
**Briefing session on Air-conditioning & Refrigeration Systems,
Paper & Printing Machinery and Machine Tool operations**

**Section 1: Air Conditioning &
Refrigeration Systems Operations**

September 27, 2007

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Air-conditioning & Refrigeration Systems Headquarters

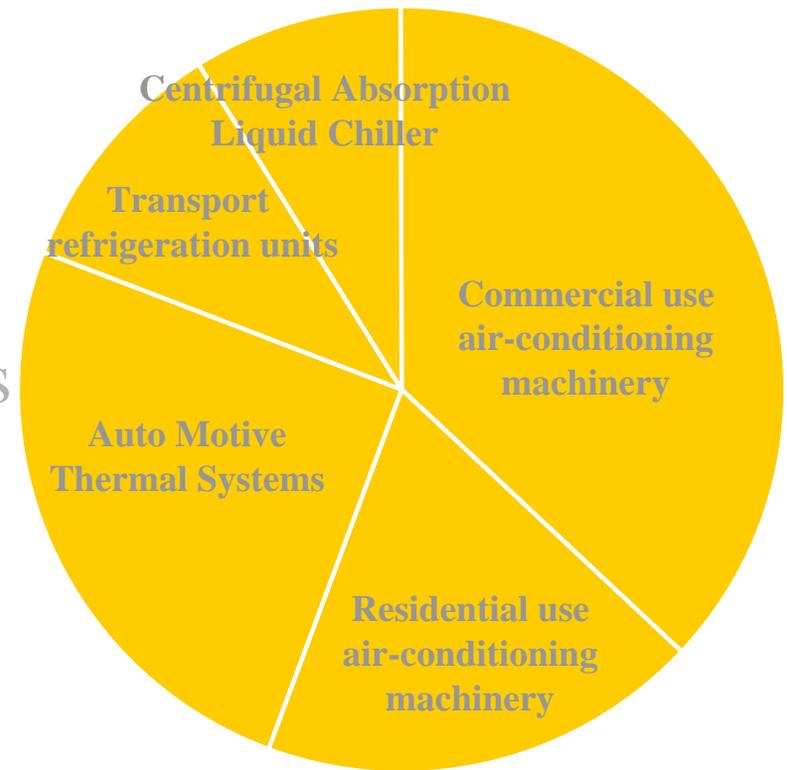
Contents

- 1 Outline of the Air Conditioning & Refrigeration Division
- 2 Outline of Growth Areas
- 3 Outline of Air Conditioning Operations

1 Outline of the Air Conditioning & Refrigeration Division

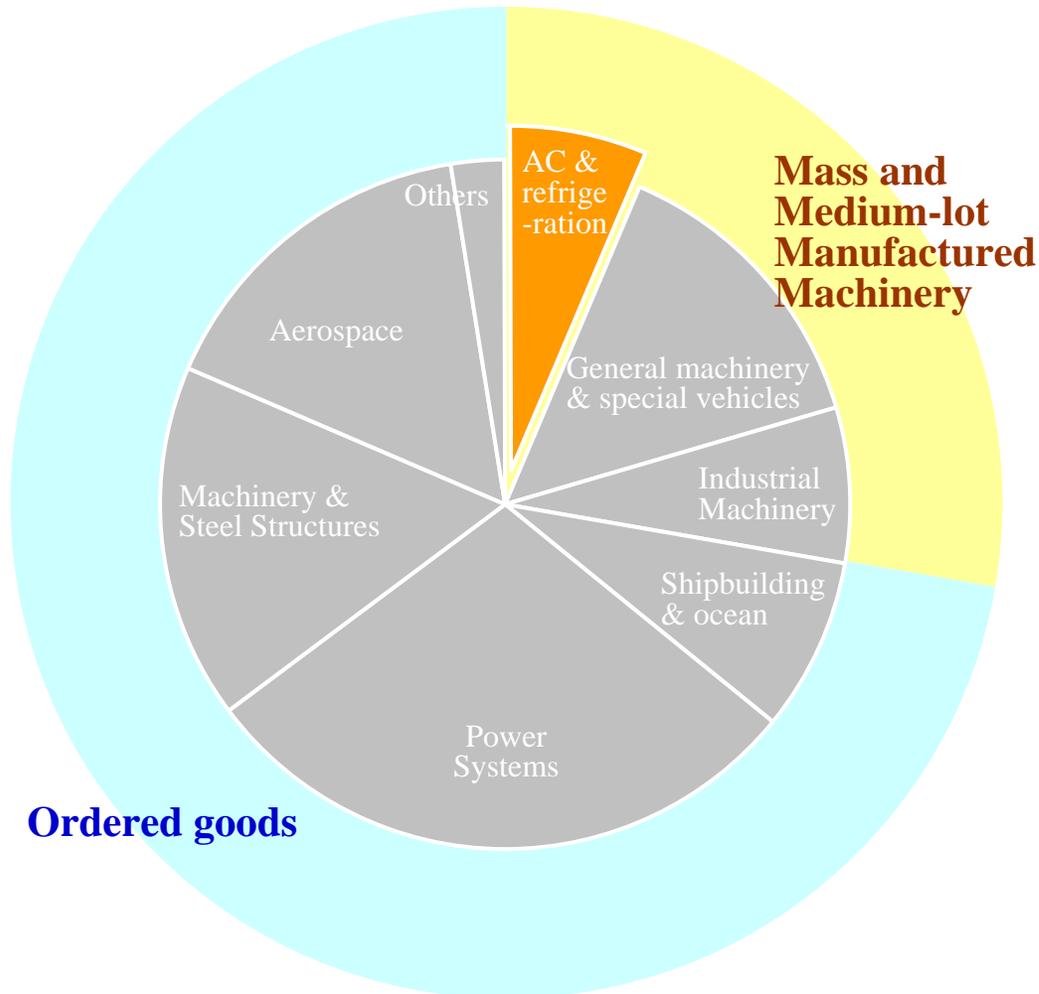
2 Outline of Growth Areas

3 Outline of Air Conditioning Operations

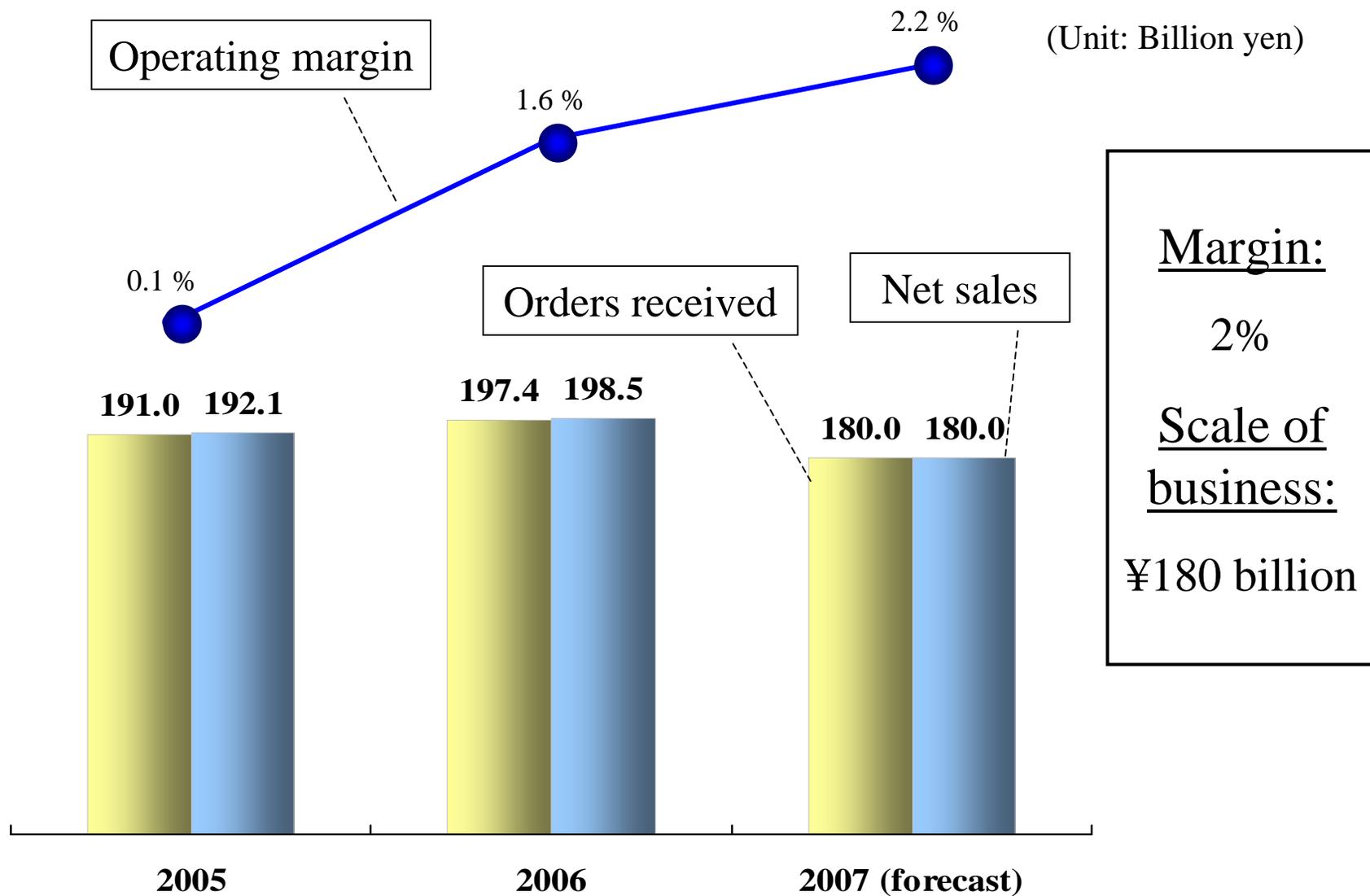


◇ Select global B to C operations

Mitsubishi Heavy Industries' sales figures for 2006

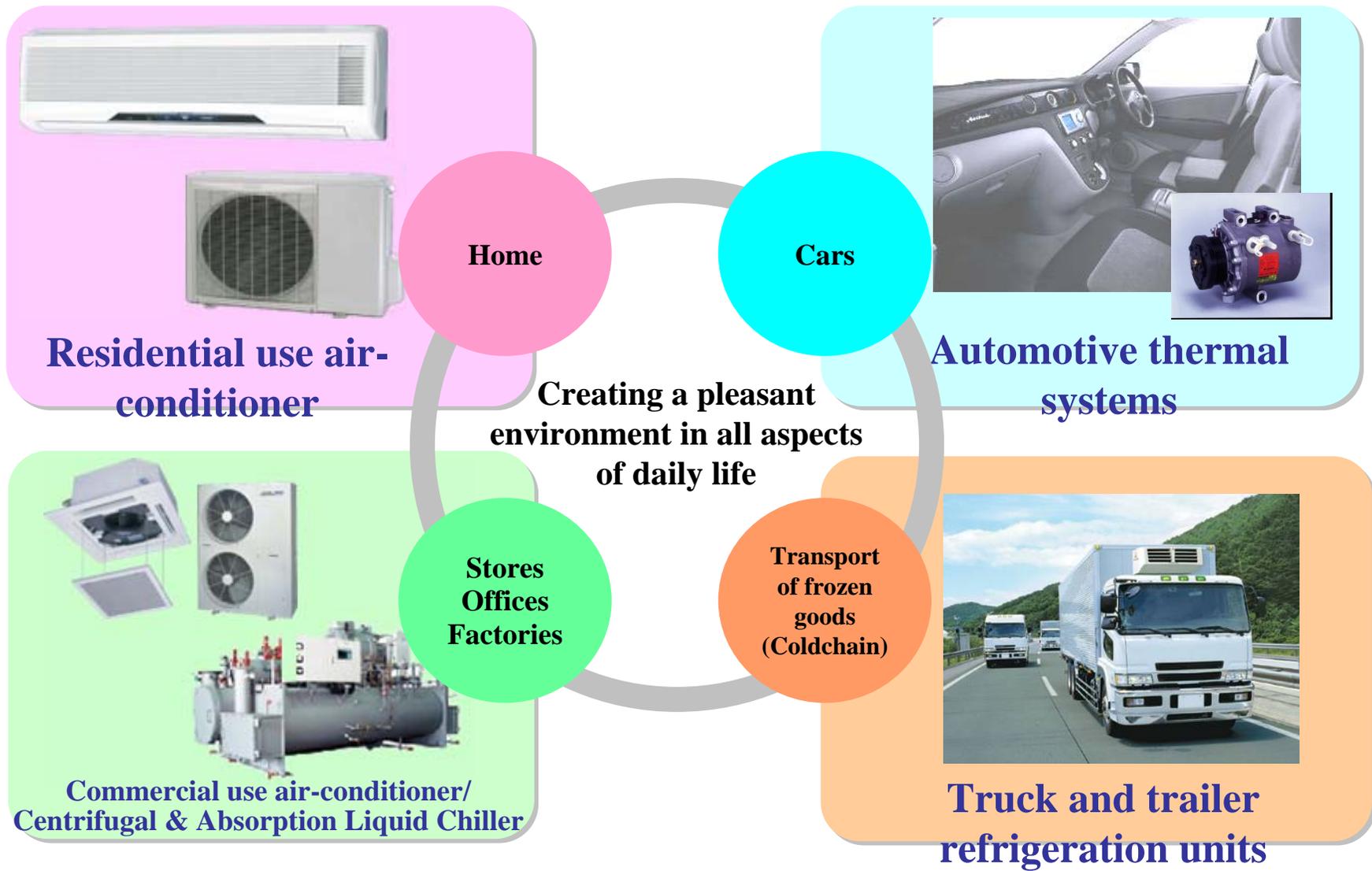


◇ Rapid improvements in our operating margin



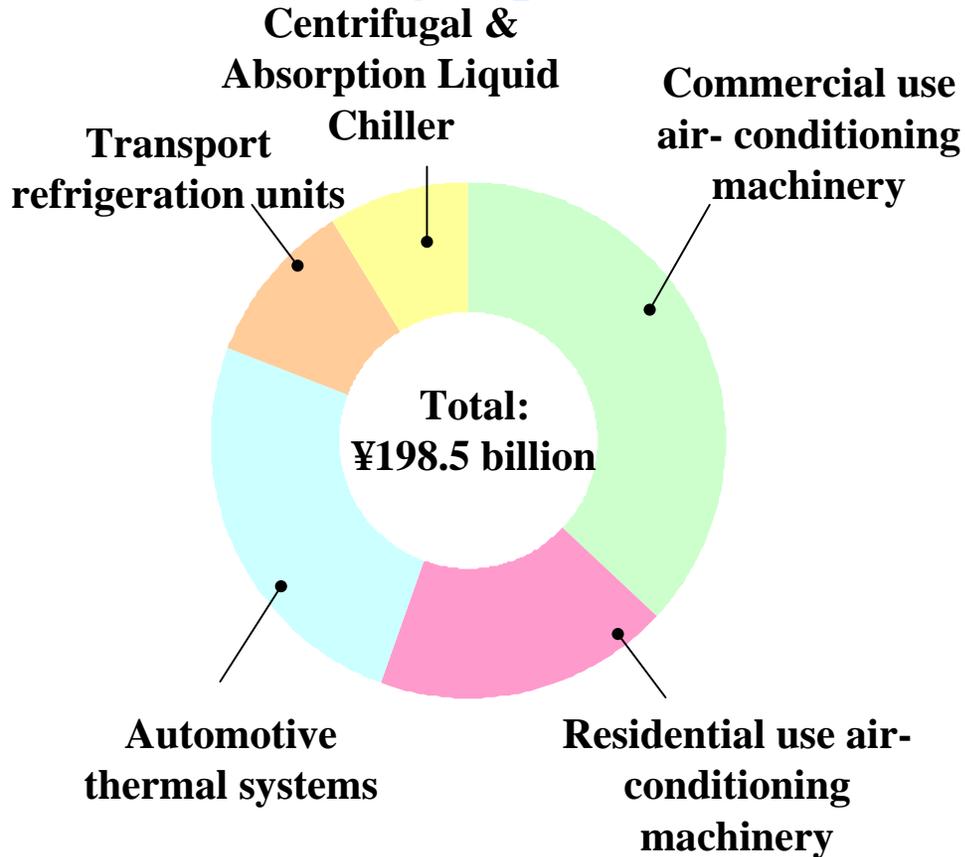
- Creating environmentally friendly, highly reliable air conditioning and refrigeration products
- Providing products and services that outperform other companies and increasing sales within domestic and overseas markets
- Establishing an open organization and ensuring optimum consolidated management

◇ A wide range of products, revolving around high-end items

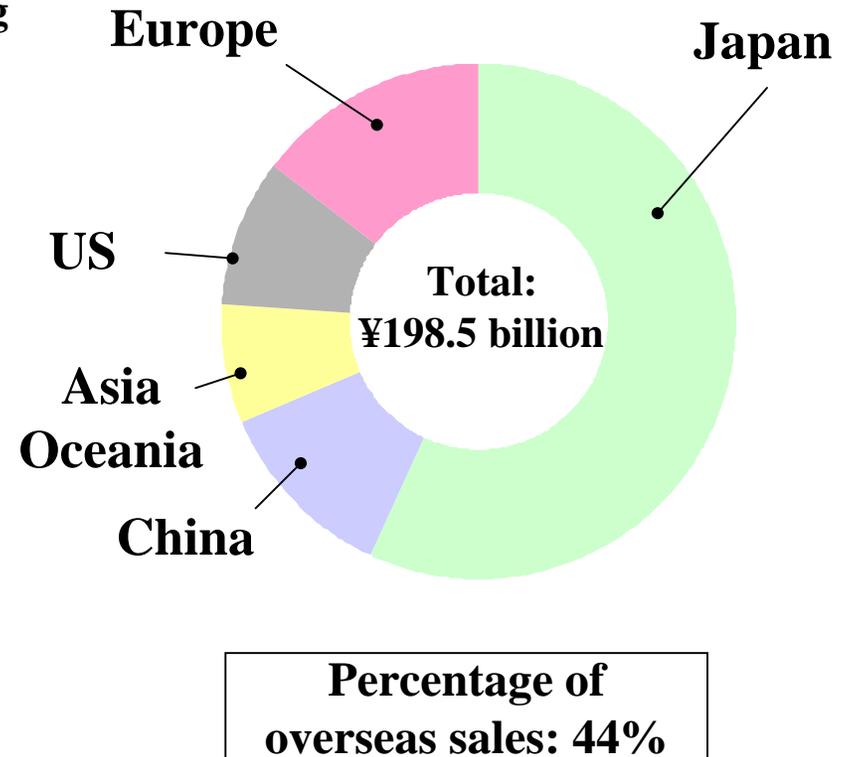


Sales figures for 2006

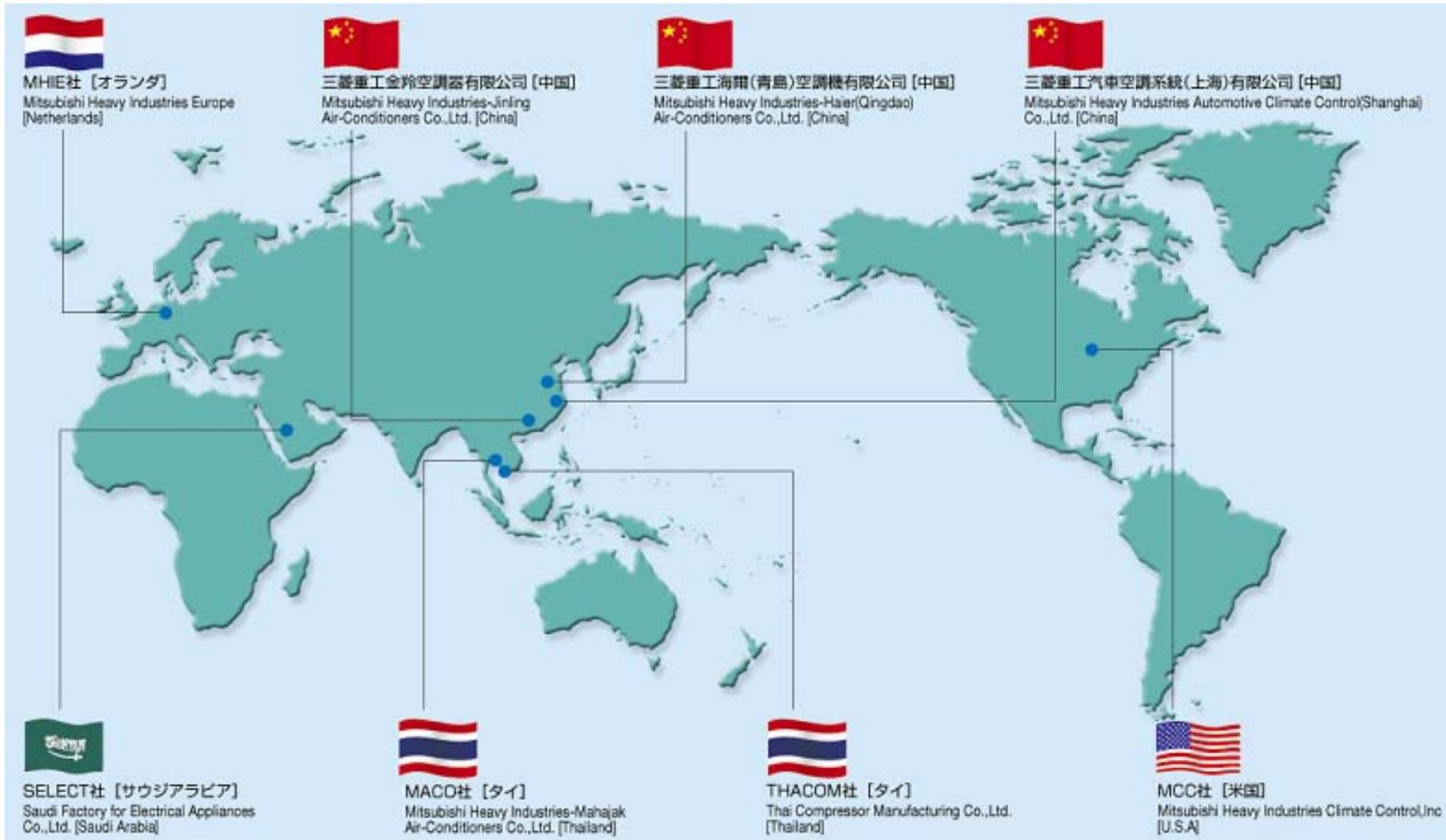
According to product



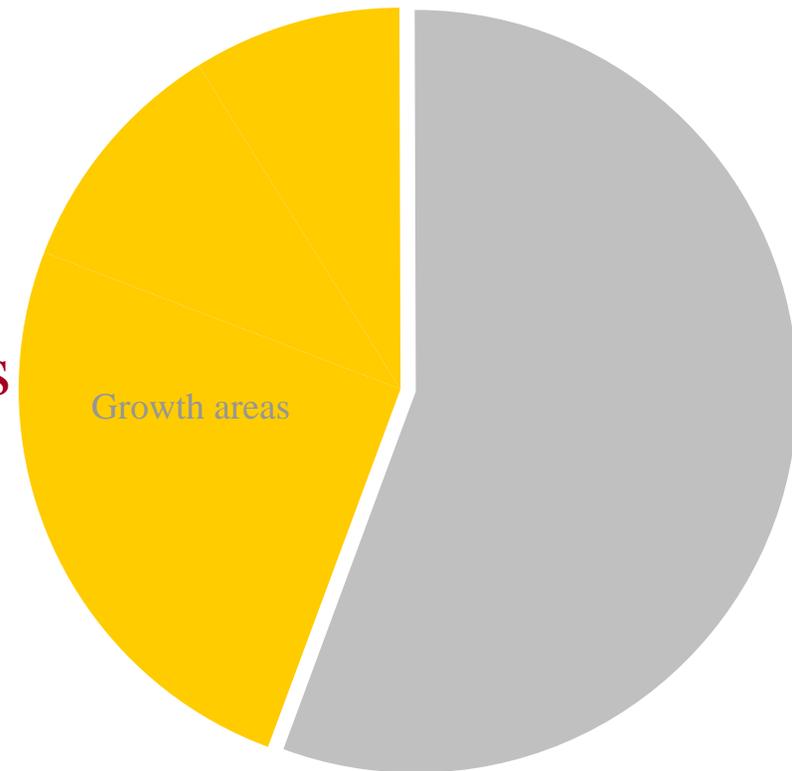
According to region



◇ Core operations in China and the rest of Asia and operations in North America, Europe and the Middle East



- 1 Outline of the Air Conditioning & Refrigeration Division
- 2 Outline of Growth Areas**
- 3 Outline of Air Conditioning Operations



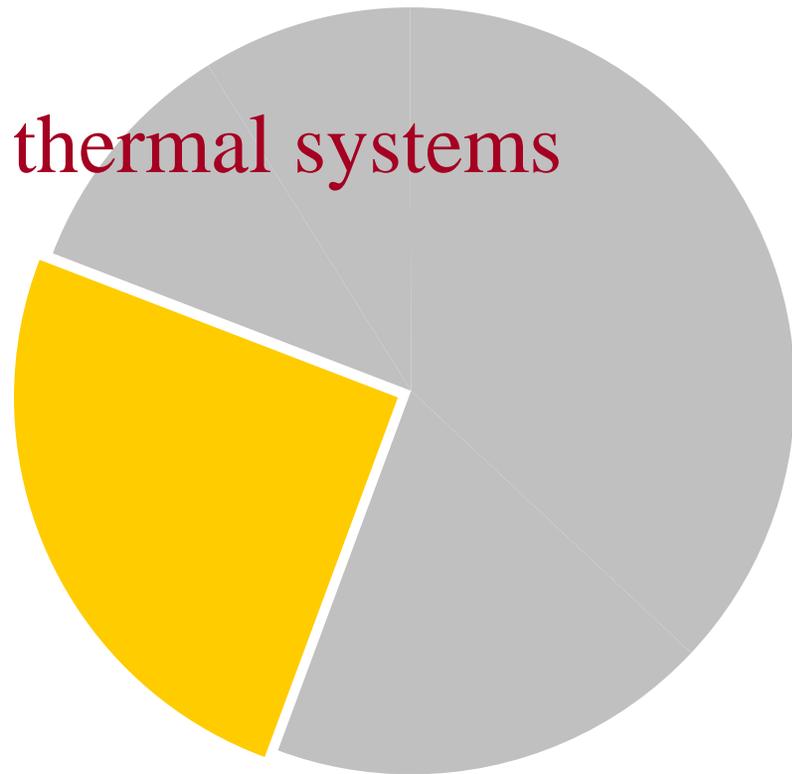
Our growth areas of business revolve primarily around high-end products. We have specifically positioned the following three lines of business as growth areas in which we intend to significantly expand the scale of our operations in the future

Growth
areas

- Automotive thermal systems
- Transport **refrigeration units**
- Centrifugal & Absorption
Liquid Chiller



Automotive thermal systems



2. Growth Areas (1) Automotive thermal systems (i) Product Lineup

Engine cleaning



Controllers



3D compressors



Electric compressors

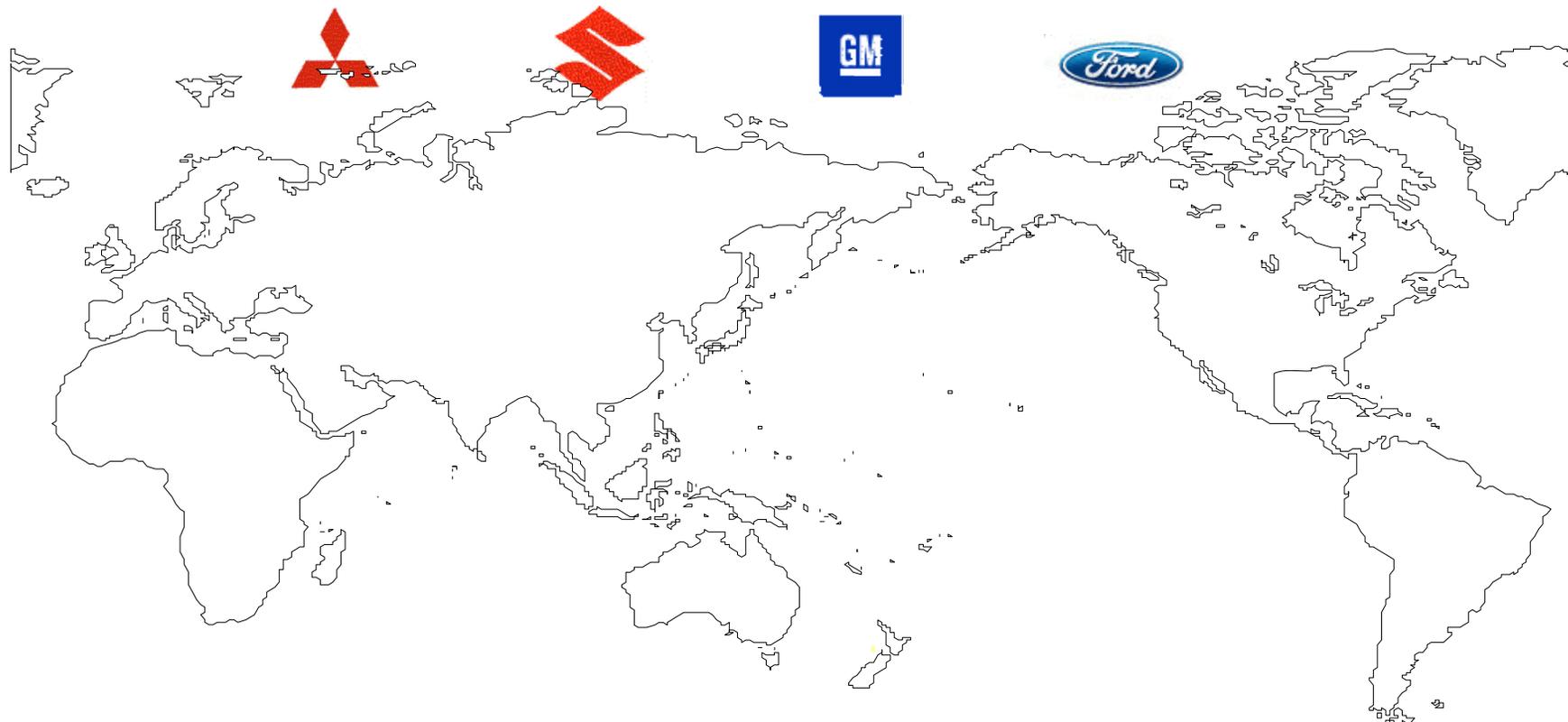
Compressors



HVAC



2. Growth Areas (i) Automotive thermal systems (ii) Our Customers



Europe

Ned Car (Netherlands)

MFTE (Portugal)

**Magyar Suzuki
(Hungary)**

Japan/Asia

Mitsubishi Motors

Suzuki

Mitsubishi Fuso

Beijing Benz (China)

Southeast Motor (China)

China Motor (Taiwan)

Changan Suzuki (China)

TATA (India)

North America

General Motors

Ford

Mitsubishi Motors



Scroll

- Smaller, lighter and more efficient thanks to its three dimensional compression mechanism

Reduced number of components (- 15%)

Smaller and lighter (- 29%)

More efficient (- 32%)

(Figures in brackets: compared to current levels)

- Series development

Current compressors: 60cc, 90cc, 105cc

New compressors: 50cc, 70cc, 90cc

- Compatible with environmentally friendly hybrid, electric and fuel cell vehicles
- Scheduled to commence mass production in September 2007

2. Growth Areas (1) Automotive thermal systems (iv) Overseas Bases

- ◇ **Company name** MHIE 
- ◇ **Established** 2000
- ◇ **Headquarters** Netherlands
- ◇ **Business activities** Sales of car air conditioners



- ◇ **Company name** MCC 
- ◇ **Established** 1995
- ◇ **Headquarters** Indiana (USA)
- ◇ **Business activities** Development base for car air conditioners



- ◇ **Company name** MACC 
- ◇ **Established** 2003
- ◇ **Headquarters** Shanghai (China)
- ◇ **Business activities** Production and sales of car air conditioners

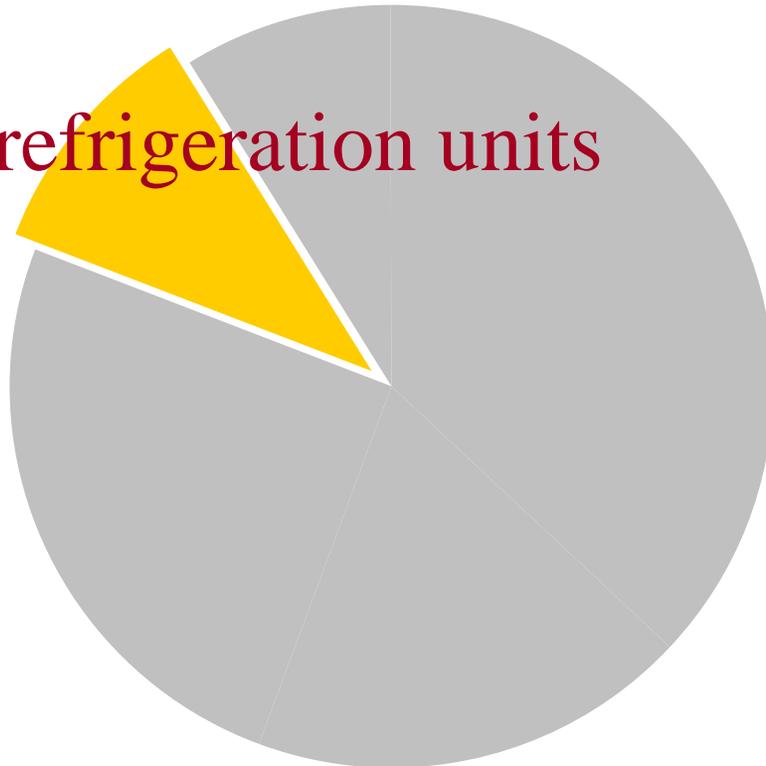


- ◇ **Company name** MCC 
- ◇ **Established** 1995
- ◇ **Headquarters** Indiana (USA)
- ◇ **Business activities** Production and sales of car air conditioners





Transport refrigeration units



Trailer units

(10t trailers or larger)



Direct-mounted units

(0.75-11t trucks)



Combined (evaporator and condenser) units



New 3D compressor



Combined isolation units



Controller

Under-mounted units

(4-11t trucks)



Evaporator units



Condensing units



Controller

Nose-mounted units

(0.75-11t trucks)



Combined (evaporator and condenser) units



Controller

2. Growth Areas (2) Transport refrigeration units (ii) New Products

◇ New direct-mounted series equipped 3D scroll compressors



Combined (evaporator and condenser) units

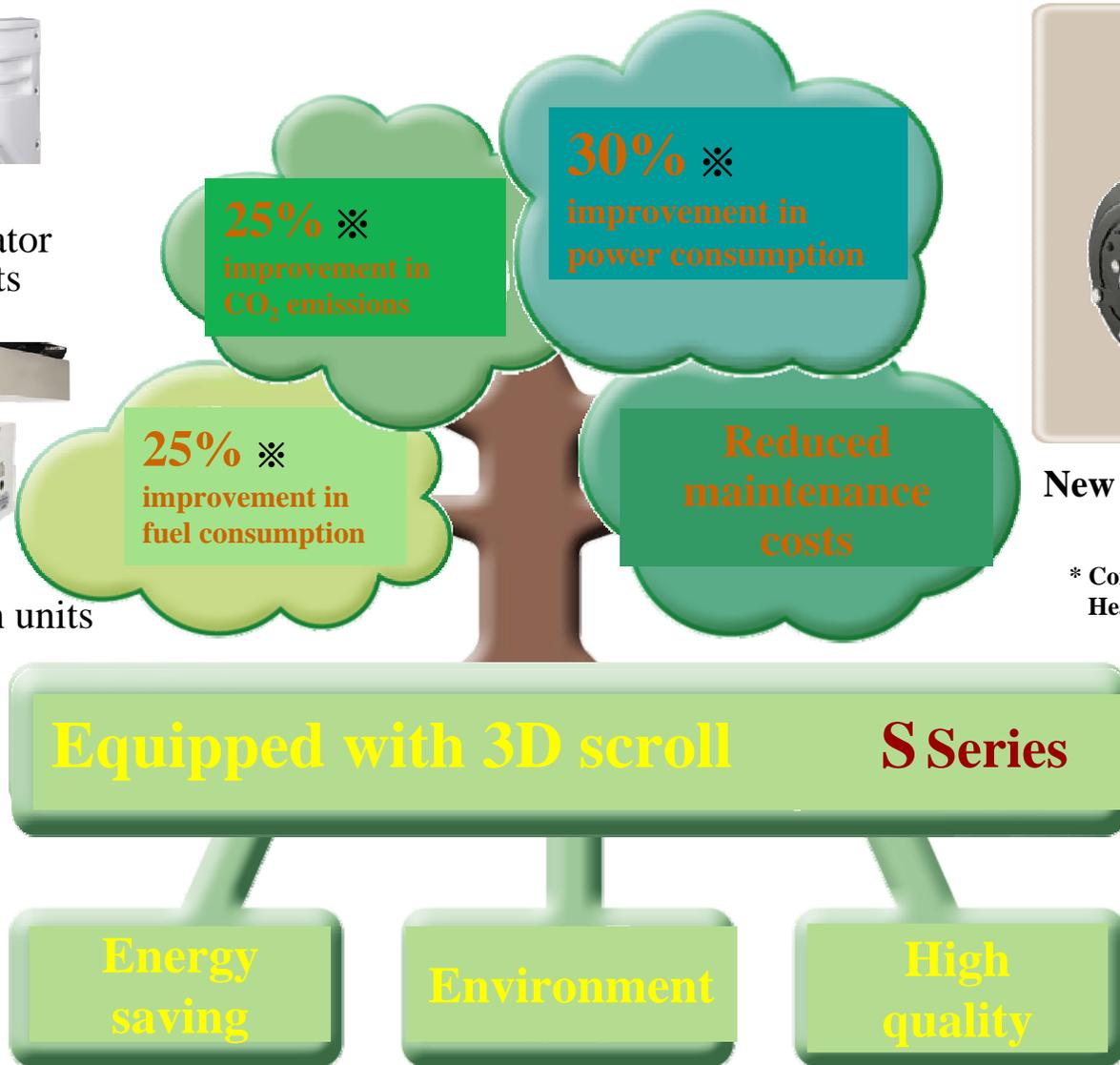


Combined isolation units



New 3D scroll compressor

* Compared to current Mitsubishi Heavy Industries models



◇ Launching new trailer units

TFV2000 (PEGASUS)

Ultra-slim sub-engine trailer unit



Enabling world leading refrigeration capacity

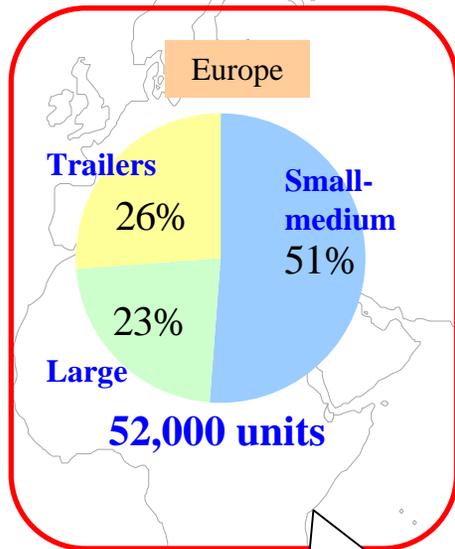
(19,000W: inside temperature: 0°C)



2. Growth Areas (2) Transport refrigeration units (ii) Market Overview

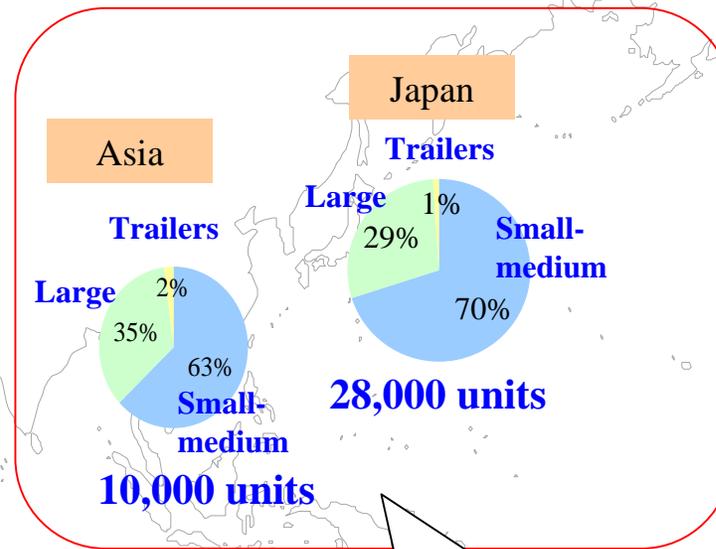
◇ Shifting focus from Japan and Asia towards full-scale entry into European market

Envisioned sales expansion in future

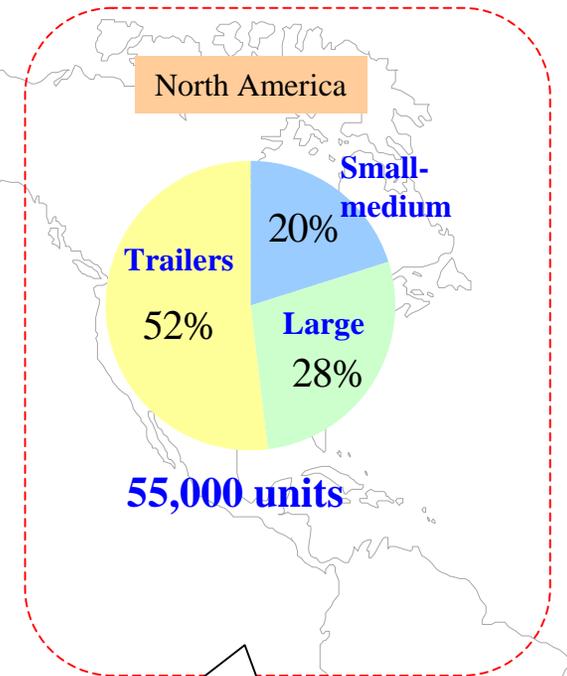


Full-scale entry into European market on the back of trailer unit development

Current markets



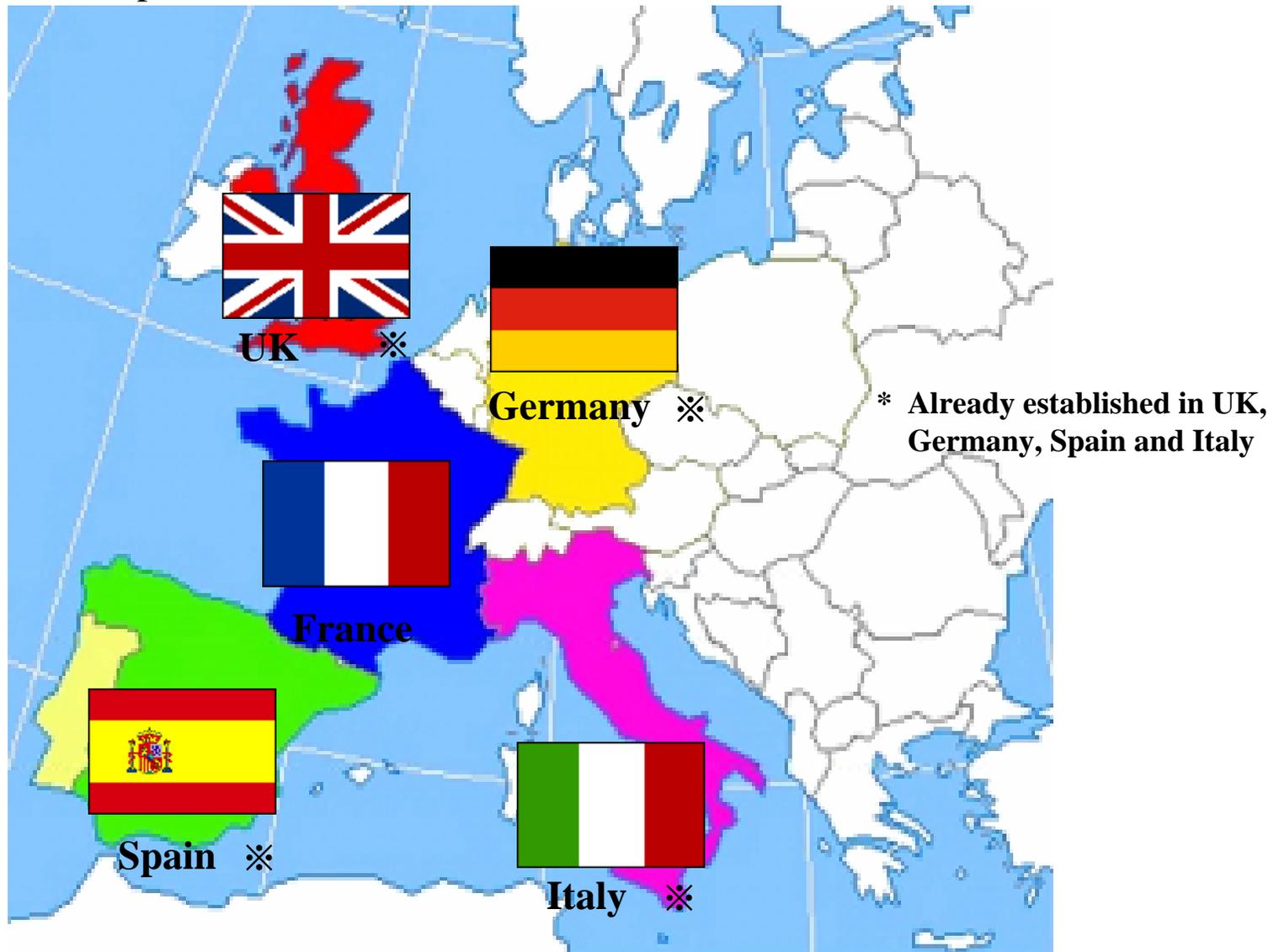
Maintaining top share of Japanese market
Increasing sales in Asia, especially for the Chinese market



Plans to look into operations in North America after increasing sales in Europe

2. Growth Areas (2) Transport refrigeration units (iii) Increasing Sales in Europe

- ◇ Establishing distributors in five main countries and achieving 80% coverage of the European market



2. Growth Areas (2) Transport refrigeration units (iv) Increasing Sales in China

- ◇ Establishing position as number three manufacturer in the Chinese market, after US manufacturers



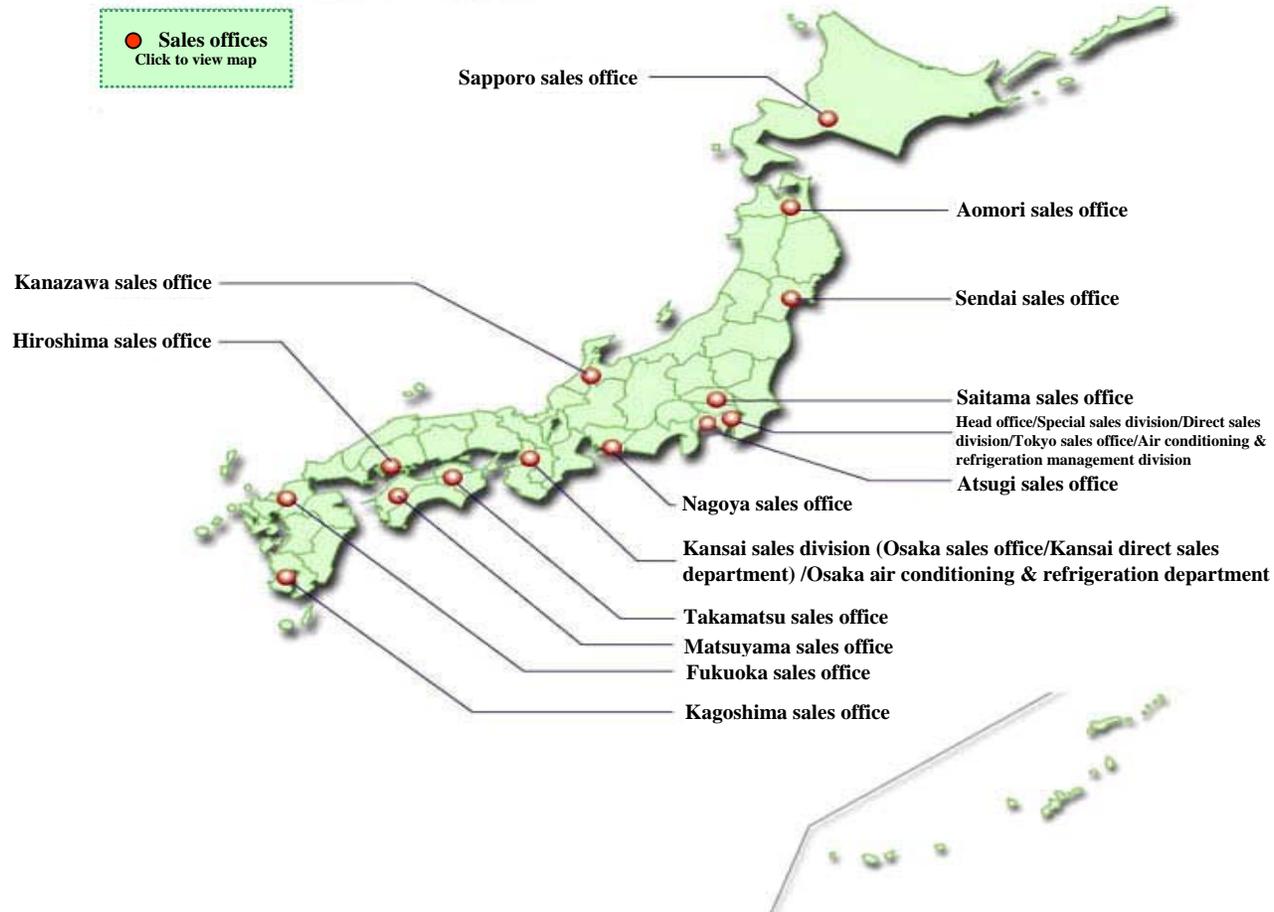
2. Growth Areas (2) Transport refrigeration units (v) Increasing Domestic Sales

- ◇ Establishing a powerful sales and service network and racing ahead with the number one share of the market

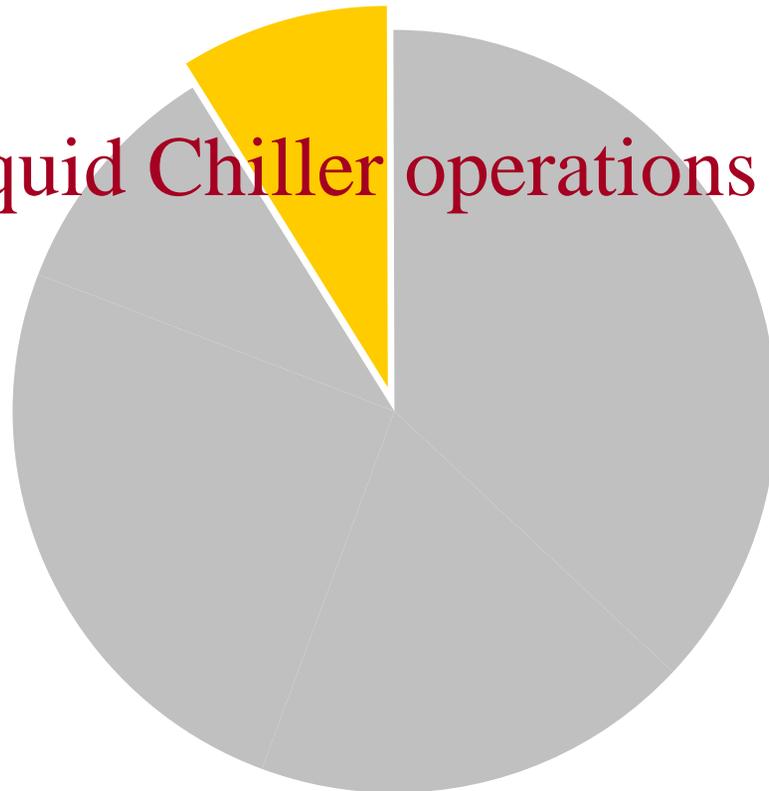
A global scale business linked together by freshness



Details of head office and sales offices



■ Centrifugal Liquid Chiller operations



2. Growth Areas (3) Centrifugal Liquid Chiller (i) Product Lineup

AART Series

Capacity range: 215-4000USRt

Rated COP **6.4**

AART-145, 180, 200 Cold water: 12 °C/7 °C

I PLV **7.9**

AART-100 Cold water: 12.2 °C/6.67 °C



IPLV: Coefficient of performance based on US Air Conditioning and Refrigeration Institute standards (ARI 550/590 – 2003 edition)



Small water-cooled turbo chillers

Microturbo W Series

Capacity range: 50-100USRt

Inverters fitted as standard

Rated COP **5.7**

Partial load COP **14.1**

Cold water: 12 °C /7 °C



Inverter-driven AART-I Series

Capacity range: 215-4000USRt

Partial load COP **21.9**

AART-100I Coolant intake: 12 °C

2. Growth Areas (3) Centrifugal Liquid Chiller (ii) Turbo Heat Pumps

* Joint development in conjunction with Tokyo Electric Power (TEPCO), Chubu Electric Power and Kansai Electric Power



**Developing large capacity
air-cooled heat pumps**

Compatible with up to 600USRt

**(Possible to connect up to four units through
modularization of single 150USRt units)**

Minimal space required for installation

30% less space than regular units

(Per unit capacity)

Absorption cooling and heating (150-600USRt)

Ideally suited for easy replacement

High performance: COP 5.0

Compact

Uses mixed refrigerants 410A

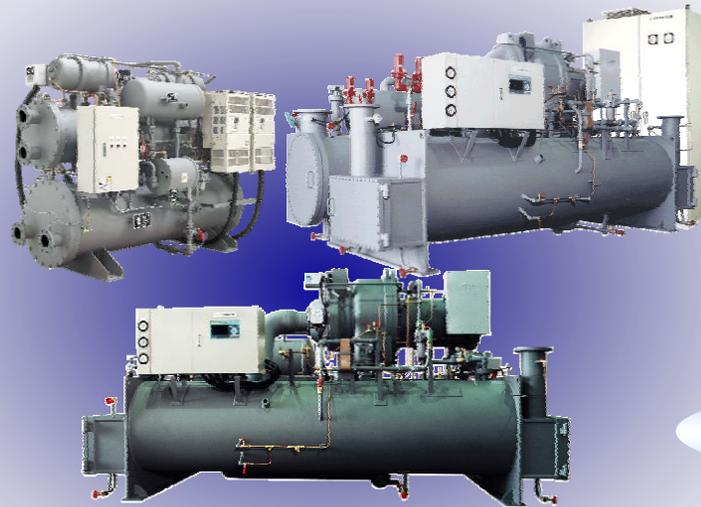
2. Growth Areas (3) Centrifugal Liquid Chiller (iii) Uses for Turbo Chillers

IT industry



Shopping centers

Hotels & hospitals



Auto industry



Clean rooms



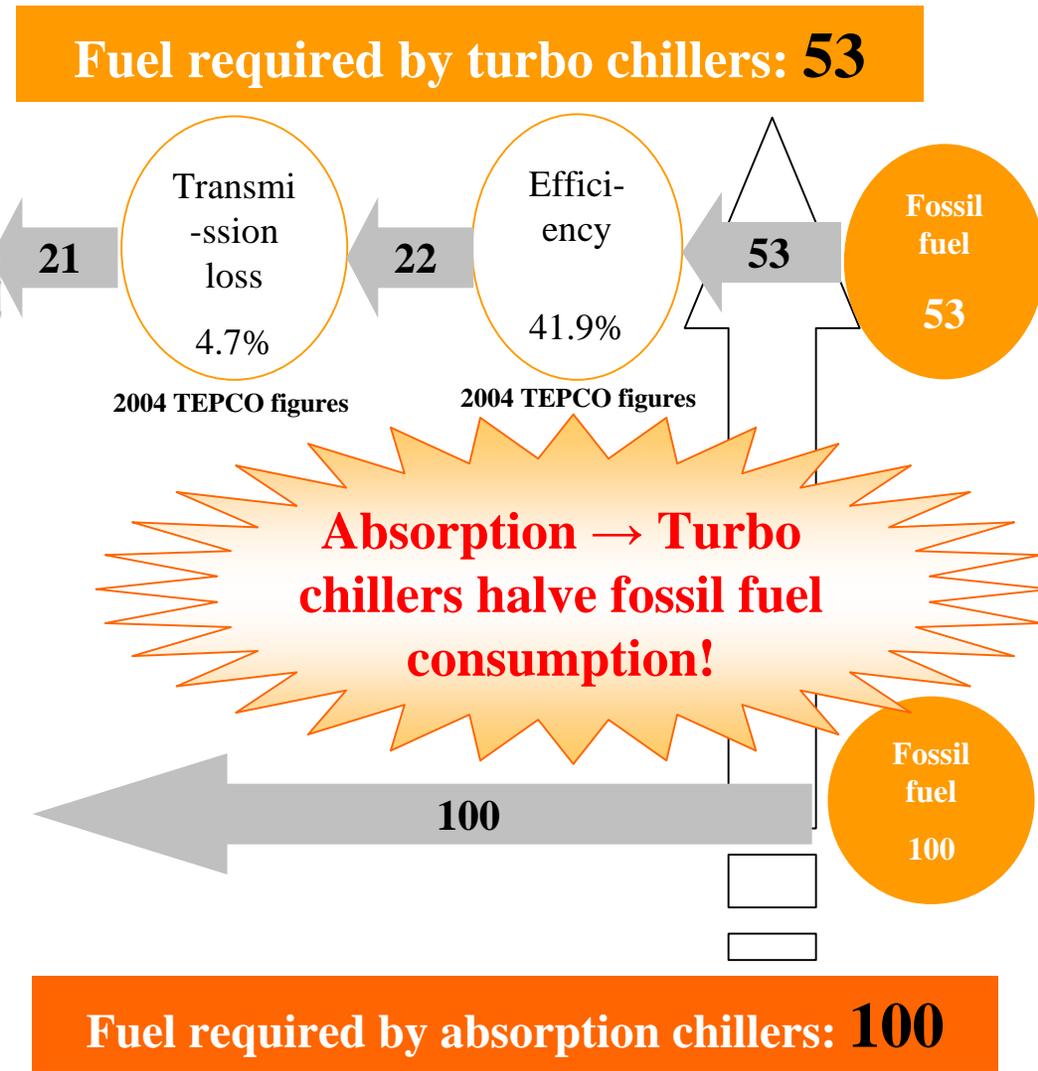
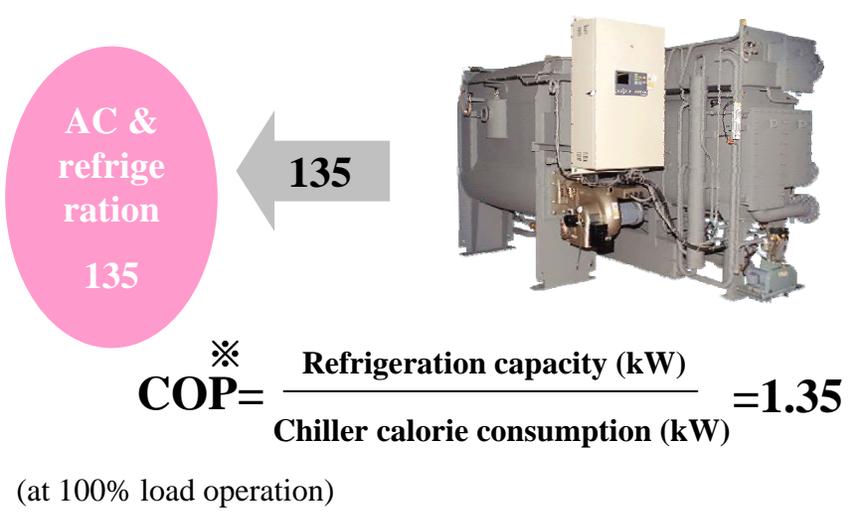
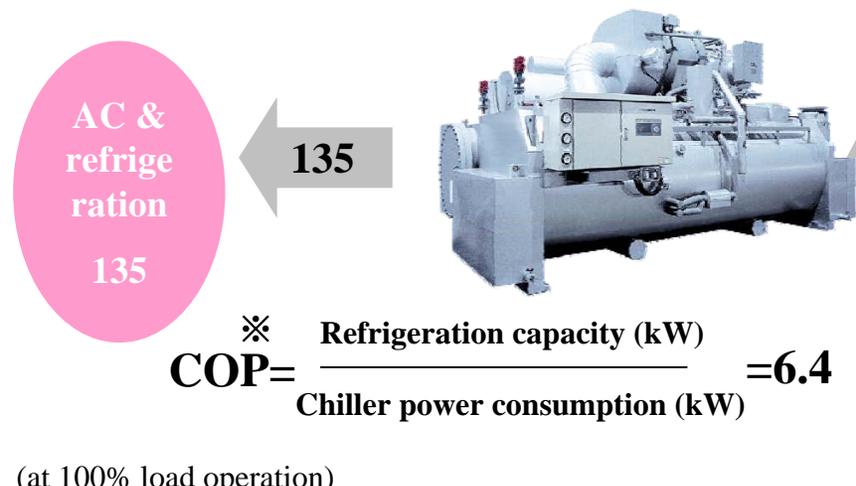
Sports facilities



Office buildings

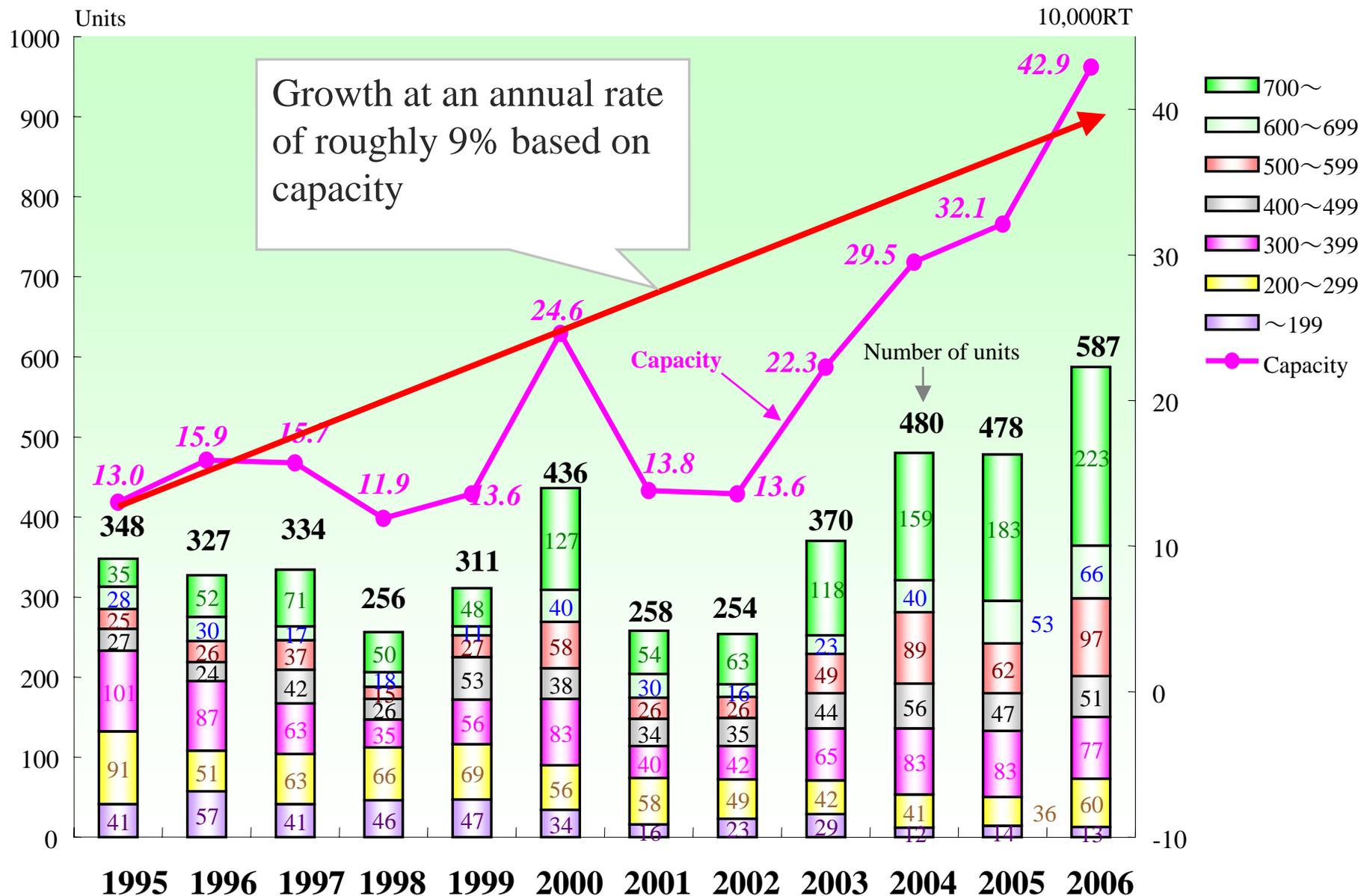
Chemical & food industries

* COP: Coefficient of performance



2. Growth Areas (3) Turbo Chiller (v) Domestic Market Trends

◇ Domestic turbo market experiencing underlying expansion



2. Growth Areas (3) Centrifugal Liquid Chiller (vi) Overseas Operations

◇ Currently working on increasing sales of high efficiency turbo chillers, especially in Asia

China: Guangzhou Exhibition Center



Hong Kong: Mega Tower



Dubai: AI Murooj Complex



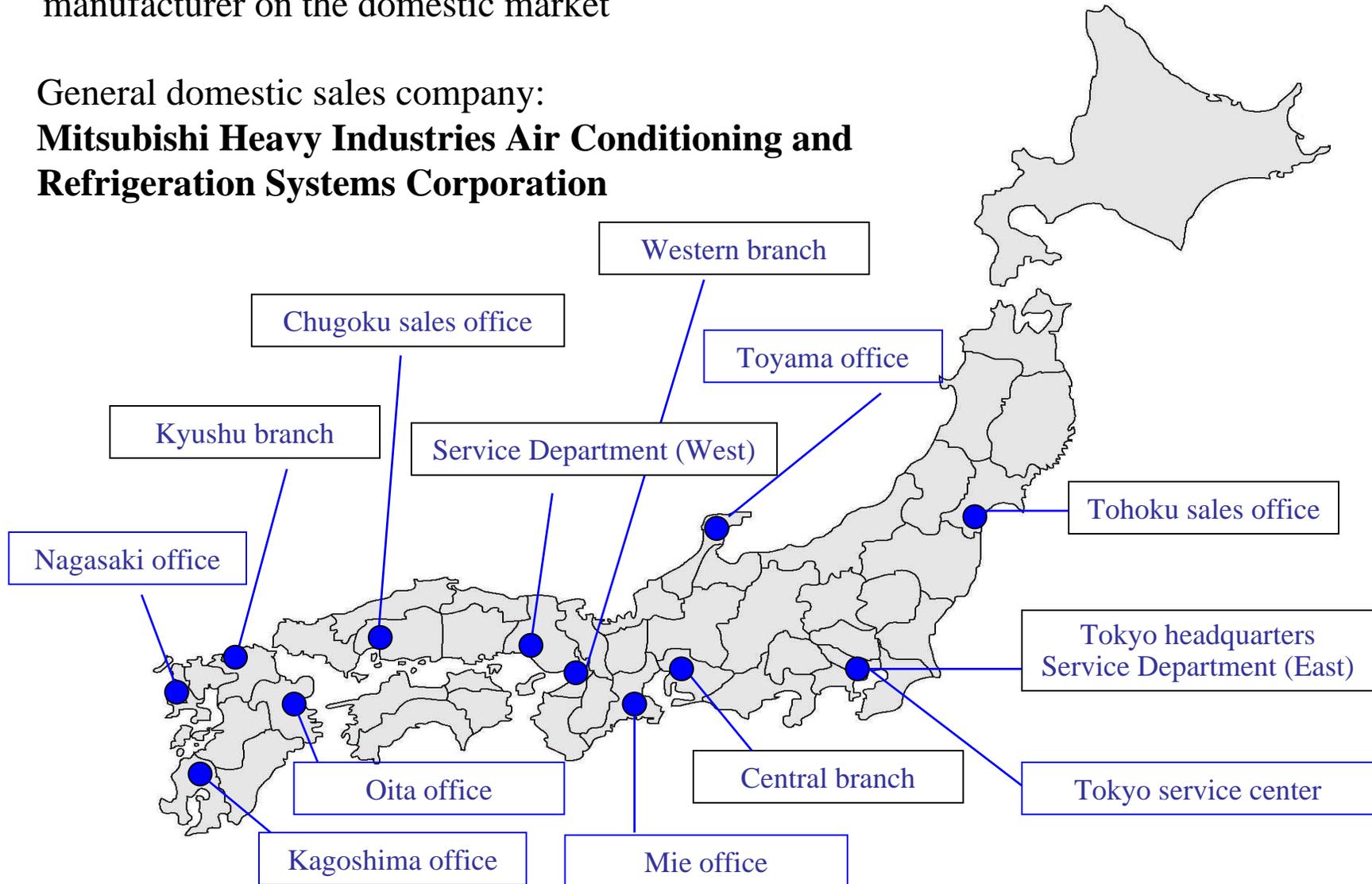
Singapore: Cooling and heating in Marina South area

2. Growth Areas (3) Centrifugal Liquid Chiller (vii) Domestic Sales and Service Network

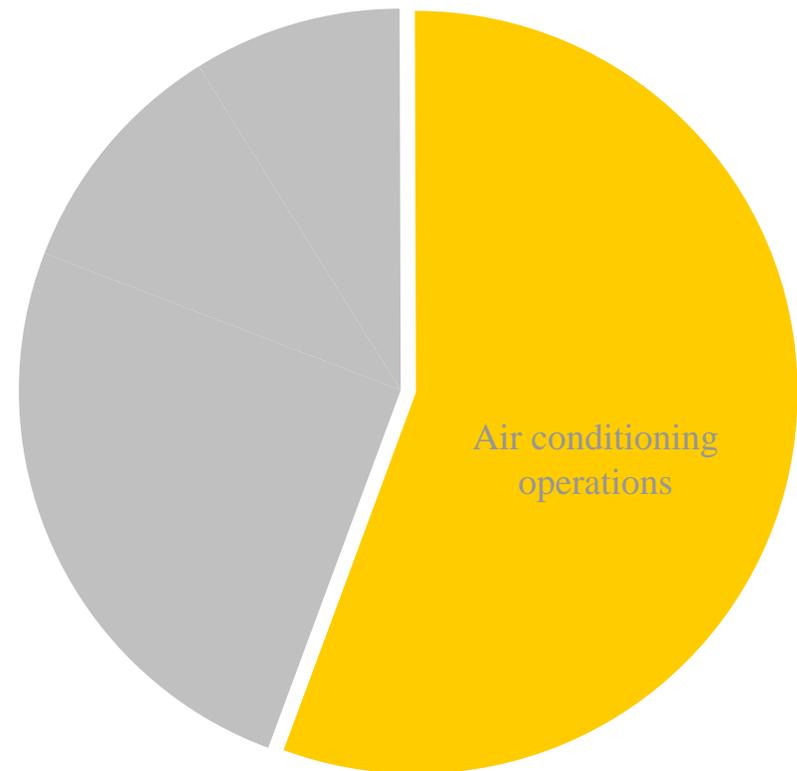
- ◇ Currently expanding our sales and service network as the leading manufacturer on the domestic market

General domestic sales company:

Mitsubishi Heavy Industries Air Conditioning and Refrigeration Systems Corporation



- 1 Outline of the Air Conditioning & Refrigeration Division
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Home air-conditioner



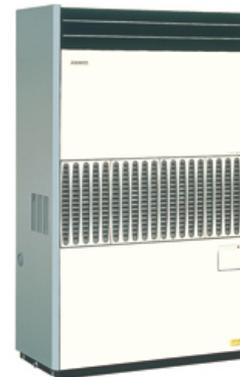
Luxury SI Series



Standard ZI Series



Industrial air-conditioner



3. Air Conditioning Operations (ii) New Products

◇ Development of lightweight outdoor units and increased usage of compact technology

Enabling space saving and facilitating installation

Hyper Inverter

HyperMultiLX



New Hyper INV
(4 horsepower)



New Hyper INV
(5, 6 horsepower)



New Hyper INV
(8, 10 horsepower)



(4, 5 horsepower)



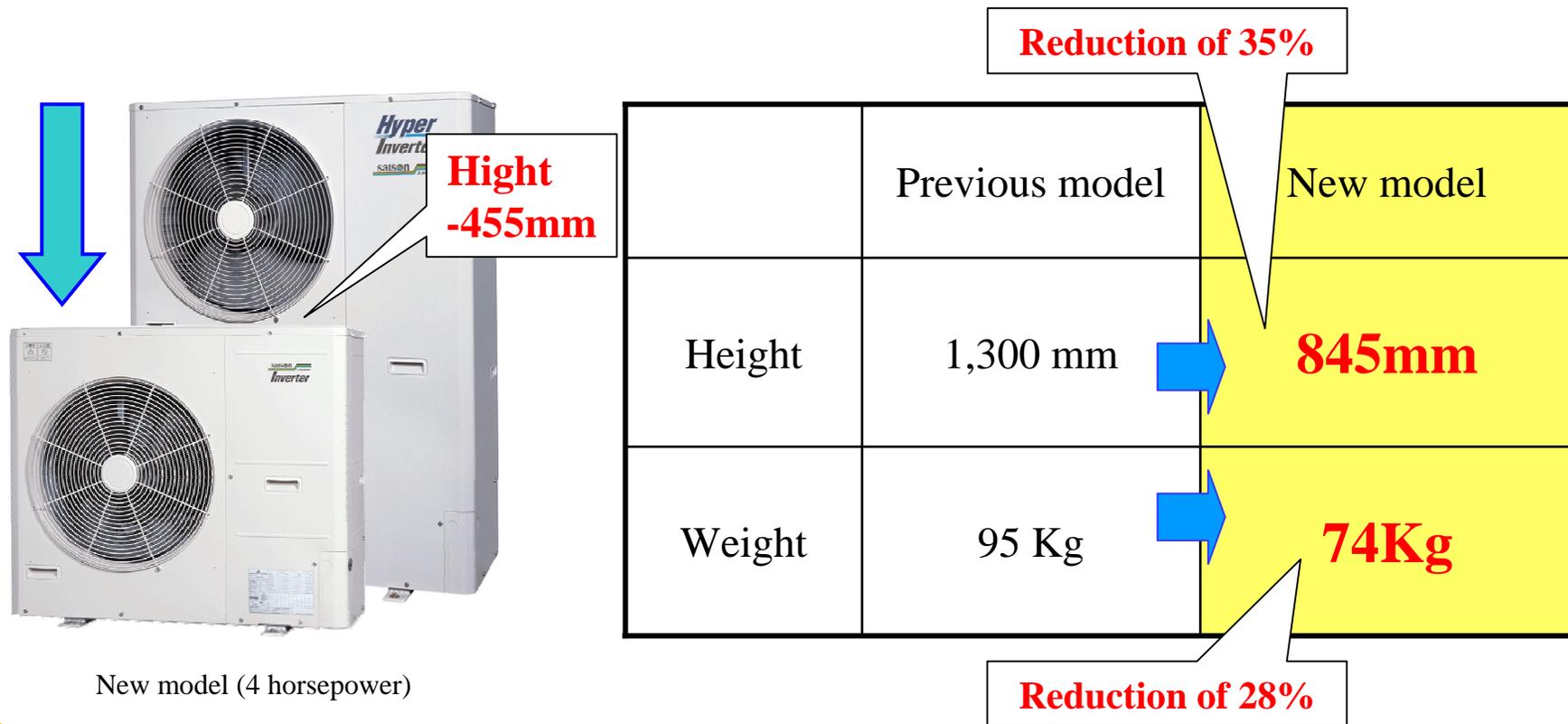
(8, 10, 12 horsepower)

3. Air Conditioning Operations (ii) New Products

◇ Significant reductions in size and weight to facilitate installation

Making installation easier when renewing equipment

⇒ Examples of size and weight reductions (4 horsepower)



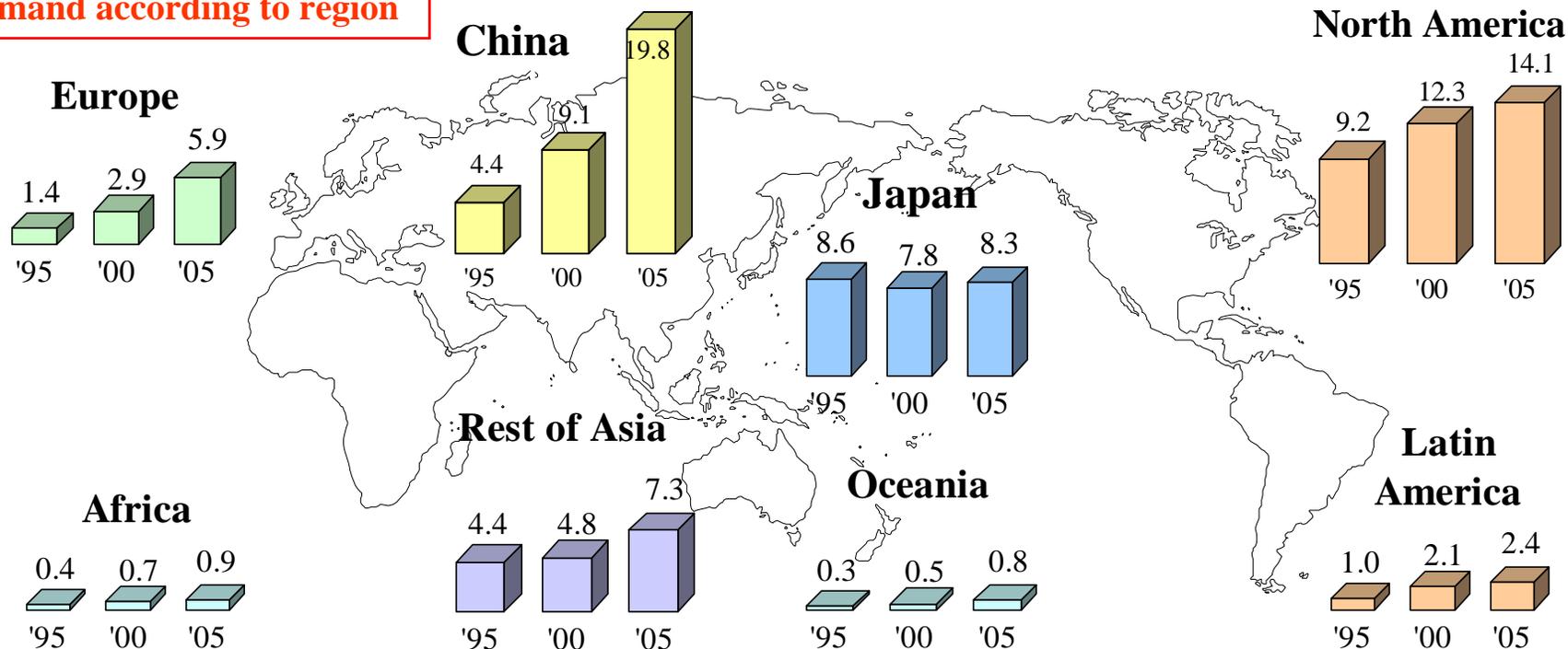
3. Air Conditioning Operations (2) Market Scale

◇ Leveling off of domestic market but rapid growth in Chinese and European markets

Country/Region	Market scale	Demand
Japan	Level (reduced new purchases but increase in replacement purchases)	→
China	Rapid growth	↗
Rest of Asia	Rapid growth	↗
Europe	Growth	→
USA	Level	→

(Unit: million yen)

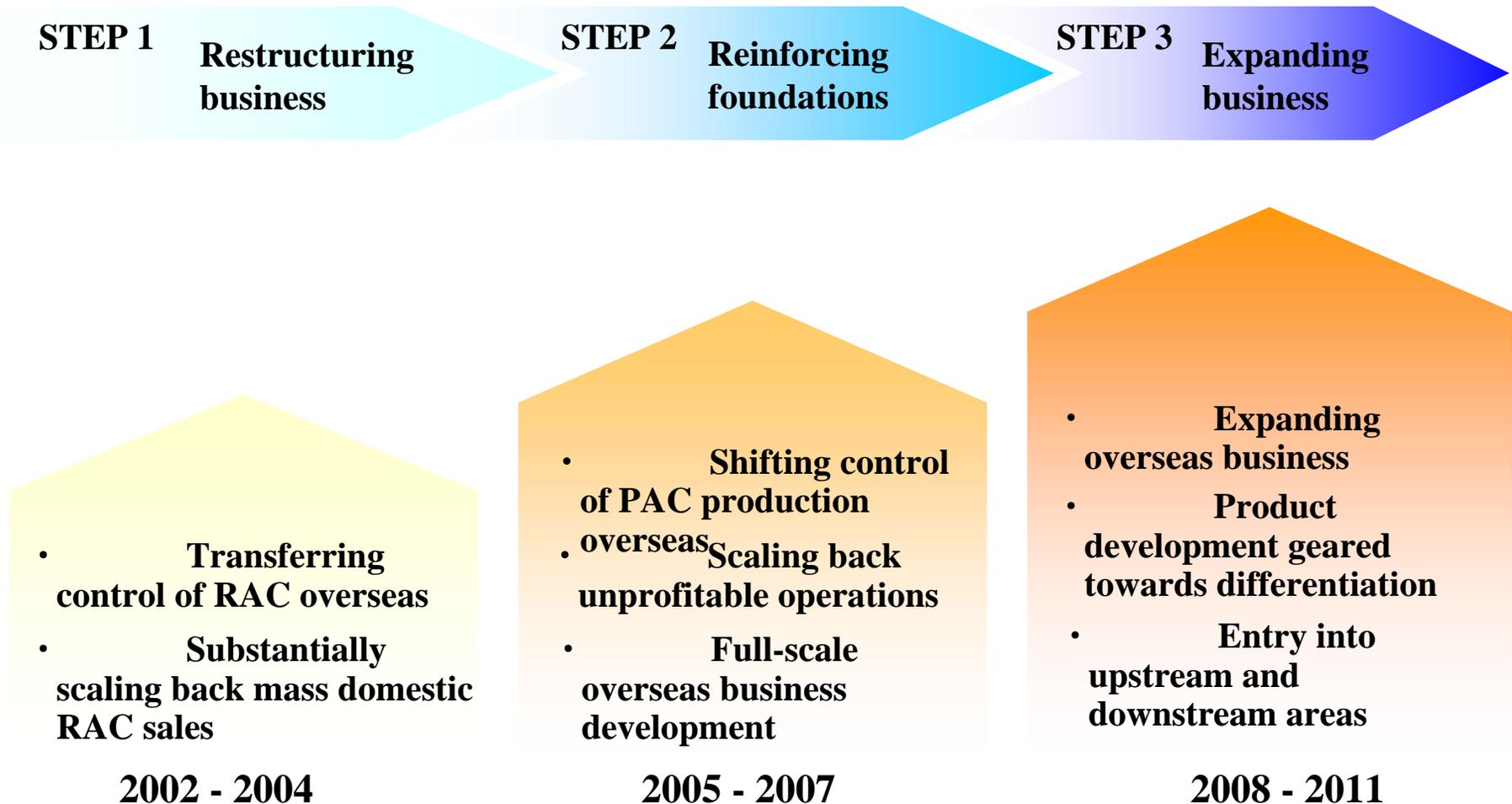
Demand according to region



Compiled based on data published by the Japan Refrigeration and Air Conditioning Industry Association

3. Air Conditioning Operations (3) Developments in Air Conditioning Operations

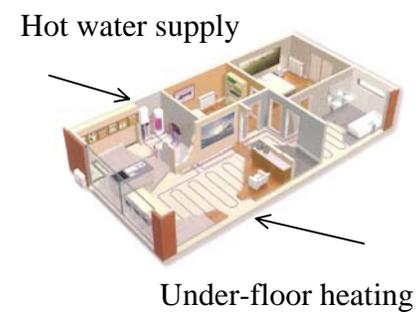
◇ Restructuring through selection and concentration →
Expansion centered around overseas operations



3. Air Conditioning Operations (4) Overseas Operations (i) European Market

◇ Establishing position as the top Japanese group, leading with multi-function building systems

Free training using our AC systems



Full-scale entry into European heat pump market

Currently reinforcing our construction and service framework in order to expand sales of multi-function building systems

Currently increasing distributor numbers with an eye to expanding sales of PAC/RAC in the European market



3. Air Conditioning Operations (4) Overseas Operations (ii) Chinese Market

◇ Number two Japanese group in the Chinese multi-function building system market

Major buildings with multi-function systems in China (construction completed)

Donghuan Plaza
(Commercial complex)
Construction completed summer 2005
KX2 & KX4 mini x 3,300 horsepower

Li Yuan Mountain Retreat
(State guest house)
Construction completed summer 2004
KX2 & PAC x 2,800 horsepower

Shaoniangong 2
(State educational facility)
Construction completed Spring 2005
KX2 & PAC x 2,000 horsepower

Soochow University New Campus
(General university)
Construction completed summer 2006
KX4 x 2,000 horsepower

North Bank Wealth and Business Center
(Commercial complex)
Construction completed Autumn 2007
KX4 x 5,200 horsepower

International Chamber of Commerce Tower
(Office building)
Construction completed winter 2004
KX2 x 5, 200 horsepower

Richgate
(Deluxe apartments)
Construction completed Summer 2006
KX4 x 700 horsepower

Heung-to Oasis
(Luxury apartments)
Construction completed Spring 2006
KX4mini x 2,250 horsepower

Hangzhou Street
(Commercial facility)
Construction completed Winter 2004
KX2 x 3,000 horsepower

3. Air Conditioning Operations (5) Overseas Bases

- ◇ **Company name** MJA
- ◇ **Established** 1994
- ◇ **Headquarters** Jiangmen, Guangdong (China)
- ◇ **Business activities** Production and sales of interior air conditioners



- ◇ **Company name** MHAQ
- ◇ **Established** 1993
- ◇ **Headquarters** Qingdao (China)
- ◇ **Business activities** Production and sales of air conditioner packages



- ◇ **Company name** SELECT
- ◇ **Established** 1986
- ◇ **Headquarters** Jeddah (Saudi Arabia)
- ◇ **Business activities** Production and sales of interior air conditioners



- ◇ **Company name** MACO
- ◇ **Established** 1988
- ◇ **Headquarters** Bangkok (Thailand)
- ◇ **Business activities** Production and sales of interior air conditioners
Production of air conditioner packages



- ◇ **Company name** THACOM
- ◇ **Established** 1988
- ◇ **Headquarters** Chachoengsao (Thailand)
- ◇ **Business activities** Production and sales of compressors for air conditioners



3. Air Conditioning Operations (6) Domestic Sales and Service Network

◇ Providing general air conditioner sales and services nationwide

General domestic sales company:
**MHI Air-Conditioning and
Thermal Systems Corporation**

