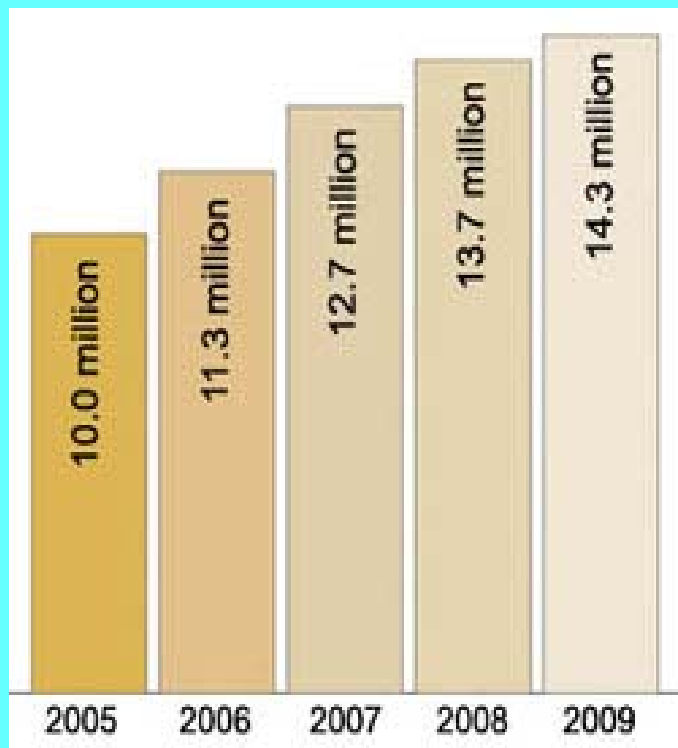


Opportunities of Chemical Industry in Asia Auto Market

21st CACCI Conference
Asian Chemical Industry Council
Frank J. Chen, Ph. D.
Nov. 1, 2006, Taipei

World Auto Industry

➤ Global auto production



High growth in Asia-Pacific region

By 2010:

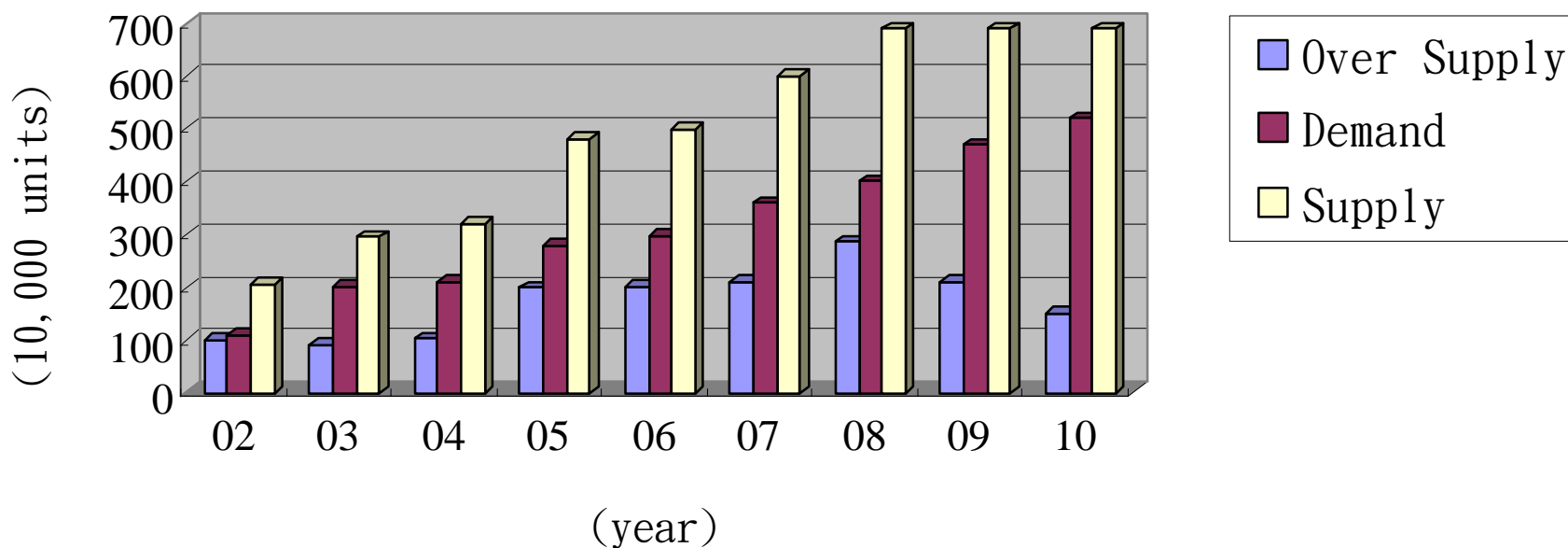
- Increase in Semiconductor
- Drive by-wire to increase
- Internal combustion engine will still dominate, hybrid and clean diesel will increase in shares, fuel cells to have limited impact.
- 100,000 miles/10 years warranty is expected to increase to 150,000 miles/15 years.



Auto Market in China

- China – 3rd largest auto market, 4th in auto production.
- Annual demand of passenger cars greater than 5 millions units by 2010年

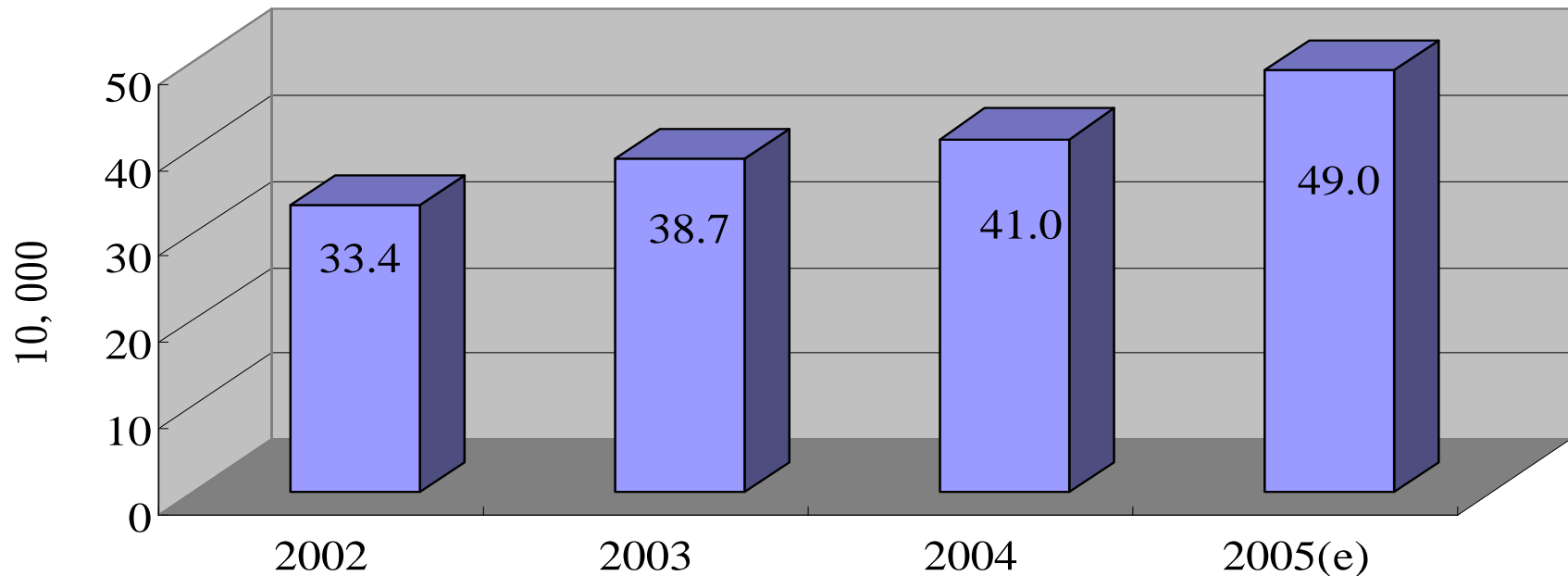
Forcast Demand/Supply of China passenger Cars



Source : 日本瑞穂實業銀行産業調査部 (2005)

Taiwan Auto Industry

Auto Production



- Auto parts production 276 B NTD
- Export 108 B NTD (2003)

Source : IEK-ITIS (2004/07)

Status of Taiwan Auto Industry

- Production of about 50 M unit passenger cars annually with 11 auto manufactures
- Domestic auto parts industry took off in 1995. Highly competitive in quality, price and time to deliver. Maintain about 87% market share in domestic auto market
- Actively invest in mainland China. Focus on OEM and after market
- Focus on alliance in auto-materials, parts and whole car system. Use modular and system approach to compete with low cost products in China

Taiwan Major Plastic Auto Parts Production

unit : 10,000

Auto parts	2003				2005			
	Total	New cars	Used cars	Export	Total	New cars	Used cars	Export
bumper	250	32%	16%	52%	320	28%	16%	56%
light	600	27%	6%	67%	760	24%	5%	71%
rear mirror	360	23%	8%	69%	430	23%	7%	70%
panel	140	28%	—	72%	180	25%	—	75%
radiator	160	25%	25%	50%	200	23%	23%	54%

Source : IEK-IT IS (2004/07)

Major Plastic Auto Parts Producers in Taiwan

unit : 100 M NTD

Product	2003	2005	Growth rate (CAGR)	Major producer
Bumper	65	83	13%	東陽、裕器、聯城
Head light	120	152	12.5%	大億、堤維西、帝寶、堤勝
Rear mirror	50	60	9.5%	健生、堤維西、喬工科技
Inst. Panel	30	39	14%	東陽、裕器
Radiator	8	10	11.8%	東陽、裕器、協人、三龍
Total	273	344	12.3%	

Total plastic auto parts production: 90 billions NTD (2004)

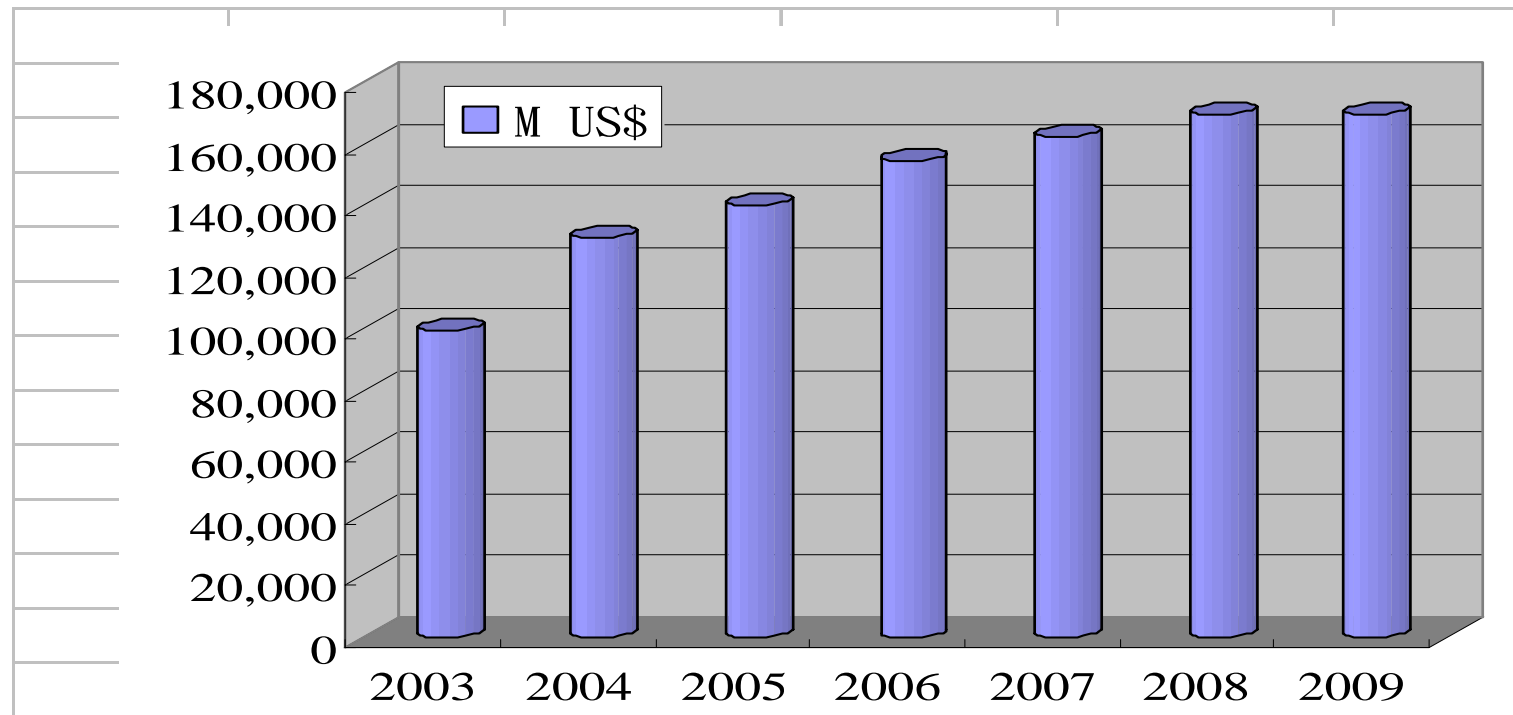
Source : IEK-IT IS (2004/07)

Auto Trends

- **Safety : Electronic control system**
- **Save Energy : High efficiency engine, light weight body**
- **Comfort : Information/communication, entertainment, insulation**
- **Environmental Friendly : Recyclable**

Global Market of Auto Electronics

- **111.3 B US\$ (2003) → 163.5 B US\$ (2008), 7.5% growth**



Source : Strategy Analytics
 IEK-IT IS 2005/5

Product Trends in Auto Electronics

- **Safety system :**
side air-bag 、 tire pressure sensor 、 parking aid 、 distance sensor
- **Driving info system :**
GPS 、 display 、 entertainment system
- **Auto body electronics :**
HID light 、 wiper sensor 、 Anti-glare mirror

Taiwan IT Companies Target on Auto Electronics

Company	Auto Products Strategy
鴻海	Merge 安泰電業、JV with 普誠，setup auto parts plant in China。
公信電子	Focus on auto multimedia system, with orders from 台灣福特汽車、馬自達、大陸通用汽車、南韓起亞、現代。
憶聲電子	Auto mid and small size LCD TV。
微星	Established Universal Multimedia Center product line，with auto GPS and multimedia functions.
威盛	Started with embedded system (VEPD) for auto.
敦揚	Auto products in anti-theft, auto control module, LED lights
建興	Optical disk drive for auto
聯積	Optical disk drive for auto
東貝	Auto brake light – red LED
國聯光電	High intensity LED for auto
全新、鼎元	New WB red LED for auto
環隆電氣	Auto LED module
明基	Auto multimedia system
廣達	Division of auto systems in auto computer, TV, GPS and auto audio

Specification of Auto Display

	Test item	Auto Test Condition
1	High temp storage	+ 85°C
2	Low temp storage	- 30C
3	High temp/humidity	+ 60C 、 90% RH
4	High temp operation	+ 85°C
5	Low temp operation	- 30C
6	Anti-static	± 200V 、 200 pF
7	Vibration	980
8	Thermal shock range	- 30°C ~ + 85°C

Source : Digitimes 2005/6

Opportunities for Chemical Industry

- **Develop innovative materials and products for enhancing comfort/safety/reliability**
- **Commercialize nano-composites for automotive connectors or body panels**
- **Develop high performance TPV or elastomers for under-the-hood or exterior applications**
- **Capitalize high Tg material for auto lighting system**
- **Develop smart or tough coatings for plastics or top clear coat**