Present Status of Korean Surface Finishing Industry

Dr. Hee-Taek Yum

Adviser, Samsung Electro-Mechanics Co., Ltd.

Chairman, Interfinish 2008

The Korean Institute of Surface Engineering

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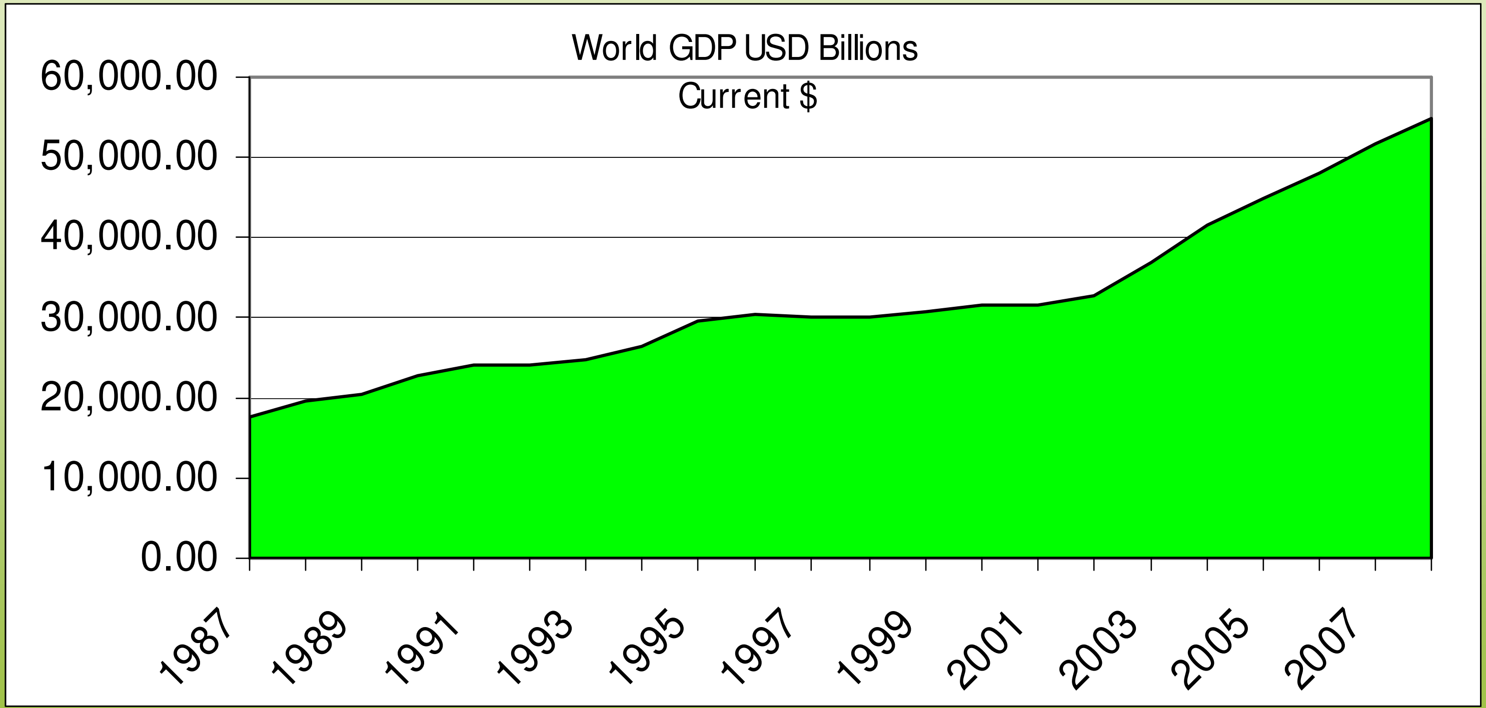
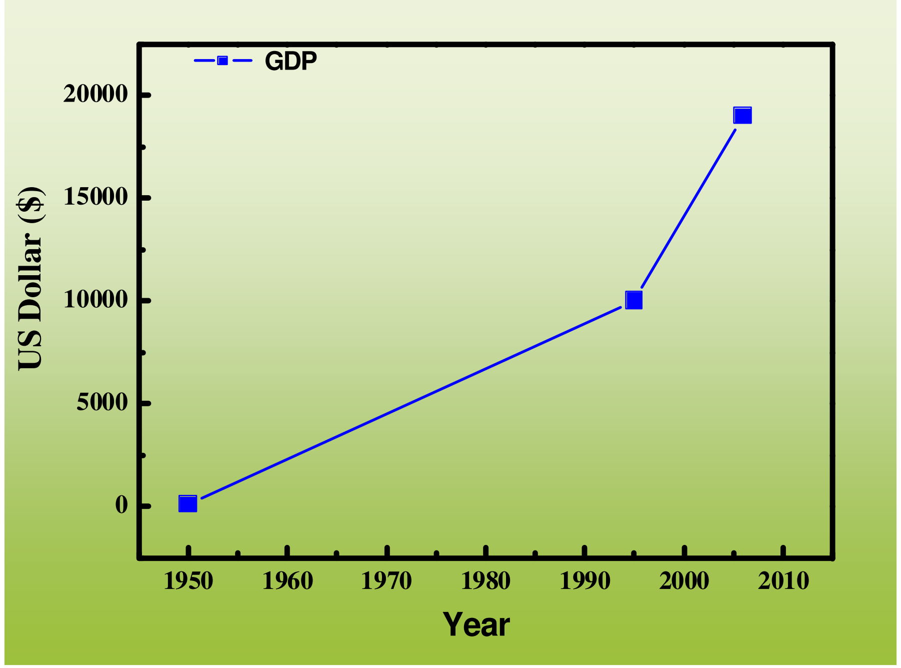
The world output has grown 3x in the last 20 years!

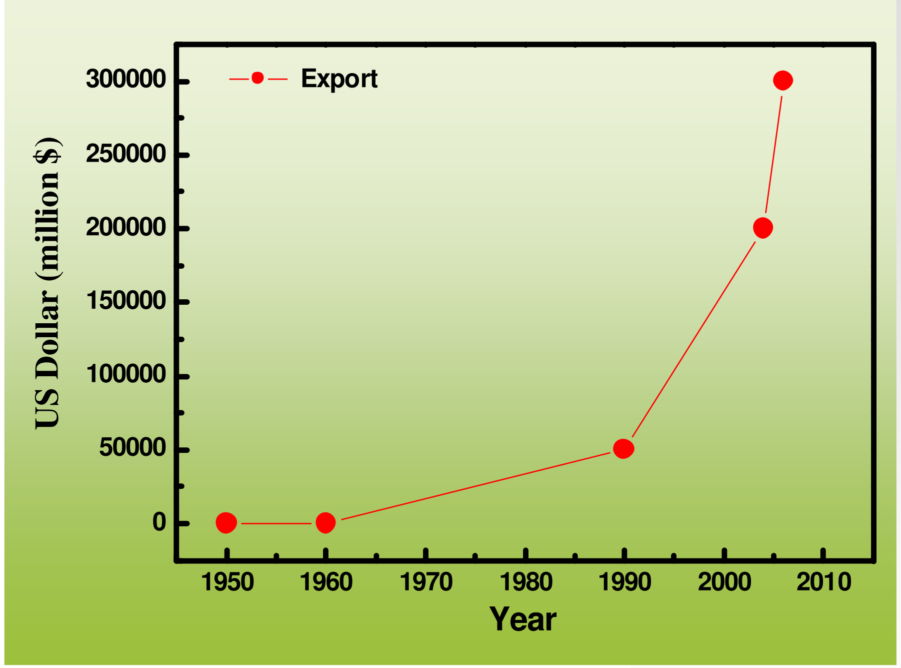


1.6 X growth in the last 5 years!

3 X Growth for the last 20 years

Increase of GDP and Export





In 2007, GDP is now 20,000 $

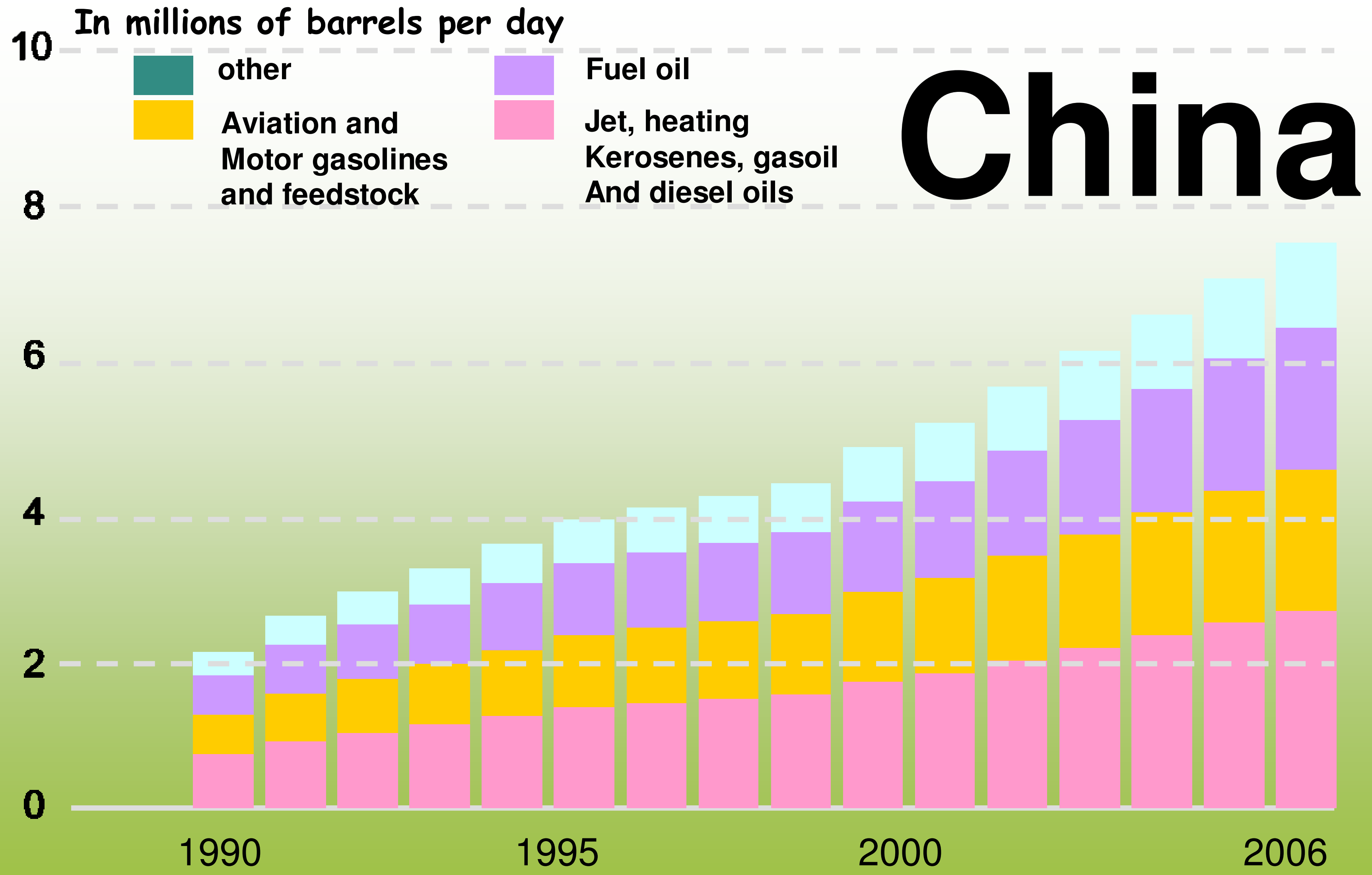
World's 10th export country

Target :

In 5 years,500,000 M$

In 10 years, 1,000,000 M$

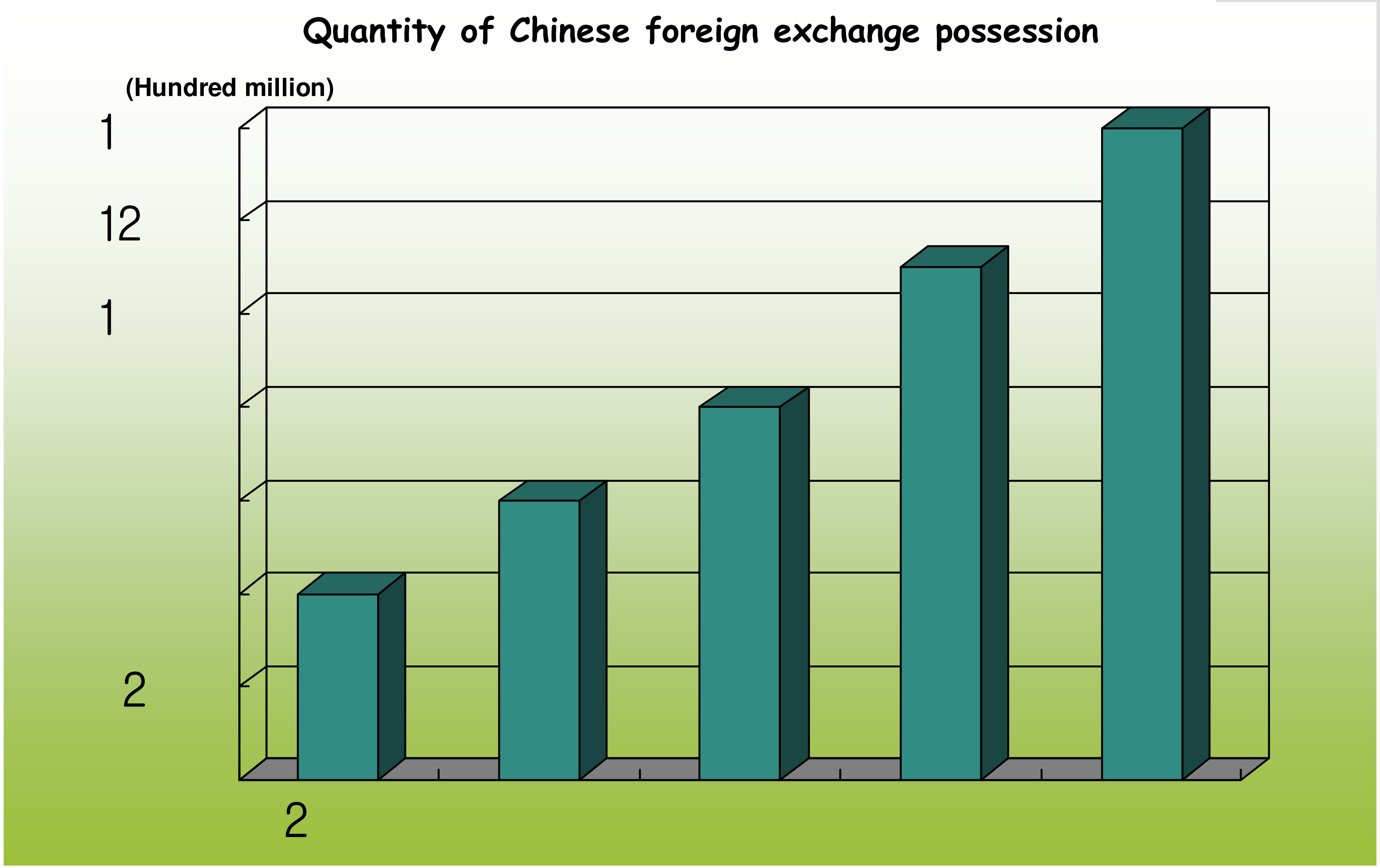
Demand for petroleum products



Refinery gas, LPG, solvents, petroleum coke, lubricants, bitumen, wax other refinery fuel an loss

Source : BP Statistical Review of World Energy 2007

A Chinese economic new record



Details of Export in Korea

Export

(Unit : M$, %)

		2003	2004	2005	2006
Total	Export	193,800	253,800	284,400	325,460
	%	19.3	31.0	12.0	14.4
Industry	Export	57,000	74,300	82,000	88,500
	Change	24.3	29.9	10.4	7.9
	%	29.5	29.3	28.8	27.2
Motor Vehicle	Export	19,100	26,600	38,000	43,200
	Change	29.4	39.0	42.0	13.6
	%	9.9	10.5	13.4	13.3
Ship	Export	11,300	15,700	17,700	22,200
	Change	4.3	38.1	12.5	24.7
	%	5.8	6.2	6.2	6.8

Korean 3 Major IT ITEM Export

(unit : M$, %)

	2002		2003		2004		2005		2006	
	amount	%	amount	%	amount	%	amount	%	amount	%
Semiconductor	16,775	36.4	20,011	35.0	26,830	36.1	22,606	39.4	29,930	36.5
Cellular Phone	11,244	24.4	15,516	27.1	22,348	30.1	17,843	32.1	24,000	29.2
LCD	4,262	9.3	6,029	10.5	6,290	8.5	5,398	9.4	6,855	8.3
Sum.	32,281	70.1	41,556	72.6	55,469	74.6	45,847	80.0	60,785	74.0
Overall Sum.	46,046	100.0	57,220	100.0	74,306	100.0	57,316	100.0	82,000	100.0

Export by Major Company

(2006.3)

- Samsung Electronic : 50,000 M$ (Semiconductor: 36.200 M$)
- LG Electronics : 17,000 M$
- Hyundai & Kia Motors : 25,000 M$
- Samsung, Hyundai, etc. Ship Construction : 22,000 M$

- 10 major companies in Korea occupy 37% of Korean total export
- Countries with export amount of 300,000 M$ have GDP higher than 30,000 US Dollars

Industry related to Surface Treatment(Semiconductor)

DRAM Sales Revenue

(Unit : M$, %)

Rank		Company	Revenue		G/R (06/05)	Market Share(05)
2005	2006		2006	2005		
1	1	Samsung	9,479	7,460	27%	28.0%
2	2	Hynix	5,637	4,117	37%	16.6%
-	3	Qimonda	5,369	-	-	15.9%
3	4	Micron	3,740	3,813	-2%	11.0%
5	5	Elpida	3,527	1,776	98%	10.4%
6	6	Nanya	2,241	1,509	48%	6.6%
7	7	Powerchip	1,573	1,205	30%	4.6%
8	8	ProMos	1,382	890	55%	4.1%
9	9	Etron	285	161	77%	0.8%
-	10	Winbond	172	-	-	0.5%
		Others	464	476	-3%	1.4%

*Source : Isuppli(2007.Q1)

Industry related to Surface Treatment(Semiconductor)

Nand Flash Sales Revenue

(Unit : M$, %)

Rank		Company	Revenue		G/R (05/04)	Market Share(05)
2004	2005		2005	2004		
1	1	Samsung	5,742	3,901	47%	52.9%
2	2	Toshiba	2,382	1,850	29%	21.9%
4	3	Hynix	1,382	221	525%	12.7%
3	4	Renesas	735	600	23%	6.8%
7	5	Micron Technology	238	8	2,875%	2.2%
6	6	STMicroelectronics	215	25	760%	2.0%
5	7	Infineon	165	30	450%	1.5%
		Total	10,859	6,635	64%	-

*Source : Isuppli(2006.Q1)

Status of Semiconductor Industry in Korea

- Position in the world

- Korean Semiconductor fabrication : 3rd rank (11%, 35 trillion US $) country followed by USA and Japan for 300 trillion US $ world market.

- For Memory :DRAM(44.6%), Flash(65%) all No.1 in the world

- 50nano DRAM, 32nano Flash memory : World first development ('06)

Industries Related to Surface Treatment (Other Electronic Items)

2006. 3

No	Cellular Phone	LCD TV	PDP Panel
1	Nokia (35.1%)	Phillips (13.9%)	LG Electronics (30.6%)
2	Motorolla (20.6%)	Sharp (13.1%)	Matsushita Elec. (27.5%)
3	Samsung Electron. (12.2%)	Samsung Electron. (12.5%)	Samsung SDI (23.5%)
4	Sony Ericson (7.7%)	Sony (10.9%)	Hitachi (11.7%)
5	LG Electron. (6.0%)	LG Electron. (6.9%)	Pioneer (6.6%)

Industries related to Surface Treatment (World motor vehicle by country)

Unit: 1000 vehicles

No	2003		2004		2005		
1	USA	12,114	USA	11,989	USA	11,980	0%
2	Japan	10,286	Japan	10,512	Japan	10,799	3%
3	Germany	5,506	Germany	5,570	Germany	5,757	3%
4	China	4,443	China	5,234	China	5,708	9%
5	France	3,620	France	3,666	France	3,549	-3%
6	Korea	3,118	Korea	3,469	Korea	3,699	7%
7	Spain	3,030	Spain	3,011	Spain	2,753	-9%
8	Canada	2,553	Canada	2,711	Canada	2,688	-1%
9	United Kingdom	1,846	Brazil	2,210	Brazil	2,528	9%
10	Brazil	1,827	United Kingdom	1,856	United Kingdom	1,803	-3%

Industries related to Surface Treatment

World motor vehicle production by manufacturer

World ranking 2006

Rang	GROUP	Total	CARS	LCV	HCV	HEAVY BUS
				Year 2006		
	Total	**68 340 304**	**51 953 234**	**13 187 688**	**2 850 233**	**349 149**
1	GM	8 926 160	5 708 038	3 156 888	43 838	17 396
2	Toyota	8 036 010	6 800 228	1 049 345	122 569	63 868
3	FORD	6 268 193	3 800 633	2 386 296	81 264	
4	VOLKSWAGEN	5 684 603	5 429 896	219 537	29 175	5 995
5	Honda	3 669 514	3 549 787	119 727		
6	PSA	3 356 859	2 961 437	395 422		
7	Nissan	3 223 372	2 512 519	570 136	134 874	5 843
8	Chrysler	2 544 590	710 291	1 834 299		
9	RENAULT	2 492 470	2 085 837	406 633		
10	Hyundai	2 462 677	2 231 313	966	145 120	85 278
11	FIAT	2 317 652	1 753 673	450 544	89 071	24 364
12	Suzuki	2 297 277	2 004 310	292 967		
13	DAIMLERCHRYSLER	2 044 533	1 275 152	378 278	340 296	50 807
14	Mazda	1 396 412	1 169 640	223 995	2 777	
15	Kia	1 381 123	1 181 877	197 060		2 186

Status of Korean Surface Finish Industry

- Total Number of Korean Surface Finishing Companies are decreasing,

  But, production is increasing continuously.

  SUR/FIN 2005 showed the trend of world SUR/FIN :

Country	Net Increase/Decrease (%) (compared to 2004)
USA	-45 %
Japan	-25 %
China	+75 %
Korea	+45 %

* Mr. Christian Richter (The Policy Group) ~SUR/FIN 2006, Milwaukee, U. S.

Status of Korean Surface Finish Industry

Total Number of Korean Surface Finishing Companies :

about 3000 Among these, about 1500 companies' category is as follows;

Category	Number of Companies
Electroplating	840
Electroless Plating	120
Anodizing and Phosphating	290
Other Special Metal Finishing	250

Every year, about 10% of the companies are decreased by losing the business and Movement to abroad

Status of Korean Surface Finish Industry

- Due to the problem on the waste water disposal, industrial complexes having common waste water disposal plant are formed by an individual or by government.

- Generally, one complex contains average about 20 companies

- Current number of industrial complex for surface finishing companies are;

Category	Number of Complex
Governmental Complex	22
Individual Complex	43

PCB Industry in 2006 by Country

Estimate of Total 2005~2006 PCB Production in the World's Major Producing Areas (in millions of U.S. dollars)

Country or region where PCBs were produced	rigid 1-2 sided	standard multilayer	HDI/Microvia/ Build-up	IC substrate	Flexible Circuits*	Rigid Flex*	Others	Total Estimated PCB Production (2005)	Total Estimated PCB Production (2006)
China	3,061	5,648	1,391	335	373	22	-	10,830	12,102
Japan	1,624	2,158	1,082	3,124	1,736	126	208	10,059	11,228
Taiwan	470	1,870	1,020	1,752	709	47	-	5,869	7,350
Korea	653	1,179	1,053	947	988	200		5,020	5,795
North America	412	3,378	185	50	340	129	-	4,494	4,624
Europe	1,212	1,518	150	390	152	165		3,587	3,660
Other Asia**	392	497	56	397	1,240	1	2	2,584	3,263
Total production of Major PCB Producing countries/regions	7,695	16,079	4,915	6,966	5,532	691	210	42,089	48,022

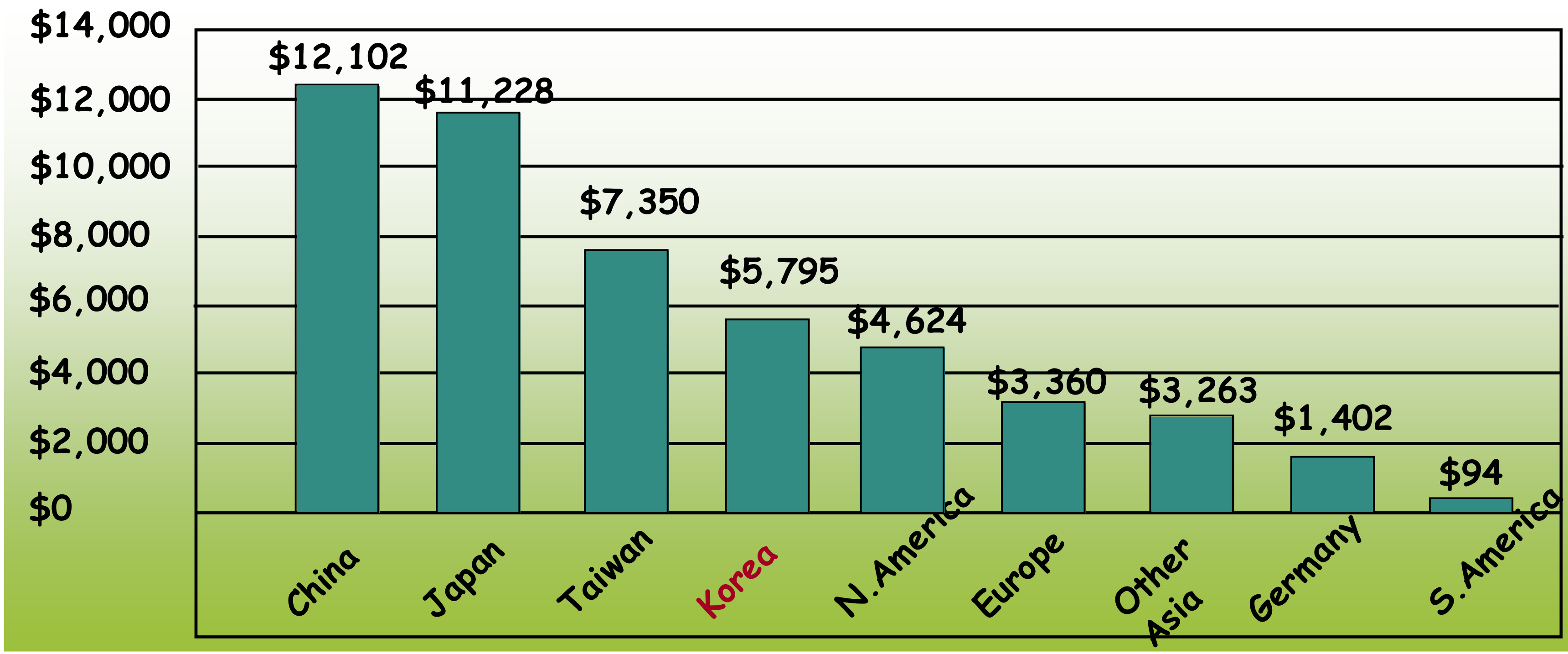
* Bare circuits only, not including assembly or other value-added service

** Other Asia includes Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam

PCB Production in 2006

Total Estimated 2006 PCB Production by Major Producing Countries/Regions

(in Million of US Dollars)



- Major portion of Korean Surface Finishing Companies is PCB companies.
- Compared to general surf/fin companies, PCB production companies have higher production skills.

PCB Production Trend by Country

	2001	2002	2003	2004	2005	2006	Average change/year
North America	7,380	5,370	5,400	5,740	5,980	4,624	-7.8 %
South America	140	130	120	120	130	92	-7 %
Europe	4,530	3,970	3,100	3,340	3,400	3,360	-5 %
Japan	8,780	9,620	9,740	10,520	10,850	11,228	4.8 %
Taiwan	3,930	4,260	4,300	5,450	6,100	7,350	13 %
China	3,600	4,510	5,610	7,330	8,820	12,102	27 %
Other	2,700	2,680	2,510	2,850	3,100	3,263	6.2 %
Korea	2,040	2,260	2,520	3,850	5,500	5,795	24 %
Sum.	33,100	32,800	33,300	39,200	43,880	47,814	7.2 %

'06 Prismark Report, '06 NTI Report, KPCA

This table shows that PCB production increase in China, Japan, Taiwan, and Korea

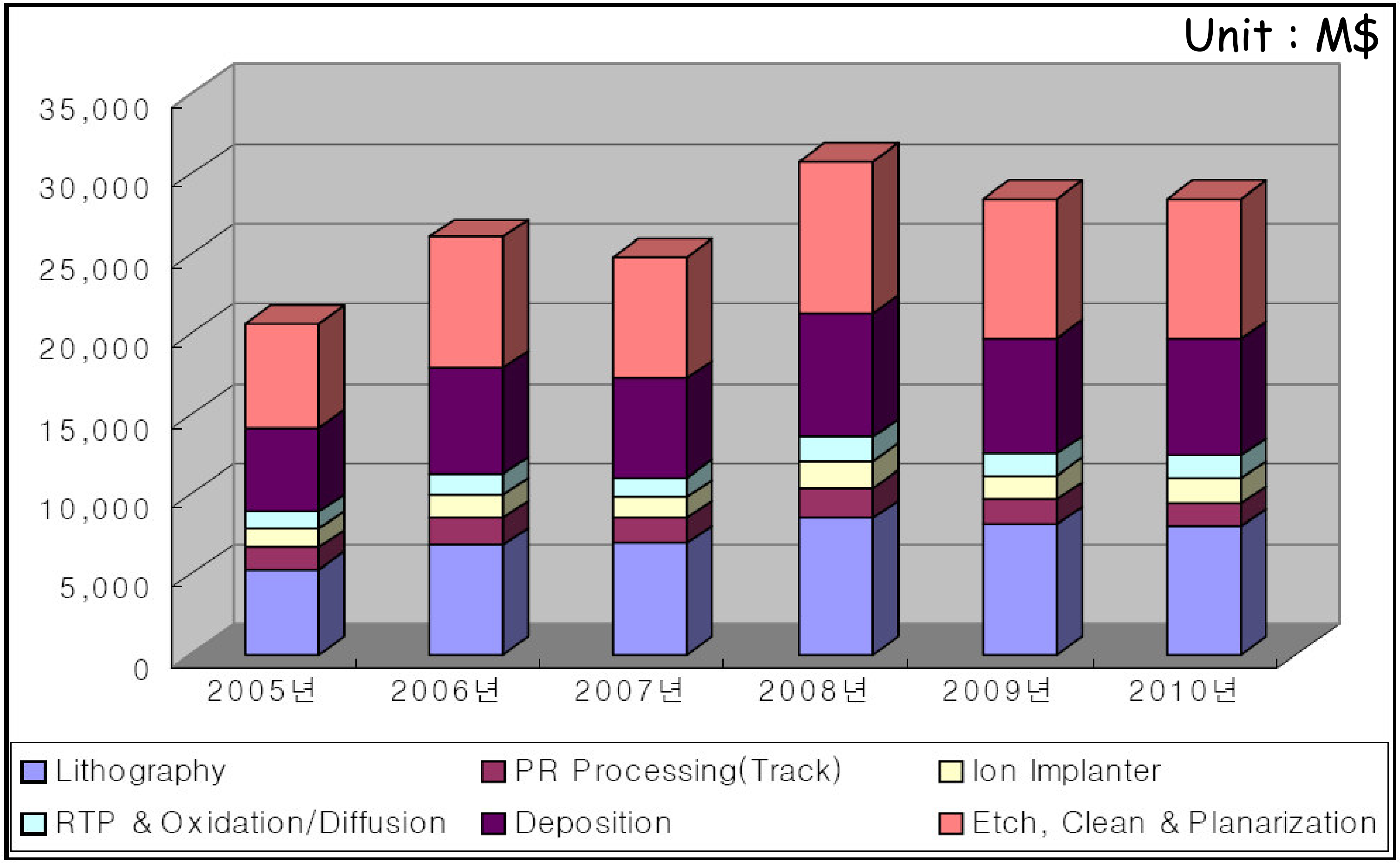
Korean PCB Production by Applications

[Unit : m^2/year]

	2004	2005	2006		Average change/year
			expectation	Net change	
Rigid PCB	20,000,000	20,600,000	19,920,000	-3%	7%
Single/both sides	14,500,000	13,500,000	12,500,000	-7%	-2%
Multilayer (< 6 layers)	3,000,000	4,150,000	4,400,000	6%	21%
Multilayer (> 8 layers)	800,000	1,150,000	1,200,000	4%	11%
Build-up (< 6 layers)	700,000	750,000	750,000	0%	4%
Build-up (> 8 layers)	1,000,000	1,050,000	1,070,000	2%	2%
Flex PCB	2,000,000	2,440,000	2,860,000	17%	18%
Single-side	600,000	840,000	1,000,000	19%	27%
Two-side	800,000	860,000	1,050,000	22%	14%
Multilayer	500,000	550,000	590,000	7%	11%
Rigid-Flex	100,000	190,000	220,000	16%	38%
IC-Substrate	650,000	890,000	1,090,000	22%	32%
PBGA	200,000	220,000	240,000	9%	8%
CSP	350,000	530,000	690,000	30%	44%
FCBGA	100,000	140,000	160,000	14%	41%
Total	22,650,000	23,930,000	23,870,000	-	14%

This Table shows the increase of **high value-added PCB such as Flexible or IC-substrate** compared to single-double sided PCB.

Dry Processing Equipment World Market and Forecast for Semiconductor



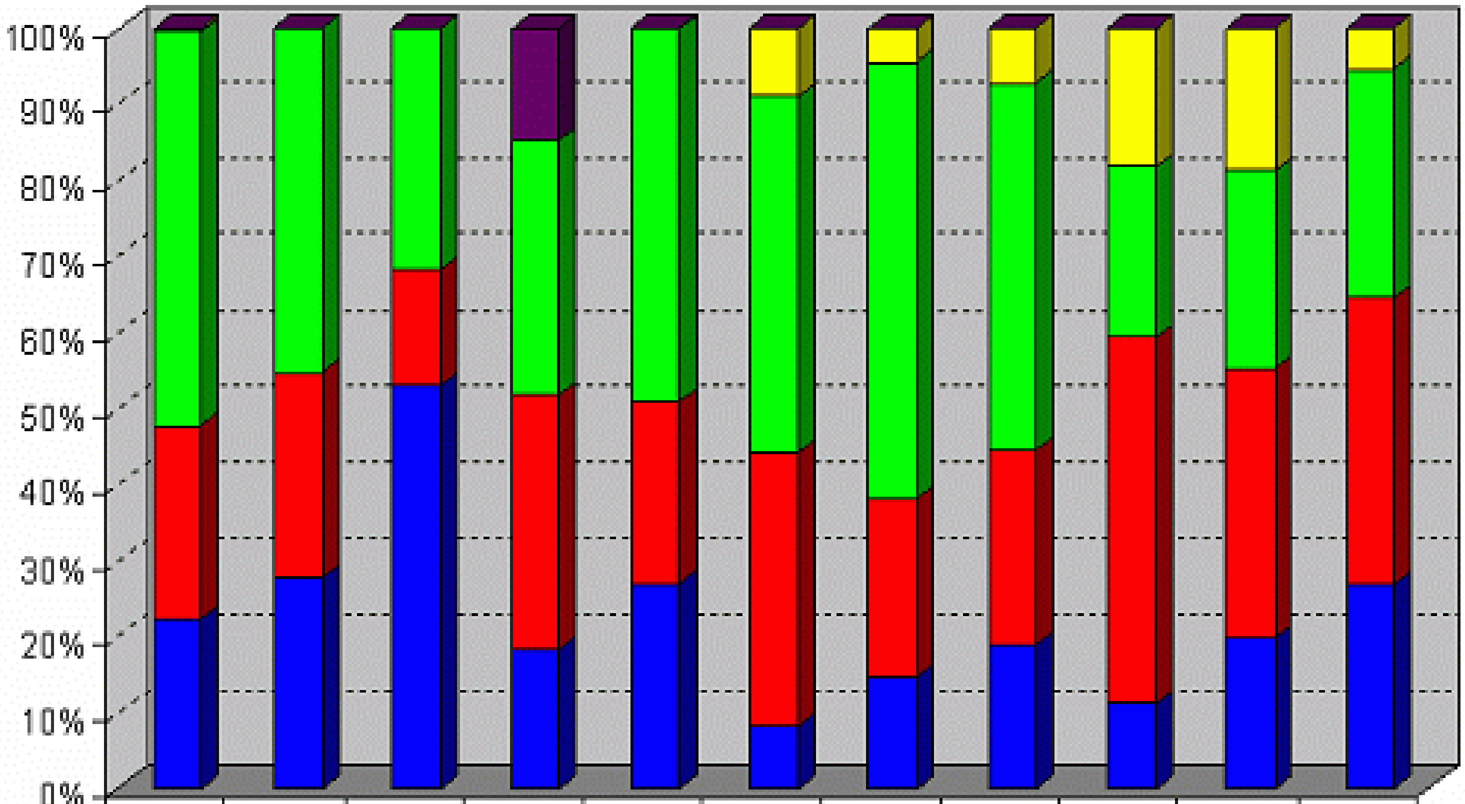
	2005	2006	2007	2008	2009	2010
Deposition	5,220	6,610	6,223	7,737	7,186	7,251
Etch & Clean	6,507	8,184	7,571	9,495	8,739	8,816

Dry Processing Equipment Market for Semiconductor in Korea

(unit: M$)

(unit: M$)		2001	2002	2003	2004	2005	2006	2007	2008
Dry Etcher		3,230	1,818	1,826	3,149	2,668	2,842	3,246	3,951
	Poly-Si etcher	809	536	523	901	764	807	916	1,109
	Oxide Etcher	1,535	823	876	1,510	1,273	1,367	1,569	1,918
	Metal Etcher	886	459	427	738	631	668	761	924
Asher		313	169	169	292	248	263	298	360
CVD		3,377	2,397	2,261	3,638	3,075	3,257	3,713	4,562
	Atm CVD	130	80	16	20	18	19	21	26
	Low P CVD	883	512	482	827	714	758	865	1,054
	Plasma CVD	1,655	1,325	1,304	2,094	1,755	1,851	2,104	2,591
	Metal CVD	709	480	459	697	588	629	723	891
Sputter		1,503	1,064	1,042	1,772	1,492	1,593	1,818	2,214
Cu Plating		172	213	228	399	349	390	461	576

Dry Processing Equipment Investment Trend for Flat Panel Displays by Country



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Singapore	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%
China	0.4%	0%	0%	0%	0%	9%	4%	7%	18%	19%	5%
Taiwan	52%	45%	32%	33%	49%	47%	57%	48%	23%	26%	30%
Korea	25%	27%	15%	34%	24%	36%	24%	26%	48%	36%	38%
Japan	22%	28%	53%	18%	27%	8%	15%	19%	11%	20%	27%

Korean Dry Processing Companies

- The number of Dry Processing Companies are about 86 Companies.
- Most companies are small-medium companies having sales less than 100M$/year.
- Most of major dry processing equipments are imported even though many companies are developing actively.
- Some of the major companies are:

Name of Company	Items	Sales/year (US$)
SEMES	Etch	250
JUSUNG Eng.	CVD	170
AVACO	Sputter	100
ATTO	PECVD	70
NPP	Etch	30
ADP	Etch	30

Korean Companies in Abroad

Due to the high labor cost or due to the movement of major electronics companies to abroad

- Many Companies are moved to countries such as China, India, Indonesia, Viet Nam, etc.
- Also, some of the companies are moved to USA, Europe, and Eastern Europe
- Example China : about 1,000 electroplating companies near Qindao, Tianjin, I Woo.

Major Items : Electroplating of accessory item 80% of Korean Accessory Companies have moved China.

Summary

- Korean export is increasing including export to china, but future is not transparent due to the competition with other countries.
- Korean export is rapidly increasing but profit is gradually decreasing.
- **40% of Korean export** is from 10 major companies and Korean economy depends on the export of these major companies.
- About 10 % Korean surface finishing companies are closing every year but **total production is still increasing**.
- Due to the environmental issues, Korean surface finishing companies are experiencing many problems but currently moving towards zero discharge similar to Europe.

Thank You !