

APTSIS

Mitsubishi Chemical Holdings Group Investors Meeting



December 9, 2008

**Yoshimitsu Kobayashi, President
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

- **APTSIS 10 Current Status**

- **Business Topics**
 - **Carbon Business**
 - **Li-ion Battery Materials Business**

APTSIS 10 Current Status

- **Business Environment**
- **Acceleration of Restructuring Petrochemical Businesses**
- **Next-generation Growth Business**
 - **White LED Project**

Business Environment

Variables	APTSIS 10 assumptions (May 13, 2008)	Current status (December 2008)
Economic condition	Economic downturn	Global negative growth ('09-'10) No longer decoupling
Naphtha price	68,000 yen/kl	Weighted average of imported naphtha 4Q: 53,000 yen/kl (19,000 yen/kl*) <small>* Referring spot price as of Dec.5</small>
FOREX	105 yen/US dollar	92 yen/US dollar (as of Dec. 5)
Intensifying competition in advanced materials	Identify seven next-generation growth businesses	Prioritization
Drug price revision in Japan	Every other year	Every other year
Supply volume increase from the Middle East	<ul style="list-style-type: none"> • Excess supply • Global economic growth rate of 4.4% 	<ul style="list-style-type: none"> • Excess supply • Further damage caused by recession • Global economic growth rate of 2.8% or lower

Turning point

Business Portfolio: Current Status (December)

*Today's topics

Next-generation Growth Businesses

White LED*
Li-ion battery materials for HEVs*
 Chemical components for automobiles
 Sustainable resources
 Next-generation displays
 Organic photovoltaic modules
 Personalized medicine

Existing Growth Businesses

e.g.
 Pharmaceuticals
 Food Ingredients
 Recording media
 Performance polymers
High performance graphite*



High performance polyester films
 Electronic device components
C4 chemicals*
 Polypropylene
Polycarbonate and bisphenol-A*



Businesses to be Restructured

e.g.
Terephthalic acid*



Stable Businesses

Blast furnace coke*
Olefins and aromatics*



Business Environment of Petrochemicals

Recognition on upcoming business environment

- Global economic growth rate is 2.8%/yr or lower
(Further oversupply of price competitive Middle Eastern products)
- A sharp demand drop in automobile and IT industries

2010 - 2011
Global ethylene operation rate of 80%

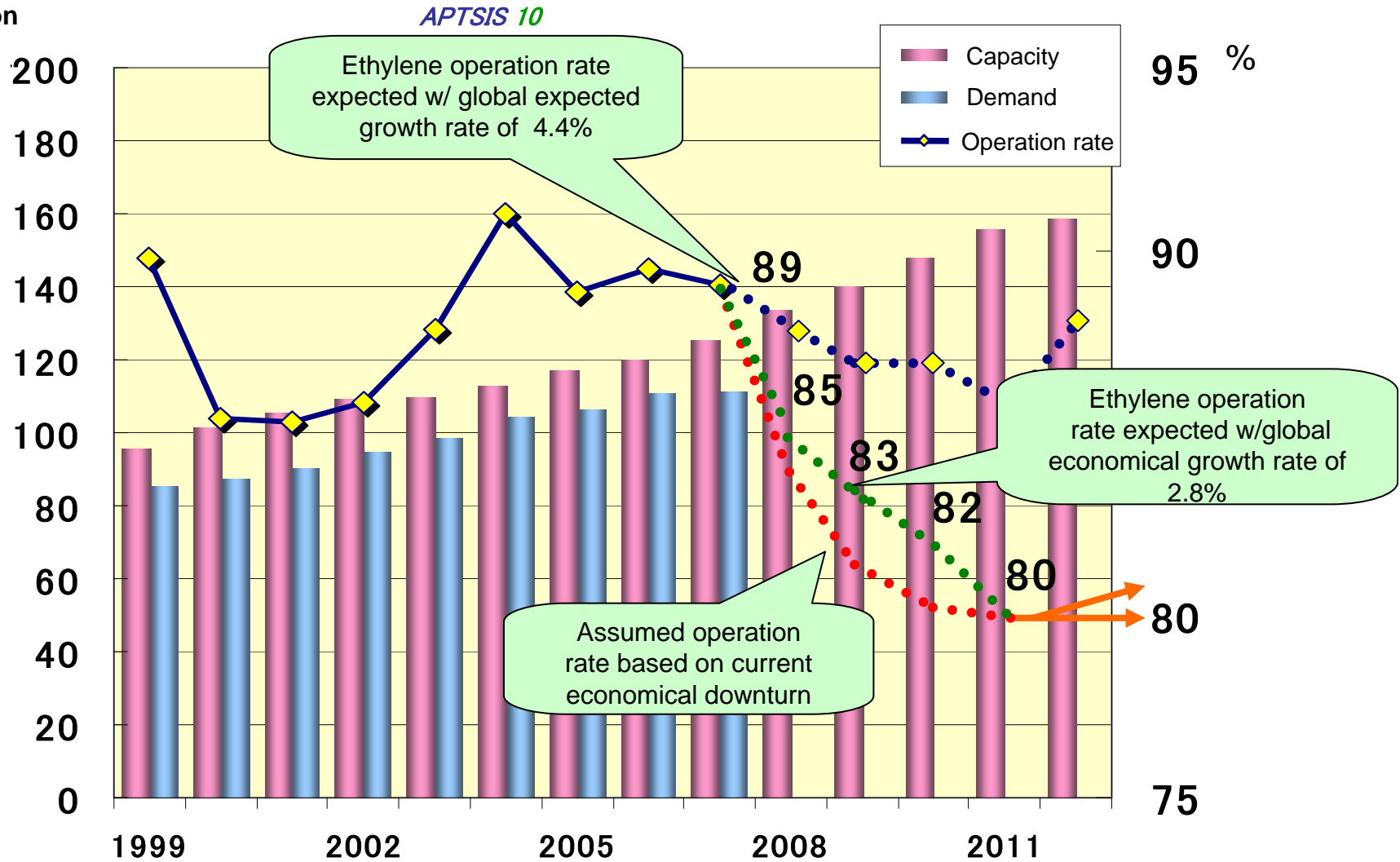
Recognition on upcoming impact on Asian suppliers

- **C2 derivatives: Operation rate 50 - 60%**
 - Commodity products are dominated by middle eastern products
- **C3 derivatives: Operation rate 80 - 85%**
 - Compete by delivering high value-added products
- **C4 derivatives: High value- added products are practically competitive**

Can compete in C3/C4 derivatives market
Tough to compete in C2 derivatives market

Global Ethylene Supply/Demand Balance

Million ton



Source: Demand forecast by METI (as of May 28, 2008) & Internal forecast

Measures for C2 Derivatives

Accelerate the following items during *APTSIS 10*

■ Withdraw weak C2 businesses

- Raising profitability **approx. by 10 billion yen**

■ Strengthen the foundation of polyethylene business

- Consolidating production facilities & shifting to higher value-added products


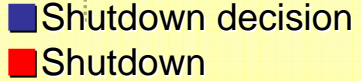




■ Optimize & reduce utility facilities

- Reducing number of boilers & improving fuel conversion
(**improve approx. 10 billion yen**)
- Sharing utilities in petrochemical complexes through partnership & cooperation

■ Asset lean

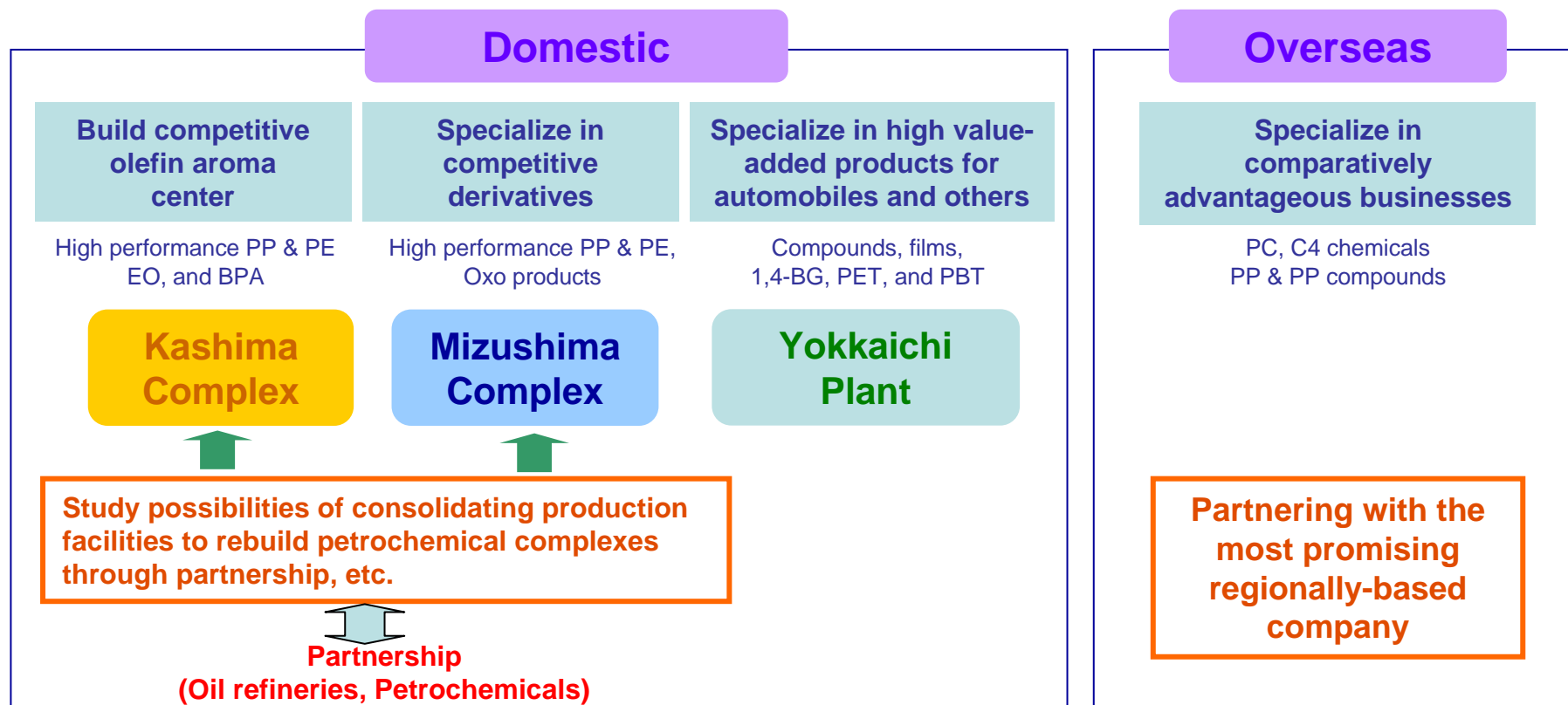
- FY2010 target is **approx. 200 billion yen reduction**
 - Reduce inventories
 - Reduce common facilities, etc.
 - Transfer shares
 - Business withdrawals : ABS, α -olefin, etc.

Timeline on Restructuring of Petrochemical Complexes

	FY2008	FY2009	FY2010	FY2011	FY2012
Linear alkylbenzene Acrylonitrile Melamine Acrylic acid, acrylic ester Polystyrene Compounds, polyethylene Polyvinyl chloride Styrene monomer	Mar. 2006: Production facility shutdown (surfactant) Apr. 2006: Decrease share in Dia-Nitrix Co., Ltd. (50% to 35%) Mar. 2007: Production facility shutdown Sep. 2007: JV dissolution with Sasol Chemical Industries Limited (South Africa) Mar. 2008: Dissolution decision on HMT Polystyrene Co., Ltd. (Thailand) Apr. 2008: Merger with Advanced Plastics Compounds Company in compounds business; Make Japan Polyethylene Corporation to a consolidated subsidiary of MCC May 2008: PVC production facility shutdown: V-TEC Corporation's Mizushima Plant Jul. 2008: Dissolution decision of Yuka Seraya Private Limited				
AO/HA (α -olefin)	 Dealing w/ customers and preparation for shutdown				
Ethoxylate	 Dealing w/ customers and preparation for shutdown				
ABS (Techno Polymer Co., Ltd.)	 Sale of shares				
Other C2 derivatives PTA	 Shutdown studies and decision making; preparation for shutdown				
Restructuring of petrochemical complex & Partnership	 Restructuring of each petrochemical complex by partnership				

Building Competitive Business Structure

Business expansion with competitive derivatives



Accelerate R&D to diversify feedstock from naphtha

- | | | | |
|------|------------------|---|-------------------------|
| e.g. | 1. Coke oven gas | → | Propylene (C1 chemical) |
| | 2. Butene | → | Butadiene |
| | 3. C2 | → | 1-Hexene |

Business Topics

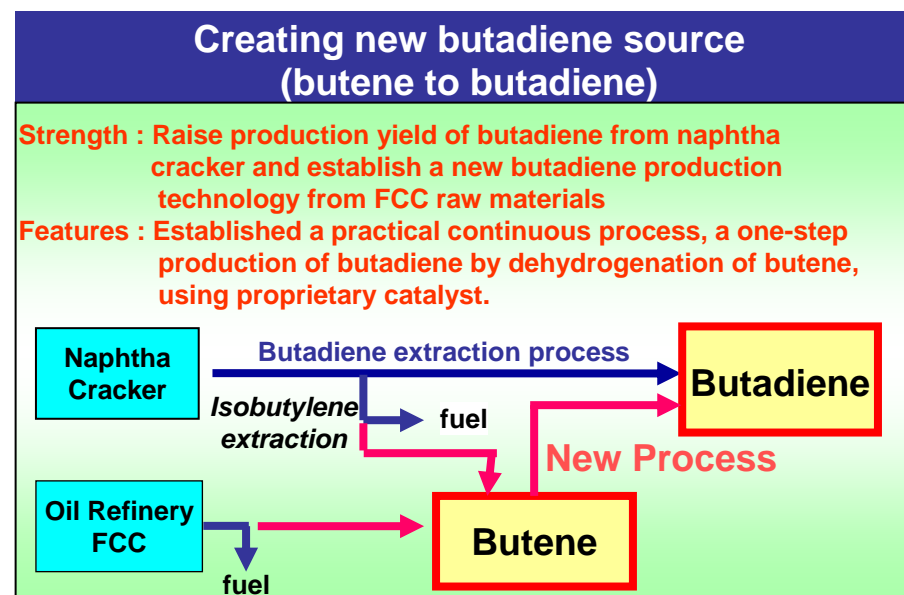
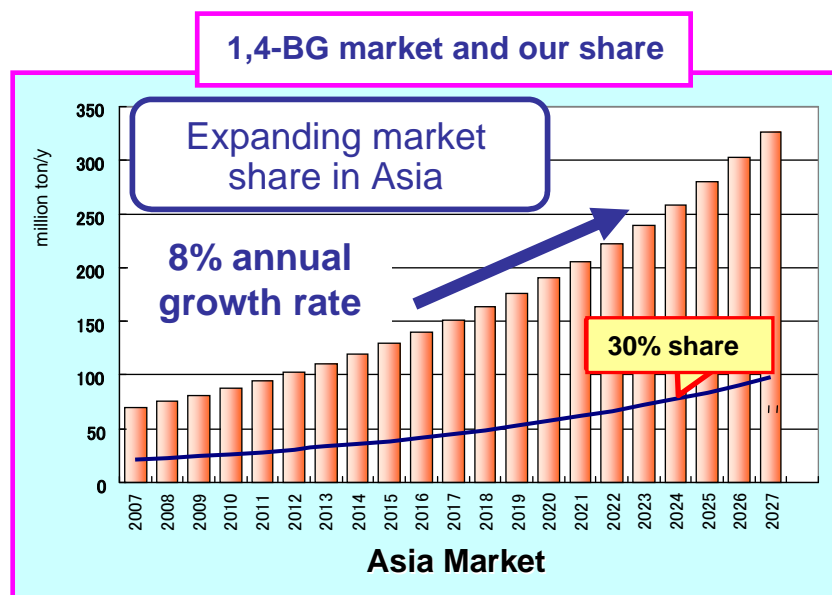
- Existing growth businesses
 - C4 Chemicals
 - Polycarbonate and bisphenol-A
- Business to be restructured
 - Terephthalic Acid

C4 Chemicals (1,4-BG, PTMG)

Increase market exposure in expanding Asian market

- Complete No.1 PTMG plant in China as planned (3Q, FY2008)
- Establish a new 'butene to butadiene' process to secure butadiene (Operation confirmed by 200t/yr pilot plant)
- Supply raw materials for green sustainable plastic, *GS Pla**

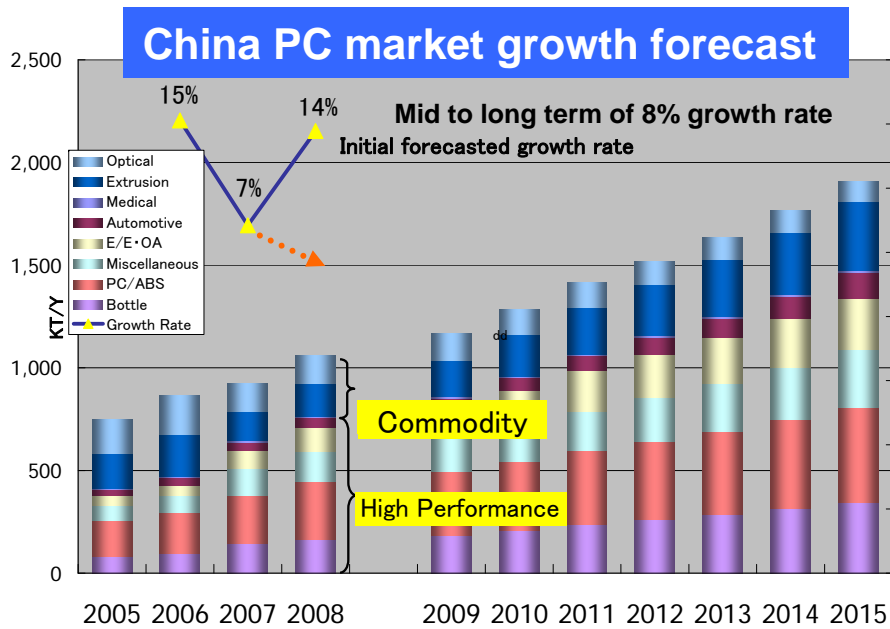
* Copolyester derived from succinic acid and 1,4-BG



Polycarbonate and Bisphenol-A

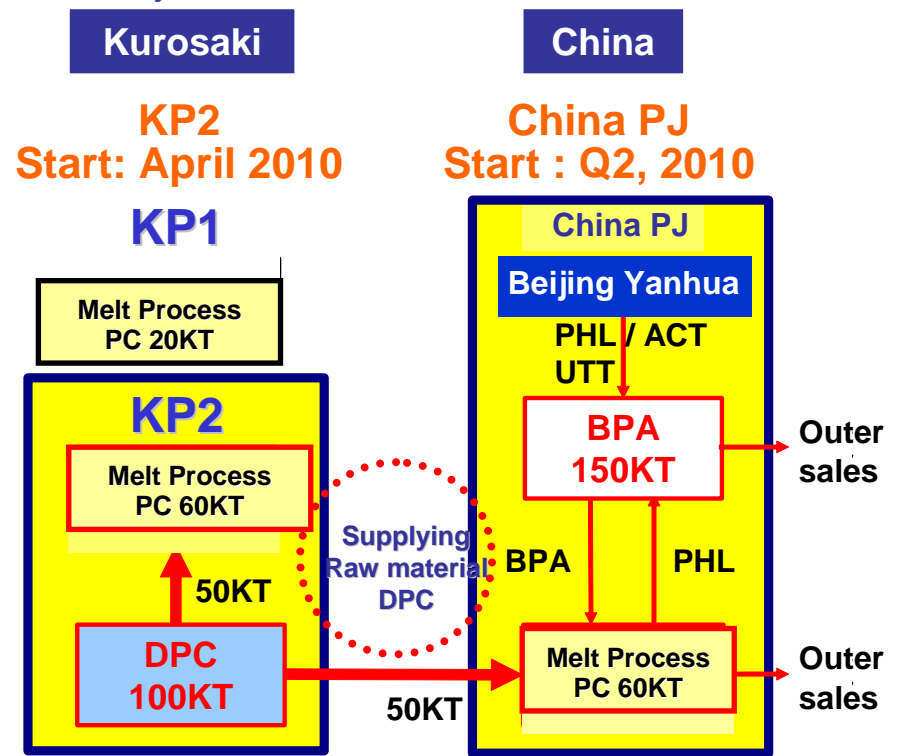
Targeting high performance market segment in China

- Combine SINOPEC and Mitsubishi Engineering-Plastics Corporation's sales channel & our R&D to increase market presence in China.
- Supply DPC (raw material, diphenyl carbonate) to China from No. 2 polycarbonate production facility (KP2) at the Kurosaki Plant in conjunction with China PJ.



China Market
Asian share 20% or more

'08 MEP Share 5% → MEP Share 10%



Terephthalic Acid

Thorough cost reduction and alliances

■ Regional strategy

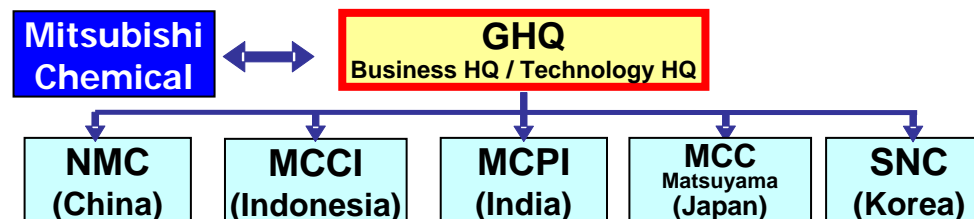
India, Indonesia, and China: Alliance with regionally-based company to leverage sales and production

■ Cost competitiveness

- Secure profit with 150\$/t spread
 - Streamlining, etc. 4.5 billion yen (FY2008)
 - Variable cost reduction 3.0 billion yen (Investment 4 billion yen; within 2yrs recovery period)
- Unprofitable production facilities are under review

■ Management by overseas global head quarters (GHQ)

- Manage procurement, sales, and technology
- Streamline organization by human resource localization



CAPEX and Investment & Loan

APTSIS 10 resource allocation revised

■ CAPEX and investment & loan

➤ Reduction by prioritization

590 billion yen → 430 billion yen (−160 billion yen)

Performance Products	210 billion yen	➔	150 billion yen
Health Care	75		75
Chemicals	155		100*
Others	150		105

* ca.70 billion for petrochemical's safety measures and rationalization

■ Strategic investment & loan

➤ 250 billion yen (guide line) + α

■ R&D expenses

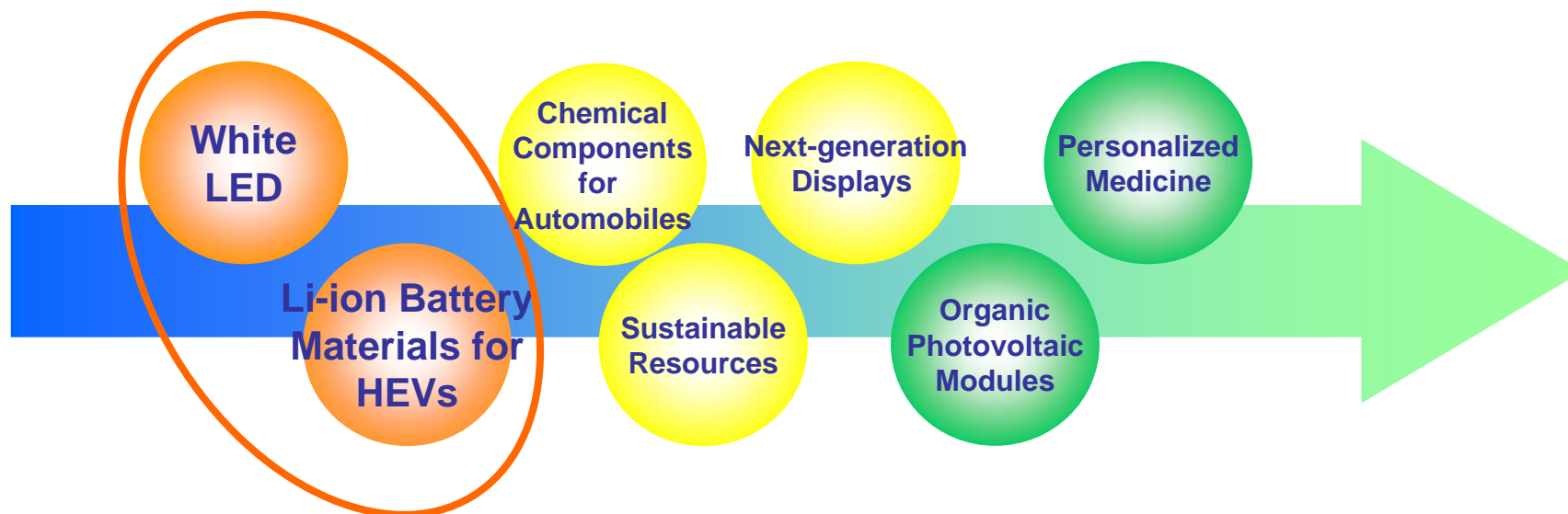
➤ Prioritize

425 billion yen → 405 billion yen (−20 billion yen)

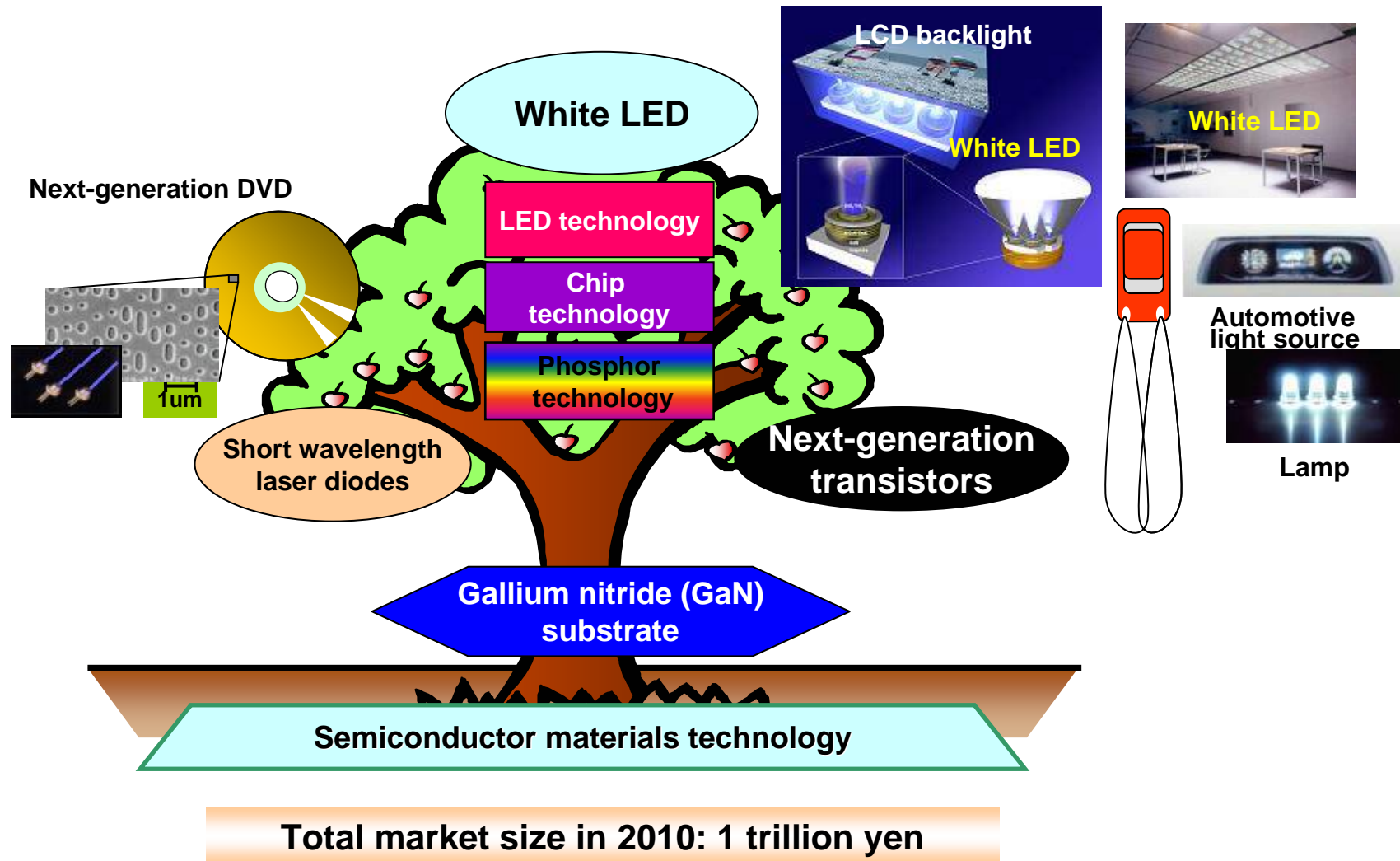
White LED and Li-ion battery materials will be top priority among the seven next-generation growth business

Seven Next-generation Growth Business

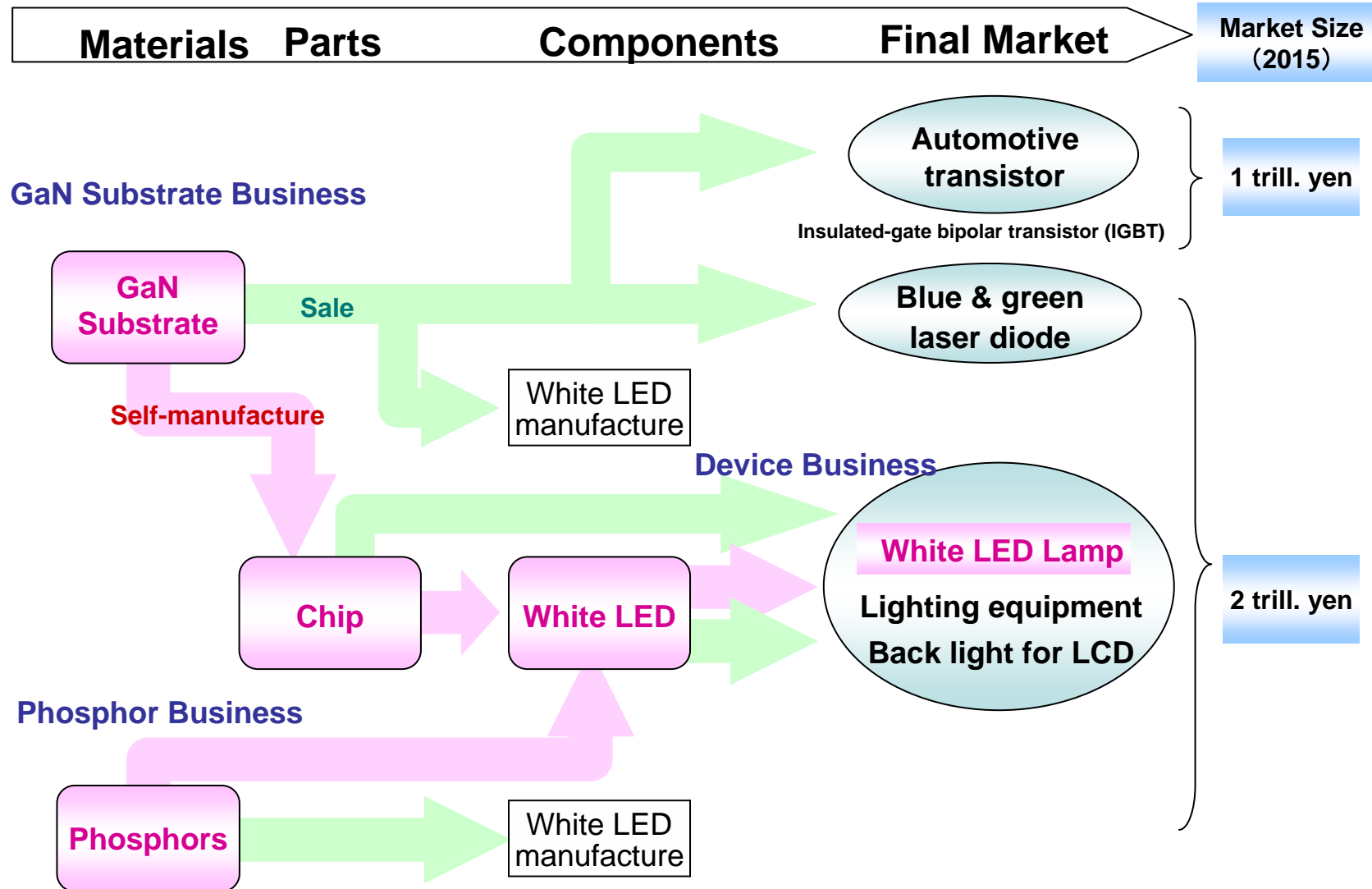
Prioritize in white LED and Li-ion battery material for HEVs



White LED Project



Business Expansion Flow



Update on GaN Substrate

Vapor deposition method

2" c-plane
(production stage)



Full-scale sales

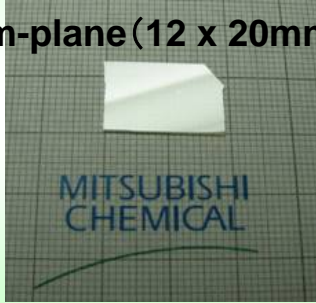
- ◆ Achieve high output
- ◆ Surpassing competitor's surface quality



2nd to launch
in the market

m-plane
(development stage)

m-plane (12 x 20mm)



World's 1st to successfully develop nonpolar & semipolar crystal plane

- ◆ More efficient than current products
- ◆ Possible to be used for green laser
- ◆ Collaboration with UCSB (Prof. S. Nakamura's team) <hold wide range of patents>



- Mass Production (2009)
- Replacing c-plane, aim to lead the market (target 2015)

Update on GaN Substrate

Liquid phase growth method



Developing an ultra low cost manufacturing technology

■ Progress

- ◆ Joint development w/ Prof. S. Nakamura's team (Ammono-Thermal)
- ◆ MCC's proprietary production process (Chemical equilibrium method: G-CHEM)
⇒ Currently at a small size crystal formation stage, similar luminescence to vapor deposition method

■ Features and Purpose

- ◆ Bulk production ⇒ Ultra low cost
- ◆ Large diameter ⇒ Driver to expand the next-generation transistor market (e.g. automotive transistor: IGBT)
Si → SiC (silicon carbide) → GaN



Target to lead the market by 2015 through supplying m-plane substrate (ultra high performance), using liquid phase growth method (ultra low cost)

Update on Phosphors



Exceeding original sales plan

■ Activated the market



Adopted for LED lighting



Substitute incandescent light bulbs
(energy conservation, CO₂ reduction)



Adopted for LED backlights



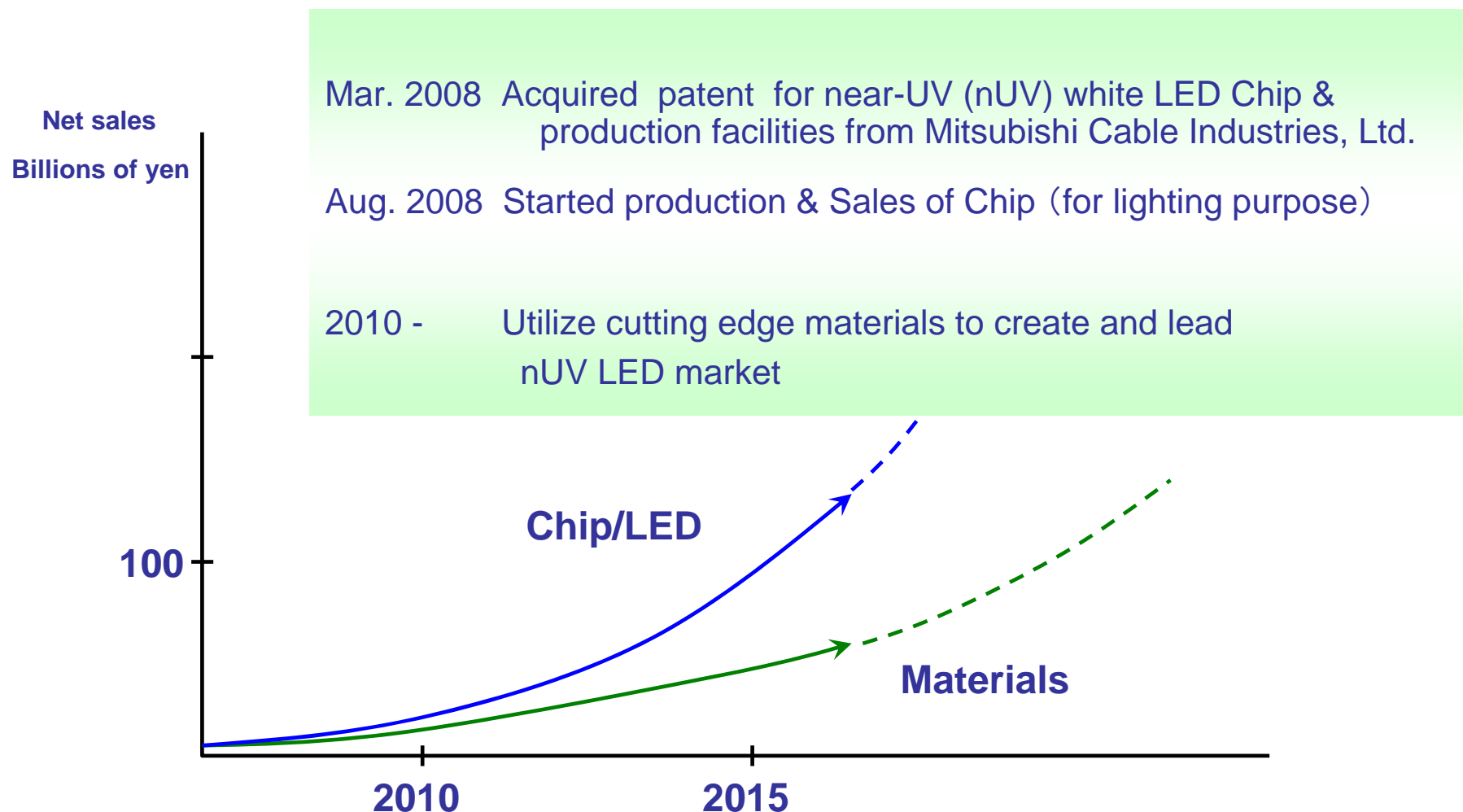
Key LED materials for LCD backlights

■ Progress

- ◆ Dominant world wide share in RED; expanding sales in GREEN
- ◆ Merge Kasei Optonix, Ltd. with Mitsubishi Chemical to integrate sales, production and R&D (April 2009)

Business Scope

From materials to Chip/LED components business



MCHC Group Carbon Business

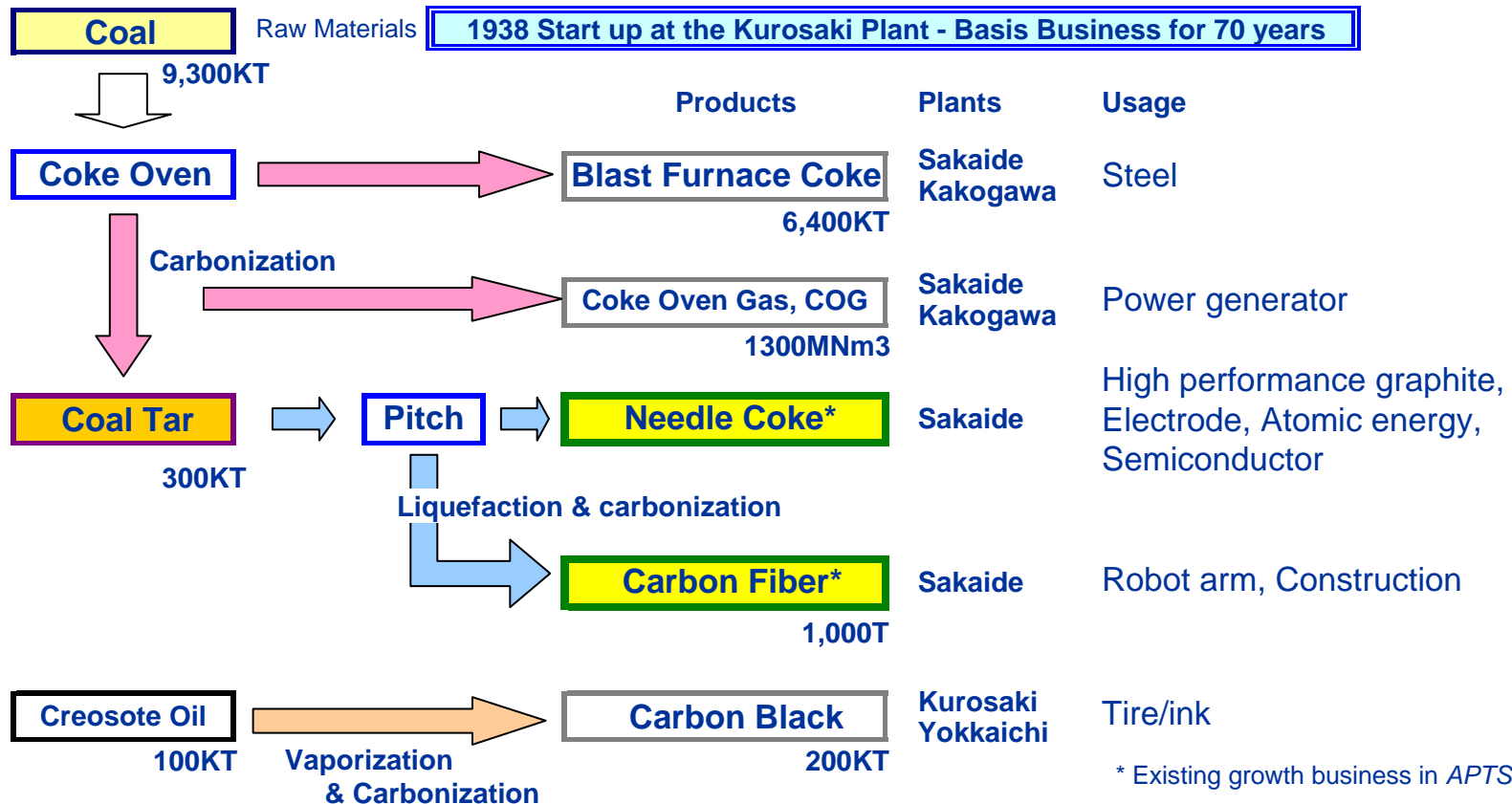
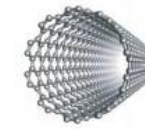
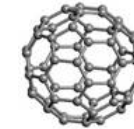
**Masanori Karatsu
Executive Officer
Chief Operation Officer, Carbon Division
Mitsubishi Chemical Corporation**

Agenda

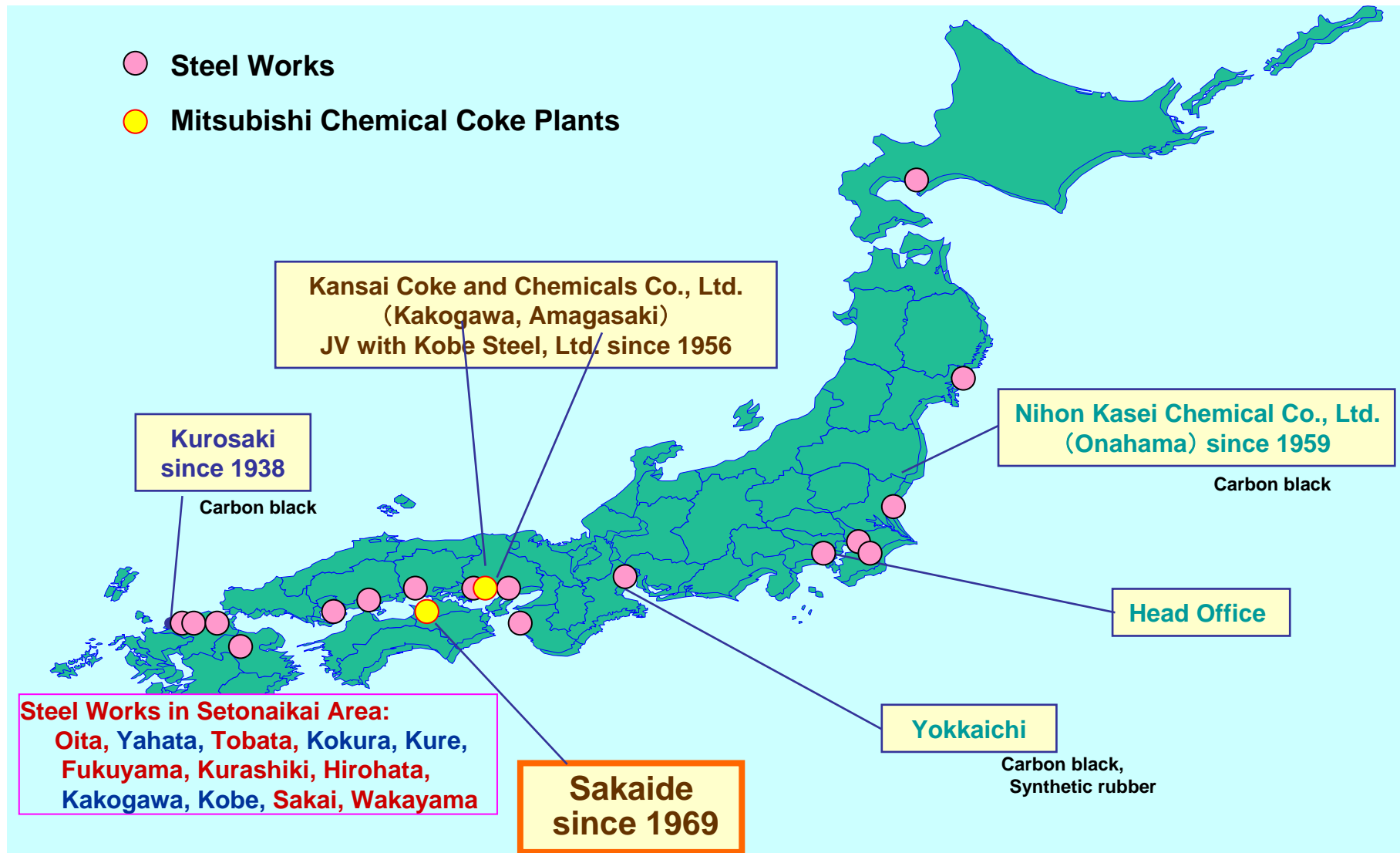
- **Carbon Business - History and its Product Chain**
- **Business Performance**
- **Carbon Production Base**
- **Basis and Key Business**
 - **Blast Furnace Coke**
- **Existing Growth Business**
 - **High Performance Graphite**
- **Fusion of Carbon Chemistry and Petrochemicals**
 - **Carbon Oven Gas**

Carbon Business and Product Chain

Carbon allotrope: diamond and fullerene



Locations – Carbon Products Business

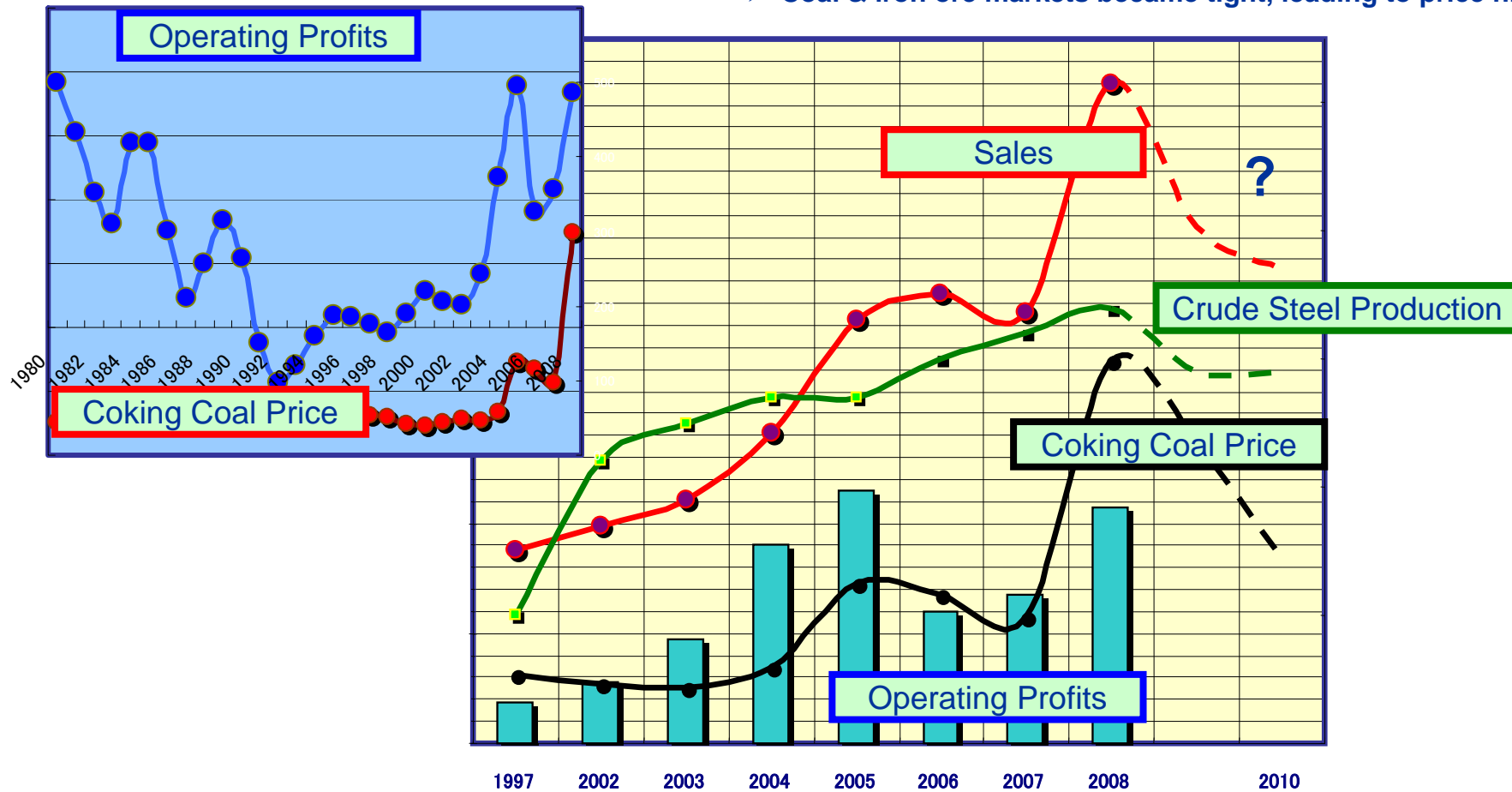


Business Performance (2002 - 2008)

Rapid growth in China from 2003

- The domestic production of crude steel has expanded to 120 million tons
- Coal & iron ore markets became tight, leading to price hike

Operating profits and coking coal price 1980 - 2008



Carbon Production Base, Sakaide Plant

Carbon Fibers



Needle Coke

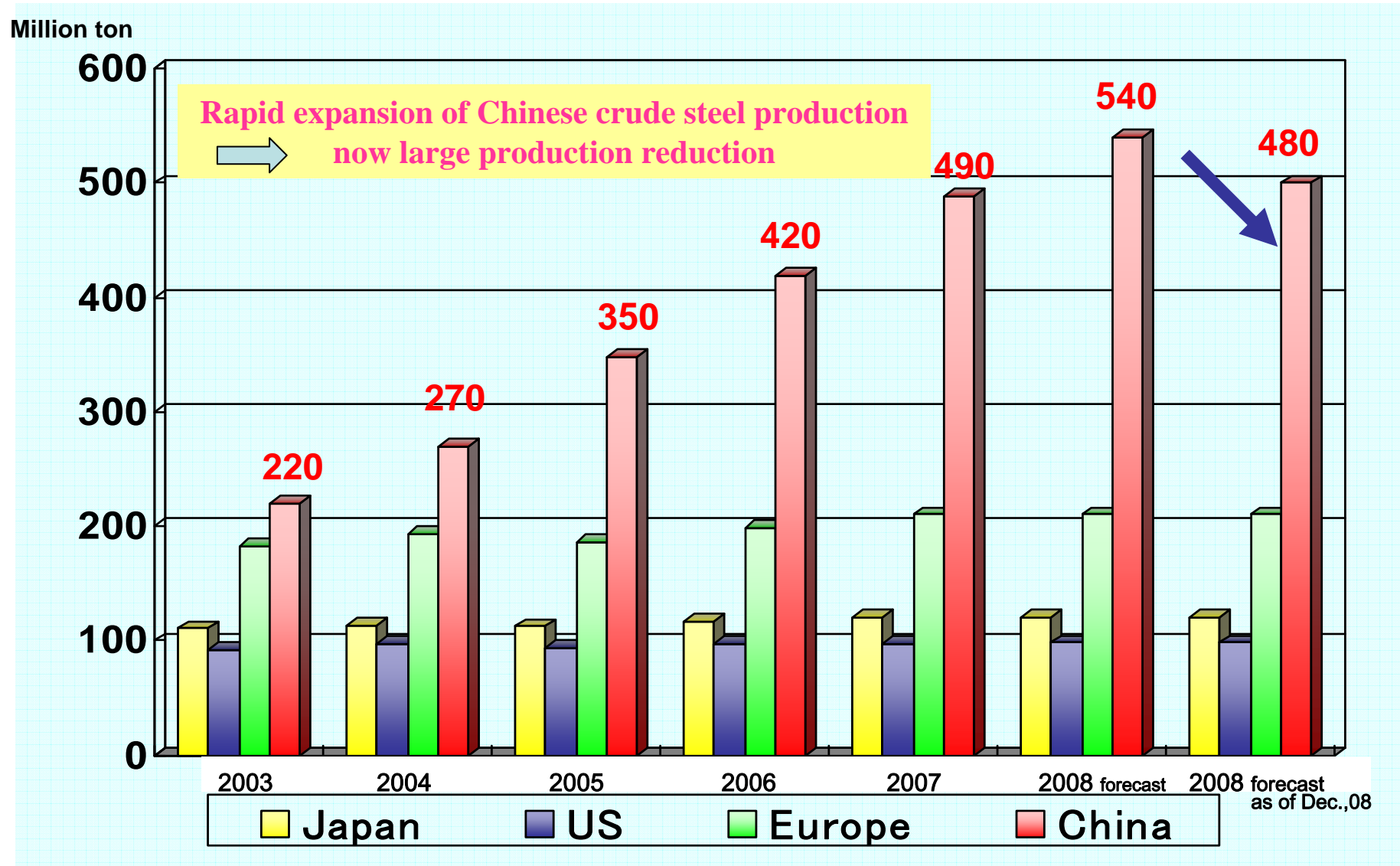


Coking Coal from Australia

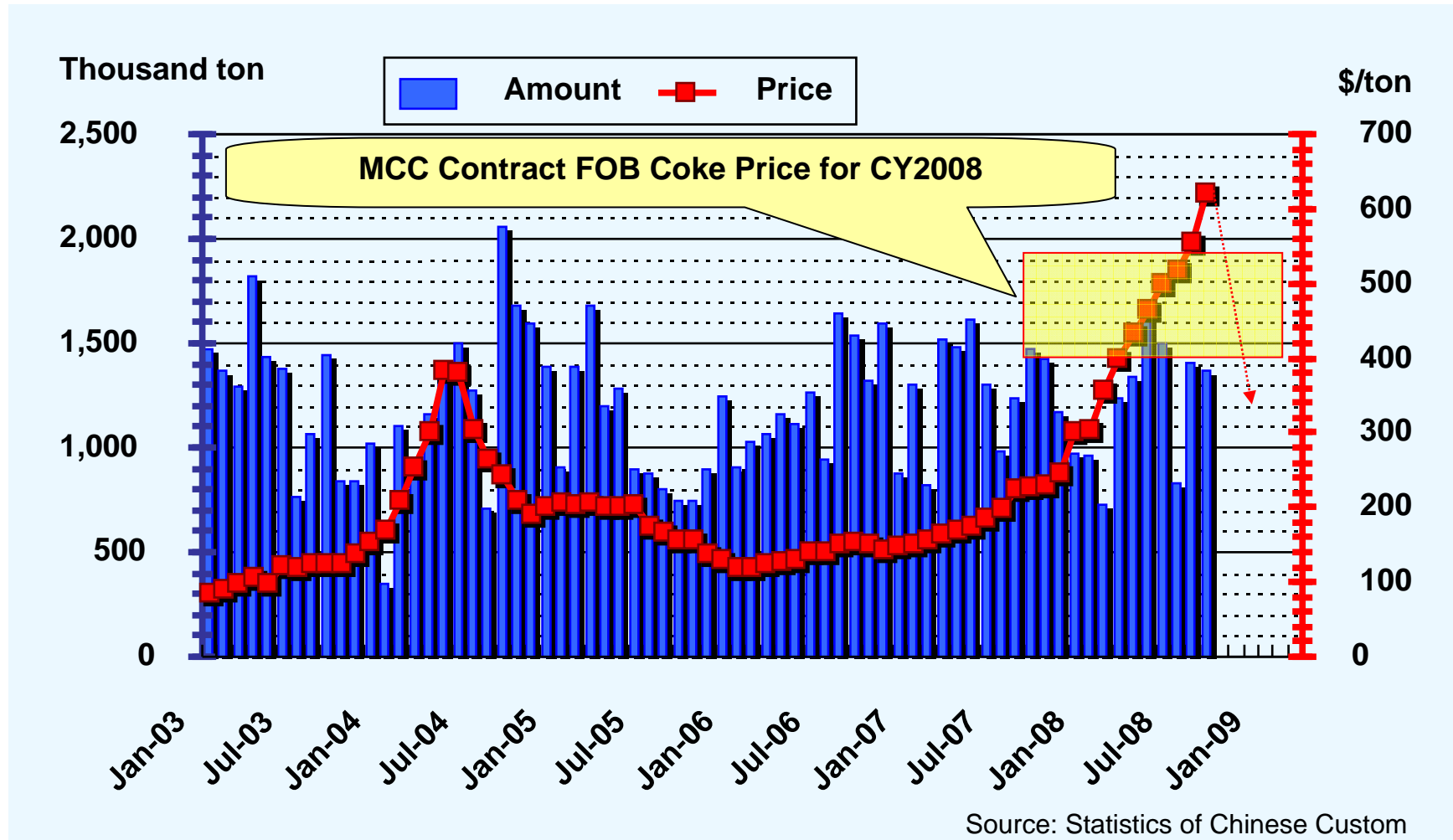


Blast Furnace Coke

World Crude Steel Production



Monthly Chinese Coke Export (2003 – 2008)



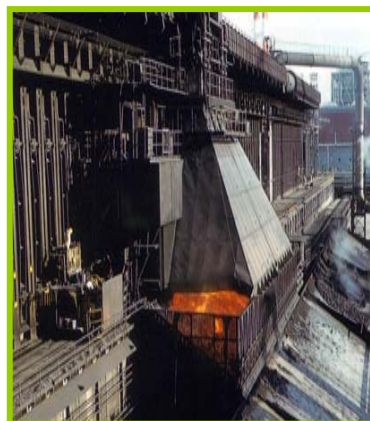
APTSIS 10 Carbon Business Strategy

**Basis & key business:
Blast furnace coke**

Coal



Coke oven



COG

Tar



Coke



6.4 million ton

Dry distillation

■ R&D 'clean energy', H2: 60%

R&D-1:
COG ⇒ benzene ⇒ methanol
COG ⇒ DME ⇒ propylene

R&D-2:
C1 chemistry, utilize CO2
H2, C, and heat used for deoxidization

■ Existing growth business:
High performance graphite

Global shortage of needle coke:
Electrode for steel production & specialty application
Rapid growth of carbon fiber demand

R&D-3:
✓ Improve pitch purification efficiency
✓ Capacity increase by 25%

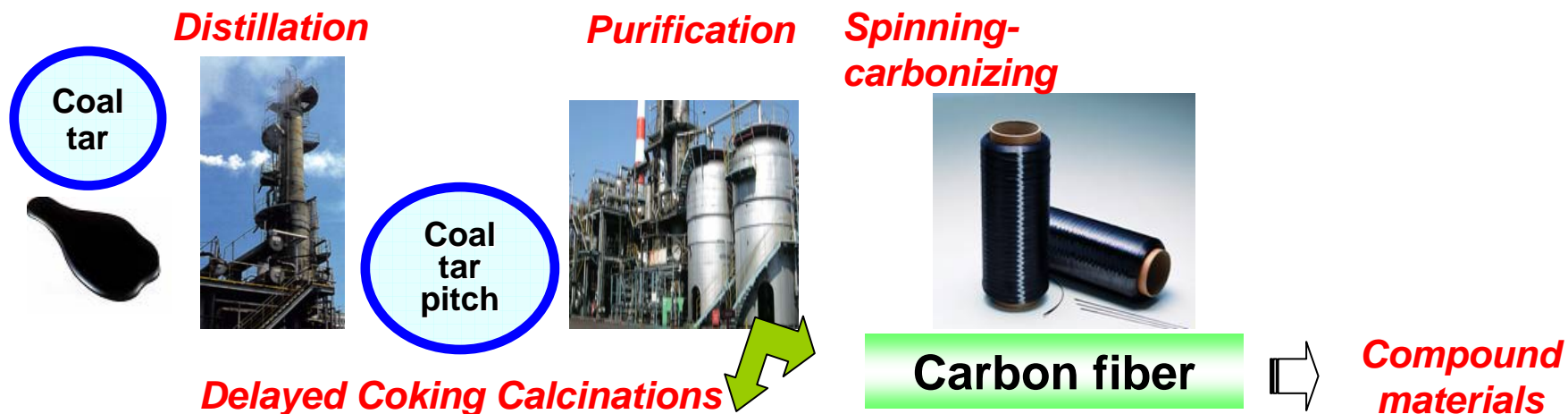
Competitiveness depends on tar and COG.

■ Blast furnace coke:
Recent high growth caused by strong Chinese demand lead price hike of coking coal and coke. Steel production, however, are slowing down.

Domestic customers: Nippon Steel, Sumitomo Metals, Kobe Steel, and Nisshin Steel
(for competitive high grade steel)

Export: US, EU, and Brazil

High Performance Graphite



Applications

- **Graphite electrode for electric arc furnace steel making**
 - Competitive steel products, depending on prices of scrap & electricity
 - Increasing demand
- **Various electrode and electric brush**
 - Advancement of electrical application
- **Semi-conductor application**
 - Increasing demand on crucibles for silicon pulling furnace
- **Atomic power core material, pantograph slider and sealing material**

Needle Coke Applications

Needle Coke

Artificial graphite features heat, acid, and chemical resistant, electrical conductivity thermal conductivity, and lubrication

■ Graphite electrode for electric arc furnace steel making

- ✓ Competitive steel products (depending on prices of scrap & electricity)
- ✓ Increasing demand



■ Various electrode and electric brush

- ✓ Advancement of electrical application



■ Semi-conductor application

- ✓ increasing demand on crucibles for silicon pulling furnace



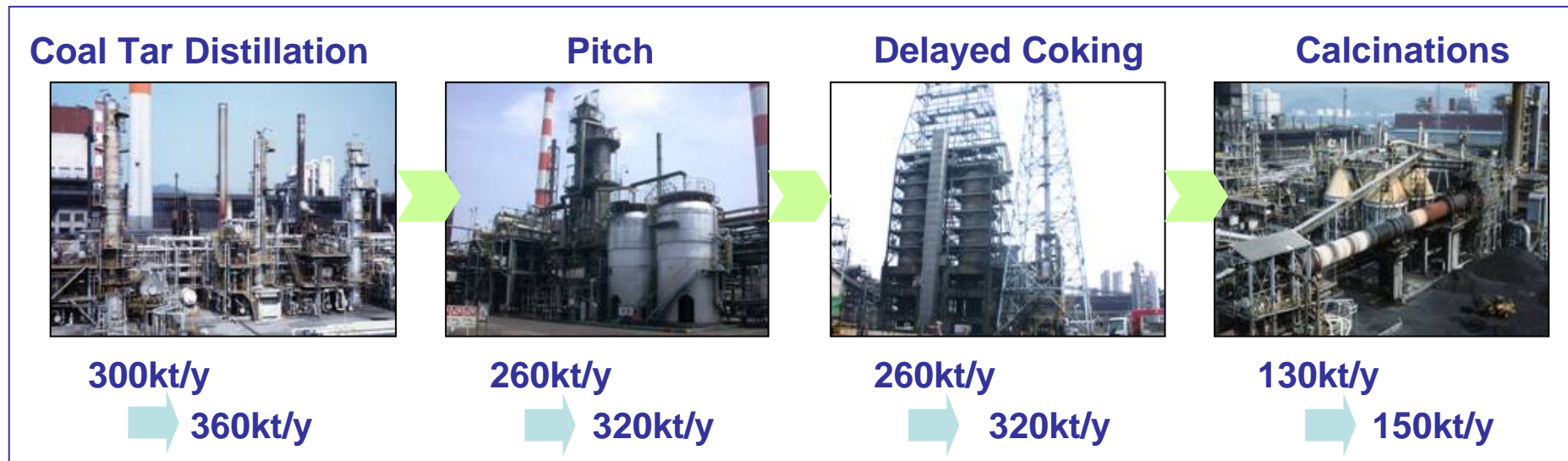
■ Atomic power core material, pantograph slider, and sealing material



High Performance Graphite - Capacity Increase

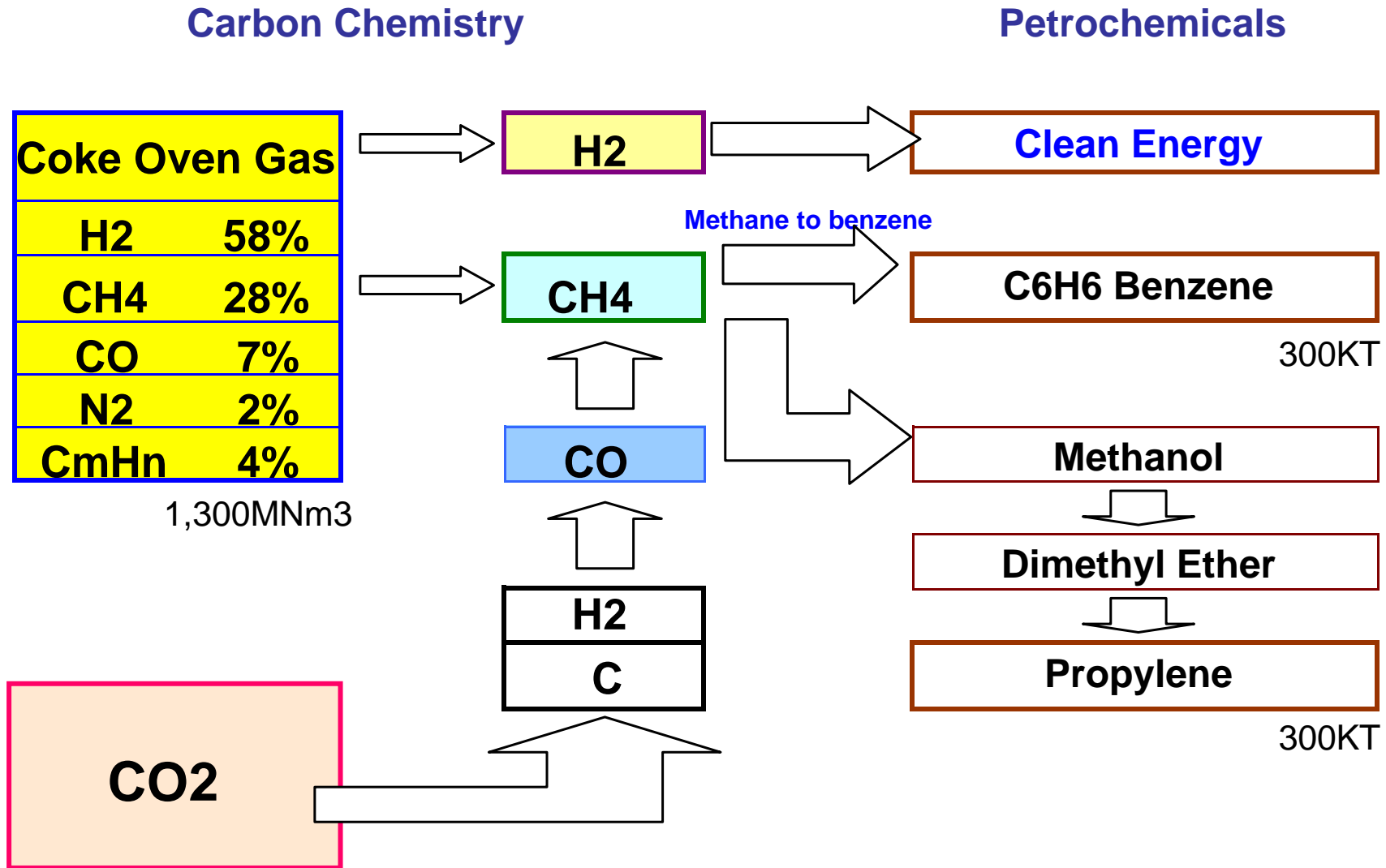
APTSIS 10 Capex: 4 billion yen

To be completed in Aug. 2010

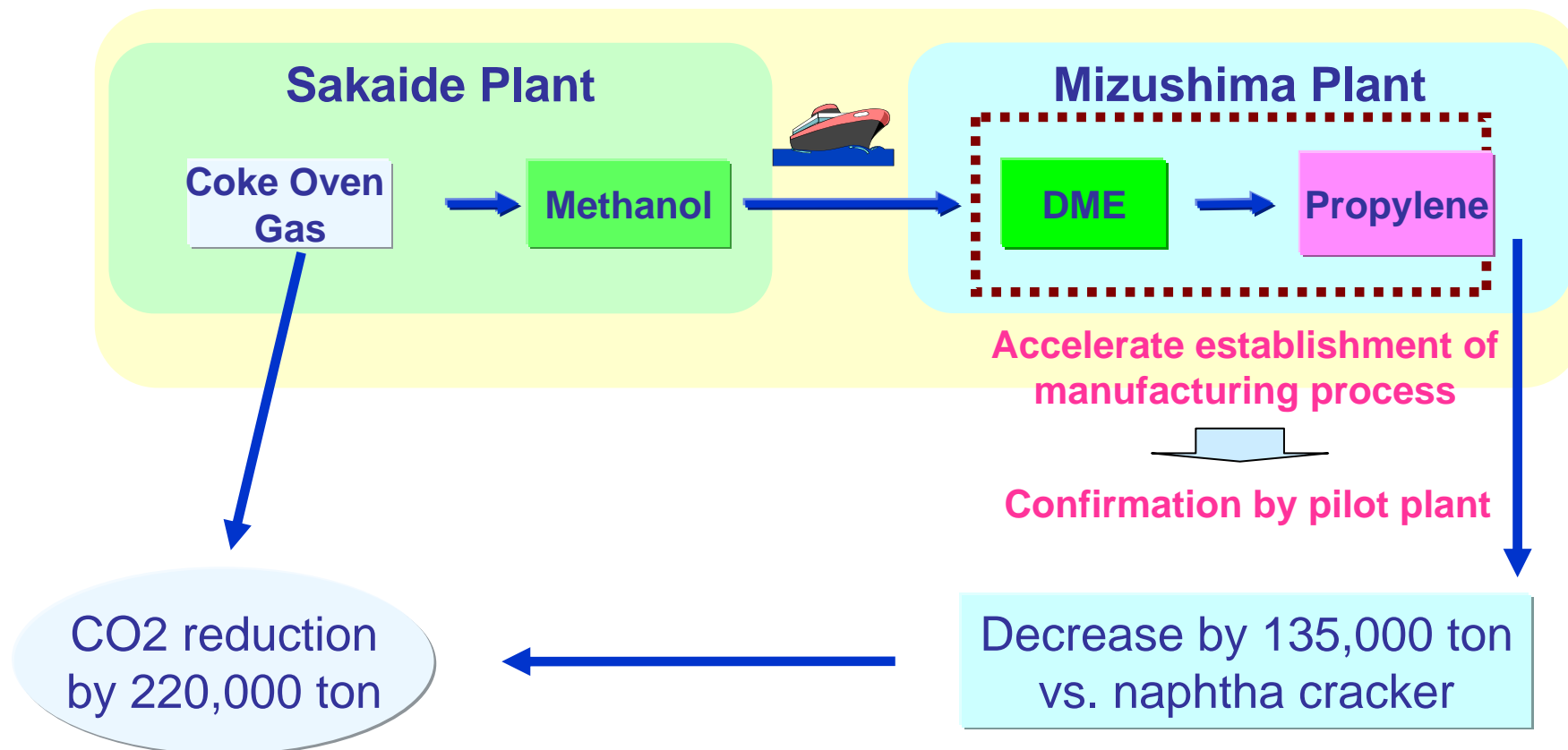


- Needle coke for graphite electrode
+15,000t/y; share +10%
- Pitch base coke for special carbon products for semiconductor applications and atomic power core material
+ 6,000t/y; share + 10%
- Pitch base carbon fiber
+10,000t/y; increase carbon fiber capacity to 1,300t/y

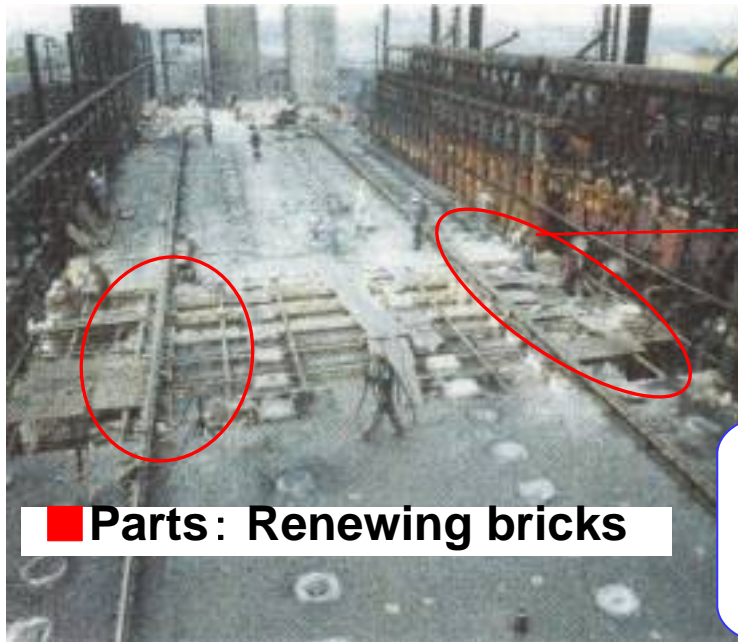
Fusion of Carbon Chemistry and Petrochemicals



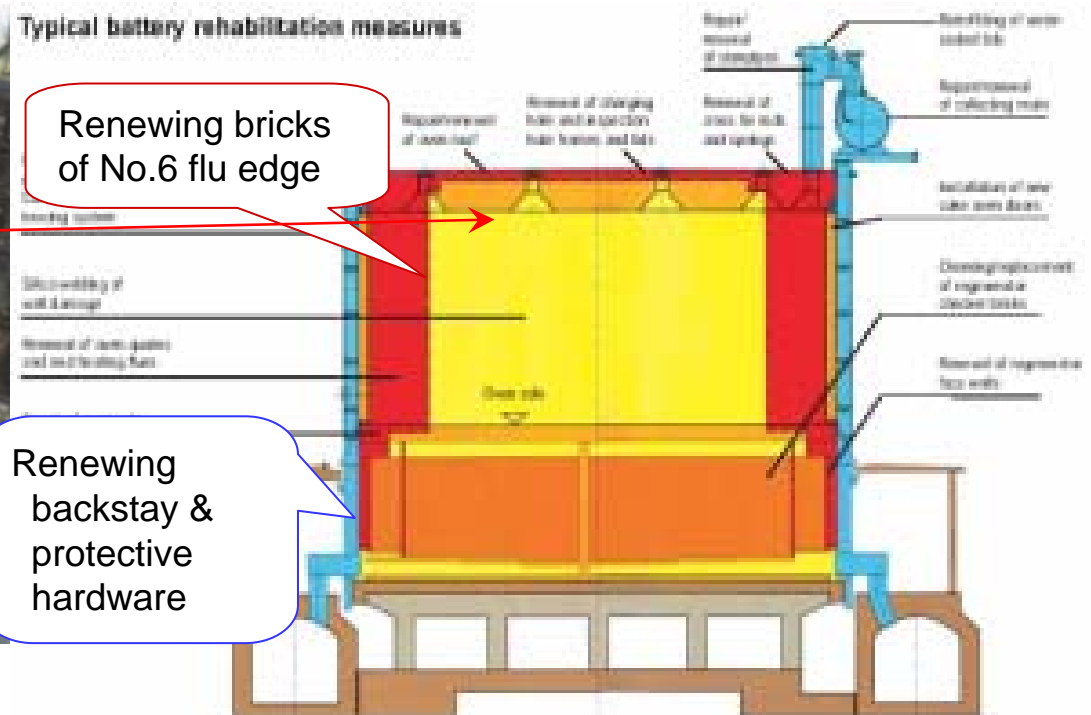
Add Value to Coke Oven Gas



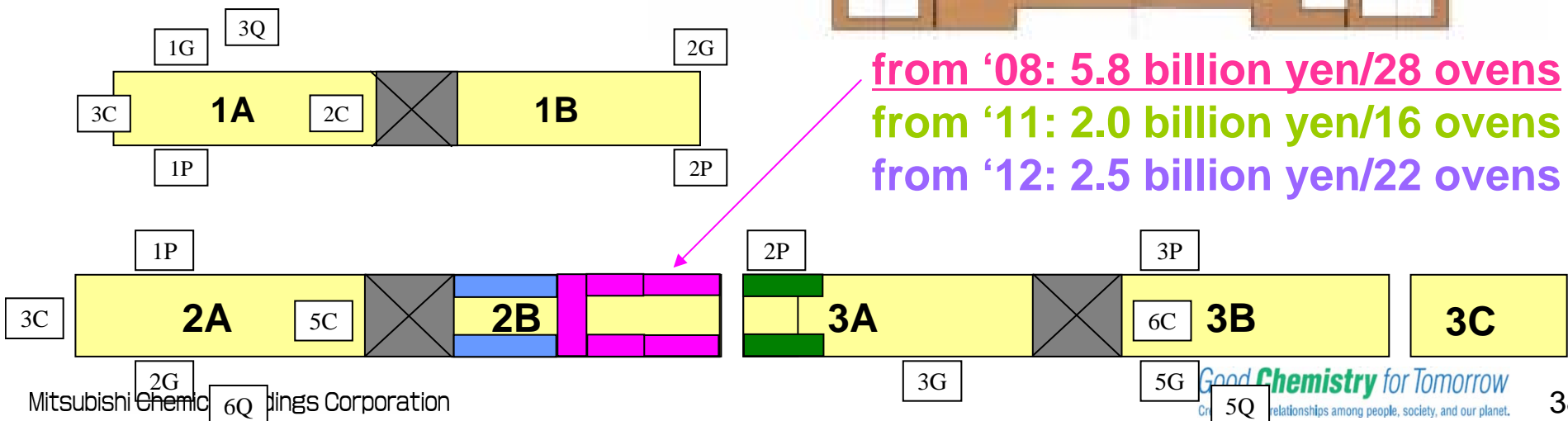
Coke Oven Hot-renewal Start up from 2008



■ Parts: Renewing bricks



from '08: 5.8 billion yen/28 ovens
 from '11: 2.0 billion yen/16 ovens
 from '12: 2.5 billion yen/22 ovens



APTSIS 10 Carbon Business Summary

■ Plant measures

- Coke oven hot-renewal to ensure reliability

■ Environment measures

- Desulphurization
- Dust catcher
- Prevention of marine pollution

■ Demand expansion

- Further expansion in exportation of needle cokes for special steel

■ Add value for COG

- Completion of technological development of COG to propylene

■ High Performance Graphite

- Capacity increase by 25%

■ Energy Efficiency

- Streamline and improvement
- CO₂ reduction

MCHC Group Li-ion Battery Materials Business

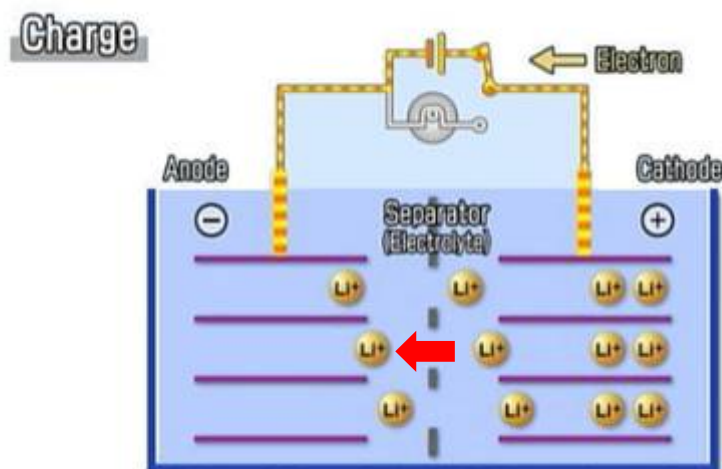
Shigeru Tsuyuki
Managing Executive Officer
Chief Operation Officer, Performance Products Division
Mitsubishi Chemical Corporation

Agenda

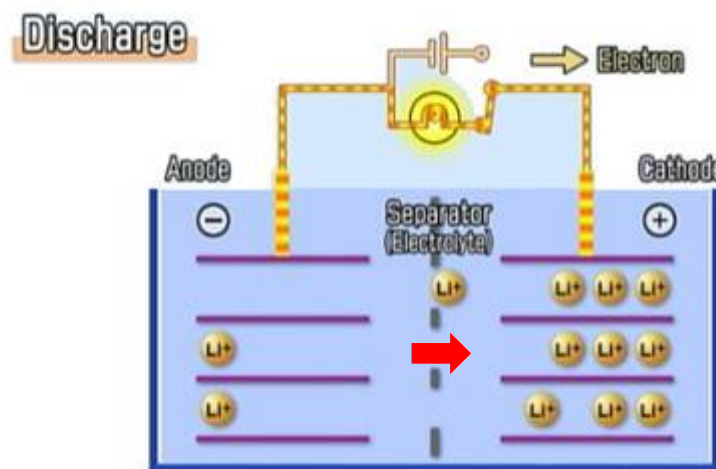
- **What is Li-ion Battery?**
- **Li-ion Battery Market**
- **Li-ion Battery Materials Market**
- **MCC's Battery Materials Business Activity**
- **MCC's Battery Materials Strategy**

What is Li-ion Battery?

Working Principals



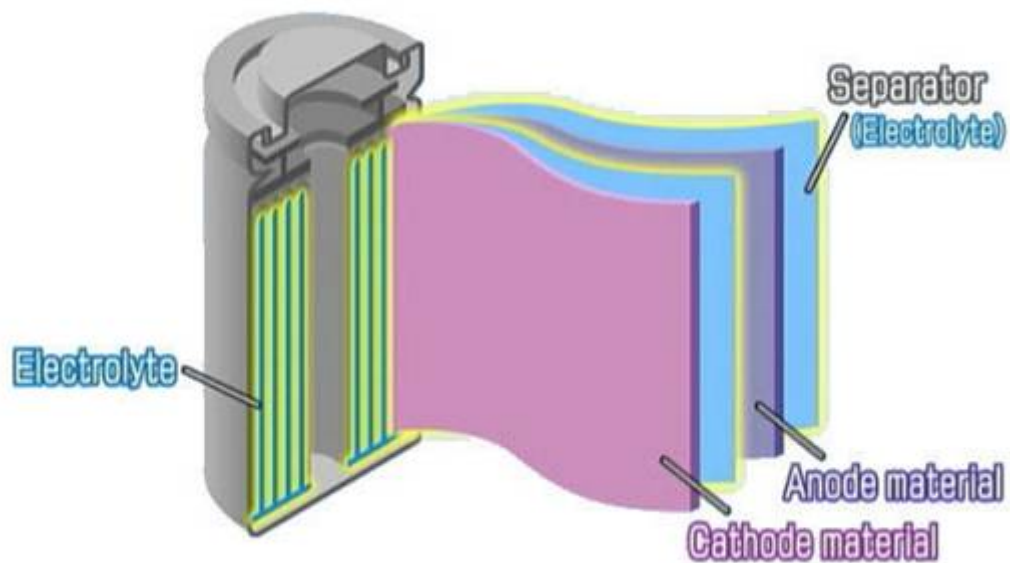
Li-ion transfers from Cathode to Anode when the battery is charged.



Li-ion transfers from Anode to Cathode when the battery is discharged.

What is Li-ion Battery?

Structure



18650 Cylindrical electrode



18650 Cylindrical cells



What is Li-ion Battery?

Applications

For High Capacity

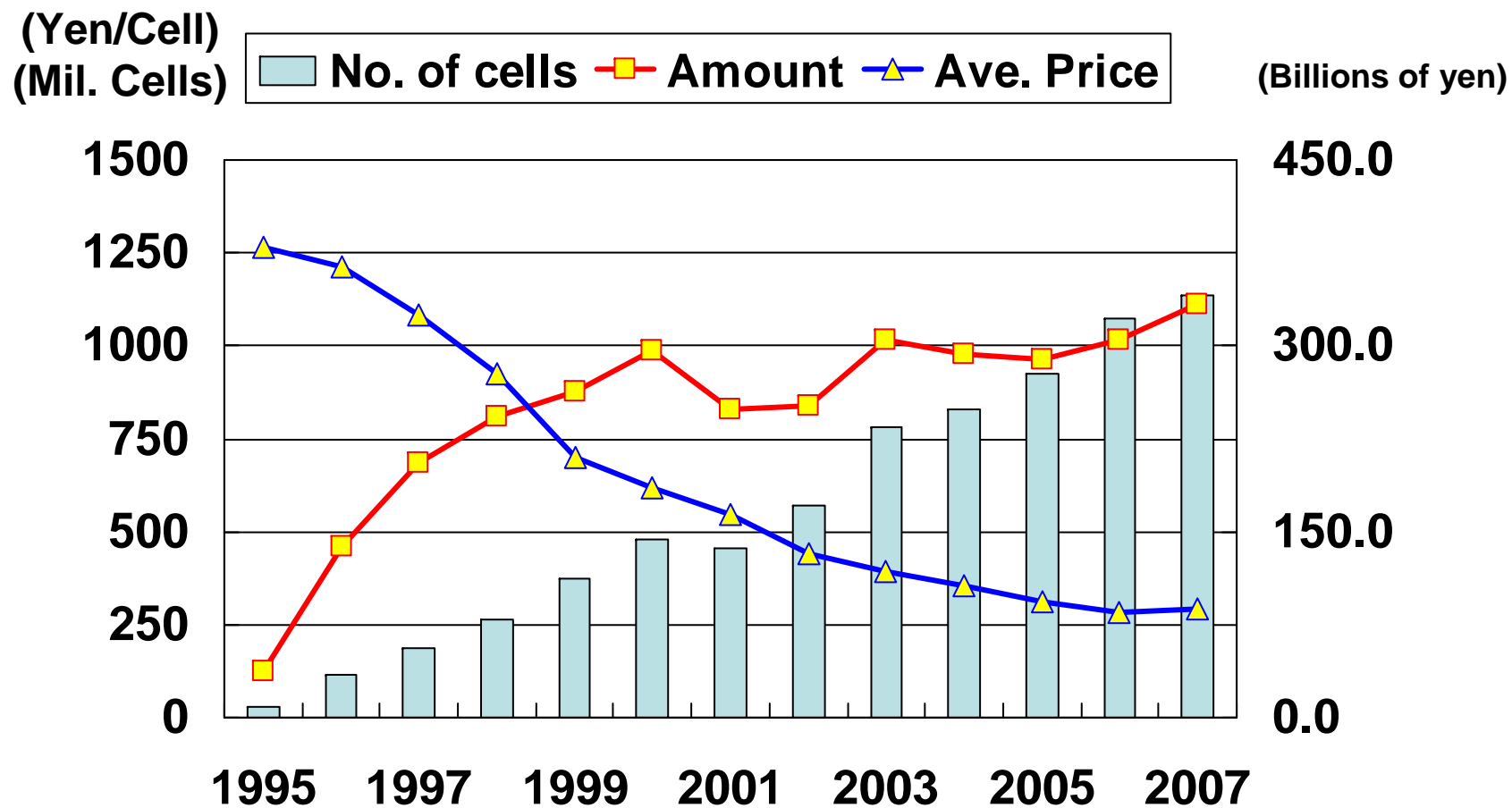


For High Power



Li-ion Battery Market

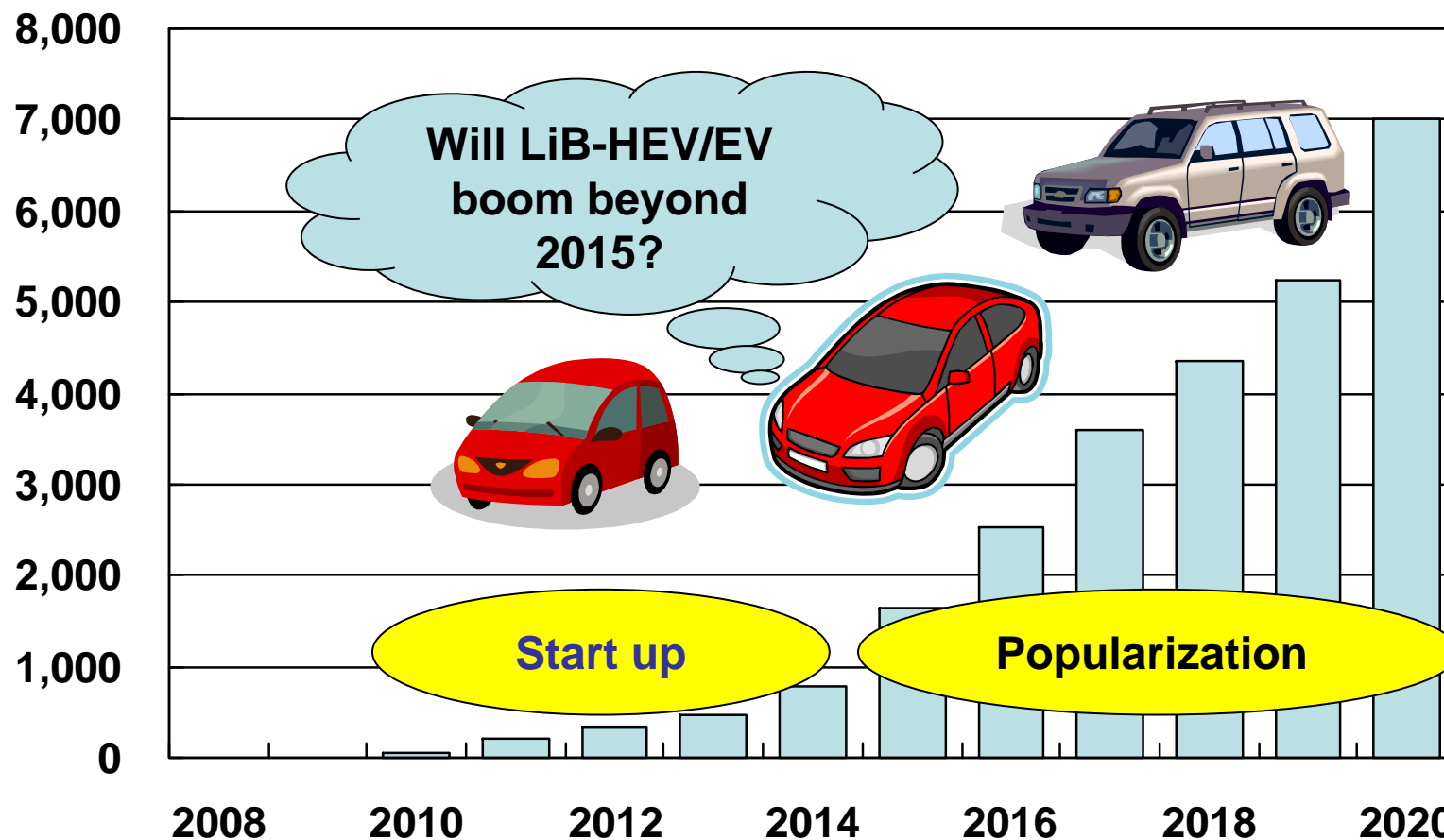
Domestic sales



Li-ion Battery Market

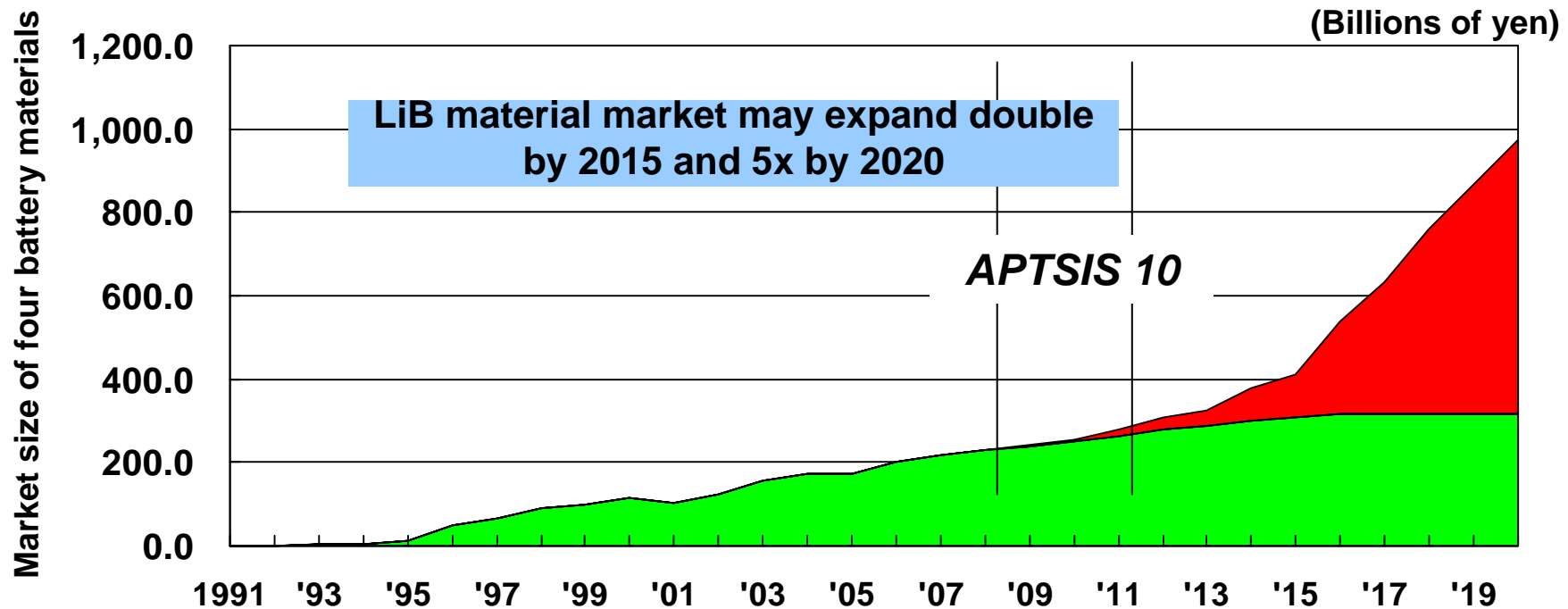
Estimated market for LiB HEV/EVs

(Thousand units)



Li-ion Battery Materials Market

	2007	2010	2015	2020
Consumer	200.0	250.0	300.0	310.0
HEV	—	5.0	100.0	650.0
MCC (share)	10.0 (5%)	17.0 (6%)	50.0 (12.5%)	



MCC's Battery Materials Business Activity

Our Products

	Product	Phase	Place of Production	Market Share
Electrolyte	Li salt (LiPF ₆) Solvents (EC, DMC) Additives	Business	Yokkaichi, Suzhou	20-25%
Anode	Amorphous carbon Natural/Artificial Graphite	Business	Sakaide	10-15%
Cathode	Li compound made up of Ni, Mn, Co	Business	Sakaide, Mizushima	<5%
Separator	Micro porous film made of polyolefin	Development	Nagahama	-

MCC's Battery Materials Business Activity

Electrolyte

High-performance additives based on;

- Molecular design
- Organic synthesis
- Battery evaluation technologies



Anode

Customizing the material by controlling;

- Amount of coating material
- Particle size
- Particle form
- Specific surface area, etc.



Cathode

- Ni, Mn rich type
- Pore structure in the secondary particle is designed to improve Li-ion diffusion, enabling high power.



Separator

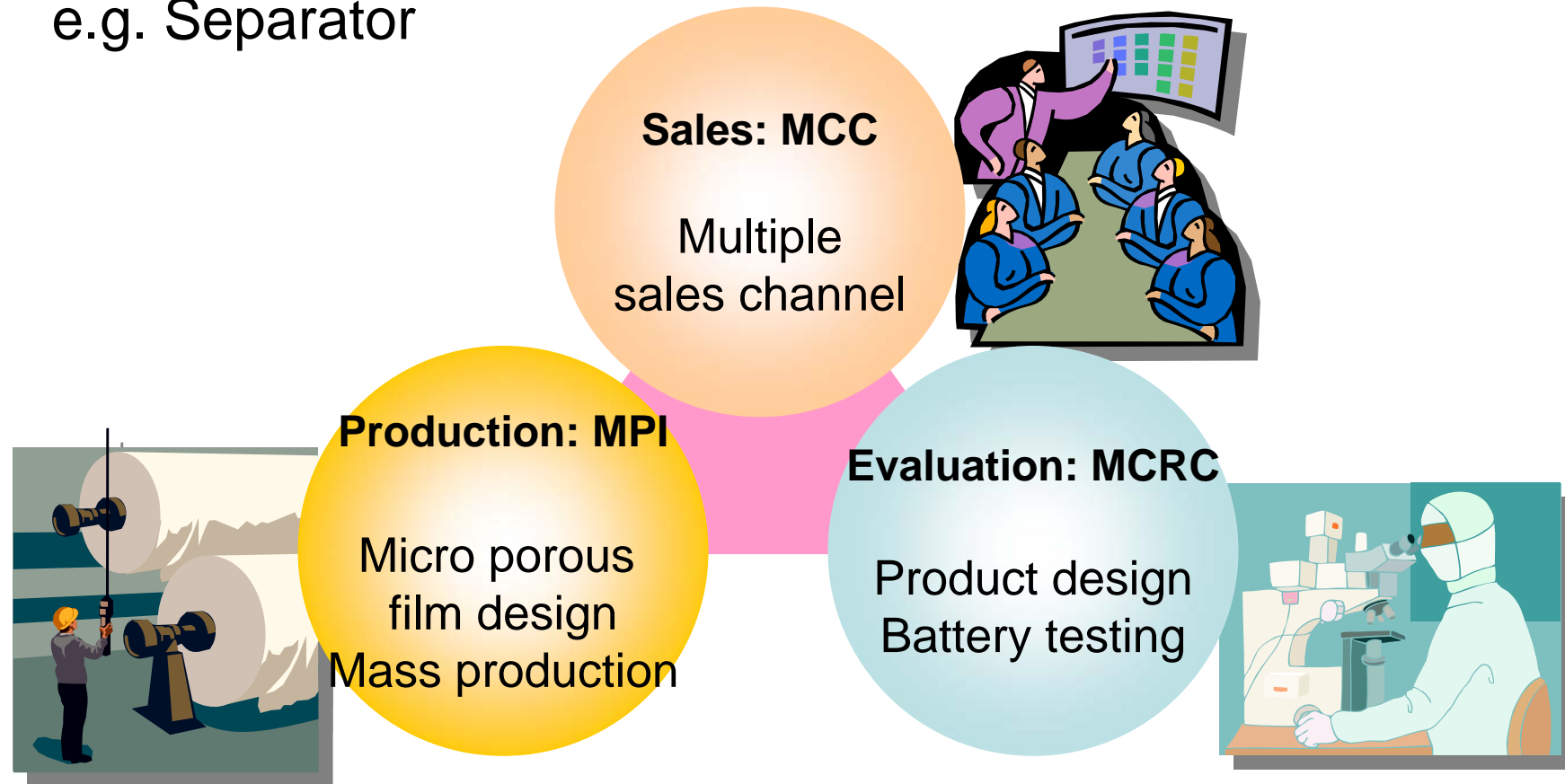
Solvent-free three-dimensional micro porous structure having;

- High power at low temperature
- Cyclic life
- High temperature storage



MCC's Battery Materials Business Activity

e.g. Separator



Synergy of product development in MCHC Group

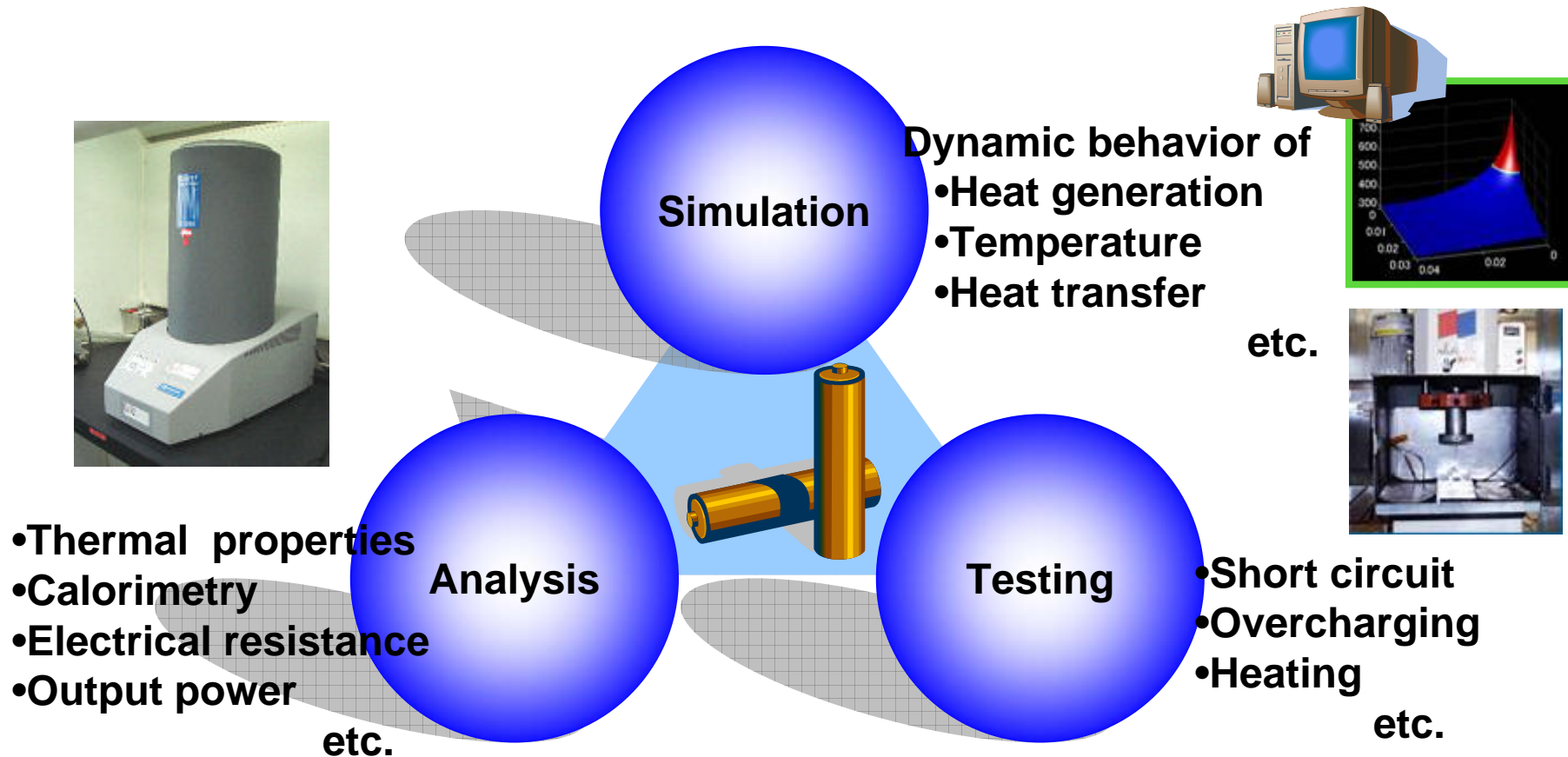
MCC's Battery Materials Business Activity

Capital Expenditures Planned (2008-2010)

	Estimated Amount	Launch	Capacity
Electrolyte	0.2 Bil.	Jan. 2010	2,500 MT/Y
Anode	1.0 Bil.	Oct. 2009	2,000 MT/Y
Cathode	2.0 Bil.	Oct. 2009	600 MT/Y
Separator	1.0 Bil.	Jul. 2009	12 mil. m ² /Y

Electrolyte and Anode capacity increase includes de-bottling of current lines.

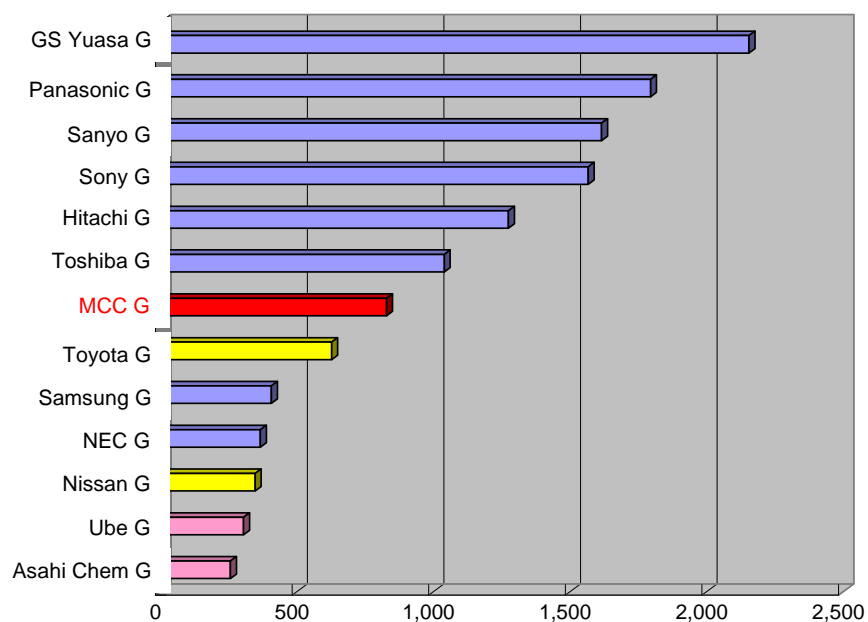
Battery Evaluation & Safety Analysis



Safety engineering for innovation of new materials

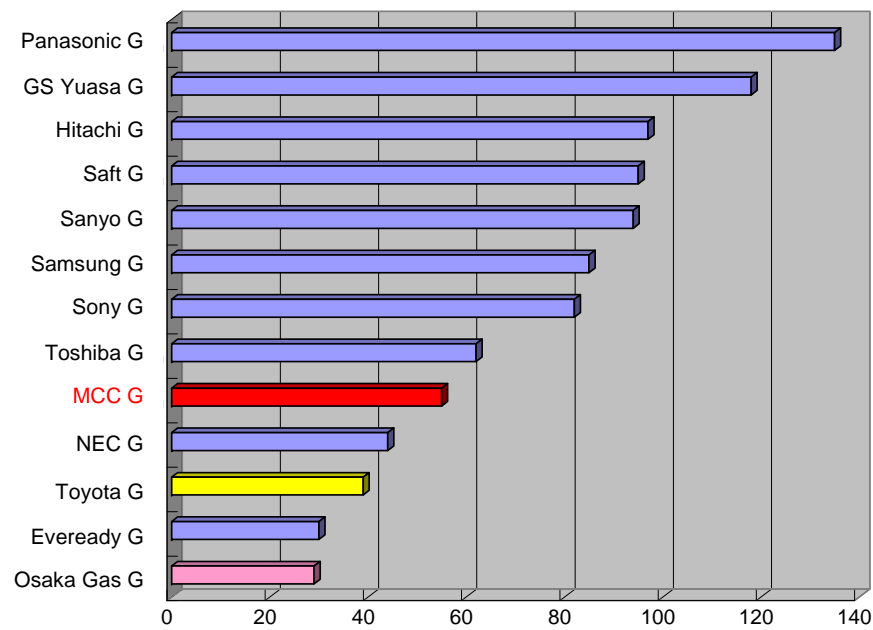
R&D Activities

One of the top applicants of LiB related patents and original papers



Number of open-laid patents applied (Japan)

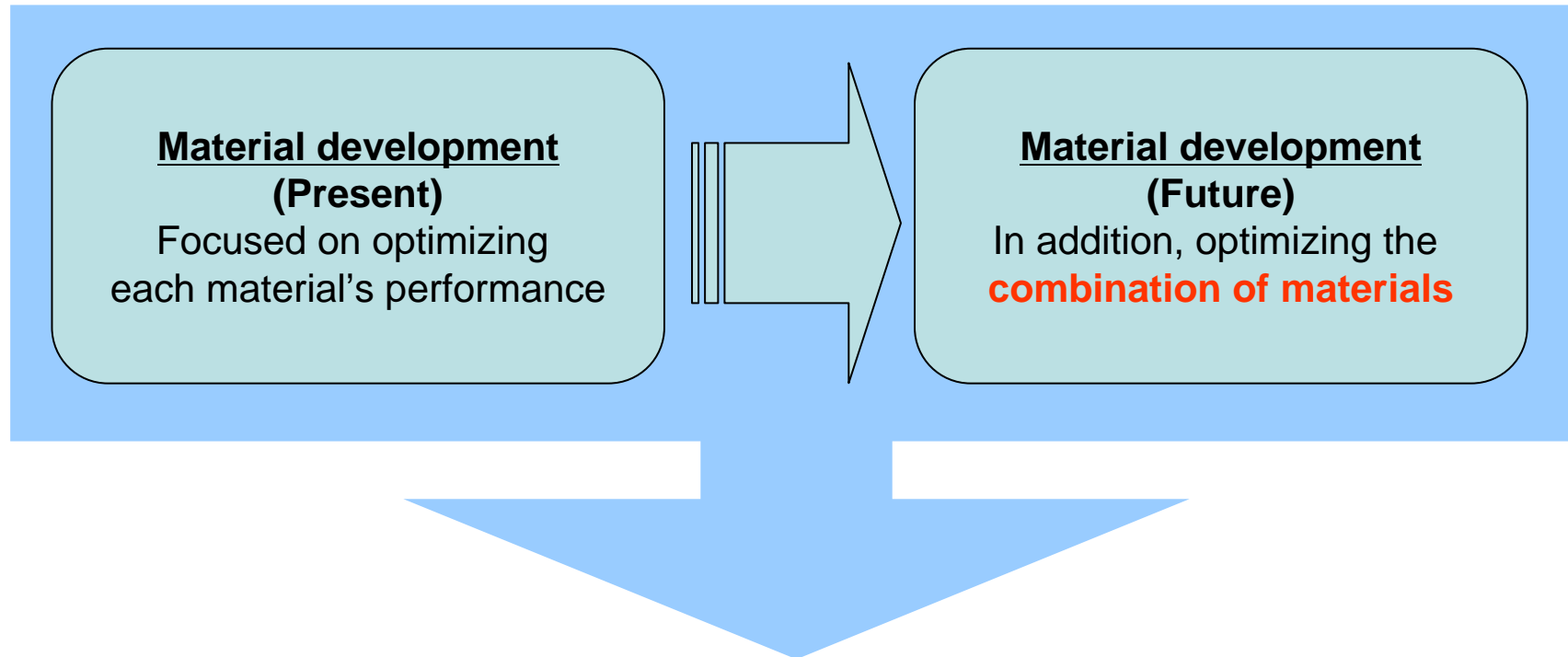
PATOLIS DB (1971 - 2007/4/30)
 "IC = H01M10/40"
 18,692 applications (67% covered by Top 13)



Number of original paper

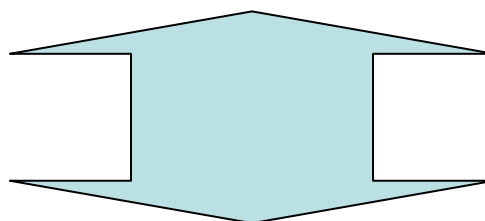
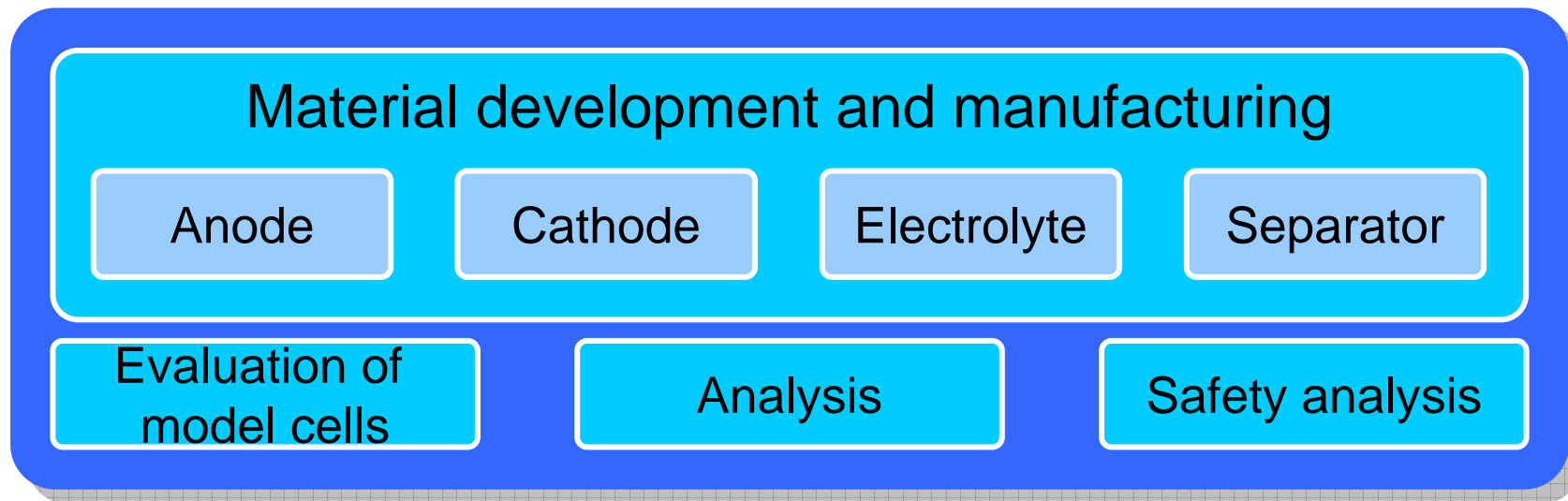
CA Plus DB (1907 - 2007/5/18)
 "Li + lithium"
 x "battery + cell + electrode + electrolyte"
 x "journal + letter"
 55,730 papers (1.7% covered by Top 13)

Our Business Model



By having four key materials in-house, we offer total solution for high performance battery.

Our Business Model



Battery Manufacturers

MCC's Battery Materials Strategy

- MCC will become a total solution provider of LiB materials such as
 - *Electrolyte *Anode *Cathode *SeparatorWith supporting technology and know-how of
 - *Battery evaluation *Battery analysis
- Target sales and operating income in 2015
Net Sales JPY50.0 Billion, ROS 10%