

2018 Medium-Term Business Plan Update (FY2018~2020)

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October 31, 2019

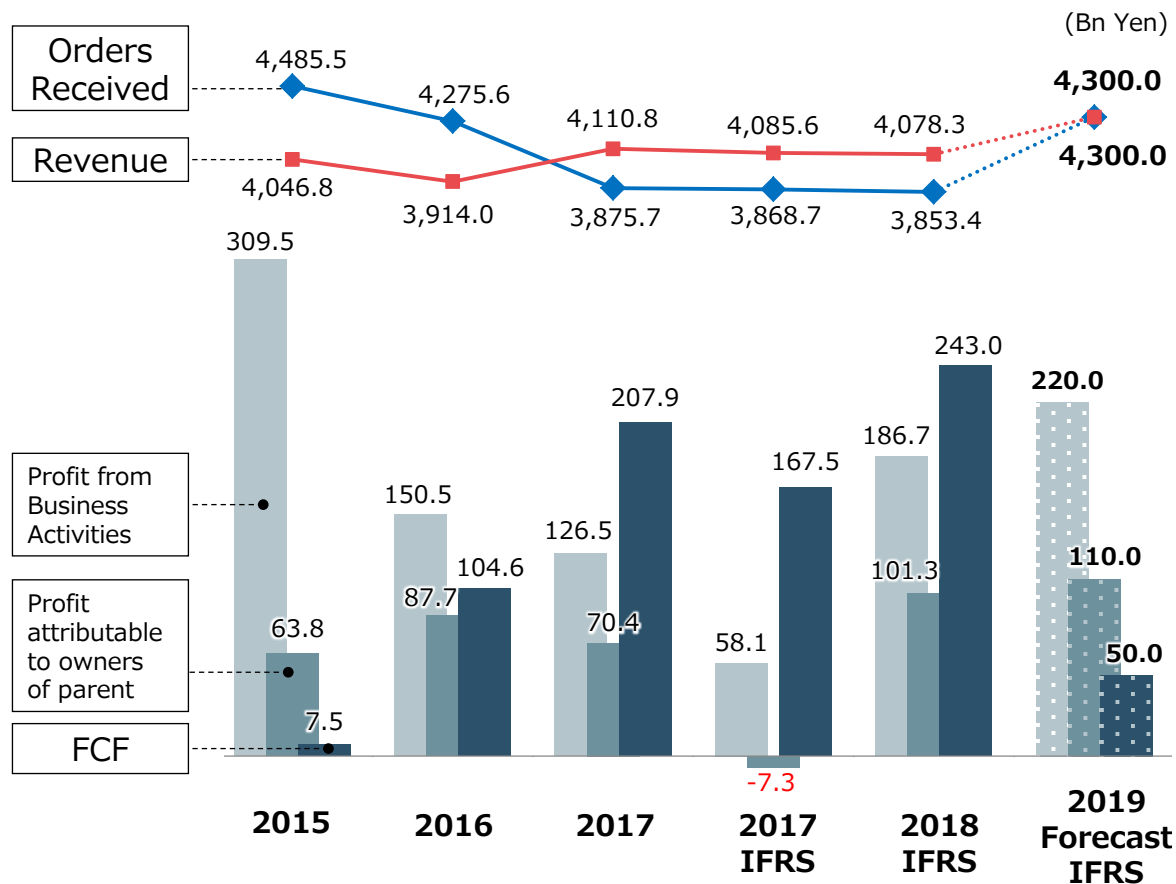
Mitsubishi Heavy Industries, Ltd.

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I . FY2019 Status Update

Overview of FY2019 Measures

- Midway through 2018 MTBP, MHI is executing as planned, strengthening financial foundations by embedding cash flow management processes
- Addressing near-term issues like reduction of demand for steam power, market for medium-lot products, while building a firm financial foundation to enact growth measures for coming years
- Accelerating SpaceJet M90 development toward Type Certification and first delivery



Business Scale

- Revenue proceeding according to plan
- Orders for medium-lot products lower mainly in China and Europe
- Delays in large-scale projects development

Profit

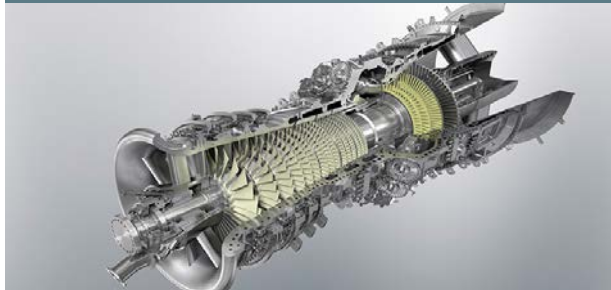
- Faster identification and addressing of issues (P.9)
- Focusing on fixed cost reduction in response to change in medium-lot product market

FCF & Financial Foundation

- Measures to address FCF and strengthening of financial foundations proceeding according to plan
- Secure investment funds for sustainable growth

IFRS: International Financial Reporting Standards CF: Cash Flow FCF: Free Cash Flow

Growth in Advanced Class GTCC



- U.S. Order for 1,200 MW GTCC
- Upgrade of 2 GTs in Egypt

Growth in Middle & Small Capacity GT



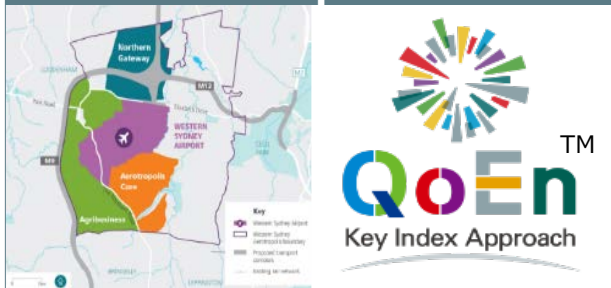
- Growth of H100 use in mechanical drive and private power generation
- Strong order intake for aero-derivative gas turbines

Thermal Power Service Business



- MOU with Uzbekistan's Ministry of Energy on Collaboration in Power Plant Operation and Maintenance Support
- Established service company in Philippines

West Sydney Urban Development



- Developed QoEn™, an index to quantitatively indicate optimal energy infrastructure, under joint verification with the University of New South Wales

Triple Hybrid



- Stand-alone power supply system combining renewables, engine generator and storage battery
- Collaborative sales to Africa with Calik Enerji of Turkey

Green Energy Usage



- Purchased and operating wind farm in U.S. (70 units of 1,000kW MHI turbines)
- Improved output through refurbishment achieving equivalent power generation to MHI Group's entire energy needs in U.S.

Strengthening Logistics Equipment Business



- U.S. dealer acquisition led to direct sales expansion and used business entry
 - Progressed with PMI, including organizational integration, model unification and consolidation of test facilities in Shiga
- PMI: Post Merger Integration

Expansion of Car Aircon Business



- Concentrated resources on electric compressors for EVs
- Boosted production capacity in Thailand, opened new plant in Changshu, China, expanded in Europe to double business scale

Marine SOx Scrubbers



- Built mass production system for SOx scrubbers that remove sulphur oxide from ship's exhaust gasses
- Started shipping from affiliate factories in China and Taiwan

Kaizen in Commercial Aircraft Production



- Steady production of 14 sets of 787 main wing boxes per month
- Started operation of automated 777X assembly line

Reduction of CO2 in Steel Production



- Developed breakthrough zero CO2 emission hydrogen based direct reduction technology using concentrate fines
- Test plant to start running in 2020

Strengthening of Aero Engine Business



- Building new aero engine parts factory in Nagasaki Shipyard
- Growing MRO business

MRO: Maintenance, Repair & Overhaul

SpaceJet M90

Assembly of flight test aircraft



- Advancing assembly of flight test aircraft, accelerating TC testing
- Established base in Montreal to accelerate design work

SpaceJet M100

MOU with Mesa Airlines



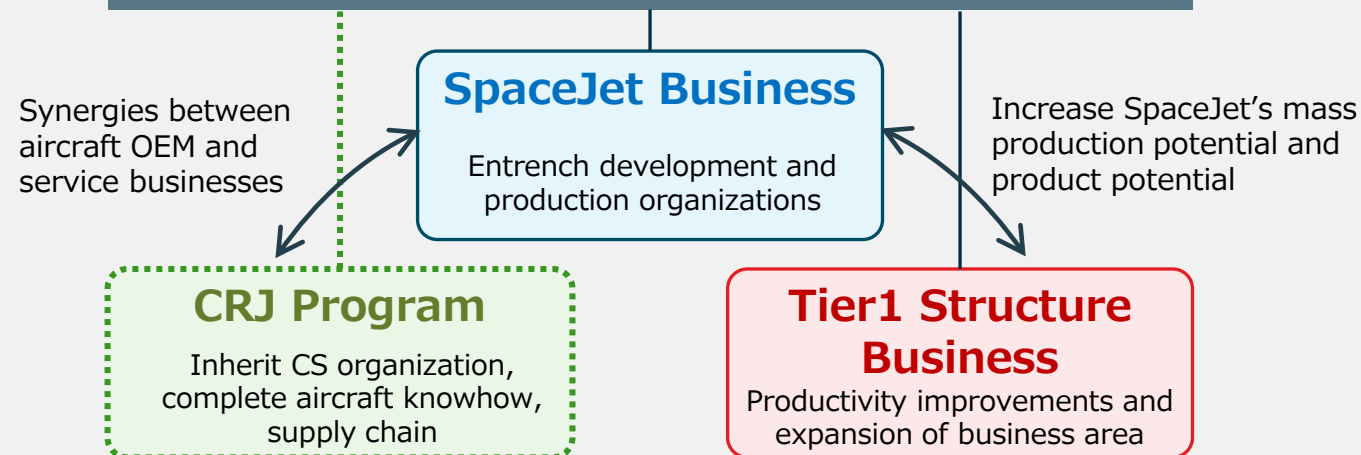
- Advancing study of main model for U.S. market, M100
- Negotiating with potential customers and suppliers

Service Organization



- Installed simulator in Haneda Training Center
- Signed acquisition agreement for CRJ program with Bombardier

Commercial Aviation Systems Segment



CS: Customer Service

- Moved MRJ Division under Commercial Aviation Systems Segment as of October 1
- Maximize synergies between Aircraft OEM Business (SpaceJet), Tier1 Structure Business and Service Business (CRJ)

CRJ: Canadair Regional Jet

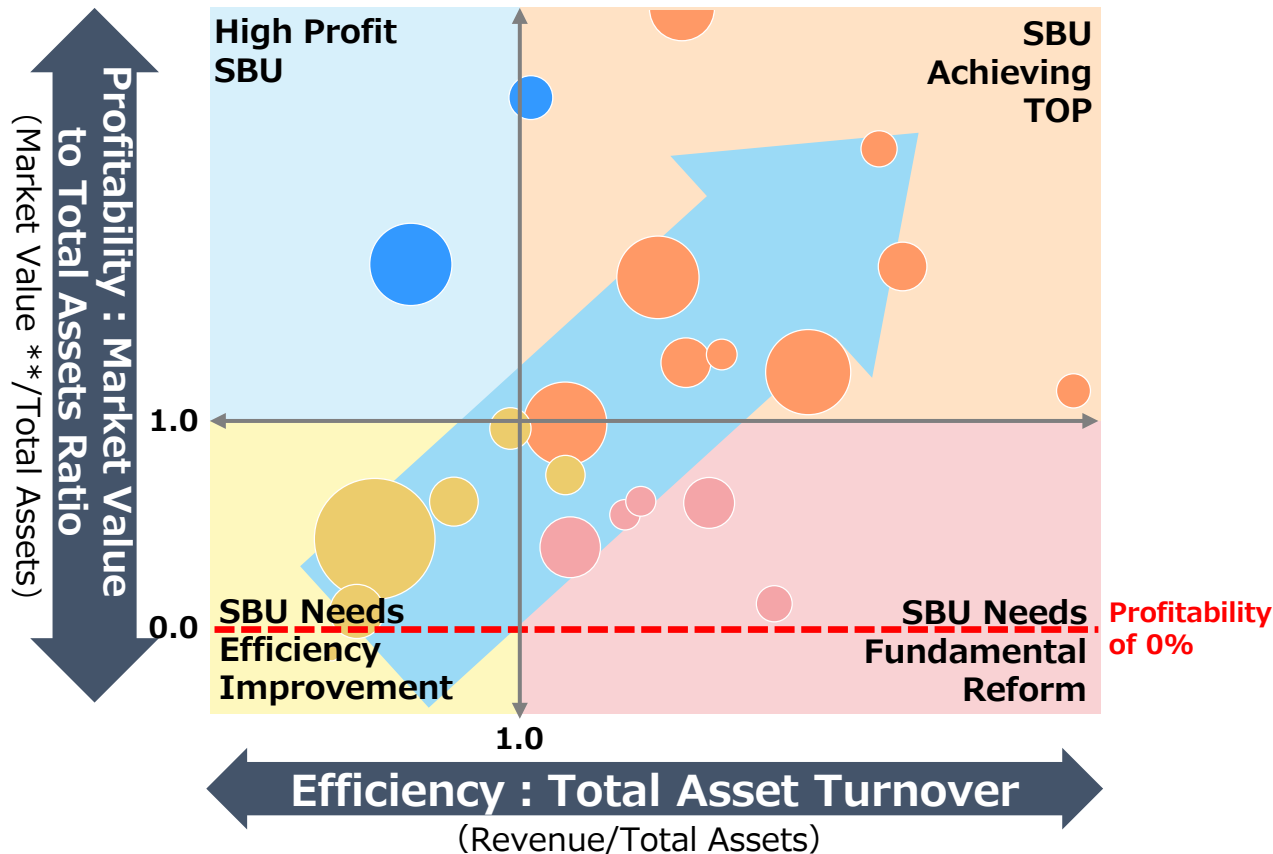
II. Balancing Growth with Financial Stability

~ The Deepening of TOP Management ~

Balancing Growth with Financial Stability (TOP* Management)

- Identify issues and implement solutions more effectively and faster through TOP* Positioning
- Achieve financial stability and growth potential by ensuring current businesses achieve TOP

*TOP(Triple One Proportion) = MHI Group Management Indicator that aims at a 1:1:1 balance between Revenue : Total Assets : Market Value



**Market Value = SBU profit ÷ expected rate of return

① SBU Needs Efficiency Improvement

By increasing efficiency, achieve profit improvement and business growth

② SBU Needs Fundamental Reform

Regardless of efficiency, profits do not increase; need fundamental reform (e.g. change in strategy)

③ Group-wide Measures

HQ takes lead on group-wide issues (low performing assets, personnel measures for steam power etc.)

GROWTH CAPITAL / RESOURCES

ENABLE SUCCESS OF GROWTH STRATEGY

SBU: Strategic Business Unit

Allocating investment capital for growth strategy

- As originally planned, capital gained from strengthening financial foundation can now be concentrated in funding growth strategy
- Thanks to significant progress in strengthening of financial foundation and operational efficiencies we have funding capacity for sustained growth

2018 MTBP Capital Allocation Plan

Steady Cash Inflow
1,320

(Unit: Billion Yen)

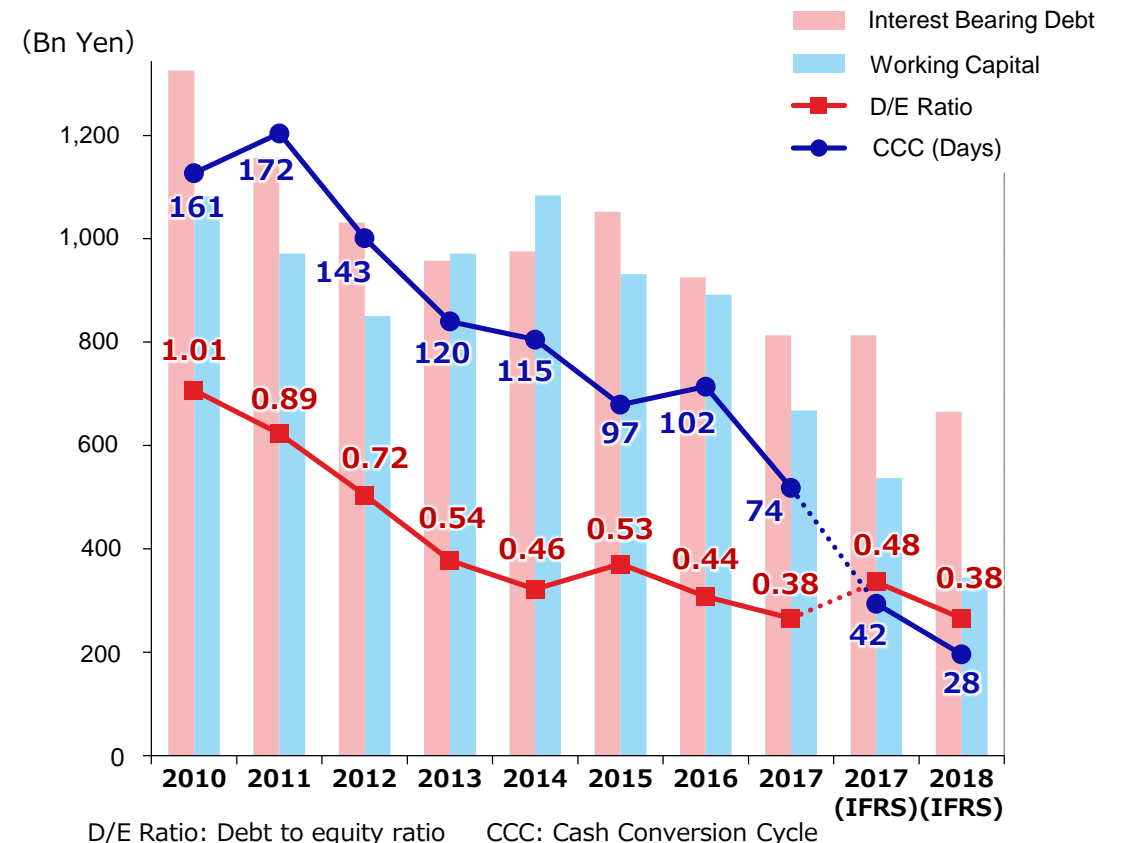
960

170

190

Aggressive Investment 960		Defensive/Maintain Investment 170		Shareholder Returns 190
New Business & MSJ 580	New Facilities 240	Facility Updates 160	Reduction in Interest Bearing Debt 50 <small>(Includes appropriation of 90bn in cash in hand)</small>	Dividends 190
	Investment & Lending 140	Risk Response 50		

Strengthening financial foundation, operational efficiency



Revision of FY2020 Forecast

- M&A deals have been undertaken with an emphasis on balancing business growth and financial stability
- Revised FY20 target reflecting committed M&A deals and the current state of the medium-lot product market
- Implementing growth strategy built on megatrends to enable business expansion for the next MTBP

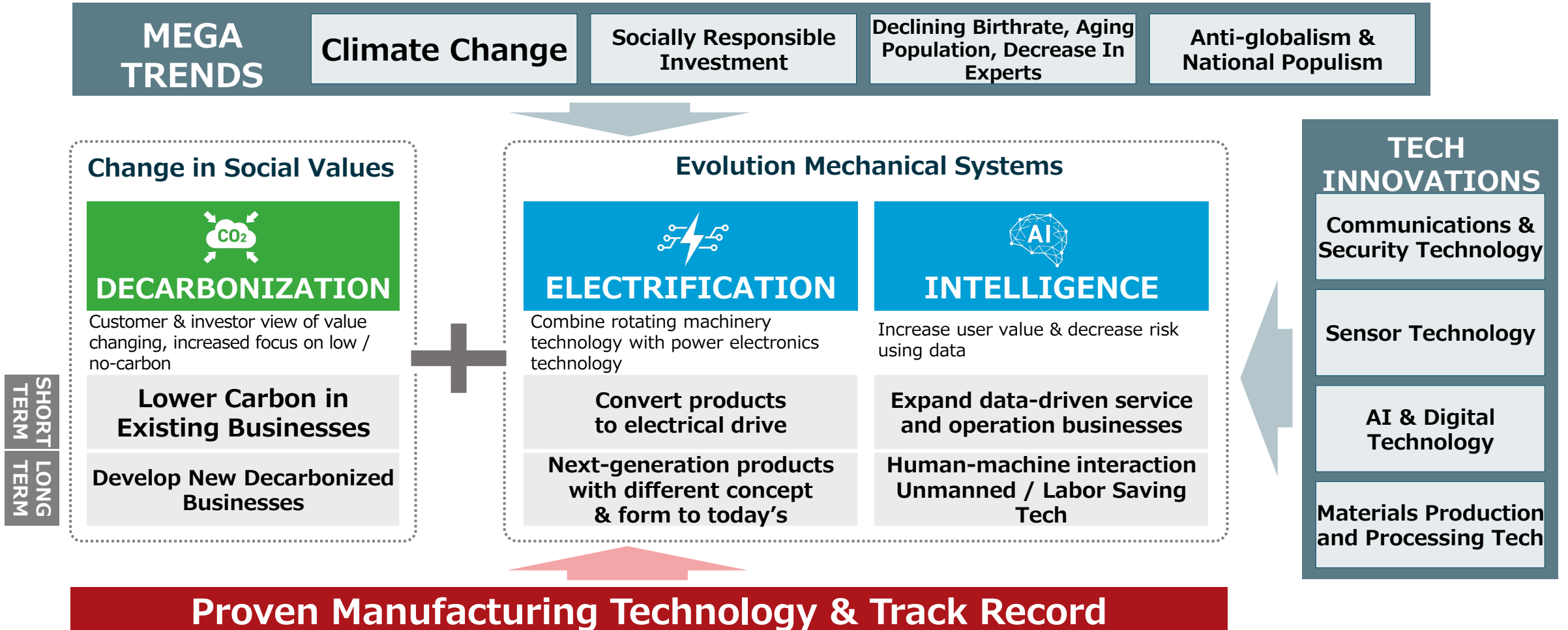
	FY2019 Forecast	FY2020	
		Original Target	Current Forecast
Orders Received	4,300	5,000	→ 4,600
Revenue	4,300	5,000	→ 4,700
Profit from business activities	220	340	→ 300
Profit attributable to owners of parent	110	170	→ 150
ROE	8%	11%	→ 10%
FCF	50	50	→ 50

(Unit: Billion Yen)

III. Growth Strategy

Megatrends and MHI's Business

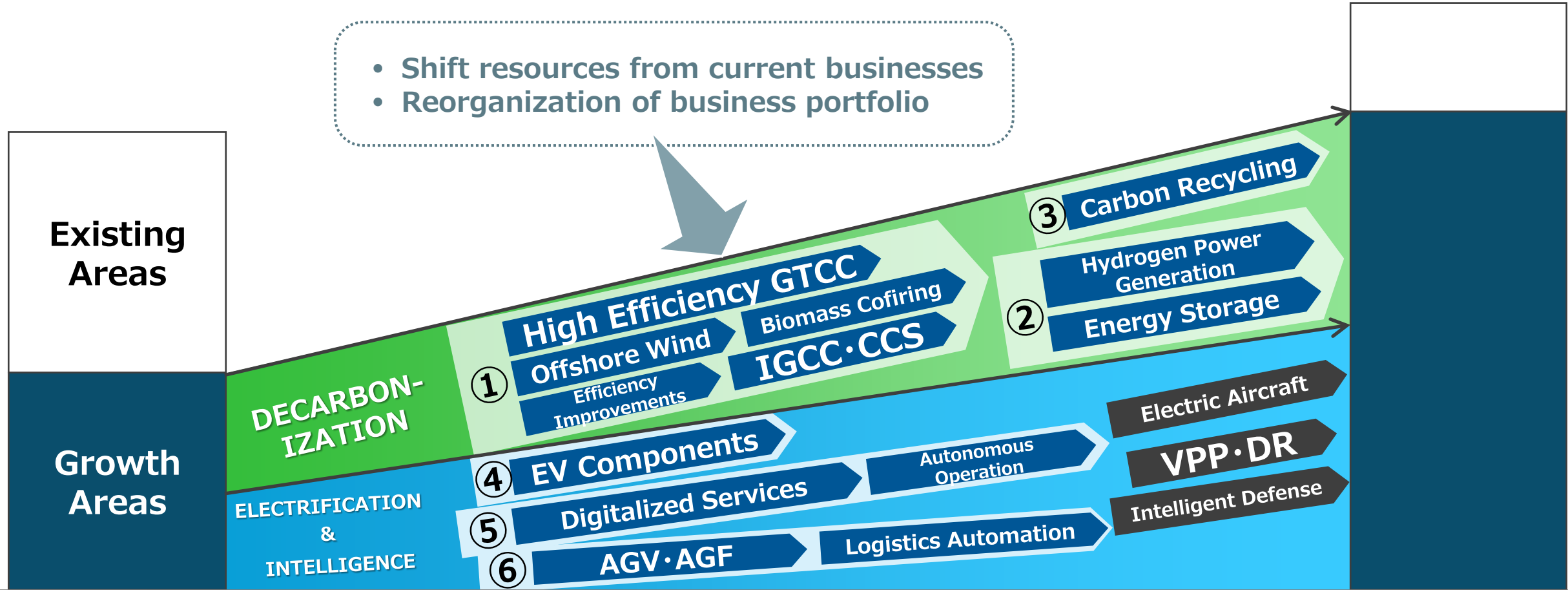
- With manufacturing at the core, we will expand business areas that take on changing social values and technological innovations
- We will address Decarbonization and evolve mechanical systems based on Electrification and Intelligence



MHI's Growth into the Future

- Decarbonization, Electrification, Intelligence are growth areas that leverage MHI's core competences
- Shift resources from current businesses to develop growth areas over time

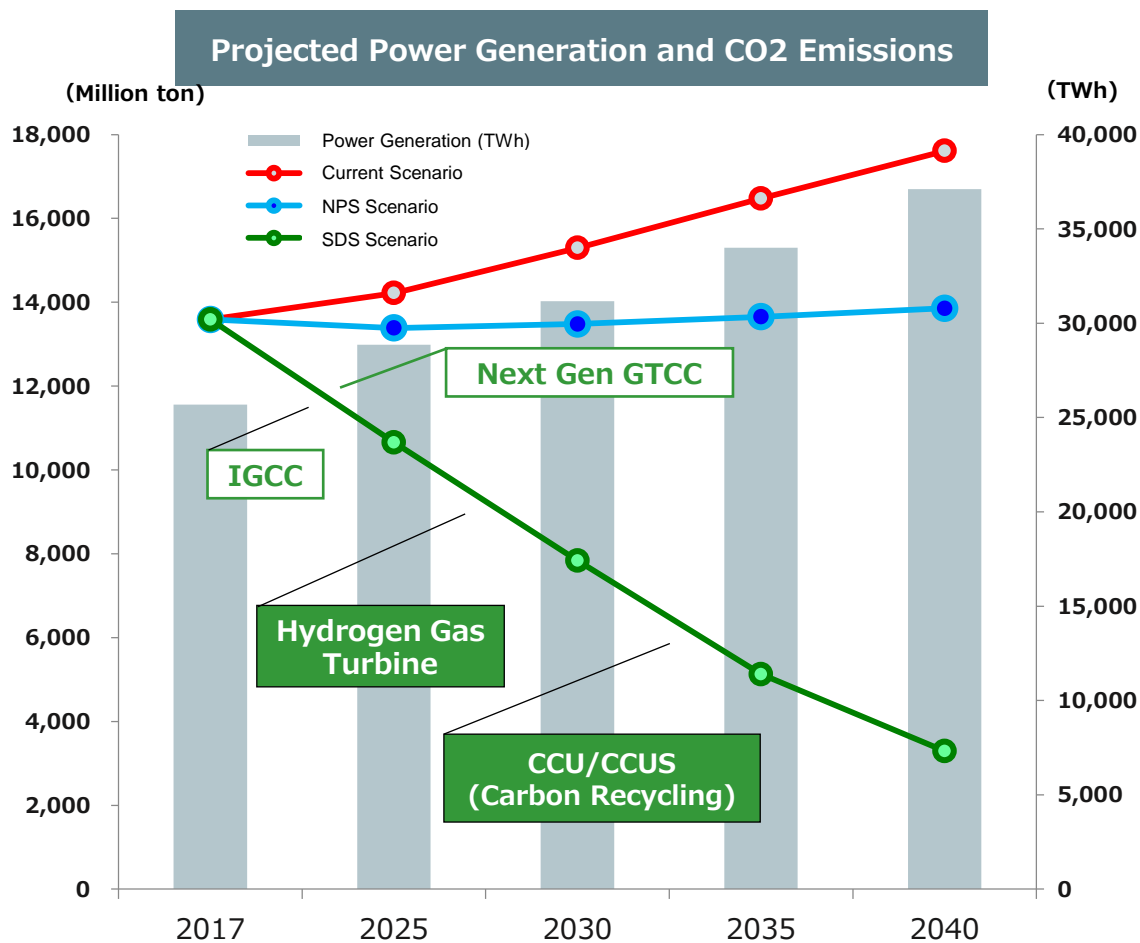
• Shift resources from current businesses
• Reorganization of business portfolio






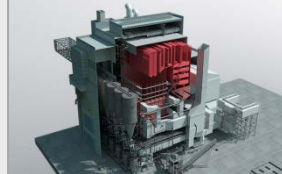




AGV/AGF: Automated Guided Vehicle/Forklift VPP: Virtual Power Plant DR: Demand Response

① Existing Power Business

- Balance increased demand for electricity with lowering carbon emissions
- Strengthen MHI's core competencies to deliver latest technologies to customers



ZERO CARBON	LOW CARBON
<p>Hydrogen Gas Turbine (100% H₂)</p> 	<p>Next Gen GTCC</p> 
<p>CCS/CCUS</p> <ul style="list-style-type: none"> • CO₂ Capture, Utilization, Storage 	<p>IGCC</p> 
<p>Light Water Reactor</p> <ul style="list-style-type: none"> • Zero carbon baseload electricity 	<p>Steam Power</p> <ul style="list-style-type: none"> • Increase efficiency/replace • Biomass cofiring • Ammonia cofiring 
<p>Offshore Wind</p>  <p>MHI VESTAS OFFSHORE WIND</p>	<p>ORC</p> <ul style="list-style-type: none"> • Waste heat capture • Binary Power Generation  <p>TURBODEN clean energy ahead</p>

※Source: IEA World Energy Outlook 2018
 NPS Scenario: "New Policies Scenario" – direction in which today's stated policy ambitions would take the energy sector
 SDS Scenario: "Sustainable Development Scenario" – scenario charts a path fully aligned with the Paris Agreement by holding the rise in global temperatures to "well below 2°C ... and pursuing efforts to limit [it] to 1.5°C"

② Hydrogen Power Generation & Energy Storage

- Develop hydrogen gas turbines in time for arrival of hydrogen society
- Grow businesses through best mix of energy systems to realize a decarbonized future

Broad Operational Track Record
Over 3m hours
Rich track record of hydrogen cofiring in over 30 GTs since 1970



Technology validation of latest advanced class gas turbines
30% H₂ Cofiring
STEP 1 (Complete)
Hydrogen Cofiring
30vol% H₂
Premix Combustor
(NEDO Sponsored Program)



World's largest hydrogen power generation
100% H₂ Firing
STEP 2 (~2025)
Hydrogen Firing
100vol% H₂
Diffusion Combustor
(MAGNUM Project in The Netherlands)

Further Advancement in Technology
High Efficiency
STEP 3 (~2030)
Hydrogen Firing
100vol% H₂
Multi-cluster Combustor
(NEDO Sponsored Program)



Testing of Carbon Zero Power Generation Systems in Two Locations

MAGNUM Project (The Netherlands)

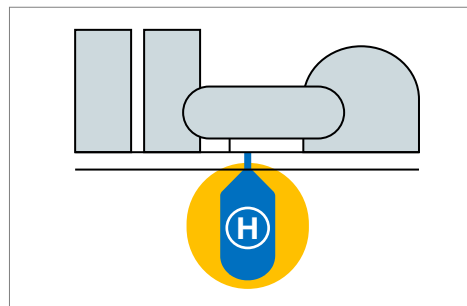
World's Largest 100% Hydrogen Combustion Power Generation Project



Hydrogen from Natural Gas
(Zero CO₂ Using CCUS)
CO₂ Reduction
1.3M CO₂t/Year
(440MW GTCC)

ACES* Project (Utah, USA) * Advanced Clean Energy Storage

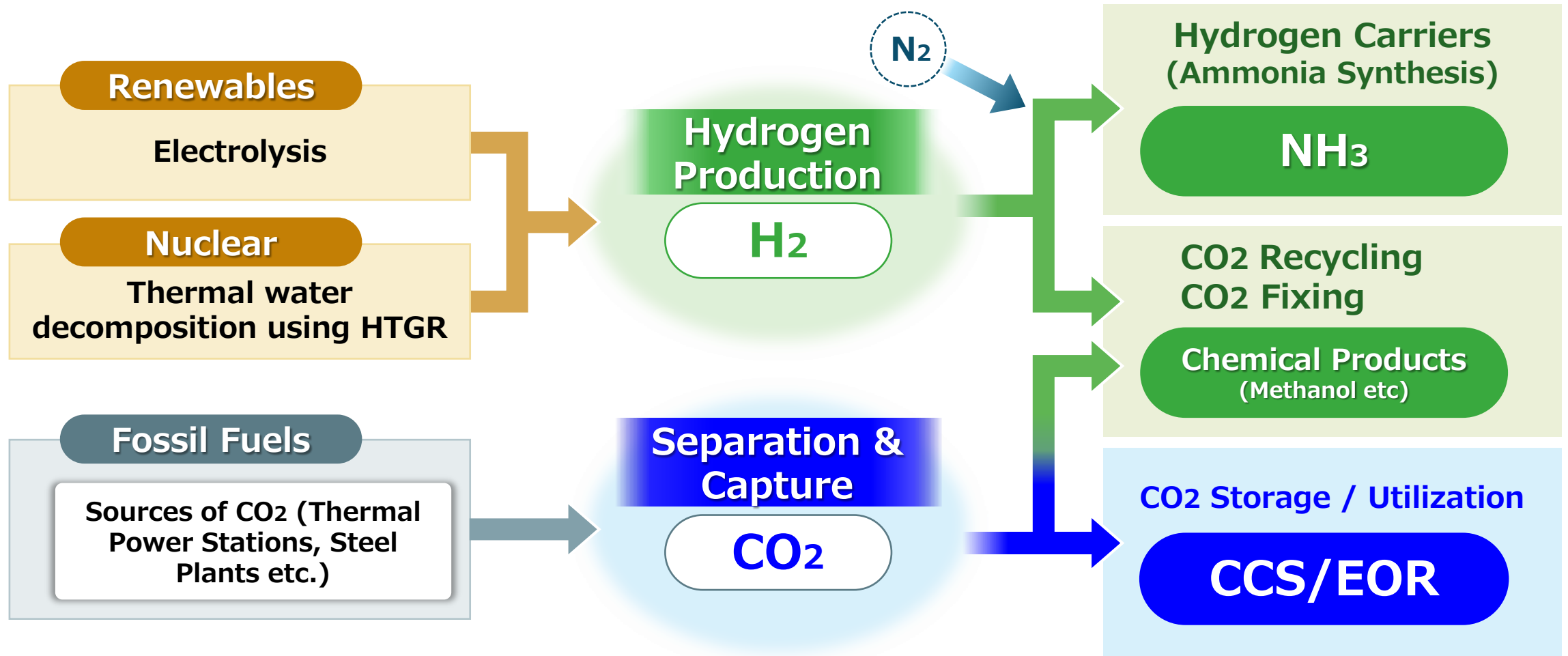
World's largest renewable energy storage project



Hydrogen from Renewable Energy
(Using Surplus)
Amount of energy stored
1,000MW

③ Carbon Recycling

- Convert fossil fuels into green fuels and deliver carbon recycling by building on MHI's core competencies



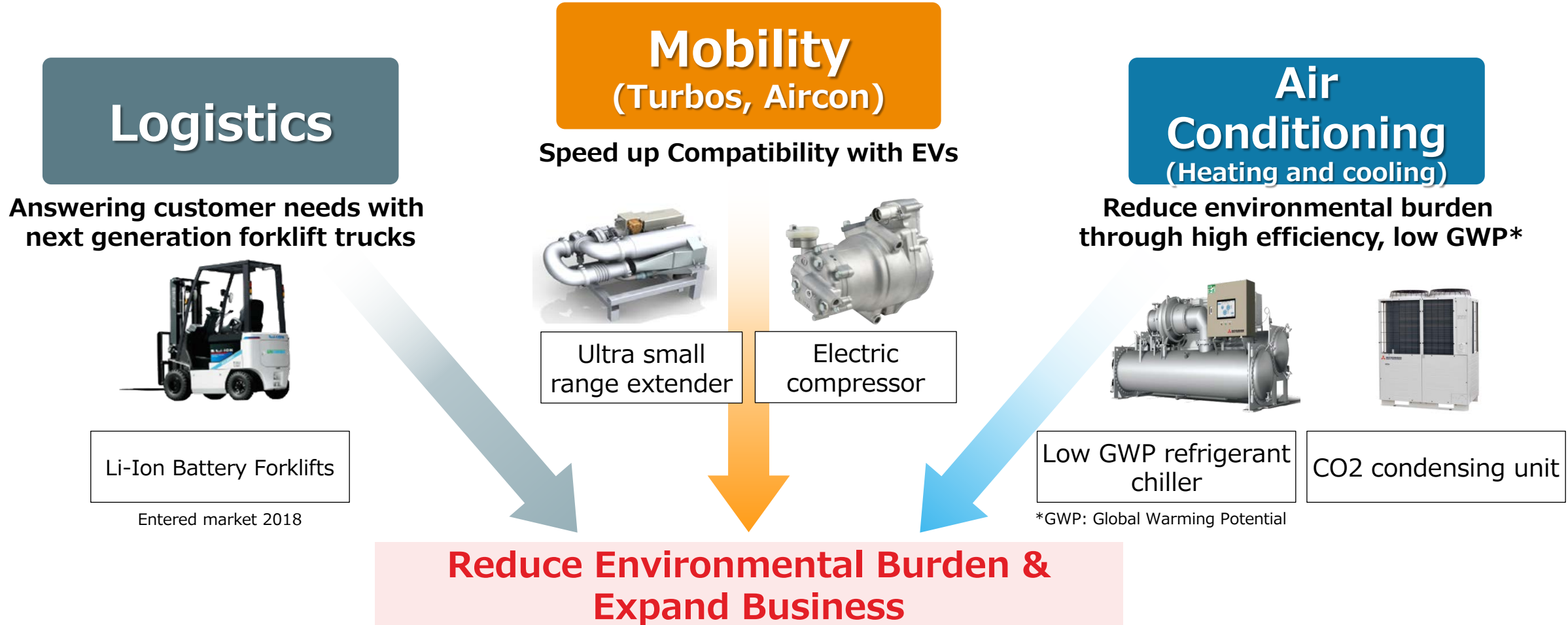
HTGR: High Temperature Gas-cooled Reactor

CCS : Carbon dioxide Capture and Storage
EOR : Enhanced Oil Recovery

④ Electrification and reducing environmental burden of medium-lot products

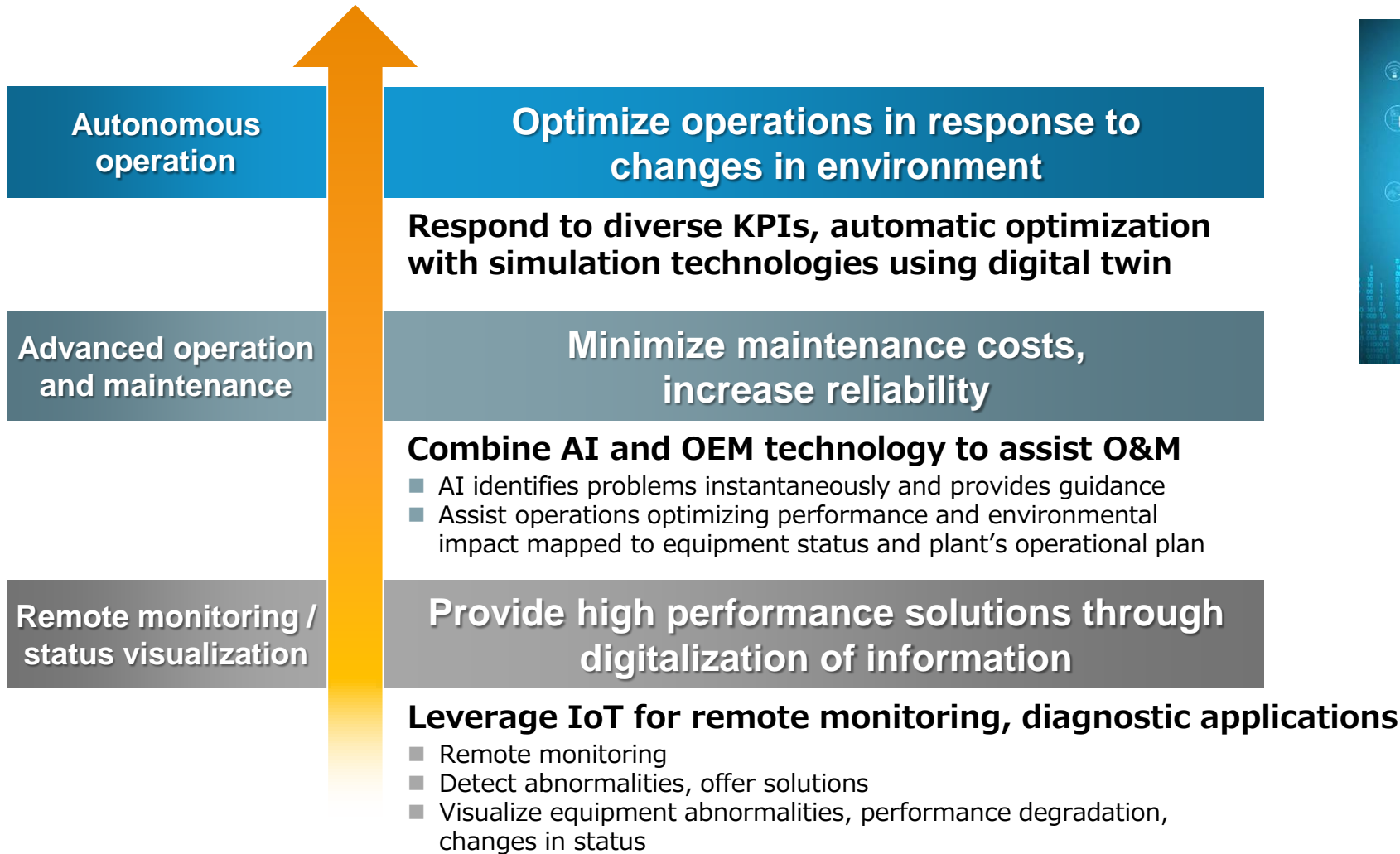


- Expand medium-lot product business by contributing to environmentally conscious growth markets like EV components, next generation forklifts, low GWP chillers etc.



⑤ Autonomous operation of power plants

- The role of power plants will become more diverse with the realization of a low carbon society
- Optimize operations in response to changes in environment



- Due to the boom in e-commerce, demand for logistics solutions are rapidly expanding and diversifying
- Develop logistics solution business to respond to diversified customer needs

Automation (Unmanned / Labor Saving)

Improvements in functionality of Laser Guided Forklifts responding to customer needs especially driver shortage (e.g. for automated truck loading)

- Expanding use of image recognition and sensor technology for unmanned warehouse receiving and dispatch
- Established new logistics testing center last year at MHI Research & Innovation Center to strengthen development and demonstrate new solutions to customers



Logistics Testing Center (Takasago)

Object Recognition (Increase Safety)

Introduced anti-collision function into forklifts using human detection technology

- Advanced detection technology employing deep learning, onboard cameras detect people and alert the driver via alarm
- Prevent accidents due to oversight or assumption



Human Detection System

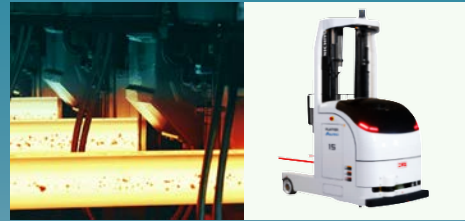
IV. Foundation for Growth

Strengthening Technological Core to Achieve Growth Strategy

- Strengthen technological foundations by developing MHI Group's core competencies while acquiring technologies through open innovation



POWER



INDUSTRY & INFRASTRUCTURE



AIRCRAFT DEFENSE & SPACE



DECARBONIZATION

- Energy systems integration
- Carbon recycling
- Innovative catalyst technology (Using materials & infomatics)

- Energy carrier production technology (hydrogen, ammonia, methanation etc.)
- Renewables, hydrogen GTs, fuel cells, energy storage, CCUS



ELECTRIFICATION

- Electromagnetic field measurement & analysis
- Inverter circuit design & analysis

- Electrification system control tech
- Energy management tech



INTELLIGENCE

- Digital technology
- Data analysis, AI
- Sensing, image recognition tech

- Systems security tech
- Robotics & mechatronics

- Infrastructure and mechanical systems are changing at a rapid pace
- The latest megatrends and technological innovations point to the way forward
- We will collaborate with external partners to develop frameworks to produce innovative ideas and quickly commercialize them

Innovation Promotion Research Institute

Produce innovative ideas,
Cutting-edge technology
development

- Established as research and development specialized corporation in April, 2018 with 100% MHI investment capital
- Undertaking joint R&D globally with universities, research institutes and other companies
- Utilizing cutting-edge external knowhow and ideas to develop foundational technology and new products

Technology Scouting

Venture
Investment

- Technology discovery through direct investment in venture capital and venture companies (e.g. Geodesic Capital)
- Leveraging Global Research and Innovation Centers in USA, UK and Singapore for market and new technology exploration

Testbed Hub

Co-creation with external partners

- Supporting start-ups and regional development
- Nurturing entrepreneurship among employees
- Developing new businesses

■ Pushing ahead with management structure reform to drive growth strategy

Establish Growth Promotion Department

- Establish agile business development department with direct CEO oversight to strengthen HQ-driven incubation
- Support growth of existing businesses by rolling out technological trends and new business models across the Group

Reorganize business structure to match growth strategy

- Explore reorganization of business structure to drive global expansion of businesses in growth strategy
- Drive synergies by placing Mitsubishi SpaceJet, CRJ and Tier 1 businesses under same Commercial Aviation Systems segment management

HR Management

- Acquire talent that can thrive in businesses focused in electrification, intelligent technologies and further globalization
- Develop plans to nurture self-directed talent, HR systems and shared platforms that support growth strategy

Appendix

Numerical Targets by Domain

Domain	Orders Received			Revenue			Profit from business activities		
	FY2018 Actual	FY2019 Forecast	FY2020 Attainment Target	FY2018 Actual	FY2019 Forecast	FY2020 Attainment Target	FY2018 Actual	FY2019 Forecast	FY2020 Attainment Target
Power	1,426.5	1,600.0	1,800.0	1,525.1	1,650.0	1,900.0	132.8	140.0	190.0
Industry & Infrastructure	1,852.0	2,000.0	2,100.0	1,907.8	1,950.0	2,050.0	70.1	110.0	135.0
Aircraft, Defense & Space	610.6	700.0	700.0	677.5	700.0	770.0	△ 37.4	△ 20.0	0
Others	73.3	100.0	100.0	71.6	70.0	100.0	35.9	5.0	0
Eliminations or common	△ 109.1	△ 100.0	△ 100.0	△ 103.8	△ 70.0	△ 120.0	△ 14.8	△ 15.0	△ 25.0
TOTAL	3,853.4	4,300.0	4,600.0	4,078.3	4,300.0	4,700.0	186.7	220.0	300.0

(Unit: Billion Yen)

MOVE THE WORLD FORWARD

**MITSUBISHI
HEAVY
INDUSTRIES
GROUP**