

Delivering Excellence Through
Innovation & Technology



Ricardo plc Interim Results Presentation

Half year ended 31 December 2018
Presented February 2019

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HIGHLIGHTS – for the half year ended 31 December 2018

- Order intake good at £202m, compared to £238m in HY 2017/18
- Order book increased to £302m, up £7m on June 2018
- Revenue up 4% to £188m on HY 2017/18
- Underlying PBT up 1% to £15.3m on HY 2017/18
- Strong order intake in High-Performance Vehicles and Defence, with a well-diversified order mix overall
- Good performance in Rail, Energy & Environment, Defence, Performance Products and Software have fully offset weaknesses in our European and US Automotive businesses, demonstrating the importance of diversification across sectors and geographies
- Strong cash performance with neutral working capital and net debt at £27.5m, compared to £26.1m at June 2018
- Interim dividend increased by 4% to 6p from 5.75p
- Acknowledging the uncertain economic climate, we remain positive due to a good order book and diverse pipeline, the recently signed long-term McLaren programme, and deliveries of ABS kits now underway

Note: the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period.



	Half year ended 31 December	
	2018	2017 ⁽¹⁾
Order intake (£m)	£202m	£238m
Order book (£m)	£302m	£308m
Underlying operating profit margin ⁽²⁾ (%)	8.8%	8.9%
Underlying effective tax rate ^{(2) (3)} (%)	22.2%	23.2%
Underlying basic earnings per share (pence) ⁽²⁾	22.1p	21.7p
Dividend (pence)	6.00p	5.75p
Net debt (£m)	£(27.5)m	£(31.5)m
FCFe ⁽⁴⁾	£8.9m	£21.8m
Pre-tax pension deficit (£m)	£7.6m	£12.3m
Closing headcount incl. subcontractors (no.)	2,972	3,156

(1) the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period.

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

(3) reported effective tax rate is 23.3%.

(4) calculated as net cashflow excluding dividends, FX, proceeds from share issue and acquisition and restructuring related costs.

Income statement



£m	Half year ended 31 December		H1 2018/19 v H1 2017/18
	2018 Underlying ⁽²⁾	2017 Underlying ^{(1) (2)}	% change
Revenue	188.1	181.4	4%
Gross profit	64.3	68.5	(6)%
Administration costs	(47.7)	(52.3)	(9)%
Operating profit	16.6	16.2	2%
Net finance costs	(1.3)	(1.1)	18%
Profit before tax	15.3	15.1	1%
Taxation charge	(3.4)	(3.5)	(3)%
Profit for the period	11.9	11.6	3%

- (1) the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period. Comparative information has also been re-presented to reclassify certain indirect payroll and depreciation costs from cost of sales to administrative expenses in a manner that is consistent with their classification in the current period.
- (2) excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.
- (3) A full income statement including these items is included in the Appendix.

Revenue by customer location



External Revenue

Half year ended
31 December

£m	2018	2017 ⁽¹⁾
UK	77.3	67.7
Rest of Europe	46.3	50.2
Europe total	123.6	117.9
US	25.9	20.2
China	16.1	21.4
Japan	9.5	11.0
Rest of Asia	7.2	6.6
Asia total	32.8	39.0
Rest of the World	5.8	4.3
Total	188.1	181.4

(1) the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period.

Half year ended 31 December

£m	Revenue earned		Underlying operating profit ⁽²⁾		Underlying operating profit ⁽²⁾ margin	
	2018	2017 ⁽¹⁾	2018	2017 ⁽¹⁾	2018	2017 ⁽¹⁾
Technical Consulting	137.1	140.8	11.7	12.3	8.5%	8.7%
Performance Products	51.0	40.6	4.9	3.9	9.6%	9.6%
Total	188.1	181.4	16.6	16.2	8.8%	8.9%

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(2) excluding specific adjusting items, which comprise amortisation of acquired intangible assets, acquisition-related expenditure and reorganisation costs.

£m	Half year ended 31 December	
	2018	2017 ⁽¹⁾
Underlying operating profit	16.6	16.2
Depreciation and amortisation	5.7	6.0
Working capital decrease	0.2	11.3
Dividends	(7.9)	(7.4)
Tax paid	(2.6)	(4.7)
Capital expenditure	(6.2)	(5.1)
Pension charge and funding	(2.2)	(2.2)
Cash flow hedges, FX, interest/other	(2.6)	0.3
Cash inflow before acq'n & restructuring related costs	1.0	14.4
Acquisition and restructuring related costs	(2.4)	(8.0)
Cash inflow/(outflow) ⁽²⁾	(1.4)	6.4
Opening Cash Balance	(26.1)	(37.9)
Closing Cash Balance	(27.5)	(31.5)

(1) the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period.

(2) Cash inflow/(outflow) net of movement in borrowings

Balance sheet summary

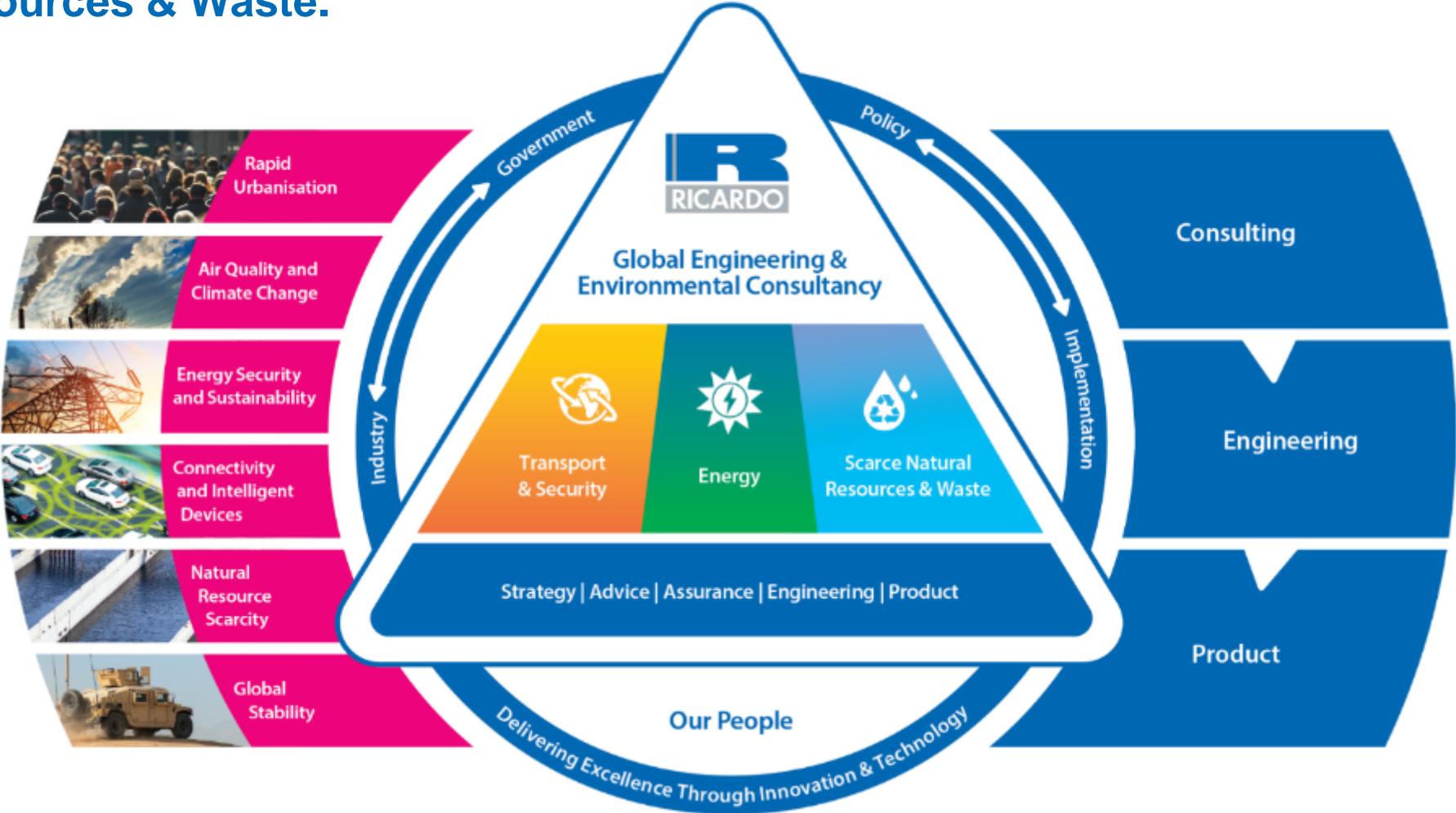


£m	31 December		30 June
	2018	2017 ⁽¹⁾	2018 ⁽¹⁾
Tangible non-current assets	45.4	47.9	45.3
Intangible non-current assets	96.8	95.9	97.2
Inventories, trade and other receivables	156.9	149.8	148.6
Assets held for sale	-	2.7	-
Net (debt)/funds	(27.5)	(31.5)	(26.1)
Trade and other payables	(92.6)	(95.1)	(83.0)
Pension deficit	(7.6)	(12.3)	(4.6)
Other ⁽²⁾	(5.5)	1.4	(6.6)
Net assets	165.9	158.8	170.8

(1) the prior period has been restated due to the impact of IFRS 15 'Revenue from contracts with customers' on a like-for-like basis with the current period.

(2) other includes provisions, deferred tax and current tax liabilities.

Our ambition is to be the world's pre-eminent organisation focused on the development and application of solutions to meet the challenges within the markets of Transport & Security, Energy, and Scarce Natural Resources & Waste.



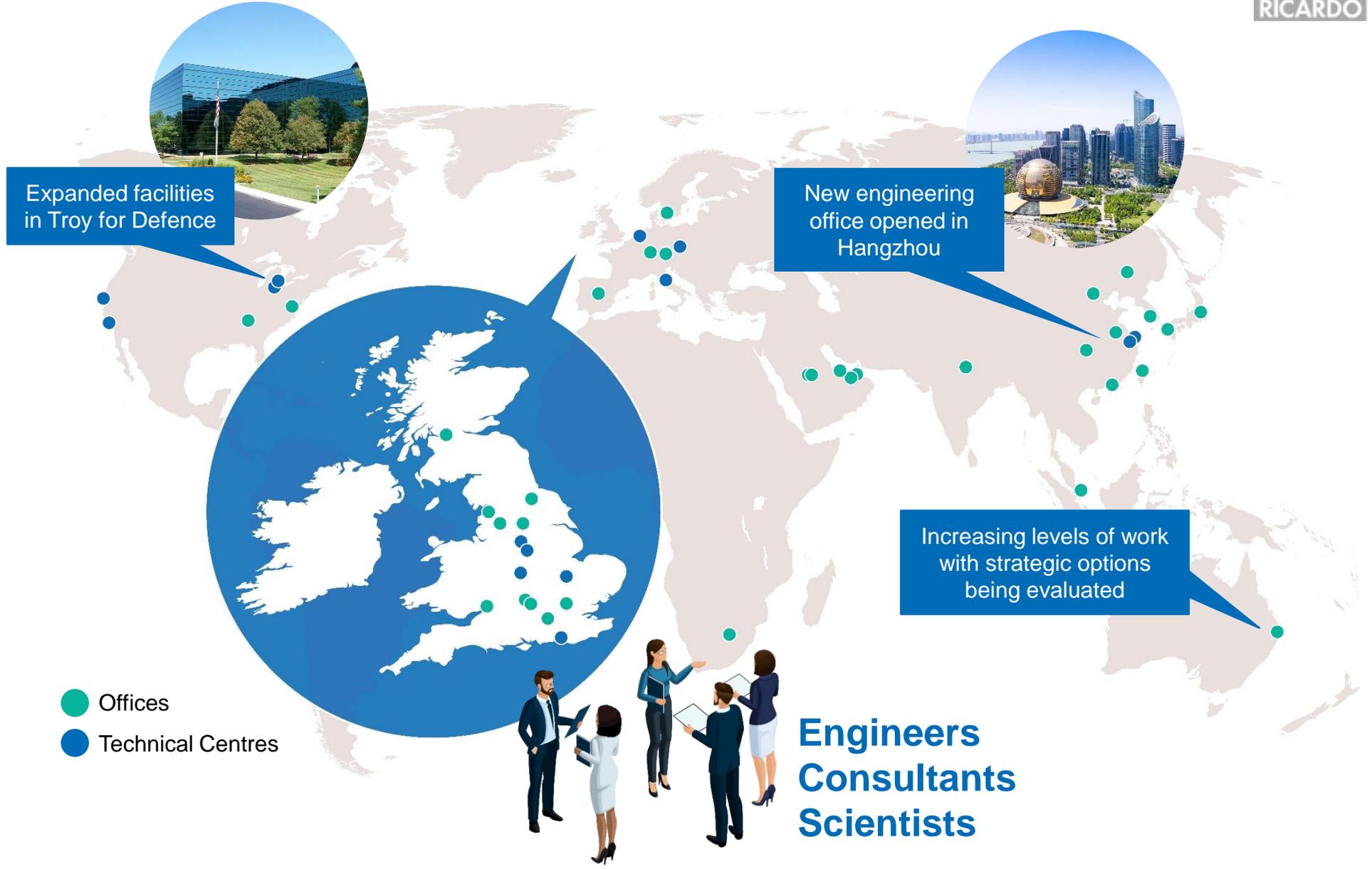
3,000 people

73 Nationalities

48 Sites

20 Countries

Continue to expand the global footprint



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

- Continued uncertainty around Brexit and slowing China economy
- Automotive sector facing significant change and sales have slowed worldwide
- CO₂ reduction continues as a global priority
- Transition towards electrification continues
- Continued investment in public transport and infrastructure globally
- Increasing action on waste management and recycling
- Water as a scarce resource – worldwide drought and increased temperature conditions (Australia, California, Mainland Europe)



Working with clients to develop a diverse, growing and sustainable long term business fit for the future

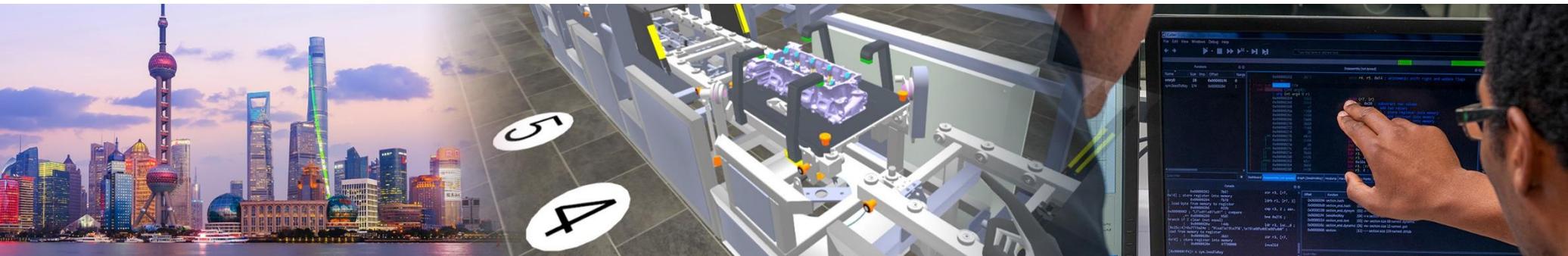


- 2,530 McLaren engines delivered, up from 1,810 in prior period. 20,000 milestone passed
- Follow on engine programme with McLaren secured
- Initial orders of 1,800 units with delivery commenced on ABS, discussions on retrofit progressing to plan
- Asset monitoring technology delivered to Network Rail / PanMon
- UK hybrid rail technology programme secured
- Large scale EV battery cell test programme for European client
- Continued good levels of Automotive orders in China
- Air quality and waste management business strong with moves into Australia
- Ricardo Roke digital resilience offering gaining traction and orders in Europe and Asia



Managing the challenges and opportunities in a volatile and changing global market

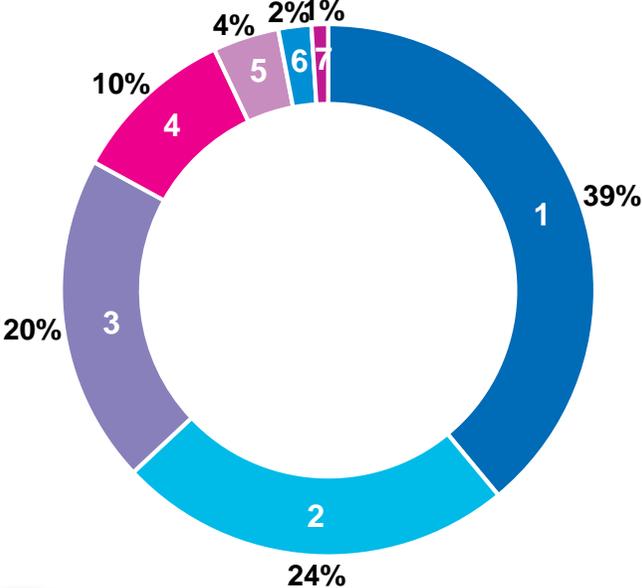
- Resetting resource levels reflecting the Automotive market conditions
- Growing China engineering facility to deliver locally and new sales office opened
- Establishing low cost Prague shared service centre
- Setting up ABS delivery capability
- Expanding Energy & Environment and Rail into Australia
- Investing in software and digitalisation processes/tools including virtual reality and complex system modelling for multi market applications
- Strong M&A pipeline with discussions underway to deliver the strategy and support the above



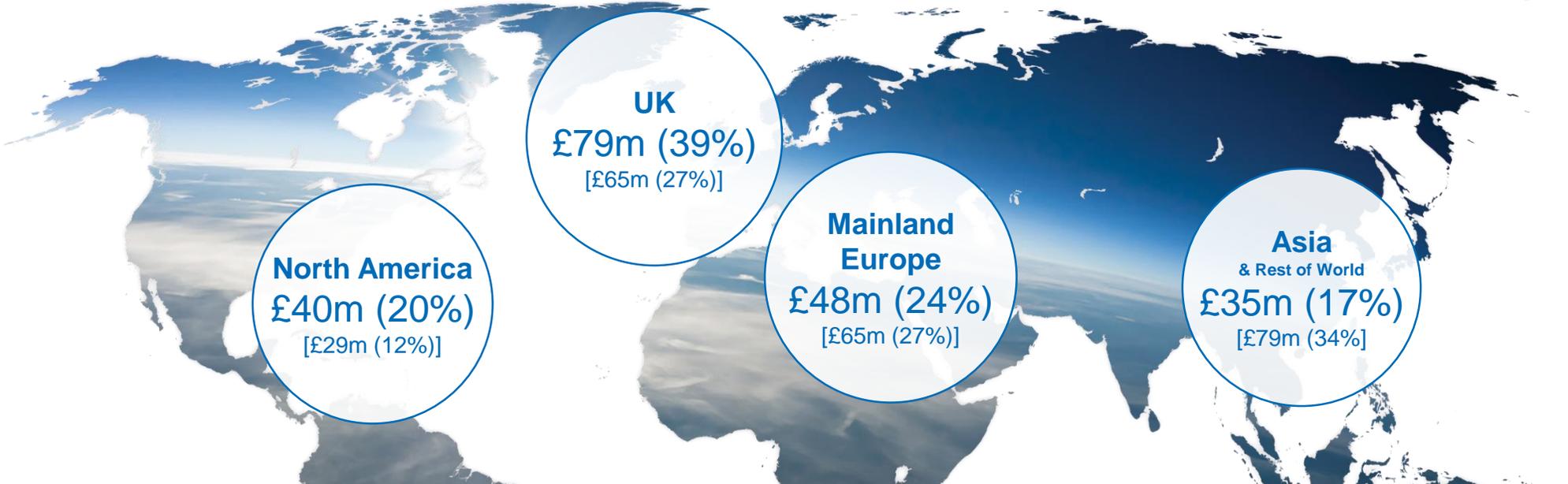
A continued good balance of order intake and pipeline from across the globe



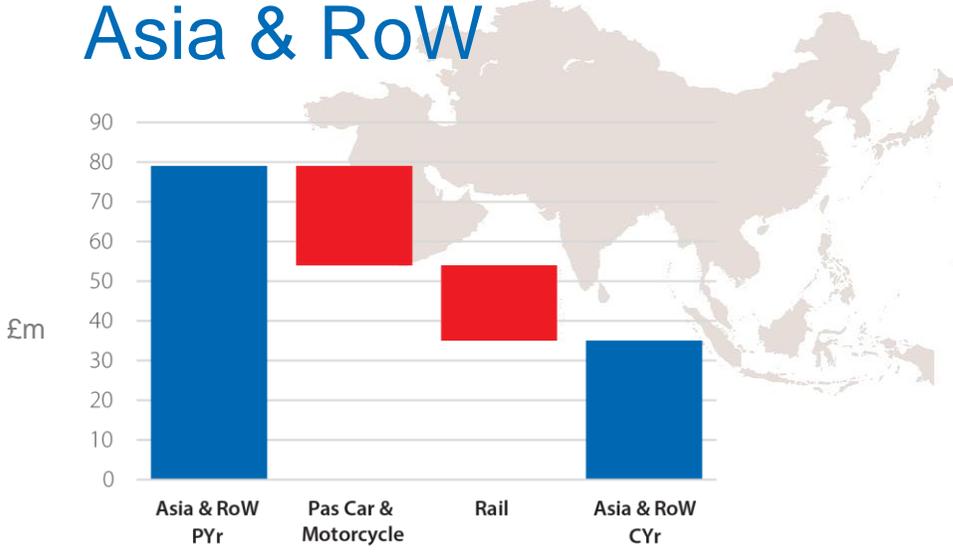
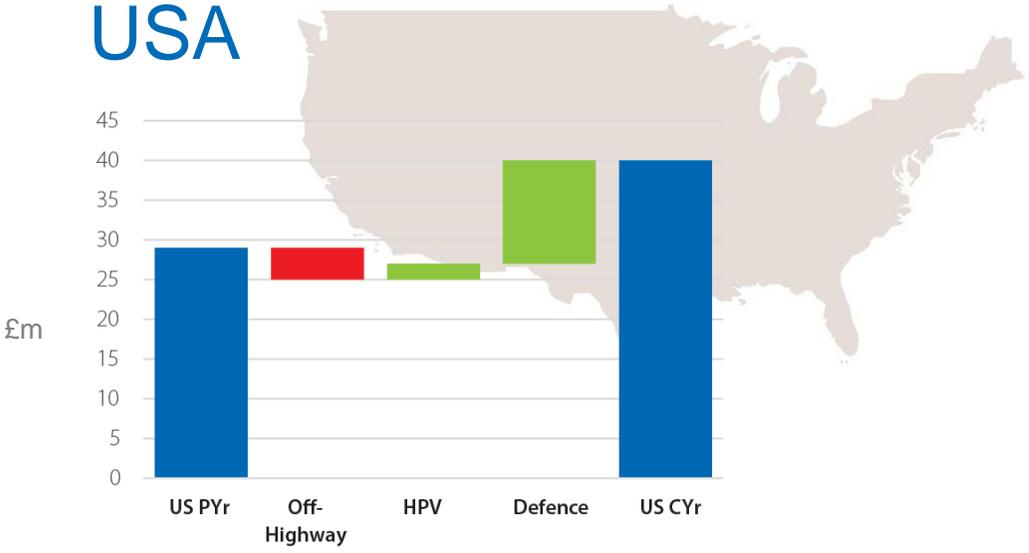
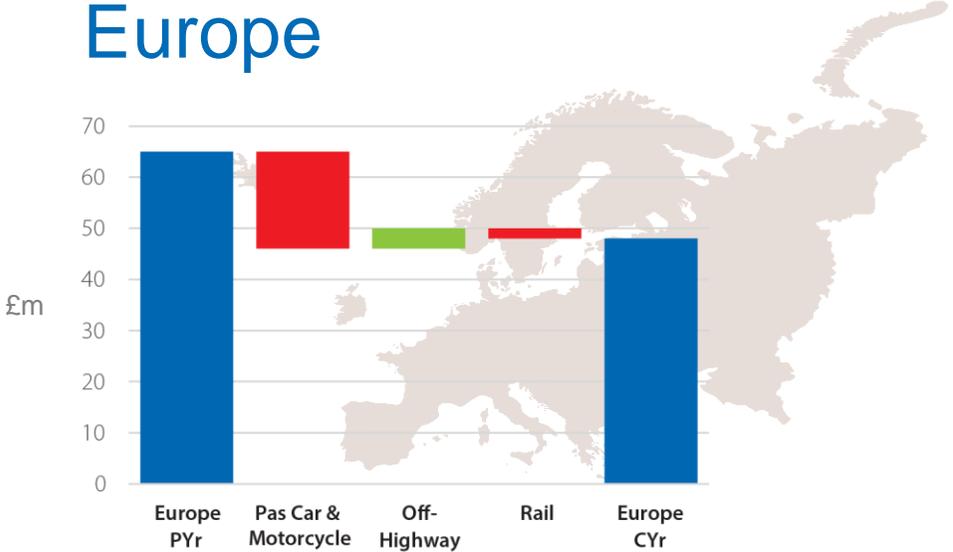
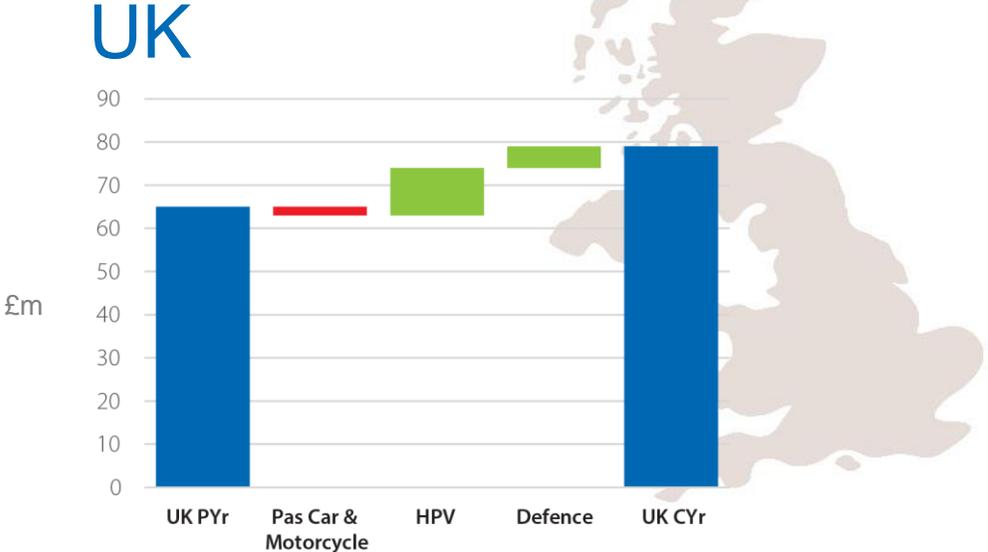
1. UK
2. Mainland Europe
3. North America
4. China
5. Japan
6. Rest of Asia
7. Rest of World



HY 2018/19
 Order Intake £202m
 [HY 2017/18
 Order Intake £238m]



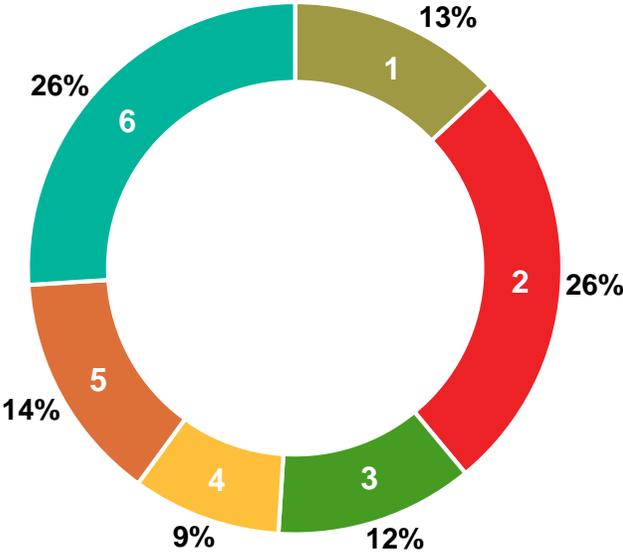
Order intake movements



Well balanced market sector order intake with strong performance from Defence and High Performance Vehicles



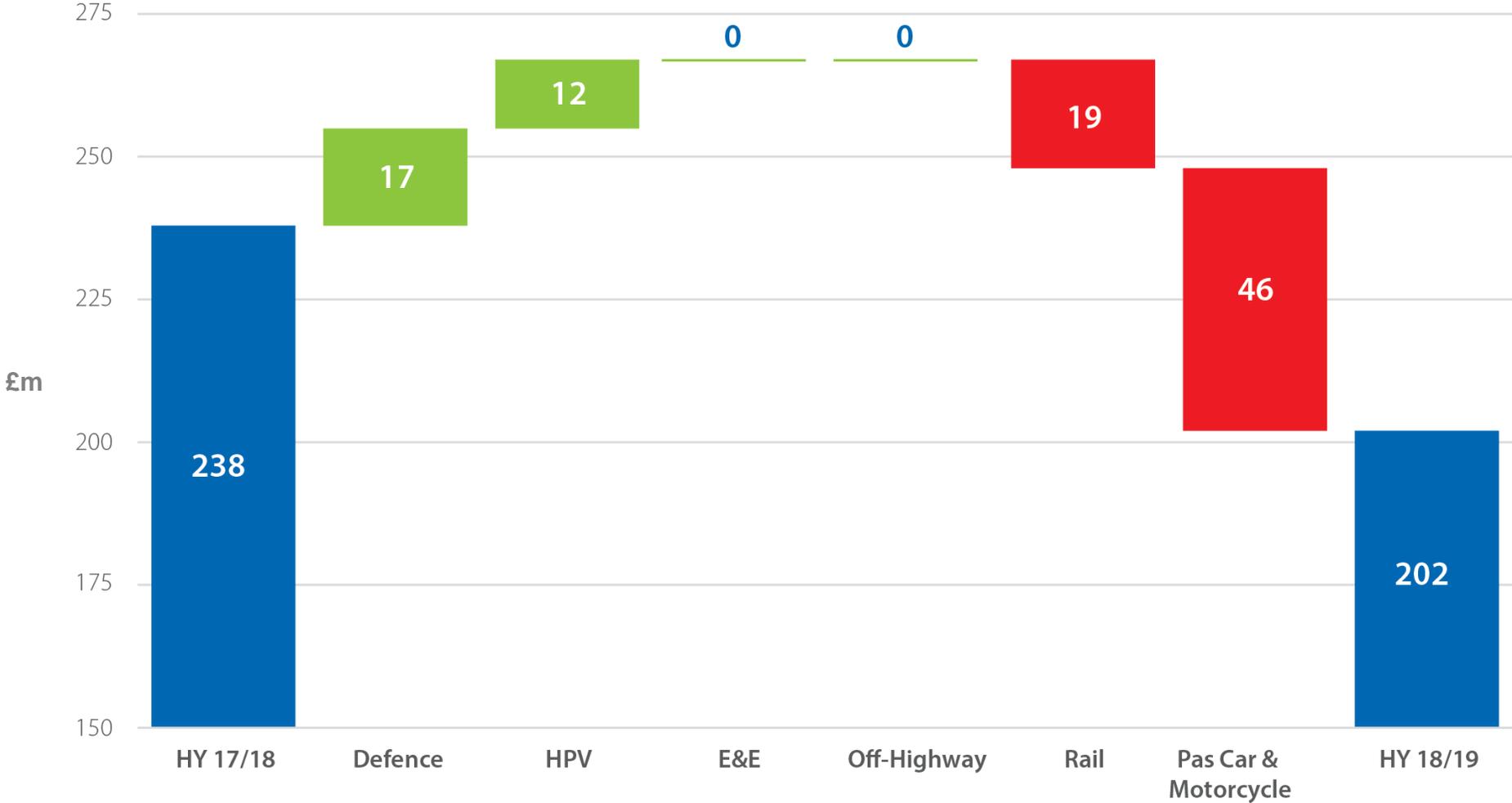
- 1. Defence
- 2. High Performance Vehicles & Motorsport
- 3. Energy & Environment
- 4. Off Highway & Commercial Vehicles
- 5. Rail
- 6. Passenger Car & Motorcycle



HY 2018/19
 Order Intake £202m
 [HY 2017/18
 Order Intake £238m]

Defence	HPV&M	E&E	Off-Highway & CV	Rail	Pas Car & Motorcycle
					
£26m	£53m	£24m	£19m	£28m	£52m
[£9m]	[£41m]	[£24m]	[£19m]	[£47m]	[£98m]

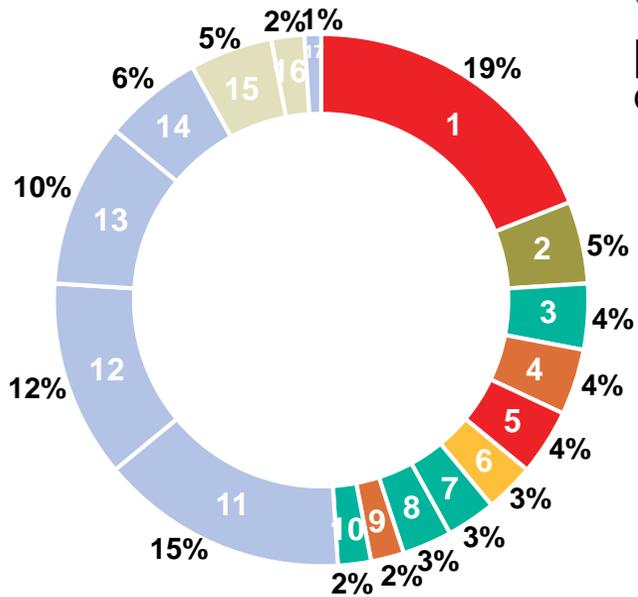
Market sector order intake bridge



Diverse customer mix, with a good level of multi-year business. Our top 4 customers are spread across Performance Products, Defence, Automotive and Rail



Ricardo External Order Intake by Customer for the six months ended 31 December 2018



HY 2018/19
Order Intake £202m
[HY 2017/18
Order Intake £238m]



- | | | |
|-----------------|------------------------|---------------------------------|
| 1. Key client 1 | 7. Key client 7 | 13. Other Europe clients |
| 2. Key client 2 | 8. Key client 8 | 14. Other North America clients |
| 3. Key client 3 | 9. Key client 9 | 15. US Defence |
| 4. Key client 4 | 10. Key client 10 | 16. UK Defence |
| 5. Key client 5 | 11. Other Asia clients | 17. Rest of World clients |
| 6. Key client 6 | 12. Other UK clients | |

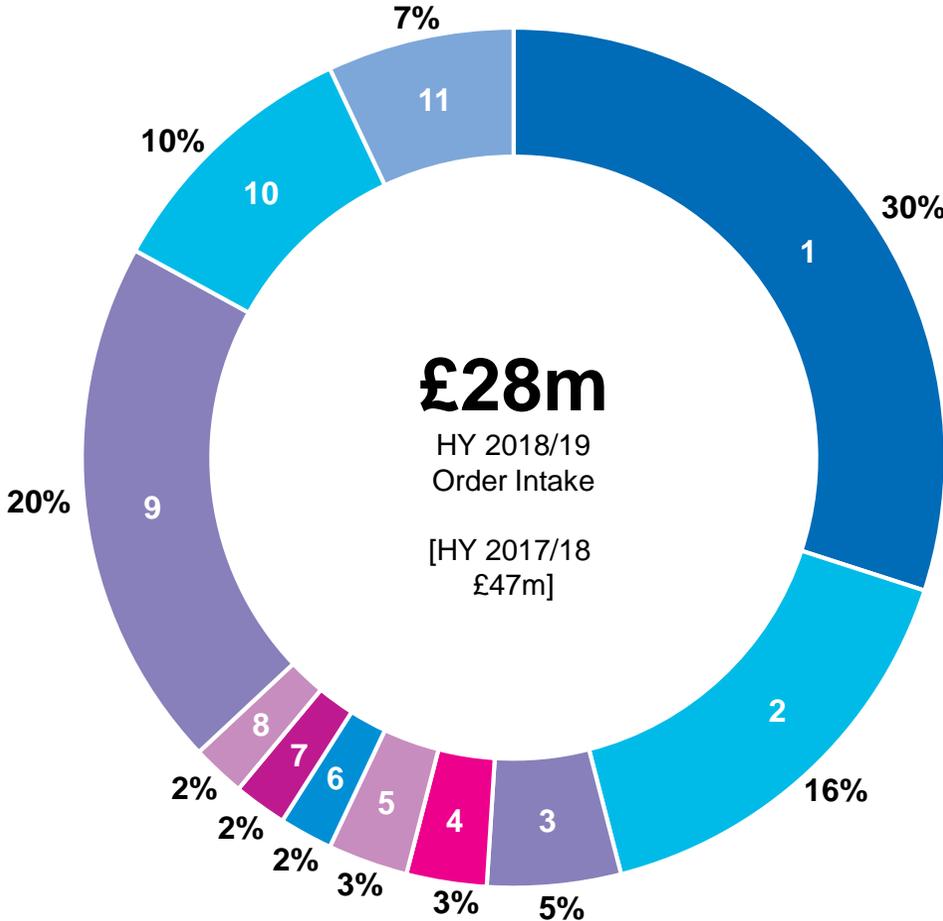
Order Book Profile



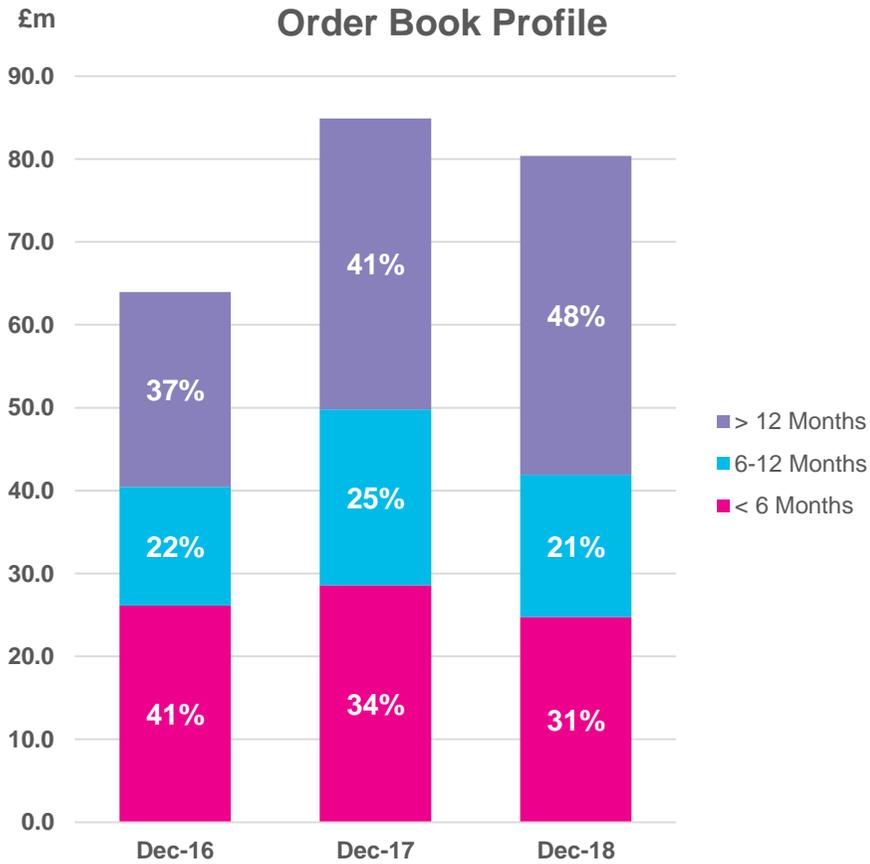
Focus on Rail – Technical Consulting



- Over 1,130 live projects
- No of people – 550
- H1 Revenue of c. £35m



- | | |
|-----------------|-------------------------|
| 1. Key client 1 | 7. Key client 7 |
| 2. Key client 2 | 8. Key client 8 |
| 3. Key client 3 | 9. Other Europe clients |
| 4. Key client 4 | 10. Other UK clients |
| 5. Key client 5 | 11. Other Asia clients |
| 6. Key client 6 | |

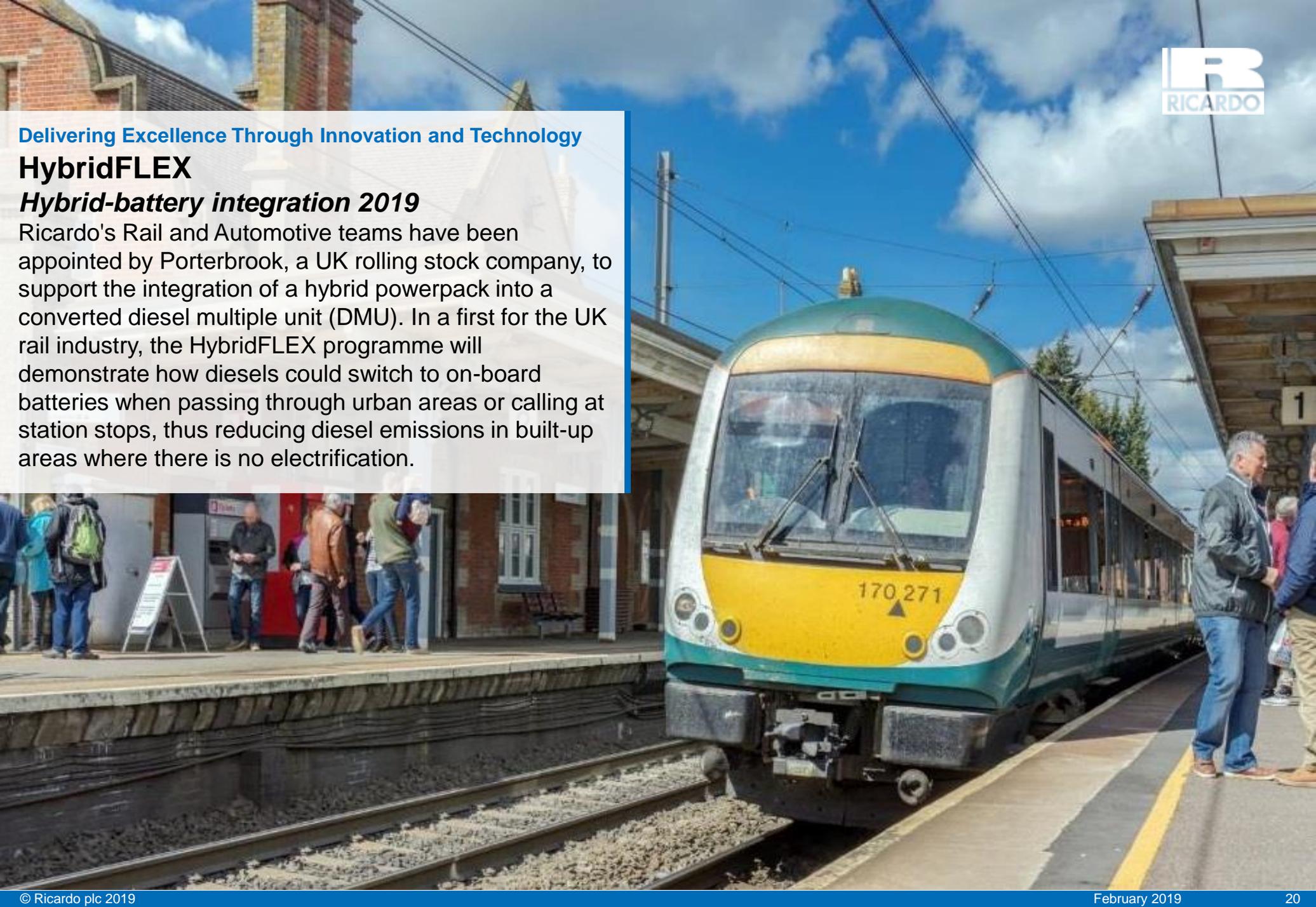


Delivering Excellence Through Innovation and Technology

HybridFLEX

Hybrid-battery integration 2019

Ricardo's Rail and Automotive teams have been appointed by Porterbrook, a UK rolling stock company, to support the integration of a hybrid powerpack into a converted diesel multiple unit (DMU). In a first for the UK rail industry, the HybridFLEX programme will demonstrate how diesels could switch to on-board batteries when passing through urban areas or calling at station stops, thus reducing diesel emissions in built-up areas where there is no electrification.



Delivering Excellence Through Innovation and Technology

Serbia High Speed Rail Link

Notified Body

The upgraded Belgrade-Budapest line will reduce journey times between the two capitals from eight hours to under three, restoring a vital corridor for Central and South East Europe. As the Notified Body, Ricardo Certification will conduct verification activities during the planning, construction and testing of the 184km Serbian section, ensuring the upgrade is in full compliance with industry standards and reducing risk of delay and cost overruns at later stages of the project.



Delivering Excellence Through Innovation and Technology

Eurostar

Designated Body Certification

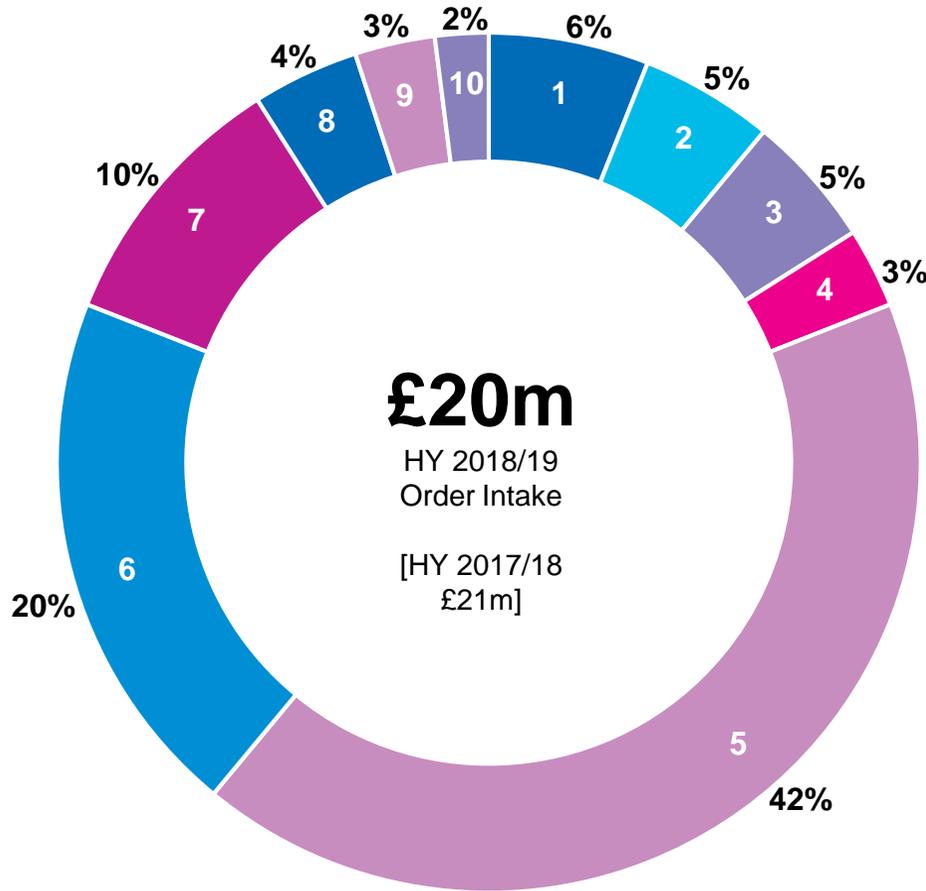
Eurostar sought to launch direct London-Amsterdam services using Siemens 'Velaro e320' rolling stock. Ricardo Certification performed the certification of the vehicles for the Dutch section of the route and also oversaw assurance testing of some of the vehicle's safety systems on the network. The service launched in April 2018 providing direct services between the city centres in 3hrs 40mins and offering a competitive alternative to one of Europe's busiest air routes.



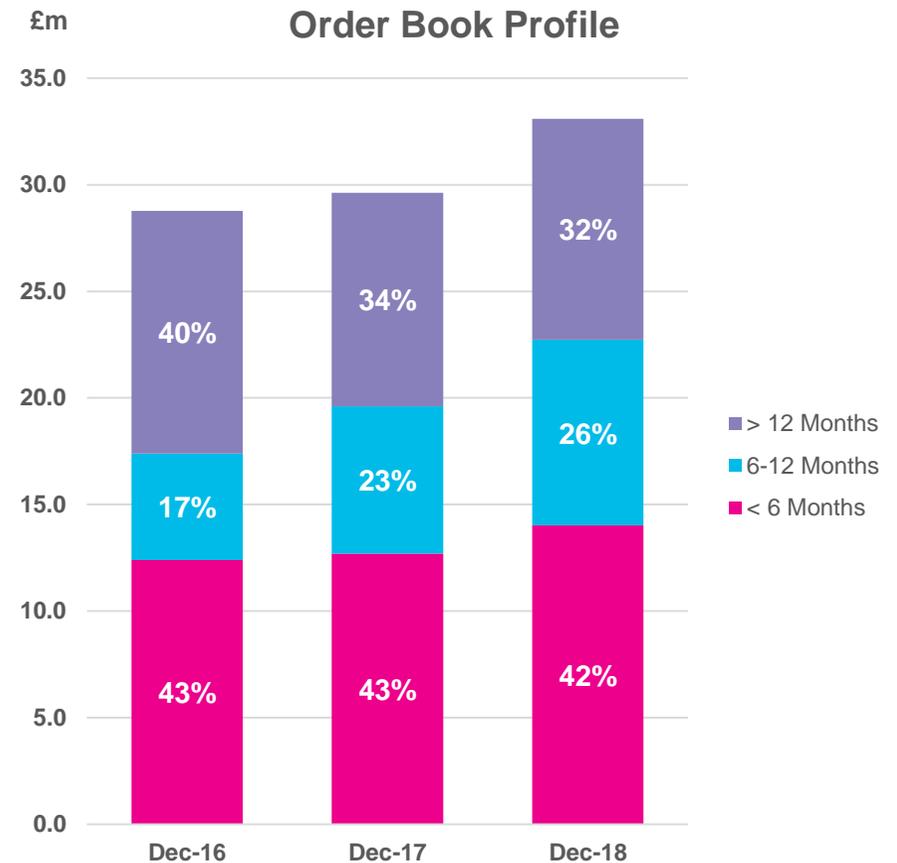
Focus on Energy and Environment – Technical Consulting



- Over 1,140 live projects
- No of people – 470
- H1 Revenue of c. £20m



- | | |
|---------------------|--------------------------------|
| 1. Key client 1 | 6. Other Europe clients |
| 2. Key client 2 | 7. Other UK Gov clients |
| 3. Key client 3 | 8. Other North America clients |
| 4. Key client 4 | 9. Other Rest of World clients |
| 5. Other UK clients | 10. Other Asia clients |





Delivering Excellence Through Innovation and Technology

Developing the New South Wales circular economy

Ricardo's world-leading expertise in supporting the delivery of the circular economy in Scotland, provided the unique practical experience to inform the development of the New South Wales circular economy policy. The project also outlined eight key recommendations to stimulate change through various supply-and-demand factors.

Delivering Excellence Through Innovation and Technology

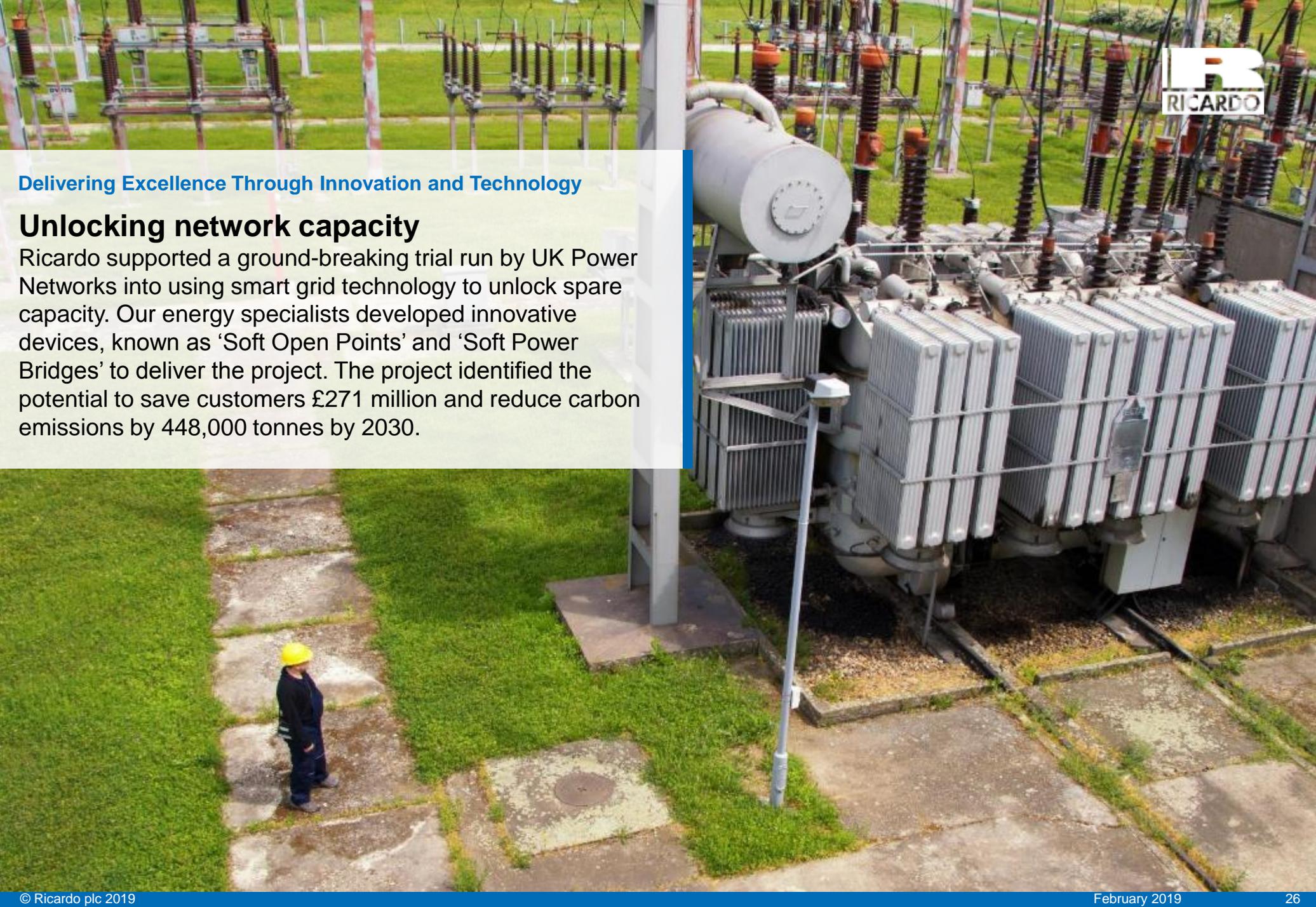
Innovative approach to climate change risk-mapping for Welsh Water

Ricardo was commissioned by Welsh Water to research the potential environmental consequences of climate change and the subsequent impacts on their operational costs and service delivery. Ricardo's water and environment experts developed a comprehensive risk-mapping model, from which a response plan and decision support tool was developed to identify the current and future risks to water supply, as well as a suite of management actions/research priorities.

Delivering Excellence Through Innovation and Technology

Unlocking network capacity

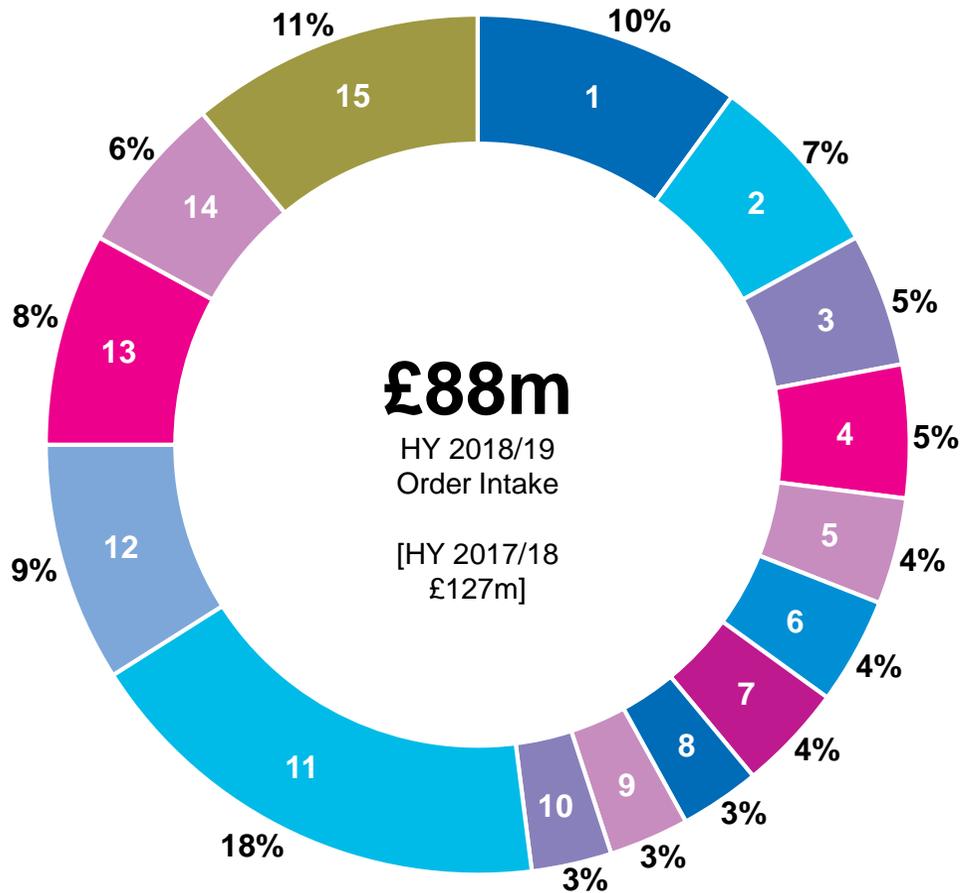
Ricardo supported a ground-breaking trial run by UK Power Networks into using smart grid technology to unlock spare capacity. Our energy specialists developed innovative devices, known as 'Soft Open Points' and 'Soft Power Bridges' to deliver the project. The project identified the potential to save customers £271 million and reduce carbon emissions by 448,000 tonnes by 2030.



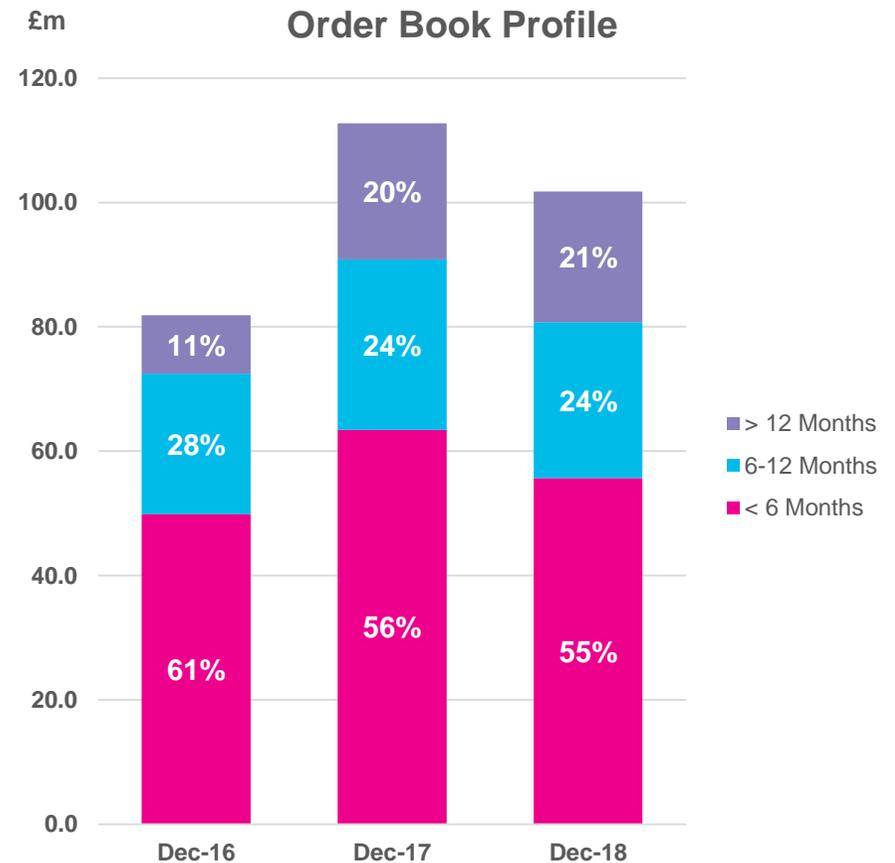
Focus on Automotive, Industrial and Other – Technical Consulting



- Over 540 live projects
- No of people – 1,520
- H1 Revenue of c. £80m



- | | | |
|-----------------|-------------------|---------------------------------|
| 1. Key client 1 | 6. Key client 6 | 11. Other Asia 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 UK clients |
| 5. Key client 5 | 10. Key client 10 | 15. US Defence |



Delivering Excellence Through Innovation and Technology

Developing 48V powertrain control software for PATAAC

In 2015, Ricardo was commissioned by the Pan Asia Technical Automotive Center ('PATAAC') – the Shanghai-based joint venture between General Motors and SAIC Motor – to assist with the development and demonstration of 48V powertrain technology. Ricardo's responsibilities for the 48V system included requirements specification and design, hybrid control unit software development and testing, vehicle system testing, functional safety compliance and development for China 6 emissions on board diagnostics.



Delivering Excellence Through Innovation and Technology

Zongshen 650cc motorcycle

Ricardo is collaborating with Zongshen Motorcycle, based in Chongqing, China, in the design and development of a completely new large motorcycle vehicle platform. Zongshen is one of China's leading two-wheeler manufacturers, producing around two-million units per year. To support the company's ambitions for growth in product range and engineering capability, Ricardo Motorcycles will assist with the development of a completely new platform to support a family of future large motorcycle products.



Delivering Excellence Through Innovation and Technology

Secure Data Management Service

Ricardo Defense provides enterprise software which enables the electronic distribution of technical data with ensured data integrity and cybersecurity. The software includes bi-directional messaging and data synchronisation between network nodes and provides resilient features for disconnected, intermittent network environments. Low Rate Initial Production (LRIP) started with installation on Aircraft Carriers and Amphibious Ships. Full production for fleetwide application is planned.

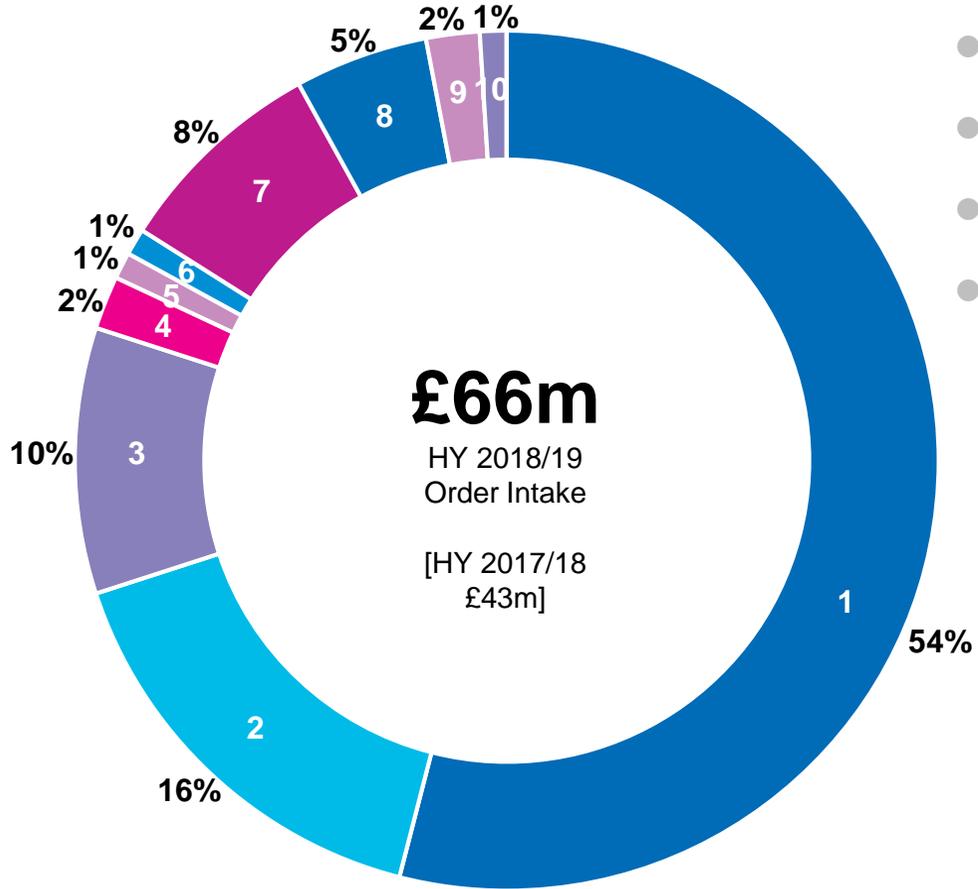


Delivering Excellence Through Innovation and Technology

Deep Space Mission Planning for NASA

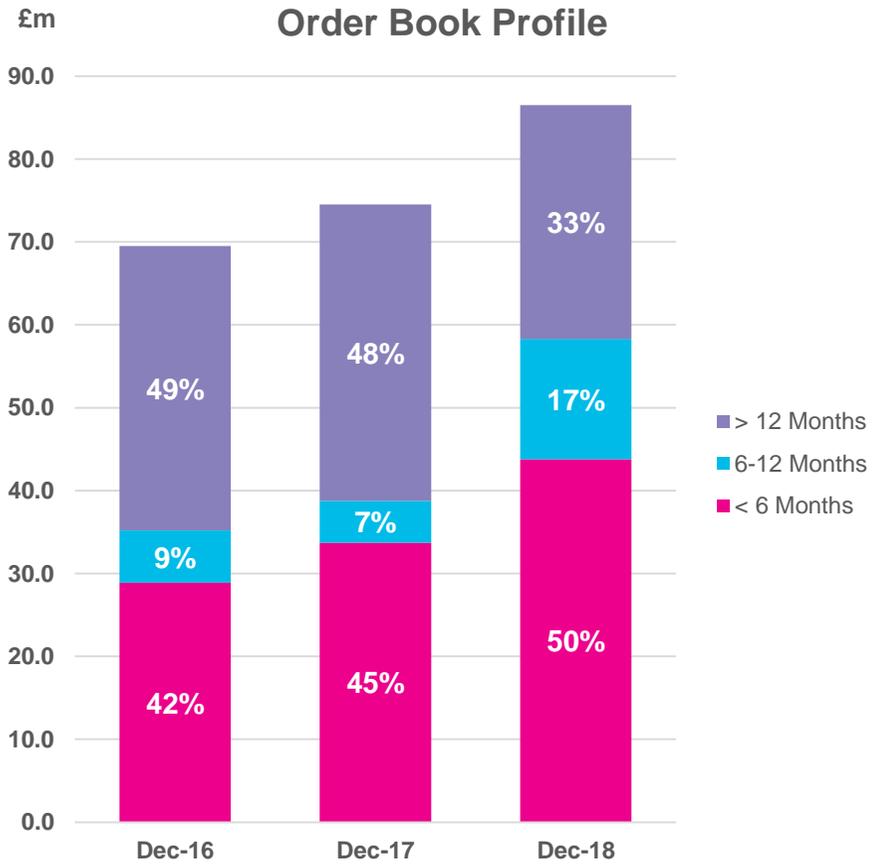
Long duration deep space missions produce hundreds of thousands of tasks and require collaboration of human factors analysts, systems analysts, engineers, risk managers and user interface developers. Ricardo Defense has developed and delivered software tools that quickly analyse the incredibly large datasets to identify and isolate potential conflicts, risks, errors, and excessive workload. The software is now in use by NASA to visualise the data, facilitate decision making, and ensure mission success.

Focus on Performance Products



- Over 20 live projects
- Contracts outside of order book is > £100m
- No of people – 430
- H1 Revenue of c. £50m

- | | |
|-----------------|--------------------------|
| 1. Key client 1 | 6. Key client 6 |
| 2. Key client 2 | 7. UK Defence |
| 3. Key client 3 | 8. Other Asia clients |
| 4. Key client 4 | 9. Other UK clients |
| 5. Key client 5 | 10. Other Europe clients |



Delivering Excellence Through Innovation and Technology

McLaren Senna V8 Engine Production

The Senna utilises the most powerful engine Ricardo has ever produced for McLaren. The 4 litre V8 engine generates over 800 horsepower and is limited to only 500 units. The production of the car sold out almost immediately, with the first cars delivered in the summer of 2018. As a track focus road car, the Senna sets a new benchmark in supercar vehicle dynamics.





Delivering Excellence Through Innovation and Technology

Bugatti Chiron Dual Clutch Transmission Manufacture

2018 was Ricardo's first full year of production for the 7 speed DCT in the new Bugatti Chiron. Designed to harness the 1,500 horse power and 1,600 Nm of torque generated by its 8 litre engine, the transmission & 4 wheel drive system is the most complex ever produced by Ricardo.

Delivering Excellence Through Innovation & Technology

Protecting Those That Protect Us: Ricardo Defense's ABS/ESC system helps to bring soldiers home safely

- Ricardo's ABS/ESC kit approved as a "standardised material item of supply" for all 29 NATO countries – National Stock Number assigned in December 2018
- ABS kit orders >\$14m this FY, a strong ramp up to volume production in the US
- Approximately 25,000 to 50,000 vehicles in the US army fleet suitable for this upgrade
- The target vehicle is currently deployed with all the US military services and some 50 foreign countries creating a world-wide market opportunity of 100,000 vehicles or more





Delivering Excellence Through Innovation and Technology

Hybridised Ro-Ro Ferry System Configuration using IGNITE

Ricardo are collaborating to establish an approach allowing complex hybridised marine powertrain systems to be specified, efficiency and emissions benefits assessed and safety systems classified. IGNITE has been used to model a ferry with conventional and electrified configurations to allow selection of the powertrain system configuration including fuel use and emissions benefit during passage and in port. Classification of safety system performance is a future evolution.



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- Strong cash performance with neutral working capital and net debt at £27.5m, compared to £26.1m at June 2018
- Interim dividend increased by 4% to 6p from 5.75p
- Acknowledging the uncertain economic climate, we remain positive due to a good order book and diverse pipeline, the recently signed long-term McLaren programme, and deliveries of ABS kits now underway

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Appendix

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Income statement – Underlying and total Group



Half year ended 31 December

£m	2018			2017 ⁽¹⁾			Year on Year growth	
	Underlying	Specific adjusting items ⁽²⁾	Total	Underlying	Specific adjusting items ⁽²⁾	Total	Underlying ⁽²⁾	Total
Revenue	188.1	-	188.1	181.4	-	181.4	4%	4%
Gross profit	64.3	-	64.3	68.5	-	68.5	(6)%	(6)%
Administration costs	(47.7)	(5.0)	(52.7)	(52.3)	(3.8)	(56.1)	(9)%	(6)%
Operating profit	16.6	(5.0)	11.6	16.2	(3.8)	12.4	2%	(6)%
Net finance costs	(1.3)	-	(1.3)	(1.1)	-	(1.1)	18%	18%
Profit before tax	15.3	(5.0)	10.3	15.1	(3.8)	11.3	1%	(9)%
Taxation charge	(3.4)	1.0	(2.4)	(3.5)	0.1	(3.4)	(3)%	(29)%
Profit for the period	11.9	(4.0)	7.9	11.6	(3.7)	7.9	3%	-

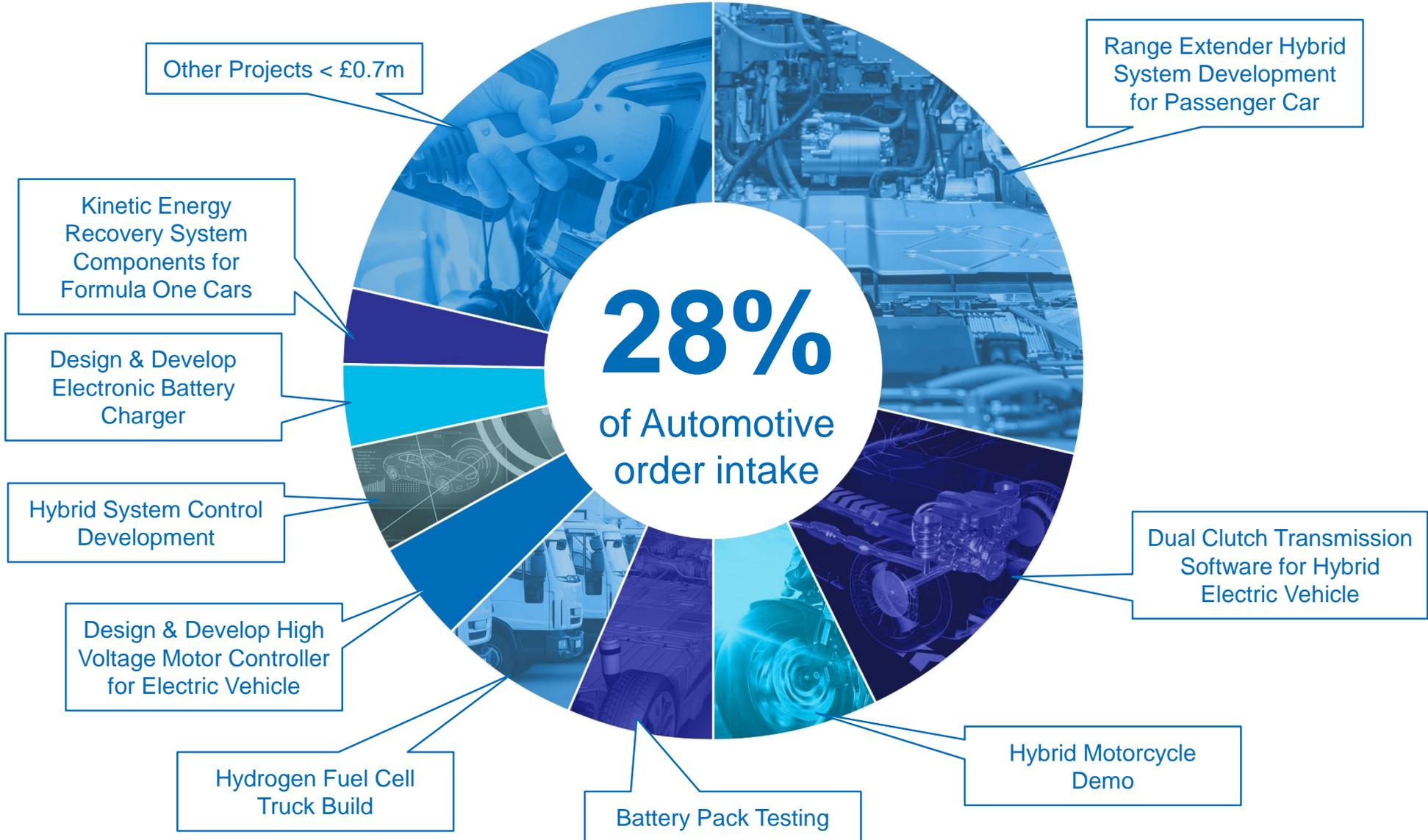
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(2) specific adjusting items comprise amortisation of acquired intangible assets, acquisition-related expenditure, reorganisation costs and non-recurring items.

Specific adjusting items

£m	Half year ended 31 December	
	2018	2017
Amortisation of acquisition-related intangible assets	2.0	2.2
Acquisition-related expenditure	0.5	0.5
Reorganisation costs	1.3	1.1
Guaranteed minimum pensions ('GMPs') equalisation	1.2	-
Total before profit	5.0	3.8
Tax credit on specific adjusting items	(1.0)	(1.2)
Non-recurring impact of change in US federal tax rate	-	1.1
Total after tax	4.0	3.7

Electrification – order intake relating to electric or hybrid vehicles is £21m or 11% of Group order intake



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



Vehicle Type	Region	2010	2015	2020	2025			
Automotive & LCV	EU	Euro 5	Euro 6a	Euro 6b	Euro 6d -TEMP (WLTP & RDE)	Euro 6d - ISC - FCM (new ISC procedure and monitoring of fuel consumption)		
		Passenger cars: 130 gCO ₂ /km			Passenger cars: 95 gCO ₂ /km			
	US (49 States)	Tier 2		Tier 3				
		2012-2016 standards			2017-2025 standards - proposed amended standards for 2021-2026			
	California	LEV II		LEV III				
		LEV II standards (2009-2016)			LEV III (2017-2025, consistent with original EPA standards)			
	China	China IV (Euro 4)		China 5 (Euro 5)		China 6a (WLTP & RDE)	China 6b (WLTP & RDE)	
	Phase 2	Phase 3		Phase 4 (Passenger Cars; new standards for LCVs from 2018)				
India	Bharat Stage IV (Euro 4 equivalent)				Bharat Stage VI (Euro 6 equivalent)			
	2017 standards			2022 standards				
Japan	Post New Long Term			WLTP based standards				
	2010 standards		2015 standards		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 VI		
Japan	2010 standards			Euro 4 based standards (WMTC)				
Commercial Vehicles (Medium- & Heavy-Duty Trucks)	EU	Euro V	Euro VI		Monitoring and reporting CO ₂ emissions		15% reduction 2019 value (proposed)	
	US (49 States)	EPA 10						
		Phase 1 federal standards			Phase 2 (2018-2027) federal standards			
	California	EPA 10						
		Compliance of older vehicles to EPA 10 - Optional low NOx limits						
		Phase 1 federal standards			Phase 2 (2018-2027) federal standards			
	China	China IV		China V		China VI		
	Phase 1 standards	Phase 2 standards		Phase 3 standards				
India	Bharat Stage IV				Bharat Stage VI			
	Phase 1 standards			Phase 2 standards				
Japan	Post New Long Term			2016 standards		2025 standards (proposed)		
	2015 standards							
Off-Highway	EU	Stage IIIB		Stage IV		Stage V		
	US	Tier 4 Interim						
		Tier 4 Final						
	China	Stage II			Stage III (Nationwide)		Stage IV (Beijing)	
		Stage IV Nationwide (revised - proposed)						
India	Bharat Stage III - Tractors and CEV					Bharat Stage IV - Tractors and CEV		Bharat Stage V - Tractors and CEV
Japan	2006 Non-road standards		2011 Non-road standards		2014 Non-road standards			
Rail	EU	Stage IIIA			Stage IIIB		Stage V (Locomotives and railcars)	
	US	Tier 2		Tier 3		Tier 4 Switch & line locomotives		
	India	Proposed standards under consideration						
	Australia	Code of practice - PM standards						

Source: Ricardo EMLEG Emissions Legislation database www.emleg.com