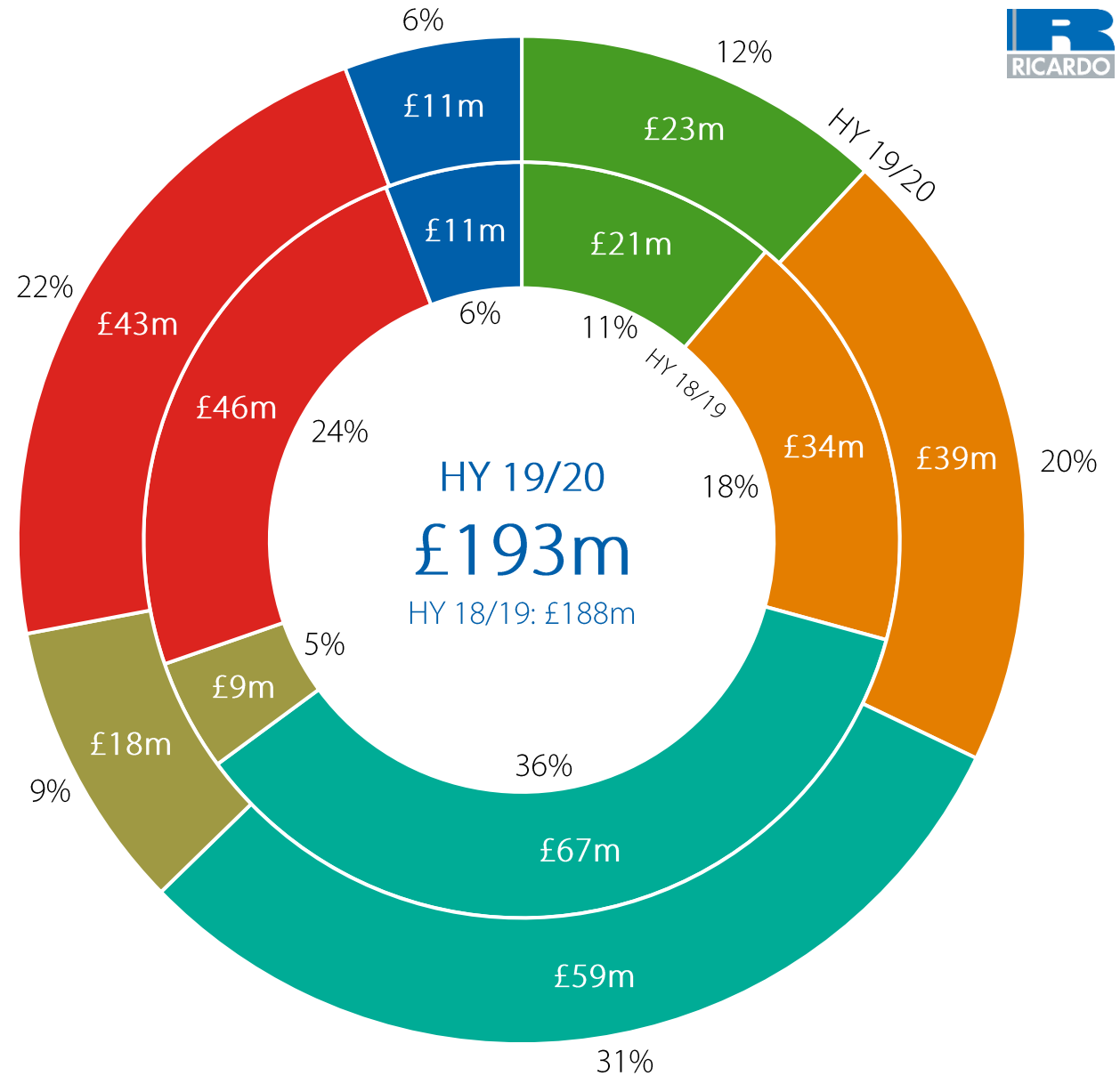


- UK
- Mainland Europe
- North America
- China
- Australia
- Rest of Asia
- Rest of the World



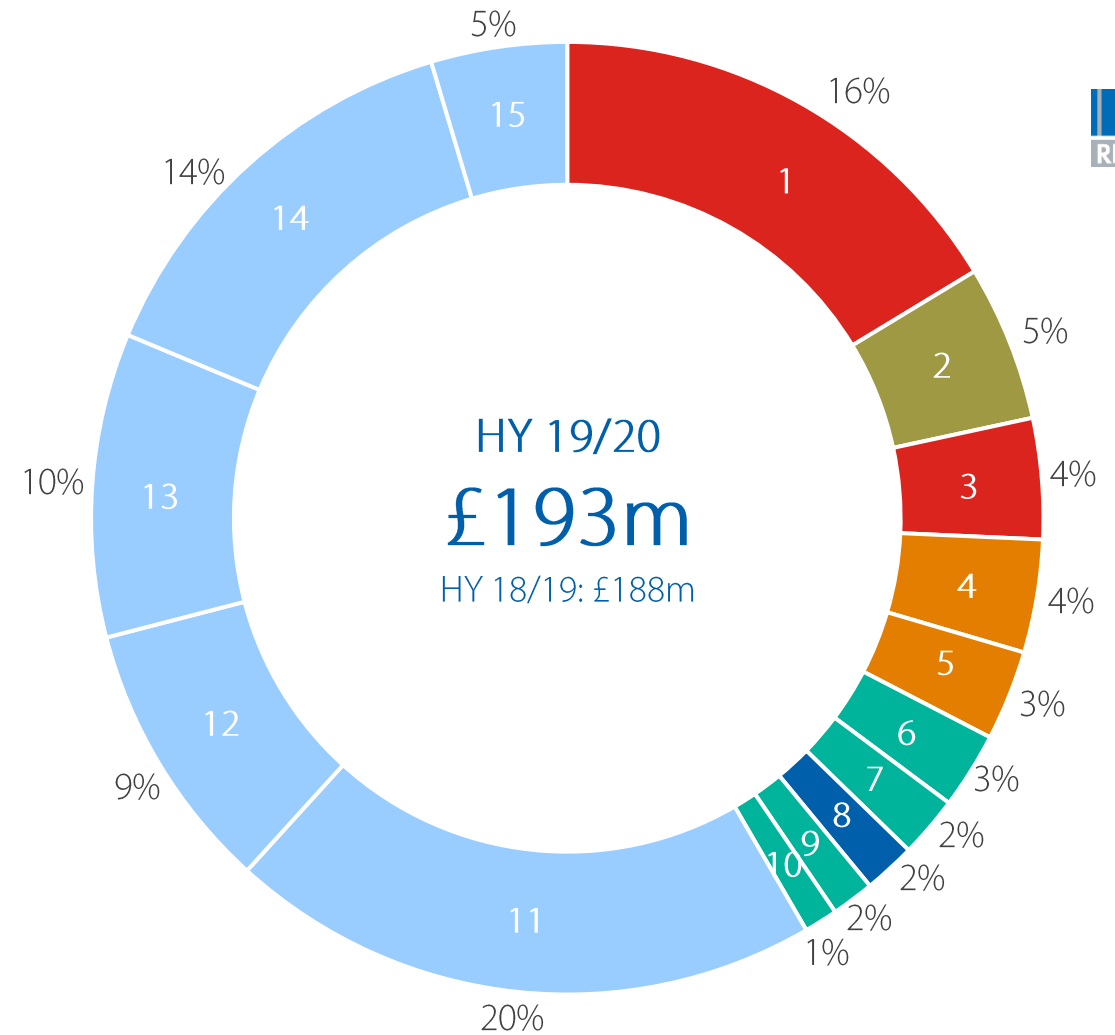
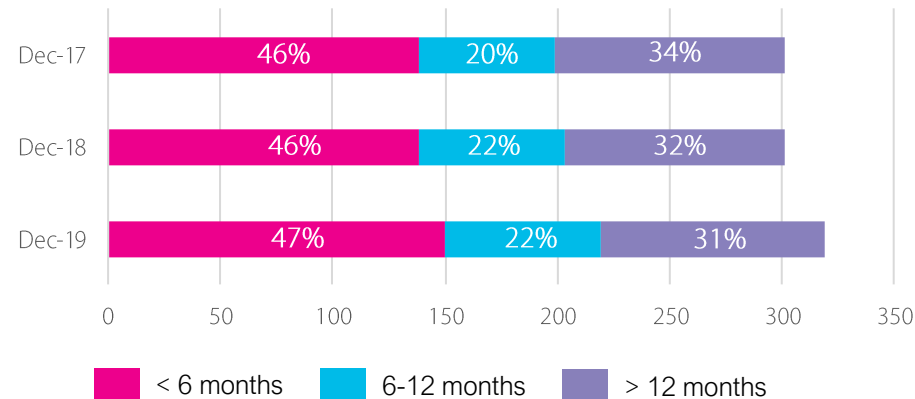
Well balanced revenue across our operating segments with strong performance from Defense and E&E, complemented by the acquisitions in Rail and E&E

- Energy & Environment
- Rail
- Automotive & Industrial
- Defense
- Performance Products
- Strategic Consulting & Software



Diverse customer mix, with a good level of multi-year business. Our top 5 customers are spread across Performance Products, Defense & Rail

Order Book Profile



- | | | |
|-----------------|-------------------|---------------------------------|
| 1. Key client 1 | 6. Key client 6 | 11. Other UK clients |
| 2. Key client 2 | 7. Key client 7 | 12. Other Europe clients |
| 3. Key client 3 | 8. Key client 8 | 13. Other North America clients |
| 4. Key client 4 | 9. Key client 9 | 14. Other Asia clients |
| 5. Key client 5 | 10. Key client 10 | 15. Rest of the World clients |

Agenda

Highlights

Financial Overview

Strategy & Market

Operating Segments

Energy & Environment

- Positive first 5 months of PLC Consulting acquisition – successfully growing waste infrastructure and planning services in the Australian market
- Continuing as market leader for UK local authority Clean Air Zone work
- Extensive success in supporting the European institutions and agencies with a wide range of new project wins, in particular on climate policies and strategies
- Delivery of UK electricity network innovation projects providing a novel solution for EV destination rapid charging in urban areas
- Poison centres notification work is continuing to lead the market - we have delivered over 6,000 notifications this HY, up from 2,000 at the same time last year
- Expectations for the second half of the year remain positive

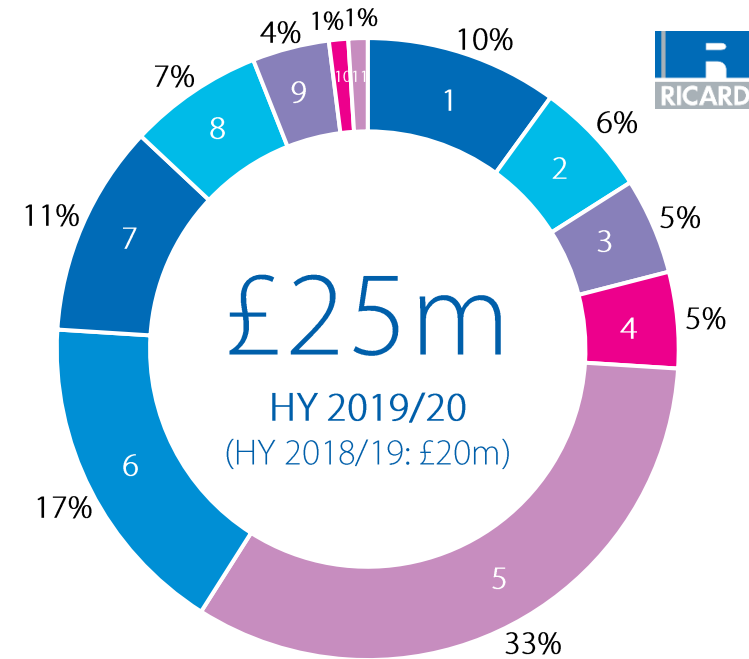
£m	Half year ended 31 December	
	2019	2018
Revenue	23.6	20.9
Underlying operating profit	2.8	2.1
Underlying operating profit margin ⁽¹⁾	11.9%	10.0%

(1) 2019 excludes the impact of IFRS 16

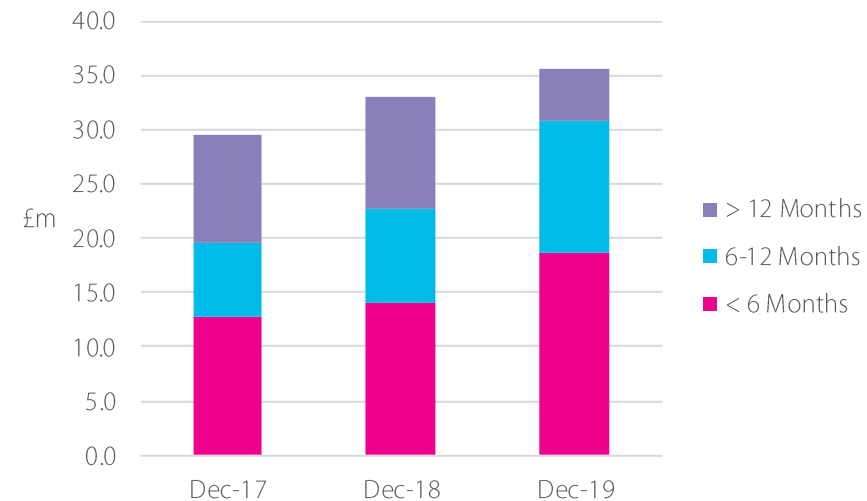


Order Intake

- 1-4. Top 4 clients
- 5. Other UK clients
- 6. Other UK Government clients
- 7. Rest of the World clients
- 8. Other Australia clients
- 9. Other Europe clients
- 10. Other Asia clients
- 11. Other North America clients



Order Book Profile



Over 1,100 live projects;
550 people

Case study

Large scale battery & EV charging facility due diligence

Battery systems need to be added to grid services to earn additional income streams, and EV charging systems require low cost electricity to be viable. Combining electricity storage and EV charging offers financial benefits for both systems. This project, located near a major airport with heavy local traffic and high road-based emissions, evaluated options for a 50MW large scale battery system, with assessment of income from grid support services, and included 15 rapid EV charger systems. Technical input provided included grid connection, planning, and other practical issues.





Case study



Sustainable energy market development in Africa

Demand for energy in Africa is increasing significantly and renewable energy and financial resources are unequally distributed. Countries have differing policies, legislation, regulation and institutional frameworks that can restrict the opportunities for international trade.

Ricardo's international power market experts reviewed the power sector context, engaging stakeholders from 21 countries. The project outcomes included a framework for regulatory oversight in the region, identifying capability gaps in stakeholders and designing a bespoke training program.

Case study

Carbon Sequestration for the Water Sector

Water Companies are energy-intensive businesses and recognise that they have an important contribution to make in tackling the causes of climate change. Ricardo were commissioned by a large UK Water utility to develop a tool to quantify carbon balance within their landholdings, and understand available pathways to carbon neutrality associated with land use and management.

This tool can be used to model the impact of multiple scenarios, including restoration of peatland or planting trees.



Rail

- Successful integration of Transport Engineering in Australia
- Digital resilience assignment on Bombardier Aventura completed - early example of major train manufacturer seeking to integrate cyber security assessments into their design and testing processes
- After seven years and the assessment of more than 10,000 reports, drawings, certificates or compliance arguments, Ricardo Certification fulfils technical role on Great Western Railway electrification
- Ricardo providing engineering support during development of Seoul's Great Train eXpress rail project
- Ricardo Certification appointed as Independent Safety Assessor for Beijing metros' line 17
- Consultancy activities in the UK and parts of Asia impacted by market changes requiring us to re-profile our capability to align with market demands

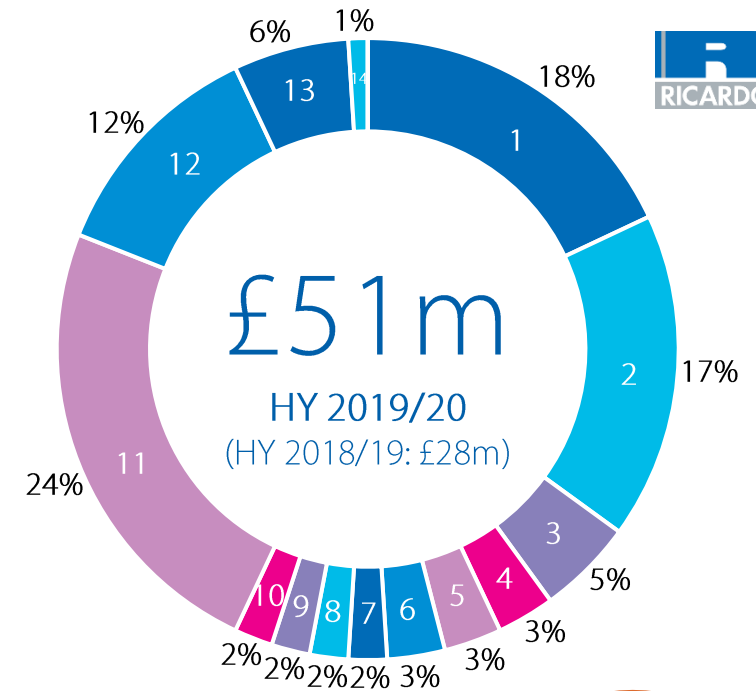
£m	Half year ended 31 December	
	2019	2018
Revenue	38.9	34.1
Underlying operating profit	2.7	1.9
Underlying operating profit margin ⁽¹⁾	6.9%	5.6%

(1) 2019 excludes the impact of IFRS 16

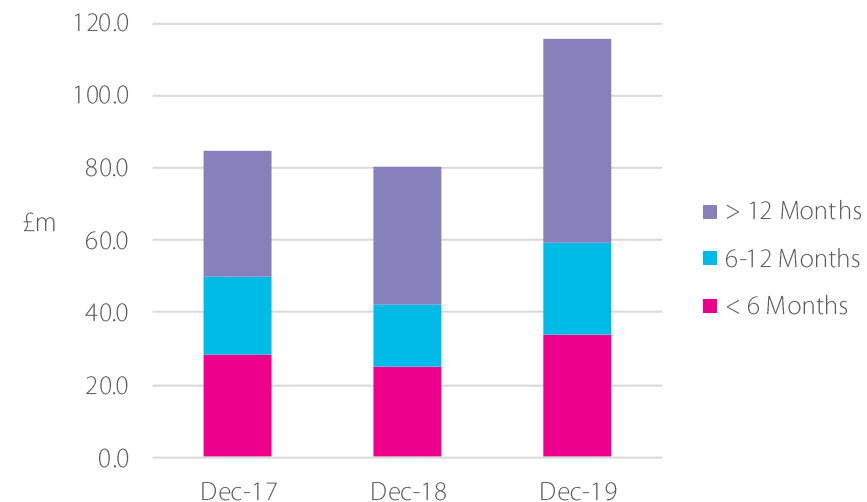


Order Intake

- 1-10. Top 10 clients
- 11. Other Asia clients
- 12. Other Europe clients
- 13. Other UK clients
- 14. Other Australia clients



Order Book Profile



Over 1,000 live projects;
630 people

Case study

Riding Sunbeams World's first solar-connected railway

In summer 2019 Ricardo's Rail and Energy & Environment teams supported a project in Hampshire, UK, which saw a test unit of around 100 solar panels become the first in the world to directly supply renewable zero-carbon electricity to an adjacent railway line. Funded by the Department for Transport through the Innovate UK competition, the trial will help forecast its application on other parts of the rail network. Initial research suggested clean, renewable power from assets close to the track side could be supplied at a lower cost than electricity supplied via the grid today - without the need for public subsidy.



Photo: Andy Aitchison / 1010 Climate Action



Case study



Rotterdam–Hoek van Holland Metro extension Independent Safety Assessment

Ricardo Certification provided Independent Safety Assessment services for the metro link between Rotterdam and Hoek van Holland, enabling services to launch on September 30th 2019. The assignment involved five years of audits and assessments on a project that saw the conversion of a conventional line to metro operations, with infrastructure in place to enable freight operations to continue (such as separate metro and freight tracks at stations).

Case study

Network Rail / RSSB Wheel/rail adhesion research

Research by Ricardo's Track Consultancy team was put to the 'real world' test by Network Rail, who are looking to reduce the impact of autumnal leaf fall. Wet leaves on rail lines are quickly crushed under the wheels of trains, forming a hard residue on the railhead that reduces brake performance. A response long used by the industry is to pour sand on the rails, however the October 2019 trials tested Ricardo's investigation (for RSSB) into whether changing the way the sand is distributed enhances stability on wet and slippery tracks.



Automotive & Industrial

- Successful delivery of £12m market leading PHEV transmission software programme for Geely group
- Good performance in orders in the motorcycle sector (c £10m+ in H1)
- Crucial role in supporting JCB's Fastrac tractor in achieving World land speed record
- Sale of self-developed Dolphin N2 IP to FPT allowing ground breaking research into next generation lean and efficient industrial propulsion systems
- Awarded US Department of Energy cooperative agreement for High Efficiency Powertrain for Heavy Duty Trucks using Silicone Carbide Inverter
- Automotive market slowdown, particularly in China, has led to lower HY order intake

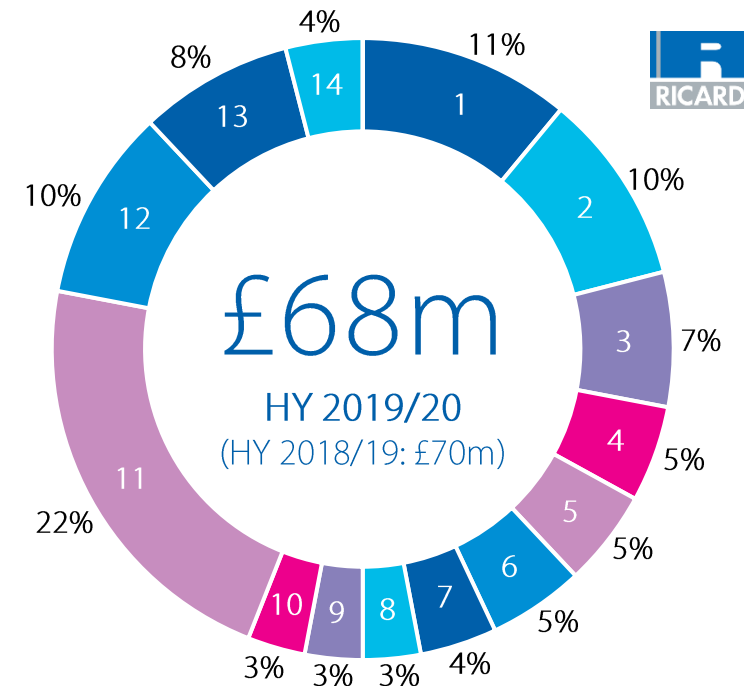
£m	Half year ended 31 December	
	2019	2018
Revenue	59.0	67.2
Underlying operating profit	4.8	7.4
Underlying operating profit margin ⁽¹⁾	8.1%	11.0%

(1) 2019 excludes the impact of IFRS 16

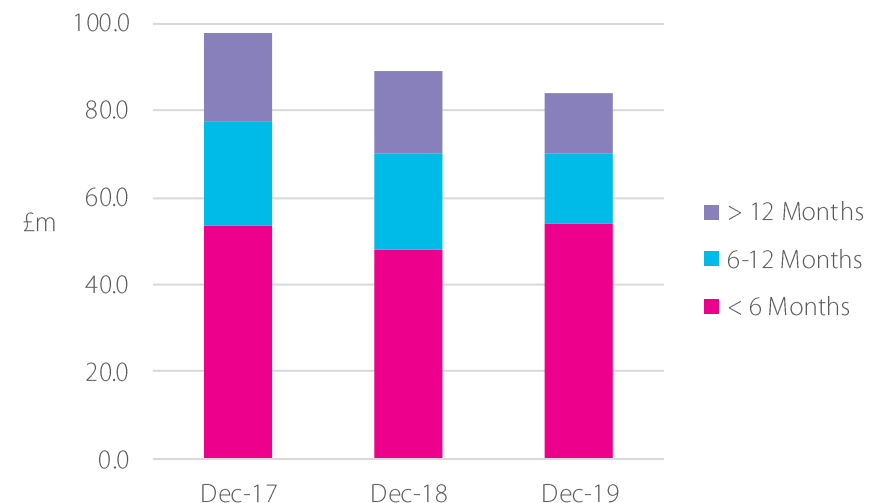


Order Intake

- 1-10. Top 10 clients
- 11. Other Asia clients
- 12. Other UK clients
- 13. Other North America clients
- 14. Other Europe clients



Order Book Profile



Over 500 live projects;
1,180 people

Case study

How Ricardo contributed to JCB's world speed record-breaking tractor

Ricardo played a crucial role in the development of JCB's Fastrac tractor, which Guy Martin was shown powering to a new Guinness World Records speed record with a speed of 135.191 mph, in the Channel 4 documentary, Guy Martin: The World's Fastest Tractor. Ricardo used cutting edge digitalisation methods to maximise performance, value and efficiency. These included using virtual reality (VR) for design reviews which enabled engineering teams across multiple sites to collaborate quickly and in real time, without having to travel extensively.





Case study



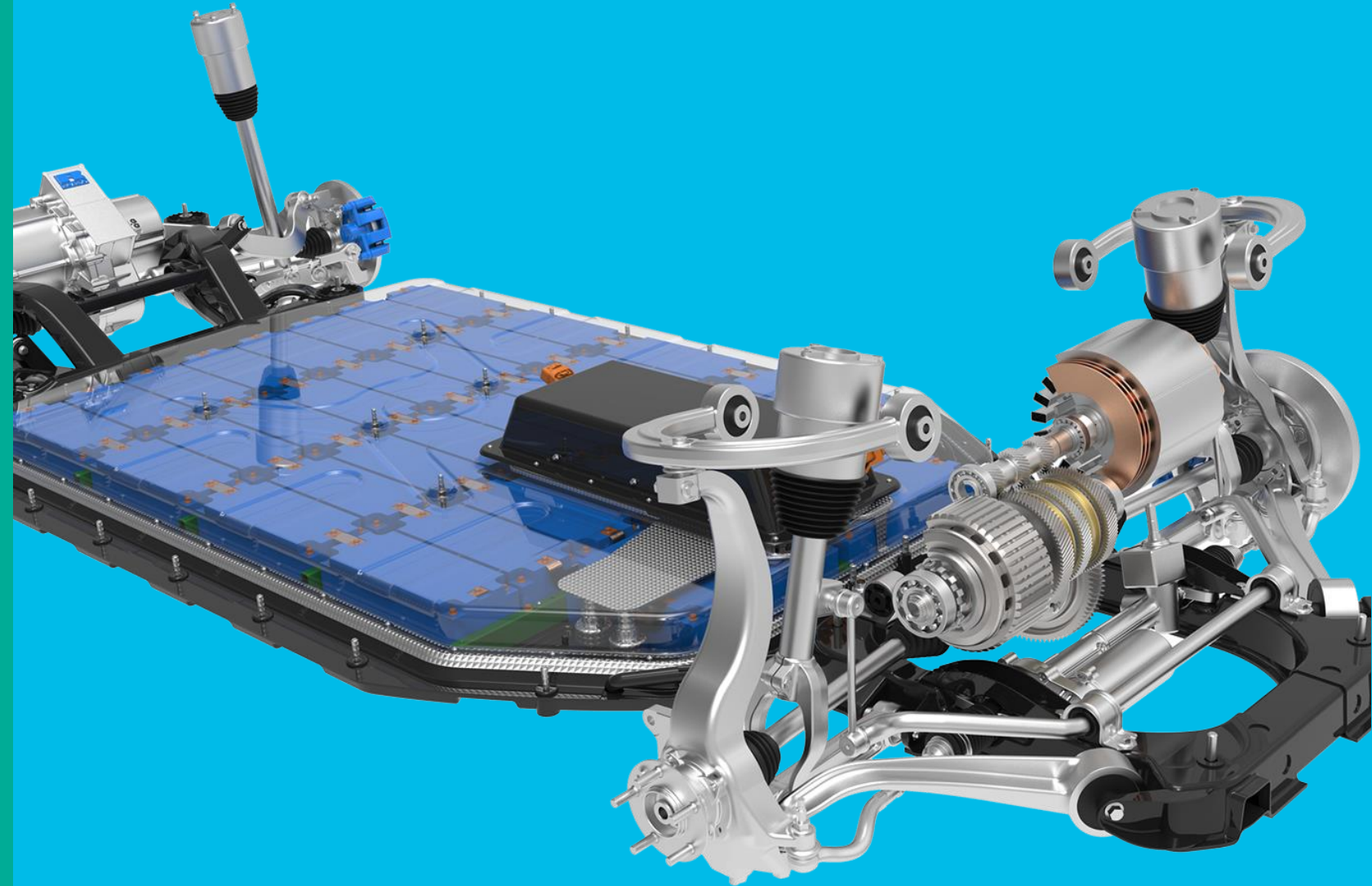
Ricardo demonstrates militarized version of Ford Ranger 2019

Ricardo has produced a highly versatile and cost-effective general service defence adaptation of Ford's iconic Ranger product, Europe's best-selling pickup. The demonstrator is ideally suited as a flexible application, general purpose utility vehicle for defence, policing, security and rescue services roles.

Case study

Ricardo research improves efficiency and reduces the cost of electrification

The cost of electrification technology remains a limiting factor in EV market growth. To address this Ricardo has accelerated a portfolio of research activities aimed at improving EV efficiency to enable increased range with reduced battery size and lower system cost. This is achieved by novel solutions for future batteries, electric drive unit, and connected control, integrated into a scalable future vehicle architecture.



Defense

- 3,300 ABS kits delivered through December 2019
- Delivered modernised maintenance software suite to US Army
- Launched wireless intercom pilot programme for ground vehicles systems for Department of Defense
- Delivered Army robotic mission vehicle for manned/unmanned experimentation
- Completed lifecycle sustainment planning for Army watercraft fleet
- Market outlook positive - President's FY20 Defense budget of \$750bn is \$34bn above FY19

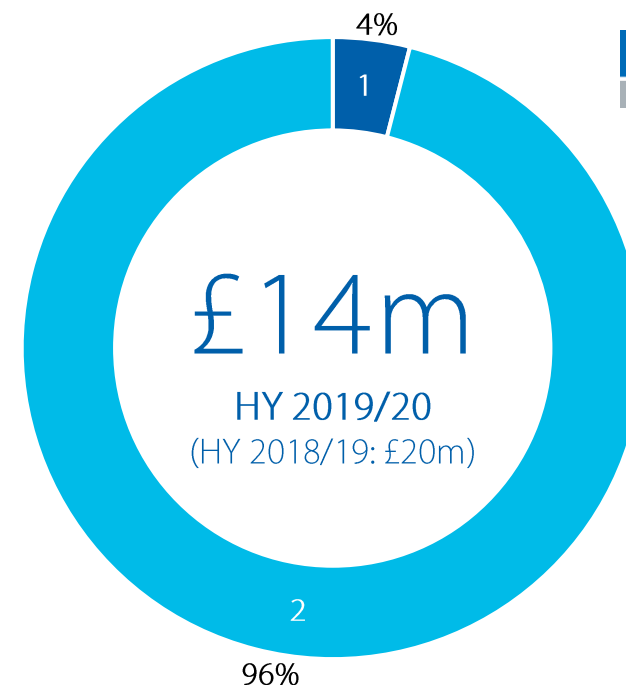
£m	Half year ended 31 December	
	2019	2018
Revenue	17.6	8.8
Underlying operating profit	2.9	0.4
Underlying operating profit margin ⁽¹⁾	16.5%	4.5%

(1) 2019 excludes the impact of IFRS 16

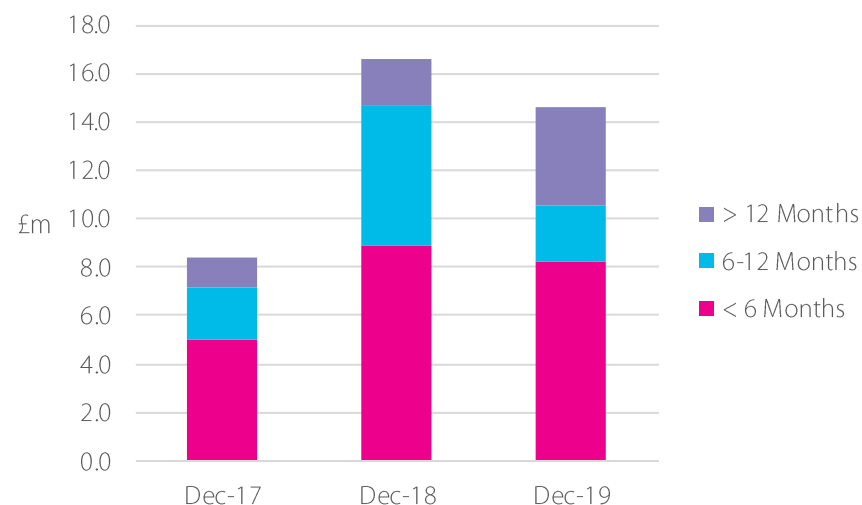


Order Intake

1. Top client
2. Other North America clients



Order Book Profile



Over 30 live projects;
140 people

Case study

Improving Safety through Fuel and Energy Management

Ricardo Defense provides software to the U.S. Department of Defense that manages fuel and other natural and consumable resources. Our Mobile Fuel and Energy Management tools improve safety by reducing unnecessary exposure to hostile fire while refueling or restocking. Our system is designed to be used whenever and wherever fuel resources are needed to provide safe, accurate and timely management of these natural resources.



The appearance of U.S. Department of Defense (DoD) visual information does not imply or constitute DoD endorsement.



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Case study

Improving Readiness

Over the past year Ricardo Defense has worked with the U.S. Army to develop and implement Condition-Based Maintenance (CBM). Our CBM software tools monitor and report remaining vehicle component useful life to minimize maintenance expenses, reduce transportation system failure and improve mission readiness.

Case study

Deploying Automation

Ricardo Defense has developed tools which automate and optimise resource allocation throughout U.S. Army acquisition program milestones. The Ricardo Defense Integrated Program Planning Process (IP3) provides a workforce planning approach that produces reasonable and justified resource allocation and program budget forecasts. Ricardo Defense has created this common yet flexible integrated framework which guides Army program planners and managers to efficiently reduce the cost of executing new programs and optimises the use of taxpayer dollars.



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Performance Products

- Enabled Bugatti to deliver a record number of cars during 2019, including the first 300mph production car, whilst developing new transmission variants for future models
- Started deliveries of final drive systems to the MoD for the CVRT platform, which will continue over the next 18 months
- Celebrated the 12th Engine derivative entering production for McLaren and new record set for engine output with 120 produced in a week
- Record year for aerospace component manufacture with the 20,000th part supplied
- Production of transmissions to support the 2020 Formula E season began, following on from the championship winning success in 2019 with PSA
- As anticipated, order intake and operating profit were lower than the prior period due to the phasing of both engine and transmission supply programmes, which is expected to continue in H2

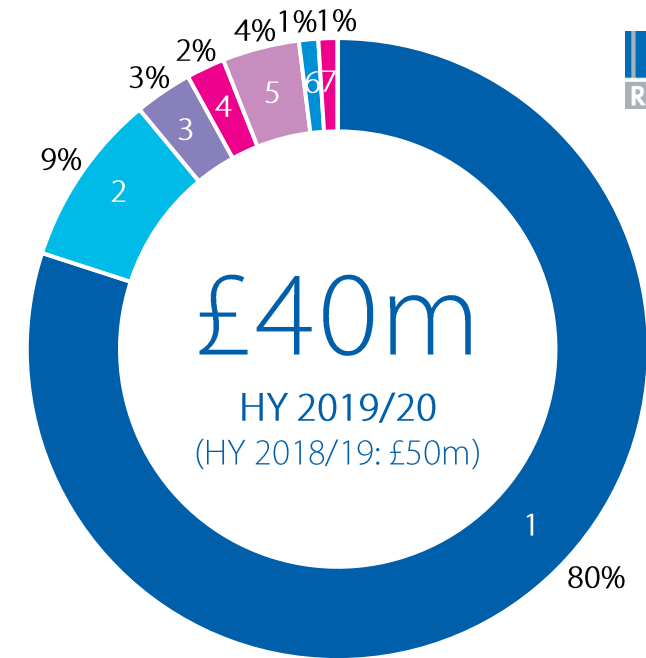
£m	Half year ended 31 December	
	2019	2018
Revenue	43.2	45.9
Underlying operating profit	4.1	4.3
Underlying operating profit margin ⁽¹⁾	9.5%	9.4%

(1) 2019 excludes the impact of IFRS 16

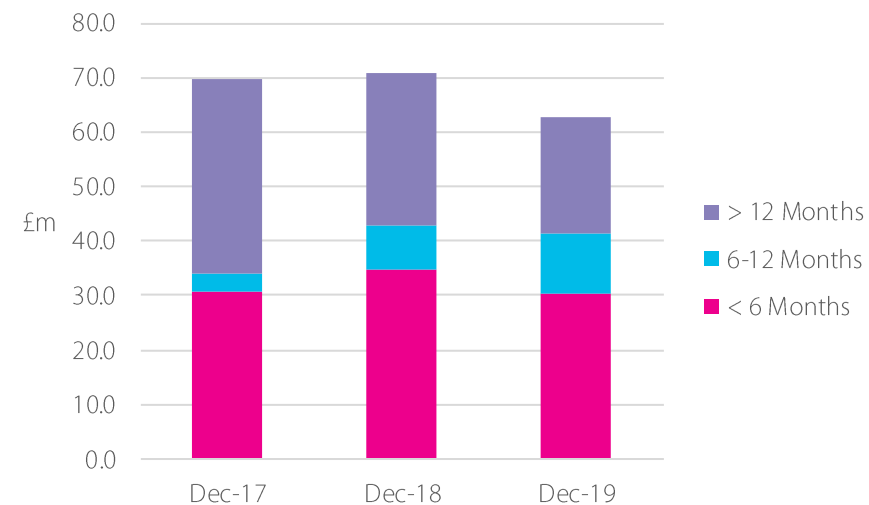


Order Intake

- 1-4. Top 4 clients
- 5. UK defence
- 6. Other UK clients
- 7. Other Europe clients



Order Book Profile



Over 20 live projects;
310 people

Contracts outside of order book
>£100m

Case study

McLaren Speedtail Engine Assembly

During the first half of the year, the latest McLaren Ultimate Series entered production with the a new 820 PS V8. This is the 12th engine derivative that Ricardo has produced and is the most powerful engine in McLaren's Sports, Super Sports and Ultimate Series of cars.





Case study



Precision Aerospace Manufacturing

Over the last 7 years Ricardo has invested significantly in its equipment, staff and accreditations to support its growing aerospace component business. Working with some of the worlds most prominent aerospace companies, Ricardo supplied its 20,000th component, marking a major milestone in this growing sector.

Case study

Bugatti Transmission Supply & Service

Ricardo continues to not only supply new transmission for the iconic Bugatti brand but also extended its service and aftersales support contract. With Ricardo transmissions exclusively used since 2005, the continued support with components & servicing is critical to keeping over 800 of the worlds most iconic cars on the road.



Strategic Consulting & Software

- New virtual consultancy business model (TRNTY) and new digital service (RiCK) launched
- Exciting projects being delivered in the Mobility space with key European financial institutions
- New software product VSOLVE released with improved solver capability
- Moved to multiple software releases per year to better meet customer needs
- Strong product development pipeline, such as TCFD and Niche New Product Introduction, which aim to maximise the synergies of Ricardo Group
- Strategic Consulting order book is lower than the previous period due to lower order intake as customers split projects into multiple, shorter duration orders
- Software order intake was below the prior period, driven by lower one-off perpetual license sales particularly in China due to the slowdown in the Chinese market

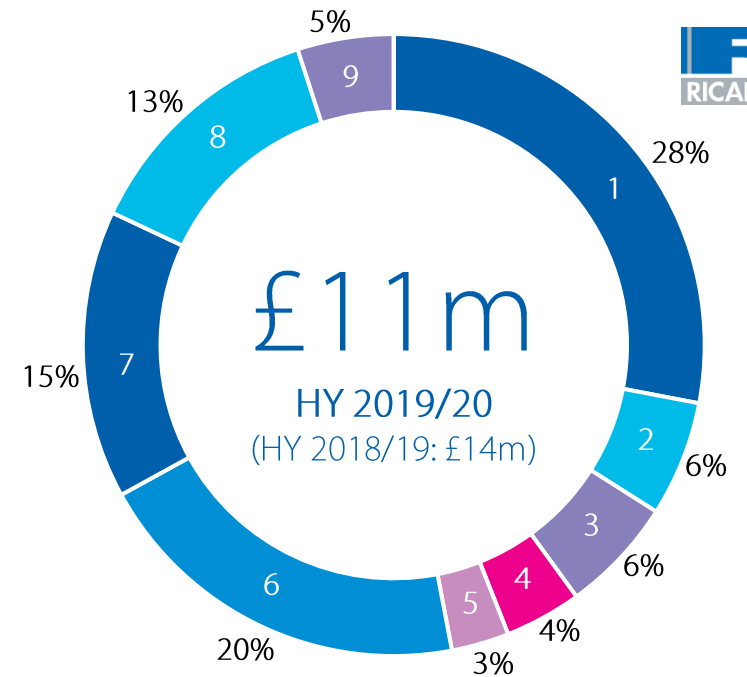
£m	Half year ended 31 December	
	2019	2018
Revenue	10.6	11.2
Underlying operating profit	1.4	2.1
Underlying operating profit margin ⁽¹⁾	13.2%	18.8%

(1) 2019 excludes the impact of IFRS 16

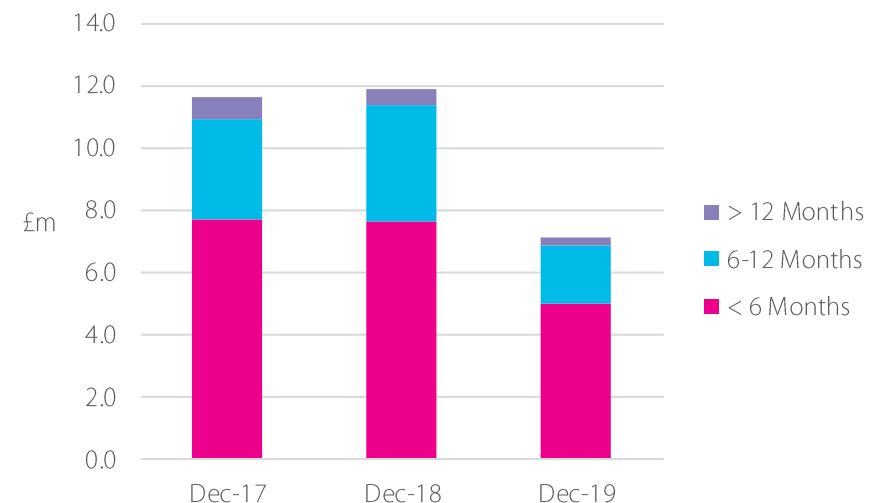


Order Intake

- 1-5. Top 5 clients
- 6. Other Asia clients
- 7. Other Europe clients
- 8. Other North America clients
- 9. Other UK clients



Order Book Profile



Over 180 live projects;
190 people

Case study

Assessing the impact of increased adoption of automated vehicles for a European Financial Institution

Ricardo Strategic Consulting produced a detailed study to help the EIB understand how different sectors within the road transport value chain will be impacted by increased adoption of autonomous vehicles in Europe to guide future investment in the road transport industry.





Case study



Rail components market study

A client was considering the acquisition of a rail supplier and wanted a bottom up approach view of the future rolling stock demands for their key European markets. Ricardo Strategic Consulting conducted a technology review of the acquisition target, identifying any red flag items and supplying information on the risks, allowing informed negotiation to take place.

Case study

IGNITE for Motorcycles

Ricardo Software's systems engineering tool IGNITE now includes motorcycle modelling capabilities. Thanks to new powertrain libraries, users can predict and optimise fuel economy, drive cycles and performance of standard conventional and electric motorcycles.



Highlights

for the half year ended 31 December 2019



- Good half year performance with order intake up 3% and underlying PBT up 5% on HY 2018/19
- Strong growth in Energy & Environment (E&E) and Defense, together with our newly acquired Rail and E&E businesses in Australia, has more than offset continuing pressures in the global automotive sector, underlining the importance of our strategy of diversification
- Acquired businesses integrated and performing well



Order intake
£209m
+3%

H1 2018/19: £202m

Order book
£319m
+£5m

June 2019: £314m

Underlying PBT
£16.0m
+5%

H1 2018/19: £15.3m

“As we start the second half of the year, we have seen increased headwinds in the automotive sector which we anticipate will lead to suppressed order intake in our US, EMEA and China Auto businesses. The Coronavirus outbreak at the start of H2 has already had an operationally disruptive impact on our Auto and Rail operations in China and we anticipate continuing disruption to client engagement, project delivery and business development in the coming months in mainland China and surrounding countries. Based on the issues highlighted above we are anticipating a material impact to our forecast second half profits and thus full year.”

Creating a world
fit for the future



Appendix

Income statement – Underlying and total Group



Half year ended 31 December

£m	2019			2018			Year on Year growth	
	Underlying	Specific adjusting items ⁽¹⁾	Total	Underlying	Specific adjusting items ⁽¹⁾	Total	Underlying	Total
Revenue	192.9	-	192.9	188.1	-	188.1	3%	3%
Gross profit	66.3	-	66.3	64.3	-	64.3	3%	3%
Administration costs	(48.3)	(7.7)	(56.0)	(47.7)	(5.0)	(52.7)	1%	6%
Operating profit ⁽²⁾	18.0	(7.7)	10.3	16.6	(5.0)	11.6	8%	(11)%
Net finance costs ⁽²⁾	(2.0)	-	(2.0)	(1.3)	-	(1.3)	54%	54%
Profit before tax	16.0	(7.7)	8.3	15.3	(5.0)	10.3	5%	(19)%
Taxation charge	(3.6)	1.7	(1.9)	(3.4)	1.0	(2.4)	6%	(21)%
Profit for the period	12.4	(6.0)	6.4	11.9	(4.0)	7.9	4%	(19)%

(1) Specific adjusting items comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

(2) Current year includes the impact of IFRS 16, excluding this total operating profit would be £9.7m and net finance costs would be £(1.4)m.

Specific adjusting items



Half year ended 31 December

£m	2019	2018
Amortisation of acquisition-related intangible assets	3.0	2.0
Acquisition-related expenditure	1.0	0.5
Reorganisation costs	3.7	1.3
Guaranteed minimum pensions ('GMPs') equalisation	-	1.2
Total before tax	7.7	5.0
Tax credit on specific adjusting items	(1.7)	(1.0)
Total after tax	6.0	4.0

Balance sheet summary



£m	31 December		30 June
	2019	2018	2019
Tangible non-current assets	44.9	45.4	44.6
Intangible non-current assets	124.2	96.8	125.2
Right of use assets	27.0	-	-
Inventories, trade and other receivables	147.3	156.9	155.9
Assets held for sale	11.0	-	2.9
Net debt	(73.8)	(27.5)	(47.4)
Trade and other payables	(80.2)	(92.6)	(89.9)
Lease liability	(29.8)	-	-
Pension deficit	(5.5)	(7.6)	(8.5)
Other ⁽¹⁾	(2.5)	(5.5)	(10.9)
Net assets	162.6	165.9	171.9

(1) Other includes provisions, deferred and current tax and derivative financial assets and liabilities.

Impact of IFRS 16



Key changes

- No distinction between finance and operating leases – all leases on balance sheet
- Operating lease charges replaced by depreciation and interest
- No underlying economic impact and no impact on cash flows
- Net debt will continue to be measured as bank borrowings less cash and cash equivalents, including hire purchase agreements, but excluding any impact of IFRS 16 lease liabilities

Balance sheet

- Transitional adjustments

£m	As at 1 July 2019				
	Previously reported	Right of use asset	Lease liability	Other	Adjusted under IFRS 16
Non-current assets	176.5	37.8		3.3	217.6
Current assets	192.5			(1.5)	191.0
Assets held for sale	2.9				2.9
Current liabilities	(95.7)		(4.6)	2.1	(98.2)
Non-current liabilities	(104.3)		(41.1)		(145.4)
Net assets	171.9	37.8	(45.7)	3.9	167.9

More detail is given in Note 17 of the Interim Financial Statements

Impact of IFRS 16



Income statement

- No impact on PBT
- Net increase of £0.6m to operating profit and finance costs

Half year ended 31 December 2019

£m	Pre-IFRS 16	IFRS 16 impact	Post-IFRS 16
Underlying operating profit ⁽¹⁾	17.4	0.6	18.0
Net finance costs	(1.4)	(0.6)	(2.0)
Underlying profit before tax ⁽¹⁾	16.0	-	16.0

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

Segmental results incorporating IFRS 16



£m	Half year ended 31 December		
	Revenue earned	Underlying operating profit ⁽¹⁾	Underlying operating profit ⁽¹⁾ margin
	2019	2019	2019
Energy & Environment	23.6	3.0	12.7%
Rail	38.9	2.7	6.9%
Automotive & Industrial	59.0	5.2	8.8%
Defense	17.6	2.9	16.5%
Performance Products	43.2	4.1	9.5%
Strategic Consulting & Software	10.6	1.4	13.2%
Plc Costs		(1.3)	
Total	192.9	18.0	9.3%

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

Segmental results on historic basis

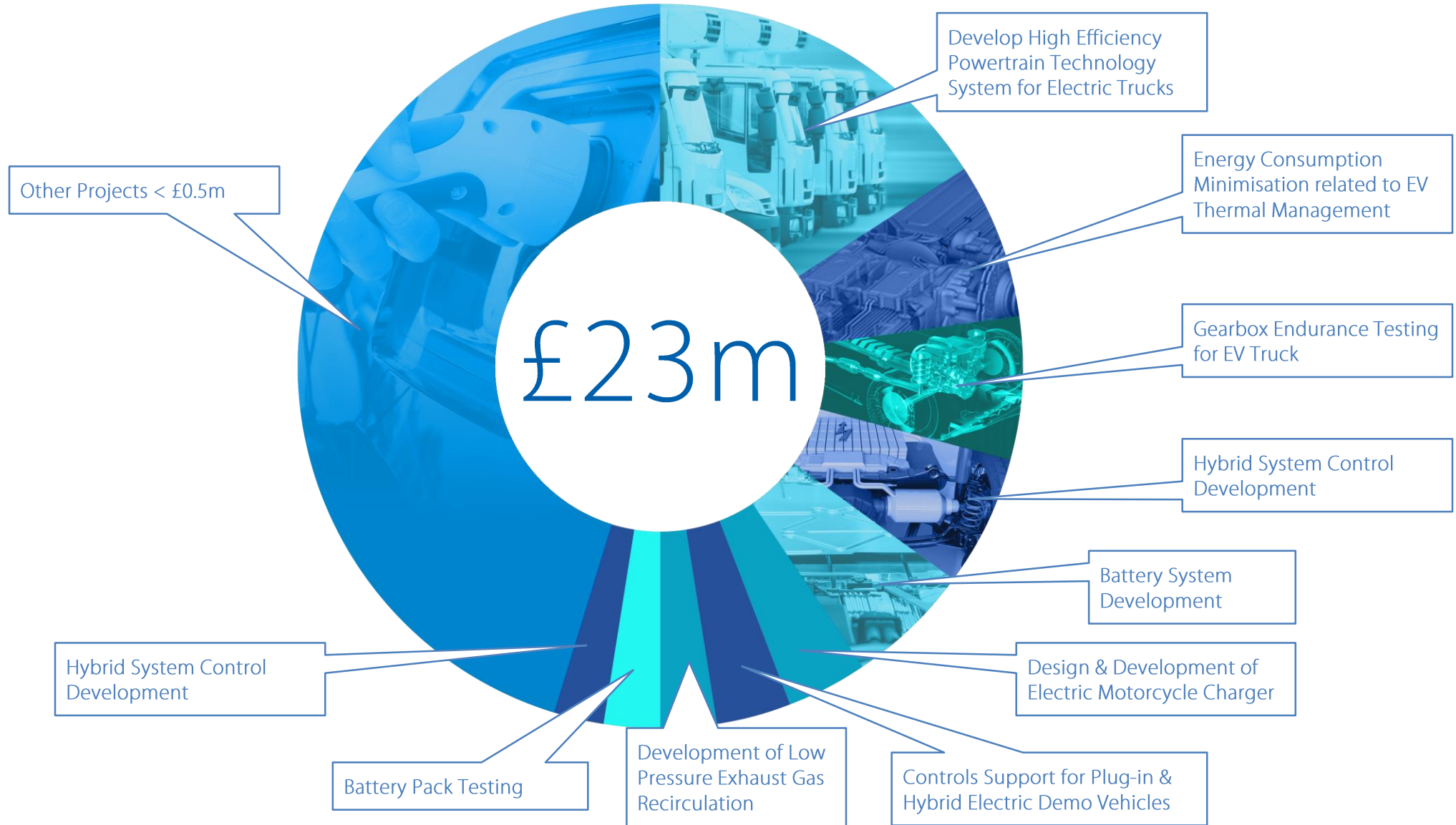


£m	Half year ended 31 December					
	Revenue earned		Underlying operating profit ⁽¹⁾		Underlying operating profit ⁽¹⁾ margin	
	2019	2018	2019 ⁽²⁾	2018	2019 ⁽²⁾	2018
Technical Consulting	135.7	137.1	12.0	11.7	8.8%	8.5%
Performance Products	57.2	51.0	6.0	4.9	10.5%	9.6%
Total	192.9	188.1	18.0	16.6	9.3%	8.8%

(1) Excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

(2) Current year includes the impact of IFRS 16, excluding this underlying operating profit would be £17.4m and underlying operating profit margin would be 9.0%.

Order intake relating to electric or hybrid vehicles is £23m



Investments and acquisitions



PLC Consulting

- £4.2m paid in H1 FY20 (£3.8m, net of cash acquired).
- Additional £1.5m, subject to financial performance targets, to be paid over the next two years.

Date Acquired	No. of people	Cash consideration	Revenue p.a.	Operating Profit p.a.
31 July 2019	21	£4.2m (max £5.4m)	£2.2m	£0.8m

Detroit Technical Center

- Purchase of DTC for £14m in August 2019 to provide strategic flexibility and realign cost base
- Potential sale of test facility in FY20 and office building in FY21
- Impairment and/or gains on freehold property and assets treated as specific adjusting items

Considerations regarding Brexit



Key mitigating actions we have taken include:

Performance Products

- McLaren – Supply chain on notice to flex inventory in support of engine production. Currently jointly monitoring the situation with McLaren;
- Bugatti – Supply chain on notice to flex inventory in support of transmission production. Currently jointly monitoring the situation with Bugatti;
- Export Systems and Compliance Documentation updated to accommodate a No Deal scenario.

Rail

- We hold licences for our Rail Certification business in England and Netherlands to provide certification services throughout the World and the EU.

Energy and Environment

- We continue to bid for and are contracting with European customers from our Netherlands office;

Automotive

- We have the ability to deliver some Automotive projects within the EU using our Prague technical centre (260 engineers).

Brexit strategy is to mitigate, where possible, the impact of Brexit whilst avoiding unnecessary cost.



Environmental Social Governance (ESG)



To support the wider ESG community we have developed additional services to support clients on the ESG journey. We are using these internally to develop our approach:

- We are responding to market need by adding capability and capacity on scenario planning, climate change risk and opportunity identification, Net Zero planning and delivery
- We will increase our narrative reporting on the opportunities and risks due to climate change in the spirit of TCFD
- Reported non-financial data will be externally verified
- We will maintain our approach on community engagement and social matters with our focus on STEM, local communities and supporting employee driven charitable initiatives

- We have published more relevant policies on Ricardo.com as part of an increase in transparency
- We will publish targets for future reductions in emissions, our Net Zero plan and other environmental impacts in our 2020 Report and Accounts



Global tailpipe and CO₂ emissions legislation adherence are “must haves” in the development budget of many of our clients

Vehicle Type	Region	2015	2020	2025	2030	
Automotive & LCV	EU	Euro 6b Passenger cars target: 130 gCO ₂ /km	Euro 6d -TEMP (WLTP & RDE) Passenger cars target: 95 gCO ₂ /km	Euro 6d - ISC - FCM	Euro 7 (in preparation) Passenger cars and LCVs: 15% reduction 2021 target	Passenger cars: 37.5% reduction 2021 target (31% for LCVs)
	US (49 States)	Tier 2 2012-2016 standards	Tier 3 2017-2025 standards - proposed amended standards for 2021-2026			
	California	LEV III LEV II (2009-2016)	LEV III (2017-2025, consistent with original EPA standards)			
	China	China 5 (Euro 5)	China 6a (WLTP & RDE)	China 6b (WLTP & RDE)		
	India	Bharat Stage IV (Euro 4 equivalent) 2017 standards	New LCVs standards	Bharat Stage VI (Euro 6 equivalent - includes RDE) 2022 standards		
	Japan	PNLT 2015 standards	WLTP based standards	RDE method being developed		
					2020 standards	2022 LCVs standards
Motorcycle & Personal Transportation	EU	Euro 3	Euro 4	Euro 5		
	US (49 States)	Tier 2 for Class III; Tier 1 for classes I and II (harmonised with California)				
	California	California Motorcycle limits: Tier 2 for Class III; Tier 1 for classes I and II				
	China	China III	China IV (WMTC)			
	India	Bharat Stage III	Bharat Stage IV	Bharat Stage V		
Japan	2010 standards	Euro 4 based standards (WMTC)	Euro 5 based standards (WMTC)			
Commercial Vehicles (Medium- & Heavy-Duty Trucks)	EU	Euro VI	Euro VI E	Euro VII (in preparation)		
	US (49 States)	EPA 10 Phase 1 federal standards	Phase 2 (2018-2027) federal standards	Monitoring and reporting CO ₂ emissions	15% reduction 2019-2020 CO ₂ emissions	30% reduction 2019-2020 CO ₂ emissions
	California	EPA 10 - Optional low NO _x limits Phase 1 federal standards	Phase 2 (2018-2027) federal standards			
	China	China V Phase 2 standards	China VIa	China VIb		
	India	Bharat Stage IV	Bharat Stage V	Bharat Stage VI		
	Japan	PNLT 2015 standards	2016 standards			2025 standards
Off-Highway	EU	Stage IV	Stage V			
	US	Tier 4 Final				
	China	Stage III (Nationwide)	Stage IV (Beijing)	Stage IV Nationwide (revised)		
	India	Bharat Stage III - Tractors and CEV		Bharat Stage IV - Tractors and CEV	Bharat Stage V - Tractors and CEV	
	Japan	2014 Non-road standards				
Rail	EU	Stage IIIB	Stage V (Locomotives and railcars)			
	US	Tier 4 Switch & line locomotives				
	India	Proposed standards under consideration				
		2015	2020	2025	2030	