## Progress of Medium-Term Business Plan – "MTBP 2016" and Growth Strategy

November 21, 2017 Kawasaki Heavy Industries, Ltd.

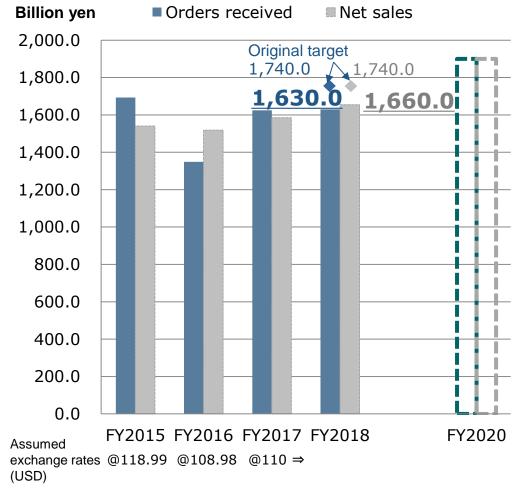


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## **Progress of "MTBP 2016" Orders Received/Net Sales**

• Orders received and net sales are one to two years behind schedule.



#### **Business environment**

- Global economy is smoothly expanding as a whole
- Weak oil price yields delay in energy-related business.
- Drastic Recovery of Chinese construction machinery market

#### **Review of FY2018 target**

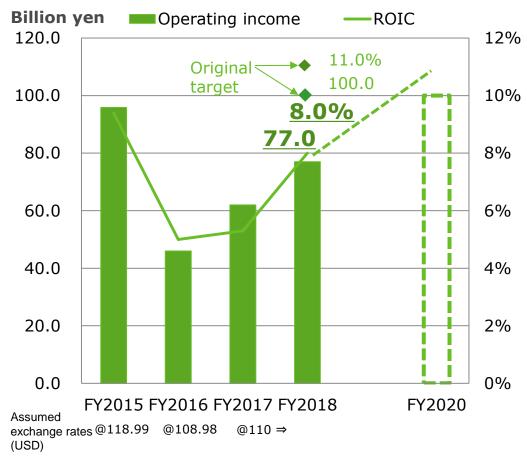
- Decrease in ship & offshore structure and commercial aircraft-related businesses
- · Rolling stock and energy are behind schedule
- Sales expansion in hydraulic component and robot

#### Picture of FY2020

- Expansion of rolling stock business for overseas markets
- Recovery of energy-related business
- Continuous sales growth in hydraulic component and robot businesses

## **Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC**

• The achievement of the MTBP targets, an operating income of 100 billion yen and before-tax ROIC of 11%, is scheduled for FY2020, two years behind original. However, before-tax ROIC will recover to 8% in FY2018.



#### **Review of FY2018 target**

- Lower profit due to decrease in net sales as a whole
- Incremental profit from hydraulic component and robot businesses with buoyant sales

#### **Picture of FY2020**

- Income will increased due to sales expansion of whole segment.
- For hydraulic component and robot businesses, both of revenue and profit will keep growing.

#### FY2021 and beyond

 Expansion of after-sales for jet engines and production expansion of component parts for aircraft yield significant improvement of profitability.

## **Promotion of Kawasaki-ROIC Management**

### Strict control applied to achieve the hurdle rate (8%)

- For BU with ROIC of less than 8%, discuss an action plan to achieve 8% at the management committee.
- For all applicable BU, set KPI targets for each stage gate in accordance with the above plan.
- Examine alternatives, considering a case in which it is difficult to clear the gate.

### **Enhancement of risk management**

- Hold a meeting of the project risk management committee headed by the President.
- Share each company's risk management method, knowledge, lessons and others in a risk information sharing meeting.
- Strengthen the involvement of the Head Office at each phase of a project.

### **Utilization of KPI**

- Set KPIs that significantly contributes to ROIC improvement for each company.
- Regularly report the KPI targets and results in a management committee and others.

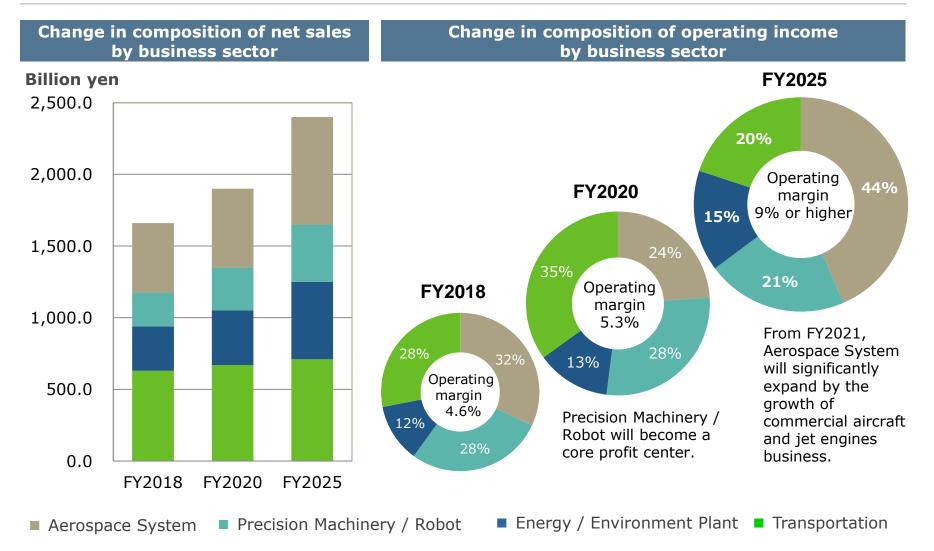
## **Business Portfolio Strategy**

• Priority allocation of company resources and pursing group synergy through a clear-cut business portfolio strategy

Priority allocation of company resources	Four business sectors			
• Into the businesses which big growth can be	Aerospace System	Energy/ Environment Plant		
expected in mid-long term, such as the Aerospace Systems, Energy and Robots.				
Pursuing group synergy	Aerospace	Plant & Infrastructure Gas Turbine & Machinery		
<ul> <li>Maximize the synergy and accelerate growth by performing integral administration in</li> </ul>	Jet Engine	,		
Aerospace/Jet engine and a variety of energy- related businesses.	Precision Machinery/Robot	Transportation		
Reorganization	Hydraulic Component	Ship & Offshore Structure		
Partial reorganization according to business sectors is under consideration with an April 2018 target.		Rolling Stock		
	Robot	Motorcycle & Engine		

🛛 🕊 Kawasaki

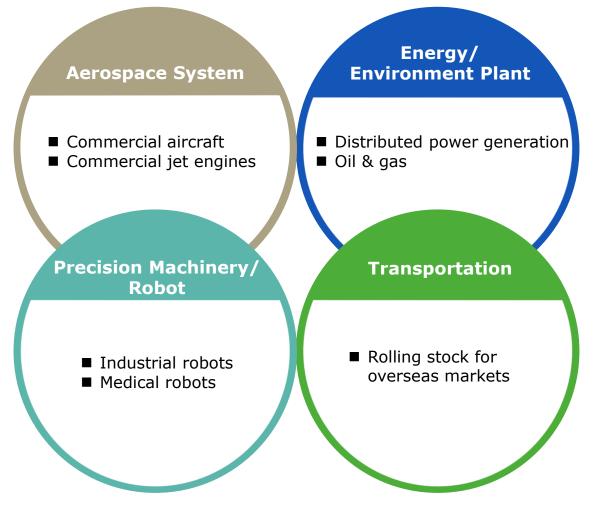
## **Business Portfolio Strategy** – **Steady improvement in profitability**



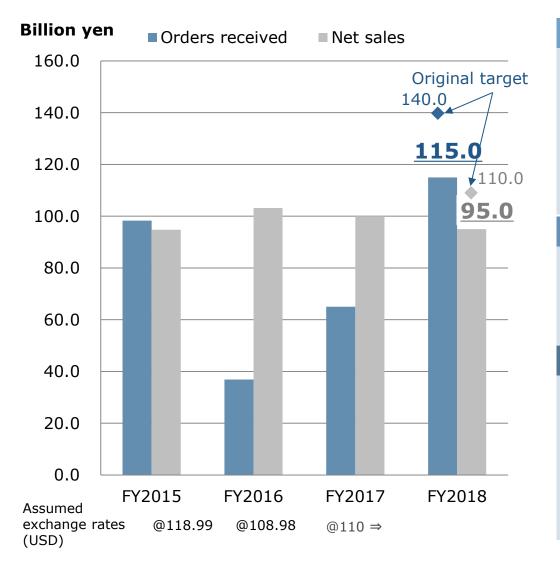
Powering your potential

## **Business Portfolio Strategy**

• Key products and services that drive growth



## **Progress of "MTBP 2016" Orders Received/Net Sales** (Ship & Offshore Structure)



#### **Business environment**

- Excessive construction capacity globally and prolonged poor shipping market condition
- Increasing demand for environmentfriendly vessels as a result of strengthening environmental regulation surrounding shipping segment

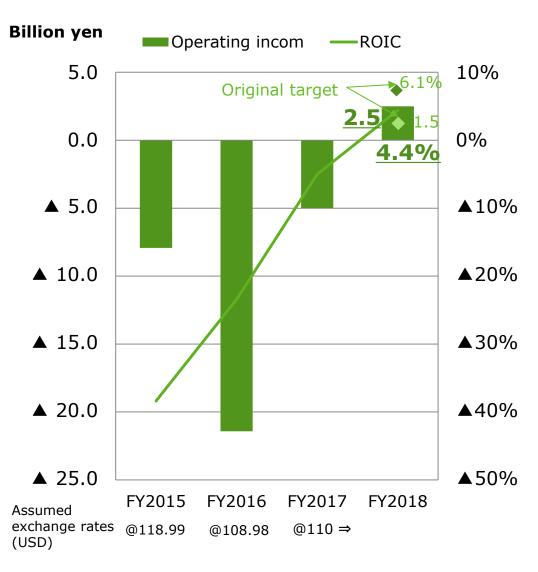
### Review of FY2018 target

• Review based on restructuring plan with FY2020 as target fiscal year

### Picture of FY2020

- Increasing demand of gas-fuelled vessels
- Accelerating the integrated operation with shipyards in China
- No.2 dock at DACKS scheduled to go into operation in December 2018

### Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Ship & Offshore Structure)



#### **Review of FY2018 target**

- Review based on restructuring plan with FY2020 as target fiscal year
  - Effect of fixed cost reductions, etc.

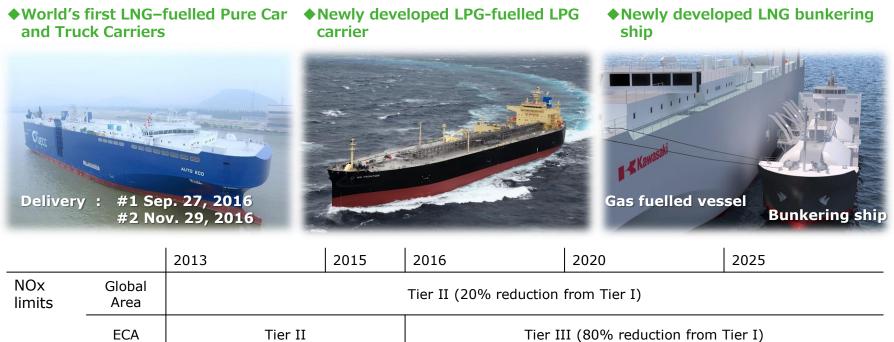
### **Picture of FY2020**

- Achievement of restructuring plan
   Target ROIC of 8% or higher
- Profit growth through frontloading of design and procurement and effect of improvement in productivity of KPS activities

### FY2021 and beyond

- Increasing demand of gas-fuelled vessels
- Expansion in consolidated Group profitability through accelerating the integrated operation with shipyards in China
- Contribution to profit of commercialized AUVs utilizing sophisticated submarine technology

### Growth Business : Initiatives for Environmentally Friendly Vessels (Gas-fuelled ship)



om Tier I) (80% reduction from )			
(80% reduction from			
Tier III (80% reduction from Tier I)			
than 3.5% Less than 0.5%			
Less than 0.1%			
Phase 2 (20% reduction)	Phase 3 (30% reduction)		

- 3. SOx limits are set for sulfur content of marine fuel oil.
- 4. CO<sub>2</sub> limits are according to Energy Efficient Design Index (EEDI).

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### Growth Business : Development of Autonomous Underwater Vehicle (AUV)

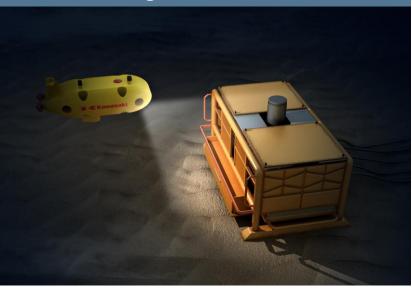
Existing technology built up through submarine business, etc.

Differentiation using in-house robot technology Commercialization of AUV business

#### Inspection of subsea pipelines using robotic arm

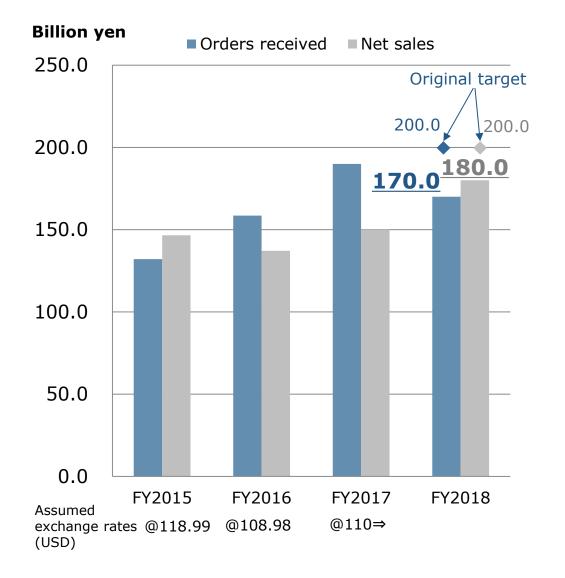








## Progress of "MTBP 2016" Orders Received/Net Sales (Rolling Stock)



#### **Business environment**

- Stable domestic demand for replacement railcars
- Increase in demand for rolling stock to ease congestion in NY
- Emergence of projects funded by ODA loans in Asia
- Global trend for restructuring of rolling stock manufacturers

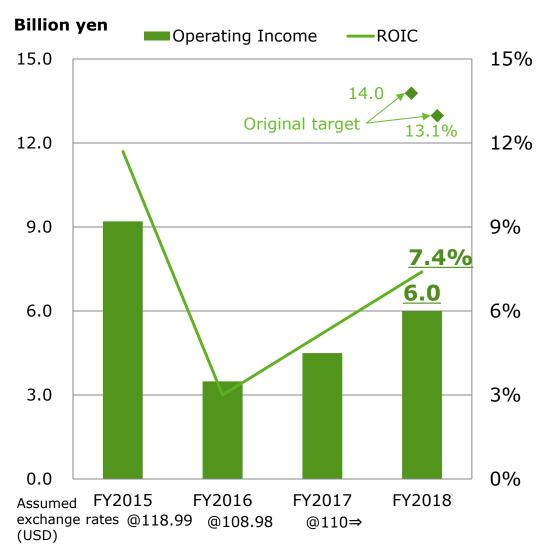
#### **Review of FY2018 target**

- Decrease in net sales because projects expected in Asia disappeared or are behind schedule
- Reduction based on concentration of orders received in FY2017

#### Picture of FY2020

- Continuation of high level operations in Japan
- Steady high level sales, especially in North America
- Increase in sales from projects funded by ODA loans in Asia

# Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Rolling Stock)



#### **Review of FY2018 target**

- Lower profits due to decrease in net sales resulting from fewer orders received
- Delayed commercialization of stockbased business
- Additional costs for certain contracts

### **Picture of FY2020**

- Profit growth due to large amount of operations in North America
- Start-up of stock-based business
- Improvement in profitability due to promotion of cost reductions

#### FY2021 and beyond

- Business expansion in Asia
- Acceleration of stock-based business

### **Growth Business (Asia Business) :** Expansion to 1.5x Current Size

#### Proactive response to expansion of Asian market

- Projects funded by ODA loans for more than 2,000 railway cars planned over a period of around 10 years starting in 2019
- Orders for 144 railway cars and depot equipment for the Dhaka MRT Line-6 in Bangladesh received in August 2017

#### Sales expansion in regions with market superiority

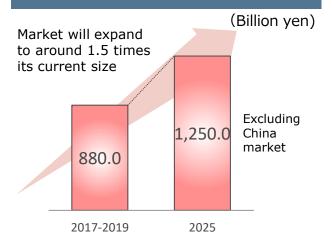
 Steady capturing of car demand and expansion of net sales in maintenance business and components business in markets where KHI has market superiority (Singapore,etc)

#### Strategic collaboration with local partners

- Collaboration with strategic partners to meet local production requirements
- BHEL\*, India's largest power equipment manufacturer, signed technology collaboration agreement with us in June 2017

\*Bharat Heavy Electricals Limited

#### **Expansion of Asian Market**



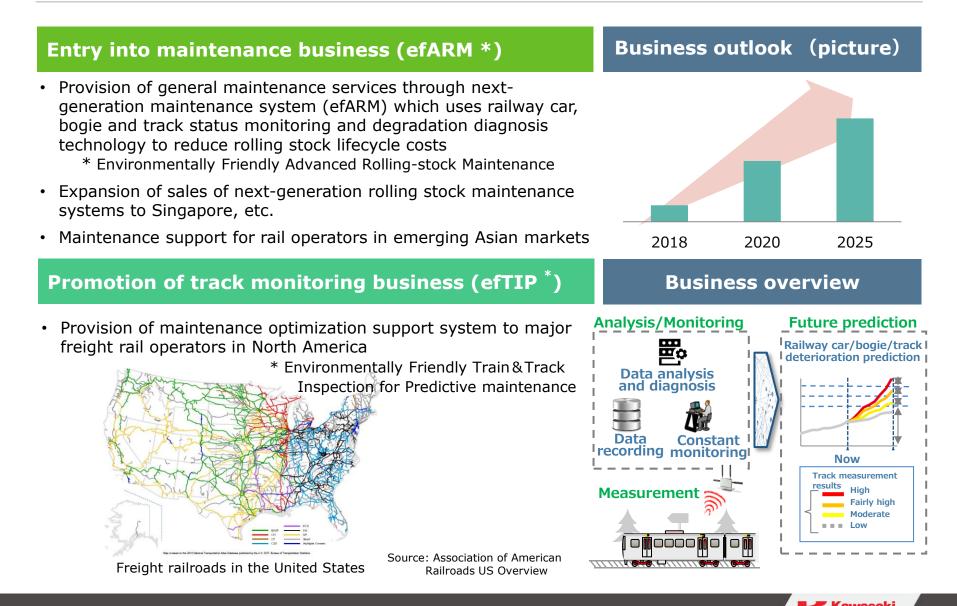
- 2017-2019 figure is calculated by KHI based on UNIFE data.
- 2025 figure is KHI estimate assuming continuation of growth rate according to UNIFE data



Dhaka MRT Line-6

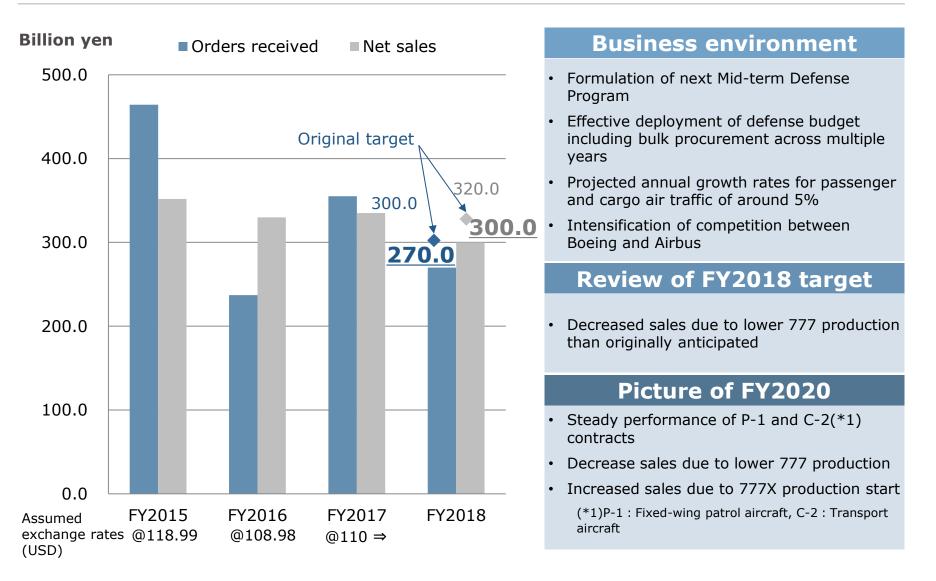
T251 for Singapore LTA

### **Growth Business (Stock-Based Business):** Growth of Maintenance and IoT Services

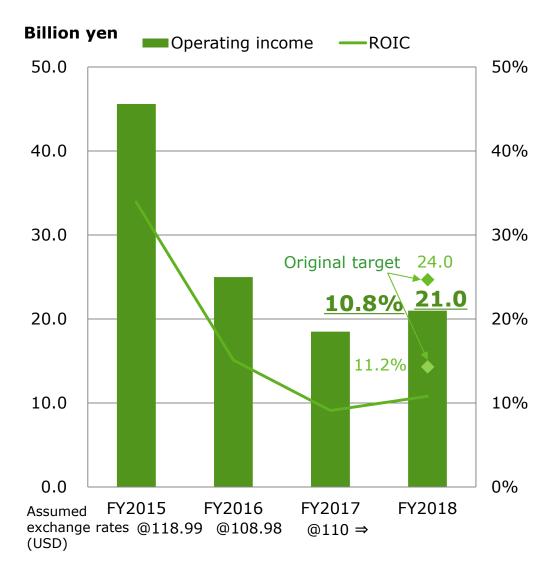


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# Progress of "MTBP 2016" Orders Received/Net Sales (Aerospace)



# Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Aerospace)



#### **Review of FY2018 target**

- Lower profit mainly due to decreased 777
   production
- Aiming for achievement of MTBP target through use of KPS(\*) to drastically cut costs

### Picture of FY2020

- Steady implementation of P-1 and C-2 contracts
  - Lower profit due to decreased 777 production
- Higher profit due to 777X production start

### FY2021 and beyond

- Business expansion through sales of aircraft derived from P-1 and C-2
- Significant business expansion chiefly due to increased 777X production and participation in next-generation commercial aircraft
  - Growth of both sales and profit in FY2021 compared to FY2020

<sup>(\*2)</sup>Kawasaki Production System

## **Growth Business (Aerospace):**

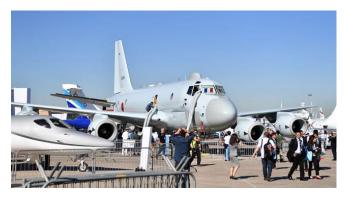
## Performance of contracts and expansion in military aircraft business

- Steady implementation of P-1 and C-2 mass production contracts
- Promotion of proposal activities for aircraft derived from P-1 and C-2
- Capturing of demand for next-generation models of current aircraft

#### **Export of defense equipment**

- Export of P-1 and C-2
- Researching demand in each country while complying with national policy

#### Paris Airshow (Jun. 2017) P-1 static display



Source: Aviation Wire

#### Dubai Airshow (Nov. 2017) C-2 static display



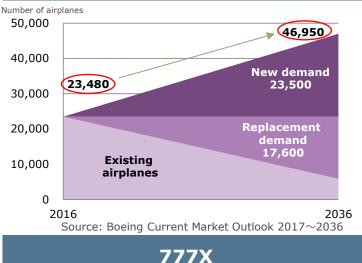


## Growth Business (Aerospace) :

#### Development and expansion of commercial aircraft business

- Demand forecast to double over next 20 years
- Response to increased 787 production (12→14 aircraft per month)
  - Further promotion of improvement in productivity
- Steady response to start of 777X production
  - Promotion of KPS using advanced production technology
    - Incorporation of robot and IoT technologies
    - Pursuit of synergies internally
       (Corporate Technology Div. and Robot Division)
- Promotion of cooperation with Boeing
  - Conclusion of agreement with Boeing in Jun. 2017
- Participation in next-generation commercial aircraft

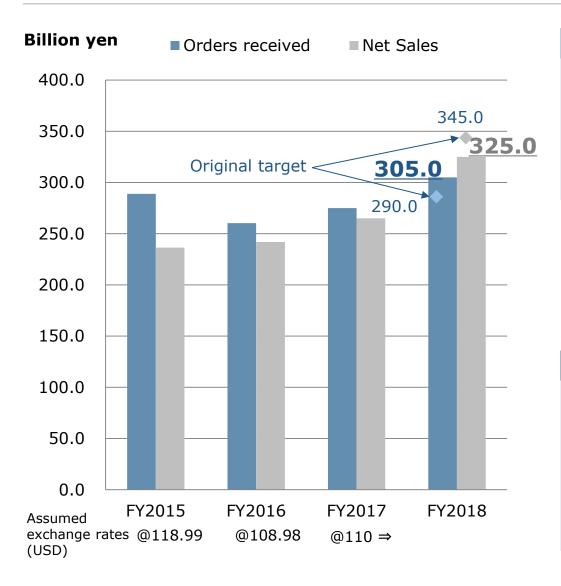
#### Projected demand for commercial jets





Provided by Boeing

## Progress of "MTBP 2016" Orders Received/Net Sales (Gas Turbine & Machinery)



#### **Business environment**

- Aircraft engine:
  - Continued demand expansion towards the future
- Energy:
- Rapid growth in global energy demand, with significant growth expected in Southeast Asia and the Middle East in particular

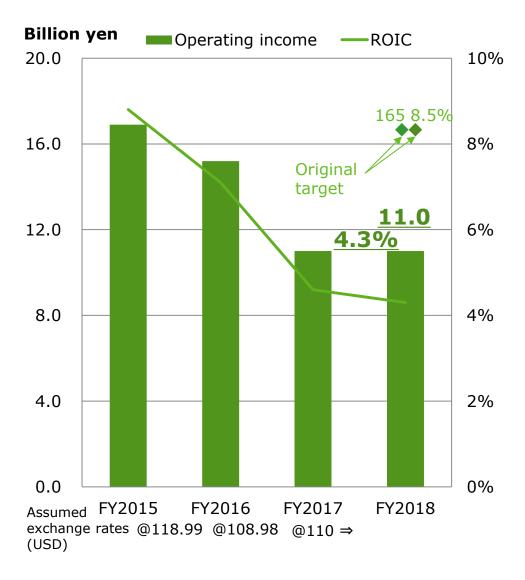
#### **Review of FY2018 target**

- Aircraft engine:
- Good performance, almost in line with target
- Energy:
- Orders received are on target. Sales are lower due to delays in international projects

### Picture of FY2020

- Aircraft engine:
  - Increased sales due to start of full-scale mass production and generation of aftermarket sales for newly launched programs.
- Energy:
- Expansion of sales due to strengthening international business and growth in EPC orders received

### Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Gas Turbine & Machinery)



#### **Review of FY2018 target**

#### Aircraft engine:

- Lower profit due to increase in amortization of development costs resulting from increase in sales volume

#### **Eneray:**

- Lower profit due to decreases in orders received and net sales

#### Picture of FY2020

#### Aircraft engine:

- Enter into phase of investment return and start of profit growth for newly launched programs

#### Energy:

- Profit growth based on the strengthening of international business, EPC orders received and services

### FY2021 and beyond

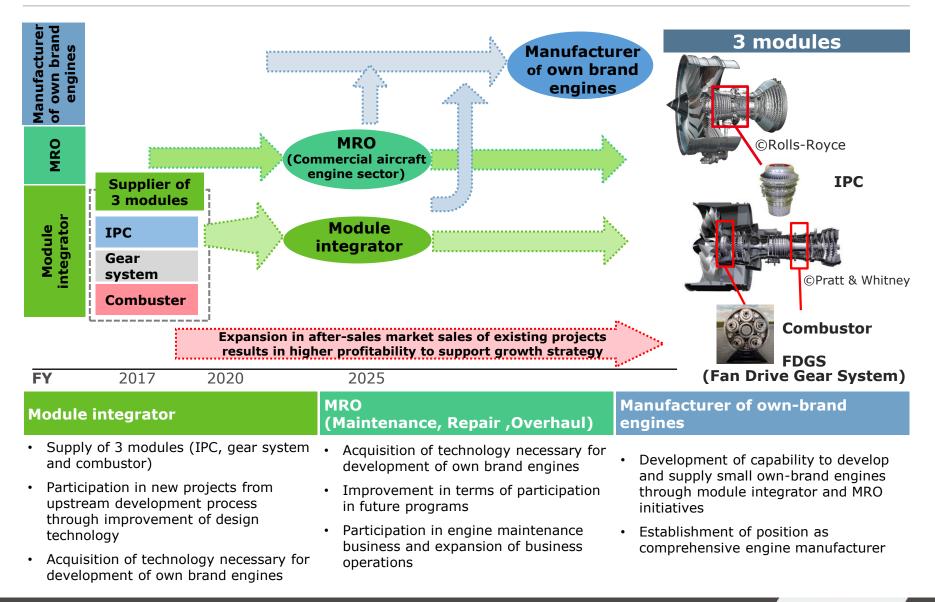
#### Aircraft engine:

- Profit growth due to transition to investment return phase and full scale generation of aftermarket business
- Expand business through start of investment for market entry in to MRO
- Energy:
  - Business expansion mainly due to strengthening of EPC and L30CCPP sales expansion



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### **Growth Business :** Future Business in Aircraft Engine Sector



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### **Growth Business :** Priority Activities in Energy Business

### **Current status**

- Large share of domestic market for industrial gas turbines and gas engines for power generation thanks to world-class efficiency
- Secure profit through aftersales services for using growth in units delivered

### **Priority activities in future to expand sales**

#### 1. International sales activities

- Global trend for expansion in capacity of gas-based thermal power plants, with growth in Southeast Asia particularly noticeable
- Strengthening of international bases to conduct region-based sales activities
- Development of lower cost engines and systems for overseas markets
- Profit growth through strengthening of aftersales services system

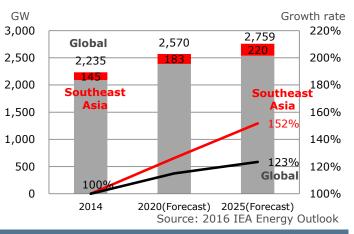
#### 2. Sales expansion of L30 CCPP(\*)

 Realization of high efficiency L30, development and market introduction of CCPP package (\*)CCPP : Combined Cycle Power Plant

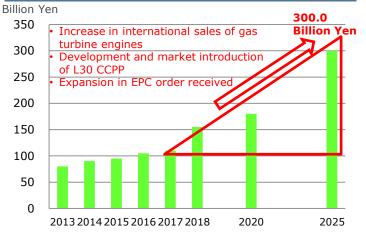
#### 3. Strengthening of EPC(\*) functions

- Expansion in EPC orders received through tie-ups with EPC players in Japan and overseas
- Cooperation with The Plant & Infrastructure segment to ensure capability to meet CCPP needs
   (\*) EPC - Engineering Programment Construction
  - (\*) EPC : Engineering Procurement Construction

## Gas-based thermal power plant capacity and growth rate

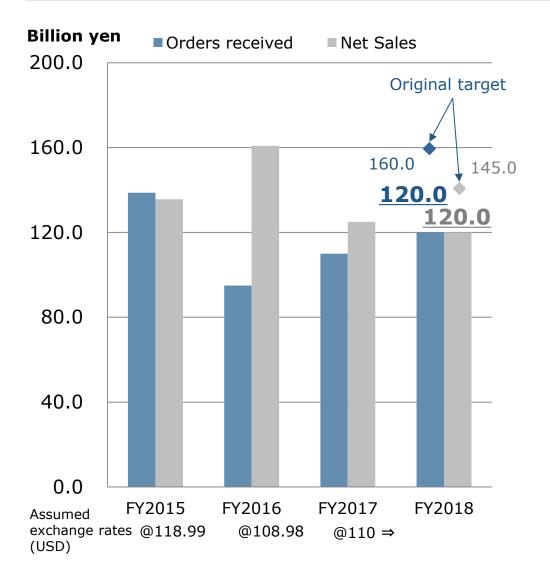


#### Sales growth of energy business



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## Progress of "MTBP 2016" Orders Received/Net Sales (Plant & Infrastructure)



#### **Business environment**

- Stable replacement demand for waste treatment facilities and increased use of shield machines associated with rail and road maintenance in Japanese market
- Delays in investment decisions of resource development projects overseas

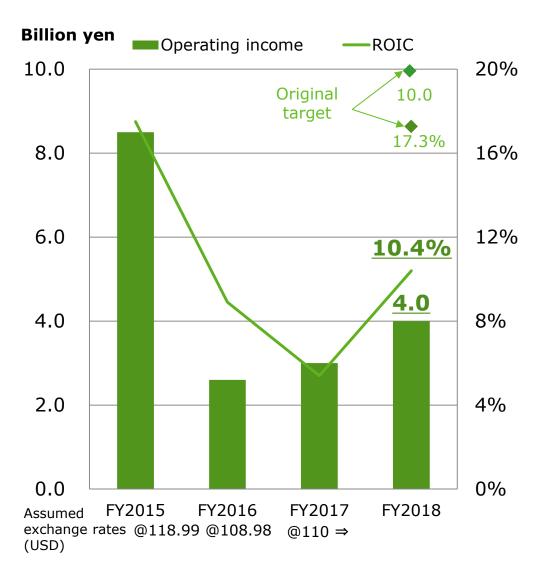
### **Review of FY2018 target**

- Decrease in orders received due to delays in investment decisions of resource development projects overseas
- Decline in sales due to decrease in orders received from FY2016-FY2017

#### Picture of 2020

- Increased orders received due to energy sector recovery overseas
- Steady orders received for waste treatment facilities in Japan

# Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Plant & Infrastructure)



#### **Review of FY2018 target**

- Lower profit due to decrease in sales resulting from fewer orders received
- Lower profit due to decrease in highly profitable projects

#### **Picture of FY2020**

- Steady sales of waste treatment facilities in Japan
- Improvement of profitability through thorough implementation of risk management and reduction of failure costs

#### FY2021 and beyond

- Promotion of overseas expansion through Chinese JV in waste treatment related business
  - Expansion of overseas operations in energy sector
- Business expansion through creation of hydrogen market



## **Growth Business (Waste Treatment) :** Utilization of Chinese JV in Overseas Business

## Focus on new domestic incinerator projects which are stable for the time being

- Domestic market conditions will remain unchanged for the next five years and then trend goes downward
- Most orders are for Design-Build-Operate (DBO) projects (public sector owns the new assets and private sector operates them).
  - O&M is baseload for business continuation; Orders for new incinerators are key

## Strengthening of both price and non-price competitiveness at the same time

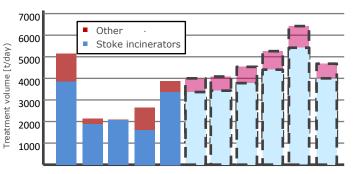
- Implementation of differentiation strategy based on high efficiency power generation boilers
- Creation of mechanisms for utilization of waste-based power generation and heat energy
- Development and market introduction of operation monitoring and support systems using AI

#### **Overseas operations utilizing Chinese JV**

- Expansion of Chinese market for CKK system (\*) and stoker incinerators
- Use of Chinese JV products in Chinese facilities
- EPC support for overseas investment projects with CONCH Group as project operator
- Collaboration in overseas operations utilizing CONCH Group's cost competitiveness and KHI's technical expertise
- (\*) CKK System: CONCH Kawasaki Kiln System

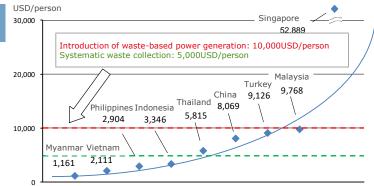
The CKK System integrates a waste incinerator into an existing cement plant, thereby combining cement manufacturing with waste processing. The system detoxifies, reduces, and recycles waste and also helps reduce cement plant fuel costs.

## Trend of waste treatment business in Japan



2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

#### Relationship between per capita GDP and waste treatment



Source: The World Bank World Development Indicators (2015) Mizuho Bank Characteristics and Changes of Infrastructure Demand

### Growth Business (Low Temperature) :

**Establishment of Structure with Two Pillars: LNG Tanks/Terminals and Hydrogen** 

## Global LNG demand expected to reach 1.8 times 2015 level by 2025

- Asian region will account for 65% of LNG demand growth
- Demand in European region will also increase to three times current level due to policy of pulling out of Russia
  - Plans for the construction of around 200 LNG tanks are in the pipeline around the world

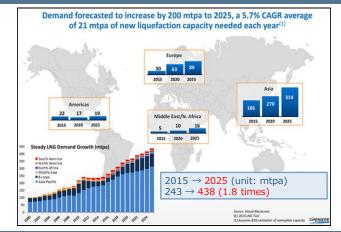
## Expectation for recovery in domestic demand as a result of gas liberalization

- Tendency for slowdown in LNG tank construction/replacement demand since 2013
- Expectation for progress on LNG terminal construction plans as a result of gas liberalization
  - Satellite LNG terminals, entry to LNG business by companies from other industries

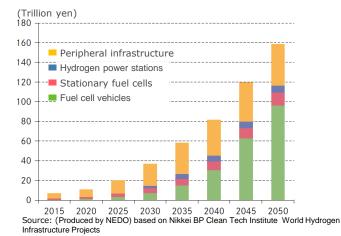
## Promotion of commercialization of hydrogen energy supply chain

- Participation in hydrogen business at every stage from manufacture to storage & offloading, transport and use
  - Acquisition of hydrogen station and liquefier projects, and establishment of O&M business
- Creation of solutions business including distributed power generation

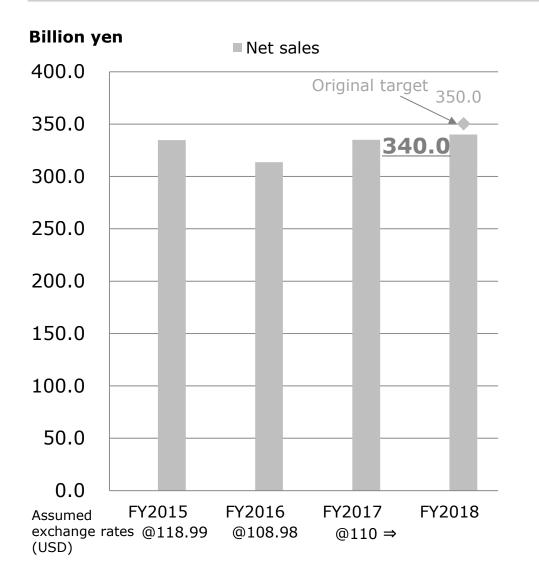
#### **Global LNG Demand Forecast**



#### Global Hydrogen Infrastructure Market Forecast



## Progress of "MTBP 2016" Orders Received/Net Sales (Motorcycle & Engine)



#### **Business environment**

- Motorcycles:
- Solid performances in advanced economies. Delayed recovery of existing market in emerging economies
- Four wheelers:
  - Sustained growth albeit at a slower pace
- General purpose engines:
- Solid performance of lawnmower engines market in the U.S.

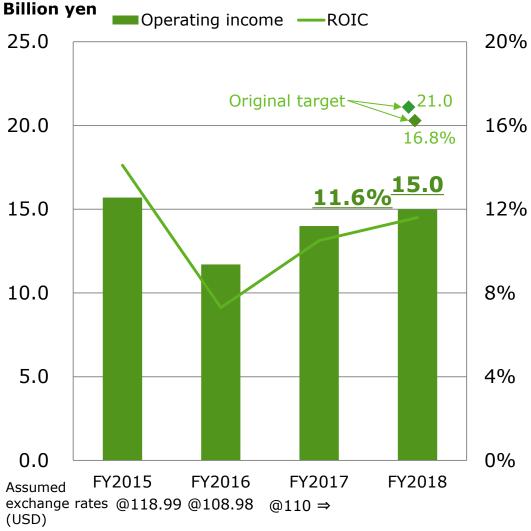
### **Review of FY2018 target**

 Down slightly with decreased sales resulting from delayed recovery in emerging market offset by increased sales of motorcycles in Europe and general purpose engines

### Picture of FY2020

- Continuing expansion in sales of motorcycles and four wheelers in advanced economies
- Full-scale recovery of motorcycle sales in emerging economies

# Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Motorcycle & Engine)



#### **Review of FY2018 target**

- Lower profit as a result of lower sales
  - Higher development expenses due to increased number of models, and higher development facility expenses associated with tighter environmental regulation

#### Picture of FY2020

- Steady sales expansion and profit growth in North America and Europe
  - Increase in sales and profits due to fullscale recovery of emerging economies
  - Improvement in profitability through promotion of efficient management

### FY2021 and beyond

- Development of advanced technology, strengthening of brand power
- Expansion of business in new markets and new sectors
- Prioritization of development and facility investment in growth areas



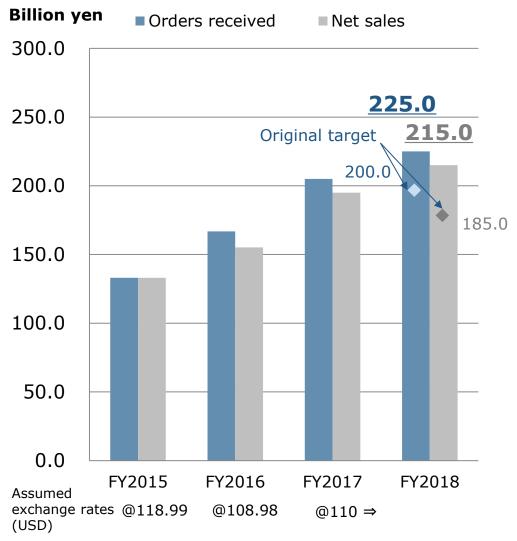
## **Growth Business (Motorcycle & Engine) :** Three Priority Sectors

#### Indian motorcycle market **Response to Indian motorcycle market** forecast India is world's largest motorcycle market and is expected to maintain high growth in the future. 49 Leisure bike market is also expected to expand to more than million 300,000 units in 2025 (110,000 units in 2016). units 18 million Development of sales network and development base, and units strengthening of production capacity 2025 2016 Off-road four-wheelers used Strengthening of off-road four-wheelers (Side by Side) business in diverse applications Stable growth of off-road four-wheelers market, mainly in North America Strengthening of product line-up and accessory business Strengthening of general purpose **R&D** (Grand Rapids) engine business Stable growth of lawnmower engines market in line with growth of housing market in North America

• Strengthening of R&D base in North America (Grand Rapids)



## Progress of "MTBP 2016" Orders Received/Net Sales (Precision Machinery)



#### **Business environment**

 Hydraulic: Strong demand for excavator, especially in Chinese market

**Robot:** Continued growth in demand globally

### **Review of FY2018 target**

#### • Hydraulic:

Upward revision of KHI excavator demand forecast

-2018 excavator demand forecast: 180,000 units  $\rightarrow 260,000$  units

#### • Robot:

Review of robot sales due to demand growth

-2018 robot net sales 15% up

#### Picture of FY2020

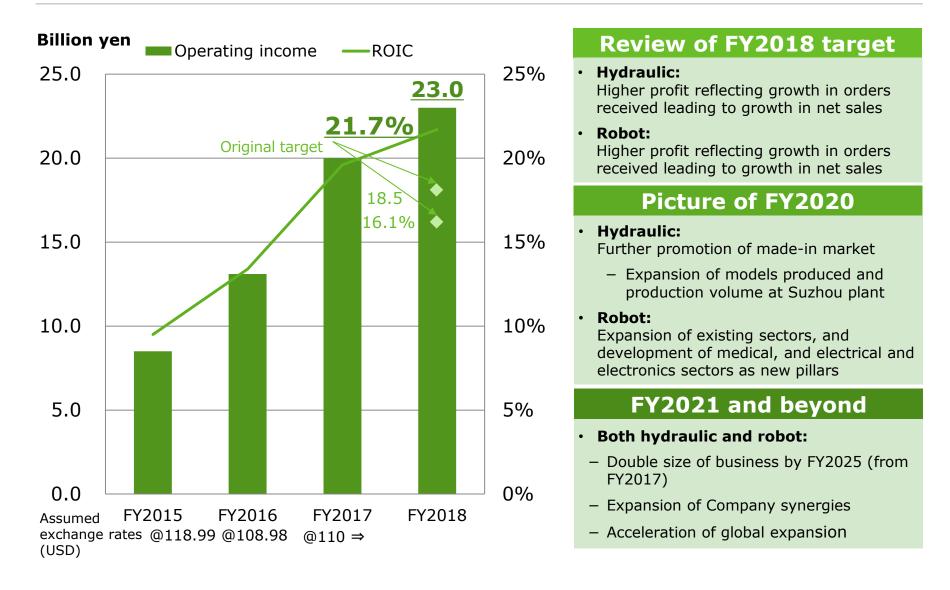
#### • Hydraulic:

Keeping on current strong performance in excavator sector, promotion of sales expansion in other construction/agricultural equipment sectors

#### • Robot:

Sharp growth in existing sectors(automobile, painting, semiconductors, general industries etc.) and also in area of human collaboration such as duAro

# Progress Status of "MTBP 2016" Operating Income/Before-Tax ROIC (Precision Machinery)





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### **Growth Business:** Hydraulic Excavator Business in China and India

### **Expansion of Chinese excavator market**

- Chinese excavator demand expected to remain at current high level (around 100,000 units)
- Promotion of expansion in models produced at KPM (Suzhou) Plant



#### Chinese excavator market forecast (KHI estimate)

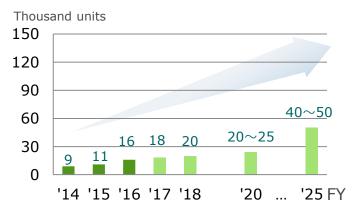


### **Expansion of Indian excavator market**

#### Indian excavator market forecast (KHI estimate)

- Indian excavator demand estimated to expand to 40,000-50,000 units by FY2025
- New plant under construction in suburbs of Bangalore
  - Scheduled for completion in FY2018





## **Growth Business:Robot (1)**

**Response to Shrinking Working-Age Population and Succession of Skills** 

#### Response to Shrinking Working-Age Population

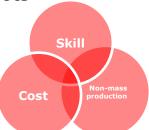
## Dual-arm SCARA robot that can coexist with humans in the workplace



#### **Response to Succession of Skills**

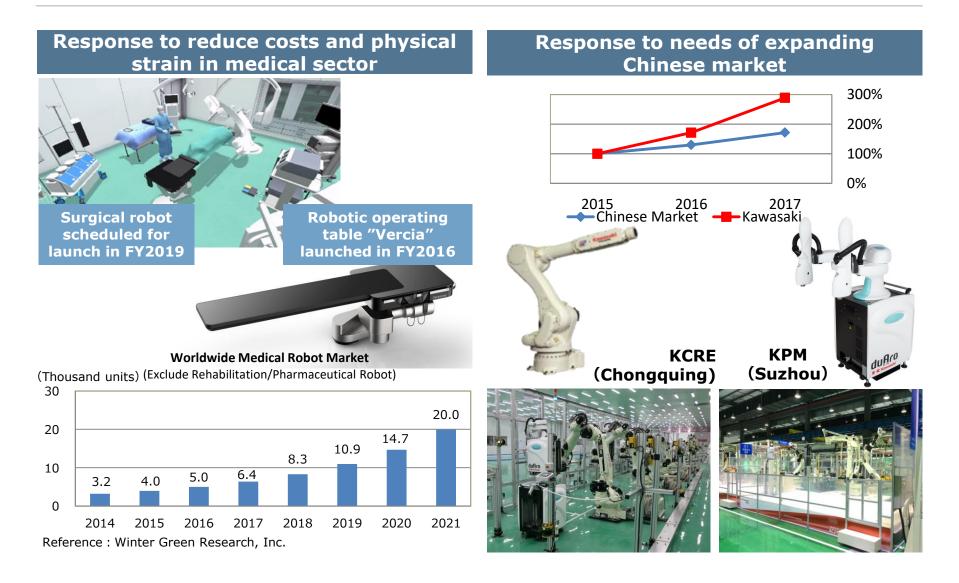


## Realization of succession of skills through robots



- AI function
- AI technology enables varied tasks to be mastered and converted into automatic operations
- Training function
  - New workers learn operations "taught" to robots by skills workers

### **Growth Business:Robot (2)** Medical Sector and Chinese Market





## <Reference>FY2018 Forecast by Segment①

(Billiion Yen)									
	Orders Received			Net Sales			Operating Income		
FY2018	MTBP 2016	In Nov. 2017	Change	MTBP 2016	In Nov. 2017	Change	MTBP 2016	In Nov. 2017	Change
Ship & Offshore Structure	140.0	115.0	▲25.0	110.0	95.0	▲15.0	1.5	2.5	+1.0
Rolling Stock	200.0	170.0	▲30.0	200.0	180.0	▲20.0	14.0	6.0	▲8.0
Aerospace	300.0	270.0	▲30.0	320.0	300.0	▲20.0	24.0	21.0	▲3.0
Gas Turbine & Machinery	290.0	305.0	+15.0	345.0	325.0	▲20.0	16.5	11.0	▲5.5
Plant & Infrastructure	160.0	120.0	<b>▲</b> 40.0	145.0	120.0	▲25.0	10.0	4.0	▲6.0
Motorcycle & Engine	350.0	340.0	▲10.0	350.0	340.0	▲10.0	21.0	15.0	▲6.0
Precision Machinery	200.0	225.0	+25.0	185.0	215.0	+30.0	18.5	23.0	+4.5
Others	100.0	85.0	▲15.0	85.0	85.0	0	▲5.5	▲5.5	0.0
Eliminations and corporate	-	-	-	_	-	-	-	-	-
Total	1,740.0	1,630.0	▲110.0	1,740.0	1,660.0	▲80.0	100.0	77.0	▲23.0

Assumed exchange rates (USD) : @110

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## <Reference> FY2018 Forecast by Segment ②

5/2010		efore-tax RO / Invested Ca		Operating Margin (Operating Income / Net Sales)			
FY2018	MTBP 2016	In Nov. 2017	Change	MTBP 2016	In Nov. 2017	Change	
Ship & Offshore Structure	6.1%	4.4%	<b>▲</b> 1.7%	1.3%	2.6%	+1.3%	
Rolling Stock	13.1%	7.4%	▲5.7%	7.0%	3.3%	▲3.7%	
Aerospace	11.2%	10.8%	▲0.4%	7.5%	7.0%	▲0.5%	
Gas Turbine & Machinery	8.5%	4.3%	<b>▲</b> 4.2%	4.7%	3.4%	<b>▲</b> 1.3%	
Plant & Infrastructure	17.3%	10.4%	▲6.9%	6.8%	3.3%	▲3.5%	
Motorcycle & Engine	16.8%	11.6%	▲5.2%	6.0%	4.4%	<b>▲</b> 1.6%	
Precision Machinery	16.1%	21.7%	+5.6%	10.0%	10.7%	+0.7%	
Total	11.0%	8.0%	▲3.0%	5.7%	4.6%	▲1.1%	

Assumed exchange rates (USD) : @110

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