Status of 2018 Medium-Term Business Plan (FY2018-FY2020)

May 9, 2019
Mitsubishi Heavy Industries, Ltd.

Seiji Izumisawa, President and CEO
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MHPS : Mitsubishi Hitachi Power Systems
I. Business Plan Progress Status
## Financial Targets of 2018 Business Plan

| FY2020 target |  
|----------------|----------------|
| **Revenue**    | ¥ 5 trillion  |
| **Total assets** | ¥ 5.3 trillion or less |
| **ROE**        | 11%           |
| **TOP**        | 1: 1.1 : 0.6 |

**Strong financial base allowed investment into growth areas** (Balance between business growth and financial soundness)

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular cash inflow</td>
<td>¥ 1,320 billion</td>
</tr>
<tr>
<td>New businesses and MRJ</td>
<td>960</td>
</tr>
<tr>
<td>Capital investment</td>
<td>170</td>
</tr>
<tr>
<td>Investment and lending</td>
<td>190</td>
</tr>
<tr>
<td>Facility updates</td>
<td>240</td>
</tr>
<tr>
<td>Risk management</td>
<td>580</td>
</tr>
<tr>
<td>Interest-bearing debt reduction</td>
<td>160</td>
</tr>
<tr>
<td>Investment and lending</td>
<td>140</td>
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<tr>
<td>Facility updates</td>
<td>160</td>
</tr>
<tr>
<td>Risk management</td>
<td>50</td>
</tr>
<tr>
<td>Interest-bearing debt reduction</td>
<td>50</td>
</tr>
<tr>
<td>Shareholder returns</td>
<td>190</td>
</tr>
</tbody>
</table>

**TOP: Triple One Proportion**

Revenue : Total assets : Market value = 1 : 1 : 1

### FY2018 review

- **BS/CF:**
  - 2018 Business Plan financial targets achievable due to significant FCF surplus.

- **Orders/PL:**
  - Medium-lot manufacturing was solid, but orders were down on shrinking of coal-fired power plant market.

- **Growth strategies:**
  - Short-term measures and medium/long-term MHI FUTURE STREAM progressing.

### Main points in FY2019

- **Further improve productivity to prepare for possible deterioration in market environment**
- **Raise profit from business activities in all segments, and secure orders through strengthening of servicing business**
- **Accelerate both short-term and medium/long-term strategies, to achieve growth**

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BS: Balance sheet  CF: Cash flow  PL: Profit and loss  FCF: Free cash flow  ROE: Return on equity

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## I-2. FY2018 Results

<table>
<thead>
<tr>
<th>FY2017 results</th>
<th>FY2018 initial forecast</th>
<th>FY2018 revised forecast (as of Feb.26)</th>
<th>FY2018 result</th>
<th>Major reasons for variances with initial targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orders received</td>
<td>3,868.7 yen/$129.9 yen/€</td>
<td>4,100.0 yen/$130yen/€</td>
<td>3,800.0 yen/$130yen/€</td>
<td>3,853.4 yen/$128.5 yen/€</td>
</tr>
<tr>
<td>Revenue</td>
<td>4,085.6 yen/$130yen/€</td>
<td>4,200.0 yen/$130yen/€</td>
<td>4,200.0 yen/$130yen/€</td>
<td>4,078.3 yen/$128yen/€</td>
</tr>
</tbody>
</table>
| Profit from business activities (Profit rate) | 58.1% (1.4%) | 16.0% (3.8%) | 190.0% (4.5%) | 186.7% (4.6%) | Proceeded smoothly as planned

- ¥30 billion in profit from business activities and
- ¥20 billion in net income booked on sales of fixed assets |
| Profit attributable to owners of parent | -7.3 yen | 80.0 yen | 100.0 yen | 101.3 yen | Surplus achieved on progress in reducing working capital |
| ROE             | -0.5% | 6% | 7.2% | 7.2% |  |
| FCF             | 167.5 yen | 50.0 yen | 130.0 yen | 243.0 yen |  |
| D/E ratio       | 0.48 | 0.4 | 0.38 |  |
| Equity ratio    | 26.6% | 28% | 27.8% |  |
| Interest-bearing debt | 813.1 yen | 770.0 yen | 665.1 yen |  |
| Total assets    | 5,248.7 yen | 5,100.0 yen | 5,142.7 yen |  |
| Dividend(yen/share) | 120 yen | 130 yen | 130 yen |  |

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## I-3. FY2019 Numerical Targets

(Billion yen)

<table>
<thead>
<tr>
<th>FY2018 results</th>
<th>2018→2019 Core measures</th>
<th>FY2019 targets</th>
<th>2019→2020 Core measures</th>
<th>FY2020 targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>110.7yen/$ 128.5yen/€</td>
<td>110yen/$ 125yen/€</td>
<td>110yen/$ 130yen/€</td>
<td></td>
</tr>
<tr>
<td>Orders received</td>
<td>3,853.4</td>
<td>4,300.0</td>
<td>5,000.0</td>
<td>5,000.0</td>
</tr>
<tr>
<td>Revenue</td>
<td>4,078.3</td>
<td>4,300.0</td>
<td>5,000.0</td>
<td>5,000.0</td>
</tr>
<tr>
<td>Profit from business activities</td>
<td>186.7 (4.6%)</td>
<td>220.0 (5.1%)</td>
<td>340.0 (6.8%)</td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>7.2%</td>
<td>8%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>FCF</td>
<td>243.0</td>
<td>50.0</td>
<td>* 50.0</td>
<td></td>
</tr>
<tr>
<td>D/E ratio</td>
<td>0.38</td>
<td>0.3</td>
<td>* 0.3</td>
<td></td>
</tr>
<tr>
<td>Equity ratio</td>
<td>27.8%</td>
<td>29%</td>
<td>* 30%</td>
<td></td>
</tr>
<tr>
<td>Interest-bearing debt</td>
<td>665.1</td>
<td>600.0</td>
<td>* 600.0</td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td>5,142.7</td>
<td>5,200.0</td>
<td>* 5,500.0</td>
<td>180yen</td>
</tr>
<tr>
<td>Dividend(yen/share)</td>
<td>130yen</td>
<td>150yen</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* FY2020 original targets have been revised to reflect achievement of surplus FCF and new IFRS lease accounting standards.
  
  FCF 200.0→50.0   D/E ratio 0.4→0.3  Equity ratio 31%→30%  Interest-bearing debt 760.0→600.0  Total assets 5,300.0→5,500.0
II. Progress Status of Core Measures
## II-1. Summary for Progress Status of Core Measures

<table>
<thead>
<tr>
<th>MHPS Business</th>
<th>FY2018</th>
<th>FY2019 and beyond</th>
</tr>
</thead>
</table>
|               | • Increased Orders: #1 Market Share Heavy Duty Gas Turbines and Expanding Service Orders  
                • Increased Profit: Achieve Fixed Cost Reduction plan | • Enhance gas turbine competitiveness  
                • Grow service faster with A.I. introduction  
                • Accelerate fixed cost reduction  
                • Introduce factory digitalization |

<table>
<thead>
<tr>
<th>MRJ Business Measures</th>
<th>FY2018</th>
<th>FY2019 and beyond</th>
</tr>
</thead>
</table>
|                       | • Capital increase at Mitsubishi Aircraft Corp.  
                • Received TIA from MLIT  
                • Began TC flight testing | • Continue TC flight testing  
                • Strengthen synergies with Tier 1 business  
                • Pursue full-scale development of MRJ70 |

<table>
<thead>
<tr>
<th>Growth Strategies</th>
<th>FY2018</th>
<th>FY2019 and beyond</th>
</tr>
</thead>
</table>
|                   | • Continued to expand medium lot manufacturing  
                • Expanded orders for offshore wind turbines  
                • Launched MHI FUTURE STREAM | • Short term: Expand portfolio of environmentally conscious products  
                • Medium/long term: Shift to new business areas and business models |

<table>
<thead>
<tr>
<th>Global Group Management Structure</th>
<th>FY2018</th>
<th>FY2019 and beyond</th>
</tr>
</thead>
</table>
|                                   | • Determined direction after deliberations by task force  
                • Began implementing measures to improve diversity and management development | • Strengthen portfolio management functions  
                • Promote transfer of authority to SBUs  
                • Pursue group synergies  
                • Reform workstyle and improve employee engagement |

MHPS: Mitsubishi Hitachi Power Systems  
GT: Gas turbine  
TIA: Type Inspection Authorization  
TC: Type Certificate  
MLIT: Ministry of Land, Infrastructure, Transport and Tourism
II-2. MHPS — Natural Gas Power Generation Growth

How did we increase orders in a competitive market?

MHPS moved from #3 to #1 global market share in the 100 MW+ Heavy Duty Gas Turbine market segment as customers embraced the J-series gas turbine

We project a flat natural gas power generation market in the near term, with growth in the longer term.

We will continue to grow revenues and profits through enhanced product competitiveness, and new service products.

Natural gas & renewable growth

New capacity projections

<table>
<thead>
<tr>
<th>Year</th>
<th>Gas</th>
<th>Oil &amp; Coal</th>
<th>Nuclear</th>
<th>Hydro</th>
<th>Wind</th>
<th>Solar</th>
<th>Others</th>
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</thead>
<tbody>
<tr>
<td>2016-18</td>
<td>54</td>
<td>48</td>
<td>54</td>
<td>62</td>
<td>390</td>
<td>368</td>
<td>331</td>
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<tr>
<td>2019-21</td>
<td></td>
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<tr>
<td>2022-24</td>
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<tr>
<td>2025-27</td>
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</tr>
</tbody>
</table>

Source: Bloomberg New Energy Finance (NEO 2018)

Gas turbine market size and market share (100 MW and larger)

<table>
<thead>
<tr>
<th>Year</th>
<th>MHPS</th>
<th>All others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>6.7</td>
<td>3.8</td>
</tr>
<tr>
<td>2017</td>
<td>14%</td>
<td>28</td>
</tr>
<tr>
<td>2018</td>
<td>41%</td>
<td>22</td>
</tr>
</tbody>
</table>

Improving product competitiveness

1. World’s highest efficiency large gas turbine

   J-Series Evolution
   - 20 orders received or expected.
   - First delivery scheduled for Nov. 2019.
   - Up to 3.2% higher efficiency than earlier models
   - Contributes to CO₂ reduction

   JAC
   Today
   - 64% Efficiency
   - 2020-2030 65+% (next-generation GT)
   - Beyond 2030 67+% (next-generation GT)

   GT recipient of 2018 METI Minister’s Award for excellence in energy conservation

2. Small/medium scale GTs: for flexible operations and mechanical drive applications

   - Orders increased significantly in FY2018
     FY2017: 2 units → FY2018: 18 units

   - H-100 product certification
     Major oil companies: Shell, Total, ExxonMobil
     (6 units for Mozambique)
     Major engineering firm: Bechtel (U.S.)

   - Back-up support to renewable energies

3. Development of new technologies

   - Next-generation (67%+) and 100% hydrogen-fired GT, toward carbon-free society
   - Autonomous operation
     Next-generation power plants capable of power demand forecasting, maintenance detection, etc.

   JAC: J-Series Air-Cooled
   H-100 GT
   H-25 GT

Source: McCoy Power Reports 2018

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New build project backlog is strong through FY2020

From FY2021 we see a decline in new projects

Profitable service fleets will continue to operate.

We will accelerate ongoing fixed cost reduction and base restructuring plans for new build projects

We will expand our profitable service business

Steam power market

Expanding service business

- Support optimized operation and create customer value
  - Utilize AI technologies (MHPS-TOMONI)
  - Remote monitoring services
- Expand application of Air Quality Control Systems
  (No.1 market share in global FGD market)
- Support improving availability of Steam Power assets.
  - Shorter inspection durations
  - Active use of drones / digital solutions
  - Support other-OEM Fleets

Fixed cost reduction acceleration

Fixed cost reductions and base restructuring are progressing on schedule.

→ To be accelerated further

MHPS head-count

From merger to Apr. 2019
- Domestic: Consolidation to 1 factory per product
  Steam turbines → Hitachi Plant
  Boilers → Nagasaki/Kure joint operation
- Overseas: Reduction of redundant resources and restructuring to match business scale (downsized in China, Americas, Europe, Australia.)

Starting from 2021
- Align headcount with business forecast
- Improve productivity through digitalized factories

RMC: Remote Monitoring Center
FGD: Flue gas desulfurization

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II-3. MRJ Business Measures

- Proceeding TC flight tests toward first delivery in mid-2020
- Enhancing the business structure through synergy with Tier1 business

- July 2018  Demonstration flight at Farnborough Airshow
- Dec 2018  TIA received from MLIT
- Dec 2018  Capital increase at Mitsubishi Aircraft Corp.
- March 2019  Start of Type Certification (TC) flight testing
- March 2019  LOA received from U.S. Federal Aviation Administration (FAA)
- June 2019  Paris Air Show
- Strengthen synergy with Tier1 business (build optimal structure)
- MRJ90 Type Certificate Acquisition
- Mid-2020  Delivery of first MRJ90
- Pursue full-scale development of MRJ70

TIA: Type Inspection Authorization   MLIT: Ministry of Land, Infrastructure, Transport and Tourism   LOA: Letter of Authorization (permitting FAA pilots to fly on the MRJ for TC purposes)
II-4. Growth Strategies

- Drive growth measures both in short and medium/long term
- Devote resources and utilize shared platform

Strategic resource allocation
- Determine investment area and concentrate resources
- Liquidation and reallocation of resources across MHI Group

Shared platform
- Shared technology framework
- Drive digitalization
- Business support for regions etc.

Medium/long-term measures led by Group Headquarters

Short-term measures led by SBUs

Long Time span

New

Business areas (products, customers)

Existing
II-4. Growth Strategies  Short-term (1)  Medium-lot Manufacturing

- Focused growth investments, including M&A
- Expand business through product development using technology synergies

**Results to date**

**Turbochargers**
- Optimized production system (Japan, Europe, China, Thailand, North America) set in place, and productivity improved
- Chinese market developed

**ACR / CAC**
- Overseas production system strengthened, and productivity improved
- Toyo Engineering Works converted to group company (2014)
- Management speed improved (spin-off in 2016)

**Material Handling Equipment**
- JV with Nichiyu (2012)
- Acquisition of UniCarriers (2015)
- PMI advanced and business scale expanded on solid market growth

**Future initiatives**
- Cease reliance on China (expand European market share)
- Focus on profitability improvement
- Simultaneously develop products for Electric/Hybrid vehicles
- Market to remain solid
- Strengthen sales and servicing, especially in China and Europe
- Develop products with lower environmental impact
- Expand electric compressors business
- Expand response to logistics revolution (AGF autonomous driving, etc.)
- Expand earning sources through shift to direct sales (PMH acquisition)
- Further expand collaborative business operations

* 15-month accounting period, due to change of account closing at some consolidated subsidiaries

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II-4. Growth Strategies  Short-term (2)  Offshore Wind Turbines

- Offshore wind turbine market is growing faster than anticipated
- MHI established JV with Vestas, world’s leading supplier of onshore wind turbines

MHI established a 50:50 JV with Vestas, world’s leading supplier of onshore wind turbines, in April 2014.

- Offshore wind turbine market is growing faster than anticipated.
- After the core European market, auction has begun in U.S. and Taiwan. In Japan, projects are taking shape amid development of legal framework to allow use in “general common sea areas.”
- Developing local markets by establishing bases in Boston, Taiwan and Japan.
- Market share steadily increasing (order backlog and preferred supplier as of FY2018-end totaled 8.7 GW).
- Support provided by MHI:
  1. Production technology/control, Quality Management System, development support
  2. Support of expansion in Asia

Scale of offshore wind turbine market (excluding China)*

<table>
<thead>
<tr>
<th>Year</th>
<th>GW/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>'17</td>
<td>3.2</td>
</tr>
<tr>
<td>'18</td>
<td>3.2</td>
</tr>
<tr>
<td>'19</td>
<td>3.0</td>
</tr>
<tr>
<td>'20</td>
<td>3.7</td>
</tr>
<tr>
<td>'21</td>
<td>4.1</td>
</tr>
<tr>
<td>'22</td>
<td>6.8</td>
</tr>
<tr>
<td>'23</td>
<td>7.2</td>
</tr>
<tr>
<td>'24</td>
<td>6.0</td>
</tr>
<tr>
<td>'25</td>
<td>9.5</td>
</tr>
<tr>
<td>'26</td>
<td>9.7</td>
</tr>
<tr>
<td>'27</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Sales and market share*

<table>
<thead>
<tr>
<th>Year</th>
<th>Siemens</th>
<th>Gamesa</th>
<th>MHI-Vestas</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY17</td>
<td>26%</td>
<td>12%</td>
<td>15%</td>
<td>62%</td>
</tr>
<tr>
<td>FY21</td>
<td>53%</td>
<td>9%</td>
<td>38%</td>
<td>6%</td>
</tr>
<tr>
<td>FY21-2026 share projections*</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

Shares recorded through FY2016*

<table>
<thead>
<tr>
<th>Year</th>
<th>Siemens</th>
<th>Gamesa</th>
<th>MHI-Vestas</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>'14</td>
<td>68%</td>
<td>17%</td>
<td>15%</td>
<td>17%</td>
</tr>
<tr>
<td>'15</td>
<td>62%</td>
<td>12%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>'16</td>
<td>62%</td>
<td>12%</td>
<td>17%</td>
<td>17%</td>
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<td>'17</td>
<td>62%</td>
<td>12%</td>
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<td>'18</td>
<td>62%</td>
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<td>'21</td>
<td>62%</td>
<td>12%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>'24</td>
<td>62%</td>
<td>12%</td>
<td>17%</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Source: Wood Mackenzie (installations/yr)

FY17 → FY21 CAGR above 30%

GW/yr
II-4. Growth Strategies  Short-term (3)  Further Expansion of SDGs-Oriented Business

- Contribute to SDGs through MHI’s broad range of technologies and products
- Provide solutions through systemization of products and application of AI/IoT

**Electric compressors**
- Electric compressors for EV air conditioners

**New transportation systems**
- Airport APM (Automated People Mover) and LRT (Light Rapid Transit) to create livable communities

**Solid oxide fuel cells (SOFC)**
- Low-carbon cogeneration systems enabling use of various fuels: natural gas, biogas, hydrogen, etc.

**Hydrogen gas turbines**
- Hydrogen gas turbines to reduce CO₂ Emission (verified 30% hydrogen mix, planned to achieve 100% hydrogen)

**Refrigeration condensing units using CO₂ refrigerant**
- Achievement of GWP of 1 and ODP of 0
  - GWP: Global Warming Potential
  - ODP: Ozone Depletion Potential

**SOx scrubber system for marine use**
- Remove SOx (sulfur oxides) from exhaust gas on ships

**Barrier-free PBBs**
- Advanced barrier-free PBBs reflecting world universal design. In January 2019, the company won MLIT commendation for promotion of universal accessibility.
  - MLIT: Ministry of Land, Infrastructure, Transport and Tourism
  - PBB: Passenger Boarding Bridge

**CO₂ capture and storage (CCS)**
- World’s largest post-combustion CO₂ capture system for coal exhaust; top market share in the world for the commercial applications
II-4. Growth Strategies  Short-term (4) Safety and Security Initiatives

- Provide total solutions enabling safety and security
- Meet private sector demand for dual use cutting edge technologies developed in Defense & Space Systems business

Expanding needs for safety and security measures

MHI technologies cultivated in defense and space areas

Total solutions for safety and security

- Cybersecurity
- Situational awareness
- Wide-area status observation

Cyberattacks targeting critical infrastructure
Threats from suspicious ships
Intensification of natural disasters

Cybersecurity

Integrating UAVs, USVs and UUVs

CoasTitan
Monitoring by Unmanned Vehicles

Protection of Control Systems

Integrating UAVs, USVs and UUVs

• UAV: Unmanned aerial vehicle
• USV: Unmanned surface vehicle
• UUV: Unmanned underwater vehicle

Real-time analysis of operation patterns in infrastructure control systems; early anomaly detection

Developed system matching customer needs, integrating UAVs, USVs and UUVs

Satellite image data analyzed by AI, enabling swift grasp of damage, contributing to disaster relief
II-4. Growth Strategies - Medium/Long-Term  MHI FUTURE STREAM (1/4)

**Mega Scan**

**Finding business opportunities in the uncertainty of the future**

**Social changes**
- Increasing individual impact
- Population increase
- Urbanization
- Megatrends and social challenges surrounding MHI
- Low birth rate and aging population
- Climate change

**Sustainable development goals**

**New technologies**
- Digital technology
- Material technologies
- Micromachining technology
- Technological innovations
- Biotechnology

**Changes in social infrastructure**
(assumptions to 2030 and beyond)
- Value shift: from supply to demand
- Source of demand: from government to individuals/communities
- Value provided: from functional value to experience/emotional value
- Infrastructure configuration: from central/regulated to distributed/autonomous
- Flow of resources: from consumption/disposal to recycling/reuse

**Changes in machine systems**
- Source of value:
  1) From hardware supporting supply to services creating demand
  2) To smaller, functionally consolidated components
- Characteristics of machine systems:
  1) From individual components to modules and systems
  2) From automation to autonomy/AI

**Shift the Path**

**Medium/long-term shifts in existing businesses based on understanding of megatrend changes**

**Energy aspect**
(distributed/integrated supply/demand)

**Carbon cycle aspect**
(carbon cycle in everyday lives)

**Technology Scouting**

Exploring as yet under-developed technologies that may have significant impact
Exploring technologies necessary for Shift the Path businesses

Establishment of co-creation bases with outside partners
Quick-cycle testbedding of ideas for new technologies and business models
II-4. Growth Strategies - Medium/Long-Term  MHI FUTURE STREAM (2/4)

**Shift the Path (energy aspect):** in addition to supply infrastructure, shift to value creation on demand side

<table>
<thead>
<tr>
<th>Supply side</th>
<th>Demand side</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central power source</strong></td>
<td><strong>Transportation/transport Consumer goods Industry ...</strong></td>
</tr>
<tr>
<td><strong>Distributed power sources</strong></td>
<td><strong>Energy supply/demand integration Human-friendly AI machines</strong></td>
</tr>
</tbody>
</table>

**Energy flow**

- **Renewable energies as baseload power sources**
- **Supply/demand adjustment**
- **Adjusted/distributed power source**

**New value in line with changes in social infrastructure**

- Renewable energies and thermal power for adjustments
- Compact, lightweight energy equipment; storage capacity, regeneration, etc.
- Distributed power sources

**Universally Provided value**

- Machine design, manufacture, integration and control
- Functional values, including low cost, stable supply and low carbon

- **Machine systems evolved through technological innovation**
- Energy supply/demand integration
- **Develop experience/emotional value with outside partners, using co-creation centers**
II-4. Growth Strategies - Medium/Long-Term  MHI FUTURE STREAM (3/4)

Shift the Path (carbon cycle aspect): value creation on demand side and contribution to carbon neutrality

<table>
<thead>
<tr>
<th>Natural Carbon Cycle</th>
<th>Human-Influenced Carbon Cycle</th>
<th>Measures contributing to carbon neutrality</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image of Natural Carbon Cycle]</td>
<td><strong>Human-Influenced Carbon Cycle</strong></td>
<td><strong>Measures contributing to carbon neutrality</strong></td>
</tr>
</tbody>
</table>

- **Supply side** (infrastructure)
- **Demand side** (everyday life)

### Atmosphere (carbon neutrality)

- Photosynthesis
- Incineration, power generation, etc.
- Vegetable, etc.

### Natural forests

- Wild animals

### Soil

- Ground surface layer
- Fossil resources

### Carbon formation in earth

- Accumulation

### Fixing surplus carbon

- Energy-saving
- Suppression of carbon emissions through efficiency enhancement and optimization

### Biomass, waste, CO2

- Biofuel
- Valuables derived from CO2

### Offshore wind farm

- Energy-saving

### Plant factory, etc.

- Power / heating

### Everyday goods, wooden products

- Clean gas energy, energy-efficient equipment
- Offshore wind farm
- Biomass usage, creation of valuables
- Plant factory, etc.

### Food

- Clean gas power
- Renewable energy
Establishment of co-creation centers with partner organizations

1. Social contribution through venture business incubation and regional revitalization
2. Development of employee entrepreneurship
3. Creation of new group businesses

“MHI Testbed Hub”
(tentative name)

- Shared creative spaces (offices)
- Prototype creation and testing facilities
- Utilities
II-5. Global Group Management Structure (1/3)

**Requirements and challenges of growth-oriented global / group management**

**Background**
- Maturity of Japanese market since the 1990s
- Maturity of MHI’s business portfolio

**Promotion of business structure reforms**
- Termination of business office structure and launch of domains and SBUs
- Introduction of strategic business evaluation system
- Management focus on cash flows
- Strengthening of risk management and governance
  
  SBU: Strategic business unit

**Challenge**
- Strengthening of businesses capable of global growth
- Entry into growth areas
- Results-oriented advancement toward resolving issues

**Results through 2015 Business Plan**
- Shift to portfolio management
- Concentration into core competencies
- Shift to cash flow management
- Strengthening of financial foundation

**Basic policies**

**Stability AND Growth**
- Portfolio management enabling stable growth
- MHI FUTURE STREAM
- Strategic resource allocation (HR, technologies, capital)
- Promotion of growth strategies and incubation

**Independent SBU Management AND Group Synergy**
- Transfer of authority to business units
- Management structure optimized to each business unit’s strategy
- Pursuit of group synergies

**Flexible AND Quick**
- Simple, flat structures and clarification of authority
- Development of managerial candidate for Group Headquarters and business units

**Reorganization in 2010 Midterm Business Plan**
- embedding and driving forward the results
II-5. Global Group Management Structure (2/3)

- **Business Philosophy**
- **Long-Term Vision**
- **Group Headquarters**
  - Shared platform
  - Independent SBU Management AND Group Synergy
  - Transfer of authority to business units
  - Management structure optimized to each business unit's strategies
  - Pursuit of group synergies
  - Pursuit of group synergies
  - Stability AND Growth
  - MHI FUTURE STREAM
  - Development of managerial candidate for Group Headquarters
  - Development of managerial candidate for Group Headquarters
  - Strategic resource allocation envisioning future potential of each business unit
  - Development of managerial candidate for business units
  - Incubation
  - Simple, flat structures improve employee engagement
  - Flexible AND Quick

- **Business unit**
- **Business unit**
- **Business unit**
- **Business unit**
- **Growth advancement unit**

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II-5. Global Group Management Structure (3/3)

**Major initiatives**

- **Stability AND Growth**
  - Strengthening of portfolio management functions of Group Headquarters
  - MHI FUTURE STREAM
  - Strengthening of resources (HR, technology, capital) reallocation functions
  - Establishment of budgeted growth advancement unit, dynamic pursuit of business opportunities

- **Independent SBU Management AND Group Synergy**
  - Transfer of authority to business units
  - Management structure optimized for business strategies, appropriate support by Group Headquarters
  - Pursuit of synergies (exploration of projects in overseas regions, enhancement of corporate efficiency, etc.)
  - Coordinated development of global policies
  - Efficiency enhancement through consolidation of Japan-based support functions

- **Flexible AND Quick**
  - Simple, flat management structures and clarification of responsibilities and authority
  - Greater diversity in management
  - Planned development of management human resources
  - Diverse, flexible working style and greater employee engagement
MOVE THE WORLD FORWARD
Reference Materials

Reference 1: Numerical Targets by Domain 26
Reference 2: From Structure Reforms to Global Group Management 27
Reference 3: ENERGY CLOUD™ and MHPS-TOMONI™ 28
Reference 4: Map of Provided Service about ENERGY CLOUD™ 29
Reference 5: Service Growth: Path to Autonomous Power (MHPS-TOMONI™) 30
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Reference 8: ESG Initiatives 33
Reference 9: Actions for SDGs through business activities 34
<table>
<thead>
<tr>
<th>Domain</th>
<th>Orders Received</th>
<th>Revenue</th>
<th>Profit from business activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powar Systems</td>
<td>1,426.5</td>
<td>1,600.0</td>
<td>1,800.0</td>
</tr>
<tr>
<td>Industry &amp; Infrastructure</td>
<td>1,852.0</td>
<td>2,000.0</td>
<td>2,100.0</td>
</tr>
<tr>
<td>Aircraft, Defense &amp; Space</td>
<td>610.6</td>
<td>700.0</td>
<td>700.0</td>
</tr>
<tr>
<td>Other (Including non-organic)</td>
<td>73.3</td>
<td>100.0</td>
<td>500.0</td>
</tr>
<tr>
<td>Eliminations or Corporate</td>
<td>-109.1</td>
<td>-100.0</td>
<td>-100.0</td>
</tr>
<tr>
<td>Total</td>
<td>3,853.4</td>
<td>4,300.0</td>
<td>5,000.0</td>
</tr>
</tbody>
</table>

(Billion yen)
Reference 2: From Structure Reforms to Global Group Management

Entrench and evolve the achievements of business structure reforms implemented in 2015 Medium-Term Business Plan and before, and aim to build structure to realize global growth.

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Effective use of management resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Removal of siloes between businesses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integration and reorganization of business headquarters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple and flat structure</td>
<td>3 domains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous management of business sections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth strategy promotion section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MHI FUTURE STREAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic resource allocation (HR, technologies, capital)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Business works structure | Business headquarters structure (9 business headquarters) | Domain structure (4 domains) | Autonomous management of business sections |

Review of business portfolio (concentration into core competencies)

Strategic business evaluation system (SBUs)

Strengthening of cross-domain functions (ST framework)

Pursuit of synergies in overseas regions

Efficiency enhancement and strengthening of corporate functions (risk management, etc.)

Preparation of GPPs, development of management human resources, etc.

Company with Audit and Supervisory Committee

Chief officers system, increased ratio of outside directors

SBU: Strategic Business Unit
ST: Shared Technology
GPP: Global Policy & Procedure
ENERGY CLOUD™: Energy solutions for large energy consumers

MHPS-TOMONI™: Energy solutions for power businesses including equipment supply and services

- Operational improvement
- Performance improvement
- O&M optimization

ENERGY CLOUD™:
- Support for energy infrastructure and O&M
- EMS / total optimization system
- Predictive diagnosis, preventive maintenance

MHPS-TOMONI™ and related logomarks are registered trademarks of Mitsubishi Hitachi Power Systems Ltd.
- Take advantage of AI/IoT technology from manufacturing experience
- Provide solutions for energy consumers’ issues in production and energy

<table>
<thead>
<tr>
<th>ENERGY CLOUD™ Service</th>
<th>Market needs</th>
<th>AI/IoT</th>
<th>Provided service</th>
</tr>
</thead>
</table>
| Management            | ▪ Energy market deregulation  
                       | ▪ Business expansion       | AI / IoT technology from manufacturing experience | Support energy infrastructure  
                       |                          |                       | Support operation and maintenance |
| Operation             | ▪ Energy saving      |       | Energy management system  
                       | ▪ CO2 emission reduction  |       | Total optimizing system |
| Performance           | ▪ Technical transfer |       | Predictive diagnosis  
                       | ▪ Manufacturing know-how  |       | Preventive maintenance |

Data Analysis
- Engineering analysis
- Simulation
- Statistical analysis
- Engineering expert

Reference 4: Map of Provided Service about ENERGY CLOUD™
Apply latest ICT and AI Technology to Expand MHPS-TOMONI capabilities
Create customer value through: efficiency improvement, CO2 reduction, flexibility to partner with intermittent renewable generation

MHPS-TOMONI roadmap

- Applications group
  - O&M optimization
  - Performance improvement
  - Flexible operation

- Autonomous operation
- Advanced O&M
- O&M support
- O&M monitoring

- Applications
  - Higher capacity factor
  - Lower fuel costs
  - Faster start
  - Lower maintenance costs
  - Multi-Coal Fired

Reference 5: Service Growth: Path to Autonomous Power (MHPS-TOMONI™)
Social changes

Demands to reduce CO₂ emissions
- Supply side: make renewables a core power source
- Demand side: increasing demand for electrification, accompanied by rising power demand

1) Electricity market (kWh)
- Steam power:
  development of services menu contributing to emissions reduction
- GTCC:
  market share increase through efficiency enhancement, operability improvement, hydrogen-powered systems, etc.
- Thermal digitalization services
  - Operability/performance enhancement
  - Strengthen O&M business etc.
- Nuclear:
  contribution to low-carbon society and supply stability through continuous efforts to improve safety
- Renewable:
  Strengthening of offshore wind power, etc.

2) Regulated market (ΔkW)
- Quick-start gas turbines
- Large-scale energy storage systems
  (storage batteries, hydrogen systems)

3) Carbon cycle
- Analysis of economic viability, promotion of CCS & CCU business

CCS: Carbon dioxide Capture and Storage
CCU: Carbon dioxide Capture and Utilization

4) Demand market
- Electrification: strengthen key components
- AI, digitalization: strengthen solutions toward maximizing customers’ asset values through energy management, etc.
- Pursue projects outside conventional business framework, with focus on overseas regions
- Making use of broad business areas, raise level of large-scale project discussions from the early stage, taking a comprehensive approach
- Proactively undertake business investments, O&M, etc.

Example 1: Western Sydney urban development

- To distribute urban functions, the Government of New South Wales is planning to create multiple Central Business Districts in the Greater Sydney Area.
- On October 15, 2018 an MOU with the New South Wales Government focused on MHI Group providing its high-quality infrastructure solutions.
- Exploratory work is underway to attract similar development projects throughout the Indo-Pacific region.

Example 2: U.S. renewable energy business development venture

- MHPS launched the Oriden venture to develop renewable energy business in Pittsburgh, PA (U.S.).
- Oriden will undertake business development of renewable energy distributed power source projects mainly using solar power and storage systems.

Example 3: Expansion of servicing operations in the AP region

- In April 2019 a Service Strategy Group was established at MHI-AP to support servicing operations in all SBUs in the AP region.
- Unification of local information, IT promotion, sharing of resources and best practices, etc. are underway.
**Examples of recent ESG initiatives**

### Environment (E)
- **Contributions through products**
  - Refrigeration condensing units using CO₂, a natural refrigerant
  - Enhanced fuel efficiency and reduced CO₂ emissions through development of energy efficient hull form
  - World's first application of rectangular shaped SOx scrubber tower on ship for maximum space utilization

### Social (S)
- **Social contribution activities**
  - Tanegashima Aerospace Classroom*: science classes nationwide
  - Sports classes by Urawa Reds, Sagamihara DynaBoars, etc.
  - Support of recovery from Great East Japan Earthquake

### Governance (G)
- **Corporate governance**
  - 2015: Transition to company with an Audit and Supervisory Committee
  - 2016: Increased ratio of outside directors (up to 45%)

### Environmental load reduced through business process reform
- Established MHI Group Long-Term Environmental Target (2030) and Fourth MHI Group Environmental Targets (2020)
- Reduced environmental load through introduction of one of ASEAN region's largest solar power generation facilities

### Biodiversity protection activities
- Tanegashima Loggerhead Sea Turtle Survey

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Reference 9: Actions for SDGs through Business Activities

- Fertilizer plants
- Refrigeration units for trucks and trailers
- Agricultural machinery
- Food and packaging machinery

- Seawater desalination plants
- Sludge treatment systems
- Electrochlorination system

- Gear grinding machine
- Electric forklift trucks
- Automated guided forklift trucks
- Launch services

- CO₂ capture plants/Enhanced oil recovery (CCS/EOR)
- ENERGY CLOUD™
- MHPS TOMONI™

- SOx scrubber system for marine use
- Oil recovery ships
- Ocean research vessels
- Manned deep submergence research vehicle
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