

Business Briefing on Machinery & Steel Infrastructure Systems

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June 4, 2012

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Relationship between the Machinery & Steel Infrastructure Systems and Business Domains

* Environmental and chemical plant business were transferred to Engineering Headquarters in January 2012.

Business domain	Customers/ Markets	Segment					
		Shipbuilding & Ocean Development	Power Systems	Machinery & Steel Infrastructure Systems	Aerospace Systems	General Machinery & Special Vehicles	Others (Air-Conditioning/Machine Tool)
Energy & Environment	<ul style="list-style-type: none"> Power companies Gas companies Resource companies (oil, chemicals, steel) 		<ul style="list-style-type: none"> GTCC Large-sized thermal power plants Nuclear energy 	<ul style="list-style-type: none"> Environmental plants Chemical plants 			
Machinery, Equipment Systems	<ul style="list-style-type: none"> Core industries (steel, etc.) Automotive industry Logistics, etc. 		<ul style="list-style-type: none"> Stationary engines 	<ul style="list-style-type: none"> Compressors Metals machinery Material handling systems Rubber tire machinery Printing and packaging machinery, etc. 		<ul style="list-style-type: none"> Turbochargers Forklift trucks Engines 	<ul style="list-style-type: none"> Air-conditioning equipment Machine tools
Transportation	<ul style="list-style-type: none"> Airlines (air) Shipping companies (sea) Railways (land), etc. 	<ul style="list-style-type: none"> Commercial Ships 		<ul style="list-style-type: none"> Transportation system 	<ul style="list-style-type: none"> Commercial aircraft 		
Defense & Aerospace	<ul style="list-style-type: none"> Ministry of Defense (land, sea, air) JAXA 	<ul style="list-style-type: none"> Destroyers & submarines for the Ministry of Defense 			<ul style="list-style-type: none"> Defense aircraft Missiles Space Systems 	<ul style="list-style-type: none"> Special vehicles 	

1. Summary of the FY 2011 Initiatives
2. Business Policy for Achieving the FY 2012 Business Plan
3. Progress of the Business Structural Reform
 - (1) Business Structural reforms in FY 2011
 - (2) Structural approach to cutting fixed costs
4. Implementation of the Growth Process
 - (1) Expanding the business domain
 - (2) Rebuilding the product and business portfolio
 - (3) Growth strategy for mainstay businesses
 - (4) Growth strategy for mature businesses and others
 - (5) Growth strategy for next-generation product businesses
 - (6) Global expansion
5. Summary

1. Summary of the FY 2011 Initiatives

* Figures include those related to the environmental and chemical plant projects currently being managed by Engineering Headquarters.

Average rates for posting sales		
	2010	2011
USD	¥88.5	¥81.0
EUR	¥113.5	¥109.3

Due to a drop in sales for chemical plants and transportation systems

Positive effects of the business structural reforms. Namely, attaining profitability in printing and packaging machinery operations etc.

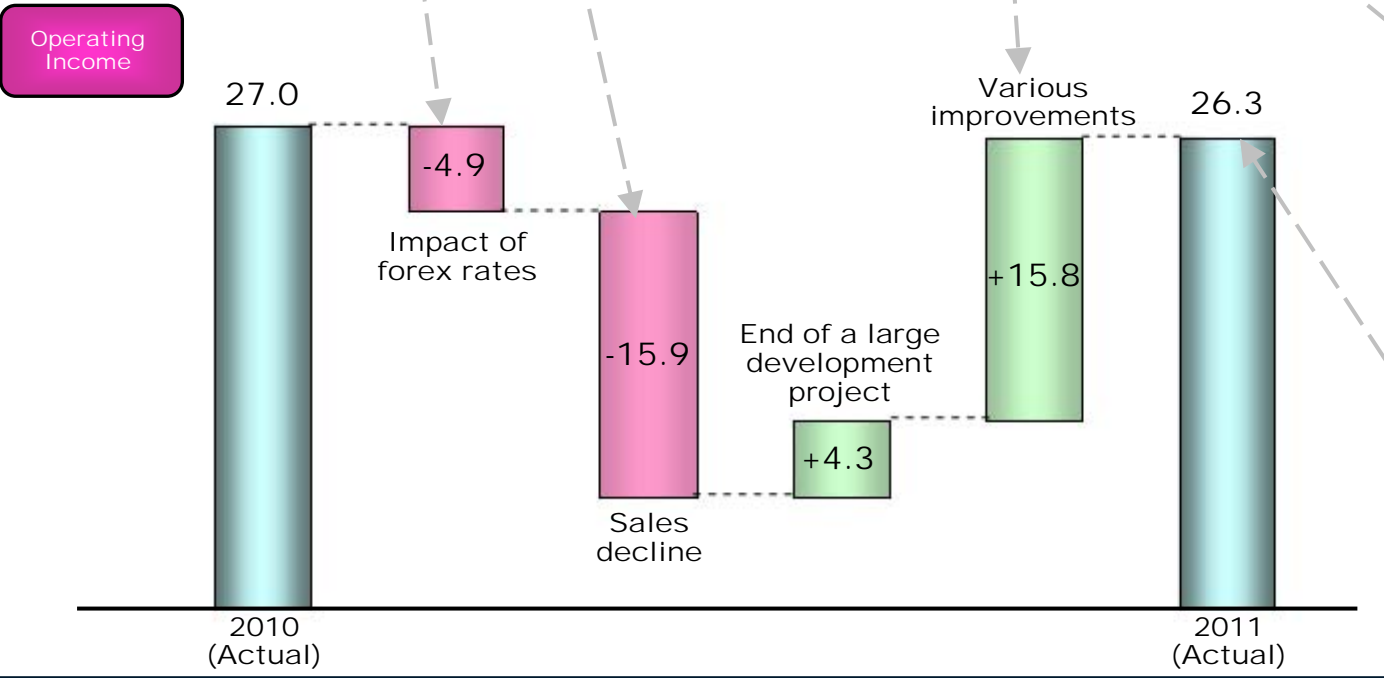
Orders Received

- ◆ Received orders for large projects
 - Chemical plant for Malaysia
 - Metals machinery for India
 - Compressor for an offshore LNG Plant
- ◆ Projects for medium- and large-scale transportation systems put off to FY 2012



Net Sales

- ◆ Constructions of specific large-scale projects, such as chemical plants and transportation systems, hit their peak, and sales fell.



Operating Income

- ◆ The massive drop in sales and the impact of the yen appreciation were offset by increasing profitability of the product business.

2. Business Policy for Achieving FY 2012 Business Plan

* Figures include those related to the environmental and chemical plant projects currently being managed by Engineering Headquarters.

Orders Received



Business structural reforms improved profitability.

Completing the structural reform of the business

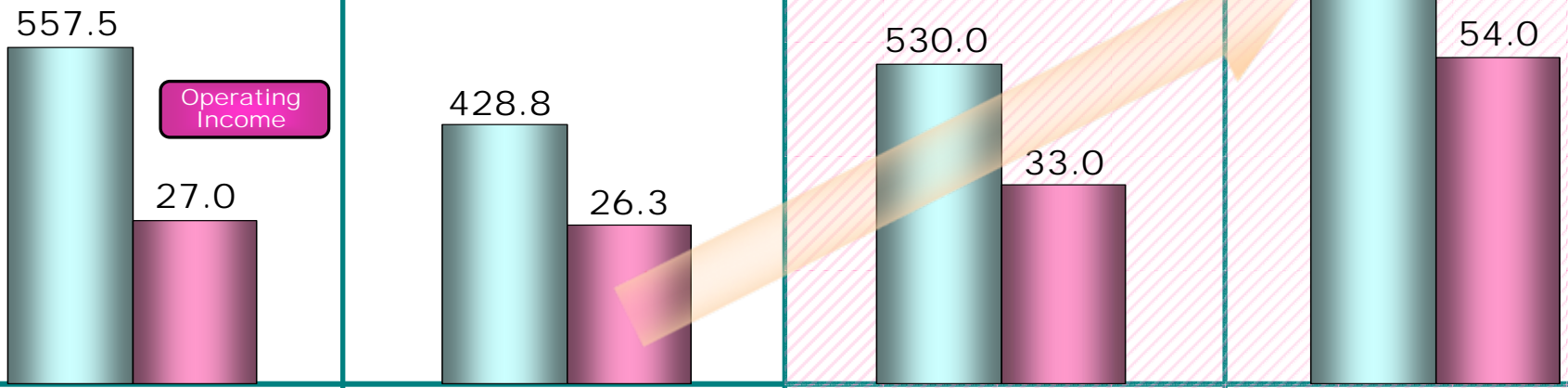
- Structural reforms of transportation, machinery, and environmental and chemical plant operations
- Profitability attained in printing & packaging machinery operations

Implementation and acceleration of growth process for business expansion

- Business domain expansion: Expand into upstream and downstream businesses
- Global expansion: Focusing on China, India, SE Asia and the Americas
- Increase in product competitiveness: Increasing earning capacity of existing products and development of next-generation products

Net Sales

Operating Income



2010 (Actual)

2011 (Actual)

2012 (Target)

2014 (Target)

Reform Process → finished 2011

Implementation & Acceleration of Growth Process

3. Progress of the Business Structural Reforms

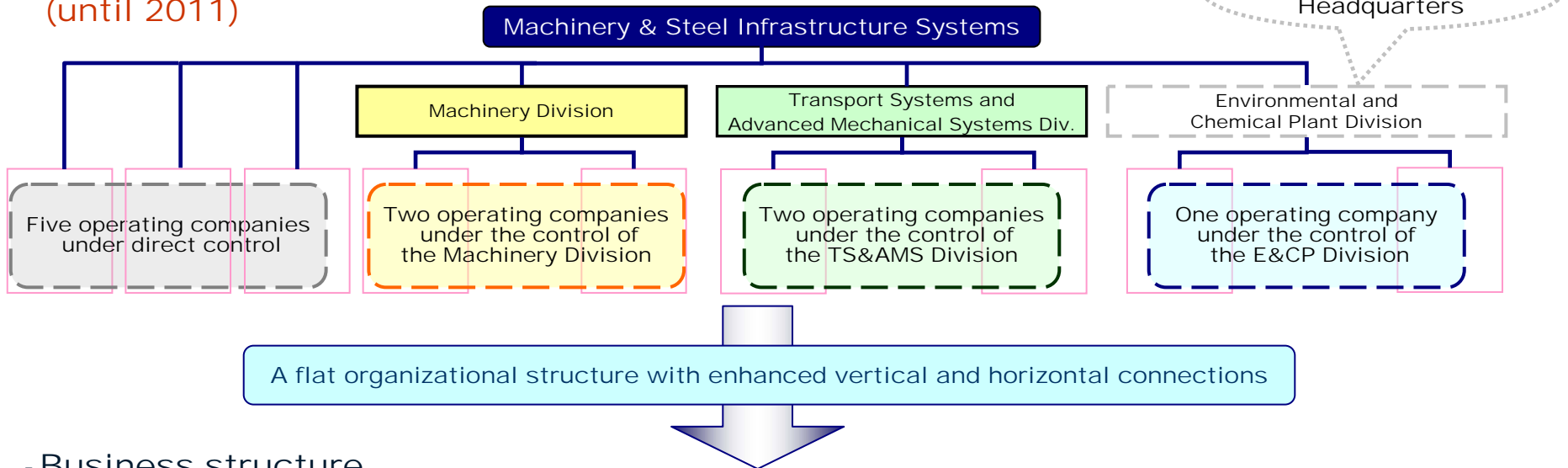
(1) Business structural reforms in FY 2011

Product/Business	Reform Description (Date of Completion)	Effect
Machinery & manufacturing	Restructuring of machinery operations in Hiroshima district (Apr. 2012)	Flat management of bases Comprehensive streamlining
Transportation infrastructure	Restructuring of the Transportation Systems Division (Apr. 2012)	Synergy in transportation systems and ITS
Advanced mechanical systems	Establishment of the Advanced Mechanical Systems Dept. (Apr. 2012)	Synergy in integration of advanced technology
Printing & Packaging machinery	Sound progress in business reconstruction measures (Mar. 2012)	Attained profitability in FY 2011
Environmental & chemical plants	Transfer of environmental and chemical plants to Engineering Headquarters (Jan. 2012)	Synergy in engineering projects
General	Integrated organizational management of processing functions (Apr. 2012)	Effective processing of personnel and acceleration of overseas expansion

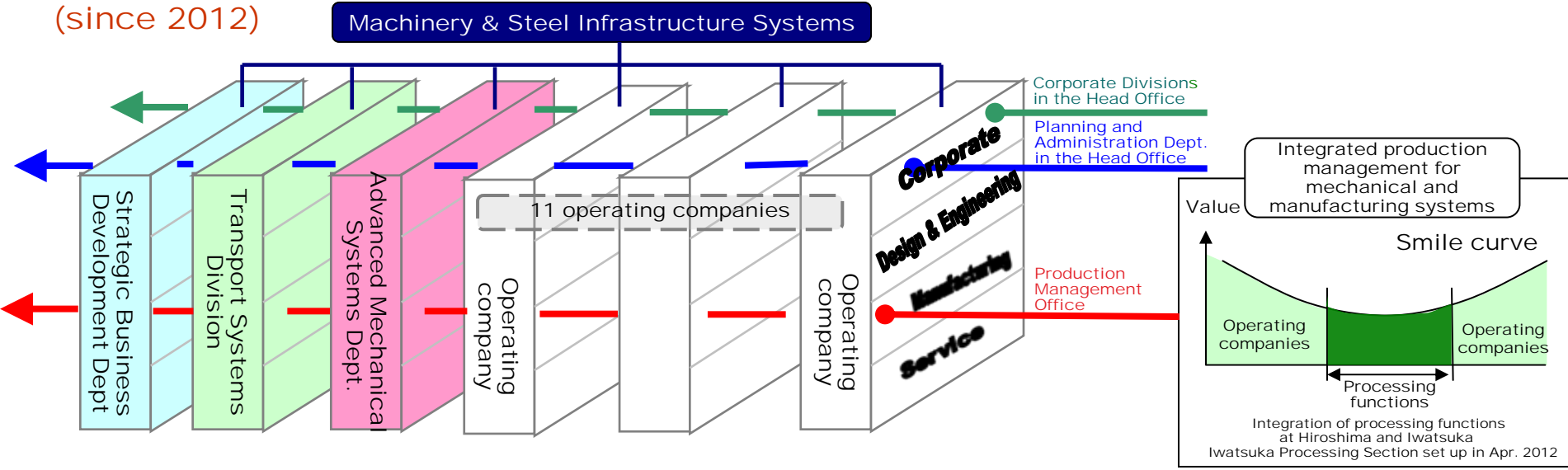
Completion of the Reform Process

3. Progress of the Business Structural Reforms (2) Structural approach to cutting fixed costs

- Business structure (until 2011)



- Business structure (since 2012)



4. Implementation of the Growth Process

(1) Expanding the business domain

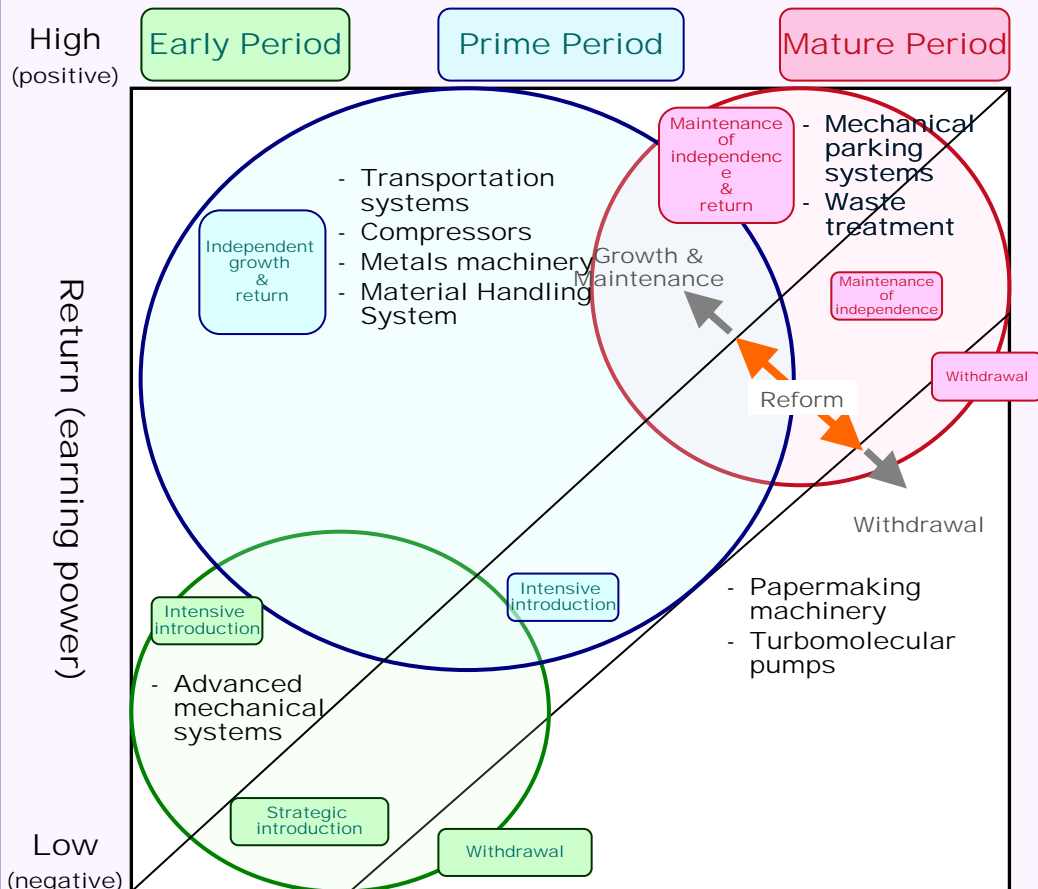
Priority domains	Product and business concerned	Circumstances behind business domain expansion
Machinery and manufacturing	Metals machinery	<ul style="list-style-type: none"> - Growing crude steel production in Asia and Latin America - Progress in the shift to electric furnaces in the upstream process of steelmaking
	Rubber tire machinery	<ul style="list-style-type: none"> - Expansion of automobile industry in emerging economies - Increasing production of large construction machinery after growth of resources industry
	Compressors	<ul style="list-style-type: none"> - Expansion of the natural gas market (offshore LNG and FPSO) - Increasing production of shale gas in North America
Transportation infrastructure	Transportation systems	<ul style="list-style-type: none"> - Growing demand for transportation and social infrastructures in emerging countries - Trend of the privatization of operations and maintenance (outsourcing)
Social infrastructure	Waste Treatment	

Expand business domains
for core products in machinery and manufacturing
and for transportation systems

4. Implementation of the Growth Process

(2) Rebuilding the product and business portfolio

Positioning in the strategic business evaluation program (provisional)



Promising and mainstay products

- Maintain continuous growth by intensively investing in development and overseas expansion

- Transportation systems
- Compressors
- Metals machinery
- Material handling System

Mature products

- Introduce low-end equipment matched to needs in Asia and emerging countries

- Mechanical parking systems
- Waste treatment

Next-generation products

- Speed up commercialization and market introduction of superior technologies

- Advanced mechanical systems

Rebuild the product and business portfolio to speed up the growth process.

4. Implementation of the Growth Process

(3) Growth strategy for mainstay businesses

(i) Transportation (Transportation systems)

Business environment

◆ Transportation systems

[Current business environment]

- EPC transportation business market scale:
→ 800 billion yen.
- The markets that can be captured by MHI
→ 450 billion yen, mainly in the Middle East and Asia.

(Full automatic unmanned operation systems: 150 billion yen,
Manned operation systems: 300 billion yen)

[Competition]

- The big three (i.e., Bombardier, Siemens and Alstom) and MHI are major players in the EPC transportation market.

→ Chinese and Korean companies, Japanese EPC specialized firms and rolling stock manufacturers are emerging.

[Trend in customers]

- Large number of projects planned, mainly in Asia and the Middle East.
- Urban transportation projects in SE Asia are anticipated in the near future.



Dubai Metro: Full operation since Sep. 2011

[Orders received in FY 2011]

- Yen loan projects in SE Asia have been delayed and put off to this fiscal year or later.
- Engineering / manufacturing of *Yurikamome* and the Macau LRT has commenced.
(Orders for them were received in FY 2010.)



Yurikamome rolling stock: 108 APMs to be delivered

Approaches for growth

◆ Increase in product competitiveness

- (a) Strengthen the core competence of signal and control systems.
- Aim to be a general integrator of the transportation business (To cover Control systems, EPC, testing, and operation & maintenance.)



Test tracks at Mihara Machinery Works



Operation Control Center

- (b) Reduce weight and size using enhanced APM production methods.

Existing APM: *Crystal Mover*



New APM: *Urbanismo*



Succeed in increasing efficiency and lowering the APM price

◆ Business domain expansion

- Reinforce the foundation for the operation & maintenance business.
- Achieve earning stability.



CMS: A US-based O&M company established in 2009

4. Implementation of the Growth Process

(3) Growth strategy for mainstay businesses

(ii) Compressors

Business environment

[Current business environment]

- Market scale: approx. 650 billion yen (as of FY 2011.)
- Growth expected at 4% to 5% a year in the medium and long term

Small and medium gas well development is gathering momentum off the coasts of Brazil and Australia.

→ Demand in the Natural gas sector (LNG, FPSO)

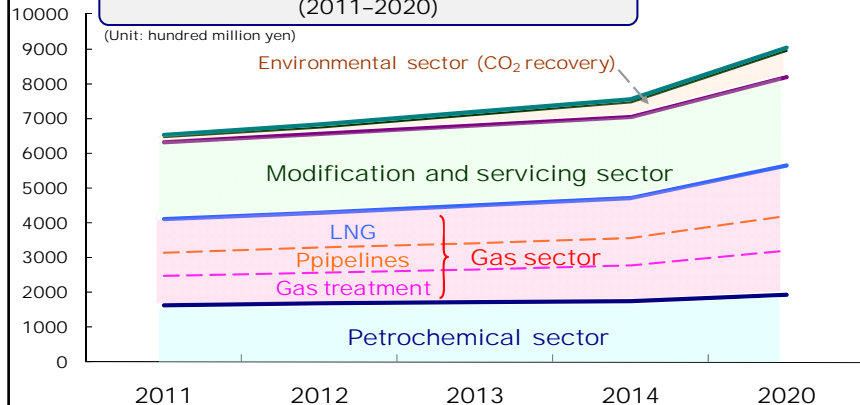
Shale gas development plans are expanding in North America.

→ Increase of petrochemical products (ethylene and propylene)

[Competition]

- MHI is in the second group after the leading group (ie. GE, Siemens, Dresser-Rand and MAN T&D).
- MHI holds the largest market share in the petrochemical field (for ethylene and others).

Trend in Market Scale by Business Sector (2011-2020)



[Trend in customers]

- Following new gas field development and increased production of shale gas, customers are eager to invest in upstream and downstream processes.
- Progress has been made in FEED and Pre-FEED.

Approaches for growth

◆ Business domain expansion

- Move toward Natural gas sector
- An enterprise framework agreement (EFA) on compressors for LNG plants was signed with Shell in May 2011.



Offshore LNG plant (conceptual)

Definitively entering into the growing natural gas domain

- Move toward shale gas sector
- Emerging of Ethane-cracking plants in North America.



Compressor for ethylene plant

→ Business expansion chiefly in applications for ethylene, in which MHI has an advantage

◆ Global expansion

- Brazil: Set up and reinforce local production bases
→ FPSO for Petrobras and downstream projects
- Middle East: Use MCOSA (after-service base in Saudi Arabia), as a base for expanding the service business.
→ Build closer ties with National oil companies.
- N. America: Increase sales and after-sales service locations.

Endeavor to increase business scale to 100 billion yen and to become one of the top three market players in the medium term.

4. Implementation of the Growth Process

(3) Growth strategy for mainstay businesses

(iii) Metals machinery

Business environment

[Current business environment]

- Market scale: 320 billion yen* (as of FY 2011)
 ⇒ In the medium and long terms : 400 billion~500 billion yen*.
- The total market scale of steelmaking machinery is about 1.6 to 1.9 trillion yen.
- Market scale continues to expand with the increase in crude steel production.

[Competition]

- MHI held the top market share in the steel plate market in FY 2011.
- The market is highly oligopolistic, with the top five companies holding a market share of around 70%. Competitors are based in Europe (Germany, Austria, etc.).

* MHI's market share position by product in FY 2011



2nd in hot rolling



1st in cold rolling



2nd to 3rd in continuous acid pickling

[Trend in customers]

- Capital investment is brisk in emerging markets, such as India and Brazil.
- Electric furnaces customers have accelerated their entry into the sheet market.

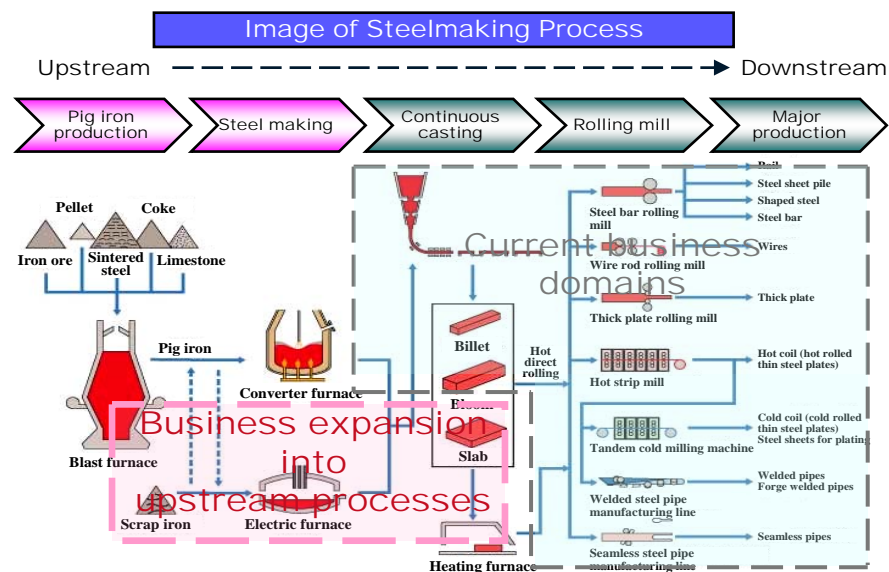
Approaches for growth

◆ Global expansion

- India: Collaboration with leading local firms in upstream processes.
- Brazil: Discover and work with local manufacturing partners to establish local production systems.
- China: Continue to boost cost competitiveness with Changzhou Baoling Heavy & Industrial Machinery Co., Ltd.

◆ Business domain expansion

- Develop new technologies to enter the upstream domain of steelmaking.
- Propose a package with MHI's strong rolling system to emerging market.



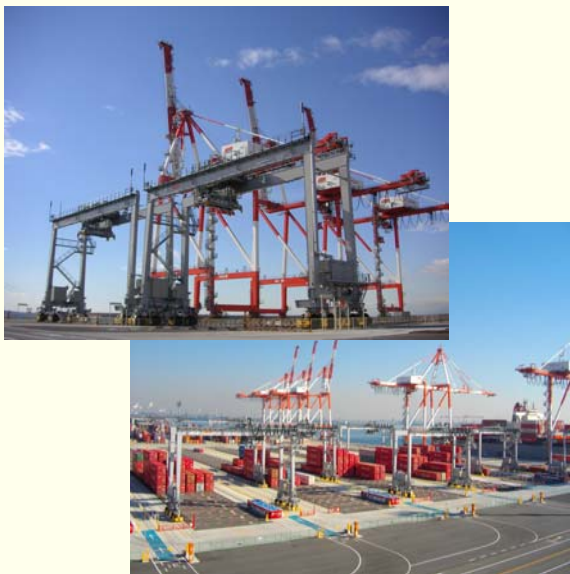
4. Implementation of the Growth Process

(4) Growth strategy for mature businesses and others

Initiatives on Asian and emerging markets

- Growing demand in Asia and emerging economies
- Introduce products matched to the needs in different countries.

Material Handling System
Market: 350 billion yen



Demand growth in India, Southeast Asia, etc.

↓

Comprehensive cost cuts through overseas production

Rubber Tire Machinery
Market: 150 billion yen

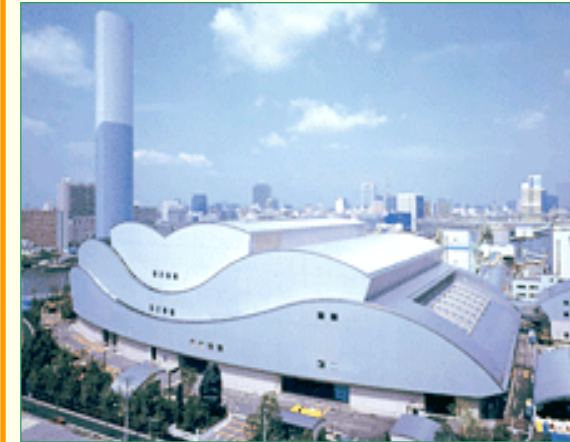


Response to growing car demand

↓

Introduction of low-end Curing press
Local production in India

Waste Treatment
Market: 200 billion yen



Demand growth in China, SE Asia and Eastern Europe

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Value chains Shift to overseas
Global Expansion in O&M Business

4. Implementation of the Growth Process

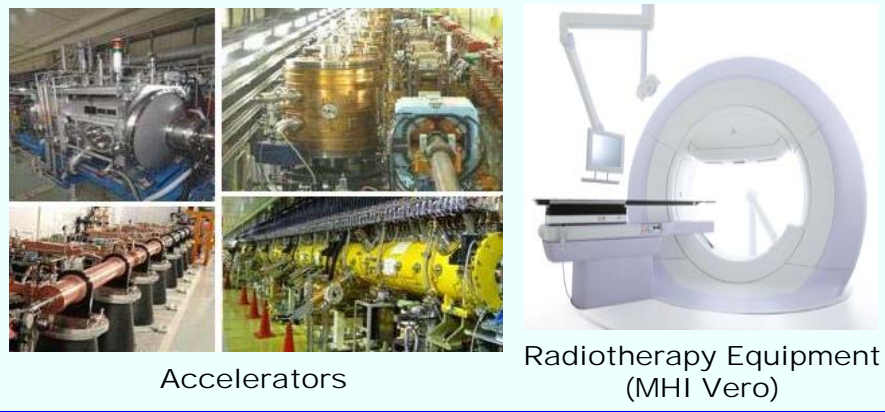
(5) Growth strategy for next-generation product businesses

Development of next-generation products

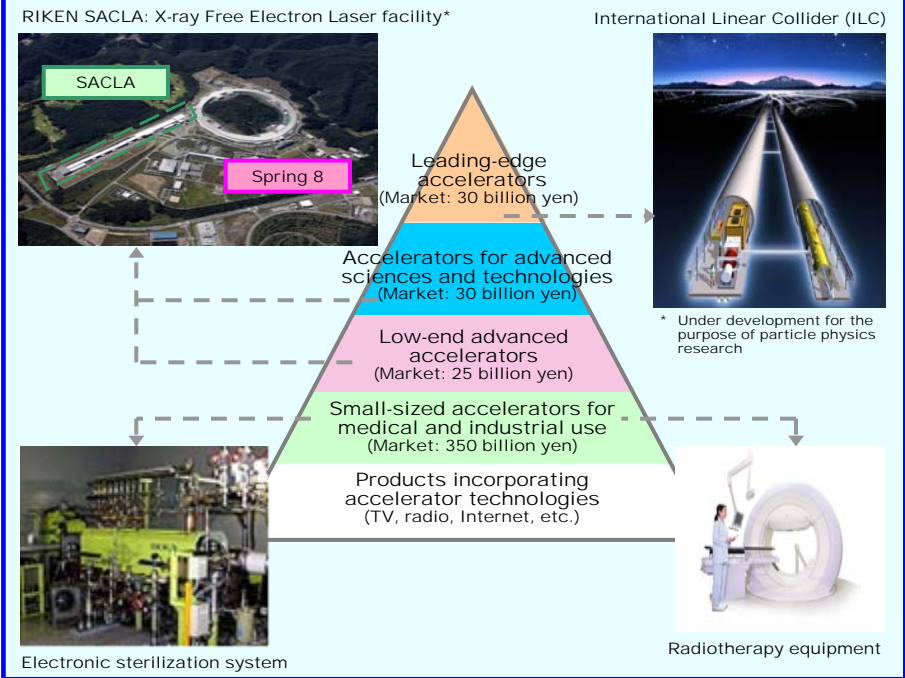
Establishment of "Advanced Mechanical Systems Dept." (Apr. 2012)

- Assembled advanced technologies (accelerator technologies) scattered across different organizations.
- ⇒ to speed up the development of advanced products

Major products



Accelerator markets and MHI's products



Actively utilize the new organization to increase competitiveness in existing business domains.

+

Evolve from a system vendor into an integrator to take part in medium and large-scale projects.

4. Implementation of the Growth Process

(6) Global expansion

(i) Basic measures for global expansion

Strengthen regional strategies (in priority regions)

● China

- Increase collaboration in the local production of machinery and manufacturing systems products

Steelmaking machinery:
Changzhou Baoling Heavy & Industrial Machinery Co., Ltd.

Compressors:
Hangzhou Steam Turbine & Power Group Co., Ltd. (technology licensing)

Rubber tire machinery:
Mitsubishi Heavy Industries (Changshu) Machinery Co., Ltd.

● SE Asia and India

- Expand engineering and sales activities using the base in Singapore.
- Smoothly launch and develop the low-cost production base in India.

Engineering: MIES (Singapore)
Conveyance systems:
Anupam-MHI Industries, a JV company (India)

● N. America & Latin America (Brazil)

- Strengthen the managing systems and promotion in the Americas.
- Expand local production. Locally produce compressors in Brazil.

Expanding the activities of Manufacturing Management & Coordination Department

● Role of Manufacturing Management & Coordination Department

- Manage production status visualization and the optimization of resources inside and outside the Machinery & Steel Infrastructure Systems
- Promote expansion of overseas production



Strive to achieve integrated management of manufacturing systems in Japan and overseas

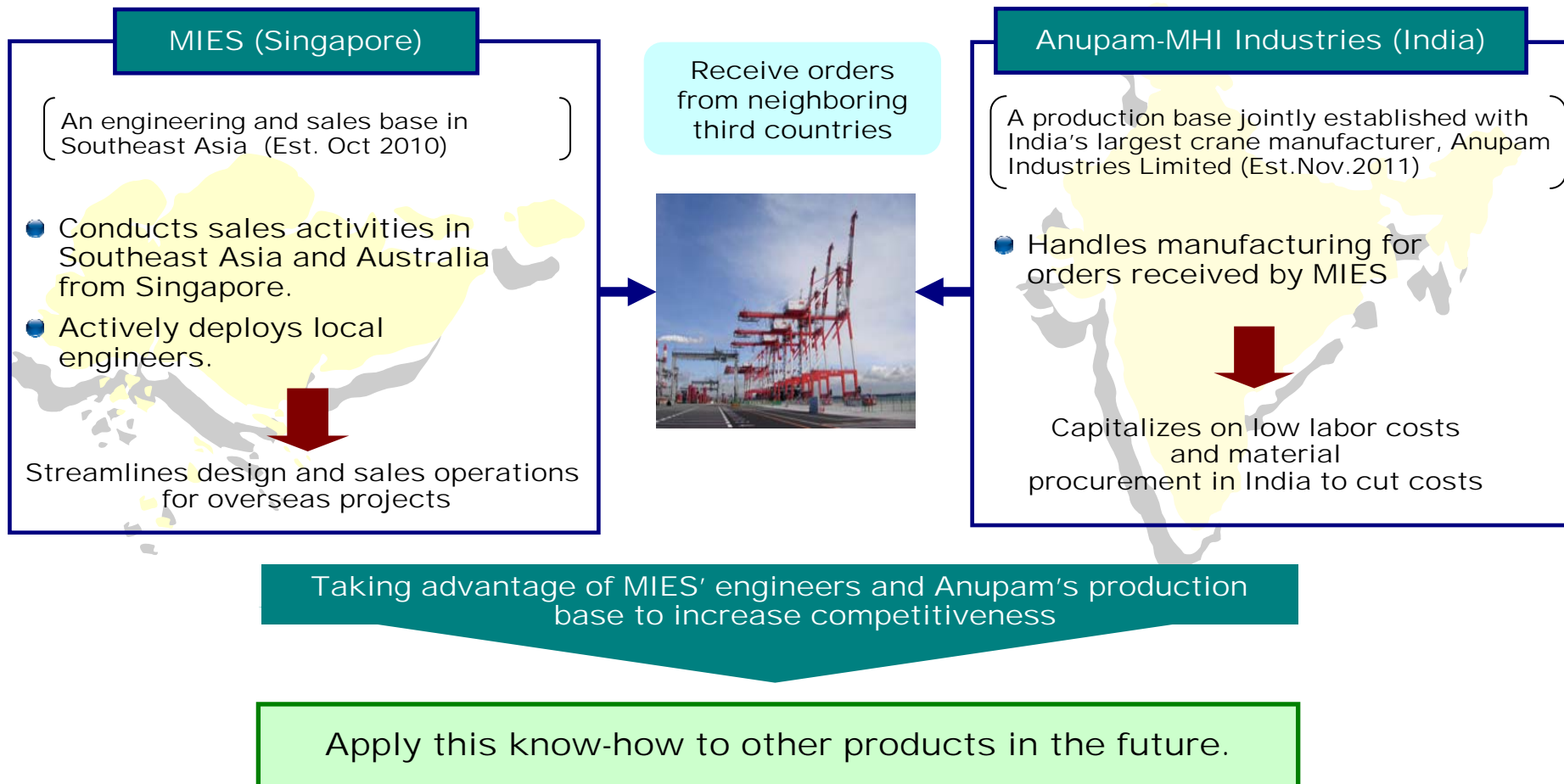


Mitsubishi Heavy Industries (Changshu) Machinery Co., Ltd.

4. Implementation of the Growth Process (6) Global expansion

(ii) Results of global expansion

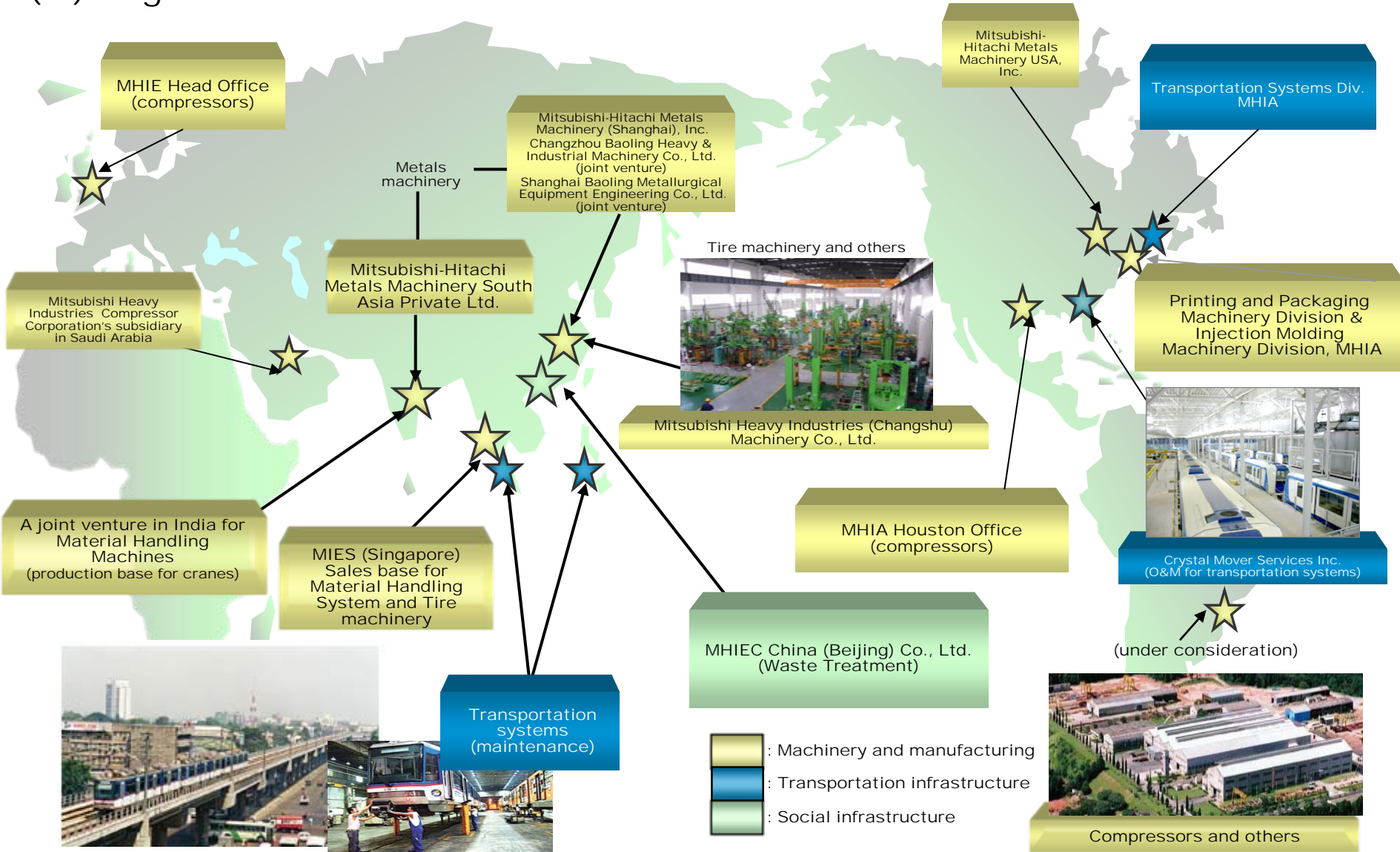
- Creating synergy by connecting multiple overseas bases: ~Case of Material handling system~



4. Implementation of the Growth Process

(6) Global expansion

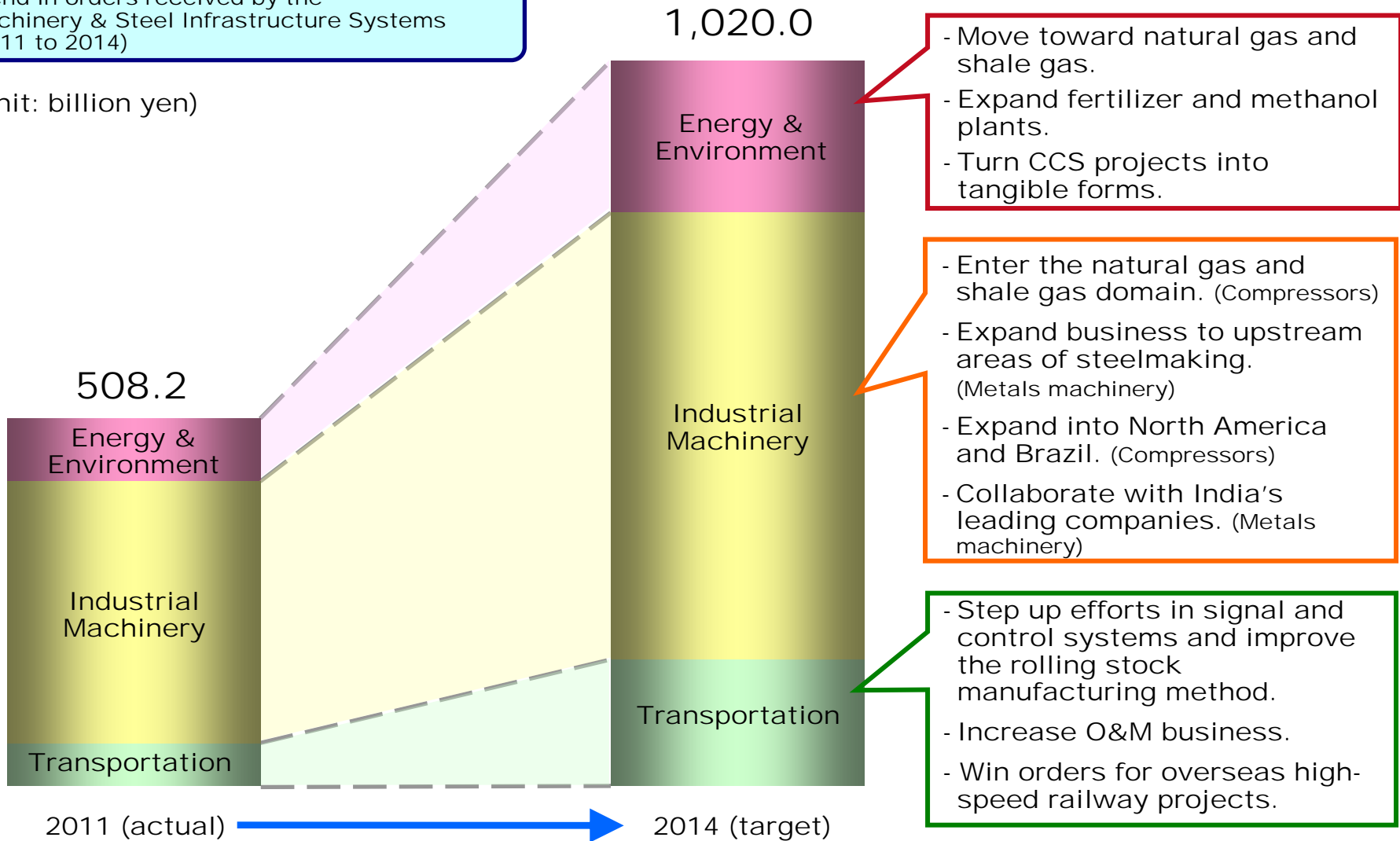
(iii) Regional bases



5. Summary

Trend in orders received by the Machinery & Steel Infrastructure Systems (2011 to 2014)

(Unit: billion yen)



Enhance product competitiveness in each of the three domains and strive towards business expansion



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