Business Strategy of the Advanced Metals Division

Hitachi Metals IR Day 2019

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Hitachi Metals, Ltd.

Hiroshi Watanabe
Vice President and Executive Officer
General Manager, Advanced Metals Division
Business Strategy of the Advanced Metals Division

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2. Basic Policy of the FY2021 Medium-term Management Plan
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4. Summary
1-1. Advanced Metals Division: Business Overview (1)

**Shift to divisional organization**

- Commonality between markets / customer needs / elemental technologies
  → Maximize the synergy between segments
- Use resources effectively and enhance the function of strategic management & governance

<table>
<thead>
<tr>
<th>Before organizational restructuring</th>
<th>After organizational restructuring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specialty Steel Company</strong></td>
<td><strong>Advanced Metals Division</strong></td>
</tr>
<tr>
<td>Specialty Steel</td>
<td>Specialty Steel</td>
</tr>
<tr>
<td>Rolls</td>
<td>Functional Components</td>
</tr>
<tr>
<td>Soft Magnetic Components &amp; Materials</td>
<td>and Equipment</td>
</tr>
<tr>
<td><strong>Functional Components Company</strong></td>
<td><strong>Advanced Components &amp; Materials Division</strong></td>
</tr>
<tr>
<td>Functional Components &amp; Equipment</td>
<td>Magnetic Materials / Power Electronics Materials</td>
</tr>
<tr>
<td><strong>Magnetic Materials Company</strong></td>
<td>Wires, Cables, and Related Products</td>
</tr>
<tr>
<td>Magnetic Materials and Applications</td>
<td></td>
</tr>
<tr>
<td><strong>Cable Materials Company</strong></td>
<td>Wires, Cables, and Related Products</td>
</tr>
<tr>
<td>Wires, Cables, and Related Products</td>
<td></td>
</tr>
</tbody>
</table>
1-2. Advanced Metals Division: Business Overview (2)

Sales Mix

<table>
<thead>
<tr>
<th>Functional Components and Equipment Segment</th>
<th>Specialty Steel Products Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible piping system</td>
<td>Tool steel for molds</td>
</tr>
<tr>
<td>Casting pipe fittings</td>
<td>Rolls for steel mills</td>
</tr>
</tbody>
</table>

Piping Components

<table>
<thead>
<tr>
<th>FY2018 Revenues ¥644.5 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible piping system</td>
</tr>
<tr>
<td>Casting pipe fittings</td>
</tr>
<tr>
<td>Automotive Casting</td>
</tr>
<tr>
<td>Cast iron</td>
</tr>
<tr>
<td>Heat-resistant cast steel</td>
</tr>
<tr>
<td>Aluminum inverter case</td>
</tr>
<tr>
<td>Industrial, Aerospace &amp; Energy Materials</td>
</tr>
<tr>
<td>CVT belt materials</td>
</tr>
<tr>
<td>Piston ring materials</td>
</tr>
<tr>
<td>Large forged components and materials for aircraft engine</td>
</tr>
<tr>
<td>Electronic Materials</td>
</tr>
<tr>
<td>Clad materials</td>
</tr>
</tbody>
</table>

Tool Steel & Rolls
Offer a lineup of “Only 1, No.1” products in the automotive, industrial infrastructure, and electronics markets.

<table>
<thead>
<tr>
<th>Specialty Steel Products</th>
<th>Industrial infrastructure</th>
<th>Automobiles</th>
<th>Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolls for steel mills</td>
<td>Turbine blade</td>
<td>Tool steel for molds</td>
<td>Lead frame materials</td>
</tr>
<tr>
<td>Turbine case</td>
<td>CVT belt materials</td>
<td>Piston ring materials</td>
<td>Organic EL materials</td>
</tr>
<tr>
<td>Turbine blade</td>
<td>Turbine wheels</td>
<td>Clad materials for batteries, heat dissipation materials, and terminals</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Functional Components and Equipment</th>
<th>Piping components</th>
<th>Suspension parts</th>
<th>Turbo housing</th>
<th>Massflow controller</th>
</tr>
</thead>
</table>

| Sales ratio breakdown | 30%                | 50%              | 20%           |

(Passenger vehicles: 35%, other transportation equipment including commercial vehicles: 15%)
### 1-4. FY2018 Medium-term Management Plan

**Overview of Efforts (1): Core Businesses**

<table>
<thead>
<tr>
<th>Core Businesses</th>
<th>Continuous Portfolio Remodeling</th>
<th>Organic Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CVT belt materials</strong></td>
<td>24-ton VIM* (FY2015)</td>
<td>Facility process (Suzhou, China: 1H, FY2018; Yasugi: 2H, FY2018) [Investment amount: ¥2.5 billion]</td>
</tr>
<tr>
<td><strong>Piston ring materials</strong></td>
<td>Facility process (Suzhou, China: 1H, FY2018; Yasugi: 2H, FY2018) [Investment amount: ¥2.5 billion]</td>
<td>Increase production capacity (start operation in FY2018-2020) [Investment amount: ¥3.0 billion]</td>
</tr>
<tr>
<td><strong>Tool steel for Molds</strong></td>
<td>High-speed forging machine (started operation in Apr., 2018)</td>
<td>New product “DAC-i™” (started mass production in Nov., 2018)</td>
</tr>
<tr>
<td><strong>Waupaca Foundry, Inc.</strong></td>
<td>10,000-ton press (started operation in May, 2018) [Total investment amount: ¥13.0 billion]</td>
<td>Introduced a dedicated line (started operation in Dec., 2018)</td>
</tr>
<tr>
<td><strong>Piping components</strong></td>
<td>Increased production capacity and efficiency at Kuwana Works (2H, FY2018) [Investment amount: ¥3.0 billion]</td>
<td></td>
</tr>
<tr>
<td><strong>Rolls</strong></td>
<td>Discontinued production in China / Concentrated production in Japan (Sep., 2016)</td>
<td>Increased the production capacity of rolls for steel mills and structural steel castings (started operation in 2H FY2018) [Investment amount: ¥3.0 billion]</td>
</tr>
<tr>
<td><strong>Aluminum wheels</strong></td>
<td>Transferred the North American subsidiary (Dec., 2016)</td>
<td>Transferred subsidiary in the U.S. (Mar., 2019) Discontinued production in Japan</td>
</tr>
</tbody>
</table>

*VIM: Vacuum Induction Melting & Casting*
1-5. FY2018 Medium-term Management Plan
Overview of Efforts (2): Growing Businesses

Growing Businesses

Organic Growth

- Clad materials
  - Hitachi Metals Neomaterial, Ltd. Increased production capacity at Tsuchiura Works (2H, FY2018) [Investment amount: ¥7.5 billion]
  - Merged Hitachi Metals Neomaterial, Ltd. and SH Copper Products Co., Ltd. (Apr., 2018)
  - Organic EL materials
    - Wide line of Yasugi Works (start operation in FY2020) [Investment amount: ¥9.0 billion]

Growth through M&A

- Aircraft and energy materials
  - High-speed forging machine (Apr., 2018)
  - 24-ton VIM (FY2015)
  - 10,000-ton forging press (May, 2018)

- Made Hitachi Metals MMC Superalloy, Ltd. a subsidiary (FY2014)
- Established Hitachi Metals Okegawa Works (Apr 2018)
- 840-ton ring mill in Okegawa (started operation in 2H, FY2016) [Investment amount: ¥5.0 billion]
1-6. FY2018 Medium-term Management Plan Challenges

Increased inventories

Delay in reaping the benefits of the large-scale investments made at the production sites in Japan

In the light of the challenges, the FY2021 Medium-term Management Plan was developed for the Advanced Metals Division that can create synergies between each business.
Business Strategy of the Advanced Metals Division

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### Basic Policy of the Advanced Metals Division

**Moving Forward Together!**

Aim to become the “No.1 high-performance business structure for advanced metals” through collaborative creation with customers

### FY2021 Targets

<table>
<thead>
<tr>
<th>Functional Components and Equipment</th>
<th>FY2018 Actual</th>
<th>FY2019 Forecast</th>
<th>FY2021 Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specialty Steel Products</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>276.9</td>
<td>280.0</td>
<td>320.0</td>
</tr>
<tr>
<td>Adjusted operating income(^2)</td>
<td>[8.1%]</td>
<td>[7.5%]</td>
<td>[10.3%]</td>
</tr>
<tr>
<td>ROIC(^3)</td>
<td>6.3%</td>
<td>5.5%</td>
<td>8.6%</td>
</tr>
<tr>
<td><strong>Advanced Metals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>367.6</td>
<td>350.0</td>
<td>350.0</td>
</tr>
<tr>
<td>Advanced operating income</td>
<td>[2.9%]</td>
<td>[4.3%]</td>
<td>[6.9%]</td>
</tr>
<tr>
<td>ROIC</td>
<td>-0.6%</td>
<td>3.7%</td>
<td>6.8%</td>
</tr>
<tr>
<td><strong>Total(^1)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>644.5</td>
<td>630.0</td>
<td>670.0</td>
</tr>
<tr>
<td>Advanced operating income</td>
<td>[5.1%]</td>
<td>[5.7%]</td>
<td>[8.5%]</td>
</tr>
<tr>
<td>ROIC</td>
<td>2.7%</td>
<td>4.6%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

*1 Simple sum before eliminating intersegment revenues
*2 Adjusted operating income = Revenues – Sales cost – Selling, general & administrative expenses
*3 ROIC by segment = IFRS operating income * (1 – Tax rate of 30%) / (Average of beginning- and end-year working capital + Average of beginning- and end-year fixed assets)
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3-1. Action Plan

Resolve the challenges and implement the growth strategy

Reduce inventories

Create synergy between businesses

Materials & Process Innovation

Ongoing restructuring of business portfolio

Take the best advantage of large-scale investments
3-8. Action Plan: Details (1)

**Reduce inventories**

Steadily implement the action plan, and control the inventories strictly with KPIs (ROIC, etc.)

**Create synergy between businesses**

<table>
<thead>
<tr>
<th>Implement a cross-selling approach</th>
<th>Identify needs in the overlapping markets of specialty steel products and functional components and equipment. Implement combined proposals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve management efficiency</td>
<td>Strategically allocate management resources to the growth areas</td>
</tr>
</tbody>
</table>

**Materials & Process Innovation**

<table>
<thead>
<tr>
<th>Develop new alloys and process</th>
<th>Merge and advance micro-structural control, alloy building, and production technology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cooperate and create collaboratively with customers and outside research institutions</td>
</tr>
</tbody>
</table>

**[Case example]** Develop new products that meet the needs of customers

- Powder materials for 3D printer and metal injection molding (MIM) products, etc.
3-2. Action Plan: Details (2)

Ongoing Restructuring of Business Portfolio (1)

Growing Businesses Expansion

New Products Expansion

Core Businesses Portfolio Restructuring

Electronic Materials

Industrial, Aerospace & Energy Materials

Tool Steel & Rolls

Piping Components

Automotive Casting (other than Waupaca Foundry, Inc.)

Automotive Casting (Waupaca Foundry, Inc.)

Long-term expansion of electronics / batteries

Medium-to long-term expansion of aircraft materials

Expansion in international markets

Expand the heavy-duty areas
Commercial vehicles, agricultural machinery, construction machinery, railways, and industrial equipment

FY2018

FY2021

FY2025

¥670.0 billion

¥644.5 billion
### 3-3. Action Plan: Details (3)
#### Automotive Casting

<table>
<thead>
<tr>
<th>Business Segment</th>
<th>Demand or Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Vehicles</td>
<td>An increase in demand for transportation</td>
</tr>
<tr>
<td>Agricultural / Construction Machinery</td>
<td>Population growth → an increase in crop yield</td>
</tr>
<tr>
<td>Railways</td>
<td>Demand rises around the world</td>
</tr>
<tr>
<td>Industrial Equipment</td>
<td>An increase in demand for complicated shaped products</td>
</tr>
</tbody>
</table>

#### Measures

**Improve productivity**
- Introduce a dedicated line
- Talent development
- Post-process automation

**Expand heavy-duty products**
- Form a business alliance with Kohler Industrial Castings and Dotson Iron Castings that own horizontal molding machines

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**Ongoing Restructuring of Business Portfolio (2)**

Expand the heavy-duty areas
- Commercial vehicles
- Agricultural machinery
- Construction machinery
- Railways
- Industrial equipment

Address the need for high added value

**Sales portion of heavy-duty: FY2018 42% → FY2021 54%**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2015</td>
<td>32%</td>
</tr>
<tr>
<td>FY2018</td>
<td>42%</td>
</tr>
<tr>
<td>FY2021</td>
<td>54%</td>
</tr>
</tbody>
</table>

**Waupaca’s sales portfolio**
- Passenger vehicles: FY2015 68%, FY2018 58%, FY2021 46%
- Heavy-duty: FY2015 32%, FY2018 42%, FY2021 54%

**Growth**
3-3. Action Plan: Details (4)

<table>
<thead>
<tr>
<th>Core Businesses</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Tool Steel for Molds** | Yasugi Works 10,000-ton forging press (started operation in May, 2018)  
Respond to larger molds and expand the sales of new products such as DAC-i |
| **Rolls** | Increase production efficiency and capacity (started operation in 2H FY2018)  
Expand sales of rolls for steel mills and structural steel castings |
| **Industrial Equipment** | Increase the production capacity of turbine wheels (start operation sequentially from FY2018 to 2020)  
Expand sales to the growing global turbo market |
| **Automotive Casting Products** | Introduced a dedicated line at Waupaca (started operation in Dec 2018)  
Improved productivity and expand the heavy-duty areas |
| **Piping Components** | Increased the system capacity of flexible piping at Kuwana Works (started operation in 2H FY2018)  
Expanded sales in the Chinese and European markets |
3-4. Action Plan: Details (5)
Aircraft-related Components and Materials

Take the best advantage of large-scale investments (2)

<table>
<thead>
<tr>
<th>Growing Businesses</th>
<th>Aircraft / Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Demand forecast for passenger jets*1

<table>
<thead>
<tr>
<th>(units)</th>
<th>2018</th>
<th>2038</th>
</tr>
</thead>
<tbody>
<tr>
<td>New demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replacement demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing units</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1: Reference: Our estimation by reference to various materials

Okegawa Works

840-ton ring mill (started operation in 2H, FY2016)

Establish an integrated production system across the three sites (melting, forging, and processing)

Yasugi Works

24-ton VIM (started operation in FY2015)
10,000-ton forging press (started operation in May, 2018)
High-speed forging machine (started operation in Apr, 2018)

J-forge*2

50,000-ton press
Closed-die forging press

*2: Japan Aeroforge, Ltd.
3-5. Action Plan: Details (6)
Aircraft-related Components and Materials

**Take the best advantage of large-scale investments (3)**

Establish an integrated production system across the three sites (melting, forging, and processing)

1) Speed up melting certification
2) Increase production efficiency through domestic integrated production system
3) Utilize CAE → Reduce design cost and certification period
4) Develop new alloys and process technology [collaborative creation]

[Topics]
Started mass production of aircraft engine-related components and materials for IHI Corporation (from FY2018)

**Strengthen business with Engine Prime (the world’s top)**

1) Enter the business of core engine components
2) Introduce new next-generation products such as isothermal forging, MIM, and precision (investment) casting to the market

FY2025 Sales of Aircraft Components and Materials: ¥60.0 billion

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*1: Metallurgical Research Laboratory, Advanced metals Division, Hitachi Metals, Ltd.
*2: Global Research & Innovative Technology Center, Hitachi Metals, Ltd.
*3: The Cross-ministerial Strategic Innovation Promotion Program, Cabinet Office
*4: Next Generation Tatara Co-Creation Centre, Shimane University
*5: National Institute for Materials Science
3-6. Action Plan: Details (7)
Electronic Materials

Take the best advantage of large-scale investments (4)

<table>
<thead>
<tr>
<th>Clad materials</th>
<th>Organic EL materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Clad metal image" /></td>
<td><img src="image2" alt="Organic EL image" /></td>
</tr>
</tbody>
</table>

Maintain high growth through electrification of automobiles and higher smartphone performance

**Clad metals**
- Composites of dissimilar metals such as copper and aluminum
- Polish surface of metals and bond them together by applying pressure or heat (pressure bonding)
- Exhibit properties that cannot be achieved by one type of metal, including conductive property, processability, thermal expansivity, and corrosion resistance.

**Application:**
- External battery terminal
- Lead material
- Heat-emitting chassis
- Heat spreader
- Coins
- Bimetal, etc.

An image of clad metal process

![An image of clad metal process](image3)

lead material to collect current
Take the best advantage of large-scale investments (5)

Bring clad metals to a new area by merging the technologies specific to the production sites

**Yasugi**
Develop alloy materials & Rolling technology for wide materials

**Suita**
Develop alloy materials & cladding technology for Sheet/Plate form

**Tsuchiura**
Up-to-date mass-production clad facility & Plate-clad technology

**Kitanihon**
Rolling technology for Ultrathin foil Surface treatment technology

**Kagoshima**
Drawing press and Punching Processing technology

Clads for batteries and heat-emitting chassis

- **Yasugi**
  - Organic EL components and materials
- **Tsuchiura**
  - Clad terminals for batteries
- **Kitanihon**
  - Hitachi Metals, Ltd.
- **Kagoshima**
  - Hitachi Metals Neomaterial, Ltd.

FY2021 Sales of Electronic Materials Business: add 14% (vs.FY2018)
3-10. Investment Plan

Capital Expenditure from FY2019 to 2021: ¥107.0 billion
(vs. previous Medium-term Management Plan: approx. 70%)

Process Innovation
- Promote automation
  Automate finishing at Waupaca, etc.

Investments to increase production
- Wide processing line for electronic materials at Yasugi Works
- Facility to increase the production capacity of turbine wheels
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Aim to become the “No.1 high-performance business structure for advanced metals” through collaborative creation with customers

<table>
<thead>
<tr>
<th>¥ billions Profit margin in brackets</th>
<th>FY2018 Actual</th>
<th>FY2021 Targets</th>
<th>vs. FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>644.5</td>
<td>670.0</td>
<td>+4%</td>
</tr>
<tr>
<td>Adjusted operating income</td>
<td>[5.1%] 32.9</td>
<td>[8.5%] 57.0</td>
<td>+24.1</td>
</tr>
<tr>
<td>ROIC</td>
<td>2.7%</td>
<td>7.8%</td>
<td>+5.1%</td>
</tr>
</tbody>
</table>

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Information on Risks Inherent in Future Projections

This document contains forward-looking statements, such as results forecasts, management plans and dividend forecasts, 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:

- Risks associated with market conditions related to product demand
- Risks associated with changes in raw material prices
- Risks associated with financing activities
- Risks associated with changes in foreign exchange rates
- Risks associated with changes in the value of securities
- Risks associated with the global expansion of businesses
- Risks associated with competitiveness and development and commercialization of new technologies and products
- Risks associated with intellectual property rights
- Risks associated with environmental regulations
- Risks associated with product defects
- Risks associated with laws and regulations, and official regulations
- Risks associated with earthquakes and other natural disasters
- Risks associated with information security
- Risks associated with retirement benefit obligations
- Risks associated with relationship with the parent company
- Risks associated with M&A
- Risks associated with securing talent