

Air-Conditioning & Refrigeration Systems Business Operation

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MITSUBISHI HEAVY INDUSTRIES, LTD.

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- 1. Product Overview of
Air-Conditioning & Refrigeration System
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- 5. Special Measures Taken**
- 6. Growth Strategies for
Air-Conditioning & Refrigeration Systems Business**
- 7. Growth Strategies by Product**

1. Product Overview

* Both net sales and percentage of domestic/overseas sales are based on FY2008 results (consolidated basis)

Air Conditioning Equipment (PAC/RAC)

PAC

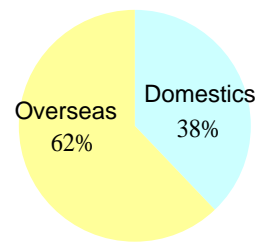


RAC



Global market size in 2008:
Approx. ¥10 trillion

Percentage of Domestic/Overseas Sales



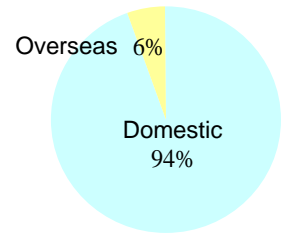
Make to Forecast Items

Centrifugal Chiller (CC)



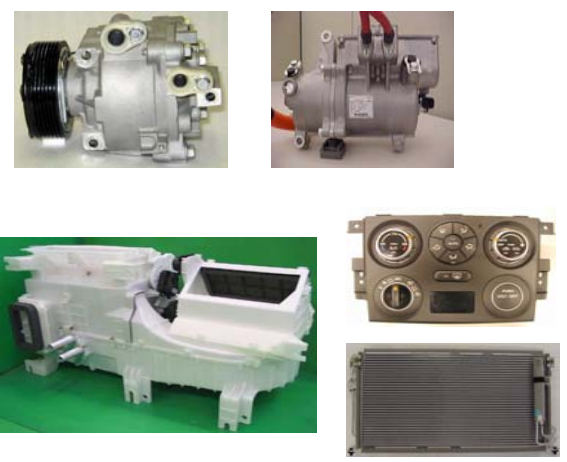
Global market size in 2008:
Approx. ¥0.2 trillion

Percentage of Domestic/Overseas Sales



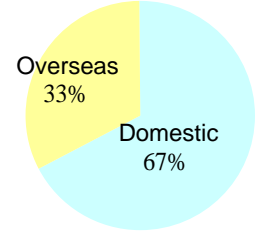
Made to Order Goods

Automotive thermal systems (ATS)



Global market size in 2008:
Approx. ¥3 trillion

Percentage of Domestic/Overseas Sales



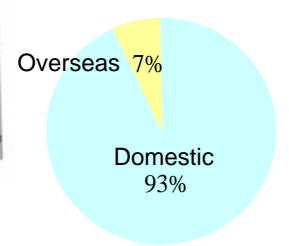
Made to Order Goods

Transport Refrigeration Units (TRU)



Global market size in 2008:
Approx. ¥0.2 trillion

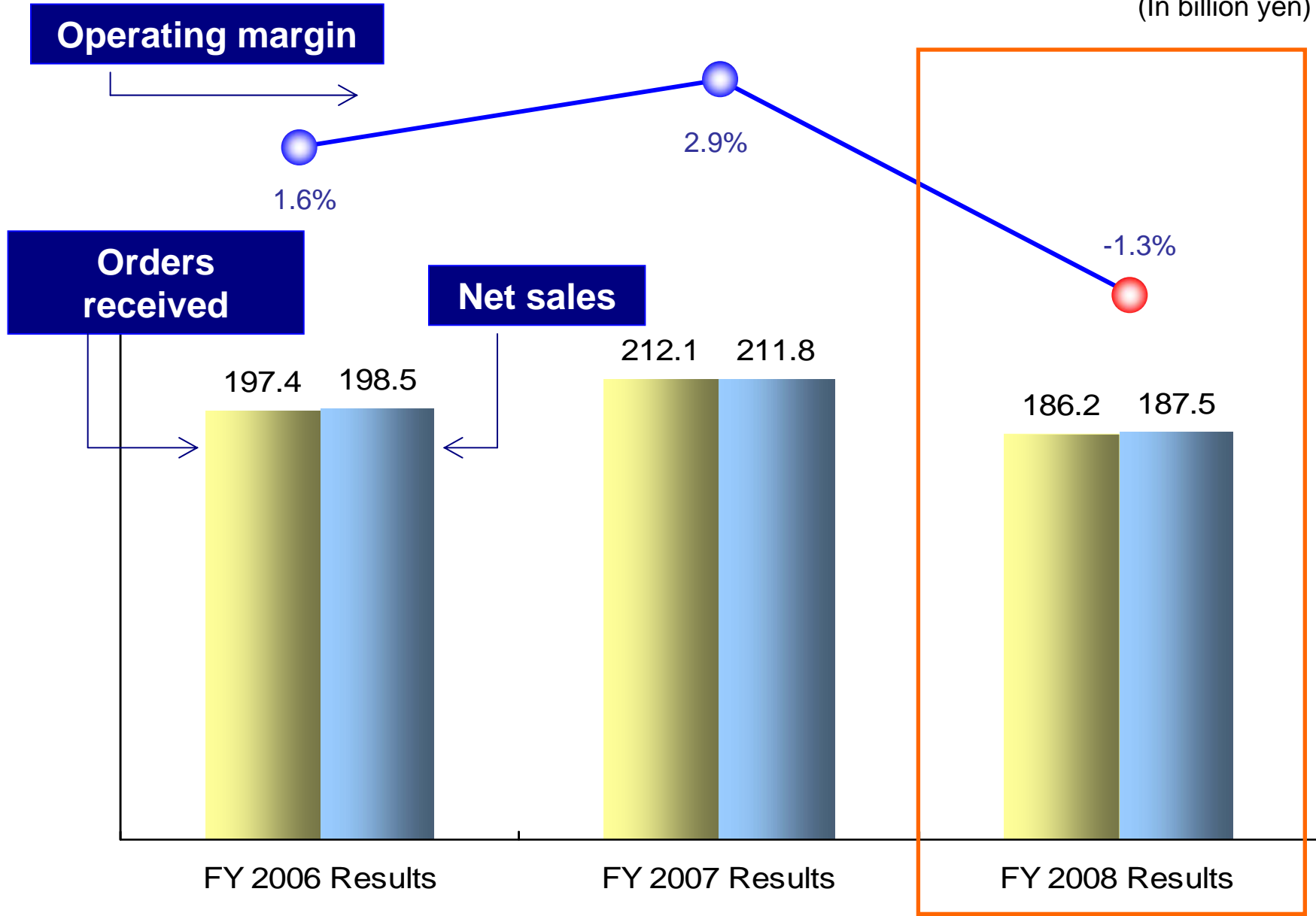
Percentage of Domestic/Overseas Sales



Make to Forecast Items

2. Business Summary for FY 2008

(In billion yen)

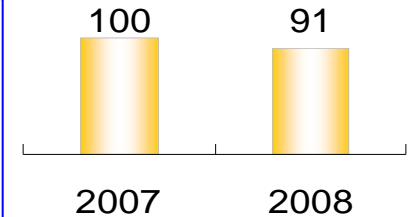


3. Operating Conditions by Business Segment

PAC/RAC

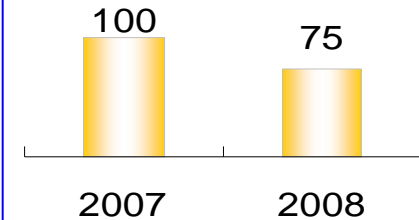
- ◇ Sales of multi-indoor type variable refrigerant flow air conditioners was relatively firm overseas, despite abnormal weather in Europe and a subsequent decline in demand as recession hit
- ◇ In Japan, sales fell on weaker demand resulting from reduced investment and a fall in construction starts, etc.

Sales index based on 2007=100 (Results)



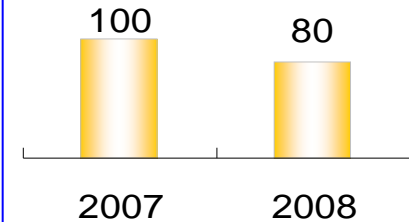
ATS

- ◇ Sales declined significantly, reflecting sharp production cuts by customers in Japan and overseas following the global recession starting last fall



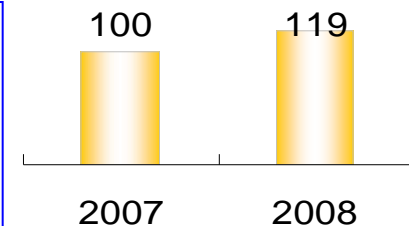
TRU

- ◇ Both domestic and overseas sales were below the year-ago levels, reflecting a decline in aggregate demand for four consecutive years in Japan due to buying restraint associated with the weak economy and the new emission control for trucks (to be enforced from October 2009), along with a considerable downturn in demand in the European market

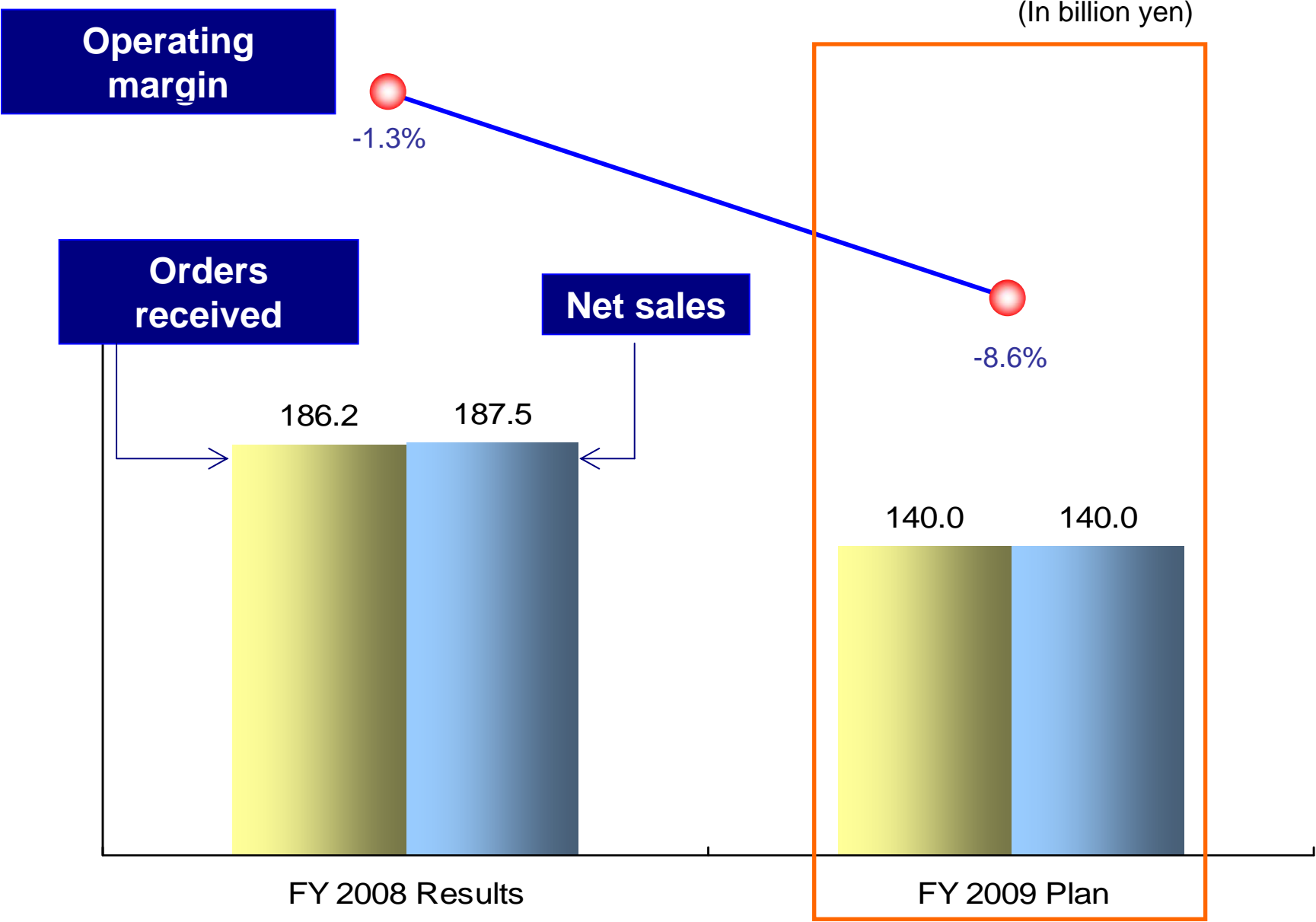


CC

- ◇ In Japan, sales climbed significantly from the previous year, thanks to robust capital investment by IT, semiconductor, and consumer electronics manufacturers up to last year and aggressive store openings of commercial complexes. Overseas sales fell short of the year-ago level, reflecting the absence of large projects.



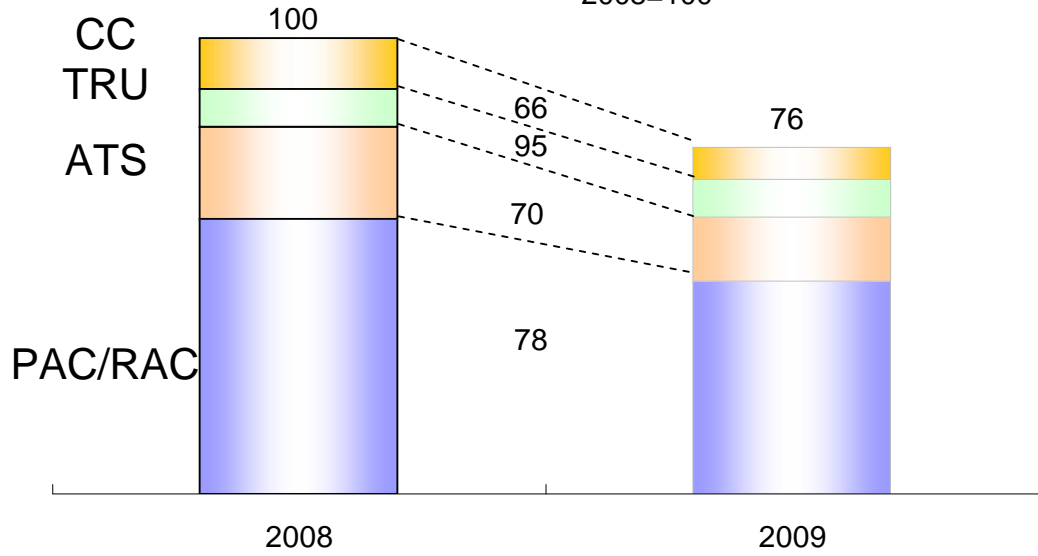
4. Forecasts for FY 2009 (1)



4. Forecasts for FY 2009 (2)

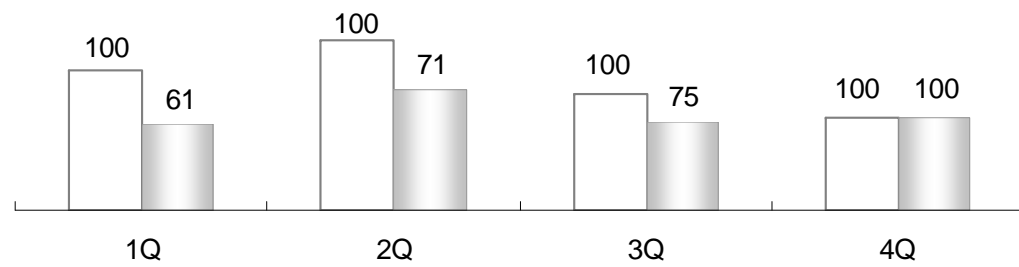
Forecast consolidated net sales of Air-Conditioning & Refrigeration Systems Headquarters in FY 2009

Expected sales index based on 2008=100



- ◇ PAC/RAC
 - Overseas market conditions have not shown improvement yet.
 - Sales of multi-type air conditioners are relatively firm.
 - In Japan, sales are expected to decline year on year, reflecting the effect of the economic recession.
- ◇ ATS
 - The future of automobile production is still uncertain, and a rapid recovery in the immediate future is unlikely.
- ◇ TRU
 - A recovery in demand is expected in the second half of 2009 due to the enforcement of the new emission control for trucks from October 2009.
- ◇ CC
 - Aggregate demand is expected to decline significantly, because of a sharp contraction in domestic capital investment.

Expected sales index by quarter based on 2008=100



- ◇ Full-year forecast
 - With the future recovery of the global economy uncertain, sales are expected to drop below the year-ago level up to the third quarter.
 - Sales in the fourth quarter are likely to be almost flat year on year.

5. Special Measures Taken (1) Countermeasures in Operation and Innovation in Manufacturing

Countermeasures in Operation

- Temporary production halt at an operation in the United States (MCC)
 - Due to sharp production fall of automobile production in North America, work load at a plant making automotive thermal systems in the United States has been dropped. Production of compressor is due to halt temporarily.
 - Engineering Sales and Marketing, distribution and services are continued at MCC.



MCC:
Mitsubishi Heavy Industries Climate Control Inc.

- Adjustment of production lines at domestic plants
 - Operation adjustment commenced in December 2008, reflecting sharp production cuts by automakers globally.
 - Measures being adopted include the change of two shifts to a single shift, a planned suspension by production line, and the temporary relocation of work force to other plants.



Matsuzaka Plant

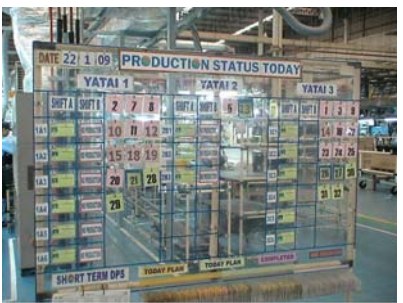
Innovation in Manufacturing

- Improvement activities at MACO (Thailand)
 - Taking steps to reduce product inventories to zero by shifting from “make-to-stock production” to “made-to-order production” by introducing the Yatai system to promptly respond to orders from customers
 - Shortening the production lead time, reducing work-in-progress, and improving productivity by synchronizing production and the pull approach
 - Implementing timely decision making through the visualization of product inventories, parts inventories and production progress, etc.
 - Making continuous improvements through mechanisms anyone can understand, such as “within hands reach” and “downsizing space” as well as handmade Yatai

MACO
Mitsubishi Heavy Industries-Mahajak Air Conditioners Co., Ltd.



Wall assembly Yatai and plastic Yatai (nearing at hand, downsizing space)



Work progress management board (Visualization)



MACO



Plastic Yatai and assembly (Synchronization)



Outdoor unit assembly Yatai (Single cubicle production)

5. Special Measures Taken (2) Sales Expansion

Solutions

- Our aim is to increase the downstream business through sales of systems rather than equipment alone, by making system proposals of air conditioning equipment for offices and plants, etc. en bloc, to respond to diverse customer needs from environmental conservation to energy saving.
- MHI plans to operate its own business, which is not provided by competitors in Europe, through marketing activities that combine commercial air conditioning equipment (PAC) and centrifugal liquid chillers (CALC)



TRU

- The lineup of the new direct driven type units S Series (for small and large trucks), launched in 2008, has been completed.
- We seek to stimulate demand of products for new trucks complied with the new emission control with a strategy of achieving high environmental effects such as improved fuel consumption and energy saving by adopting the world's first scroll compressor.



Service Support

- MHI is focusing on expanding the service business, centering on centrifugal chiller.
- We are taking steps to increase positive effects, such as higher customer satisfaction and the uptake of renewal projects in all products, by bolstering the stock business even as the flow business contracts.

- ◇ CC
 - Long-term maintenance contract
 - Remote monitoring system
 - Expanding manufacturer direct services
- ◇ PAC/RAC
 - Diamond Support Club
 - Renewal works
- ◇ TRU
 - Developing the cart system
 - Enhancement of service bases

Residential Air Conditioners

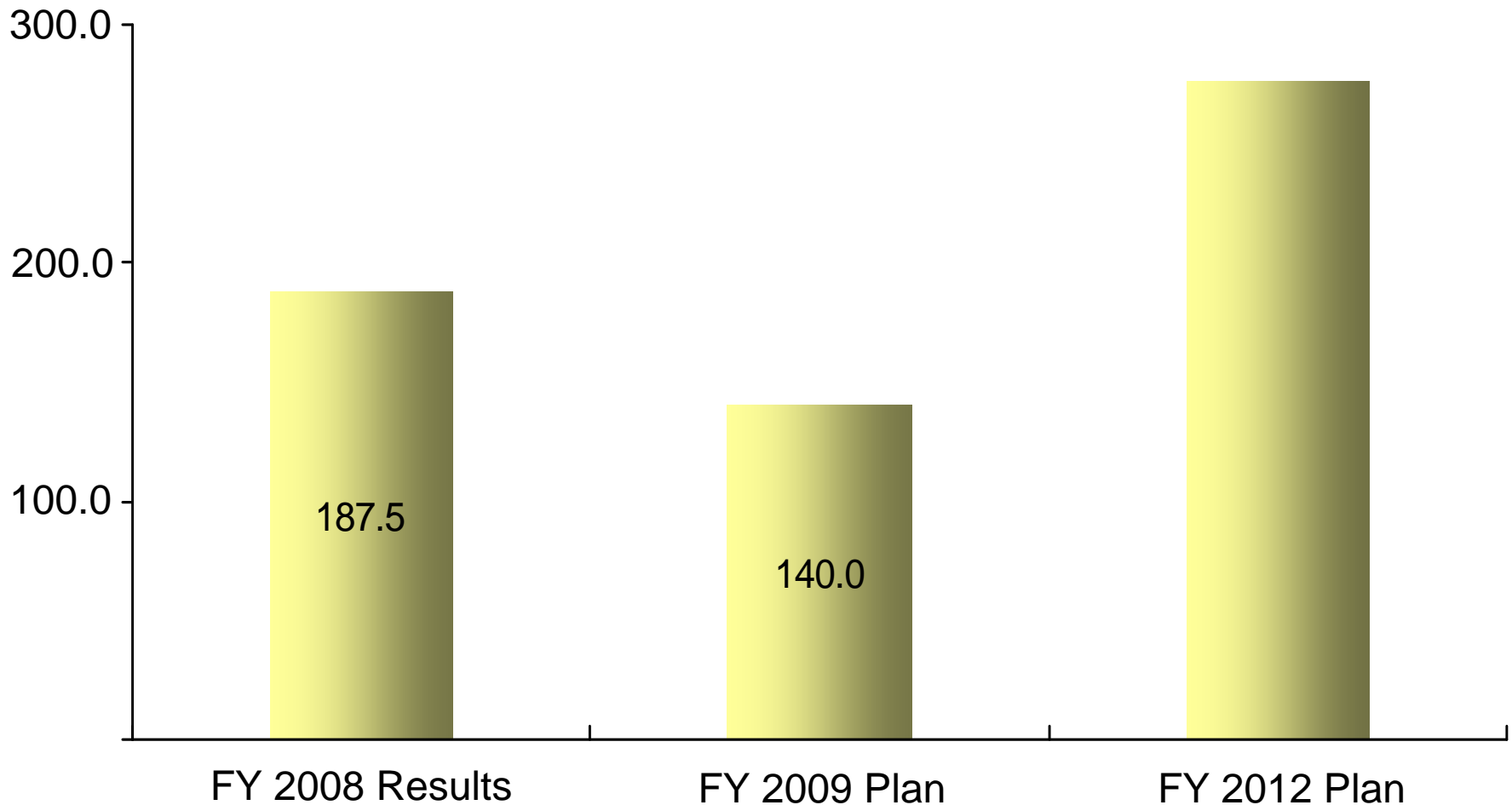
- All models of Beaver air conditioner "R" and "T" Series, which have been selling well since February 2009, are subject to the Eco Point.
- MHI aims to expand sales even under difficult market conditions with the high-performance and reasonable prices that only MHI can offer.



6. Growth Strategies for Air-Conditioning & Refrigeration Systems Business (1)

Target Business Scale in the Future

(In billion yen)



6. Growth Strategies for Air-Conditioning & Refrigeration Systems Business (2)

✧ Goals

PAC/RAC

- ✓ Becoming the global leader, with a broad array of products ranging from residential to industrial use air-conditioning machinery and centering on high value-added products (such as high-performance centrifugal chiller, heat pump hot water supply, multi-indoor variable refrigerant flow type air conditioners), leveraging the overall strength of MHI

CC

ATS

- ✓ Bolstering sales of high-performance compressors (3D scroll compressors, electric compressors), which deliver vehicle energy savings, to automakers worldwide

TRU

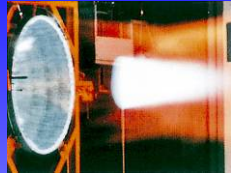
- ✓ Expanding overseas business with high-performance TRU (such as trailer units and 3D scroll compressor-mounted units)

6. Growth Strategies for Air-Conditioning & Refrigeration Systems Business (3)

Exercising the comprehensive power/integration power of MHI

Element technologies

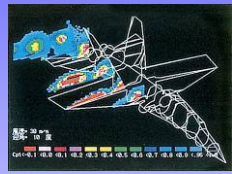
- Fluidic dynamics technology of aircraft and ships
- Heat transfer technology of gas turbines
- Control technology of rockets
- Air quality technology of environmental products



Jet engine combustion

Development process

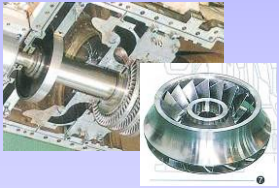
- Design support system developed by Technical Headquarters
- Concurrent engineering (DBT)



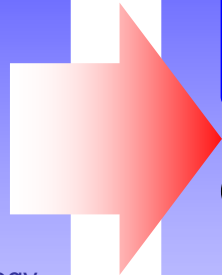
Air current visualization technology

Human resources/equipment/capital

- Five research and development centers in the Technical Headquarters
- Innovation in manufacturing (MD, SCM innovations, etc.)



Model gas turbine and high-performance impeller



PAC/RAC

- 3D scroll compressors
- Heat pump hot water supply systems




ATS

- 3D scroll compressors
- Electric compressors for EV and HEV automobiles



TRU

- 3D scroll compressors
- High-performance trailer units



CC

- High efficiency centrifugal chiller
- Heat pump centrifugal chiller
- Hot water heat pumps



✧ Expansion of improved efficiency and heat pump technology (PAC/RAC, CC)
 ✧ High-performance compressors and electric compressors (ATS, TRU)

7. Growth Strategies by Product (1)

PAC/RAC

◇ Global market

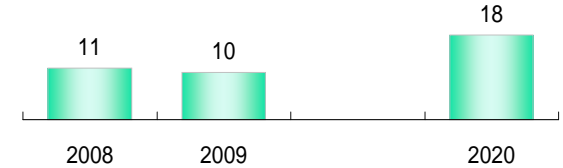
In the air conditioning industry, the global market is approximately ¥10 trillion, but is overall on slightly downward overall in the short term, mainly because of the economic recession. However, the underlying trend over the medium and long term is stronger, thanks to rising demand in emerging economies associated with economic development and the environmental movement.

◇ European market

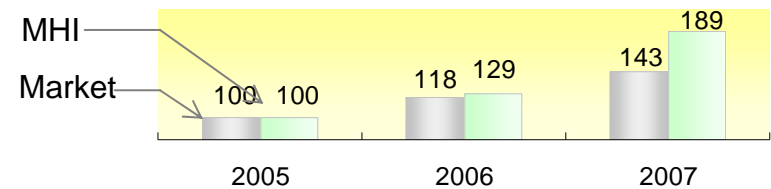
In 2007, operations in Europe expanded approximately 190% from the level in 2005.

Thanks to the distributor sales system, growth in sales of MHI in Europe outstripped those of competitors that use the direct sales system.

Global demand forecast (by MHI) In trillion yen



European market and sales index of MHI (2005=100)



Air-to-water heat pump market

The air-to-water heat pump market is expanding rapidly, particularly in Europe to reduce carbon dioxide emissions, shifting from the combustion heating to the high performance electric heat pump heating.

MHI will expand its business based on an alliance concluded in January 2009 with Swedish firm NIBE Industries, the second-largest European manufacturer of heating equipment.

Construction model of air-to-water heat pump hot water supply system



Heat pump unit for Europe

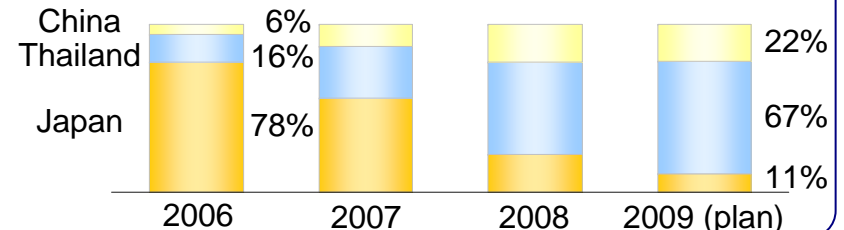


Global optimum production

Transferring RAC production in 2004 and PAC production in 2006, MHI has established a trilateral production system that encompasses China, Thailand and Japan.

As of January 2009, the ratio of MHI's investment in a compressor plant in Thailand had already been raised, from 32% to 58%.

(Ratio of PAC by production base)



Entering the expanding heat pump market with diligence

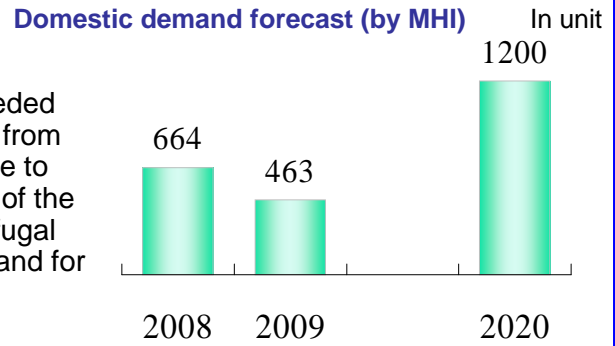
7. Growth Strategies by Product (2)

CC

◇ Domestic market

In 2006, MHI expanded its market for high-performance centrifugal chiller so that it exceeded the market for absorption chillers. This was thanks to the expansion of demand primarily from factories and commercial complexes, and also reflected a shift from absorption chiller due to the superiority of high-performance centrifugal chiller in energy saving and the reduction of the environmental burden (reduced carbon dioxide emissions). The disparity between centrifugal chiller and absorption chiller will continue to widen in the future, given the growth in demand for building air conditioning.

MHI has achieved a market share of approximately 60% on a capacity basis.



New centrifugal chiller products



Downsizing



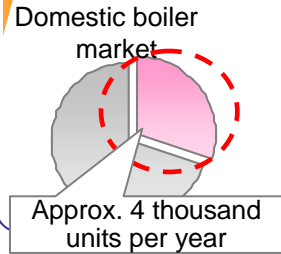
Responsive to heater



Hot water supply

Characteristics of hot water heat pumps

- Effective use of exhaust heat
- High efficiency by turbo compression system
- Steep cuts in carbon dioxide emissions and running costs compared to boilers



Approximately 30% of 12,000 units per year in the Japanese boiler market consists of potential customers who use hot water of less than 80°C using exhaust heat (Mainly steel, machinery and chemical plants, etc.)

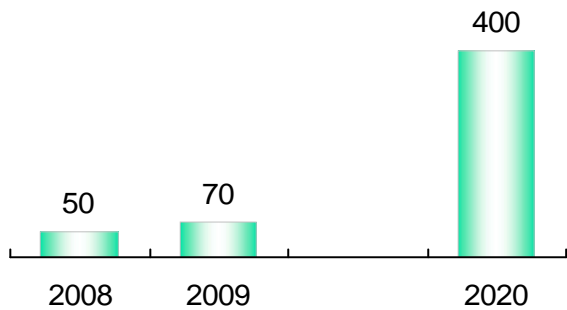
Reform of the energy consumption structure with centrifugal chiller

7. Growth Strategies by Product (3)

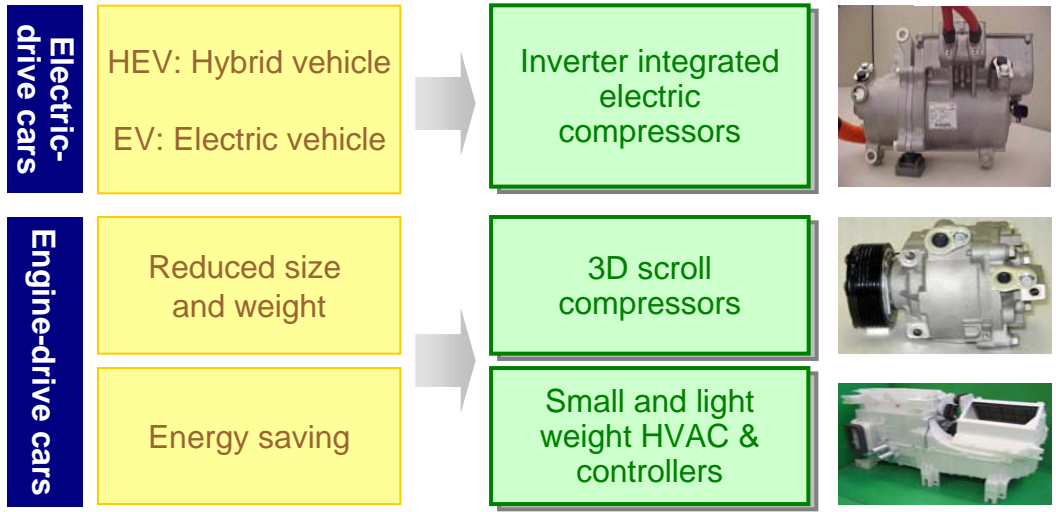
ATS

✧ Electric automotive thermal systems
 Hybrid vehicles and electric vehicles are promising markets that are expected to expand significantly over the next few years, driven by environmental concerns and government support through tax policy.
 With only two companies, including MHI, in the world possessing a track record of mass-producing electric automotive thermal systems, the products have large growth potential, and MHI is responding to a number of inquiries in Europe, China, North America and Japan in its global network.

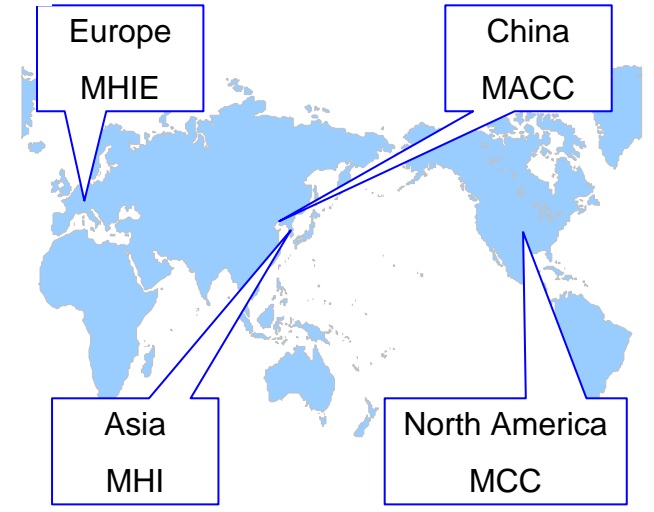
Global demand forecast for hybrid and electric vehicles (by MHI) In 10 thousand unit



MHI's response to automotive thermal system



Global network



Developing demand from new customers with electric compressors for eco cars (HEV, EV)

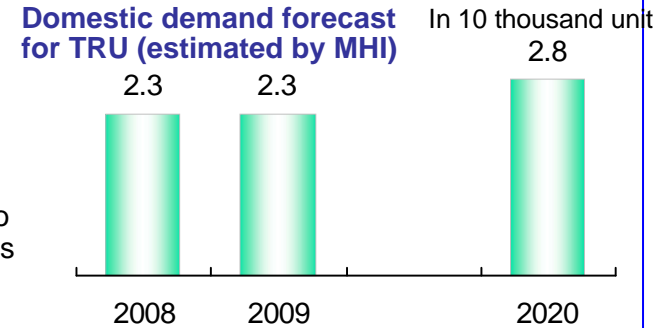
7. Growth Strategies by Product (4)

TRU

◇ Domestic market

Although the domestic market has remained flat in recent years, demand for refrigerated transport to maintain appropriate temperatures is rising, given stricter safety regulations on foods and improving dietary habits.

MHI has achieved a market share of approximately 50% on a capacity basis, thanks to high-performance direct driven type units on which the world's first scroll compressor is adopted, only one Japanese supplier of self-powered type units, and the industry-leading sales and service network of RCC, a domestic general distributor.

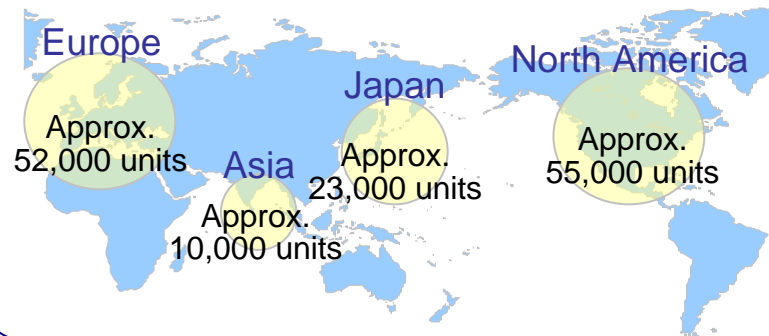


Global market of TRU

North America and Europe are the world's largest markets with a heavy weighting on trailer units.

The market is set to expand in China and Asia in the future, given the development of the cold chain resulting from improved living standards.

Global demand for TRU (estimated by MHI)



Overseas operations of TRU

In the TRU business, where the domestic market is mature, MHI aims to become the world's third largest manufacturer by accelerating overseas operations and introducing new trailer units in the Chinese and Asian markets, which MHI has already entered, as well as Europe and Middle East, where MHI stepped up its efforts starting last year.



World's greatest efficiency realized (+15% compared with competitors)

◇ Growth in sales of trailer units
Delivery to Bodybuilder, a large European company, has begun (including samples).
Sales in Japan, Asia and the Middle East will begin in stages

Operating overseas business in earnest with high-performance trailer units



Our Technologies, Your Tomorrow

