

# Delivering Excellence Through Innovation & Technology

**Ricardo plc**  
**Interim Results Presentation**  
Half year ended 31 December 2016  
February 2017



- Record order book at £244m (Jun 2016: £231m)
- Revenue up 6% to £167.0m (Dec 2015: £157.8m)
- Underlying<sup>(1)</sup> PBT up 5% to £15.1m (Dec 2015: £14.4m)
- Underlying<sup>(1)</sup> basic earnings per share up 7% to 22.3p (Dec 2015: 20.8p)
- Net debt of £47.0m after £3.7m net acquisition expenditure (Jun 2016 net debt: £34.4m)
- Interim dividend up 7% to 5.42p per share (Dec 2015: 5.07p)
- Acquisition of Motorcycle Engineering Italia (Exnovo) completed in the period and all prior acquisitions performing well
- Our progress on diversification across geographies and sectors provides us with a good platform for continued growth.

(1) Excluding specific adjusting items which comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.

|  | Half year ended<br>31 December |          | Year ended<br>30 June |
|--|--------------------------------|----------|-----------------------|
|  | 2016                           | 2015     | 2016                  |
| Order book                                   | £244m                          | £201m    | £231m                 |
| Order intake                                 | £181m                          | £163m    | £361m                 |
| Operating profit % <sup>(1)</sup>            | 9.8%                           | 9.7%     | 11.9%                 |
| Tax rate                                     | 22.3%                          | 23.5%    | 22.4%                 |
| EPS (basic) <sup>(1)</sup>                   | 22.3p                          | 20.8p    | 55.2p                 |
| Dividend                                     | 5.42p                          | 5.07p    | 18.1p                 |
| Net debt                                     | £(47.0)m                       | £(32.2)m | £(34.4)m              |
| Pension deficit (pre-tax)                    | £30.1m                         | £18.5m   | £21.5m                |
| Closing headcount (including subcontractors) | 2,909                          | 2,897    | 2,905                 |

(1) Excluding specific adjusting items which comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.

| £m                    | Half year ended<br>31 December    |                                   | H1 2016/17 v<br>H1 2015/16 |
|-----------------------|-----------------------------------|-----------------------------------|----------------------------|
|                       | 2016<br>Underlying <sup>(1)</sup> | 2015<br>Underlying <sup>(1)</sup> | % change                   |
| Revenue               | 167.0                             | 157.8                             | 6%                         |
| Gross profit          | 62.6                              | 62.0                              | 1%                         |
| Administration costs  | (46.3)                            | (46.7)                            | (1)%                       |
| Operating profit      | 16.3                              | 15.3                              | 7%                         |
| Net finance costs     | (1.2)                             | (0.9)                             | 33%                        |
| Profit before tax     | 15.1                              | 14.4                              | 5%                         |
| Taxation charge       | (3.3)                             | (3.5)                             | (6)%                       |
| Profit for the period | 11.8                              | 10.9                              | 8%                         |

(1) Excluding specific adjusting items which comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.

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

# Revenue by customer location



| External revenue £m  | Half year ended<br>31 December |              | Year ended<br>30 June |
|----------------------|--------------------------------|--------------|-----------------------|
|                      | 2016                           | 2015         | 2016                  |
| UK                   | 70.0                           | 72.5         | 154.2                 |
| Germany              | 14.3                           | 14.2         | 24.7                  |
| Netherlands          | 9.5                            | 8.8          | 18.5                  |
| Rest of Europe       | 17.2                           | 8.5          | 22.7                  |
| <b>Europe total</b>  | <b>111.0</b>                   | <b>104.0</b> | <b>220.1</b>          |
| <b>North America</b> | <b>19.6</b>                    | <b>18.1</b>  | <b>39.2</b>           |
| China                | 13.7                           | 11.8         | 21.4                  |
| Japan                | 8.2                            | 7.9          | 18.1                  |
| Rest of Asia         | 10.4                           | 12.6         | 26.7                  |
| <b>Asia total</b>    | <b>32.3</b>                    | <b>32.3</b>  | <b>66.2</b>           |
| Rest of the World    | 4.1                            | 3.4          | 6.9                   |
| <b>Total</b>         | <b>167.0</b>                   | <b>157.8</b> | <b>332.4</b>          |

## Half year ended 31 December

| £m                   | Revenue earned |              | Underlying operating profit <sup>(1)</sup> |             | Underlying operating profit <sup>(1)</sup> margin |             |
|----------------------|----------------|--------------|--|-------------|---|-------------|
|                      | 2016           | 2015         | 2016                                       | 2015        | 2016  | 2015        |
| Technical Consulting | 133.6          | 130.1        | 12.9                                       | 12.3        | 9.7%  | 9.5%        |
| Performance Products | 33.4           | 27.7         | 3.4  | 3.0         | 10.2%   | 10.8%       |
| <b>Total</b>         | <b>167.0</b>   | <b>157.8</b> | <b>16.3</b>                                | <b>15.3</b> | <b>9.8%</b>                                       | <b>9.7%</b> |

(1) Excluding specific adjusting items which comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.

| £m  | Half year ended<br>31 December |               | Year ended<br>30 June |
|---|--------------------------------|---------------|-----------------------|
|   | 2016                           | 2015          | 2016                  |
| Underlying operating profit                                     | 16.3                           | 15.3          | 39.6                  |
| Depreciation and amortisation                                   | 5.9                            | 5.0           | 10.5                  |
| Working capital increase  | (7.6)                          | (8.1)         | (17.1)                |
| Dividends   | (6.9)                          | (6.3)         | (8.9)                 |
| Tax paid  | (4.0)                          | (1.3)         | (4.5)                 |
| Capital expenditure   | (6.3)                          | (7.5)         | (14.7)                |
| Pension charge and funding                                      | (2.2)                          | (2.2)         | (4.4)                 |
| FX and net finance costs  | (2.2)                          | (2.0)         | (4.3)                 |
| Other   | (1.9)                          | 2.1           | 3.9                   |
| <b>Cash (outflow)/inflow excl. acquisition related payments</b> | <b>(8.9)</b>                   | <b>(5.0)</b>  | <b>0.1</b>            |
| Acquisition related payments                                    | (3.7)                          | (41.5)        | (48.8)                |
| <b>Cash (outflow)/inflow</b>                                    | <b>(12.6)</b>                  | <b>(46.5)</b> | <b>(48.7)</b>         |
| Opening Cash Balance  | (34.4)                         | 14.3          | 14.3                  |
| Closing Cash Balance  | (47.0)                         | (32.2)        | (34.4)                |

| £m                           | 31 December  |              | 30 June      |
|------------------------------|--------------|--------------|--------------|
|                              | 2016         | 2015         | 2016         |
| Tangible assets              | 54.1         | 52.0         | 53.6         |
| Intangible assets            | 95.9         | 79.4         | 92.3         |
| Inventory and receivables    | 149.2        | 127.4        | 119.9        |
| Net debt                     | (47.0)       | (32.2)       | (34.4)       |
| Trade and other payables     | (89.4)       | (86.8)       | (72.5)       |
| Pension deficit (net of tax) | (24.2)       | (14.8)       | (17.5)       |
| Other                        | (0.5)        | (2.0)        | (1.9)        |
| <b>Net assets</b>            | <b>138.1</b> | <b>123.0</b> | <b>139.5</b> |

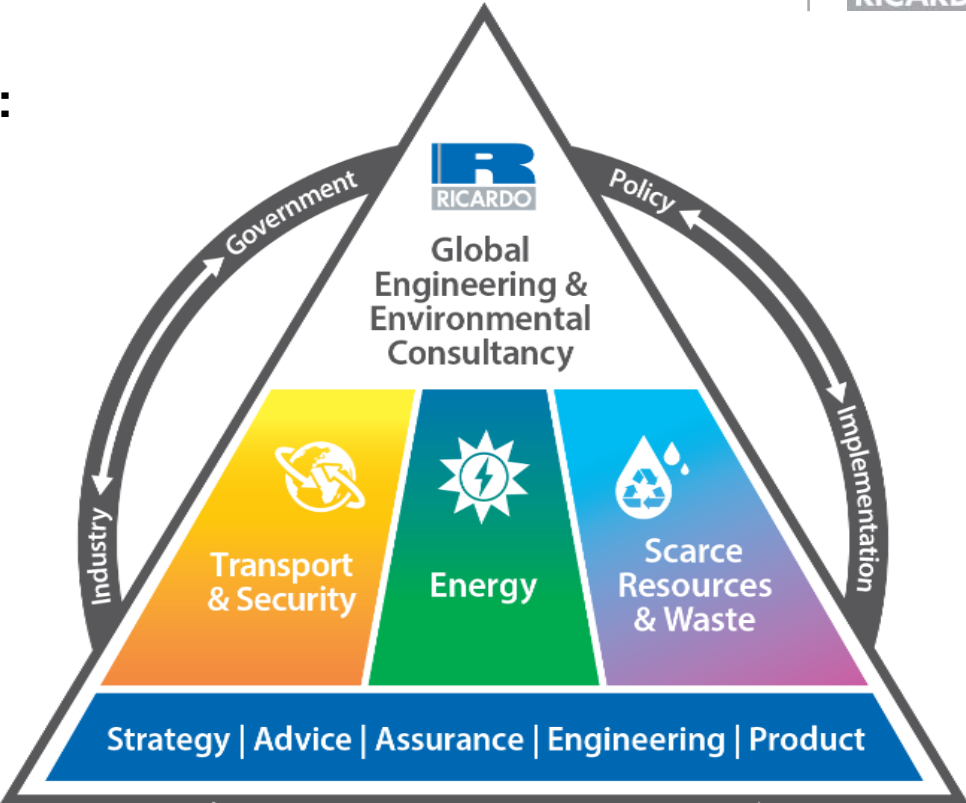


# Supported by a team of 2,900, a strategy for growth focused on global technical consulting and longer cycle revenues



## Megatrends driving focus for solutions:

- **Climate Change**  
(emissions and waste)
- **Urbanisation**  
(transport, energy, efficiency)
- **Resource Scarcity**  
(oil/water usage)
- **Energy Security**  
(renewables, bio-fuels)



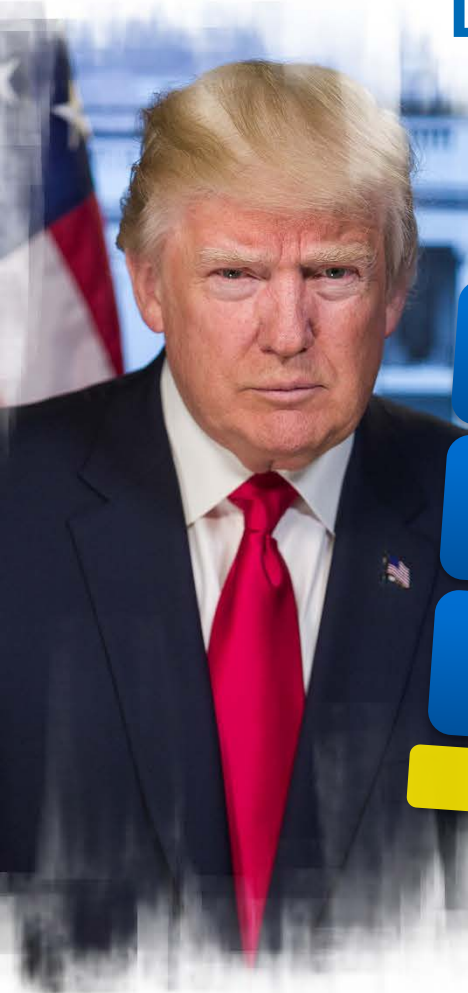
Our People  
Delivering Excellence Through Innovation & Technology

# Climate Change: is the new US administration a long-term or short-term distraction towards decarbonisation?

## Long-term issue

or

## Short-term distraction



US may frustrate future climate negotiations

US could withdraw from UNFCCC within a year

Expect less US spending on climate change

Paris Agreement is now international law

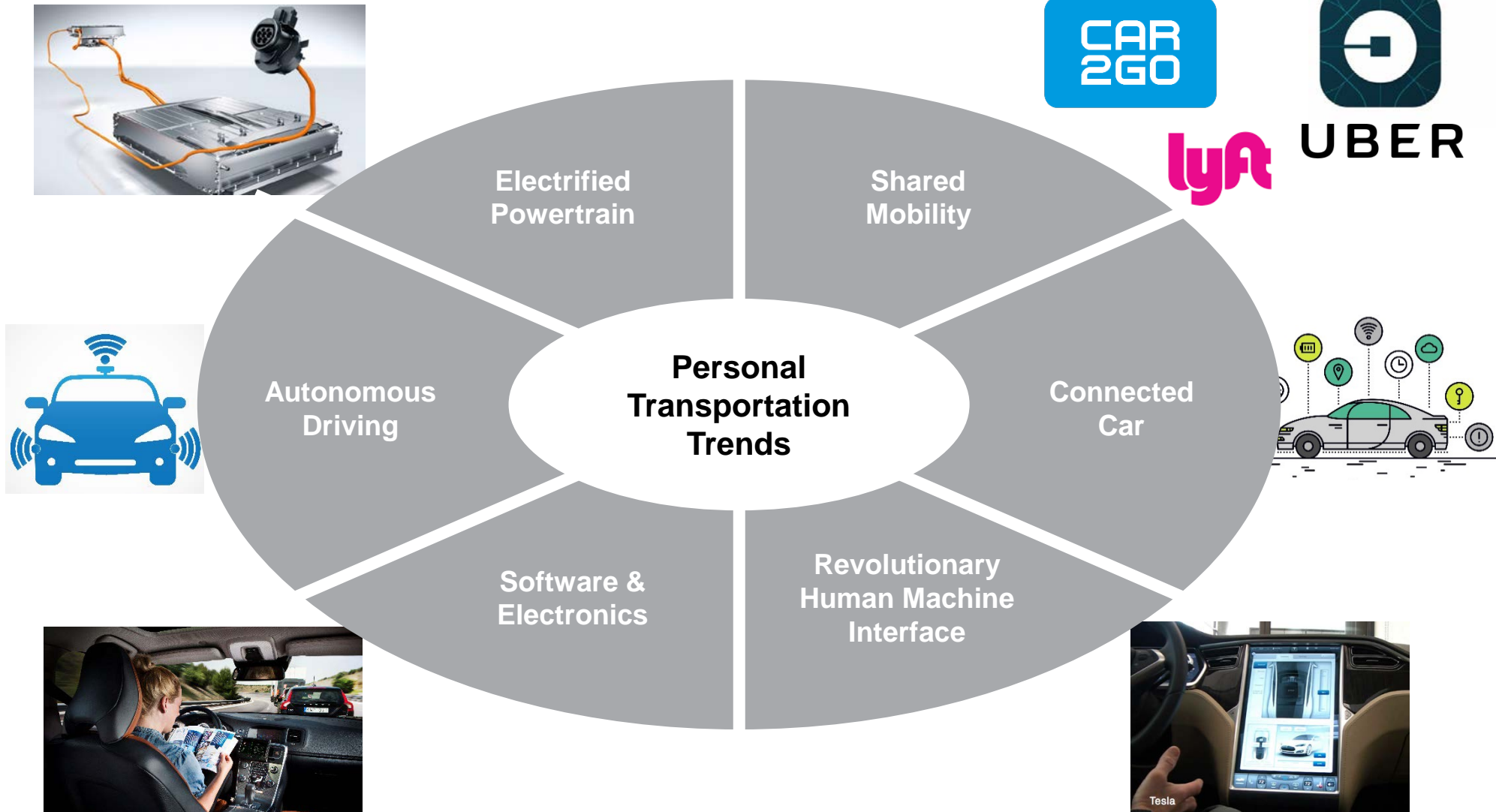
4 years to leave the Paris Agreement

All UN states are party to the UNFCCC

Momentum is not slowing down in our key markets



# Urbansation - Personal transportation will see a decade of unprecedented change driven by technology, consumer demand and political pressure on emissions control

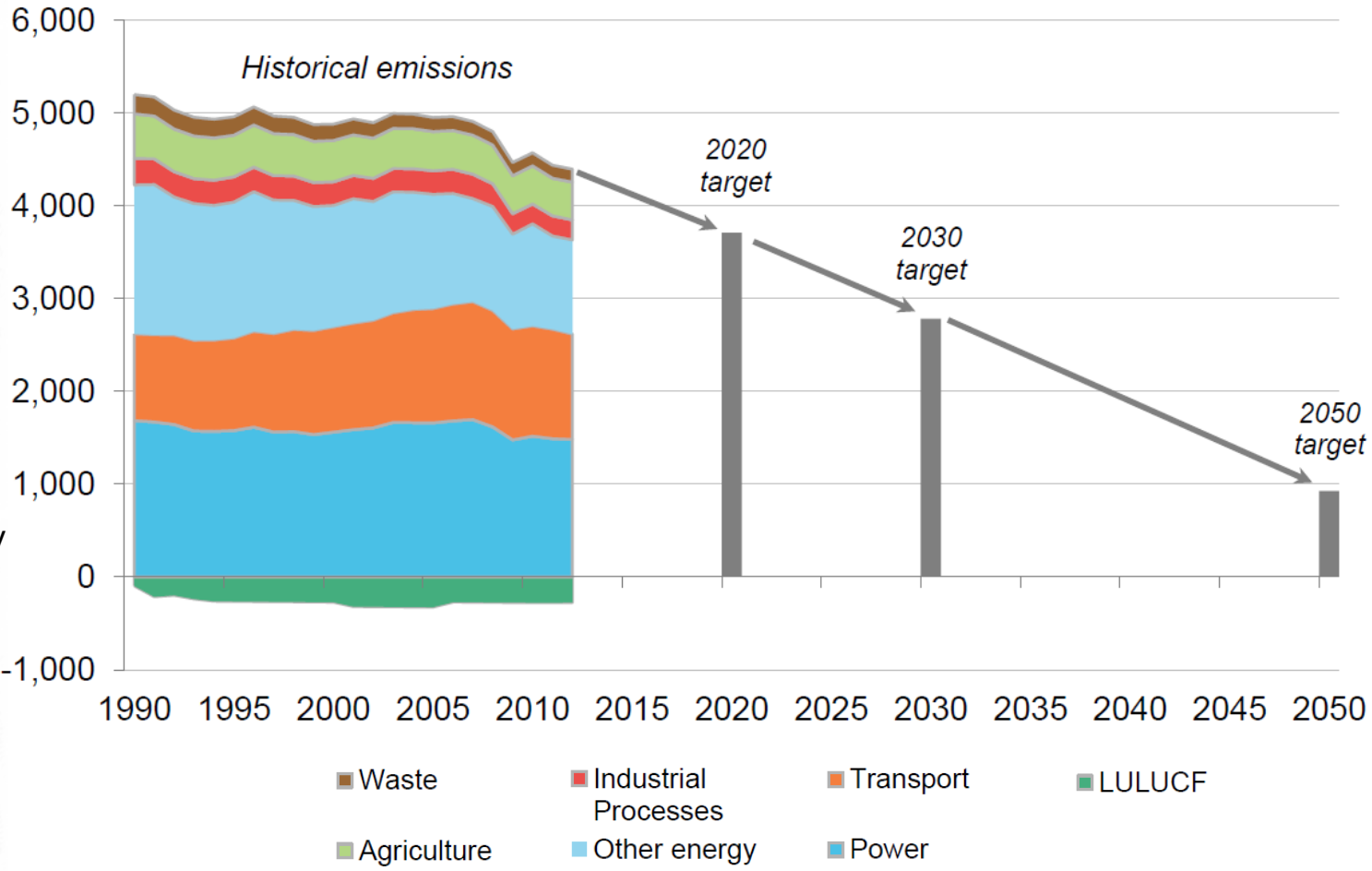


# >30% Battery Electric Vehicle (BEV) new car sales predicted in the largest automotive regions predicted; accelerated by bans of diesel vehicles in major cities and 2050 decarbonisation plans

**“Electric Cars 15-25% of new cars sales worldwide in 2025”**  
 Matthias Wissmann, VDA President

**“Volkswagen Group Electric Vehicle sales in Europe, China and USA 25% in 2025 and 50% by 2030”**  
 Volkswagen TOGETHER Strategy 2025

**“By 2025, 15-25% of all Mercedes new car sales with electric drive”**  
 Dr. Dieter Zetsche, CEO Daimler AG



EU carbon reduction commitments under Paris Agreement, MtCo2

# Diesalgate continues to generate headlines

**Nissan found guilty of using diesel emissions cheat device in South Korea**

Autocar  
9 Feb 2017

**First big German customer, Deutsche See, sues Volkswagen in diesel affair**

Reuters  
5 Feb 2017

**PSA Group is the latest carmaker to face scrutiny over its vehicles' pollution levels**

Le Parisien  
16 Jan 2017

**FCA named in second diesel engine lawsuit (Ram HD, Cummins 7 litre)**

The Detroit News  
28 Dec 2016

**VW and Freshfields mount defence as British car owners demand £3k each**

The Lawyer  
9 Jan 2017

**Renault shares fall after reports of diesel emissions probe by French prosecutors**

The Independent  
13 Jan 2017

**MEPs overhaul EU rules on car approvals to prevent further emissions scandals**

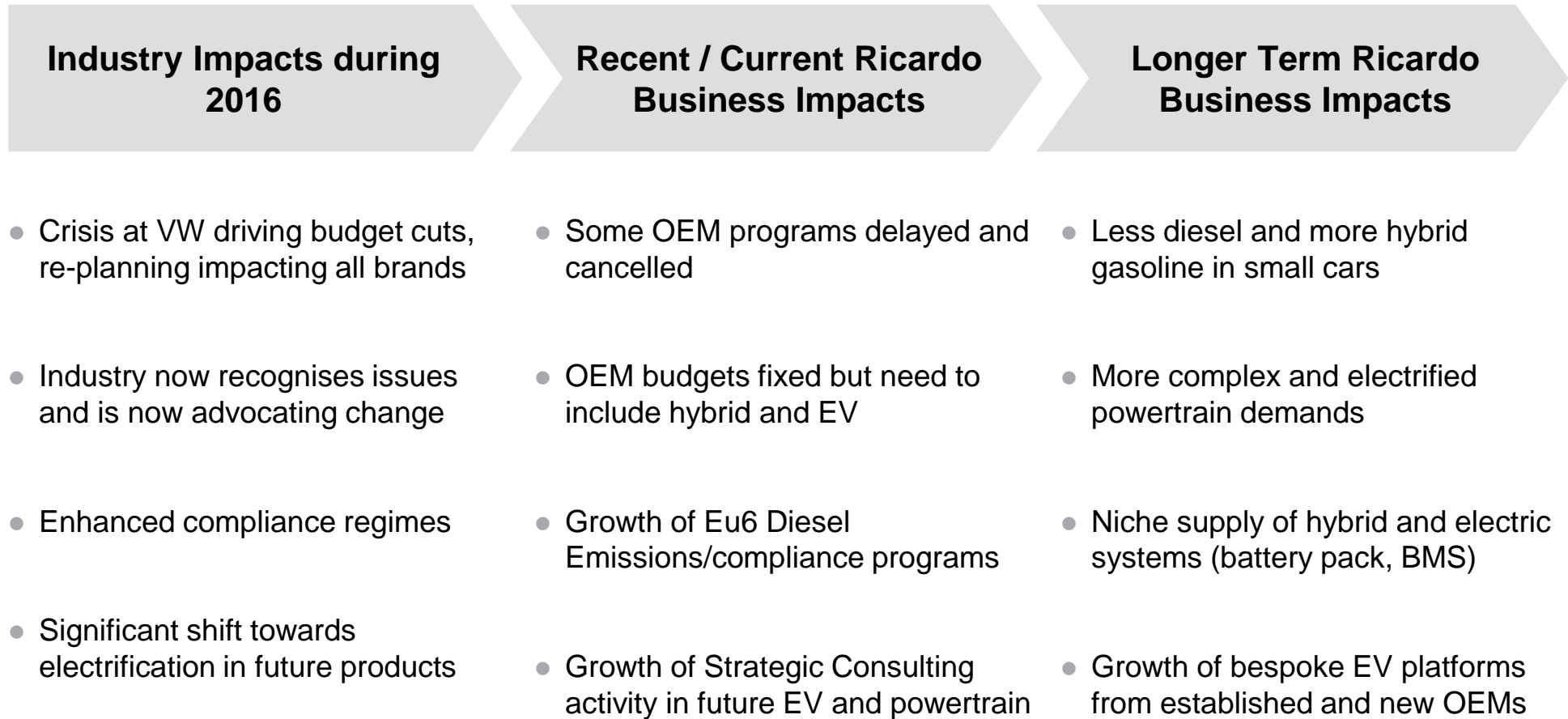
EU Parliament  
9 Feb 2017

**EPA accuses Fiat Chrysler of emissions cheating (Truck/SUV 3 litre V6)**

The Detroit News  
12 Jan 2017

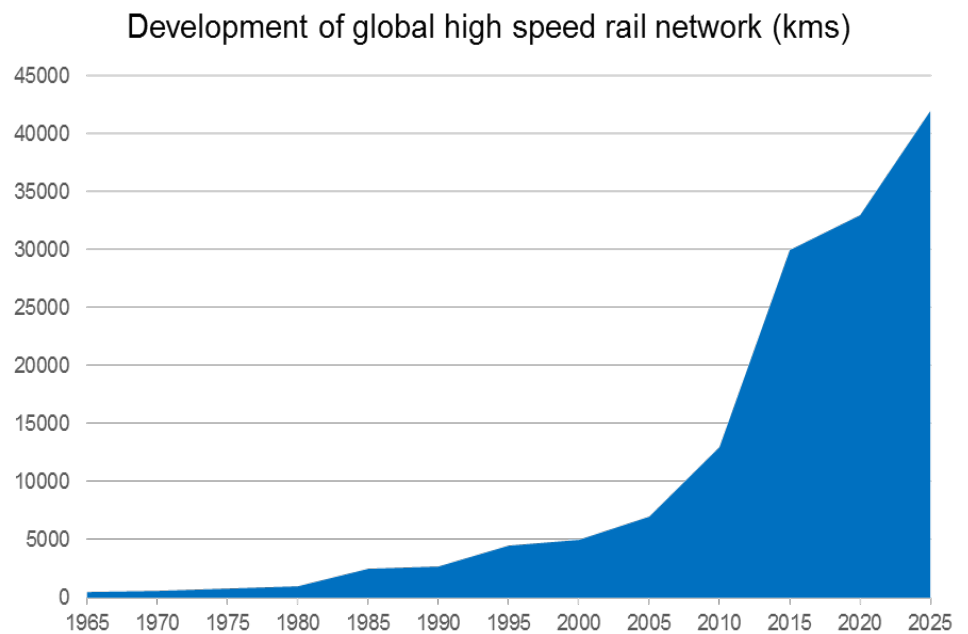
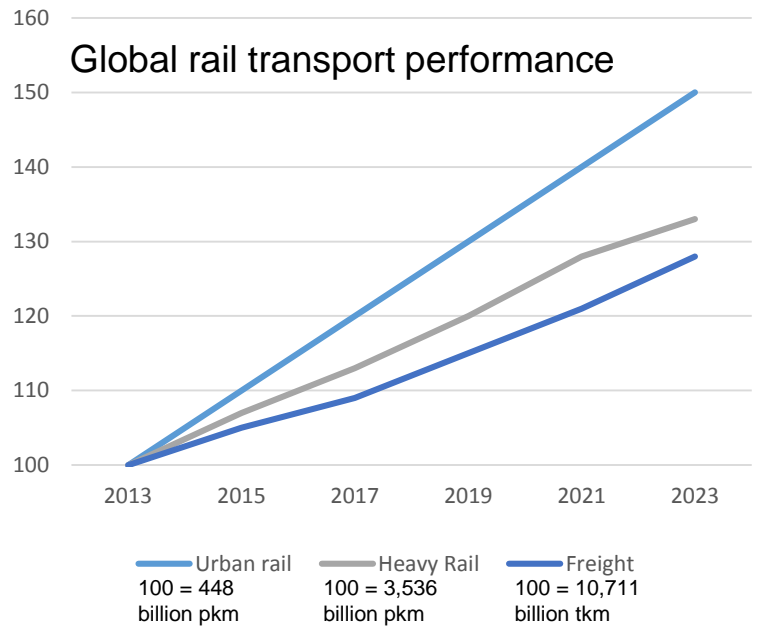
# Dieselgate has caused some short term uncertainty/delay while forcing re-planning and acceleration of future powertrain plans

## The pace of change towards electrified powertrain is accelerating



# Urbanisation – Transportation will require a mix of personal and mass transit solutions. The world is investing in Rail.

- Continued growth (usage) predicted for urban, heavy rail and freight rail
- China is the largest and fastest growing market: 2,700km of urban rail systems in operation with 2,800km under construction. EU, Middle East and Asia are also projected as increasing markets
- Rapid expansion of global High Speed Rail (> 250km/h) – more than half in China
- Rail industry body UIC predicts High speed Rail could exceed 80,000km by 2035



# The Rail sector is also going through an unprecedented change driven by usage growth, urbanisation demand, high speed rail adoption and digital technology application

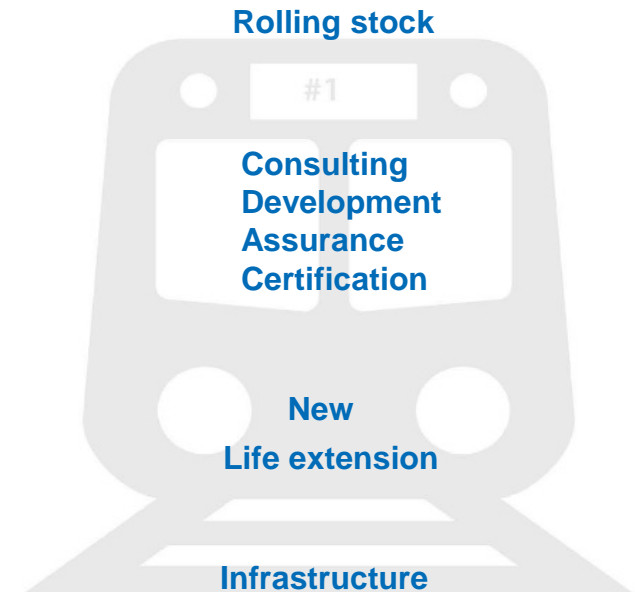
There is acceptance across the rail sector that **innovation** is required to meet global capacity constraints and rising costs...

**Globalisation** - the industry is slowly opening up as governments seek better value from capital investments. Legislation is being used to promote competition, leading to...

Common **standards and regulations** that place an expectation on the Rail industry...

**ERTMS**, a modern signalling and control system to replace the aging and incompatible systems in use around the world...

**Sophisticated digital systems** being introduced across every aspect of the industry





# Initial views re - impact to Ricardo of the key world changes in 2016

## Brexit



- Some post event disruption in Q1
- Business as usual - short to medium term
- Expect tight control on automotive spend (capex and products) to remain until tariff's and trade understood
- No material changes expected in UK-EU legislation or environmental standards
- UK to continue to export to EU, so no expectation for UK only product shift
- No medium term change with regards to EU technology funding for Ricardo
- UK infrastructure and transportation programmes
- UK industrial growth and export governmental support

## President Trump



- Focus on US jobs
- Increased US infrastructure spend
- Support to automotive industry as volume employer
- Increased defence expenditure
- Domestic gas to return as an energy source
- Environmental focus reduced
- Volatility
- Pro US business based, more difficult to export to US or take work from US to be done elsewhere
- New technology “space race” to establish US as world leader?



- Strong levels of new business in the Rail, Energy & Environment and High-Performance Vehicles
- Energy and Environment support to COP 22
- McLaren Automotive manufactured its 10,000<sup>th</sup> car with Ricardo-built engine
- Ricardo Certification business formally accredited by the UK Accreditation Service (UKAS)
- Environmental, social and governance practices achieve FTSE4Good Index status
- Full integration of the Rail business from previous owners
- Acquisition of Motorcycle Engineering Italia (Exnovo) completed

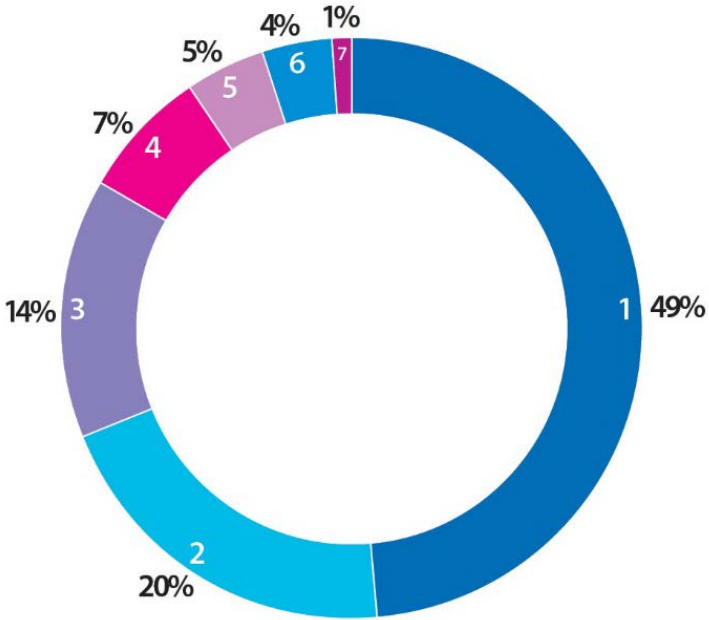


- Ricardo, McLaren and BMW developing next generation of high performance low carbon powertrains for supply by PP.
- Secured Aston Martin/Red Bull hyper car transmission, design contract and supply of 150 units.
- Discussions continue with US Congress for the supply of retrofit vehicle stability control systems for HMMWV. New near term opportunity to supply systems to new HMMWV vehicles.

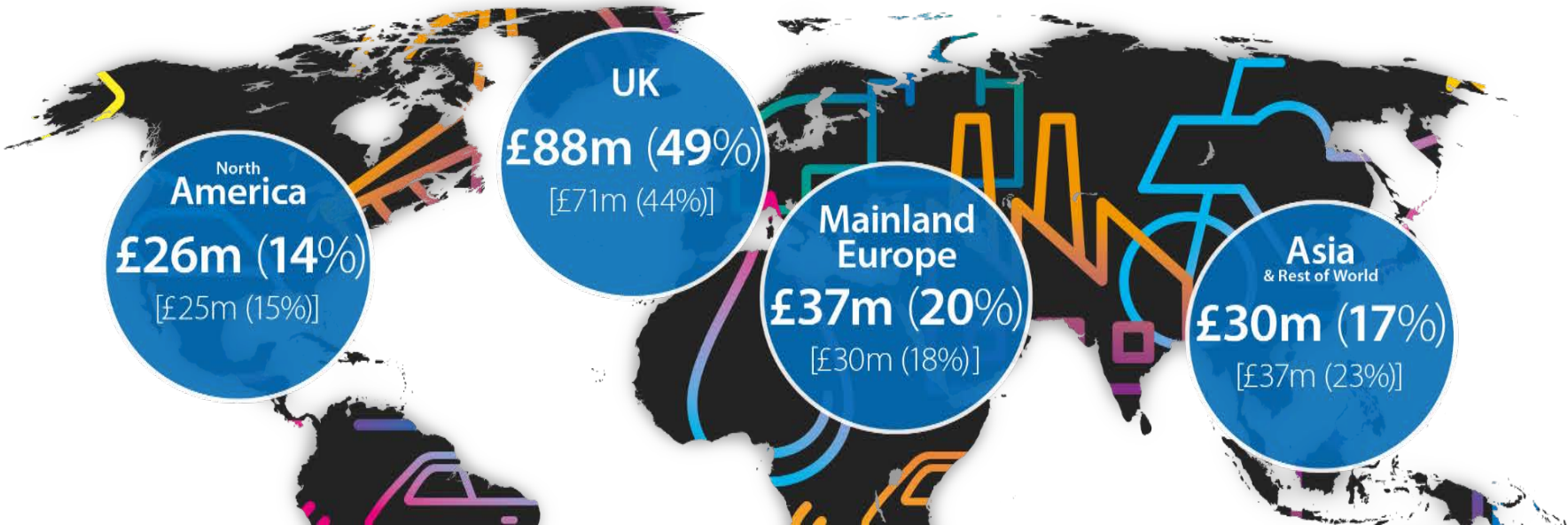
# A continued good balance of order intake and pipeline from across the globe



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



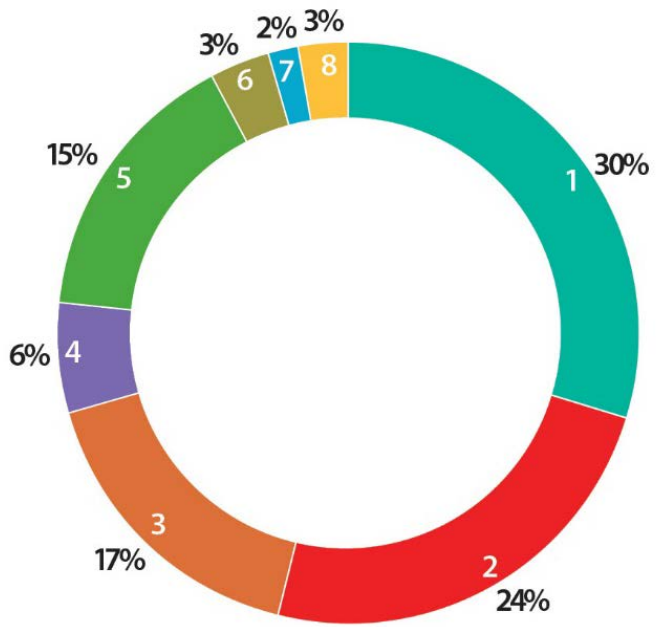
**H1 2016/17**  
 Order Intake £181m  
 (H1 2015/16  
 Order Intake £163m)



# Well balanced market sector order intake with a strong growth in Rail and Automotive



1. Automotive
2. High Performance Vehicles & Motorsport
3. Rail
4. Commercial Vehicle
5. Energy & Environment
6. Defence
7. Motorcycle
8. Off-Highway



**H1 2016/17**  
**Order Intake £181m**  
 (H1 2015/16  
 Order Intake £163m)

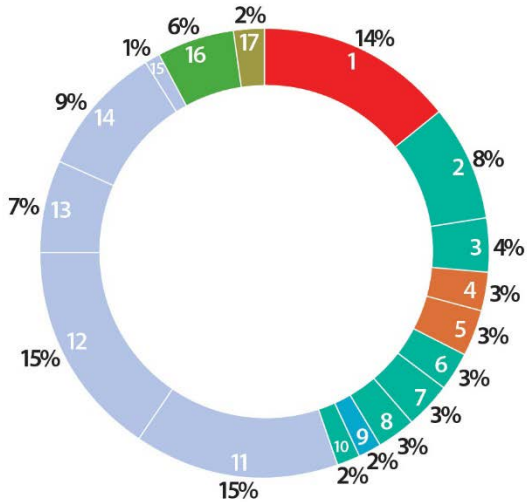
| E&E*                  | HPV&M                 | Off-Highway         | Rail                  | Automotive            | Motorcycle          | CV                    | Defence              |
|-----------------------|-----------------------|---------------------|-----------------------|-----------------------|---------------------|-----------------------|----------------------|
|                       |                       |                     |                       |                       |                     |                       |                      |
| <b>£28m</b><br>[£15m] | <b>£44m</b><br>[£34m] | <b>£5m</b><br>[£1m] | <b>£30m</b><br>[£28m] | <b>£54m</b><br>[£54m] | <b>£3m</b><br>[£6m] | <b>£11m</b><br>[£15m] | <b>£6m</b><br>[£10m] |

\*Includes order intake previously reported under clean energy and power generation

# Diverse customer mix, with increasing multi-year business



Ricardo plc External Order Intake by Customer for the six months ended 31 December 2016



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

**Key**

- High Performance Vehicles & Motorsport
- Automotive
- Rail
- Motorcycle
- Energy & Environment
- Defence



**H1 2016/17**  
**Order Intake: £181m**

(H1 2015/16)  
 Order Intake: £163m)

## Our people

# Emelia Holdaway

*International Climate Change Policy Manager, Climate Change and Sustainability Practice, Ricardo Energy & Environment*

*A key function of the International Climate Change Policy team is to help countries with the effective implementation of their Nationally Determined Contributions (“NDCs”) including climate change mitigation and adaptation, and how to finance these activities. COP21 in Paris really got the ball rolling, and this momentum was built-upon in Marrakech at COP22. My role at Ricardo Energy & Environment is to work alongside and support governments, providing them with practical solutions for implementing their NDCs.*



## Our people

### Shakeel Meharban

Senior Commercial Manager, Ricardo Rail

*The formation of Ricardo Rail has provided a strategic opportunity to grow the Ricardo brand, its reach and its capabilities in the global rail market, with a particular focus on designing and manufacturing innovative products. Already, we have experience of the delivery of innovations including train and infrastructure monitoring hardware and software solutions, new designs for more reliable and faster switching, together with training products to support energy-efficient driving. In my role as senior commercial manager, my aim is to help expand our business within the sector, delivering innovative products to market which meet the technology demands of the global rail industry.*





A man in a dark blue suit and glasses sits on a teal chair. Behind him is a white motorcycle with its headlight on. The background is a wall with faint technical drawings.

## Our people

### Dipak Mistry

*Head of project management and urban mobility, Ricardo Motorcycle*

*Ricardo Motorcycle has grown both internally and through acquisition to become one of the world's foremost independent design and engineering partners to the motorcycle, scooter and wider urban mobility vehicle sectors. As head of project management I am responsible for a large team consisting of senior project leaders and administrators, while also acting as the project director of the largest programme currently being executed by the motorcycle business, the development of a complete vehicle including powertrain.*

## Summary for period and outlook

- Good overall performance from an increasingly diversified business
- Order intake up 11% to £181m (Dec 2015: £163m)
- Revenue up 6% to £167.0m (Dec 2015: £157.8m)
- Underlying<sup>(1)</sup> PBT up 5% to £15.1m (Dec 2015: £14.4m)
- Record period end order book of £244m at end of December 2016
- Prior acquisitions performing well with good order intake in Rail, Energy & Environment
- 10,000<sup>th</sup> engine delivered to McLaren and new development programme signed
- Our progress on diversification across geographies and sectors provides us with a good platform for continued growth.

(1) Excluding specific adjusting items which comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.



# Income Statement – Underlying and total Group



Half year ended 31 December

| £m                    | 2016       |                          |        | 2015       |                          |        | Year on Year growth |       |
|-----------------------|------------|--------------------------|--------|------------|--------------------------|--------|---------------------|-------|
|                       | Underlying | Specific adjusting items | Total  | Underlying | Specific adjusting items | Total  | Underlying          | Total |
| Revenue               | 167.0      | -                        | 167.0  | 157.8      | -                        | 157.8  | 6%                  | 6%    |
| Gross profit          | 62.6       | -                        | 62.6   | 62.0       | -                        | 62.0   | 1%                  | 1%    |
| Administration costs  | (46.3)     | (3.0)                    | (49.3) | (46.7)     | (1.2)                    | (47.9) | (1)%                | 3%    |
| Operating profit      | 16.3       | (3.0)                    | 13.3   | 15.3       | (1.2)                    | 14.1   | 7%                  | (6)%  |
| Net finance costs     | (1.2)      | -                        | (1.2)  | (0.9)      | -                        | (0.9)  | 33%                 | 33%   |
| Profit before tax     | 15.1       | (3.0)                    | 12.1   | 14.4       | (1.2)                    | 13.2   | 5%                  | (8)%  |
| Taxation charge       | (3.3)      | 0.6                      | (2.7)  | (3.5)      | 0.4                      | (3.1)  | (6)%                | (13)% |
| Profit for the period | 11.8       | (2.4)                    | 9.4    | 10.9       | (0.8)                    | 10.1   | 8%                  | (7)%  |

(1) Specific adjusting items comprise amortisation of acquired intangible assets and acquisition-related expenditure. In the prior period, non-recurring income for claims under the Research & Development Expenditure Credit ('RDEC') scheme in respect of prior years was also included in specific adjusting items.

# Specific adjusting items



| £m  | Half year ended 31 December |            | Year ended 30 June |
|---|-----------------------------|------------|--------------------|
|   | 2016                        | 2015       | 2016               |
| Amortisation of acquisition related intangible assets             | 1.9                         | 1.7        | 3.4                |
| Acquisition-related costs associated with LR Rail                 | 0.5                         | 0.6        | 1.6                |
| Other acquisition-related costs                                   | 0.6                         | 0.4        | 1.2                |
| Income for claims under the RDEC scheme in respect of prior years | -                           | (1.5)      | (1.5)              |
| <b>Total specific adjusting items</b>                             | <b>3.0</b>                  | <b>1.2</b> | <b>4.7</b>         |

# Global tailpipe and CO<sub>2</sub> emissions legislation adherence are “must haves” in the development budget of many of our clients



|   | 2010           | 2015  | 2020  | 2025   |                             |
|---|----------------|---|---|--|-----------------------------|
| Automotive & LCV                                  | Europe         | Euro 5  | Euro 6a<br>Euro 6b<br>Passenger Cars 130 g/km   | Euro 6d - Temp<br>Euro 6d - WLTP & RDE<br>Passenger Cars 95 g/km | Passenger Cars 68 - 78 g/km |
|   | US (49 States) | Tier 2<br>8.55 l/100km Cars & LCV                                     | Tier 3<br>6.2 l/100km Cars & LCV  |  | 4.3 l/100km Fleet Average   |
|   | California     | LEV II (2009)<br>27.6/20.3 mpg Fleet/Trucks                           | LEV III<br>6.4 l/100km Fleet Average  | 5.1 l/100km Fleet Average  | 3.8 l/100km Fleet Average   |
|   | China          | CN4 (Euro 4)<br>Phase 2 (6.2-13.9 l/100km) Phase 3 (5.2-11.5 l/100km) | CN5 (Euro 5)  | China 6a - WLTP & RDE  | China 6b                    |
|   | India          | Bharat Stage IV (Euro 4 Equivalent)                                   |   | Bharat Stage VI (Euro 6 Equivalent)                              |                             |
|   |                |   | CAFE Based on Vehicle Mass-Based Formula  | 5.5 l/100km CAFE Target  | 4.5 l/100km CAFE Target     |
|   | Japan          | Post New Long-Term  | 4.4-11.5 l/100km Mass-Based   | 4-9.4 l/100km Mass-Based   |                             |
| Motorcycle & Personal Transportation              | Europe         | Euro 3  | Euro 4  | Euro 5   |                             |
|   | US (49 States) | Classes I, II & III   | Harmonisation with California   |  |                             |
|   | California     | California Motorcycle Limits  |   |  |                             |
|   | China          | Stage III   | WMTC Adoption with Euro 4 Limits  |  |                             |
|   | India          | Bharat Stage III  | Bharat Stage IV   | Bharat Stage VI (Proposed)                                       |                             |
|   | Japan          | ISO 6460 Limits 0-125cc / >125 cc                                     | ISO 6460 & WMTC   | Euro 4   | Euro 4                      |
|   | Taiwan         | Euro 3  |   | Euro 4   |                             |
| Commercial Vehicles (Medium- & Heavy-Duty Trucks) | Europe         | Euro V  | Euro VI   |  | Euro VII                    |
|   | US (49 States) | EPA 07  | Federal CO <sub>2</sub> Emissions Standards   |  |                             |
|   | California     | EPA 07  | Optional low NOx limits<br>Federal CO <sub>2</sub> Emissions Standards  |  |                             |
|   | China          | Euro IV   | Euro V  | Euro VI  |                             |
|   | India          | Bharat Stage IV   | Mass-Based Limits for Semi-Trailer and Tow Truck, Auto-Dumper, Bus and City Bus                                 |  |                             |
|   |                |   | No current fuel economy standards, but in 2014 the government announced an initiative to develop such standards |  |                             |
|   | Japan          | Post New Long Term  | Lowering NOx Limits of Post New Long-Term Standards   |  |                             |
| Off-Highway                                       | Europe         | Stage IIIB  | Stage IV  | Stage V  |                             |
|   | US             | Tier 4 Interim  | Tier 4 Final  |  |                             |
|   | China          | Stage II  | Stage III (Nationwide) - Stage IV (Beijing)   |  |                             |
|   | India          | Bharat (Tractors and CEV) Stage III                                   |   |  |                             |
|   | Japan          | 2011 Non-Road Special Vehicle Standards                               | 2014 Non-Road Special Vehicle Standards   |  |                             |
|   |                |   | Lowering NOx Limits of Post New Long-Term Standards   |  |                             |
| Rail  | Europe         | Stage IIIA  | Stage IIIB  | Stage V  |                             |
|   | US             | Tier 2  | Tier 3  | Tier 4 Switch & Line Locomotives                                 |                             |
|   | India          | Not Yet Regulated   |   |  |                             |
|   | Australia      | Not Yet Regulated   |   |  |                             |

■ Pollutant Emissions Legislation    ■ Available Fuel economy or CO<sub>2</sub> Emissions Legislation

## Glossary

**CAFE** Corporate Average Fuel Economy

**cc** Engine displacement in Cubic Centimetres

**CEV** Construction Equipment Vehicles

**CO<sub>2</sub>** Carbon dioxide

**EPA** Environmental Protection Authority of the United States

**g/km** grams per kilometre

**ISO** International Organisation for Standardisation

**l/100km** litres per 100 kilometres

**LCV** Light Commercial Vehicle

**LEV** Low-Emission Vehicle

**NOx** Oxides of Nitrogen

**RDE** Real-world Driving Emissions

**WLTP** Worldwide harmonised Light vehicles Test Procedures

**WMTC** World Motorcycle Test Cycle