

Machine Tool Business Operation

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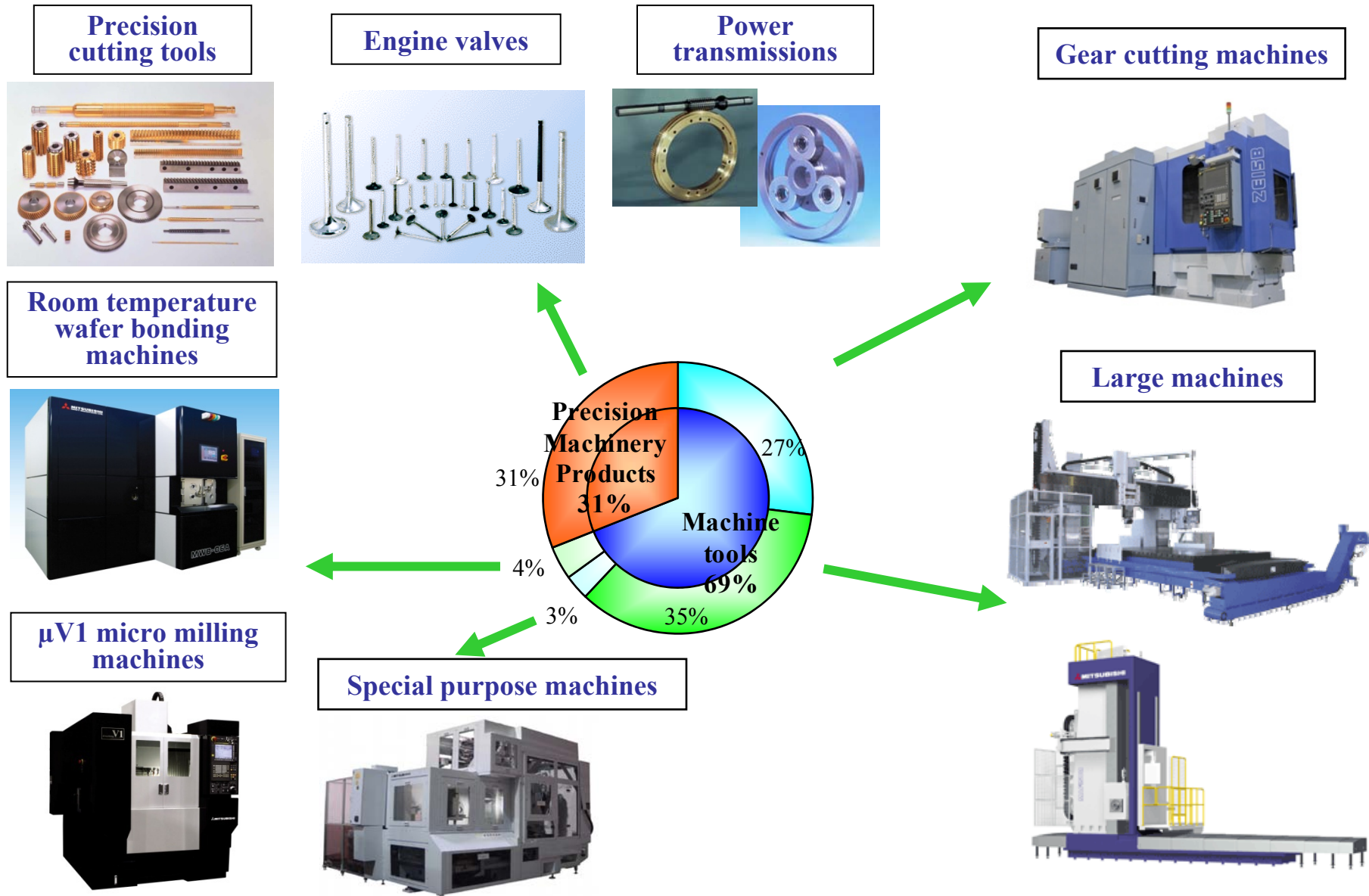
MITSUBISHI HEAVY INDUSTRIES, LTD.

Contents

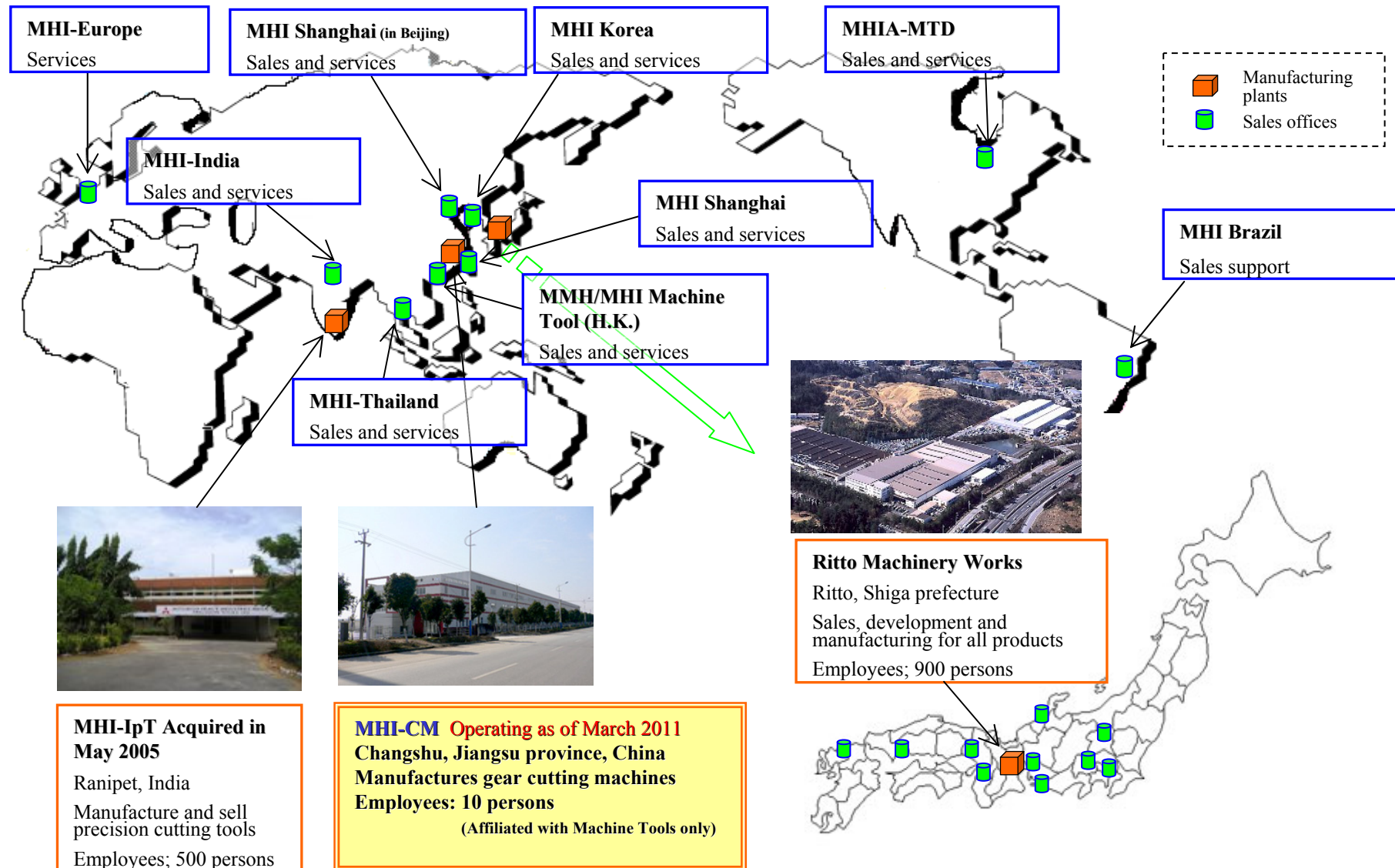
1. Overview of Machine Tool	P 3
2. FY2010 Summary	P 5
3. FY2011 Initiatives	P 8
(1) Basic Policy	P 8
(2) Accelerating Global Expansion	P 9
(3) Focus Management Resources on Growth Products	P 12
(4) Support Enhancement of In-House Manufacturing through Process Technology Centers	P 17
4. Summary	P 19

1. Overview of Headquarters: Product Portfolio

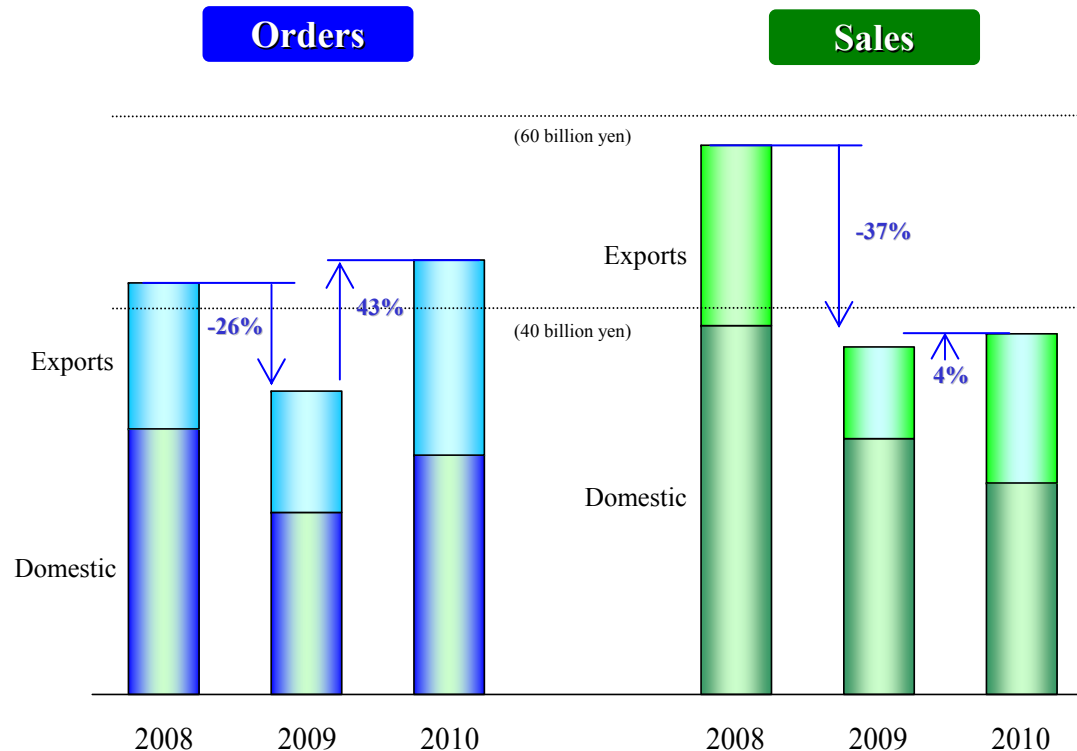
(FY2010 Net Sales)



1. Overview of Headquarters: Worldwide Locations



2. FY2010 Summary: State of Orders and Sales (consolidated)

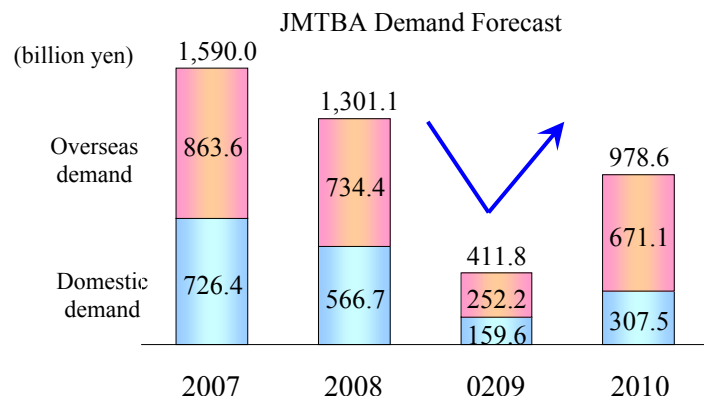


1. Orders

- Captured several major orders related to construction, energy and automotive overseas, resulting in large rise in exports.
- Investment in automotive, construction is recovering rapidly also in Japan

2. Sales

- Large rise in exports due to buoyant overseas demand focused on Asia
- In Japan, the slow recovery from the recession resulted in year-on-year decrease
- Despite a large year-on-year rise in orders, growth stopped at a slight year on year increase as sales have been delayed to the following year due to numerous orders for large machinery with long delivery terms and orders converging on the second half of the term.



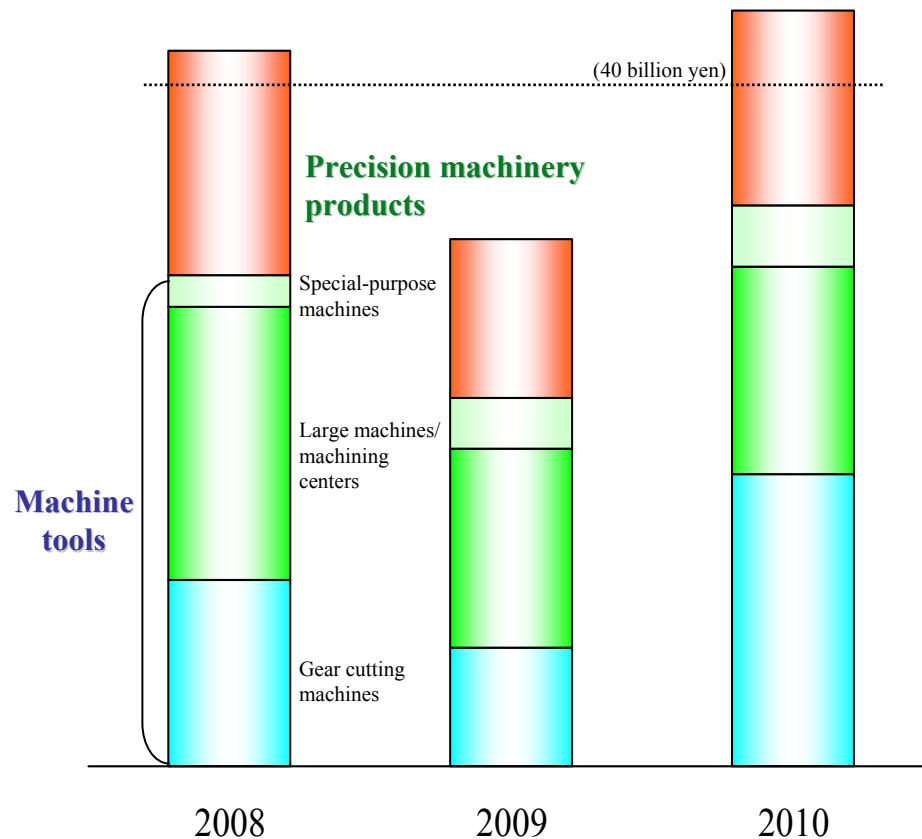
Japan Machinery Tool Builders' Association (JMTBA) Forecast

- For the first time in 3 years, demand expected to exceed 1 trillion yen to 1.1 trillion in 2011.

(In 2010, year-on-year recovery was rapid at 2.4 times.)

2. FY2010 Summary by Product (consolidated)

Breakdown of Orders



1. Gear Cutting Machines

In addition to brisk overseas demand, we also successfully expanded the product line-up of gear grinding machines, and orders from the domestic automotive and construction machinery sectors rose with the rapid increase in capital investment. A near return to levels before the collapse of Lehman Brothers.

2. Large Machines

Despite capturing major orders for the construction machinery sector both in Japan and overseas, the increase was slight due to a lull in investment in other industries.

3. Special-Purpose Machines

In addition to automotive equipment for overseas customers, we saw an increase due to capturing major order for the aircraft sector.

4. Precision Machinery Products

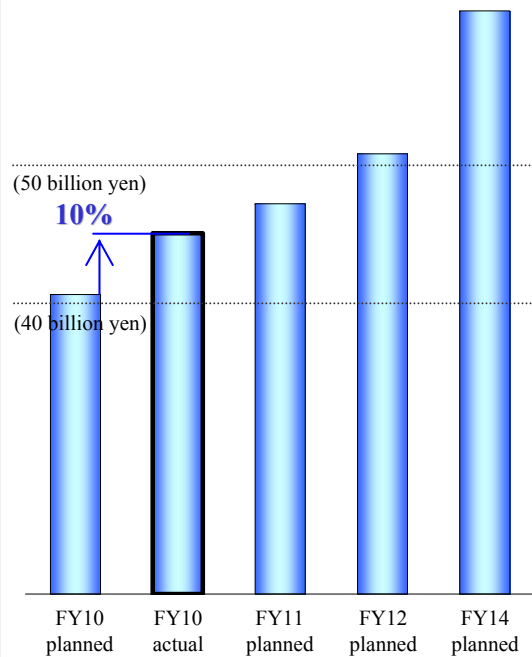
Rebound following a recovery in the automotive sector, which is the mainstay for both precision cutting tools and engine valves.

* Shipments of precision cutting tools and engine valves have slumped due to the stagnation in automobile production following the Great East Japan Earthquake, but the overall impact is slight.

2. FY2010 Summary: 2010 Business Plan Progress (consolidated)

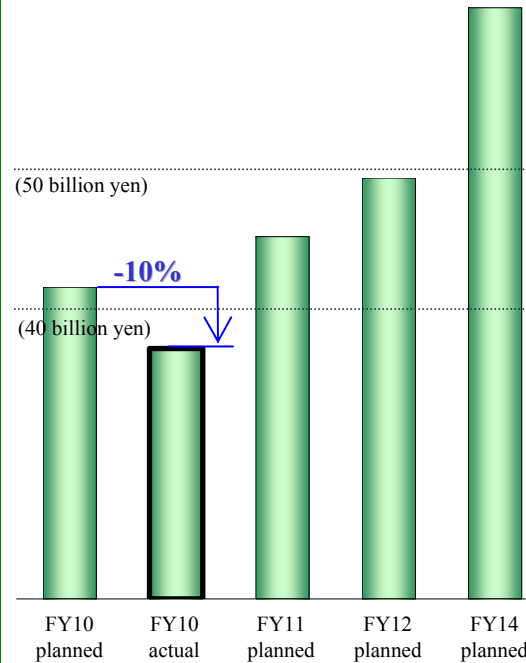
Orders

- ◇ Growth exceeded plans by more than 10%
- ◇ FY2011 as initially planned due to accumulation of major orders



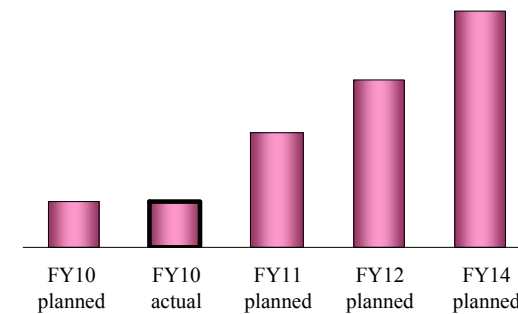
Sales

- ◇ Did not achieve sales target since major orders with long delivery terms accumulated in second half of year
- ◇ Issues with processing work due to numerous orders for FY2011



Operating profit

- ◇ Successfully reduced both costs and compensation claims to achieve target
- ◇ Planning large-scale profit increase for FY2011 by factoring in sales expansion and results of cost reduction



3. FY2011 Initiatives: (1) Basic Policy

Realize highly profitable structure through globalization and developing high added value

◆ **Accelerating global expansion**

- Expand overseas sales network and promote local development
- Expand functionality at new manufacturing plants in China
- Expand business at MHI-IPT in India

◆ **Focus management resources on growth products**

- Boost line-up with focus on products for priority enhancement
- Initiatives to gain world No. 1 market share in gears and large machines
- Promote hollow engine valve business

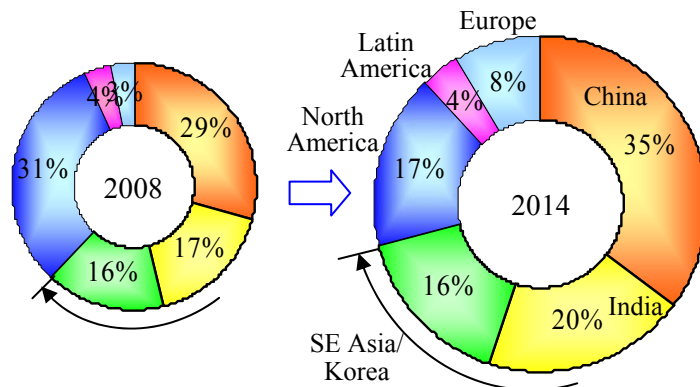
◆ **Support enhancement of in-house manufacturing through process Technology Centers**

- MHI in-house business connections and identity
- Future directions and external expansion

3. (2) Accelerating Global Expansion (i)

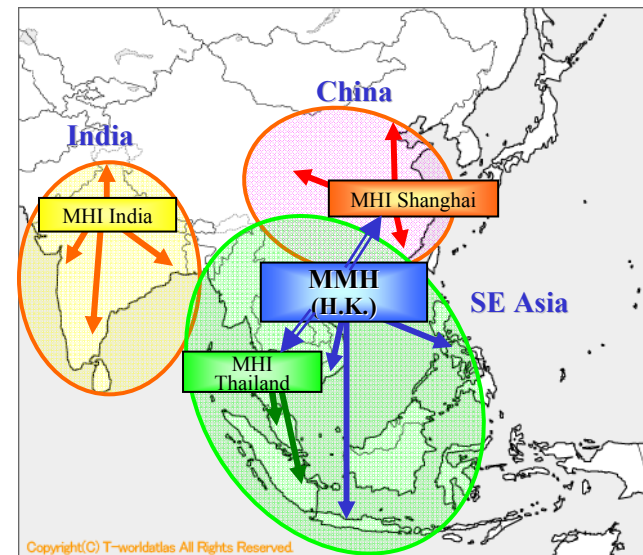
◆ Expand overseas sales network and promote local development

[Planned Orders by Destination]



Expand proportion of orders for emerging countries including China, India, SE Asia from 60% to 70%.

Division of Responsibility in Asian Market



◇ Local Development Progress

	Target	Policy	Present situation
Emerging markets	China, India, SE Asia	Expand, boost independent organization	China: Running OJT for local employees hired in country India: Local service staff undergoing long-term training at Ritto SE Asia: Reinforce Hong Kong as general base
Stable markets	North America	Maintain current organization	Local employees already pulling together to expand business for gear cutting machines
Peripheral markets	Europe, Latin America	Sales cooperation with other companies	Promote sales cooperation in Brazil

3. (2) Accelerating Global Expansion (ii)

◆ Expand functionality at new manufacturing plants in China



No. 2 plant at Mitsubishi Heavy Industries (Changshu) Machinery Co., Ltd. (MHI-CM)

- Produce gear cutting machines at No. 2 plant of existing company, which manufactures rubber tire production machinery
- **Operations started in March 2011**
- In May first shipment of two machines were made to local customers
- 10 staff affiliated with the Machine Tools Division including 4 temporary workers
- MHI Shanghai handles sales **and have already captured orders until the fall**



The GE15A gear cutting machinery is the top selling product

(1) Expand production models

Develop other models in addition to the best-selling GE15A gear cutting machine

(2) Boost showroom functionality

Start trial shaving, processing guidance

MHI-CM
Strengthen
functionality

(3) Strengthen procurement functions

Lateral development to other models and models produced in Japan after securing product quality for the GE15A

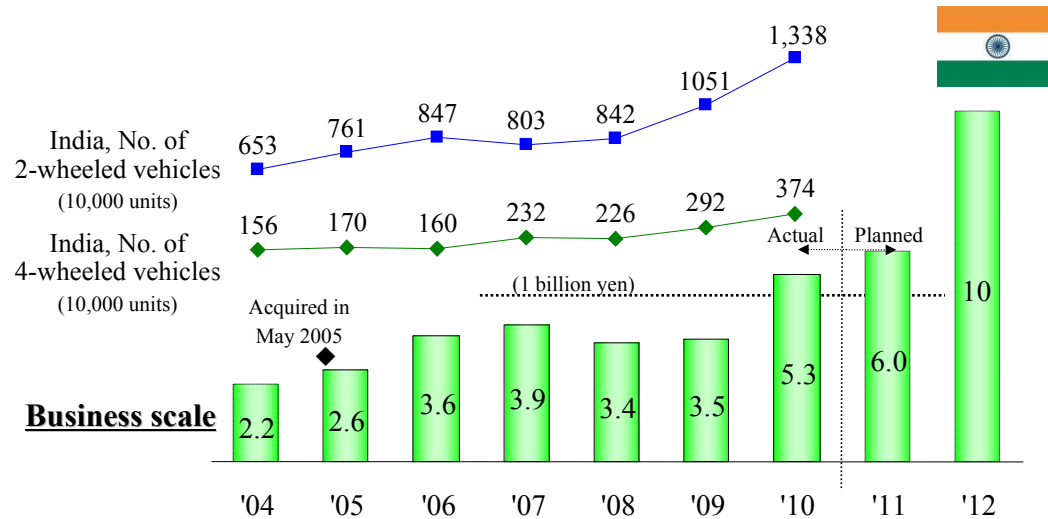
(4) Boost functionality at service locations

Develop inventory of service parts

Consider expansion to the Indian market as the next step

3. (2) Accelerating Global Expansion (iii)

◆ Expand business at MHI-IPT in India



MHI-IPT
(Ranipet, Tamil Nadu)
Started when MHI acquired SRP in May 2005
At present, about 500 employees
Producing full line-up of cutting tools
Top market of more than 40% in India

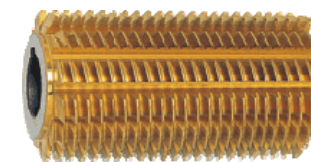
(1) Further expand production capacity to maintain top share

- Continue 2007 capacity expansion by investing in production increase
- Implement productivity on a level with the Ritto plant

(2) Strengthen collaboration with the Ritto plant

- Jointly develop design software, processing programs, processing equipment
- Set up production plant for global expansion under Ritto leadership

Solid hob

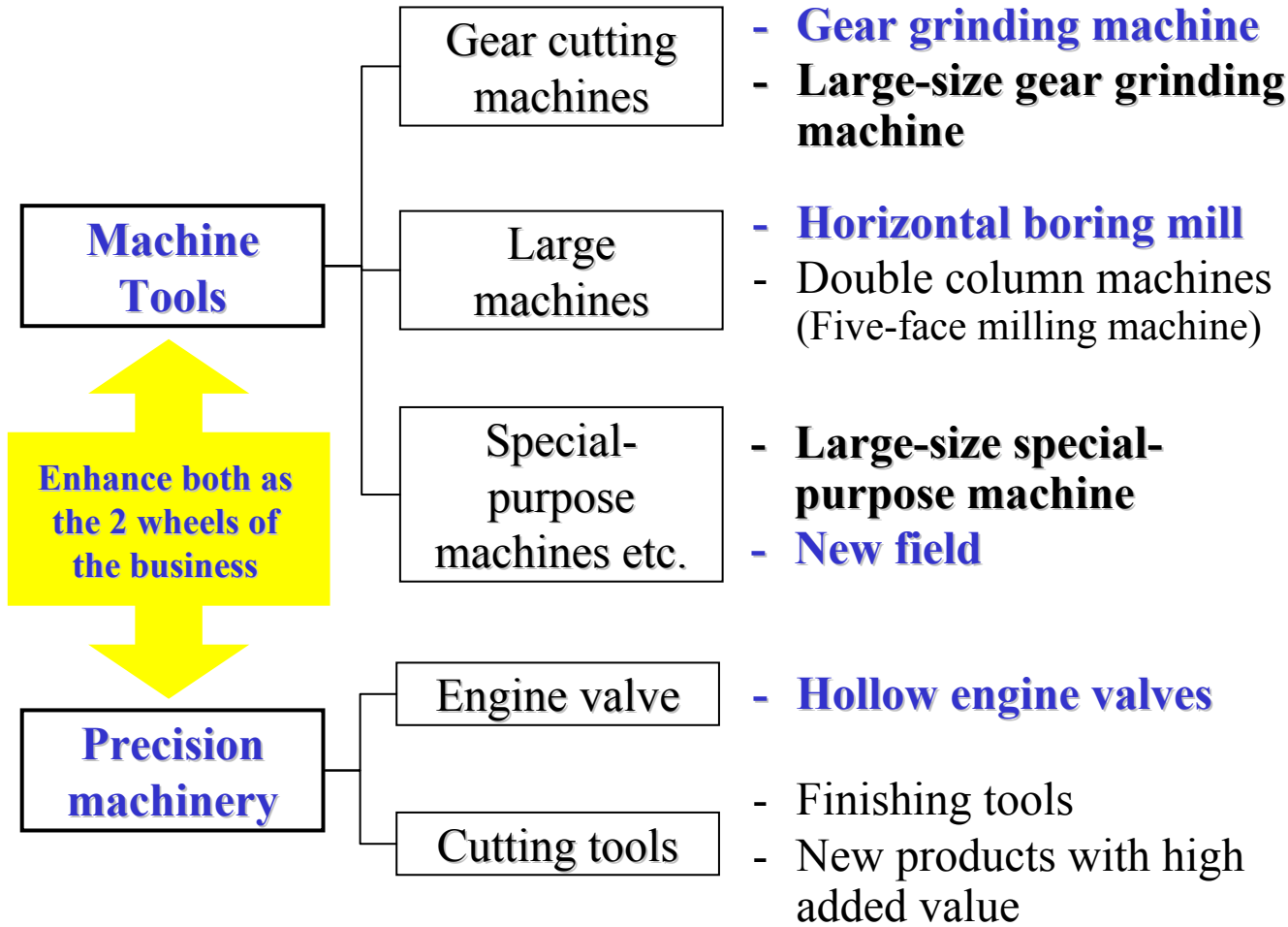


Pinion cutter



3. (3) Focus Management Resources on Growth Products (i)

◆ Boost line-up with focus on products for priority enhancement



ZE15B Gear Grinding Machine



MAF150R Horizontal Boring Mill



Engine Valves



3. (3) Focus Management Resources on Growth Products (ii)

◆ Initiatives to gain world No. 1 market share for machine tools: Gear cutting machines

(1) Priority strategy sector: Gear grinding machines

<Background>

- Increase in gear grinding due to demand for low fuel consumption and muffling in automobiles

<Course of action>

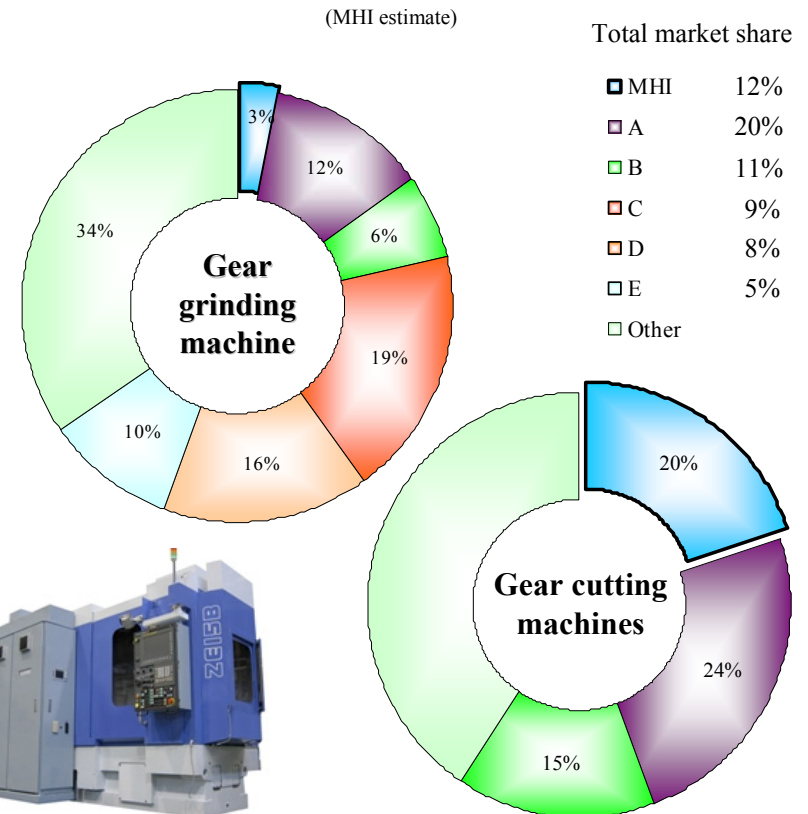
- Boost lineup by **introducing new products** (Complete introduction with the **ZE15A/B, ZE40A, ZGA2000**)
- At first, lateral expansion by grabbing overwhelming market share with Japanese customers.

(2) Sector for maintaining and improving competitiveness: Gear cutting machines

- More Modular Design (MD), cost price reductions
- Multifaceted deployment in wake of plant in China

(3) Also investigate alliances

Breakdown of market for gear cutting machines



Gear grinding machines: Complete line-up, expand from Japanese customers to US and Europe as well as emerging markets

Gear cutting machines: Expand market share by improving competitiveness, and secure solid position

3. (3) Focus Management Resources on Growth Products (iii)

◆ Initiatives to gain world No. 1 market share for machine tools: Large Machines

(1) Priority strategy sector: Horizontal boring mills

<Background>

- In Europe, the focus is lateral regardless of size of workpiece
- The same trend is strong also among European-minded emerging countries

<Course of action>

- Boost product appeal by **introducing new products** (Introduce **MAF-C to match Europe**)

(2) Sector for maintaining and improving competitiveness: Double column machines

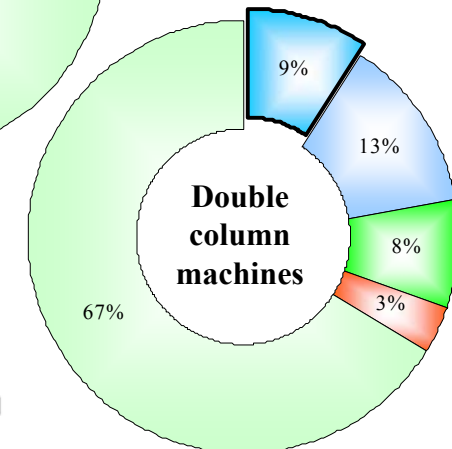
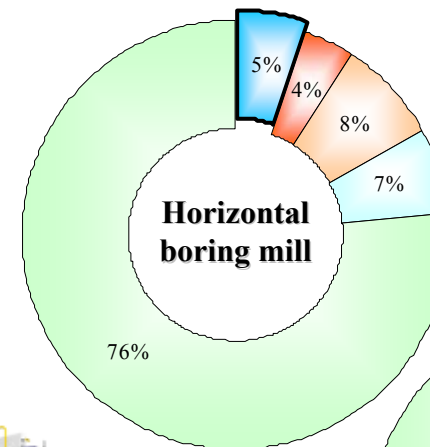
- More Modular Design (MD), cost price reductions
- Develop model for processing free-form surface, long objects

(3) Also investigate alliances

Breakdown of market for large machines

(MHI estimate)

Total market share



Horizontal boring mill: Expand business in emerging countries by introducing machine to rival Europe

Double column machine: Expand market share by improving competitiveness, and secure solid position

3. (3) Focus Management Resources on Growth Products (iv)

◆ Pioneer new fields as mainstay for the future

(1) Ultra-micro milling machines μ V1

- Allows ultra-micro milling at the submicron level
- Automatic correction of tool wear and automation of operator technique by means of CCD camera

(2) Room temperature wafer bonding machines

- High yield as there is no distortion due to heat
- Broad area of application as it is possible to bond wide-ranging materials

(3) CFRP processing equipment * CFRP: Carbon Fiber Reinforced plastic

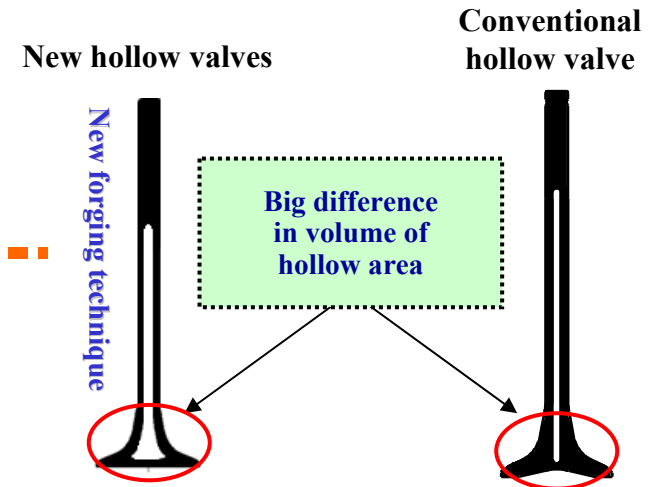
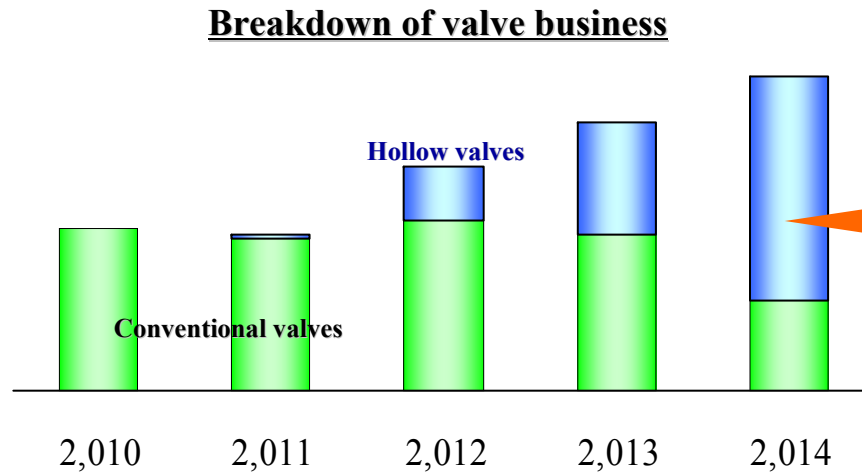
- Expand to automotive sector etc. to respond to in-house needs (process Technology Center)
- Position as growth sector, accumulate processing knowhow that differs from metals



Combine μ V1 and the wafer bonding machine to promote expansion to the ultra-micro processing field
In process of incorporating CFRP processing as important theme at the process Technology Center

3. (3) Focus Management Resources on Growth Products (v)

◆ Promote hollow engine valve business



(1) Evaluation testing underway at customers

- Installed in engines at several domestic companies and undergoing performance and endurance testing

(2) Further exploitation of prospective customers

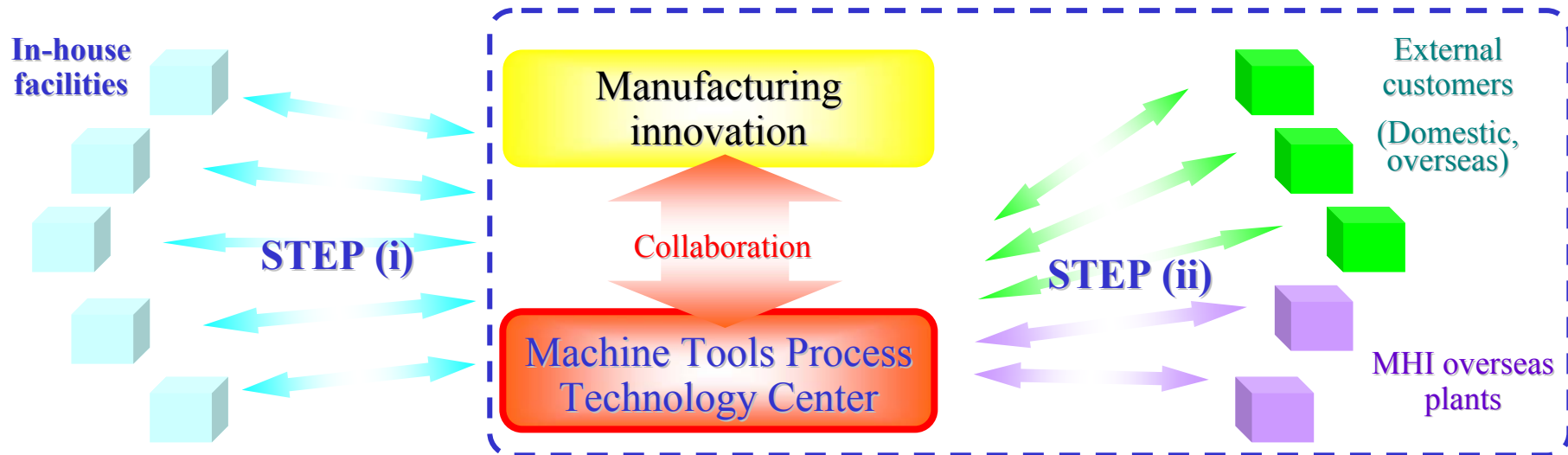
- Not only in Japan, but also inquiries from overseas manufacturers

Advantages of the hollow structure

- ◇ **Lightweight for improved fuel consumption**
 - Max. 20% lighter than the conventional model
 - ◇ **CO₂ reduction effect due to high-efficiency combustion in engine**
 - Improve thermal conductivity by filling with sodium
 - High-temperature combustion of fuel gas is possible by improving heat resistance of exhaust valve
- * Domestic patent approved, overseas patent pending

3. (4) Support Enhancement of In-House Manufacturing through Process Technology Centers (ii)

◆ Future directions and external expansion



◇ STEP (1): Already in force

- Consolidate knowhow, in-house lateral communication

Raise level of manufacturing
(Support enhancement of company-wide processing technology)

- Aircraft main wing processing facility under development

◇ STEP (2): Future development

- Apply technology for proposals to external customers
→ **Reap benefits as a business**
- Support startups and support production technology at MHI overseas plants

E.g. Processing facilities for turbine components



Apply in-house advanced processing technologies to other products and expand into business mainstay (large-size special purpose machines)

4. Summary

We are continuing initiatives with

**Creating a highly profitable structure
through globalization and
developing added value**

as the main policy.

**Aiming for a 100 billion yen business, we will continue
in the steadfast pursuit of the strategies listed in the
2010 Business plan.**

Thank you for your attention.



Our Technologies, Your Tomorrow

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