Business Briefing on General Machinery & Special Vehicles

Atsushi Maekawa
Head of General Machinery & Special Vehicles

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MITSUBISHI HEAVY INDUSTRIES, LTD.
## Relations Between General Machinery & Special Vehicles and Business Domains

<table>
<thead>
<tr>
<th>Business domain</th>
<th>Customers/Markets</th>
<th>Segment</th>
<th>General Machinery &amp; Special Vehicles</th>
<th>Others (Air-Conditioning/Machine Tool)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy &amp; Environment</strong></td>
<td>• Power companies • Gas companies • Resource companies (oil, chemicals, steel)</td>
<td>• GTCC • Large-scale thermal power plants • Nuclear power plants</td>
<td>• Environmental plants • Chemical plants</td>
<td></td>
</tr>
<tr>
<td><strong>Machinery, Equipment Systems</strong></td>
<td>• Core industries (steel, etc.) • Automotive industry • Logistics, etc.</td>
<td>• Stationary engines</td>
<td>• Compressors • Metals machinery • Crane &amp; material handling systems</td>
<td>• Turbochargers • Forklift trucks • Engines • Air-conditioning equipment • Machine tools</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>• Airlines (air) • Shipping companies (sea) • Railways (land), etc.</td>
<td>• Commercial Ships</td>
<td>• Transportation system</td>
<td></td>
</tr>
<tr>
<td><strong>Defense &amp; Aerospace</strong></td>
<td>• Ministry of Defense (land, sea, air) • JAXA</td>
<td>• Destroyers &amp; submarines for the Ministry of Defense</td>
<td>• Defense aircraft • Missiles • Space Systems</td>
<td>• Special vehicles</td>
</tr>
</tbody>
</table>
1. Business Outline
2. Revival Plan
   • Turbochargers
   • Engines
   • Forklift Trucks
   • Special Vehicles
1. Business Outline: Product Lineup

Intelligent Technology for Vehicles & Energies
- Contributing to social infrastructure development
  and the energy/environment sectors -

Main Products

- **Turbochargers**
  - For diesel vehicles
  - For gasoline vehicles

- **Forklift Trucks** (Material Handling Equipment)
  - Special vehicles

- **Engines** (for industry, for power generation, for ships)
  - Gas co-generation system: 210 to 1,000 kW
  - Diesel engines: Up to 3,800 kW
  - Type 10 tank

Breakdown of sales for FY 2011

- Turbochargers: 19%
- Engines: 31%
- Special vehicles: 11%
- Forklift trucks (material handling equipment): 30%
- Other: 9%

Consolidated net sales: 381.7 billion yen
1. Business Overview: Business Standing

Profitable for the first time in four years after efforts to improve productivity, boost overseas procurement to cut costs, and reinforce the streamlined structure.

Net sales

Operating profit/loss

Revival Plan

Q-jump12

Two years of streamlining and building foundations

Two years for massive profit growth

Operating profit/loss

2008 2009 2010 2011 2012 2013 2014

-1.3 -23.2 -16.6 3.5 5.1 10.0 26.0

Planned

Actual

(billion yen)

Net sales

432.7 343.0 381.7 390.0 430.0

2008 2009 2010 2011 2012 2013 2014

430.0

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A profit rise of more than 20 billion yen achieved by different actions for improvement

<table>
<thead>
<tr>
<th>Operating profit/loss (billion yen)</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-16.6</td>
<td>+3.5</td>
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</table>

**Factors Behind Profitability for FY 2011**

- Foreign exchange
- Sales hike
- Model integration
- Improved productivity
- Reduced material costs
- Increased overseas procurement
- Organizational rationalization
- Other
3. Q-jump 12: Policy and Measures

Policy

Execute the revival plan (Q-jump 12) without fail.

2011-2012

Two years of streamlining and building foundations

2013-2014

Two years for massive profit growth

Q-jump 12

Establish a streamlined structure.
Upgrade the service business.
Build up the global business (in development, production, sales and procurement).

Q-jump stands for “Quality management system, Quick, Quantum-jump.” “12” means FY 2012.
3. Q-jump 12: Strengthening Global Operations

Make full use of overseas bases to step up the global business.
(Respond to growing demand, lower foreign exchange risks, streamline the production structure.)
3. Q-jump 12: Turbochargers

Policy
Build a system to produce 10 million units in a bid to hold a leading market share of 30%.

Development: Create a turbocharger with high levels of efficiency and reliability.
Sales: Establish a customer-based sales model.
Production: Build a global production system.

Development
- Use the simulation technology to create a hot map and to shorten the time for engine development.
- Develop a two-stage turbocharger and an electric compressor ahead of competitors.

Hot map: A method of estimating turbocharger specifications matched with the customer's engine specifications by means of simulation.

Porsche Panamera
550 HP V8 - 4.8L Gasoline Engine

Engine output / displacement

Output

Engine displacement (liters)

85kw/ L
80kw/ L
75kw/ L
70kw/ L

80kw/ L
75kw/ L
70kw/ L
Swiftly propose a turbocharger that suits the customer’s needs and participate in the development stage in an attempt to gain more orders.

Development Support Close to Customers

- MEE (as second development base)
  - Design process for European customers
  - Dealing with part of the development process
  - Increased facilities for testing customers’ engines

- MHI
  - Basic research for foundation of development
  - Increase facilities for highly functional unit tests

Taking advantage of the time difference between Europe, Japan, and Asia to make rapid proposals.

Swift response by capitalizing on the engineering companies in India and in the Philippines

TCS: Tata Consultancy Services
MTS: MHI Technical Services Corp.
3. Q-jump 12: Turbochargers

Sales

Establish a customer-based sales model in Europe, the largest market.
⇒ Provide increased support for customers at the development and subsequent stages.
⇒ Design personnel are stationed at MEE, as turbocharger production base in Europe, to enhance production and services close to customers.

Production

Global production system in 2016 (for 10 million units)

(million units)

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<tr>
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<tbody>
<tr>
<td>Netherlands</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>0.75</td>
<td></td>
<td></td>
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<tr>
<td>Thailand</td>
<td>0.35</td>
<td></td>
<td></td>
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<tr>
<td>China</td>
<td>2</td>
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MHI Equipment Europe (MEE)

Trends in sales quantity and market share of General Machinery & Special Vehicles

(million units)

<table>
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<tr>
<th>Year</th>
<th>2012</th>
<th>2014</th>
<th>2016</th>
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<tr>
<td>Orders confirmed</td>
<td>22%</td>
<td>25%</td>
<td>30%</td>
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<tr>
<td>Potential</td>
<td></td>
<td></td>
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<td>Negotiations underway</td>
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3. Q-jump 12: Engines

Policy

Shift from sales of standalone engines to sales of power generation systems in line with changes in energy demand.

Development: Create highly efficient gas engine power generation systems and container-type gas power generation systems.

Sales: Make active sales efforts to respond to Chinese demand for distributed power sources and meet needs in Japan for private power generation.

Production: Accelerate the transfer of production to locations close to customers, i.e., China and India.

Lower the break-even point in preparation for a slowdown in emerging countries’ markets and economic fluctuations in European and other markets.

Trend in sales volumes of medium and large engines

A container-type gas power generation system: As its installation is finished just by placing it, it can be put into operation in a day at the shortest.
3. Q-jump 12: Engines

Range of engines produced

Small engines
- MEIKI
- L
- SL
- SQ
- SS
- FR/FD

Medium & large engines
- SA
- SB
- SH
- SR
- SU
- KU
- MAN
- UE
- SUL
- ZER

Stepping up global business

Small engines
Production capacity increased at MVDE
To respond to orders from Japanese and foreign construction equipment manufacturers operating in India, MVDE’s production capacity is increased.

Medium & large engines
A joint venture set up with China’s Shanghai Diesel Engine Co., Ltd.
In response to China’s distributed power source policy, a joint venture is set up with Shanghai Diesel Engine to undertake local production of large and midsize engines.

MVDE: engine production base in India

Signing ceremony with Shanghai Diesel Engine
### Policy

Push ahead with the shift to electric forklift trucks, bolster the global collaboration and service business, and establish a streamlined structure through reorganization of the production system.

### Market environment

**Engine forklift trucks:** The major market is shifting from the West to emerging countries.

**Electric forklift trucks:** Demand growth is expected due to increase in logistical volume in Europe, in which our share accounts for more than 50% of the market.

### Trends in sales quantity and market share

[Bar chart showing sales quantity and market share trends from 2006 to 2014, with MHI's market share highlighted.

- **2006:** 7%
- **2007:** 6%
- **2008:** 7%
- **2009:** 7%
- **2010:** 6%
- **2011:** 6%
- **2012:** 10%

- **Regions:**
  - The Middle East and Africa
  - Latin America
  - Asia
  - North America
  - Europe

- **Note:** MHI's market share targets are highlighted for the year 2012.
3. Q-jump 12: Forklift Trucks

Business Model Reform

Restructuring the production system
- Reduce the number of global operation bases from six to four.
- Shift production from production bases in Sagamihara and the Netherlands.
- Split production with an alliance partner to boost cost competitiveness.

Focusing on electric forklift trucks
- Adopt MHI’s high capacity lithium-ion batteries.
- Concentrate European operations on the indoor material handling equipment base in Finland.
- Replace lead batteries in turret trucks with MHI’s lithium-ion batteries.

Launching the service business on a full scale
- Introduce the advantage of the North American service business (RPI*) to locations worldwide.
- Expand the direct sales model to increase contacts with customers.

*RPI: Rapidparts Inc., a U.S.-based company selling forklift parts and servicing forklift trucks.
3. Q-jump 12: Special Vehicles

**Policy**

Maintain and solidify the defense business foundation. Embark on disaster control and security businesses using technologies nurtured in the defense sector.

- Work intensively to attract orders, especially for anti-terrorism and disaster control solutions.
- Press ahead with product development to divert special vehicle technologies to civilian use.

**Examples of products developed**

- Remote control forklift truck
- Special heavy-duty forklift with radiation shielded cabin
- Type 10 tank
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