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

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As President and CEO, I am pleased to present this update of our 2018 Medium-Term Business Plan, including an overview of the measures underway in the current fiscal year 2019.

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I. FY2019 Status Update

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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 Consolet MOO development toward Type Contification and first delivery
- Accelerating SpaceJet M90 development toward Type Certification and first delivery



The first half of our 2018 Medium-Term Business Plan proceeded as planned. By embedding cash flow management processes, our financial foundations have become increasingly stronger.

As we address such near-term issues as falling demand for steam power and erosion of the market for medium-lot products, based on our firm financial foundation we are enacting growth measures in preparation for our subsequent MTBP.

In our SpaceJet business, we are accelerating development toward acquisition of Type Certification and first delivery of the M90.

The graph at the lower left shows our business results since 2015 and our forecasts for the current fiscal year. Business scale has been adversely impacted mainly by reduced orders for medium-lot products, especially from China and Europe. To sustain profit amid these changing market conditions, we are focusing on reducing fixed costs.



Starting from this page, we introduce highlights from the first half of fiscal 2019. First, in the energy area, despite a severe business environment, we achieved steady orders for our advanced class GTCC systems and growth in orders for middle and small-capacity gas turbines.

We also took steps to expand our thermal power service business. We signed an MOU with Uzbekistan's Ministry of Energy, and also established a service company in the Philippines. Meanwhile, in conjunction with the urban development initiative underway in West Sydney, Australia, we are undertaking joint verification with the University of New South Wales of "QoEn," an index we developed to quantitatively indicate optimal energy infrastructure. We are also pursuing initiatives in renewable energies, an area marking robust growth. For example, we are promoting adoption of "EBLOX," a stand-alone power supply system combining renewables, an engine generator and a storage battery. Meanwhile, to deepen understanding of the renewable energy power generation market in the U.S., we acquired and now operate a wind farm in that country.



Here, we see highlights in our Industry & Infrastructure and Aircraft related businesses. First, to strengthen our logistics equipment business, we acquired a dealer in the U.S. This will enable us to expand direct sales and also enter the used equipment business. We also made progress with PMI, through steps including organizational integration, model unification, and consolidation of test facilities to our Shiga Plant. With these measures, we will now pursue further improvements in productivity and profitability.

Today, amid tightening regulations on ship exhaust gases, the market is expanding for marine SOx scrubbers that remove sulphur oxide from a ship's exhaust gases, and we are strengthening our initiatives in this area.

Meanwhile, to reduce CO2 in steel production, we developed a breakthrough zero-CO2 emission, hydrogen-based, direct-reduction technology using iron ore concentrate fines. Operation of a test plant will begin in 2020.

In preparation for expanded adoption of EVs going forward, we concentrated our resources on electric compressors. We are also working to secure a production system, for example by establishing a new plant in Changshu, China.

In our commercial aircraft business, we took steps to achieve further Kaizen in productivity. In our aero engine business, we decided to build a new parts factory at the Nagasaki Shipyard.

In these various ways, we are carrying out measures to pursue steady growth in each business area within these two segments.



In the SpaceJet business, we are taking steps to accelerate TC testing of the M90.

We have also begun studying the M100 as the main model for the U.S. market.

We are also working to build up our service organization, for example with the installation of a simulator at the Haneda Training Center. We also signed an agreement with Bombardier on acquisition of its CRJ program.

Effective October 1st, we transferred our MRJ Division to the Commercial Aviation Systems Segment. Doing so will enable maximization of synergies between the Aircraft OEM business (SpaceJet), Tier1 Structure business, and the Service business (CRJ).

II. Balancing Growth with Financial Stability \sim The Deepening of TOP Management \sim

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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 **High Profit** SBU **1** SBU Needs Efficiency Improvement SBU Achieving By increasing efficiency, achieve profit improvement TOP (Market Value **/Total ofitability : Market Val to Total Assets Ratio and business growth ② SBU Needs Fundamental Reform Regardless of efficiency, profits do not increase; need fundamental reform (e.g. change in strategy) 1.0 **3 Group-wide Measures** Assets) HQ takes lead on group-wide issues (low performing assets, personnel measures for steam power etc.) ue SBU Needs SBU Needs Profitability 0.0 Fundamental of 0% Efficiency **GROWTH CAPITAL / RESOURCES** Improvement Reform 1.0 ENABLE SUCCESS OF GROWTH STRATEGY Efficiency : Total Asset Turnover (Revenue/Total Assets) SBU: Strategic Business Unit **Market Value = SBU profit ÷ expected rate of return

TOP (Triple One Proportion) is an MHI Group Management Indicator that aims at a 1:1:1 balance between revenue, total assets, and market value. As shown in the figure to the left, through TOP positioning of our SBUs, their respective issues and solutions can be identified, and improvement measures devised. In the yellow area at the bottom left, we find SBUs that need efficiency improvement. By increasing these SBUs' efficiency, we pursue profit improvement and business growth. SBUs that need fundamental reform, seen at the bottom right, are SBUs that, regardless of their high efficiency, post no increases in profits. Such SBUs require fundamental reform including structural aspects: for example, changes in strategy.

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



Progress in strengthening our financial foundation is on target, so we have the necessary funding capability for sustained growth. We will proceed with capital allocation as planned and invest in future growth. The graph at right shows indicators of how much our financial foundation and operational efficiency have strengthened. Both our cash conversion cycle (CCC) and D/E ratio have improved.

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 mediumlot product market
- Implementing growth strategy built on megatrends to enable business expansion for the next MTBP

	FY2019	FY2020			
	Forecast	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	
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We have revised our forecasts for fiscal 2020, lowering our orders received target from 5,000 billion yen to 4,600 billion yen and our revenue target from 5,000 billion yen to 4,700 billion yen. M&A deals have been undertaken cautiously, with emphasis on balancing business growth and financial stability. The revised targets reflect committed M&A deals as well as the increasingly severe state of the medium-lot products market. Going forward, we will strengthen our growth strategy initiatives and seek further business expansion, as we will explain later.

III. Growth Strategy

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At our results briefing in May, in explaining MHI Future Stream we stated that we would set our future strategy areas in light of current megatrends. Here, as an interim report of what we are considering, we explain what areas we have determined look promising. With manufacturing at the core, we aim to expand business areas that respond to changes in social values and technological innovations. The area outlined in gray at the top shows the megatrends society is undergoing today; the area in gray to the right shows the various tech innovations occurring globally. From these megatrends and tech innovations, a number of keywords have potential to impact our business: decarbonization for one, and evolution of mechanical systems along with electrification and intelligence for another. We believe these developments offer us opportunities. Concerning decarbonization, in the short term, lower carbon in existing businesses is conceivable; in the long term, there is potential for development of new decarbonized businesses. Regarding evolution of mechanical systems, we see business opportunities in converting products to electrical drive and, in the future, in unmanned and labor-saving technologies.



Here we see what we believe to be growth areas pertaining to decarbonization and to electrification and intelligence, leveraging MHI's core competencies. Going forward, along with focusing on these areas, we will shift resources from current businesses and reorganize our business portfolio. We will discuss these initiatives in detail in the following pages.



First, in our existing power business, we will respond to decarbonization.

We believe power demand will continue to increase going forward. And as it increases, MHI Group will focus on developing decarbonization technologies and introducing them into the market, providing customers with products applying those technologies. On the left side, we see power generation and CO2 emissions projections according to various currently conceivable scenarios. Among them, the areas in which MHI can provide solutions – areas we see as business opportunities – are: relating to zero carbon, 100% hydrogen gas turbines, CCS (carbon capture and storage)/CCUS (carbon capture, utilization and storage), light water reactors and offshore wind turbines. And in the area of low carbon, we will focus on next-generation GTCC systems and IGCC (integrated gasification combined cycle) systems; at existing steam power plants, we will pursue increased efficiency and replacement, as well as biomass co-firing and ammonia co-firing.



Here we introduce initiatives MHI is taking with respect to hydrogen power generation and energy storage, an area much in focus today.

In anticipation of the arrival of tomorrow's hydrogen society, we are developing hydrogen gas turbines. To date, our small-scale hydrogen co-fired gas turbines have an operational track record exceeding 3 million hours. Going forward, we will aim for a corresponding track record with large gas turbines, and as the first step toward that goal we have already achieved 30% H2 co-firing. Step 2 calls for development of 100% H2 firing, and step 3 for high efficiency in 100% hydrogen-fired gas turbines.

In the MAGNUM Project in the Netherlands, 30% H2 co-firing is already underway, and now we are focusing efforts toward achieving 100% H2 firing from natural gas. Meanwhile in the United States, we are involved in the ACES (Advanced Clean Energy Storage) Project, the world's largest renewable energy storage project.



Regarding technologies and social needs slightly further into the future, we are targeting conversion of fossil fuels into green fuels and carbon recycling. Here, hydrogen will be produced by electrolysis employing renewables and thermal water decomposition using a high-temperature gas-cooled reactor. CO2 will be separated and captured from fossil fuels, and be fixed in the form of chemical products such as methanol. And hydrogen will be synthesized into ammonia for use as an energy carrier; and CO2 itself will be stored and directly utilized. Toward achievement of these goals, we will engage in dialogue with our customers and the market.



Business opportunities exist also in our medium-lot products business, by reducing environmental burden, and here we can use our core competencies to advantage. In the areas of logistics, mobility and air conditioning, we respectively supply lithium-ion battery-operated next-generation forklifts, components of all kinds for EVs, and equipment that contributes to reduction of environmental burden through use of low-GWP refrigerants and CO2 refrigerants. We expect society's needs for products of these kinds that reduce environmental burden to expand in the years ahead.



As examples of our initiatives in the area of intelligence, we are already supplying customers with remote monitoring of power plants and diagnostic applications using IoT. Going forward, we aim to combine AI and OEM technology to assist in the enhanced manned performance of plant operation and maintenance, and to ultimately optimize plant operations through autonomous operation using digital twin, in response to diverse KPIs.

6 Logistics equipment automation and object recognition 🦓 INTELLIGENCE

- 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



We believe intelligence will be indispensable in the area of logistics equipment also, for example in terms of automation. As manpower shortages become increasingly severe, we hope to provide automation solutions in this field. We have established a new logistics testing center at the MHI Research & Innovation Center. Here, liaising closely with our customers, we will proceed to consider what kinds of solutions we can provide the customer using unmanned forklifts and so on. Also, because in the future man will need to coexist with automated equipment, applying our accumulated technologies we will strive to provide safe work environments through onboard cameras and deep learning.

IV. Foundation for Growth

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Looking ahead, we will carry forward the various initiatives described above, and at the same time develop specific plans for allocating our resources. First, as one way toward realizing our growth strategy, we will acquire the technologies that will be needed. Here we see some specific examples. For each of the three megatrend keywords, we are now discussing, in all our domains, which technologies to develop or which we need to acquire.

Open Innovation

- 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



In acquiring technologies, rather than attempting to do everything independently, we will use the ideas and strengths of external partners in the form of open innovation. To produce innovative ideas, in April 2018 we established a new Innovation Promotion Research Institute. Here, we are undertaking joint R&D together with universities, research institutes and other companies. We will continue pursuing innovative R&D.

In the area of Technology Scouting, we are exploring for new technologies through direct investment in venture capital and venture companies.

In addition, we are currently considering the establishment of a testbed hub as a place for co-creation with external partners – integrating MHI Group's foundation in monozukuri and our customer network with the ideas of venture companies.

Status of Global Gr	oup Management Reform						
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 						
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Last, we will explain the status of our global Group management reform, focusing on the achievement of our growth strategy.

First, we are mulling the establishment of a Growth Promotion Department. Here, we intend to establish a structure, under direct CEO oversight, to dynamically undertake business development and incubation. Today we are moving ahead with the specifics.

With respect to reorganizing our business structure, we are now putting together an overall framework. For example, as I explained on page 7, we intend to pursue synergies by integrating our SpaceJet operations with our commercial aircraft Tier1 business and the CRJ program.

Concerning HR management, we will acquire talent that can respond to the demands of such new areas as electrification and intelligent technologies. We also will promote and develop management personnel who can take the lead in performing autonomous management.

This completes our update of the 2018 Medium-Term Business Plan.

Appendix

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rical Target	s by I	Doma	nin						
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 FORW>RD

