Business Strategy of the Magnetic Materials Company

Hitachi Metals IR Day 2017

May 31, 2017
Hitachi Metals, Ltd.

Ryoji Akada
Executive Officer
President of the Magnetic Materials Company
Business Strategy of the Magnetic Materials Company

[Table of Contents]
1. Business Overview
2. Basic Policy
3. Overview of Initiatives in FY2016
5. 2018 Medium-term Management Plan Goals
1-1. Our Position in the Magnet Industry

Supplying an extensive line-up of magnet products to the market

Electronics-related: 14%
- Neodymium magnets
- Ferrite magnets
- Information system components

Industrial infrastructure-related: 21%
- Neodymium magnets
- Ferrite magnets
- Applied products

Automotive-related: 65%
- Neodymium magnets
- Ferrite magnets

Magnetic Materials Segment
FY2016 results
Revenues ¥99.8 bn

For HEV & EV
For EPS

World’s No. 1 brand
NEOMAX

A global supply system from five bases across the world
1-2. Market Environment: Expanding Demand for EV*

Automotive-related Market

- The production volume of EVs is expected to expand rapidly in China and other countries in the world following the spread of EVs.
- Projected annual growth rate on a global basis is around 30% (2017–2023).

Projection of production volume for EVs in each country/region

*Including term for hybrid electric vehicles (HEV) and plug-in hybrid electric vehicles (PHEV).

(Source: Hitachi Metals’ estimate based on various materials)
Business Strategy of the Magnetic Materials Company

[Table of Contents]

1. Business Overview
2. Basic Policy
3. Overview of Initiatives in FY2016
5. 2018 Medium-term Management Plan Goals
2. 2018 Medium-term Management Plan: Basic Policy and Goals of the Company

Basic Policy of the Magnetic Materials Company

Innovate *monozukuri* to pave the way for growth

- Strengthen global production system
- Build innovative production line

2018 Medium-term Management Plan: Goals

<table>
<thead>
<tr>
<th>FY2016 Results (¥108 = US$1)</th>
<th>FY2018 Goals (¥110 = US$1)</th>
<th>Change vs. FY2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>¥99.8 bn</td>
<td>¥120.0 bn</td>
<td>120%</td>
</tr>
<tr>
<td>Adjusted operating income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>¥9.3 bn</td>
<td>¥13.0 bn</td>
<td>+ ¥3.5 bn</td>
</tr>
<tr>
<td>Adjusted operating margin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.3%</td>
<td>10.8%</td>
<td>+1.3%</td>
</tr>
<tr>
<td>Overseas sales as a percentage of total sales</td>
<td>53%</td>
<td>58%</td>
</tr>
</tbody>
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Business Strategy of the Magnetic Materials Company

[Table of Contents]

1. Business Overview
2. Basic Policy
3. Overview of Initiatives in FY2016
5. 2018 Medium-term Management Plan Goals
3. Overview of Initiatives in FY2016

FY2016 Overview of Initiatives

- Established Hitachi Metals San Huan Magnetic Materials (Nantong) Co., Ltd. Started test run.  <Held opening ceremony on April 7, 2017>

- Decided to introduce an innovative production line for Neodymium magnets and ferrite magnets at the Kumagaya Works. Determined the specifications of the line and started construction.  <Scheduled for operation in the 1H of FY2018>

- Turned the Kumagaya district into a “mother plant” that integrates plants and research labs, and accelerated development of products that meet customer needs.  <Integration to be completed in FY2019>
Business Strategy of the Magnetic Materials Company

[Table of Contents]

1. Business Overview
2. Basic Policy
3. Overview of Initiatives in FY2016
5. 2018 Medium-term Management Plan Goals
4-1. Growth Strategy and Action Plan (1)

“Carry out *monozukuri* innovations: Innovative production line”

Construct a new, innovative production line for Neodymium magnets and ferrite magnets in the Kumagaya district

Respond to demand of the continuously growing automotive-related market with “quality and quantity”

Neodymium magnet plant
(Started construction in Apr. 2017)

Ferrite magnet plant
(Started construction in Feb. 2017)

Adopt a new method in the heavy rare-earth diffusion process

Enhance production lines to address small and thin shapes
"Save energy and resources with the latest magnetic materials"

**Neodymium magnets**

- **Increase technology to save heavy rare earth elements**
- **Significant reduction in use of heavy rare earth**

Alloying addition  Grain boundary diffusion  Grain boundary control

(Heavy rare-earth elements are unevenly distributed near the grain boundary)

(Magnetic coercive force significantly increased due to grain boundary control technology)

**Ferrite magnets**

- **Contribution to downsizing due to performance improvements**
  - Volume reduction
    - NMF-9: -20%
    - NMF-12: -45%
    - NMF-15

- **New composition development**
- **Microstructure control technology**
- **Grinding technology for thin products**
4-3. Growth Strategy and Action Plan (3)

“Integrate domestic bases and create a ‘mother plant’”

Accelerate development of technologies that capture customer needs

- Innovative production line
  Newly establish in Kumagaya district
- Magnetic Materials Research Laboratory
  Transfer to Kumagaya district
- Information System Component Business
  Transfer to Kumagaya district

Integrate plant and laboratory, and establish as a “mother plant” <Kumagaya district>
- Carry out smooth technology application from R&D to mass production, and accelerate overseas expansion.
- Add controlling functions and achieve efficient management.

(Contribute with integration of advanced materials technology and process technology)
4-4. Growth Strategy and Action Plan (4)

“Strengthen global production system of ferrite magnets, mainly by the ‘mother plant’”

Roll out the innovative production technology of the “mother plant” to domestic and overseas production bases, and promptly supply high-performance, high-quality products to the global market.

- European market
- S. Korean base (Pacific Metals Co., Ltd.)
- American base (Hitachi Metals North Carolina, Ltd.)
- Chinese/Asian markets
- “Mother plant” (Kumagaya district)
- NEOMAX Kyushu
- Southeast Asian base (PT. HITACHI METALS INDONESIA)
- American market

Ferrite magnets

- Roll out the innovative production technology to domestic and overseas bases to achieve the same quality and cost
- Meet the requirements of the automotive sector for high-quality components and ultra-thin, small components, which are difficult to manufacture
4-5. Growth Strategy and Action Plan (5)

“Optimize material flow”

Conduct unified operation management of manufacturing and recycling process of Neodymium magnets.

- Improve efficiency with consistent process design for magnets
- Achieve a smooth flow of effectively utilizing recycled materials
- Improve quality management through all processes

Aggressive investment in the magnet alloy manufacturing process and recycling process
4-6. Growth Strategy and Action Plan (6)

“Expand China business”

Create competitive products with the same quality as Japan

Hitachi Metals San Huan Magnetic Materials (Nantong) Co., Ltd.

- Location: Nantong, Jiangsu Province, China
- Inv. ratio: Hitachi Metals: 51% Zhong Ke San Huan: 49%
- Production capacity: 1,000 tons/year (FY2017) ⇒ 2,000 tons/year
- Sales goal: ¥10.0 billion (FY2018)

Introduce proprietary heavy rare earth diffusion technology

Chinese market

European/American and Asian markets

Exterior of plant

Opening ceremony

Launch ceremony

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4-7. Investment Plans

Carry out investment necessary to lead “business base innovations”

Cumulative total for 2016–2018: ¥48.0 billion

- Strengthen global production system
  - Enhance production capacity
  - Integrate plant and research lab
  - Introduce innovative production line
  - Optimize material flow
4-8. Medium- to Long-term Vision

“Increase share in growth markets and expand business scale”

FY2025 sales goal: ¥200.0 billion
(FY2016 result: ¥99.8 billion ⇒ FY2018 plan: ¥120.0 billion)

Strengthen the Neodymium magnet business, the market for which is growing

**Further enhancement of production capacity**
(Goal: Double FY2016 levels)
- Expand innovative production line
- Hitachi Metals San Huan Magnetic Materials (Nantong) Co., Ltd.

**Curb use of heavy rare earth**
- Heavy rare earth-saving (incl. non-use)
- Heavy rare earth diffusion

**Stable production system**
- In-house manufacturing of magnet alloy
- Strengthen recycling process
Expand revenues in the Chinese, European and American markets

(FY2016 revenues; actual) ¥99.8 billion

(FY2018 revenues; estimate) ¥120.0 billion
Business Strategy of the Magnetic Materials Company

[Table of Contents]
1. Business Overview
2. Basic Policy
3. Overview of Initiatives in FY2016
5. 2018 Medium-term Management Plan Goals
5. Conclusion

**Innovate monozukuri to pave the way for growth**

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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