Overview of FY2018 Medium-Term Management Plan, Innovation in Monozukuri and R&D

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Hitachi Metals, Ltd.

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General Manager of Technology, Research & Development Division
Overview of FY2018 Medium-Term Management Plan, Innovation in Monozukuri and R&D

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1. Overview of FY2018 Medium-Term Management Plan, Background and Purpose for Project Commencement
2. Monozukuri Innovation Project
3. Innovation in Research & Development
4. Conclusion
Change to be a competitive business; Challenge ourselves to meet new targets
Achieving our goal of becoming the world’s leading high-performance materials company

Key Policies of the FY2018 Medium-Term Management Plan

1. Accelerate the creation and execution of growth strategies.
2. Achieve a robust business structure and highly efficient business management.
3. Strive to establish a business base that is sustainable over the long-term.
## 1-2. FY2018 Medium-Term Management Plan: Main Numerical Goals for Management

<table>
<thead>
<tr>
<th>FY2015 business performance (US$1 = ¥120)</th>
<th>FY2018 Plan (Target) (US$1 = ¥115)</th>
<th>% Change vs. 2015 (¥billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>1,017.6</td>
<td></td>
</tr>
<tr>
<td>Adjusted operating income</td>
<td>76.1</td>
<td>110%</td>
</tr>
<tr>
<td>IFRS operating income</td>
<td>100.0</td>
<td>12.0</td>
</tr>
<tr>
<td>EBIT</td>
<td>99.1</td>
<td>12.9</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>96.2</td>
<td>11.3</td>
</tr>
<tr>
<td>Net income*1</td>
<td>69.1</td>
<td>5.9</td>
</tr>
<tr>
<td>Total assets</td>
<td>1,033.3</td>
<td>+216.7</td>
</tr>
<tr>
<td>Shareholders’ equity</td>
<td>495.9</td>
<td>+149.1</td>
</tr>
<tr>
<td>Interest-bearing debt</td>
<td>220.4</td>
<td>+25.6</td>
</tr>
<tr>
<td>D/E ratio (times)</td>
<td>0.44</td>
<td>-0.06</td>
</tr>
<tr>
<td>ROA</td>
<td>6.5%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>ROE</td>
<td>14.4%</td>
<td>-2.2%</td>
</tr>
<tr>
<td>Percentage of revenues from overseas markets</td>
<td>56%</td>
<td>+2%</td>
</tr>
<tr>
<td>Overseas production as % of total</td>
<td>44%</td>
<td>+1%</td>
</tr>
<tr>
<td>No. of employees</td>
<td>29,157</td>
<td>243</td>
</tr>
</tbody>
</table>

*1 Net income attributable to owners of the parent company
1-3. Background and Purpose for Project Commencement (1)

Achieving our goal of becoming the world’s leading high-performance materials company

FY2018 Medium-Term Management Plan: Basic Strategy

- Invest in growth strategy
- Expand organic growth
- Restructure businesses

- Invest proactively in global growth
- Achieve sustainable growth by enhancing growth of existing businesses
- Strengthen the business base through continuous business restructuring

Engage in monozukuri and R&D to achieve organic growth and become a true development-driven company

- Build monozukuri skills that are among the best in the world
- Implement an R&D-led business strategy
To achieve greater organic growth

Harmful effects of the company system
- Limits capital investment from a short-term perspective
- Entrenched human resources lead to technological limitations
- Lack of R&D system and themes based on a medium- to long-term perspective

Deterioration in capacity to achieve sustainable growth

Innovation from a medium- to long-term perspective and from a cross-organizational perspective

Achieve sustainable growth through innovation in R&D and building monozukuri skills that are among the best in the world.

Invest cash generated from innovation in monozukuri in R&D and growth areas. Use those results to achieve greater innovation in monozukuri.

Energize employees by equipping them with world-class monozukuri skills.
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2-1. Overview of the Monozukuri Innovation Project

Fusion of GEMBA (workplace) and technological innovations

Improved cash flow generation and energized employees

Technological innovation

- IoT
- Material processing
- Productivity
- Machine processing

Generate cash flow
Energize employees

Monozukuri skills that are among the best in the world

GEMBA innovation
2-2. Project Structure

[Before project]

**Development Center**
- Metal products & materials
- Magnetic materials & applications
- Functional components & equipment
- Wires, cables & related products

**Engineering & Technology Center**
- Metal products & materials
- Magnetic materials & applications
- Functional components & equipment
- Wires, cables & related products

- Limitations of cross-organizational corporate functions
- Action taken by each Company
- Lack of external knowledge

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**Corporate Monozukuri Innovation Project**
Lead: CTO & General Manager of the Technology, Research & Development Division

**Technology, Research & Development Division**

**Development Center**
- Process technology
- CAE

**Engineering & Technology Center**
- Productivity processing technology

**Introduction of cutting-edge knowledge**

- Benchmarks: Globally competitive companies, leading companies in different industries
- Consulting: IoT, process engineering
2-3. Technological Innovation

Innovation in manufacturing technology via cross-organizational technology throughout the entire material flow

Raw materials
- Metal products & materials
- Magnetic materials & applications
- Functional components & equipment
- Wires, cables & related products

Materials
- Refining Technology
  - Composition control
  - Structural control

Processing
- Inclusion control
  - CAE technology

Recycling
- Surface treating technology
  - Diffusion technology
- Machine processing technology
  - Composition processing technology
  - High-yield recovery technology
## 2-4. Cases of Technological Innovation

| **Use of CAE** | [Metal Products and Materials, Functional Components and Equipment]  
| • Improve loss costs through analysis of casting conditions and launch new product quickly  
| • Utilize the knowledge and human resources of the Hitachi Group |
| **Machine processing technology** | [Functional Components and Equipment, Metal Products and Materials, etc.]  
| • Introduce the latest techniques: Improved productivity  
| Increase machining speed (shorten non-cutting time)  
| • Achieve high-precision processing by analyzing vibration and considering how to counteract it. |
| **High-yield recovery technology** | [Metal Products and Materials, Magnetic Materials and Applications, Functional Components and Equipment]  
| • High-yield recovery: Recycle expensive materials  
| Reduce raw materials cost and mitigated the risk of fluctuations in supply  
| • Achieve synergies between Companies |

![High-precision processing](image1.png)  
![Temperature upon completion of filling](image2.png)  
![Internal defect risk](image3.png)
2-5. Promotion of IoT

Build innovative monozukuri through IoT

Develop sensing technology | Collect data | Analyze big data | Build system | Roll out to business locations in Japan | Roll out to global locations

Improve the customer experience

| Traceability | • Improve risk management | • Strengthen the customer base |
| Improve quality (analyze data) | • Reduce loss cost | • Eliminate mega recalls | • Improve risk management |
| Diagnose symptoms | • Ascertain anomalous conditions quickly | • Roll into the business model |

IoT Promotion Structure

Hitachi Group

Technology, Research & Development Division

External Institutions

Information Systems Division

Corporate

Business Divisions

Kyushu Works
Kumagaya Works
Yasugi Works
Roll business etc.
Roll out company-wide activities

- Be thorough in the basics of monozukuri (Sort out; set in order; fixed location, quantity, and item)
- Improve efficiency and safety
- Launch new products and new businesses quickly

- Improve cash flow by reducing work-in-process
- Energize employees by creating a workplace that is one of the best in the world

Strengthen monozukuri more by reinvesting cash.
Achieve monozukuri skills that are among the best in the world

**Business areas to concentrate on**
- Areas experiencing volume growth
- Areas with high material costs

**Roll-out to locations**
- Start with the (five) main plants
- Innovation
- Expand to global locations
2-8. Benefits from Targeted Reductions and Schedule

Generate rapid benefits from the FY2018 Medium-Term Management Plan

- Formulated concepts in FY2015 Medium-Term Management Plan

Generate ¥20 billion in additional profits (¥10 billion in FY2017)

- High-Grade Metal Products and Materials
- Magnetic Materials and Applications
- High-Grade Functional Components and Equipment
- Wires, Cables and Related Products
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3-1. Overview of Innovation in Research and Development

**Basic Policy**

Strive to be a true development-driven company
Promote new business creation tasks / Establish a Corporate Research Lab

**Medium- to Long-Term Research Themes**
Focused on Threats and Opportunities (Examples)

<table>
<thead>
<tr>
<th>Company</th>
<th>Current Products</th>
<th>Development Themes Based on Envisioned Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Products and Materials</td>
<td>Molds and materials</td>
<td>Additive manufacturing (3-D printing)</td>
</tr>
<tr>
<td></td>
<td>Aircraft and energy (ultra heat-resistant steel)</td>
<td>Composite materials</td>
</tr>
<tr>
<td>Magnetic Materials and Applications</td>
<td>Rare-earth magnets</td>
<td>New magnets</td>
</tr>
<tr>
<td>Functional Materials and Equipment</td>
<td>Castings (NM)</td>
<td>Composite materials and multiple materials</td>
</tr>
<tr>
<td>Wires, Cables and Related Products</td>
<td>Copper wire</td>
<td>Aluminum and composite conductors</td>
</tr>
</tbody>
</table>

**R&D Expenses**

¥57 billion (Cumulative for FY2015 Medium-Term Plan)
⇒ ¥70 billion (Cumulative for FY2018 Medium-Term Plan)
3-2. Main Areas of Focus in Research & Development

Promote new business creation tasks

- Medium- to long-term research focused on threats and opportunities
- Research expenses for 15 themes: ¥12 billion (FY2016-FY2018)
  2025: Total anticipated revenues: ¥180 billion
  Total anticipated income: ¥20-25 billion

- Metal materials
- Composite materials
- Plastic materials
- High-performance materials

To markets in growth areas

- Automotive
- Aircraft
- Energy
- Railway

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3-3. Restructuring R&D

Establish a Corporate Research Lab (April 2017)

- Technology, Research and Development Division
  - Engineering & Technology Center
    - Production System Laboratory
  - Development Center

- High-Grade Metals Company
  - Metallurgical Research Laboratory

- Magnetic Materials Company
  - Magnetic Materials Research Laboratory

- High-Grade Functional Components Company
  - Casting Technology Research Laboratory

- Cable Materials Company
  - Cable Materials Research Laboratory

The Corporate Research Lab will work together with each of the internal laboratories and external institutions on individual themes.
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Monozukuri innovation: Fusion of GEMBA (workplace) and technological innovations

- GEMBA innovation (Company-wide movement)
- IoT
- Materials Processing
- Productivity
- Machine Processing

Generate cash and energize employees

Achieve monozukuri skills that are among the best in the world

Achieve innovation in R&D from a medium- to long-term perspective and cross-organizational perspective

Corporate Research Lab
- Cutting-edge research
- Cross-organizational research

Become a true development-driven company

Generate new businesses in growth markets

Achieve sustainable growth through innovation in monozukuri and R&D
Information on Risks Inherent in Future Projections

This document contains forward-looking statements—such as results forecasts and management plans—that are not historical facts. All such forward-looking statements are based upon all available information and upon assumptions and projections that were deemed reasonable at the time the Company prepared this document. Changes to the underlying assumptions or circumstances could cause the actual results to differ substantially. The factors causing such differences include, but are not limited to, the following:

• Changes in economic conditions and regulations in the main markets where the Company operates, particularly Japan, the United States, Asia and Europe
• Sudden changes in technological trends
• Changes in competitive advantage and the capabilities of the Company and its subsidiaries and affiliates to develop and commercialize new products and businesses
• Fluctuations in the status of product markets, exchange rates and international commodity markets
• Changes in financing environment
• The capability of the Company and its subsidiaries and affiliates to cope with fluctuations in product supply and demand, the status of product markets, exchange rates and international commodity markets
• Protection of the Company’s intellectual property, and securing of licenses to use the intellectual property of other parties
• Changes in the status of alliances with other parties for product development, etc.
• Fluctuations in Japanese stock markets