

**APTSIS**

# Mitsubishi Chemical Holdings Group Investors Meeting



**June 2, 2009**

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**Yoshimitsu Kobayashi**  
**President & Chief Executive Officer**  
**Mitsubishi Chemical Holdings Corporation**

The forward-looking statements are based largely on information available as of the date hereof, and are subject to risks and uncertainties which may be beyond company control. Actual results could differ largely, due to numerous factors, including but not limited to the following: Group companies execute businesses in many different fields, such as petrochemicals, carbon and inorganic products, information and electronics, pharmaceuticals, polymers and processed products, and these business results are subjected to influences of world demands, exchange rates, price and procurement volume of crude oil and naphtha, trend of market price, speed in technology innovation, National Health Insurance price revision, product liabilities, lawsuits, laws and regulations.

# Agenda

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- Revision of *APTSIS 10* Basic Strategy
- Business Environment Outlook
- *APTSIS 10* Growth Strategy
- *APTSIS 10* Innovation and Leaping Ahead Strategies
- Restructuring of Petrochemicals Businesses
- Reinforcement of Management Infrastructure
- Innovation Strategy: Seven Next-generation Growth Businesses
  - White LED Business -

# Revision of **APTSIS 10** Basic Strategy

Unprecedented worldwide economic recession  
 → Serious impact on MCC & MPI

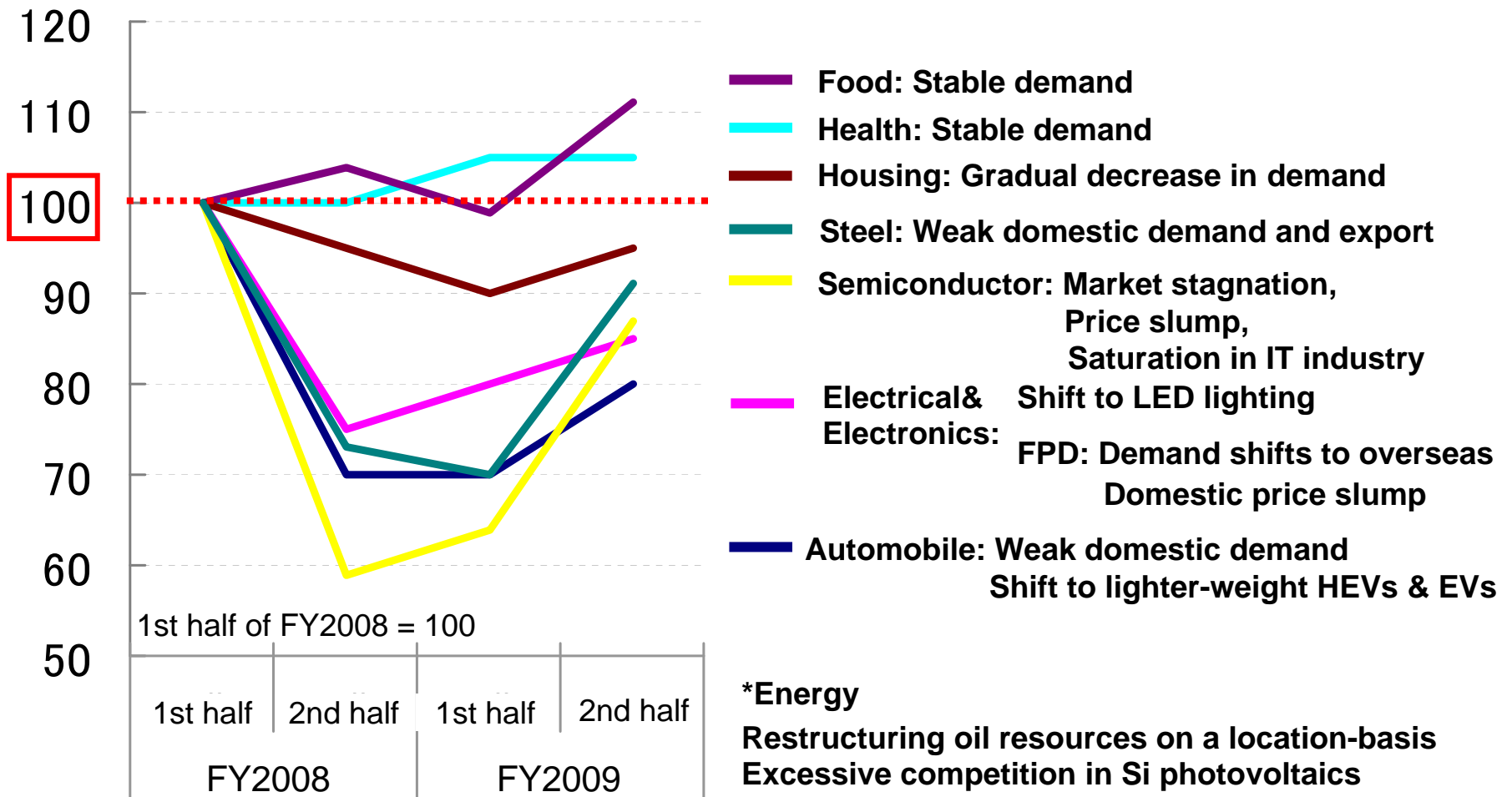
**<Original>**

**<Revised>**

<p><b>Concept</b></p>	<p>Growing, innovating, and leaping ahead</p>	<p>Respond to severe economic contraction by restructuring, in order to accelerate innovating and leaping ahead</p>
<p><b>Organic Growth</b></p>	<p>Shift to high-performance products and high value-added businesses                  Execute efficient product/business life cycle management</p>	<p>Focus on existing growth businesses                  Reduce capital expenditure</p>
<p><b>Innovation</b></p>	<p>Nurture and accelerate seven next-generation growth businesses</p>	<p>Accelerate the focused next-generation growth businesses                  • White LED                  • Li-ion battery materials for HEVs</p>
<p><b>M&amp;A</b></p>	<p>Strategic investment for alliances and M&amp;A</p>	<p>Realize strategic investment for alliances and M&amp;A</p>

# Business Environment Outlook

**Difficult to expect an immediate V-shaped recovery in demand, while customers' inventory adjustments have been almost settled**



# APTSIS 10 Growth Strategy

APTSIS

Respond to severe economic contraction

→ Reformation of business structure and stricter selection of focus in business

## Capital expenditure Investment & loan

**¥590 billion → ¥380 billion (-¥210 billion)**

FY2008-2010	Initial plan	Dec. 9, 2008	Current	(Unit: Billions of yen)
Performance Products Domain	210	150	150	
Health Care Domain	75	75	75	
Chemicals Domain	155	100	85	
Others	150	105	70	
<b>Total</b>	<b>590</b>	<b>430</b>	<b>380</b>	

## Measures by domains

### Performance Products

- **Expansion of existing growth businesses:** Food ingredients (M&A) and non-optical media
- **Overseas business expansion of high performance products:** Barrier film

### Health Care

- **Rapid execution of APTSIS 10:** Overseas business development and generic line up expansion
- **Acceleration in development of personalized medicine and expansion of Mitsubishi Chemical Medience Corporation's businesses**

### Chemicals (Petrochemicals)

**Today's topic**

- **Downsizing of domestic businesses:**  
Withdrawals from unprofitable derivative businesses and optimization of naphtha cracker operations
- **Reinforcement and expansion of overseas businesses:**  
Strategic alliances with leading companies
- **In the medium term, investment cash out will be within its cash in:**  
Capital expenditure/investment and loan: depreciation & amortization, R&D: licensing fees

# APTSIS 10 Innovation and Leaping Ahead Strategies

## New business development and M&A

### R&D expenditure control through thorough selection of focus

1. R&D expenditure **¥425 billion → ¥407 billion (- ¥18 billion)**

(FY2008-FY2010)

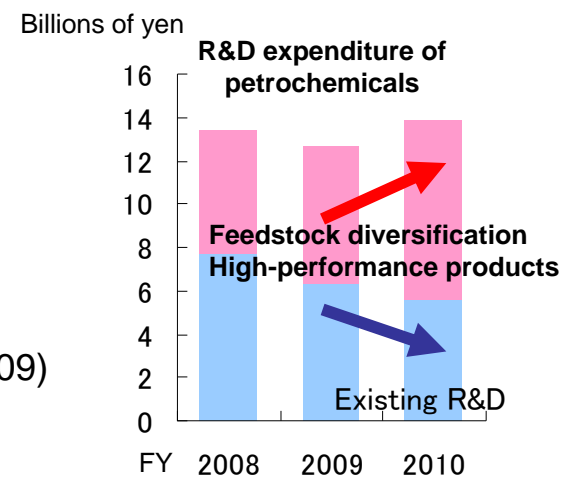
Initial plan **¥425 billion** → Dec. 9, 2008 **¥405 billion** → **Current ¥407 billion**

### 2. Focused next-generation growth businesses

- White LED** Development of leading-edge materials such as next-generation core materials (GaN, RGB phosphor, and sealant)

**Today's topic**
- Li-ion battery materials for HEVs** Development of high-power anode & cathode and electrolyte  
Development of materials with higher capacity and high security  
Commencement of preproduction of separator (Jun. 2009)
- Petrochemicals** Feedstock diversification (DTP and BTB)\*  
Shift to high-performance products (Iso-sorbite PC)

\* Dimethyl ether to propylene; Butene to butadiene



### Strategic investment

MPI's acquisition of Quadrant and others (FY2008-FY2010)

**¥250 billion → ¥250 billion + α**

# Restructuring of Petrochemicals Businesses (1)

## Domestic business restructuring and overseas business development

### Business restructure and withdrawal

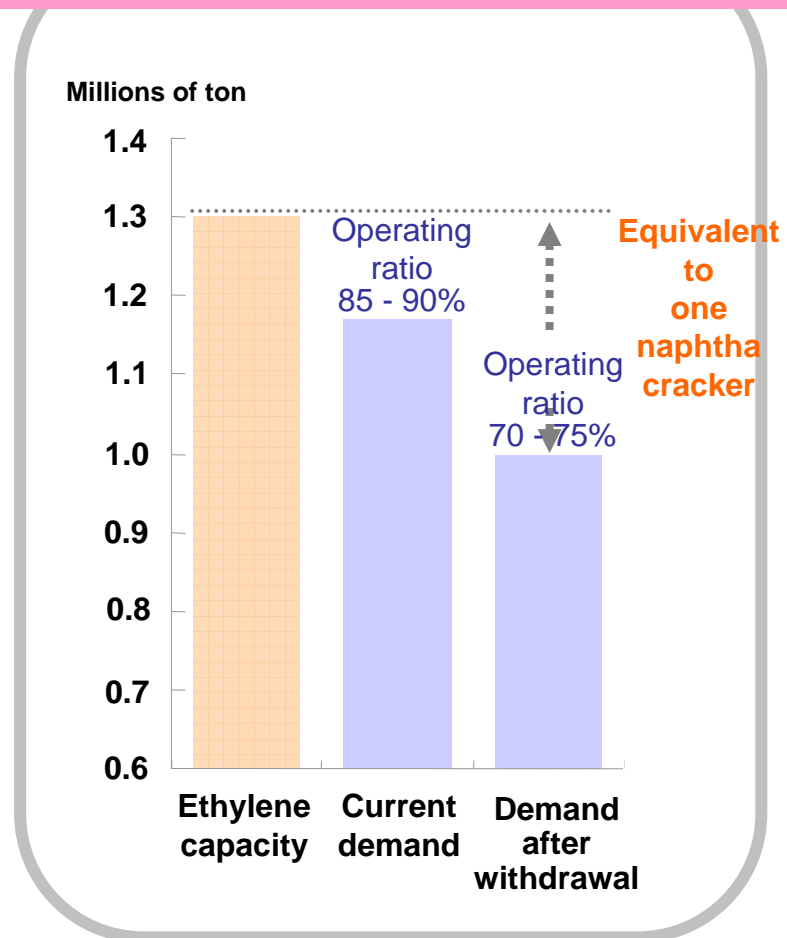
Business	Product	Plant	Measure	Timing
<b>EOG Surfactant</b> Withdrawal from unprofitable businesses and strengthening core businesses	Ethoxylate AO/HA EO	Yokkaichi Mizushima Kashima	} <b>Business withdrawal: Shutdown of production facility</b>  Strengthen business infrastructure by attracting customers (investment on infrastructure: ¥5 billion)	Mar. 2009
				May 2009
				Dec. 2010
<b>PTA</b> Shutdown of unprofitable production facilities and global operation	PTA Paraxylene (Overseas HQs)	Matsuyama Mizushima Singapore	} <b>Withdrawal from domestic business: Shutdown of production facility</b> <b>Streamlining by moving HQs operations and strengthening overseas regional strategy</b>	Dec. 2010
				May 2010
				Jun. 2009
<b>PVC</b> Withdrawal from unprofitable businesses	PVC PVC Electrolysis/VCM	Mizushima Yokkaichi/(Kawasaki) Mizushima	} <b>V-Tech's business contraction: Shutdown of production facility</b> <b>V-Tech's business withdrawal: Shutdown of production facility</b>	May 2008
				Mar. 2011
				Mar. 2011
<b>SM</b> Withdrawal from unprofitable businesses	ABS/AS SM	Yokkaichi Kashima	<b>Business withdrawal by selling shares of Techno Polymer: Contract operation of production facility</b> <b>Business withdrawal: Shutdown of production facility</b>	Apr. 2009
				Mar. 2011
<b>Lactam/Nylon</b> Withdrawal from unprofitable businesses and strengthening focused businesses	Cyclohexane Cyclohexanone Caprolactam Nylon	Mizushima Kurosaki Kurosaki Kurosaki	} <b>Business withdrawal: Shutdown of production facility</b>  <b>Overseas business expansion by transferring nylon business to Royal DSM N.V. and acquisition of PC business from Royal DSM.</b>	Mar. 2010
				Mar. 2010
				Mar. 2010
				Target:2009



# Restructuring of Petrochemicals Businesses (2)

## After withdrawal

**Low naphtha cracker operating ratio with weakened demand (Increase in shortage of C3/C4)**



## Toward restructuring

**Plant site restructuring**

### Mizushima Plant

- Study on an integrated operation of naphtha crackers with Asahi Kasei
- Establishing a joint venture
- Optimization of ethylene center (within a three-year target period)

### Kashima Plant

- Strengthening infrastructure
- Attracting EO customers

### Kurosaki Plant

Specialize in high-performance products

### Yokkaichi Plant

Specialize in high-performance products

**Common items**

Drastic reformation of utilities, tank yard, and other common facilities

# Restructuring of Petrochemicals Businesses (3) <sup>APTSIS</sup>

Partnership with global leading company in each business or region

## China

- Accelerate business development to ever-growing Chinese market by a strategic business partnership with SINOPEC

### Study items

(\*) Received an operating license from the Chinese government as of May 21, 2009  
Undertake an establishment of JV and a construction of production facility from now

Cooperation through JV: PP compound, BPA and PC, and C4 chemicals

Technology licensing: High-performance materials for automobiles  
(PP process and catalyst, etc.)

Raw materials and sales: Raw material supply and sales collaboration

New research: Effective use of C1 chemicals, CO<sub>2</sub> reduction,  
and organic photovoltaic modules, etc.

The partnership will cover various fields such as high-performance material and product business, exchanges of technological information and human resource, logistics, engineering, and others.

# Restructuring of Petrochemicals Businesses (4) <sup>APTSIS</sup>

## SE Asia, India, and the Middle East

### Study possible alliances and reform overseas business bases

- Sustainable resources:** Partnering with companies in regions which have advantages in raw material procurement
- 1-Hexene/BTB:** Partnering with companies in the Middle East which can provide competitive materials
- PTA:** Seeking alliance including polyester chain  
Streamlining organizations by transferring headquarters operations to Singapore

## Europe

### Global business expansion of high-performance products

- PP compound:** Alliance with Borealis AG
- PC compound:** Acquiring polycarbonate business of Royal DSM N.V.
- Engineering plastic products:** Business expansion by acquiring Quadrant AG

# Reinforcement of Management Infrastructure

## Reduction of fixed costs and reinforcement of business infrastructure

### ■ Reduction of fixed costs

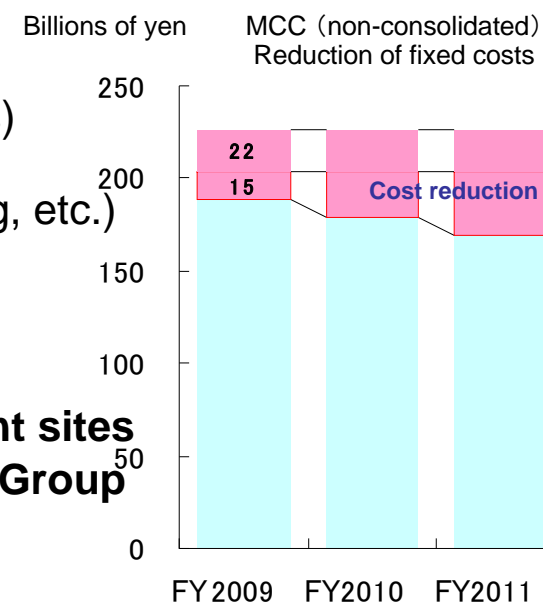
**MCHC: - ¥35 billion (included in FY2009 budget)**

(MCC Gr: - ¥25 billion; MTPC Gr: -¥6 billion; MPI Gr: -¥4 billion)

**MCC: Cost reduction by reformation of business structure**

(Non-consolidated) → **FY2011: ¥30 billion or above**

- **Streamline corporate functions**  
(Streamlining, Integration of functions)
- **Reduce plant infrastructures**  
(Reduction and optimization of excess facilities)
- **Reduce service companies' costs**  
(Logistic, information systems, and engineering, etc.)

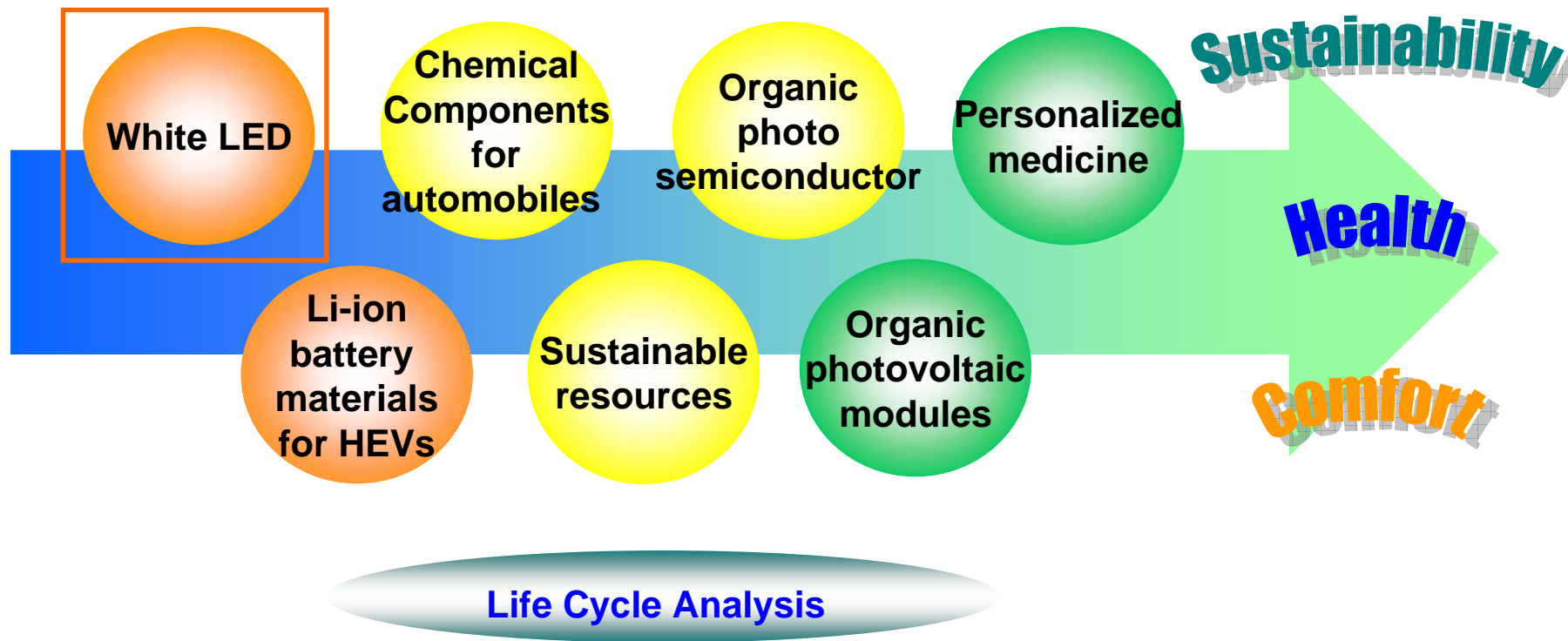


### ■ Medium- to long-term measures

**Drastic reformation envisioning future concepts of plant sites**  
**Building an efficient management system in the MCHC Group**

# APTSIS 10 Innovation Strategy: *APTSIS* Seven Next-generation Growth Businesses

Today's topic



- KAITEKI Project
- The KAITEKI Institute, Inc.

Inaugurated in June 2008  
Established in April 2009

# White LED Value Chain and MCC Business Progress



GaN substrate



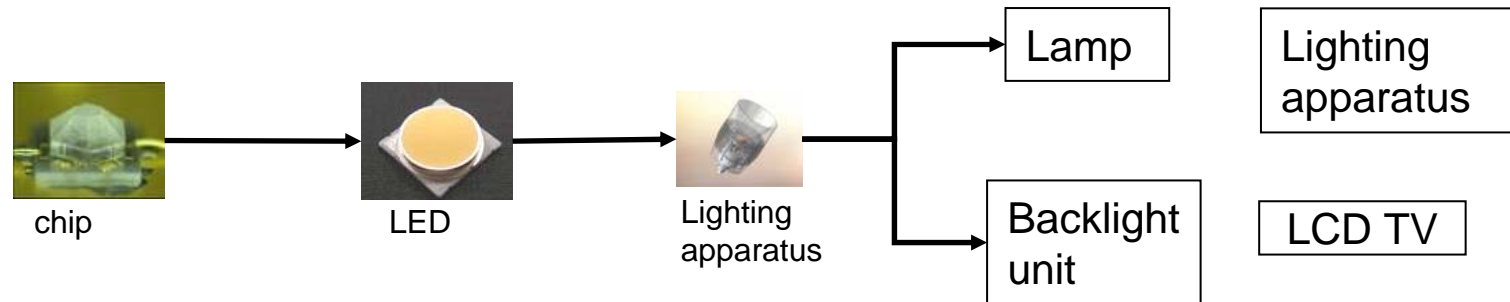
Phosphors



Encapsulant



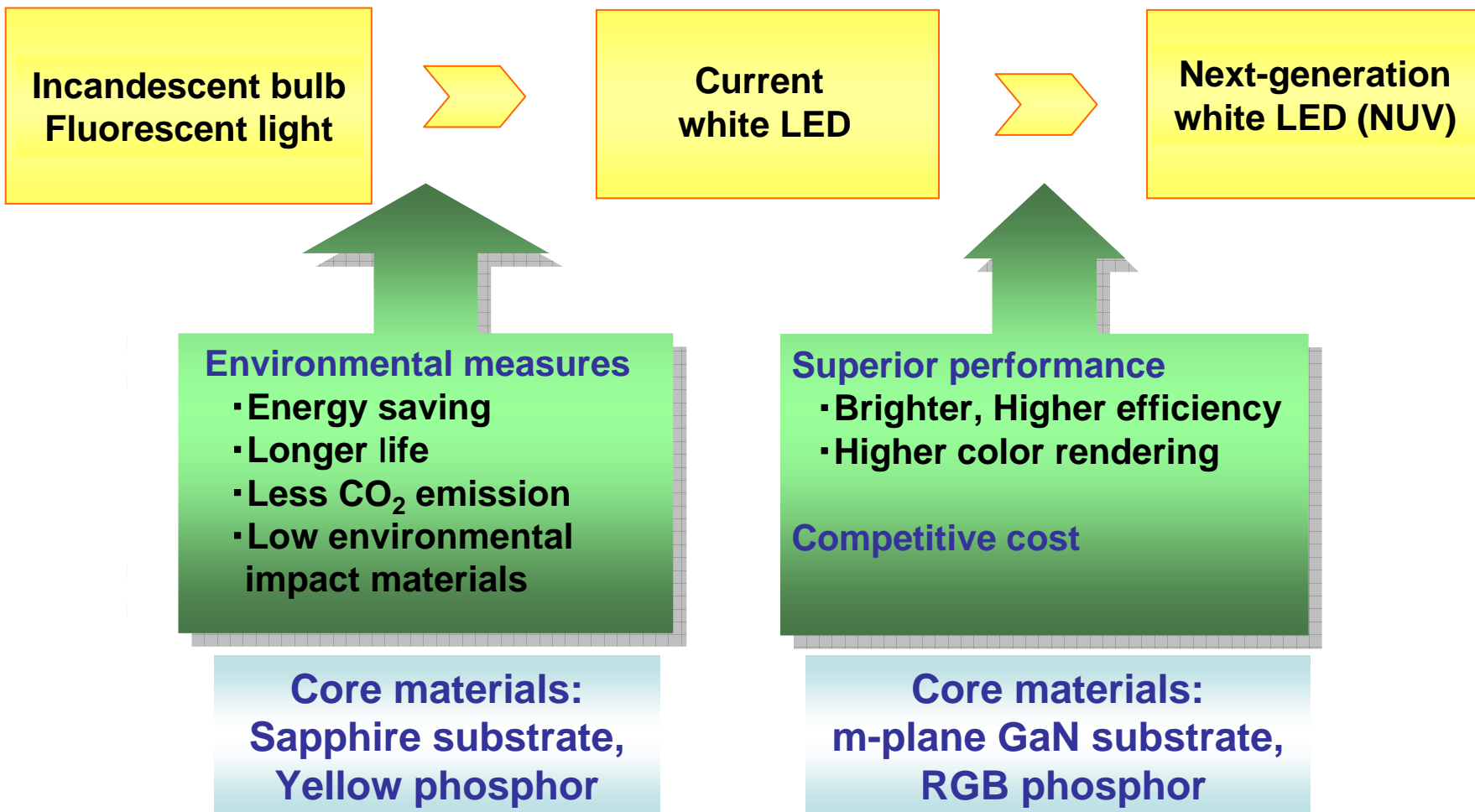
Package



- 2001 : **Started R&D of GaN at SSLDC\***  
 \*UCSB's consortium led by Dr. Shuji Nakamura
- 2006 : **Started manufacturing and sales of LED phosphor**
- 2008 : **Started manufacturing and sales of GaN substrate**  
 • **Acquired LED chip business from Mitsubishi Cable Industries, Ltd.**  
 • **Acquired exclusive patent rights of GaN substrate from Cree, Inc.**
- 2009 : **Started manufacturing and sales of NUV chip**

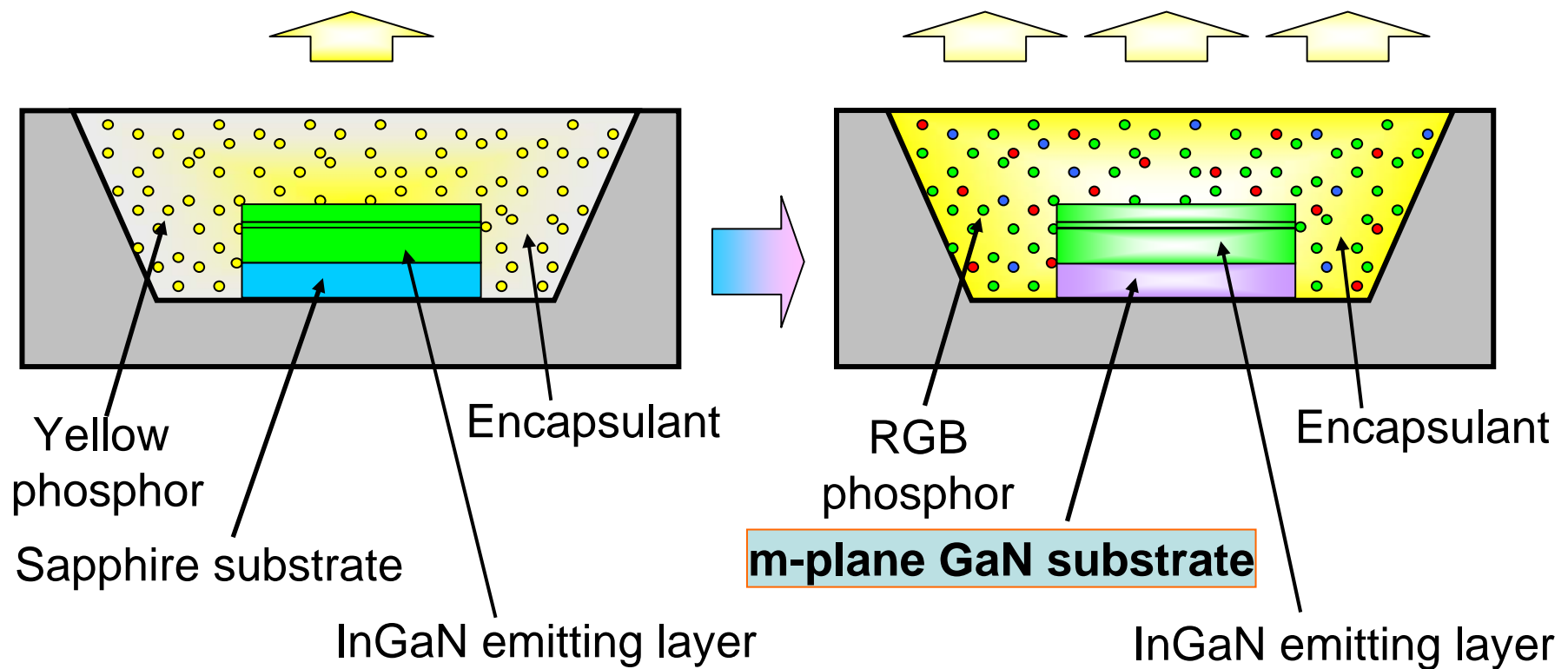
# Development of White LED

Trend for “Sustainability”, “Health”, and “Comfort”



# MCC's Challenge (1): m-plane GaN Substrate

**Efficiency improvement**  
**Three times higher efficiency is achieved**  
**by utilizing m-plane GaN !**

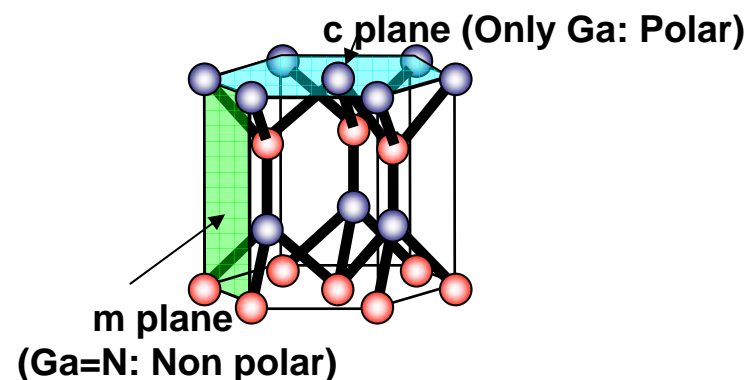




# Impact of m-plane GaN Substrate

2 inch m-plane GaN substrate

World first in preparing 2 inch m-plane GaN substrate



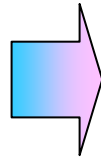
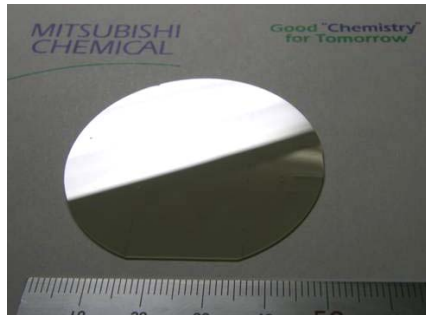
<Expected new product>

- White LED whose efficiency is three times higher than conventional white LED

Further new applications are yet to be created

# Creation of New Products by m-plane GaN

## 2 inch m-plane GaN substrate



## High efficiency green laser

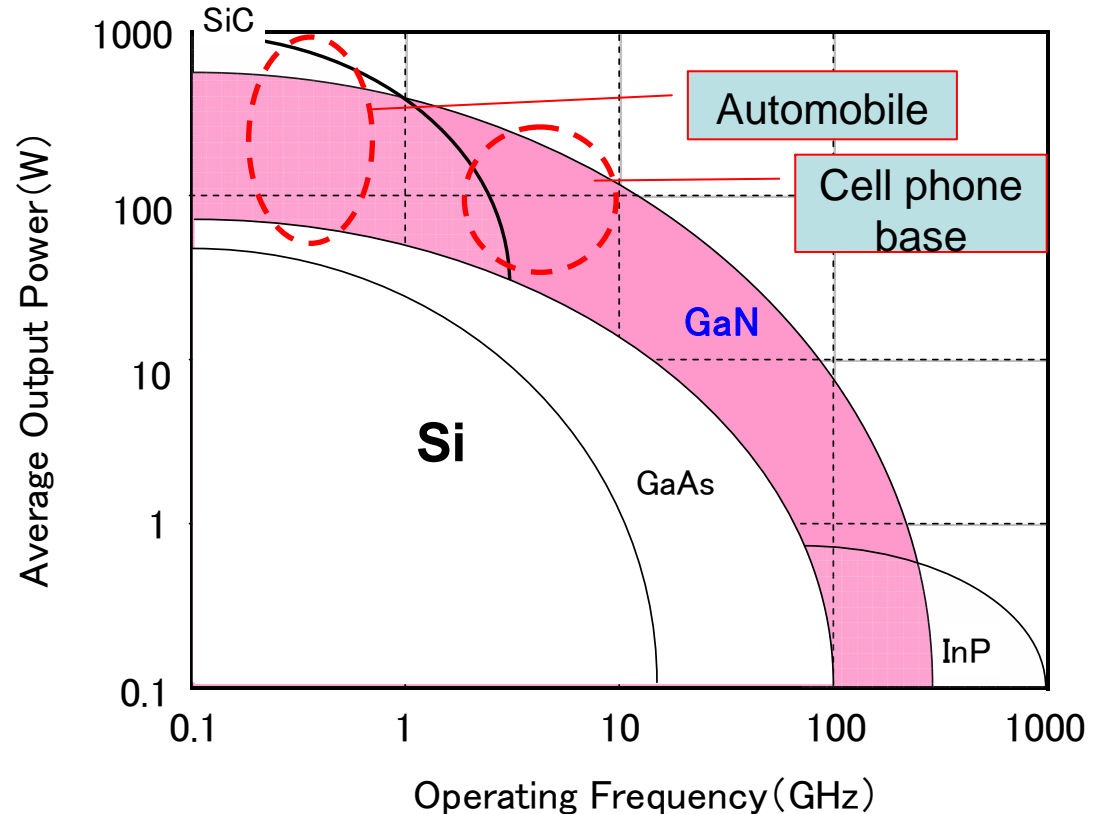
- Micro projector
- Rear projection TV



Mitsubishi Chemical Holdings Corporation

## Power transistor

- Aiming for replacing existing Si transistor by using high power and high frequency of GaN transistor.  
(For automotive usage, GaN will compete with SiC)

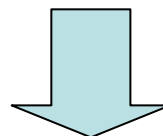


## MCC's Challenge (2): Phosphors

Optimum spectrum is realized through RGB phosphors.

This enables:

- **General lighting:**      **Natural white light**
- **Backlight for LCD TV:** **Higher color gamut**



### <Current Status>

MCC supplies phosphors for :

- White LED lighting with blue LED and RG phosphors
- White LED backlighting for LCD TV

(Market share: Red: almost 100%; Green: about 40%)

# MCC's Challenge: Material Business

**The target is to become a dominant supplier of core materials for the next-generation LED (GaN substrate, RGB phosphors, and encapsulant)**

**Supply leading-edge materials protected by strong patent networks**

**1. Phosphor**

Own material and application patent group of nitride phosphor (CASN)

**2. m-plane GaN substrate**

Own m-plane GaN patents which specify surface and thermal characteristics, and uniformity

Own exclusive license of Cree's fundamental patents of GaN

Own exclusive license of UCSB's device patent

**3. Encapsulant**

Own patents for UV durable Si encapsulant material

**Provide cost competitiveness**

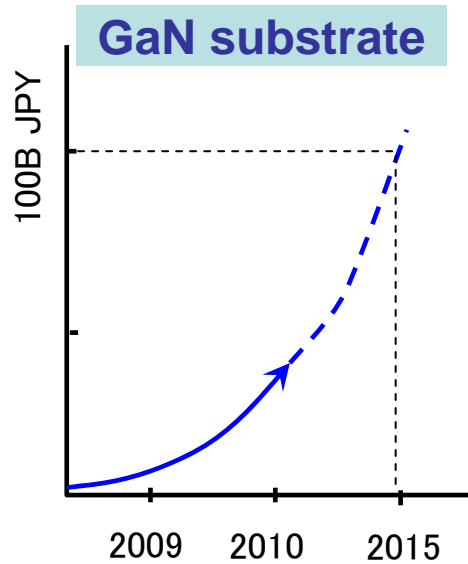
**1. Phosphor**

Merge with Kasei Optonix, Ltd. (KOX) which produces and markets phosphors since 1979 (April 1, 2009)

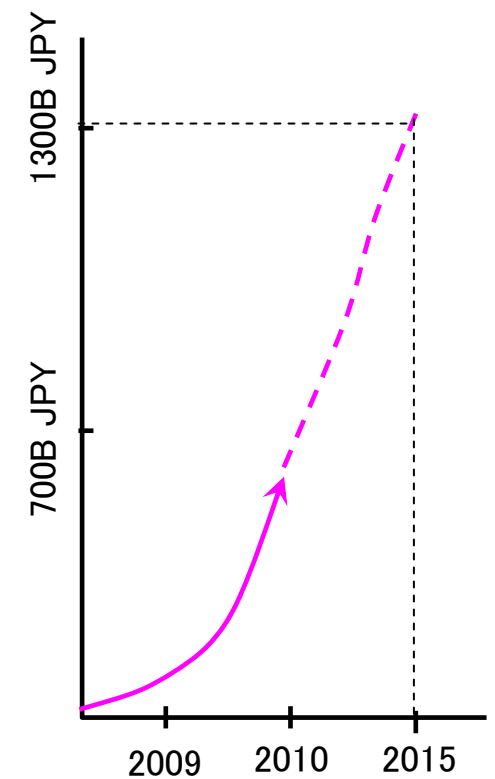
**2. m-plane GaN substrate**

Low cost preparation by ammonothermal growth of bulk GaN crystal (Targeted sample release: Spring 2012)

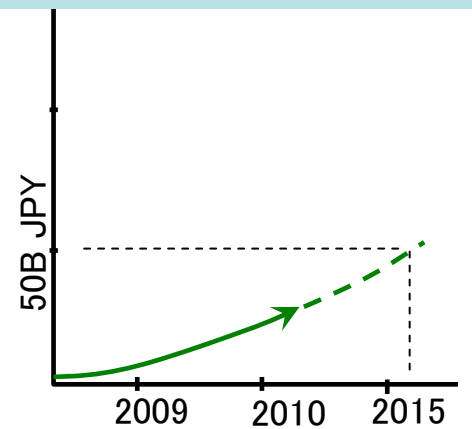
# White LED Market Forecast



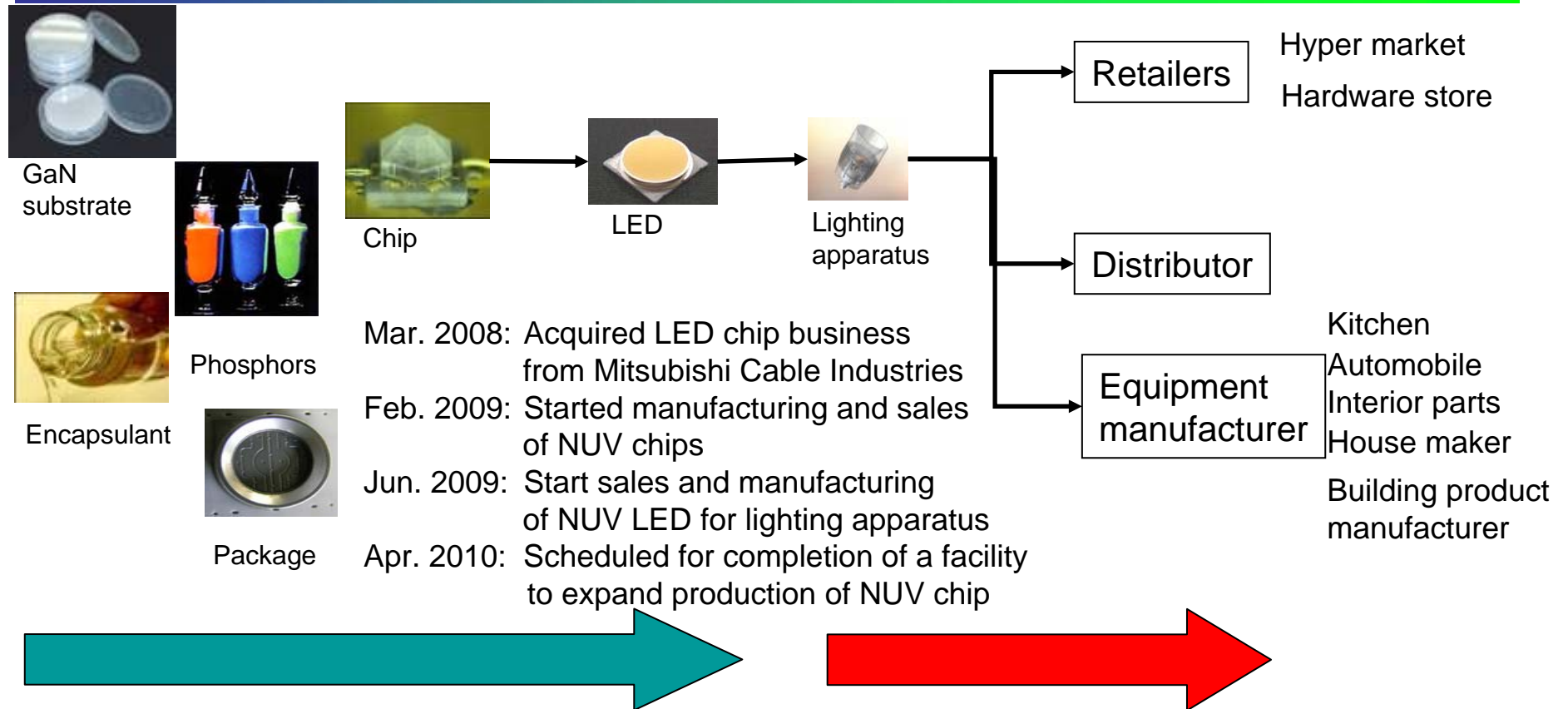
**White LED  
(for lighting and backlight)**



**Phosphors for white LED**



# MCC's Challenge: Sales of Lighting Apparatus



**Start to sell lighting apparatus in spring 2010  
using Verbatim's global sales network**

# Strategic Alliance between Mitsubishi Plastics and Quadrant



**2 June, 2009**

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**Hiroshi Yoshida**  
**President & Chief Executive Officer**  
**Mitsubishi Plastics, Inc.**

- **Purpose and Outline of Strategic Alliance**
- **About Quadrant AG**
- **Business Field of MPI & Quadrant AG**
- **Post-strategic Alliance**
- **Growth Image of MPI**

**Abbreviations are as follows:  
MPI ··· Mitsubishi Plastics, Inc.  
NPL ··· Nippon Polypenco Ltd.**



## Outline of Strategic Alliance

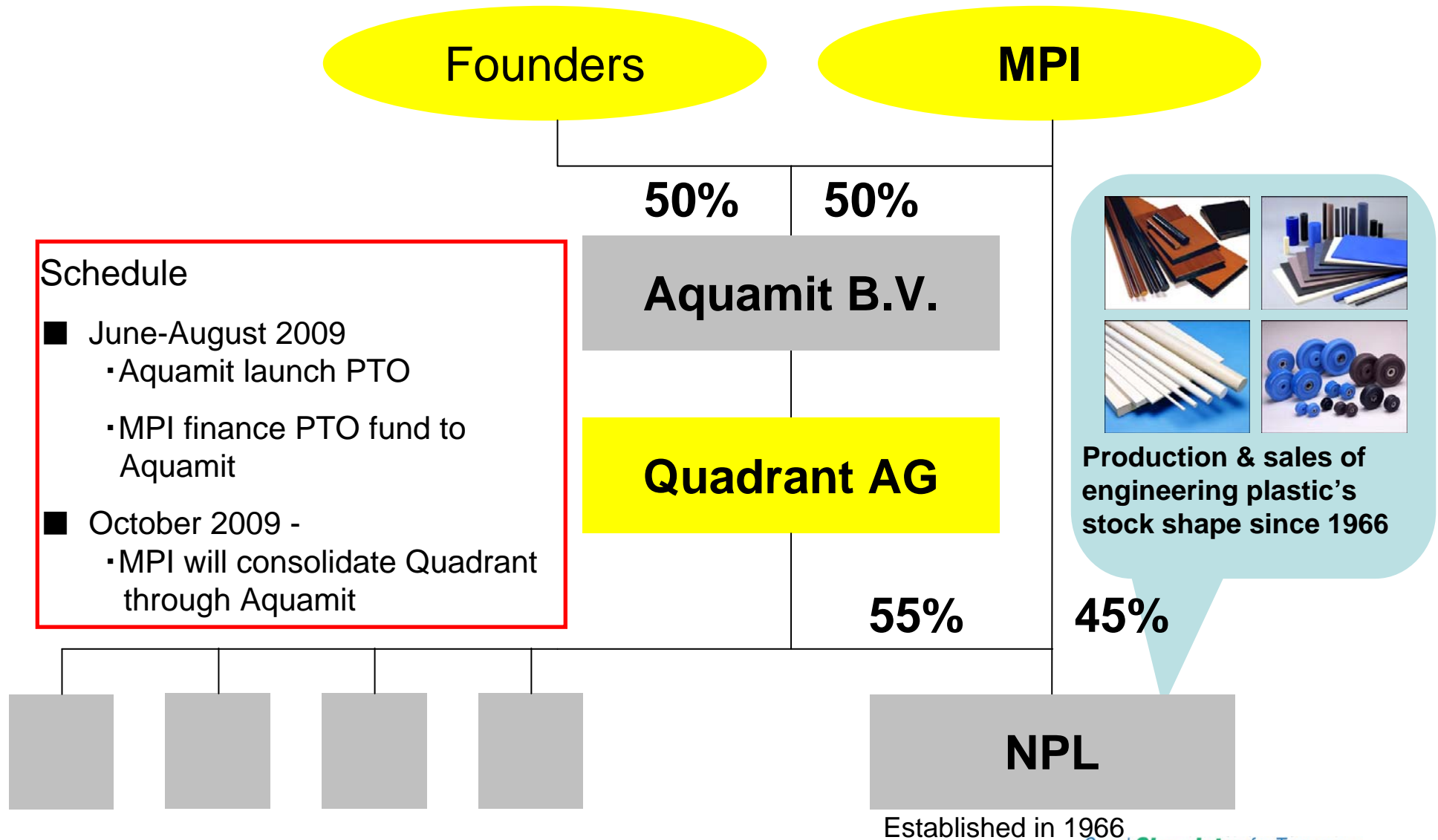
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The strategic alliance between MPI and Quadrant founders group is established as part of the global launch in engineering plastic business.

- On May 1, 2009, MPI and the Quadrant Founders Group have entered into a 50:50 Joint Venture (Aquamit B.V., NL) for the purpose of
  - Jointly running and developing Quadrant's business
  - Jointly taking Quadrant private through a public tender offer for all publicly held shares



# Aquamit Structure (from May 1, 2009)



**Schedule**

- June-August 2009
  - Aquamit launch PTO
  - MPI finance PTO fund to Aquamit
- October 2009 -
  - MPI will consolidate Quadrant through Aquamit



Production & sales of engineering plastic's stock shape since 1966

# Purpose of Strategic Alliance

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1. To become a global leading company in engineering plastic products
  - Especially in high potential growth region in ASIA
2. To achieve business cooperation
  - Achieve business partnership in engineering plastic products and plastic composites
  - Build partnership structures in injection molding business in the European and American markets
3. To build up global production network and sales channel to expand overseas business
  - Attain global production network with Quadrant's production sites and Japanese production sites owned by NPL
  - Accelerate oversea activities in various products such as plastics composites

## Who is Quadrant ?

### Corporate Motto

**YOU INSPIRE... WE MATERIALIZE**

- Location: Zurich, Switzerland
- Business field: Sales & production of engineering plastics products and glass fiber composites
- Capital: 27.5M CHF (2.3B JPY) \*1
- Total sales: 733M CHF (66.0B JPY) \*2
- EBITDA: 68M CHF (6.1B JPY) \*2
- Employees: 2,400 (19 sites in the world) \*1

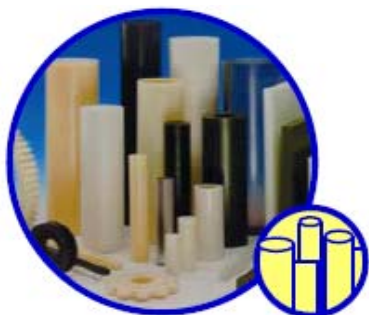
(1 CHF=90 JPY Data from Annual Report of FY2008)

\*1 As of 31 Dec., 2008

\*2 Fiscal year ending December 2008

# Business Units of Quadrant

## Engineering plastics products



**Global No.1 share**

**Sales ratio 75%**

## Creative molding & systems



**Top 10 share in Europe**

**Sales ratio 7%**

## Plastic composites



**Global No.1 share**

**Sales ratio 13%**

## Cable protection systems



**No.1 share in Switzerland**

**Sales ratio 5%**

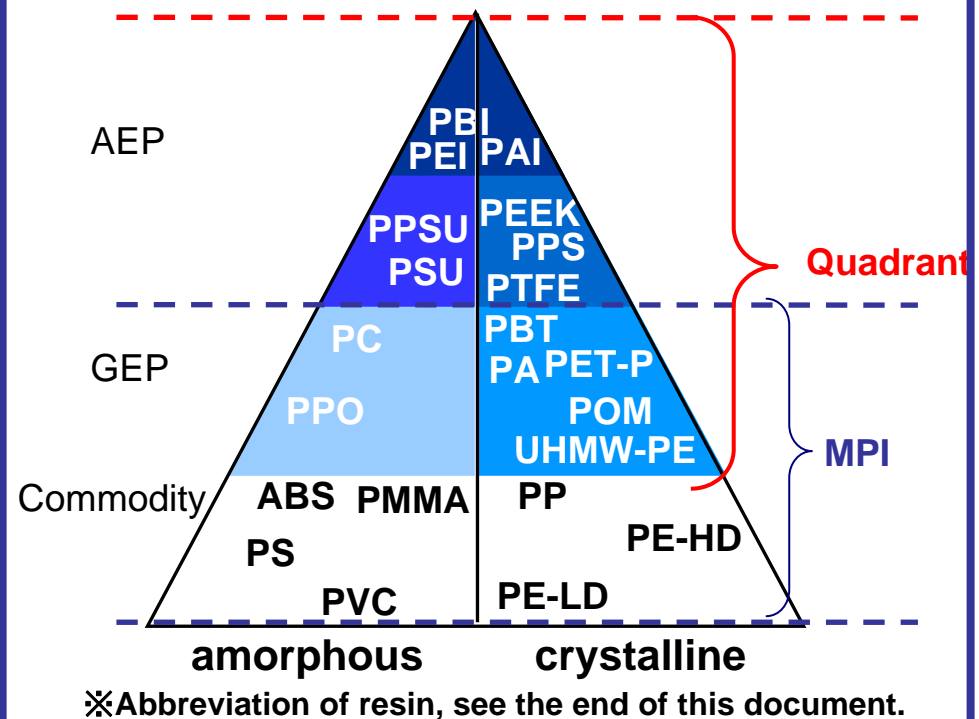
# Business Fields of MPI & Quadrant

MPI → General EPL (GEP) & Commodity plastics  
 Quadrant → Super EPL (AEP) & General EPL (GEP)

## Advantage of Quadrant

- **Technology effort**
  - Development & processing of AEP
  - Process machine technology  
(Main production machines are in-house made)
- **Wide range of EPL products**  
=Customer satisfaction
- **Worldwide network**
  - 19 sites in the world
  - Wide application field
- **Manpower for technical, marketing & sales**

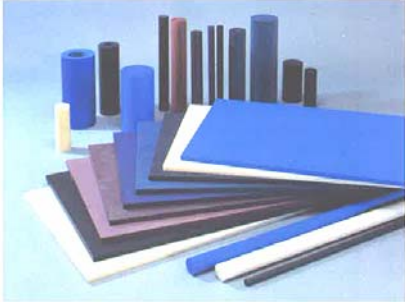



## Business fields: Quadrant & MPI



EPL: Engineering plastics; AEP: Advanced engineering plastics; GEP: General engineering plastics

# Quadrant's Business in Engineering Plastic Products

- Core business : Global No.1 share (30%)
- The joint venture company (NPL): No.1 share in Japan (75%)

	GEP products	AEP products
Semi finished parts	 <p><b>Stock shape (MC Nylon, POM extrusion)</b></p>	 <p><b>Stock shape (Extrusion of PPS)</b></p>
Finished parts	 <p><b>Gear (Machining from MC Nylon))</b></p>	 <p><b>IC Socket (Machining from PPS sheet)</b></p>

**MC Nylon: Monomer casting nylon**

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# Quadrant's Business in Composite Products

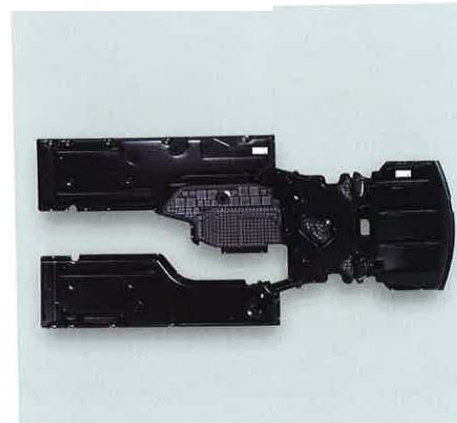
- The world top share in the glass reinforced fiber field for automobiles



Rear hatch



Floor panel module



**Materials are GMT+PP composites. Molding process is pressing.**



# Worldwide Market Share of Quadrant

**EPL business: Global 30% share**



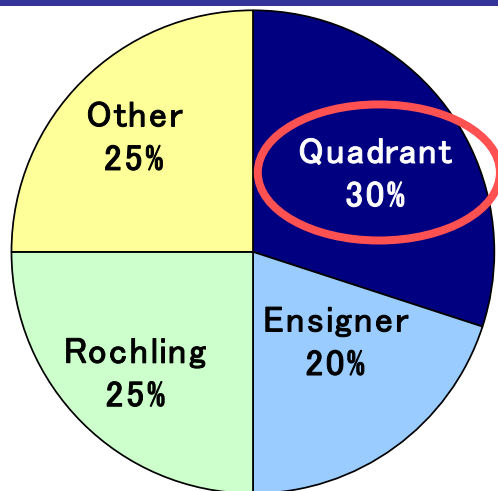
From domestic to worldwide  
⇒MPI's aims for the growing Market "Asia"

**Composite business: Global 25% share**

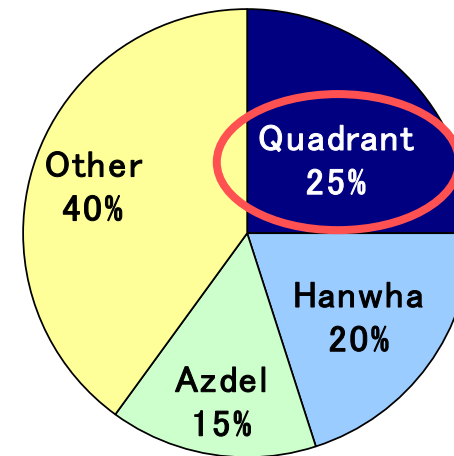


Collaboration CF, MAF and Quadrant's GMT  
Development of new hybrid composites with CF, MAF and GMT

**Market share of EPL products (worldwide)**

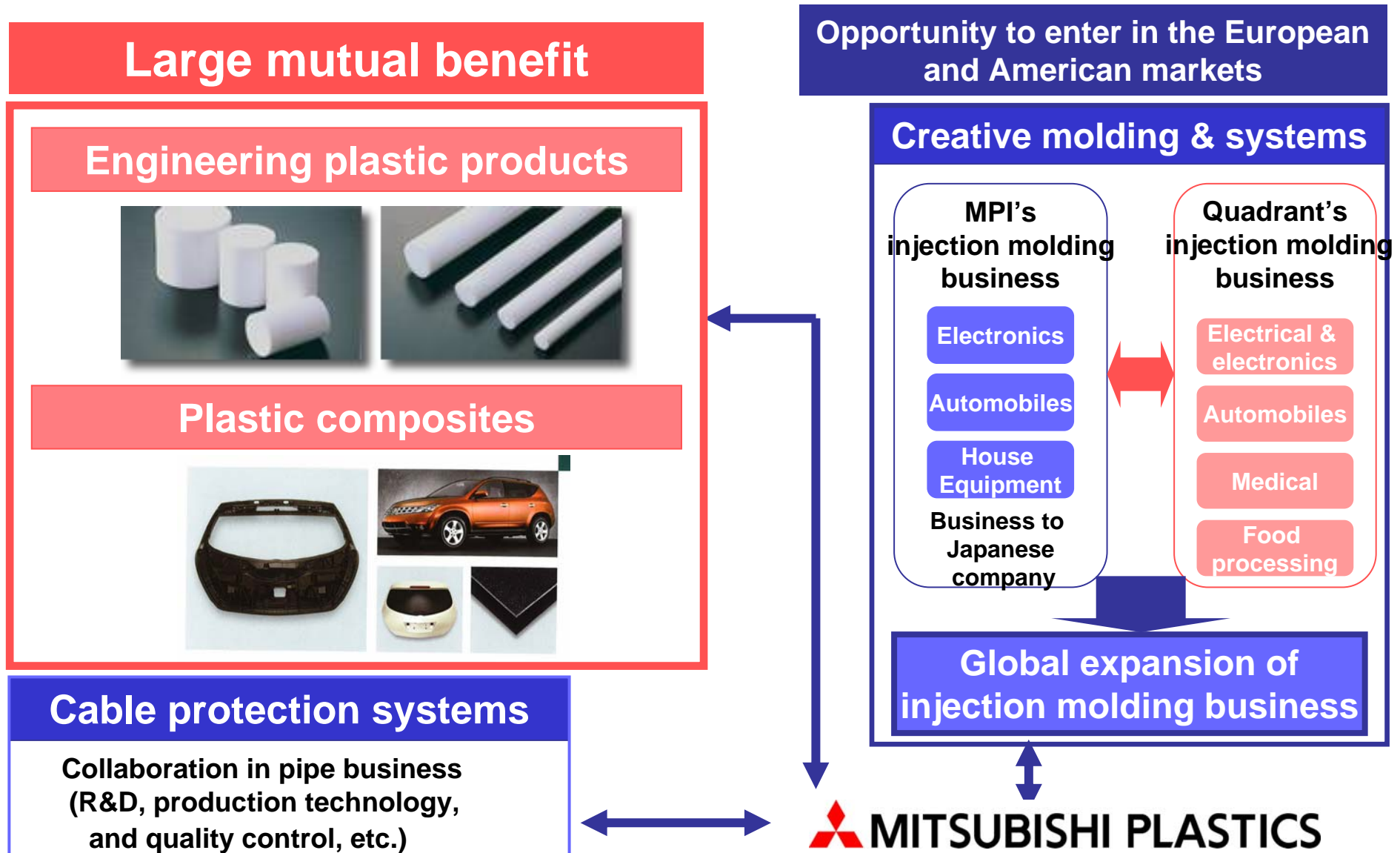


**Market share of GF composite (worldwide)**



GF .. Glass reinforced fiber  
CF .. Carbon fiber  
MAF .. Alumina fibers

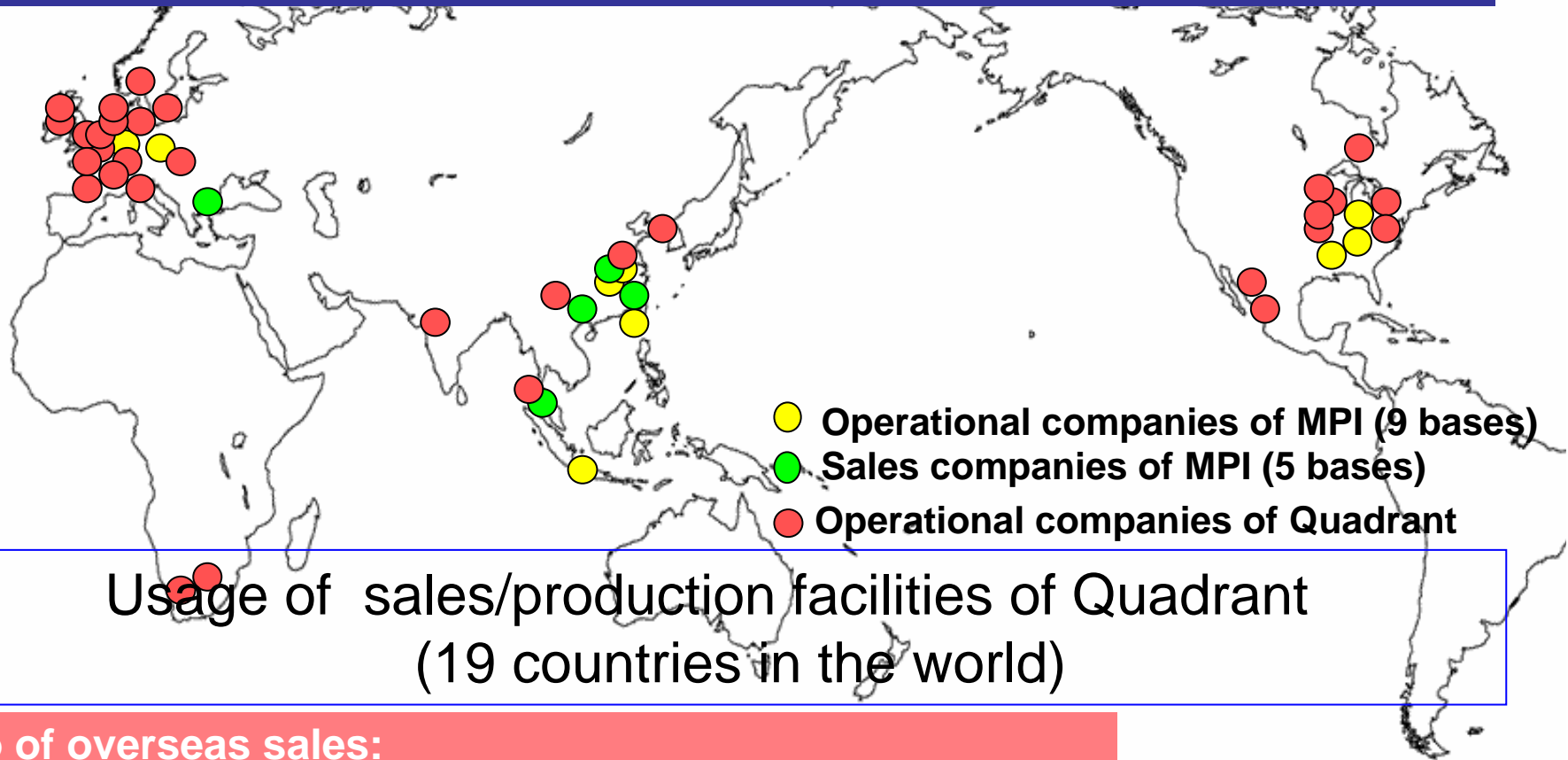
# The Main Mutual Benefit with MPI Businesses



# Overseas Deployment after Strategic Alliance

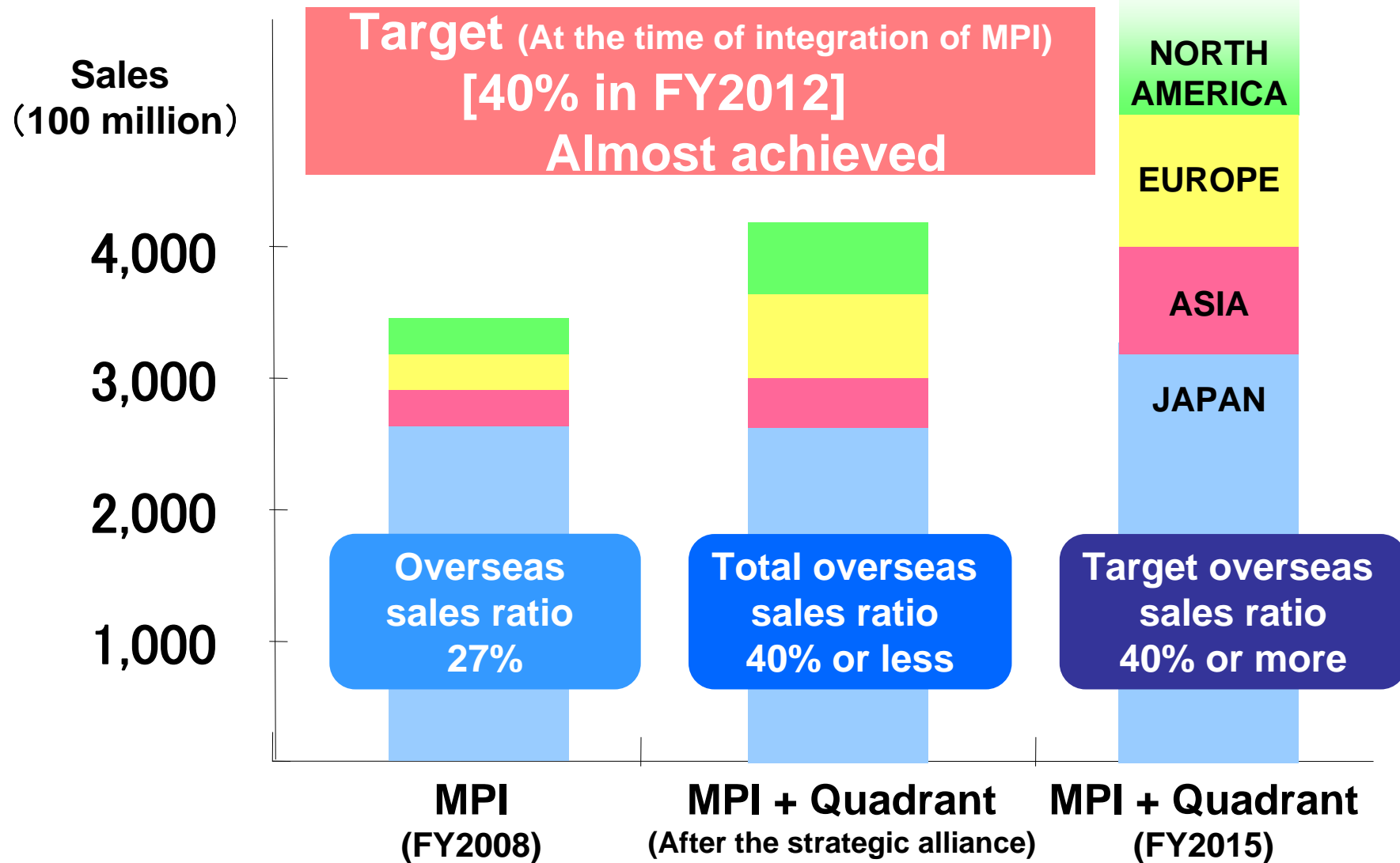
Strategic alliance → Global launch

**Overseas sales ratio target 27%→40%  
Almost achieved**



**Ratio of overseas sales:**  
The entire MCHC Group: FY2008 23%  
→After the strategic alliance 25%

# Overseas Sales Ratio after Strategic Alliance

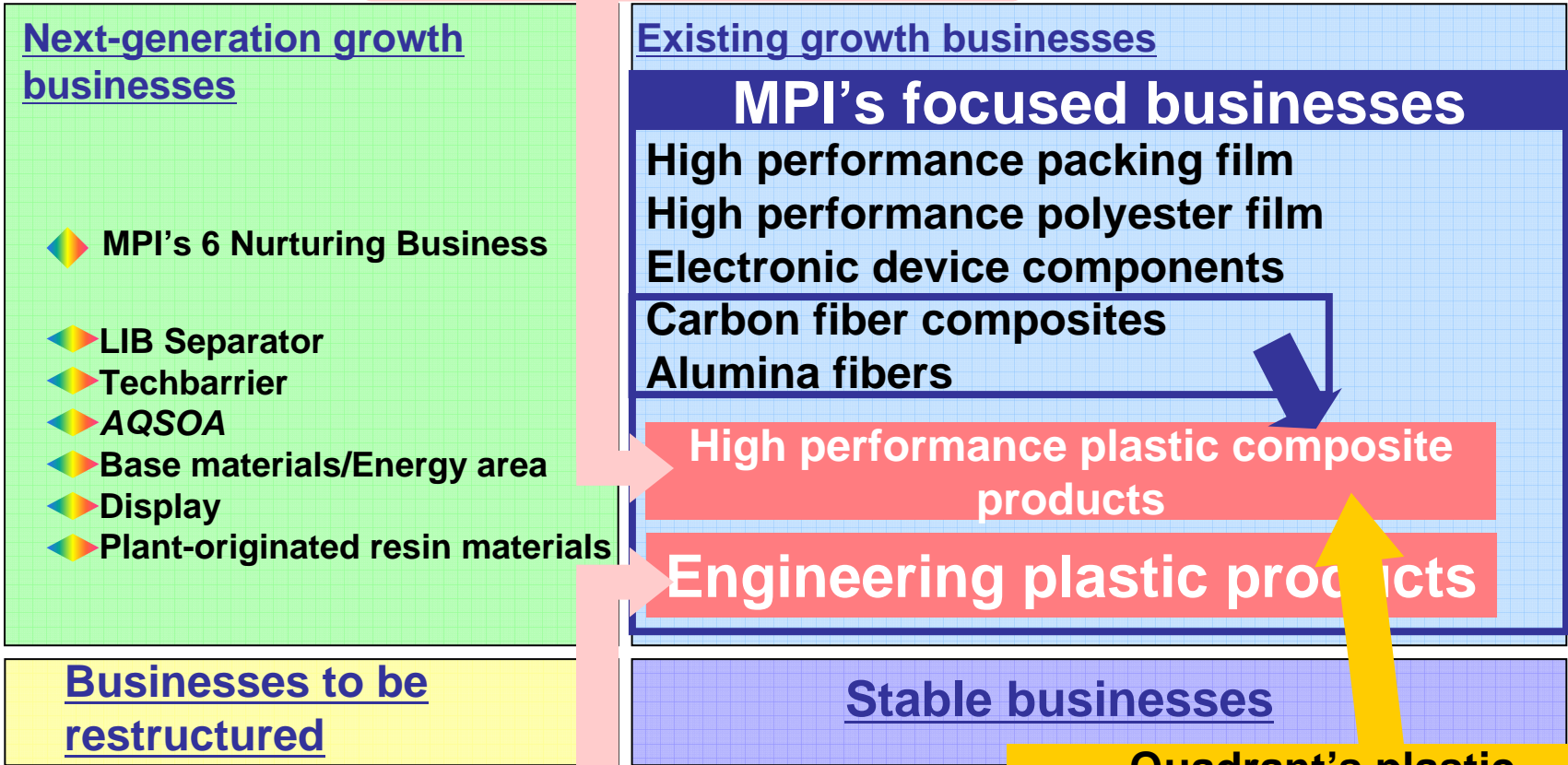


# MPI's Focused Business in the MCHC Group Business Portfolio

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**Categorized by profitability, market superiority,  
and market attractiveness**

Creation of a new business by  
cooperation with an existing business



Aims to be the next MPI's driver besides  
high performance polyester film

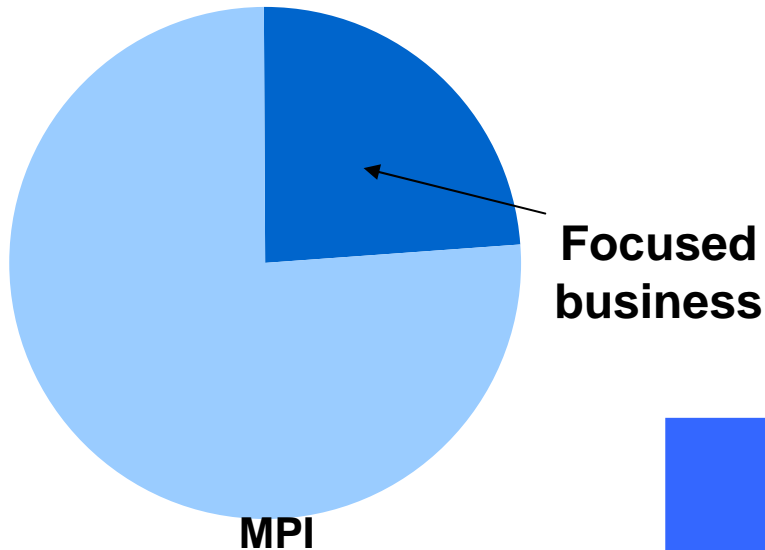
**Quadrant's plastic  
composites business**

# MPI: After Strategic Alliance

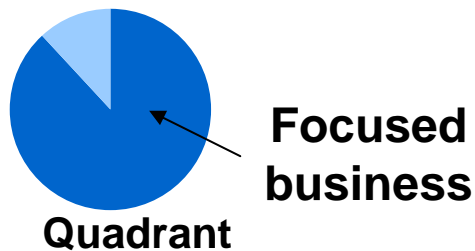
## - Scale of Strategic Alliance (Sales) -

**APTSIS**

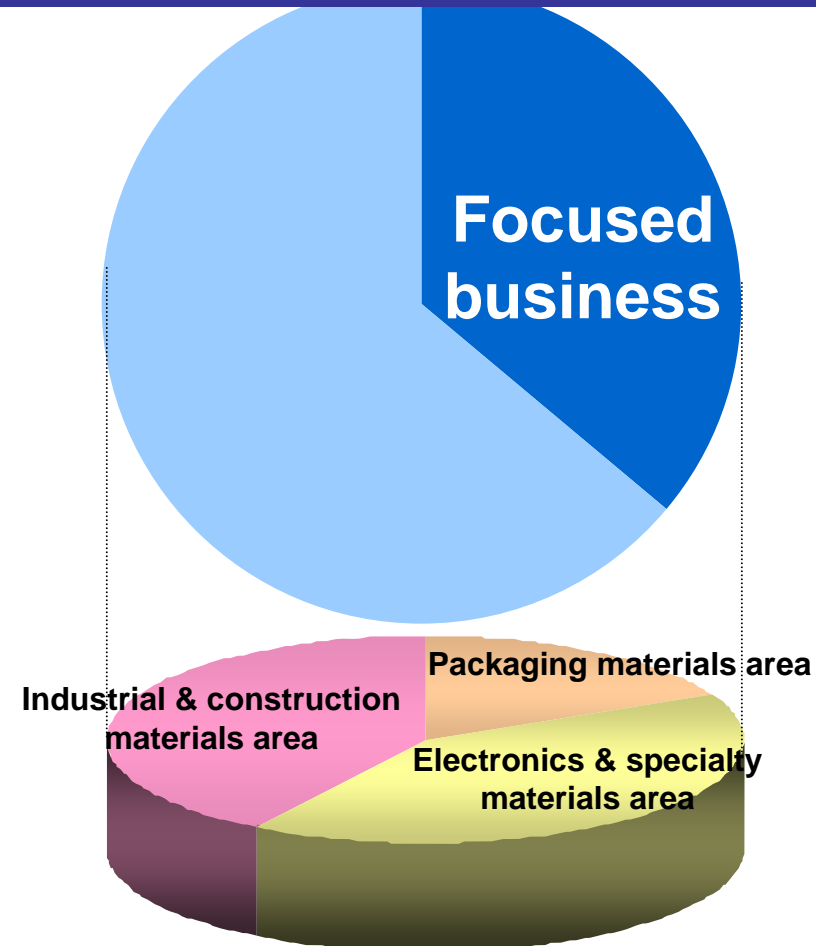
After strategic alliance  
Consolidated net sales  
412B JPY



Fiscal year ending March 2009  
Consolidated net sales  
346.1B JPY

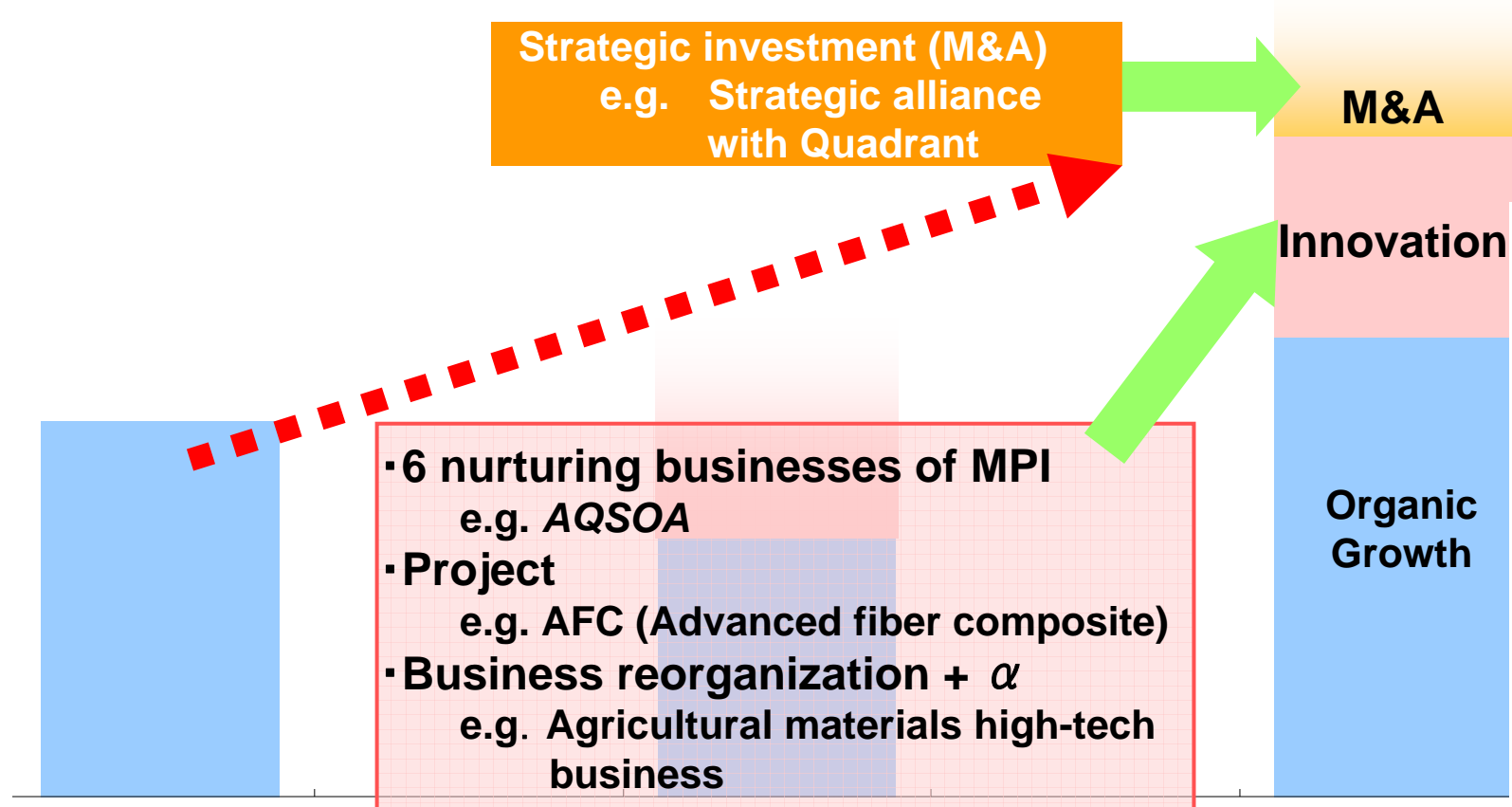


Fiscal year ending December 2009  
Consolidated net sales  
66.0B JPY



# Growth Image of MPI

Entering into high profit global market in Engineering Plastic by forming a strategic alliance with Quadrant



**Our target : To become a strong niche company**

## List of Abbreviations: Resins

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<b>PBI:</b>	<b>Polybenzimidazole</b>
<b>PEI:</b>	<b>Polyetherimide</b>
<b>PAI:</b>	<b>Polyamide-imide</b>
<b>PPSU:</b>	<b>Polyphenylsulfone</b>
<b>PSU:</b>	<b>Polysulfone</b>
<b>PEEK:</b>	<b>Polyether ether ketone</b>
<b>PPS:</b>	<b>Polyphenylene sulfide</b>
<b>PTFE:</b>	<b>Polytetrafluoroethylene (fluorine resin)</b>
<b>PC:</b>	<b>Polycarbonate</b>
<b>PPO:</b>	<b>Polyphenylene oxide</b>
<b>PBT:</b>	<b>Polybutylene terephthalate</b>
<b>PET-P:</b>	<b>Polyethylene terephthalate</b>
<b>PA:</b>	<b>Polyamide</b>
<b>POM:</b>	<b>Polyacetal</b>
<b>UHMW-PE:</b>	<b>Super-high-molecular polyethylene</b>
<b>ABS:</b>	<b>Acrylonitrile butadiene styrene copolymer</b>
<b>PMMA:</b>	<b>Polymethylmethacrylate</b>
<b>PS:</b>	<b>Polystyrene</b>
<b>PVC:</b>	<b>Polyvinyl chloride</b>
<b>PP:</b>	<b>Polypropylene</b>
<b>PE-HD:</b>	<b>High-density polyethylene</b>
<b>PE-LD:</b>	<b>Low-density polyethylene</b>