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# Railway Systems Business Unit Business Strategy

Hitachi IR Day 2017

**June 8, 2017**

**Alistair Dormer**

**Senior Vice President and Executive Officer,  
CEO of Railway Systems Business Unit  
Hitachi, Ltd.**

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# 1-1. We have built a rail business with an integrated offering

53%

## ROLLING STOCK

26%

## SIGNALLING & SYSTEMS

### Rolling Stock

### Components

### Signalling & Traffic Management

### Station & Information Solutions



Very High Speed



Shinkansen



Bogies



Interlocking



Satellite Train Control



Passenger Information



Commuter



Intercity



Traction Motor



CBTC



Components



Ticketing & Payment



LRV



Metro



Traction Inverters & Transformers



TMS



ETCS



Security



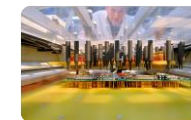
Monorail



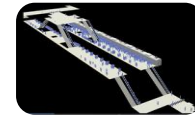
HVAC



Driverless



Facility Control



Crowd Flow Management

8% O&M



RS Refurbishment



RS Maintenance



Signalling O&M



Asset Management

13% TURNKEY

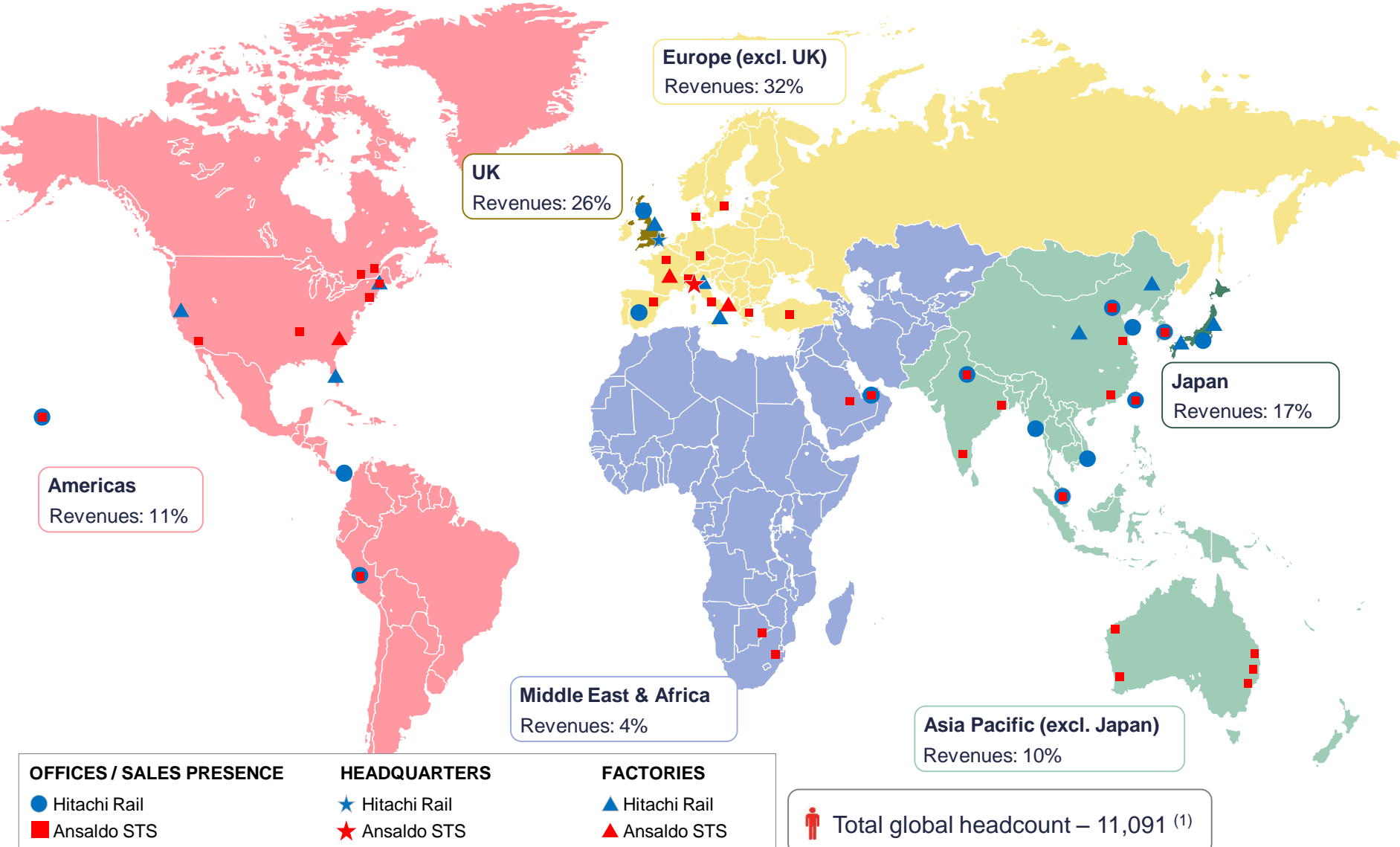


LRV: Light Rail Vehicle, HVAC: Heating, Ventilation and Air Conditioning, TMS: Train Management System, ETCS: European Train Control System, CBTC: Communications-based Train Control, O&M: Operations & Maintenance, RS: Rolling Stock

● As a % of FY16 revenues

# 1-2. We have an international footprint...

We have a geographically diverse business with the ability to bid effectively on major projects all over the world



Note: Percentages represent geographical split of FY16 revenues.  
(1) – Headcount as at 31 March 2017

# 1-3. ...and a global management team



**Alistair  
Dormer**

**Chief Executive Officer**



**Kentaro  
Masai**

**Chief Operating Officer**



**Keisuke  
Yabuta**

**Chief Financial Officer**



**Tetsuya  
Yamada**

**Chief Human Resources  
Officer**



**Shinya  
Mitsudomi**

**Group Head of Sales and  
MD Japan & APAC**



**Karen  
Boswell**

**Chief Administration  
Officer and  
MD Hitachi Rail Europe**



**Maurizio  
Manfellotto**

**CEO – Hitachi Rail Italy**



**Andy  
Barr**

**CEO – Ansaldo STS**



**Noriharu  
Amiya**

**Chief Digitalisation  
Officer and Integration  
Director**

# 1-4. We continue to grow, although this year has shown our increased exposure to FX changes

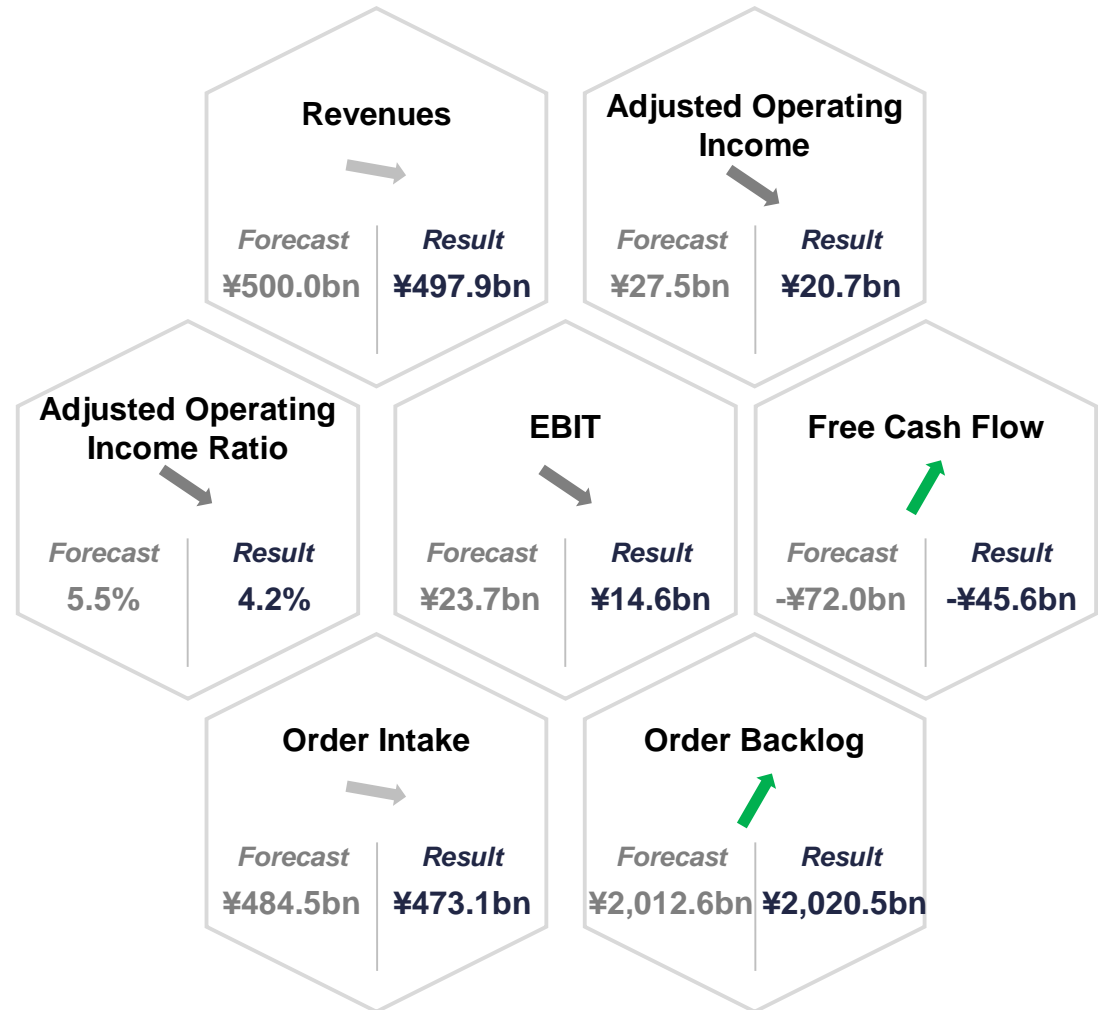
## FY2016 Results



New Rock regional double-deck train

### Key observations

- Brexit caused a significant devaluation of the Pound
- Excluding the impact of FX, revenues and order intake were ahead of forecast
- We have hedging contracts on our projects to minimise the cash impact of currency fluctuations on projects, but we still report all data in Yen
- Currency fluctuations will continue to impact reported figures on translation as sales in Yen now make up less than 20% of our business



Note: Forecast as of 1 June 2016.

FX rate used at June 2016 forecast - £:¥ = 1:160. FX rate used at FY2016 results - £:¥ = 1:142

EBIT = Earnings before Interest and Taxes

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# 2-1. We are investing in our future and delivering for our customers

## Delivering Projects



Testing began on the first of 70 commuter trains for Scotland



The first driverless train for new Lima Metro arrived in Peru



First train delivered to Miami Dade County USA as part of 68 Metro train contract



Delivered first 4 cars of 68 car order to Taipei Metro for driverless metro system



Hitachi-built battery powered trains began operation for Kyushu Railway Company & East Japan Railway Company

## Investing in Facilities



Our newly-refurbished UK Doncaster maintenance depot receives its first train



Inauguration of new Pistoia Italy Testing Facility attended by then Prime Minister Matteo Renzi



Production started at Pistoia Italy on GWR contract for the UK



Our purpose-built IEP maintenance depot in Swansea UK became operational

## Key Achievements



The first UK-built IEP train was unveiled at Newton Aycliffe manufacturing facility



Hitachi Rail and Trenitalia unveiled new double-deck regional train - Rock



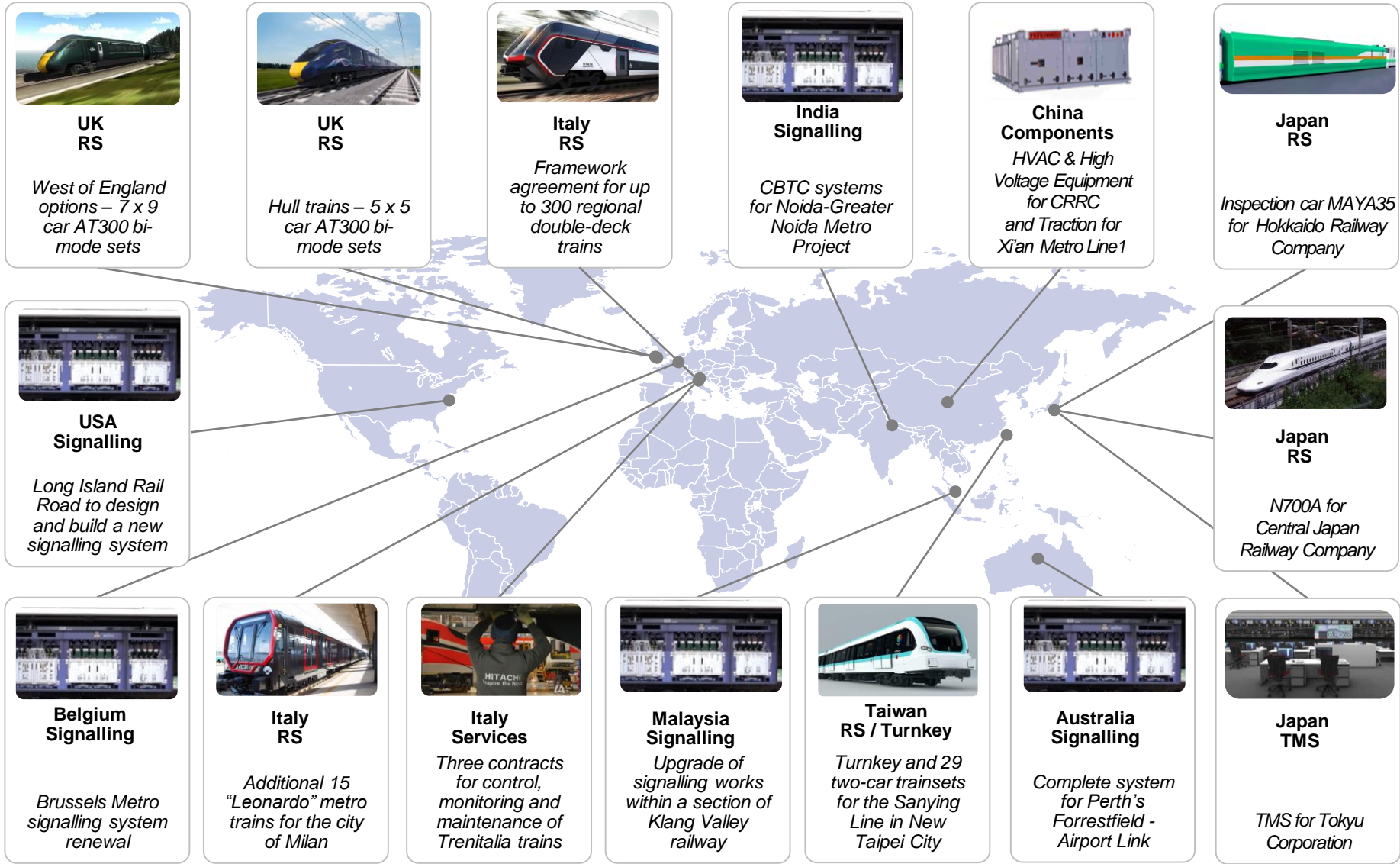
Hitachi Rail showcased its integrated global rail offering at the bi-annual InnoTrans exhibition in Berlin Germany



20<sup>th</sup> anniversary for Hitachi designed Tokyo Area Traffic Management System



# 2-2. We continue to win major contracts in the global market



CRRC: China Railway Rolling Stock Corporation

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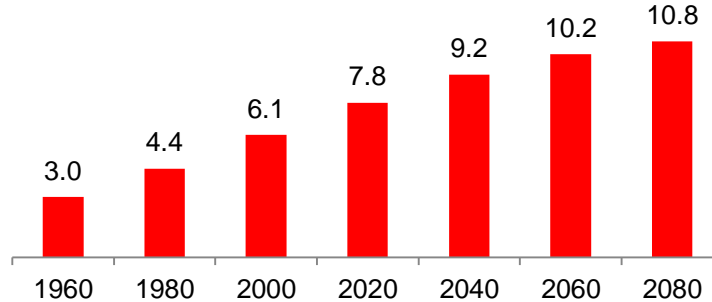
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# 3-1. Rail industry demand is underpinned by strong fundamentals

## Population Growth



Global Population (billions) <sup>(1)</sup>

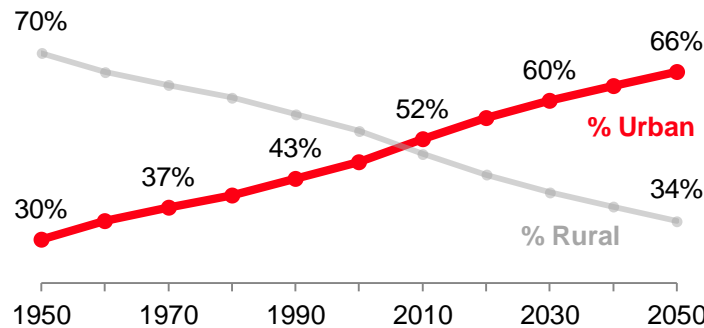


- Global population is forecast to grow to approximately 10.8 billion by 2080
- Rail will play an increasingly important role in the mass transit segment of travel as global population grows

## Urbanisation



Percentage of People Living in Urban Areas <sup>(2)</sup>



- Significant increase in urbanisation over the last century, which is forecast to continue
- Urban mobility has been a key factor in enabling this change
- Inner-city, metro and commuter rail demand will increase with continued urbanisation

## Environment



Greenhouse Gas Emissions by Travel (grams of CO<sub>2</sub> per passenger km) <sup>(3)</sup>



170g



150g



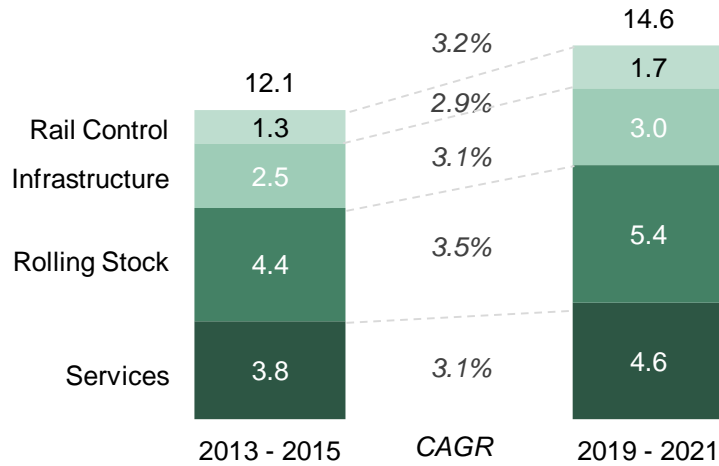
30g – 70g

- As population and urbanisation increases, reducing CO<sub>2</sub> emissions will become an increasingly politically sensitive issue
- Rail could play a key role reducing CO<sub>2</sub> emissions

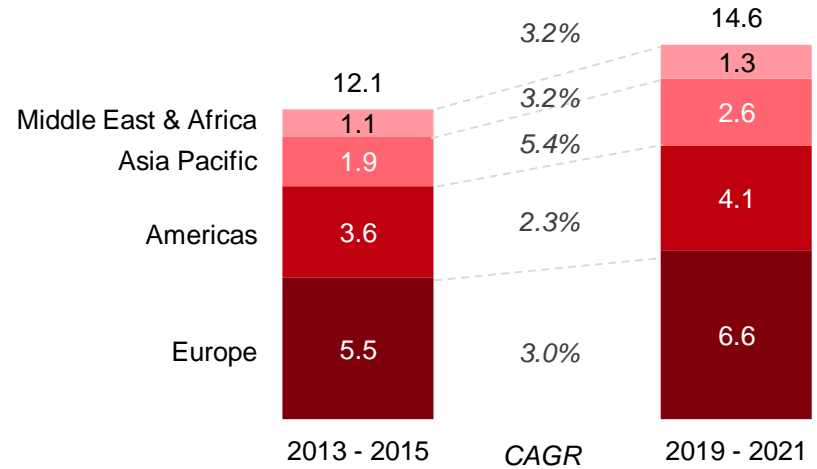
# 3-2. We are well placed to compete in growing markets

Our core geographical and product markets are forecast to continue to grow strongly to 2021

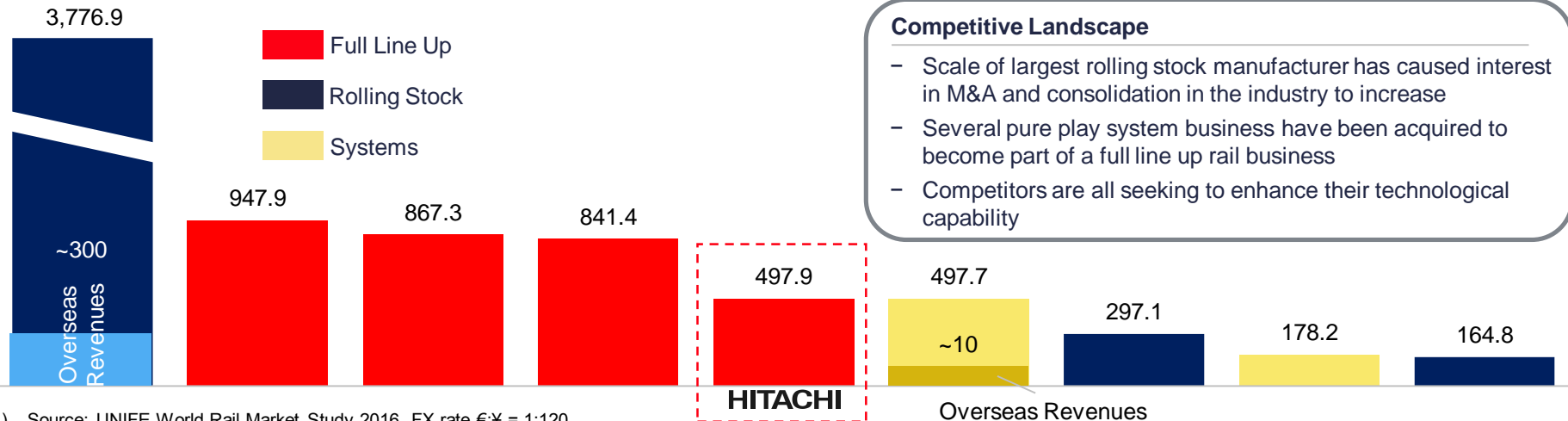
Market Growth by Product (1) ¥ trillion



Market Growth by Geography (1) ¥ trillion



Market Position by FY2016 Revenue (2) ¥ billion



### Competitive Landscape

- Scale of largest rolling stock manufacturer has caused interest in M&A and consolidation in the industry to increase
- Several pure play system business have been acquired to become part of a full line up rail business
- Competitors are all seeking to enhance their technological capability

(1) Source: UNIFE World Rail Market Study 2016. FX rate €:¥ = 1:120

(2) Financials calendarised to March 2017. Source: Annual reports, broker estimates and Capital IQ consensus estimates. Average FX rate over last 12 months from 31 March 2017 used.

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# 4-1. Our ambition is to become a ¥1 trillion business

## Strategy overview

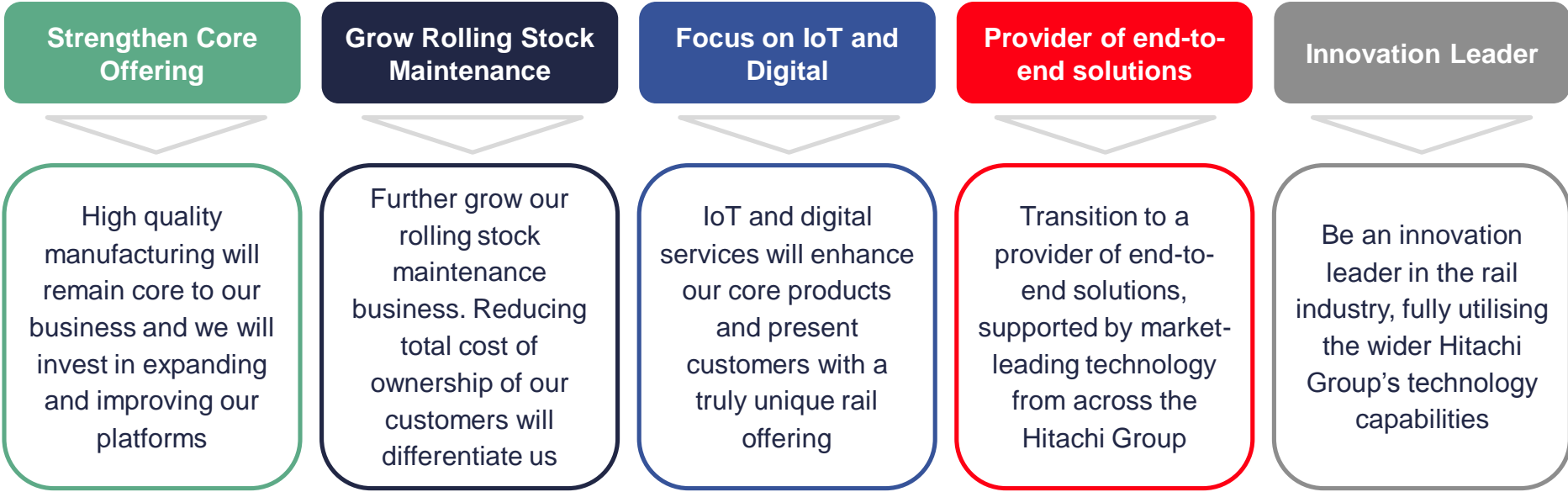
- Hitachi Rail has become a major global player within the rail industry and we have ambition to grow further
- We aim to become a ¥1 trillion revenue business with market leading profit margins by:
  - Further strengthening our product offering and leading the way in innovation
  - Continuing the transformation of our business and operations
  - Using M&A to further grow and differentiate our offering



*“Our aim is to become a ¥1 trillion revenue business by the early 2020s”*

Mr Toshiaki Higashihara –  
President and CEO, Hitachi, Ltd

### Our key areas of external focus that will allow us to achieve our ambitions



IoT = Internet of Things



# 4-2. Strategy to action – strengthen core offering

*High quality manufacturing will remain at the core of our business and is an enabler for our wider product offering*

## Investing in our rolling stock platforms

### EMU

- Double-deck EMU developed in Italy
- Signed framework agreement with Trenitalia for supply of up to 300 new trains
- Will target Western Europe and Israel for further contract wins

### LRV

- New low-floor LRV is in development to address growing market segment
- Italy, Germany, the Nordics and North America are all target geographies

### VHS

- Will utilise knowledge and experience from both Shinkansen and IEP trains
- Will enable us to bid on large projects such as HS2
- North American and Asian market also a target for this product

### Metro

- We are currently designing a new Metro platform in partnership with Bombardier Transportation in order to bid on TFL's New Tube for London (NTfL) order



Conceptual design of our new VHS train platform



Conceptual design of our new Metro train platform for NTfL

## How does strengthening our core offering contribute to our financial objectives?

### Increase global market share

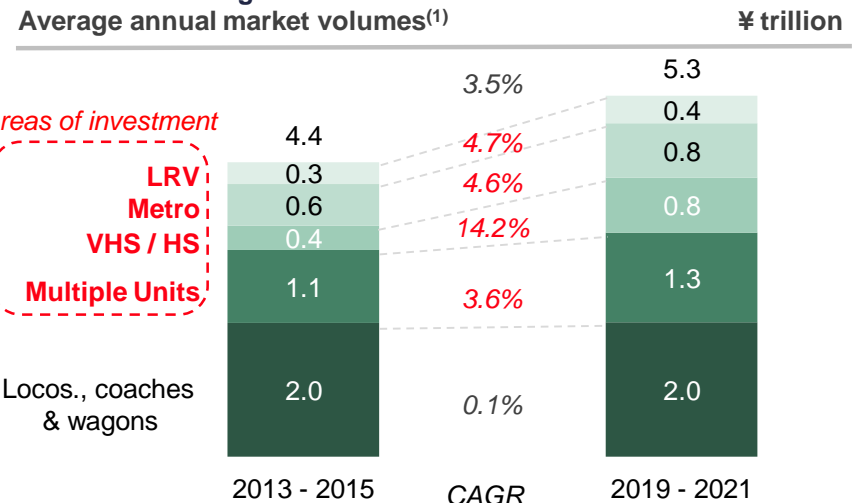
- Expands the number of projects that we can bid on, including in new geographies
- Enhances our turnkey and combined rolling stock and maintenance offering, diversifying our revenue mix
- Updated platforms make our bids more competitive

### Expand project margins

- Newly designed platforms take advantage of global production methods, eliminating waste and reducing cost
- Aligned design of new platforms will allow us to utilise global production capacity in most efficient way

## Market size for core products

We are investing in product areas forecast for strong growth over the medium to long term



Sources: (1) UNIFE Market Study. FX conversion €:¥ 1:120. Automated Vehicles category excluded from analysis  
EMU = Electric Multiple Unit, LRV = Light Rail Vehicle, VHS = Very High Speed; TFL = Transport for London

# 4-3. Strategy to action - grow rolling stock maintenance

*Hitachi has already had success in winning large, long-term rolling stock maintenance contracts and we plan to utilise technology to further grow this area of the business*

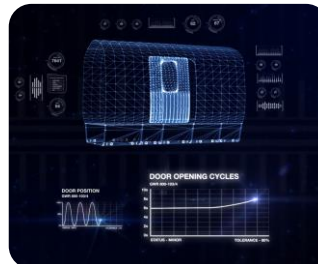
## An overview of our current rolling stock maintenance business

- Hitachi Rail has over 50 maintenance sites worldwide
- We have invested in our facilities, most recently in Doncaster and Swansea (UK), to provide the additional capacity required to deliver our recent contract wins
- We have won several major maintenance contracts including:
  - 27.5 year IEP contract
  - Several other UK contracts
  - Trenitalia ETR1000, ETR500, and TSR trains



## IoT and Digital Solution for Rail Maintenance

- Hitachi Rail aims to differentiate its rail maintenance offering by:
  - ✓ Gathering vast quantities of data – over 1,000 sensors will update 5 times per second generating around 25GB of data per train per day
  - ✓ Using predictive analytics to increase reliability and optimise efficiency in maintenance operations
  - ✓ Utilising data harvested to improve future train design considering whole life costs
  - ✓ Combining our industry knowledge with Hitachi Group's existing IoT capabilities (Lumada) to efficiently analyse this data and turn it into transformative new rail solutions

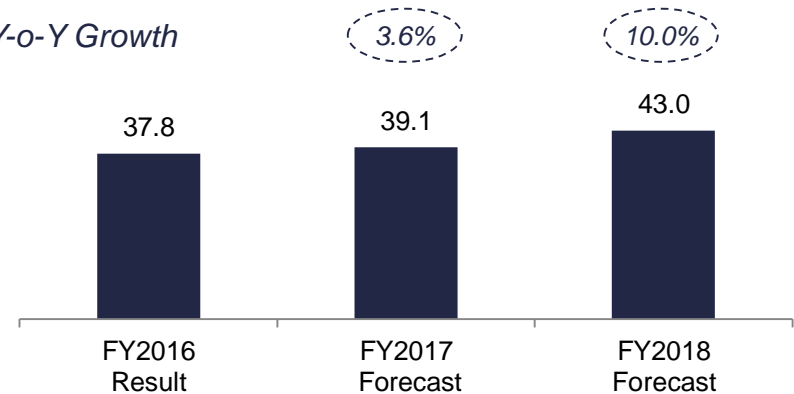


## Increase maintenance revenues

O&M revenues

¥Billions

Y-o-Y Growth



*How does growing our rolling stock maintenance contribute to our financial objectives?*

### Increase global market share

- Ability to grow further in our core markets and with closer relationships with customers
- A source of stable, long-term revenues

### Expand project margins

- Maintenance contracts can offer opportunity to earn higher margins than traditional rolling stock manufacturing, subject to high quality and maintainability of our products
- Incorporating advanced IoT / digital maintenance offering will reduce costs and risks

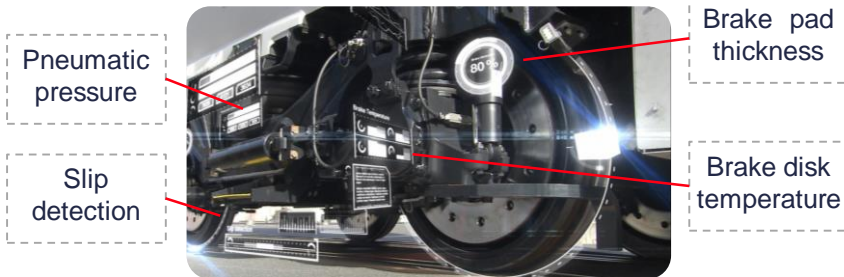
# 4-4. Strategy to action - focus on IoT and Digital

*Hitachi Rail is in a unique position in having an integrated supply chain to develop and roll-out its IoT and digital solutions*



## Asset Management

- Using data analytics
  - Transform from fixed maintenance inspections to condition based maintenance with predictive interventions to minimise required maintenance and maximise railway asset availability
  - Utilise data and knowledge gathered to 'future proof' new train designs
- Delivering
  - ✓ Improve profitability for long-term maintenance contracts
  - ✓ Enhanced competitive position for future bids



*Example of Hitachi real-time data capture from sensors used for predictive maintenance*



## Dynamic Headway & Passenger Management

- Using data analytics
  - Regulating passenger congestion rates using real-time data to better inform passengers
  - Optimisation of train headway to meet passenger demand when demand exceeds regular levels
  - Dynamic demand prediction will allow further optimisation of rail operations
- Delivering
  - ✓ Optimised service delivery for train operators
  - ✓ Enhanced competitive position for future bids

**How does IoT and Digital contribute to our financial objectives?**

### Increase global market share

- Diversifies revenue streams
- In-line with our strategy to win more turnkey contracts
- Enhances competitive position of future bids

### Expand project margins

- Efficient maintenance procedures reduce waste of both labour and materials
- IoT / Digital services typically offer higher profit margins than traditional rolling stock manufacturing

# 4-5. Continuing our business transformation

**Transforming the way we operate will allow us to achieve our ambitious financial targets**

Objective	What?	Impact
<b>Project focused operating model</b>	<ul style="list-style-type: none"> <li>- Transform operating model from legal entity model to fully integrated project focus model</li> </ul>	<ul style="list-style-type: none"> <li>- Will enable the efficient management of our large, global projects</li> <li>- Will improve efficiencies in our delivery of projects</li> </ul>
<b>Engineering capability</b>	<ul style="list-style-type: none"> <li>- Further integrate and strengthen our key capabilities of design engineering, systems engineering and project management across the business</li> </ul>	<ul style="list-style-type: none"> <li>- Will enable us to efficiently develop new rolling stock platforms</li> <li>- Will strengthen our ability to both bid on and deliver large, global projects</li> </ul>
<b>Stronger central functions</b>	<ul style="list-style-type: none"> <li>- Centralise our support functions to promote best practice and reduce costs</li> </ul>	<ul style="list-style-type: none"> <li>- Improved efficiency will reduce our SG&amp;A costs</li> <li>- Further alignment and collaboration will lead to better knowledge sharing throughout the business</li> </ul>
<b>Production capacity</b>	<ul style="list-style-type: none"> <li>- Optimise our production capacity by investing in our people and equipment to maximise efficiency</li> <li>- Improve our design and production processes in order to eliminate waste</li> </ul>	<ul style="list-style-type: none"> <li>- Maximising our production utilisation will allow us to efficiently deliver our large project backlog</li> <li>- Balance utilisation of production capacity to drive efficiency</li> <li>- Eliminating waste will improve margins and cash flow</li> </ul>
<b>'Make or Buy' strategy</b>	<ul style="list-style-type: none"> <li>- Refresh 'Make or Buy' strategy to reflect our search for opportunities to scale the business</li> </ul>	<ul style="list-style-type: none"> <li>- Will enable us to provide our customers with the best, most cost efficient solutions for their requirements</li> <li>- Will allow us to improve margins and our cash cycle</li> </ul>

# Railway Systems Business Unit Business Strategy

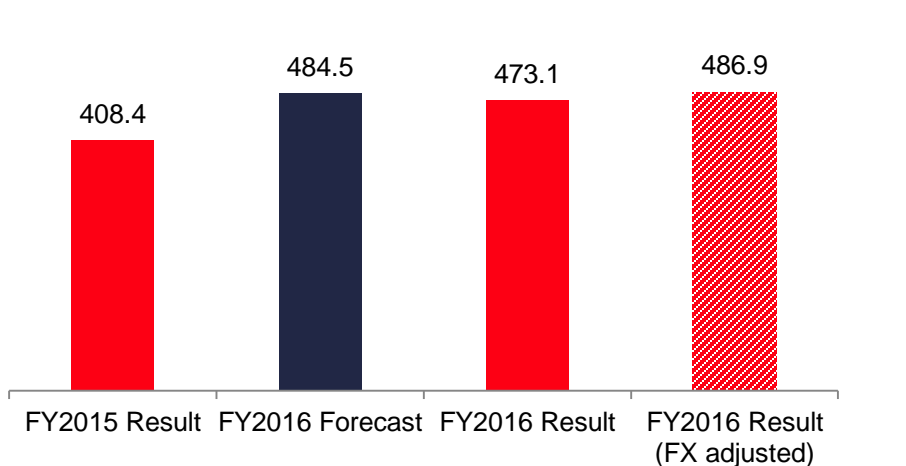
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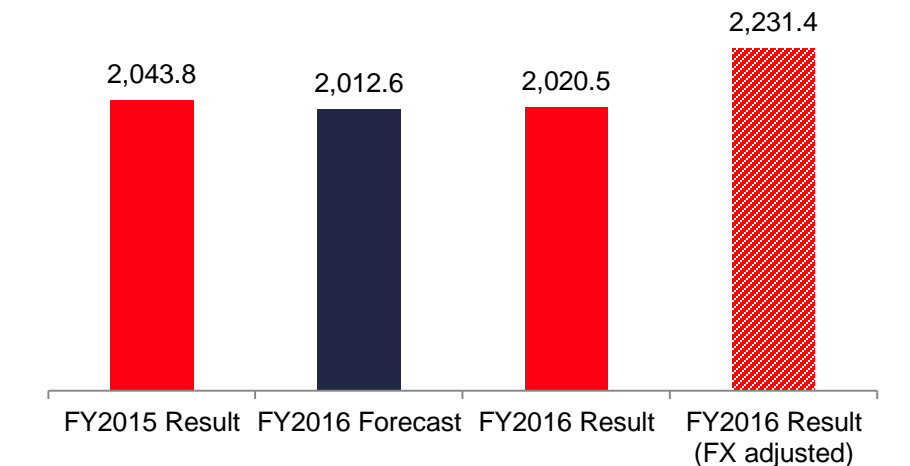
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# 5-1. Our performance has remained robust...

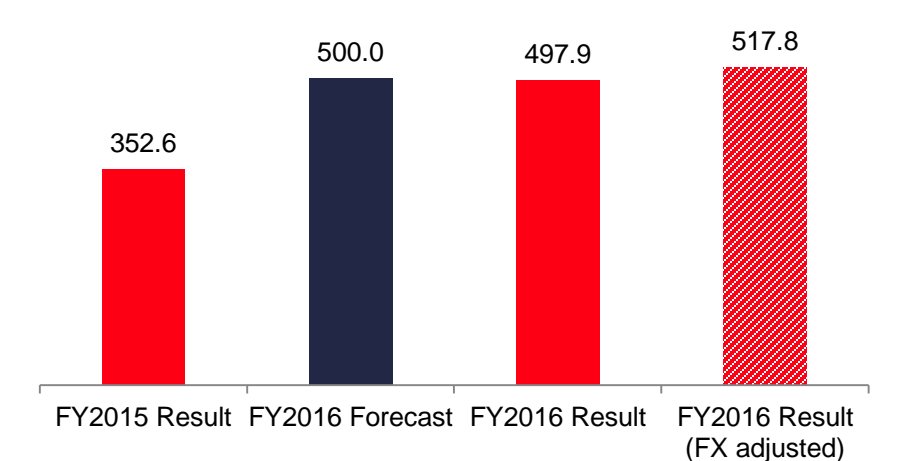
**Order Intake** (1) (2) (3) ¥Billions



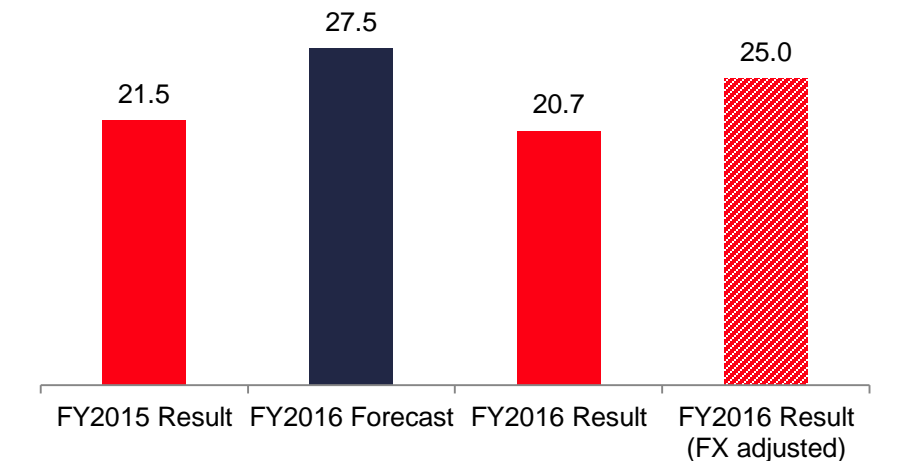
**Order Backlog** (1) (2) (3) ¥Billions



**Revenues** (1) (2) (3) ¥Billions



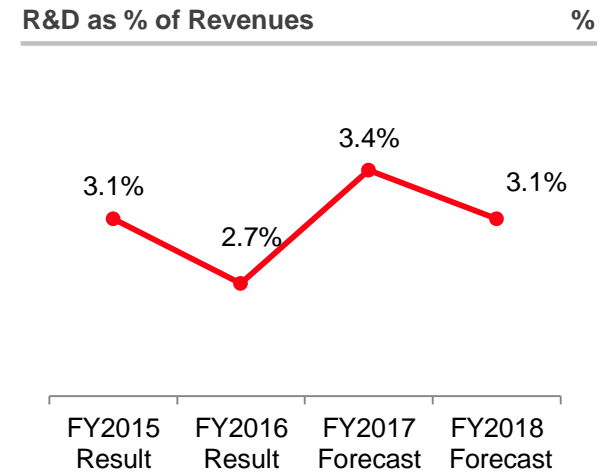
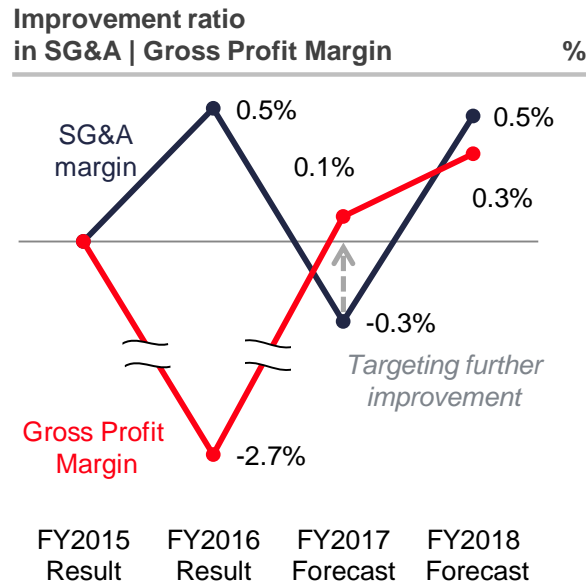
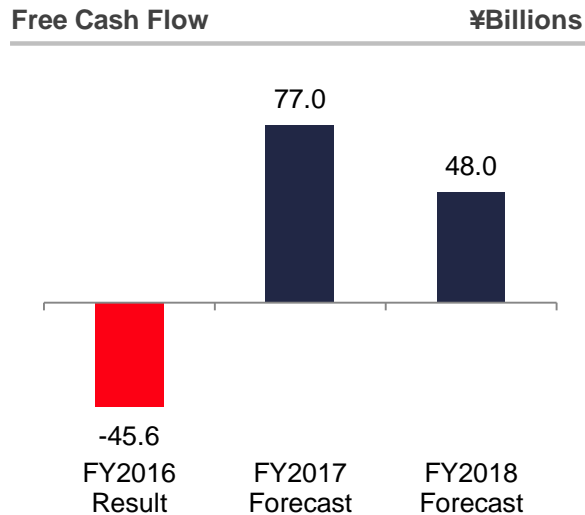
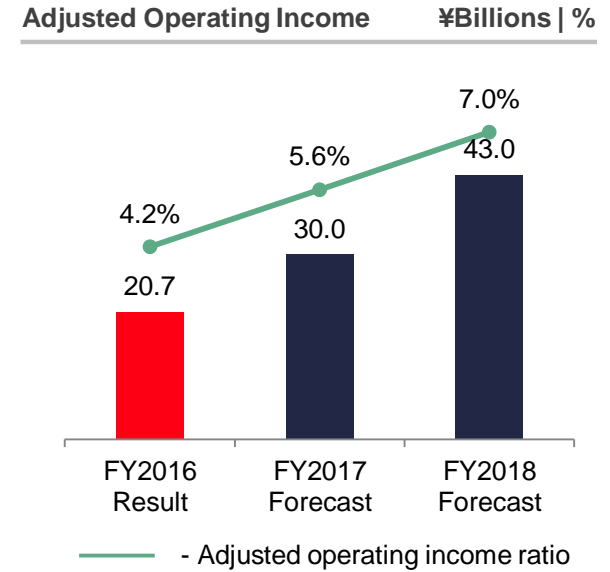
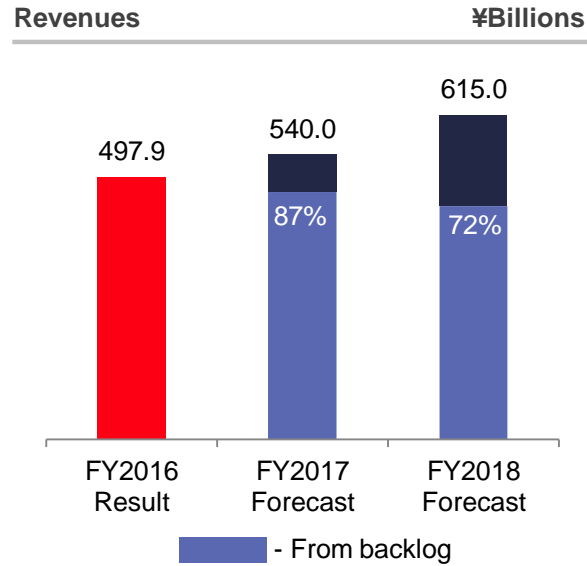
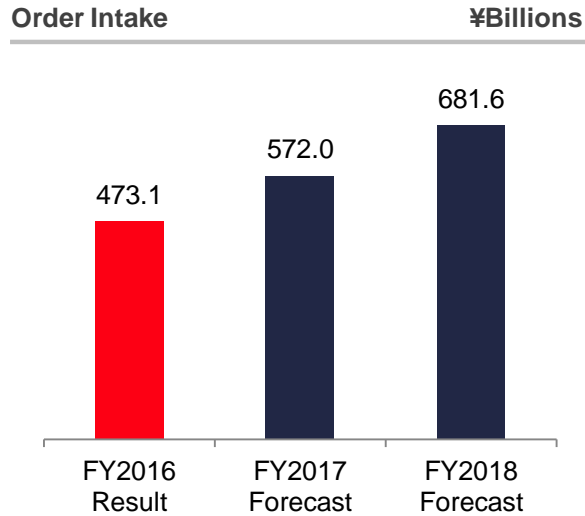
**Adjusted Operating Income** (1) (2) (3) ¥Billions



(1) FY2015 result includes 5 months of Hitachi Rail Italy and AnsaldoSTS only;  
 (2) FY2016 Forecast as of June 1 2016; (3) FX adjusted result restated for change in FX rates



# 5-2. ...and we forecast continued strong growth



# 5-3. We continue to increase order intake and have a healthy manufacturing backlog

Orders Received (¥bn)

408.4

473.1

572.0

681.6

Order Backlog (¥bn)

2,043.8

2,020.5

2,061.7

2,128.4

Overseas revenue ratio

71%

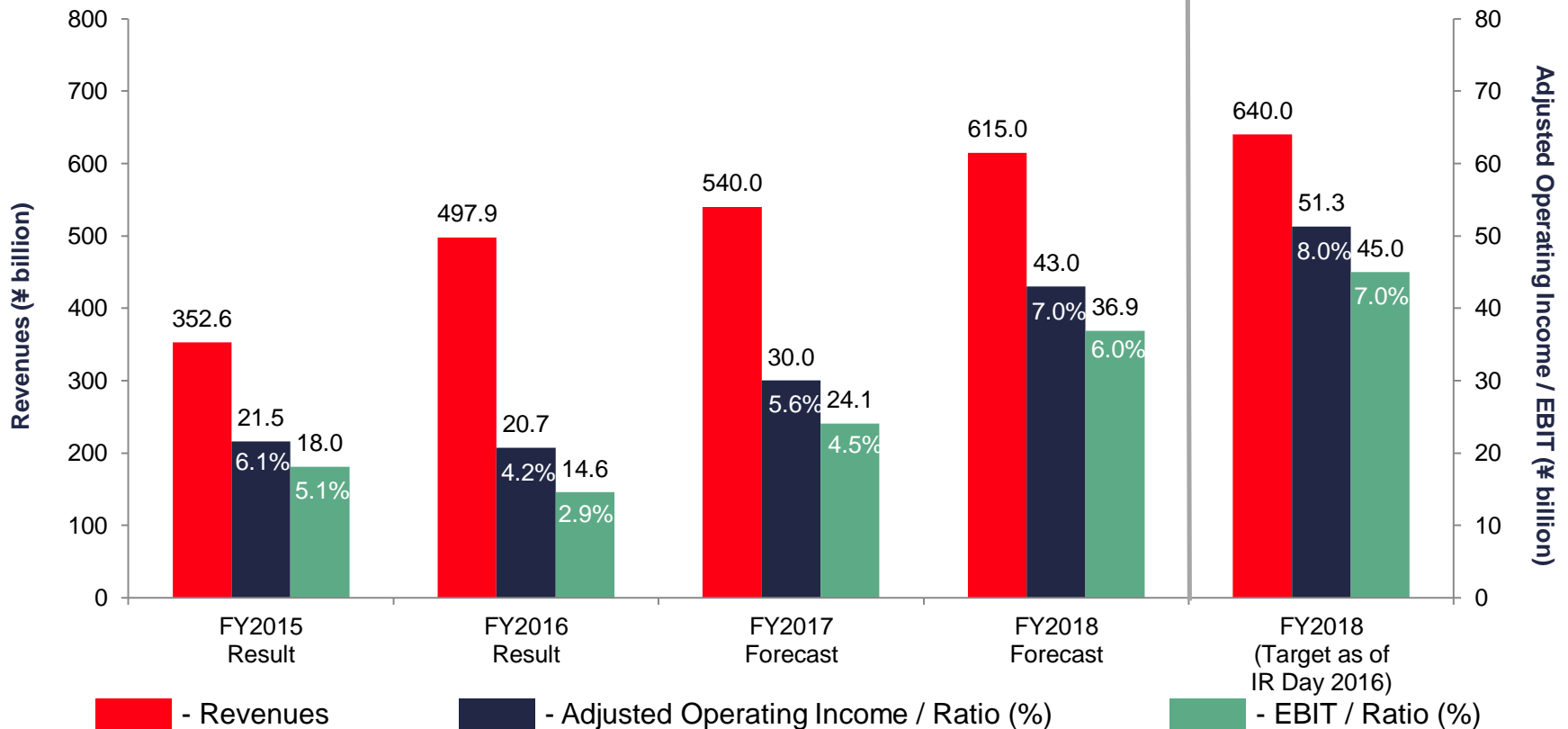
83%

87%

84%

## Change in FX rates

- FY2018 forecast and target are based on our internal FX rate forecast for GBP : JPY
  - At IR Day 2016 – 1:160
  - At IR Day 2017 – 1:140



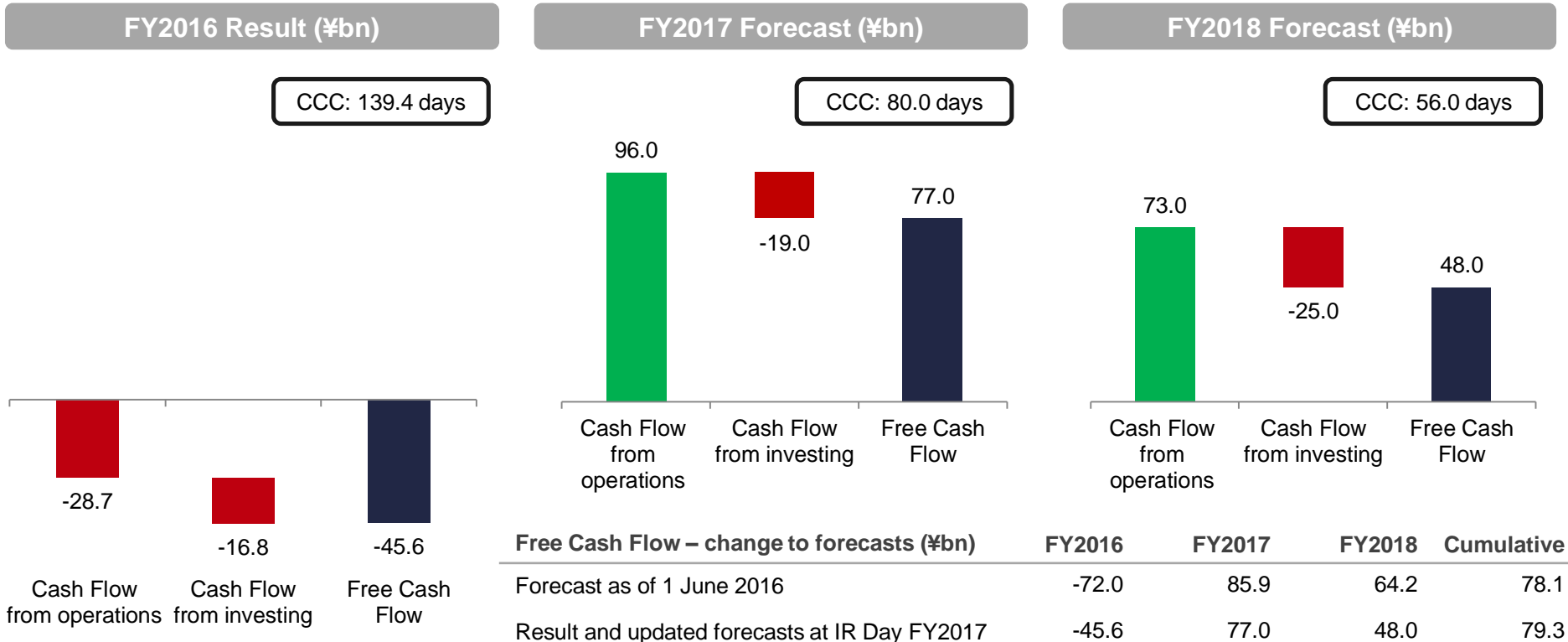
# 5-4. We will see a significant increase in FCF in FY2017 and FY2018

*Milestone payments for delivery of key projects in FY2017 and FY2018 will have a significant impact on our free cash flow. A focus on asset efficiency will also help us improve our cash conversion cycle*

## Free Cash Flow

¥Billions

- FY2016 Free Cash Flow was better than expected, ¥26.3bn up on forecast
- Cash flow from operations is expected to increase materially due to milestone payments on key projects such as IEP
- Improved management of working capital will reduce our cash flow conversion cycle (CCC) days
- We will continue to invest in the business, particularly in developing our core platforms and enhancing our production capabilities

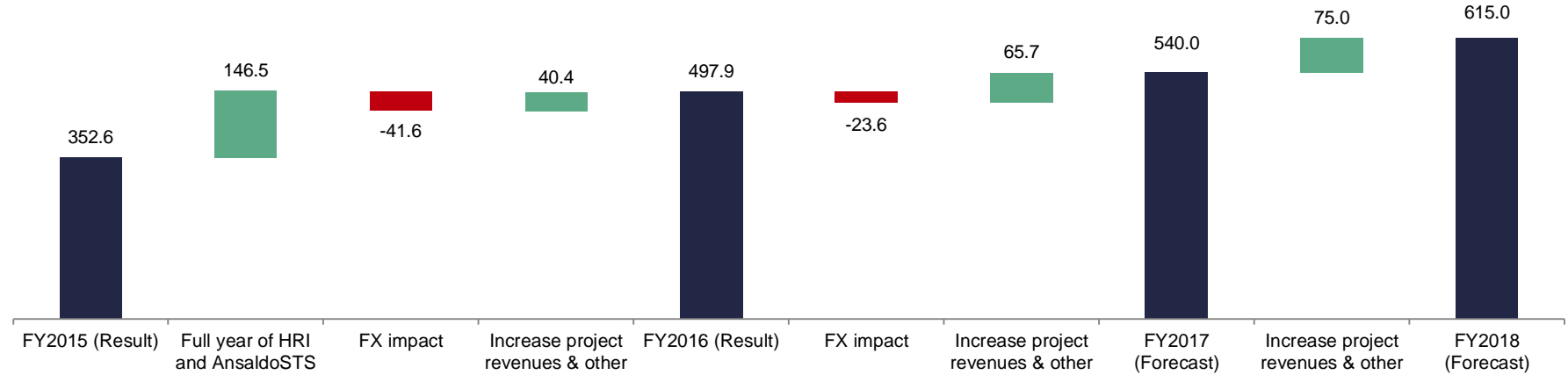


Note: FY2015 CCC was 83.6 days  
CCC = Cash Conversion Cycle

# 5-5. We will continue our successful growth and will work to expand our margins

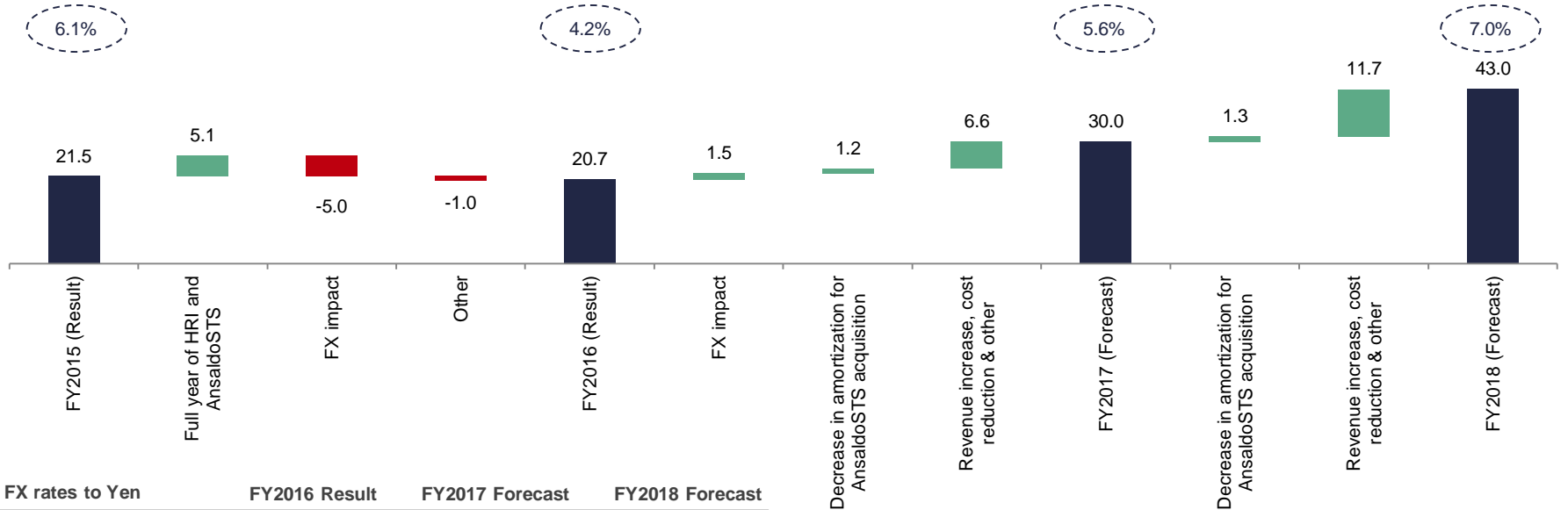
## Revenues

¥Billions



## Adjusted Operating Income | Margin

¥Billions | %



FX rates to Yen	FY2016 Result	FY2017 Forecast	FY2018 Forecast
Sterling Pound	142	140	140
Euro	119	115	120

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- The global rail market is healthy
- Our aim is to become a ¥1 trillion revenue business by the early 2020s
- We are investing in core platforms and technologies for future growth
- Our core markets remain strong. Customers continue to value the technology developed and demonstrated in Japan
- We will focus on delivery and continued integration to deliver cash and margin improvement
- We will transform the operating model to increase flexibility, optimise asset utilisation and improve focus on profitability



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<b>CAGR</b>	Compound Annual Growth Rate	<b>IEP</b>	Intercity Express Programme
<b>CBTC</b>	Communications-Based Train Control	<b>IoT</b>	Internet of Things
<b>CCC</b>	Cash Conversion Cycle	<b>LRV</b>	Light Rail Vehicle
<b>CRRC</b>	China Railway Rolling Stock Corporation	<b>MEA</b>	Middle East and Africa
<b>EBIT</b>	Earnings before Interest and Taxes	<b>NTfL</b>	New Tube for London
<b>EMU</b>	Electric Multiple Unit	<b>O&amp;M</b>	Operations & Maintenance
<b>ETCS</b>	European Train Control System	<b>RS</b>	Rolling Stock
<b>GWR</b>	Great Western Railway	<b>SG&amp;A</b>	Selling, General and Administrative Expenses
<b>HVAC</b>	Heating, Ventilation and Air Conditioning	<b>TFL</b>	Transport for London
		<b>TMS</b>	Traffic Management System
		<b>VHS</b>	Very High Speed
		<b>WoE</b>	West of England

# Cautionary Statement

Certain statements found in this document may constitute “forward-looking statements” as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such “forward-looking statements” reflect management’s current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as “anticipate,” “believe,” “expect,” “estimate,” “forecast,” “intend,” “plan,” “project” and similar expressions which indicate future events and trends may identify “forward-looking statements.” Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the “forward-looking statements” and from historical trends. Certain “forward-looking statements” are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on “forward-looking statements,” as such statements speak only as of the date of this document.

Factors that could cause actual results to differ materially from those projected or implied in any “forward-looking statement” and from historical trends include, but are not limited to:

- economic conditions, including consumer spending and plant and equipment investment in Hitachi’s major markets, particularly Japan, Asia, the United States and Europe, as well as levels of demand in the major industrial sectors Hitachi serves;
- exchange rate fluctuations of the yen against other currencies in which Hitachi makes significant sales or in which Hitachi’s assets and liabilities are denominated, particularly against the U.S. dollar and the euro;
- uncertainty as to Hitachi’s ability to access, or access on favorable terms, liquidity or long-term financing;
- uncertainty as to general market price levels for equity securities, declines in which may require Hitachi to write down equity securities that it holds;
- fluctuations in the price of raw materials including, without limitation, petroleum and other materials, such as copper, steel, aluminum, synthetic resins, rare metals and rare-earth minerals, or shortages of materials, parts and components;
- the possibility of cost fluctuations during the lifetime of, or cancellation of, long-term contracts for which Hitachi uses the percentage-of-completion method to recognize revenue from sales;
- credit conditions of Hitachi’s customers and suppliers;
- fluctuations in product demand and industry capacity;
- uncertainty as to Hitachi’s ability to implement measures to reduce the potential negative impact of fluctuations in product demand, exchange rates and/or price of raw materials or shortages of materials, parts and components;
- uncertainty as to Hitachi’s ability to continue to develop and market products that incorporate new technologies on a timely and cost-effective basis and to achieve market acceptance for such products;
- increased commoditization of and intensifying price competition for products;
- uncertainty as to Hitachi’s ability to achieve the anticipated benefits of its strategy to strengthen its Social Innovation Business;
- uncertainty as to the success of acquisitions of other companies, joint ventures and strategic alliances and the possibility of incurring related expenses;
- uncertainty as to the success of restructuring efforts to improve management efficiency by divesting or otherwise exiting underperforming businesses and to strengthen competitiveness;
- the potential for significant losses on Hitachi’s investments in equity-method associates and joint ventures;
- general socioeconomic and political conditions and the regulatory and trade environment of countries where Hitachi conducts business, particularly Japan, Asia, the United States and Europe, including, without limitation, direct or indirect restrictions by other nations on imports and differences in commercial and business customs including, without limitation, contract terms and conditions and labor relations;
- uncertainty as to the success of cost structure overhaul;
- uncertainty as to Hitachi’s ability to attract and retain skilled personnel;
- uncertainty as to Hitachi’s access to, or ability to protect, certain intellectual property rights;
- uncertainty as to the outcome of litigation, regulatory investigations and other legal proceedings of which the Company, its subsidiaries or its equity-method associates and joint ventures have become or may become parties;
- the possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- the possibility of disruption of Hitachi’s operations by natural disasters such as earthquakes and tsunamis, the spread of infectious diseases, and geopolitical and social instability such as terrorism and conflict;
- uncertainty as to Hitachi’s ability to maintain the integrity of its information systems, as well as Hitachi’s ability to protect its confidential information or that of its customers; and
- uncertainty as to the accuracy of key assumptions Hitachi uses to evaluate its employee benefit-related costs.

The factors listed above are not all-inclusive and are in addition to other factors contained in other materials published by Hitachi.

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