



Kore Modeli: Kore Kalkınma Stratejisi ve Sanayi- İnovasyon Sistem Değerlendirmesi

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Korea Facts & Figures-2009

National facts			Social and governance indicators		rank / total	
Type of government	Republic		Human Development Index (rank)	26 / 182		
Capital	Seoul		Ease of doing business (rank)	19 / 183		
Surface area (thousand sq km)	99		Economic freedom index (rank)	31 / 179		
Population (millions)	49.2		Corruption perceptions index (rank)	39 / 180		
Main languages	Korean		Press freedom index (rank)	69 / 175		
Main religions	Christian (26.3%) Buddhist (23.3%) None (49.3%)		Gini index (income distribution)	31.6		
Head of State (president)	Lee Myung-Bak		Population below \$1 per day (PPP)	n.a.		
Head of Government (prime-minister)	Chung Un-Chan		Foreign trade (2008)			
Monetary unit	Won (KRW)		<i>Main export partners (%)</i>		<i>Main import partners (%)</i>	
Economy (2009)			China	22	China	18
<i>Economic size</i>			US	11	US	16
	<i>bn USD</i>	<i>% world total</i>	Japan	7	Japan	9
Nominal GDP	821	1.43	Hong Kong	5	Germany	3
Nominal GDP at PPP	1384	1.99	<i>Main export products (2009, %)</i>			
Export value of goods and services	431	2.77	Information & communication	10		
IMF quotum (in mln SDR, 2008)	2927	1.35	Semiconductors	9		
<i>Economic structure</i>			Chemicals	9		
	<i>%</i>	<i>5-year av.</i>	Machinery & equipment	9		
Real GDP growth	0.5	4.2	<i>Main import products (2009, %)</i>			
Agriculture (% of GDP)	3	3	Crude petroleum	17		
Industry (% of GDP)	36	37	Machinery & equipment	9		
Services (% of GDP)	50	48	Semiconductors	8		
<i>Standards of living</i>			Chemicals	8		
	<i>USD</i>	<i>% world av.</i>	<i>Openness of the economy, 2009</i>			
Nominal GDP per head	16616	181	Export value of G&S (% of GDP)	52		
Nominal GDP per head at PPP	28026	253	Import value of G&S (% of GDP)	48		
Real GDP per head	19433	251	Inward FDI (% of GDP)	0.1		

Source: EIU, CIA World Factbook, UN, Heritage Foundation, Transparency International, Reporters Without Borders. World Bank.

History

Since the establishment of the modern republic in 1948, South Korea struggled with the aftermath of Japanese occupation (1910-1945), the Korean War (1950-1953), and decades of authoritarian governments, undergoing five major constitutional changes. While the government officially embraced Western-style democracy from its founding, presidential elections suffered from rampant irregularities. It was not until 1987 that direct and fair presidential elections were held, largely prompted by popular demonstrations. South Korea has been a vibrant multi-party democracy for two decades.

Managerial System

- The Republic of Korea is a democratic republic with powers shared between the president and the legislature. The three principal branches of government are: Executive - president (chief of state), legislative - unicameral National Assembly, and judicial - Constitutional Court, Supreme Court and appellate courts.
- South Korea's president is elected to a single five-year term by popular vote. The Prime Minister is appointed Head of Government by the president with the consent of the National Assembly. Deputy Prime Ministers are appointed by the president on recommendation of the Prime Minister. The president also appoints the 15 to 30 members of the South Korean Cabinet (State Council), each of whom heads a government department.

Current Account Balance

	<u>Current Account Balance</u>	<u>Rank</u>	<u>Percent Change</u>	<u>Date of Information</u>
2004	\$12,320,000,000	16		2003
2005	\$26,780,000,000	9	117.37 %	2004 est.
2006	\$16,560,000,000	17	-38.16 %	2005 est.
2007	\$2,000,000,000	38	-87.92 %	2006 est.
2008	\$5,954,000,000	33	197.70 %	2007 est.
2009	(\$6,349,000,000)	162	-206.63 %	2008 est.
2010	\$42,670,000,000	7	772.07 %	2009 est.

Currency Policy

- The exchange rate policies of South Korea — like as other East Asian countries-have been a source of trade tension with the United States for several years.
- South Korea (up until mid-March) have allowed their currencies to float freely in foreign exchange (forex)markets over the last few years
- However,Korea— much like the United States — have intervened in international currency markets if fluctuations in the exchange rate are considered too volatile and pose a risk to the nation's economic well-being.

Avarage Salary, Saving Attitude, Labor Union

- Avarage salary: 2.500.000 Won(2200 USD)
- Avarage working Hour: 42 Hour/week
- Avarage Saving rate: 30%(weighted by real GDP)
- High domestic saving rates (made possible high levels of domestic investment & large capital outflows)
- A few strikes especially during economical crises with having little impact on the stock market or on Korean economy. But, The strikes in 1997 swepted South Korea have their base in the big auto plants, the steel mills and the shipyards which was the heart of the Korean economy.

Ref-1:“Models for National Technology & Innovation Capacity Development for Turkey” Project

By

- Korea Development Institute (KDI)
- Technology Development Foundation of Turkey (TTGV)

Supported by

- Ministry of Strategy and Finance, Korea
- State Planning Organization (DPT), Turkey

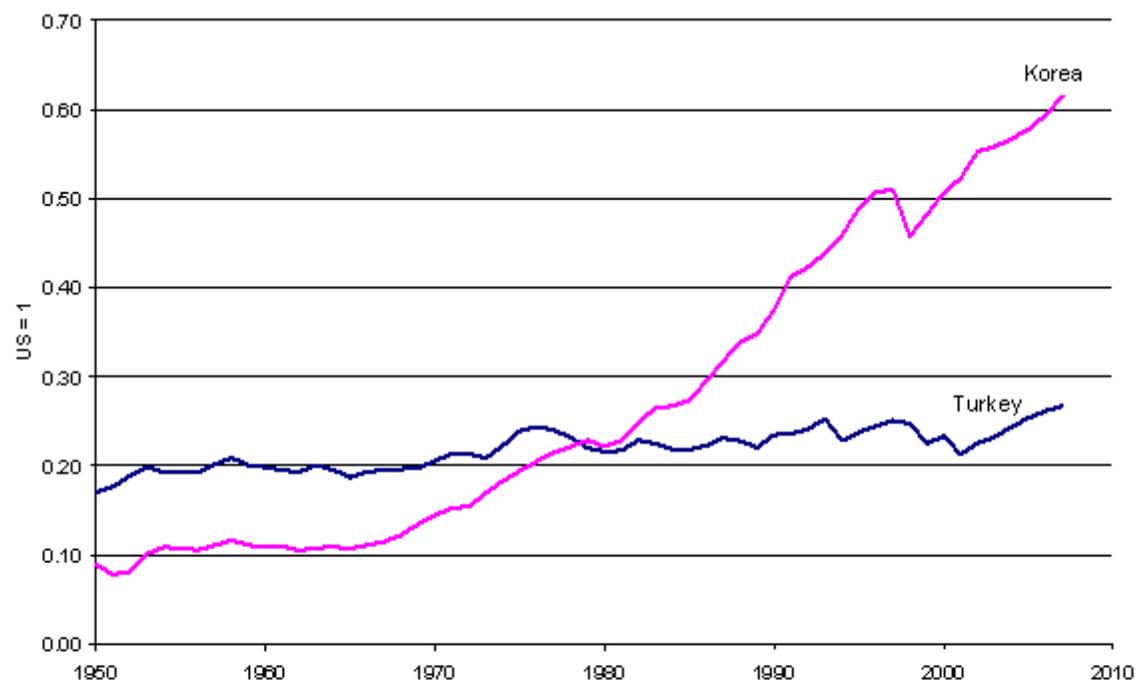
(Published the Book with the same name in 2009

<http://www.ttgv.org.tr/tr/yenilesim-ve-girisimcilik>)

Ref-2:Industrial R&D Policy of Korea

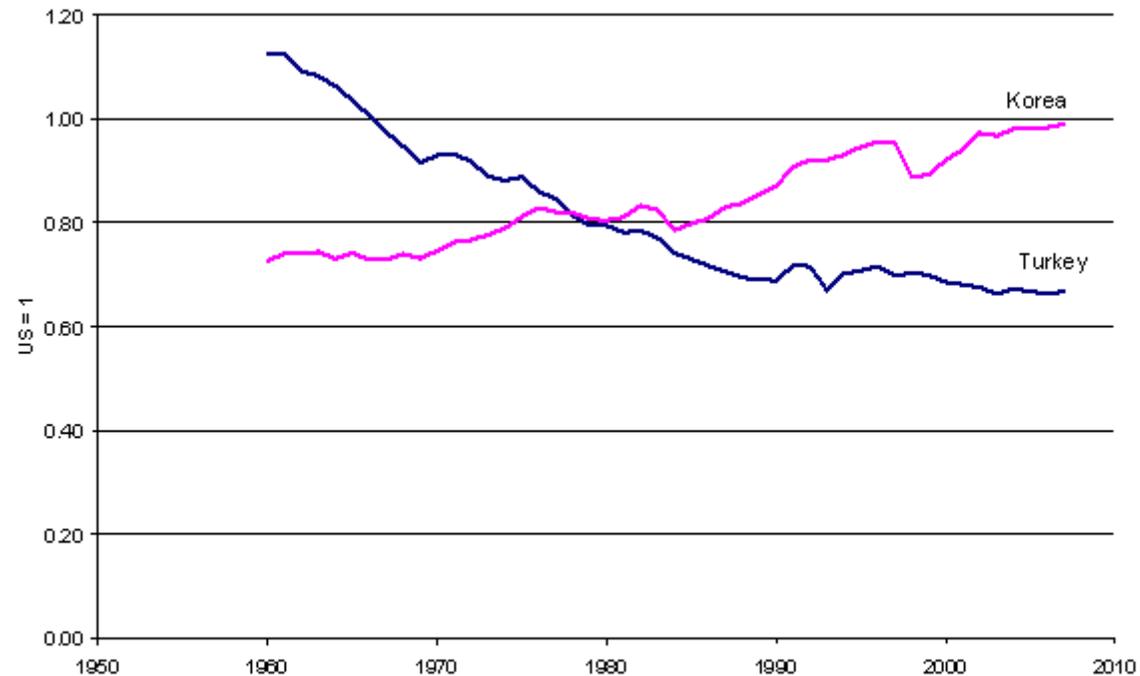
**By Yong-guen Kim - President of KIAT (Korean
Institute for Advancement of Technology)
(TAFTIE Annual Seminar 2010, December 2,
2010)**

GDP per capita in Turkey and Korea relative to the US, 1950-2007



Source: The Conference Board and Groningen Growth and Development Centre, *Total Economy Database*, September 2008, <http://www.conference-board.org/economics/>

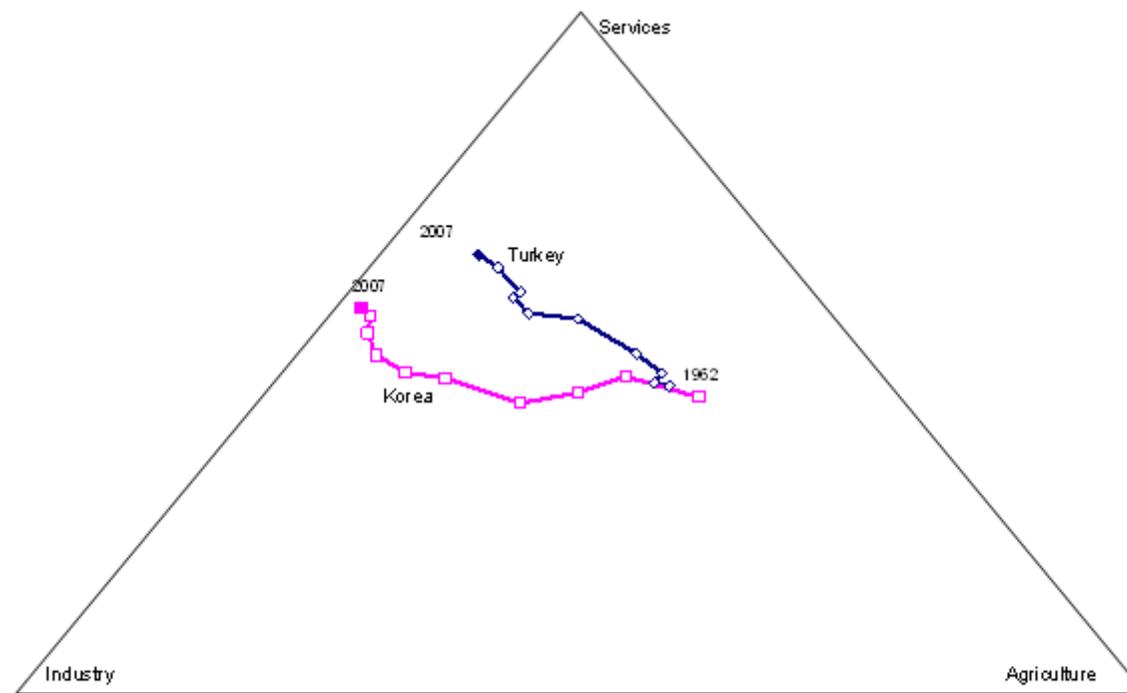
Employment ratio in Turkey and Korea relative to the US, 1960-2007



Note: Employment ratio is defined as the ratio between the number of employees and total population.

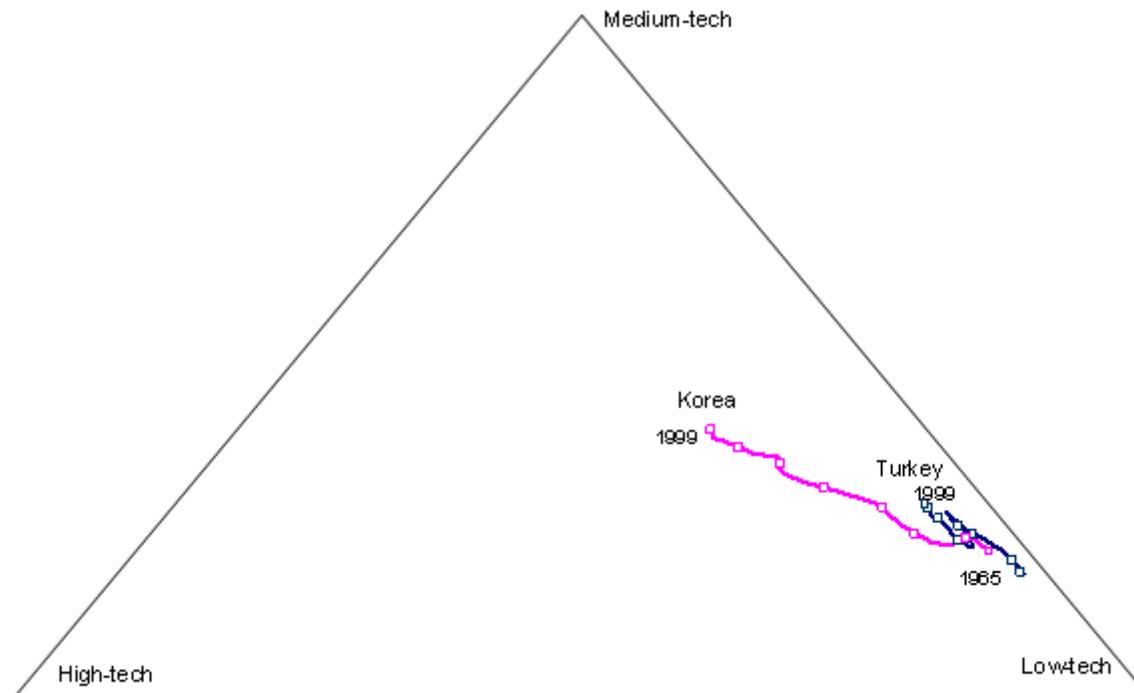
Source: See Figure 2.

Structure of the economy, Turkey and Korea (1962-2005)



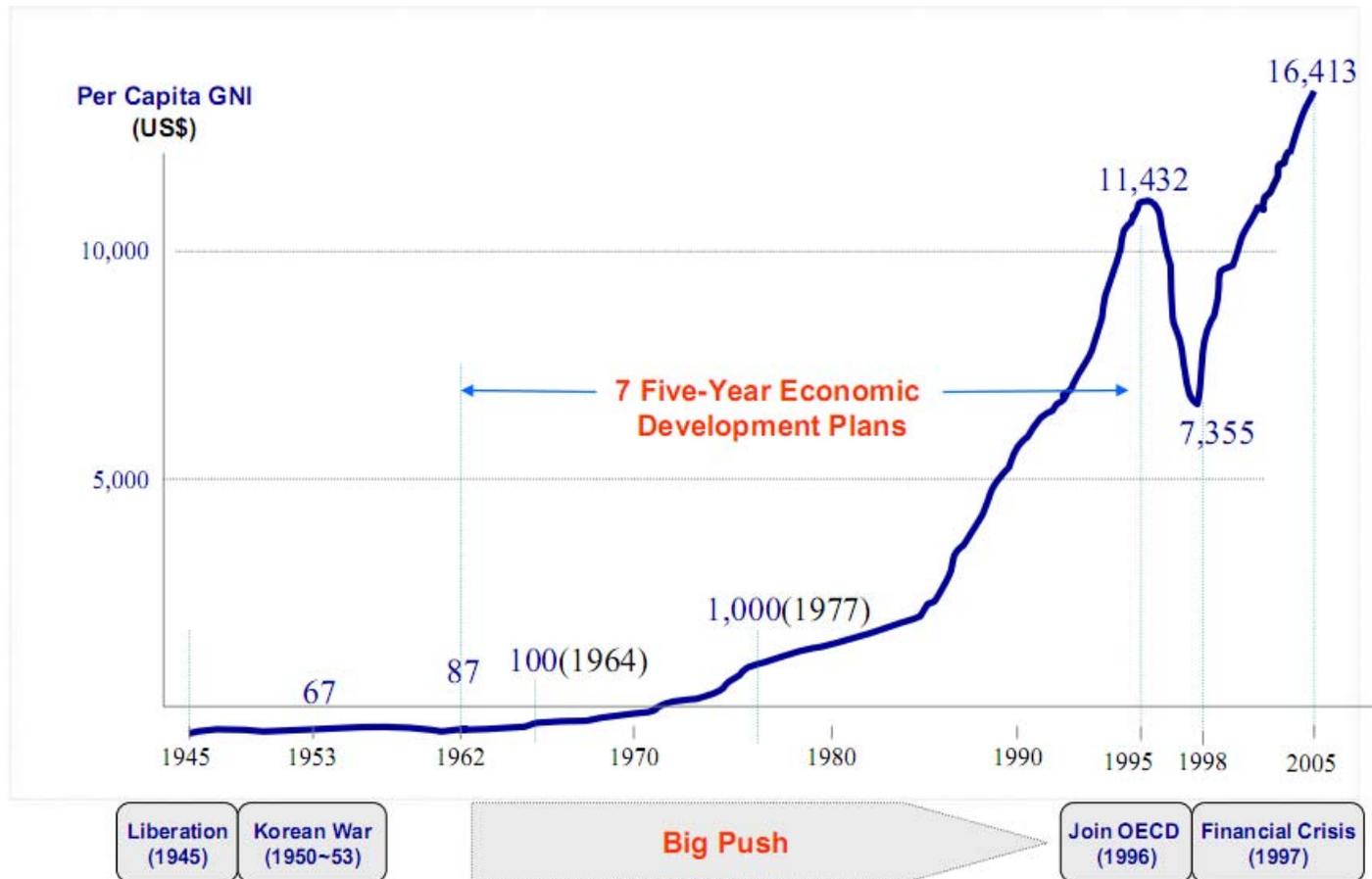
Source: Calculated from the World Bank, *World Development Indicators*, 2008.

Structure of manufacturing industry, Turkey and Korea (1965-1999)

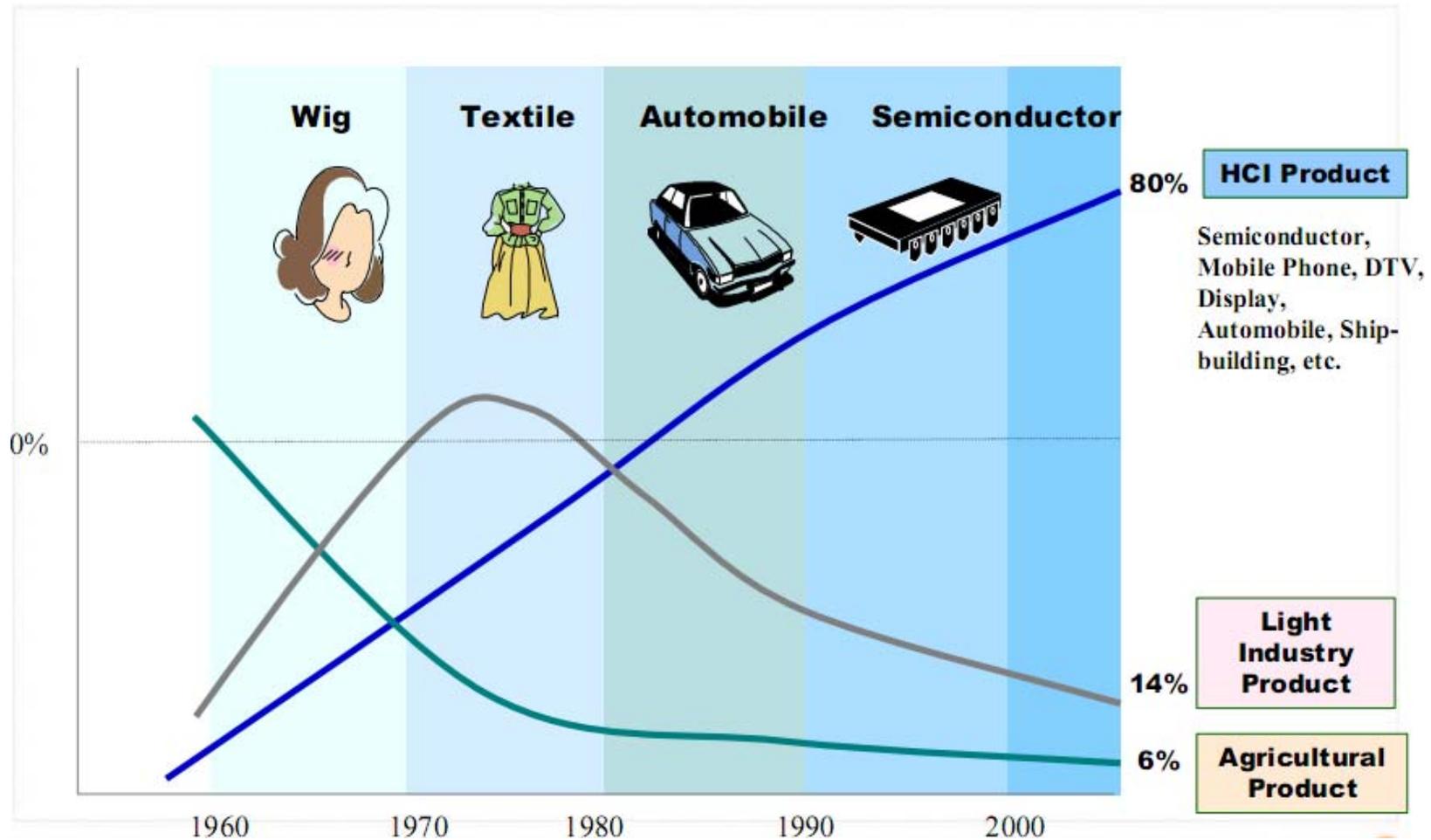


Source: Calculated from UNIDO, *Industrial Statistics Database, Rev 2.0*

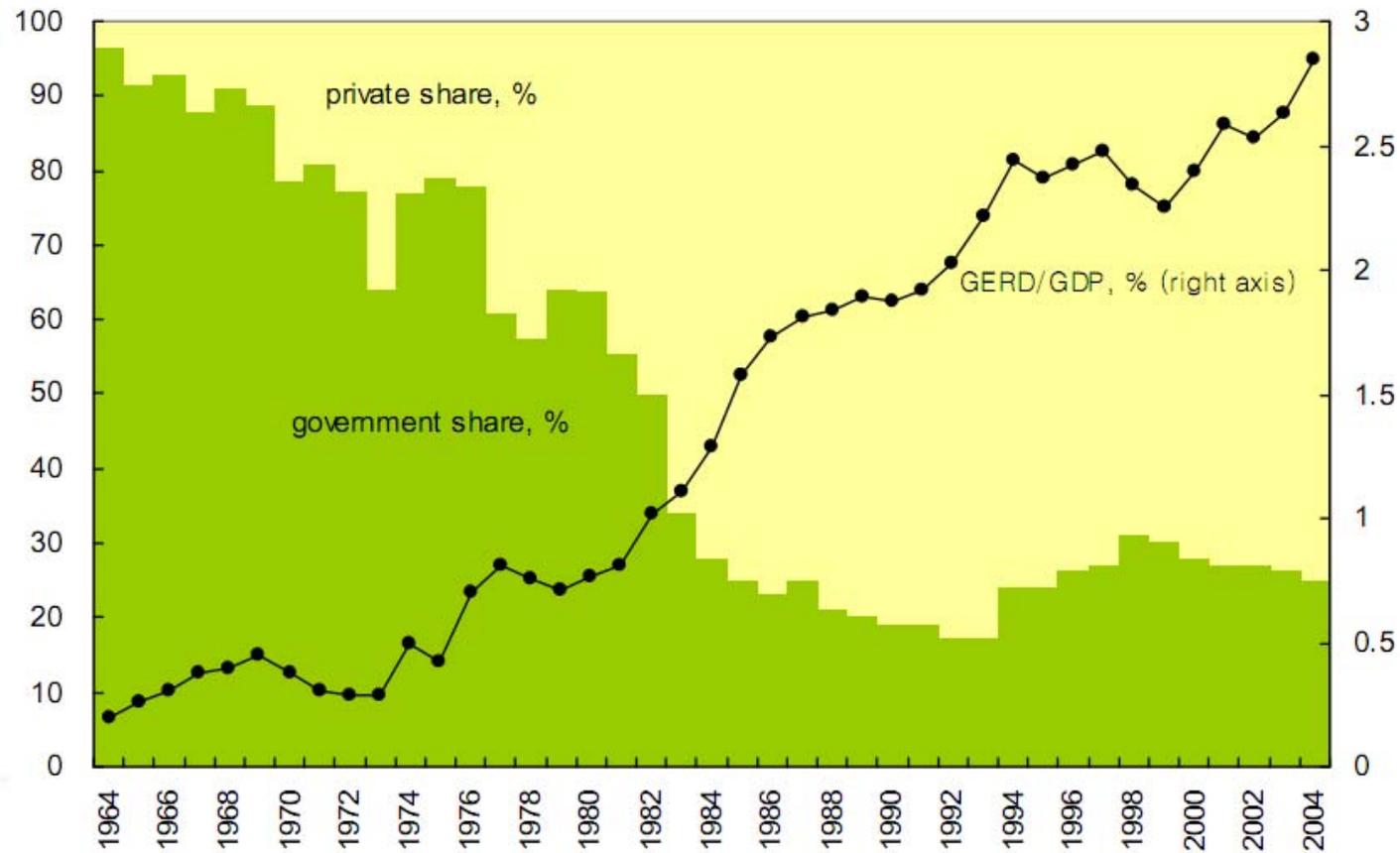
Transformation of the Korea economy



Changes in Export Commodity Profile



Trend of Korea's R&D Investment

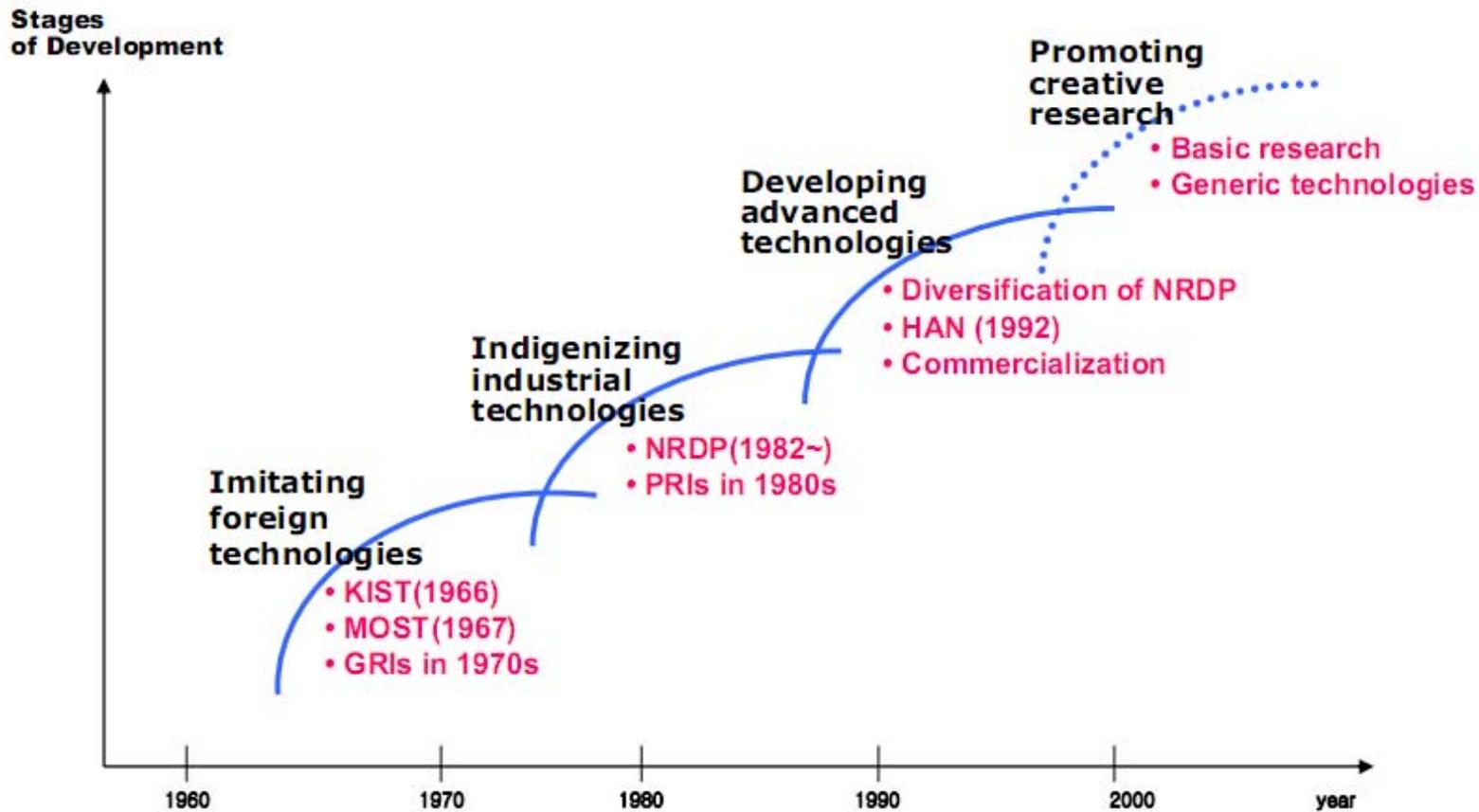


Evolution of R&D System

Some Indicators

	1970	1980	1990	2007
GERD (US\$, Bl.)	0.03	0.4	4.6	33.7
Gov't : Private (%)	71 : 29	64 : 36	19 : 81	26 : 74
R&D/GDP (%)	0.38	0.77	1.87	3.47
Researchers	5,628	18,434	70,503	221,928

Evolution of R&D System



S&T has been Presidential agenda

Collaboration

- 4 Four ministries
- Three companies: Goldstar, Samsung, Hyundai
- ETRI
- SC lab in SNU

“Head of ETRI should wield full authority on personnel management, three companies sharing **a common destiny** should cooperate under the leadership of the Head”
(Aug 22, 1986)

Front Page of Development Plan

科學技術廳長官	通傳部長官	商工部長官	副總理	大統領
白元	金容植	李承燾	李承燾	全斗煥

超高集積半導體技術共同開發(案)

電子通信研究所
所長之全所研究員
人事權完全委任
副所長
三社是共同運命
體面所研究員
指揮下之努力
協助研究員

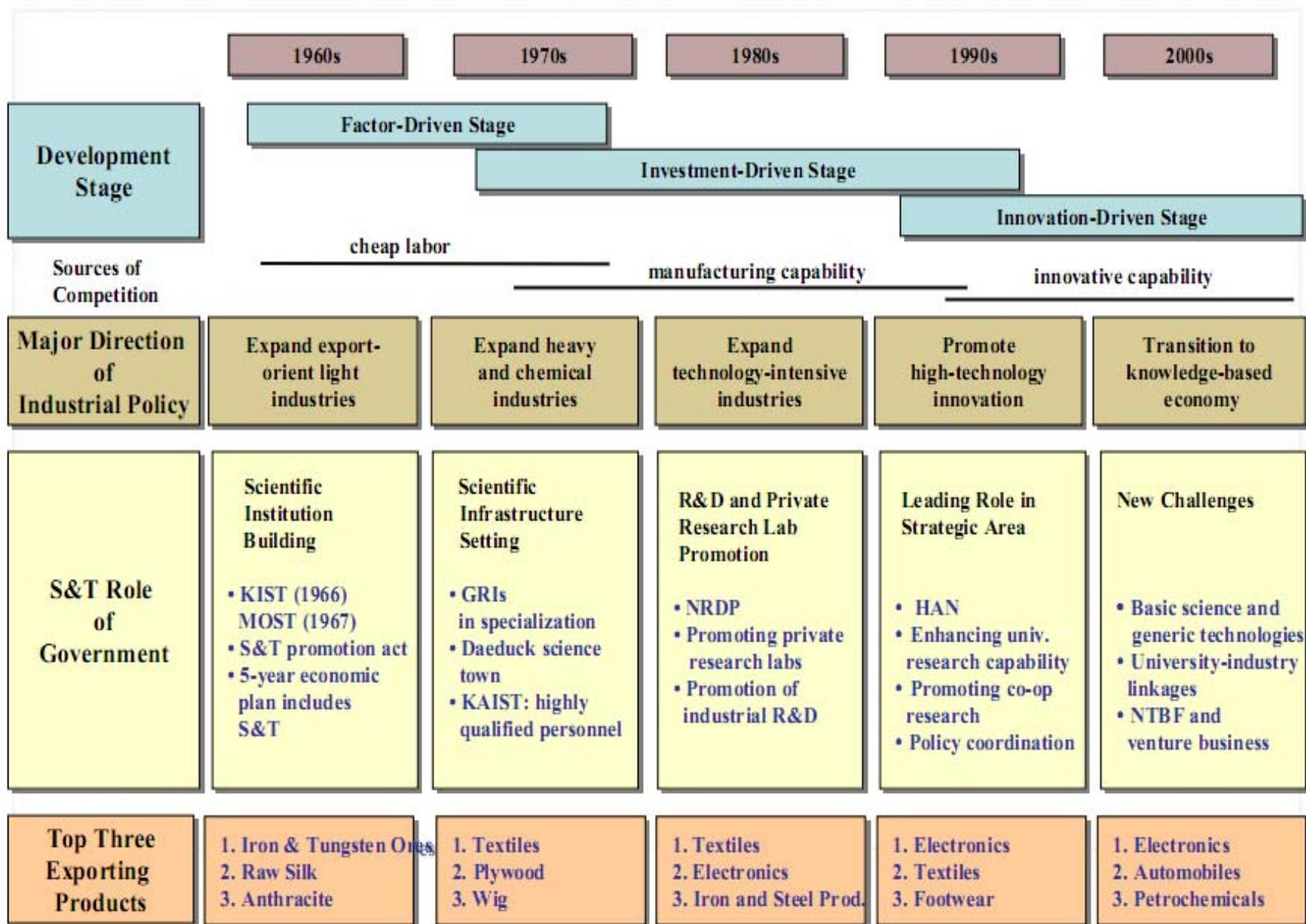
經濟企劃院·商工部
遞信部·科學技術處

Top 20 Companies in US, Japan and Korea (Business R&D Expenditures in million USD, R&D as % of sales)

	United States(2007)			Japan(2006)			Korea(2007)		
	Name of Company	R&D Exp.	R&D/Sales	Name of Company	R&D Exp.	R&D/Sales	Name of Company	R&D Exp.	R&D/Sales
1	GM	8,100	4.5	Toyota	7,659	3.7	Samsung E	5,387	7.9
2	Pfizer	8,089	16.8	Matsushita	4,971	6.4	LG Elect	1,679	6.6
3	J&J	7,680	12.6	Honda	4,745	5	HMC	1,248	3.8
4	Ford Motor	7,500	4.3	Sony	4,677	6.6	GM Daewoo	1,027	7.6
5	Microsoft	7,121	13.9	Nissan	3,997	4.4	Hynix	835	9.2
6	Intel	5,755	15	Hitachi	3,547	4	Samsung SDI	495	12.1
7	IBM	5,754	5.8	Toshiba	3,388	5.5	POSCO	245	1
8	Merck	4,558	18.8	NEC	2,877	7.2	RenaultSamsung	231	7.7
9	Cisco	4,499	12.9	Canon	2,651	6.7	LG Chem	209	1.8
10	Motorola	4,429	12.1	Denso	2,407	7.8	LG Display	170	1.1
11	Boeing	3,850	5.8	Hujitzu	2,185	5	KEPCO	166	0.5
12	HP	3,611	3.5	Taketa Pharm.	1,662	14.8	Samsung TW	153	4.4
13	Lilly(Eli)	3,487	18.7	Sharp	1,633	6.1	KIA	144	0.8
14	Squibb	3,282	17	Fuji Film	1,522	6.2	MagnaChip	142	18.4
15	Amgen	3,266	22.1	Daichi Sankyo	1,468	18.4	SsangYong	138	4.1
16	Wyeth	3,257	14.5	Yamanouchi	1,444	18.2	LIG Nexwin	138	19.8
17	GE	3,009	1.8	Mitsubishi	1,141	3.4	LG Notell	134	13
18	Schering-P	2,926	23.1	NEC	1,133	19	KT	113	0.9
19	Oracle	2,741	12.2	Sanyo	1,095	5.8	LG Innotech	107	7.6
20	Abbott	2,506	9.7	Ricoh	989	5.6	Doosan Infra	106	2.6

Bloomberg Businessweek-Most Innovative Companies 2010

2010 Rank	2009 Rank	Company	HQ Country	HQ Continent	Stock Returns 2006-09 * (in %)
1	1	Apple	U.S.	North America	35
2	2	Google	U.S.	North America	10
3	4	Microsoft	U.S.	North America	3
4	6	IBM	U.S.	North America	12
5	3	Toyota Motor	Japan	Asia	-20
6	11	Amazon.com	U.S.	North America	51
7	27	LG Electronics	South Korea	Asia	31
8	NR	BYD	China	Asia	99
9	17	General Electric	U.S.	North America	-22
10	14	Sony	Japan	Asia	-19
11	16	Samsung Electronics	South Korea	Asia	10
12	33	Intel	U.S.	North America	3
13	31	Ford Motor	U.S.	North America	10
14	8	Research In Motion	Canada	North America	17
15	18	Volkswagen	Germany	Europe	8
16	7	Hewlett-Packard	U.S.	North America	9
17	13	Tata Group	India	Asia	Private
18	20	BMW	Germany	Europe	-8
19	24	Coca-Cola	U.S.	North America	9
20	5	Nintendo	Japan	Asia	-8
21	10	Wal-Mart Stores	U.S.	North America	7
22	NR	Hyundai Motor	South Korea	Asia	23
23	9	Nokia	Finland	Europe	-14
24	34	Virgin Group	Britain	Europe	Private
25	12	Procter & Gamble	U.S.	North America	1



Summary

Development Strategy

- Korea has pursued an outward-looking, export-oriented development strategy
- Government had implemented interventionist approach, with industrial targeting that favored large firms

Evolution of Innovation System

- Competition in the world market, strong pressure for innovation ⇒ Increased needs for R&D investment
 - S&T played a supportive role for industrialization
 - Partnership between government and business
-

Roles

Government

- The role has changed from early to late years
 - Political leadership offer momentum for *quantum leap*
 - Partnership with business is the key for the success
- Strategic planning is very important, e.g., for NRDP

Business Enterprises

- Catching-up strategy : Imitation to innovation
- Large firms able to finance long-term, risky R&D projects

SW Analyse

Strength

- Exposure to international markets ⇒ Innovation pressure
- The existence of big enterprises
 - Leading industrial R&D as shown in supply chains
 - Ability to invest in long-term, risky R&D projects
- Well-educated people

Weakness

- Disadvantage of being small
- Imbalances in innovation system
 - Basic vs applied, LE vs SME, regional disparity

Overall Summary

Korean Model;

1st Phase:

- Strong in: R&D, Big firms, Focused Area

2nd Phase:

- Still strong in a.m
- Try to built the capacity in University&Industry linkages, increase high-tech SMEs

Vision:

Mutual Growth

- for Large businesses and SMEs
- for Industrialized and Developing countries

Bridge between Industrialized and Developing Countries

Global

- Provide solutions and values that serve the entire world instead of focusing on domestic demand for industrial technologies

Innovator

- Realize fresh new ideas in our unique way by raising the level of ideas
- Paradigm shift from products, service, technology-oriented to people, customers, market-oriented approach

First Mover

- From a follower of standards to a creator of standards: leads efforts to create a more people-friendly affluent future with creative innovation that pursues "out-of-box" approach all the times

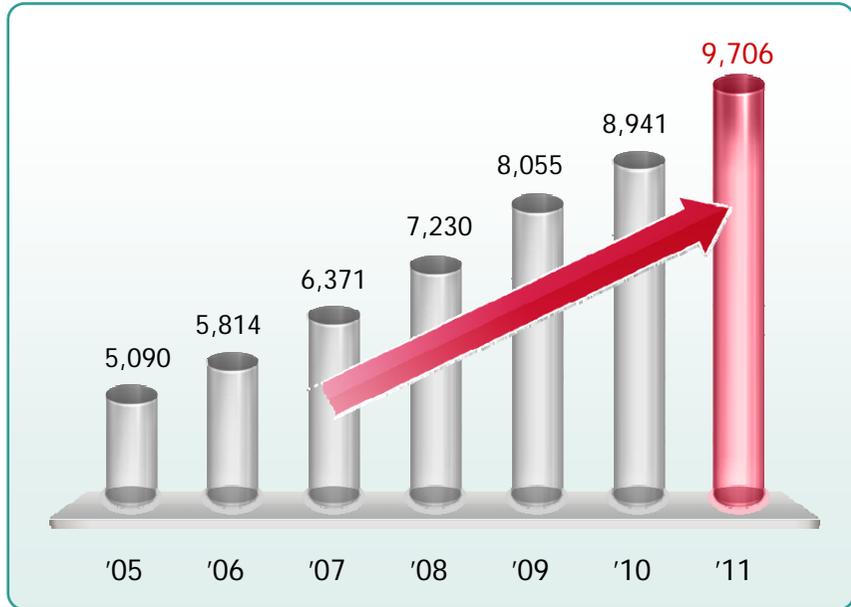
Vision

"Global Innovator & First Mover for Co-Prosperity"

Government's Budget for R&D

Government budget 2011 will be amounted to KRW 14.87 Trillion(9.7 Bil. EUR), up by 8.6% compared to 2010

Government's R&D Budget Trends (EUR Mil.)



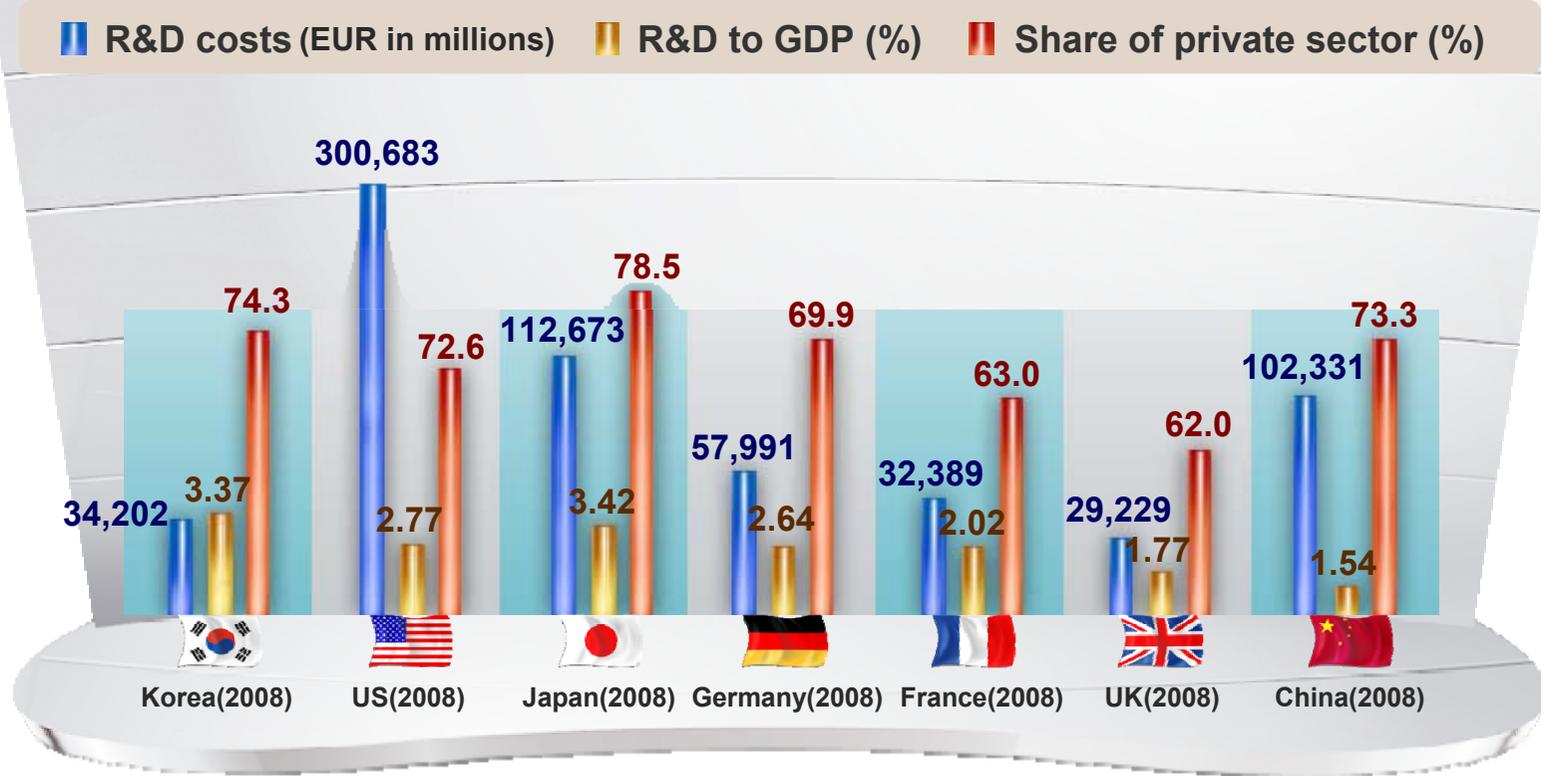
Increase in Gov't R&D Budget



Changes in R&D Investment

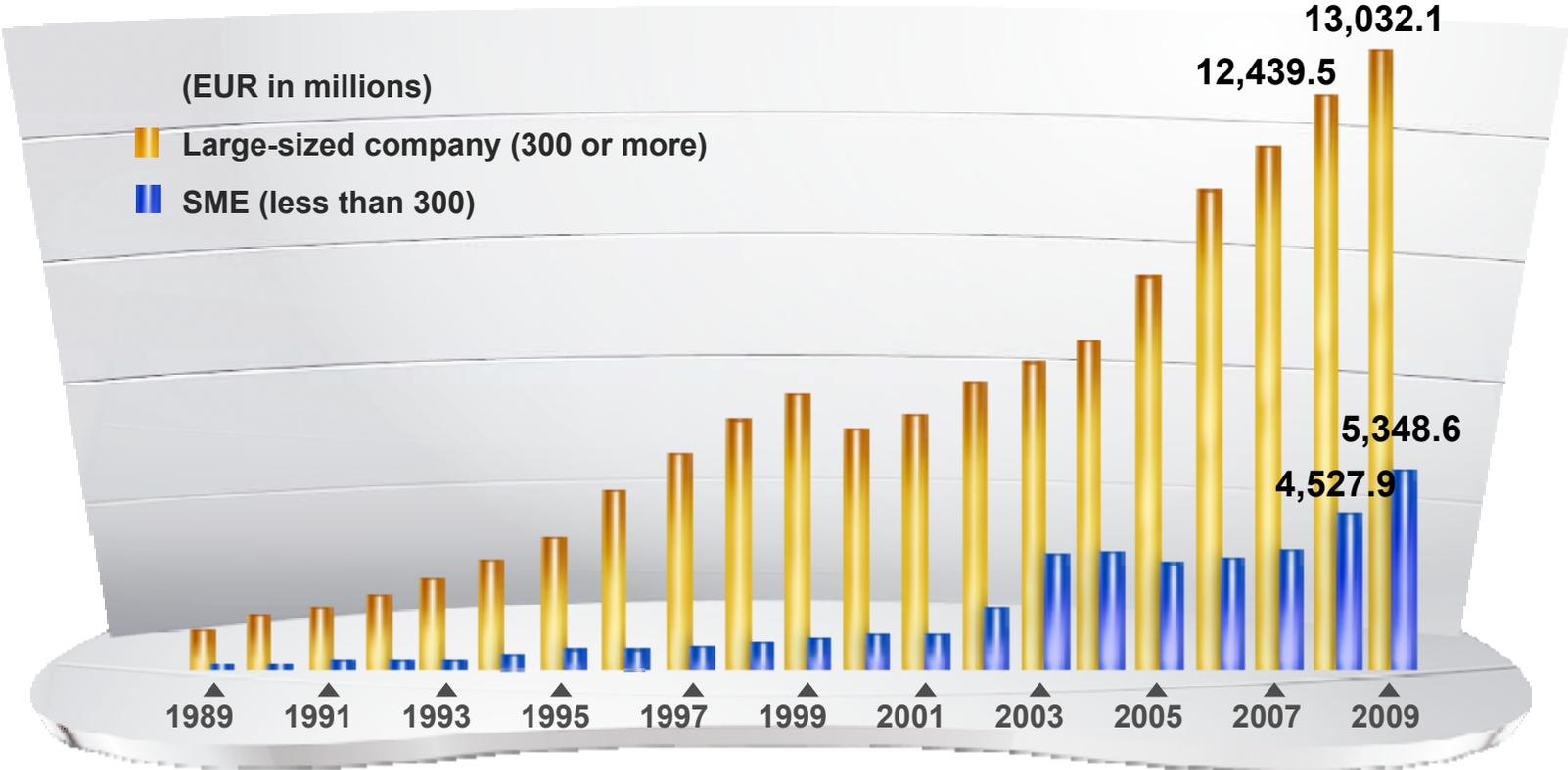
Korea has the high ratio of R&D investments to GDP

Int'l comparison of R&D Investment (OECD)



Changes in R&D Investment – Private Enterprises

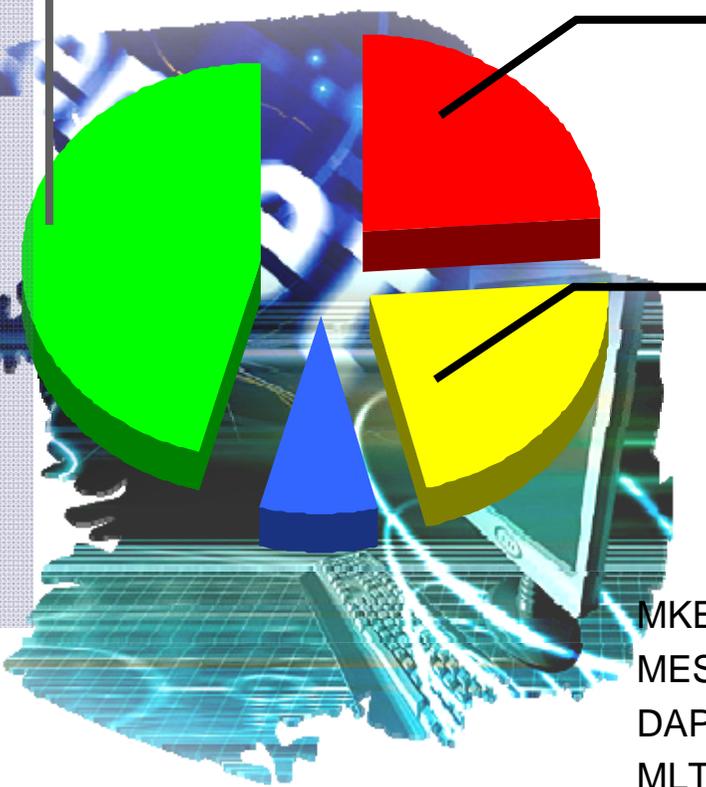
Large companies have mostly led the investments. Since 2000, SMEs have begun to accelerate R&D investments.



Government R&D Budget by Each Ministry

('10) : € 8.9 B → ('11) : € 9.7 B

DAPA : 13.6 % for Defense R&D
MLTM : 4.1% for Transport and Logistics R&D
SMBA : 4.2% for R&D for Small and Medium companies
RDA : 3.4% for Rural Development R&D



MKE : 30.4% for Industrial Technology Development

MEST : 31.9% for Science and Technology R&D

- MKE : Ministry of Knowledge & Economy
- MEST : Ministry of Education, Science & Technology
- DAPA : Defense Acquisition Program Administration
- MLTM : Ministry of Land, Transport, Maritime Affairs
- SMBA : Small and Medium Business Administration
- RDA : Rural Development Administration

Comparison of Main R&D Government Players

	MKE	MEST
Support Field	Industrial Technology	Basic Scientific Research
Support Target	Enterprises	Universities
Government Affiliated R&D Agencies	KIAT (Int'l R&D, Infra , Planning for Industrial Tech. Sector) KEIT(National R&D for Industrial Tech. Sector) KETEP(R&D for Energy Sector)	NRF (Basic Science Research)

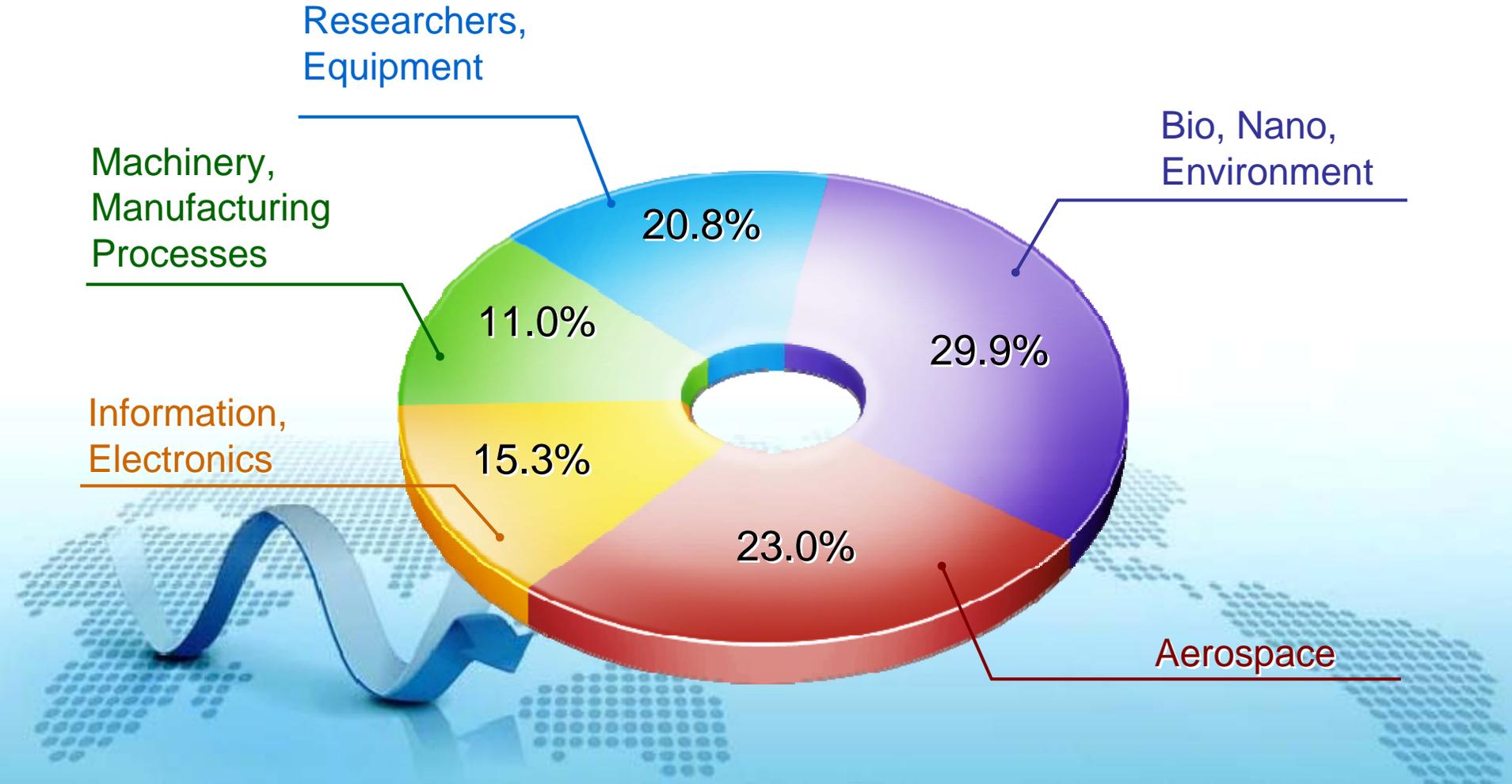
KIAT (Korea Institute for Advancement of Technology)

KEIT (Korea Evaluation Institute of Industrial Technology)

KETEP (Korea Institute of Energy Technology Evaluation and Planning)

NRF (National Research Foundation of Korea)

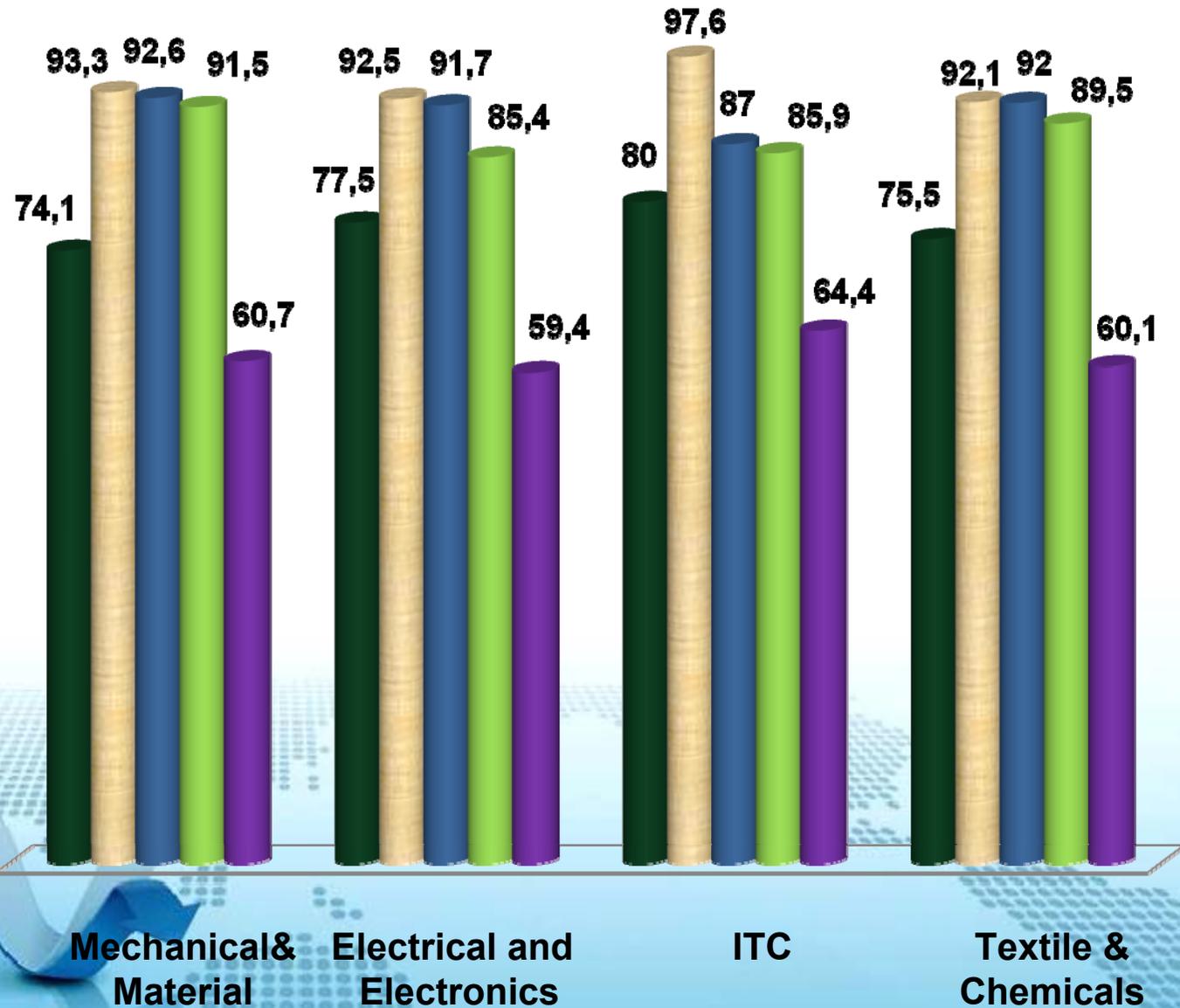
R&D Budget 2010 by Sector



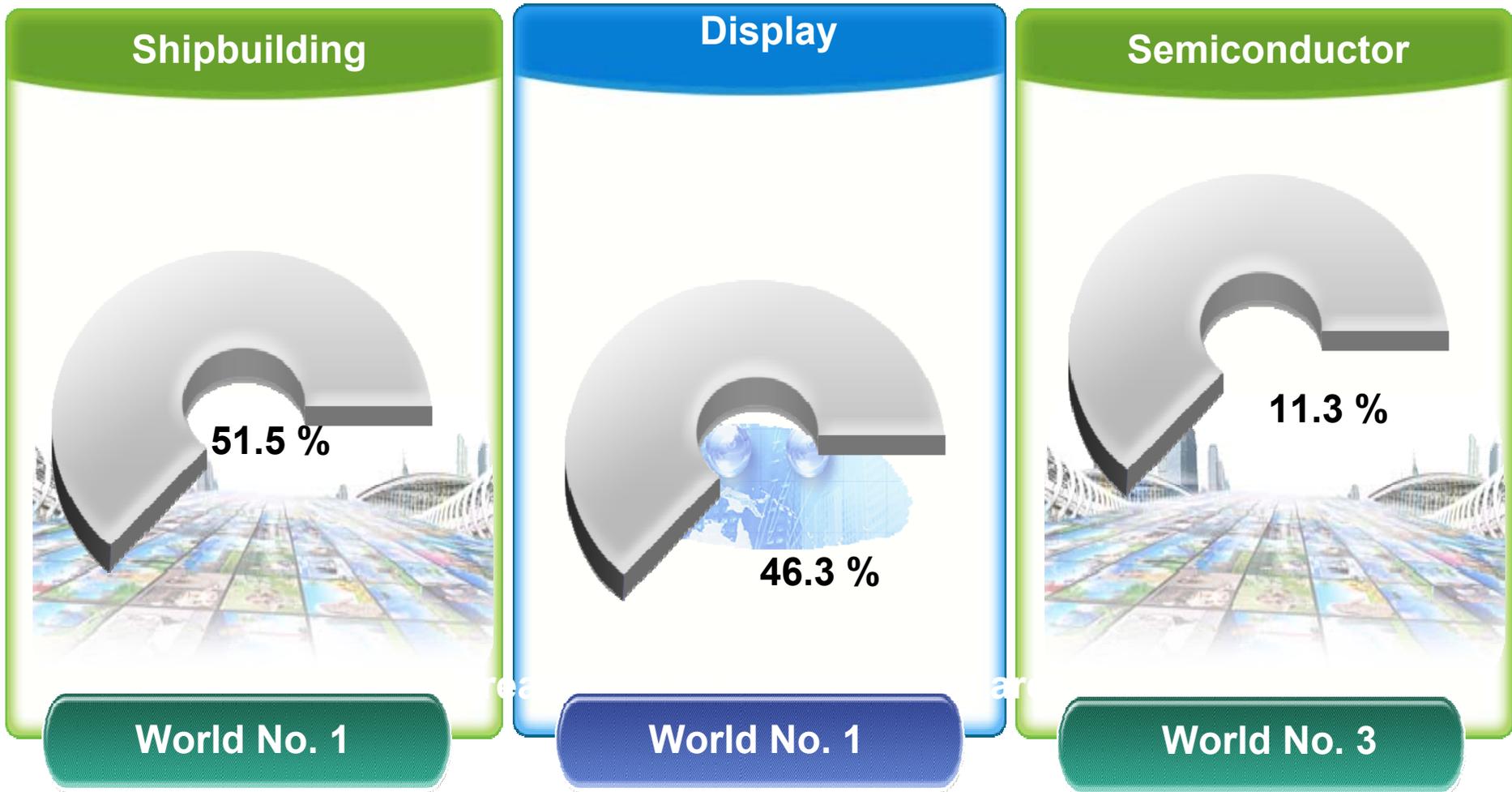
Industrial Technology Level in the World

* Scores in reference to 100 points

- Korea(2006)
- US(2006)
- Japan(2006)
- EU(2006)
- China(2006)



World Market Share of the World Best Items in Korea



Weak Industry sector in Korea :

Core Technology
Material & Component Technology

Yeni Hükümet

- Ekonomik büyüme için kapasite oluşturmaya
- Dünyanın en iyi iş ortamını sağlamaya hedefliyor.

Bilim ve Teknoloji Politikası

- **577 Girişimi**
 - GERD: %5
 - 7 odak alanı
 - Dünyadaki 7 bilim ve teknoloji gücünden biri olma

577 Girişimi-AR-Ge'yi artırmak

- GERD:

– 3,23% (2006) => 5% (2012)

577 Girişimi-AR-Ge'nin verimliliğini artırmak

- **Ulusal Bilim ve Teknoloji Komitesi**
 - 5 uzman komitesi (Üniversite, Enstitüler ve özel sektör)
 - Anahtar teknolojiler
 - Büyük ölçekli teknolojiler
 - Kamu güdümlü teknolojiler
 - Yeni teknolojiler
 - Altyapı teknolojileri
- Kurumsal entegrasyon
- Düzenlemelerde entegrasyon

577 Girişimi-Yedi Temel teknoloji alanı

- Temel teknolojiler (Kaynak yaratıcılar)
 - Otomobil, gemi inşa, yarı iletken
- Yeni gelişen teknolojiler (Yeşil, okyanus)
 - IT temelli teknolojiler, ilaç ve sağlık teknolojileri
- Bilgi tabanlı hizmet teknolojileri
 - İçerik, lojistik, yayını
- Kamu güdümlü teknolojiler (Büyük bilim)
 - İnşaat, taşıma, uzay, nükleer

577 Girişimi-Yedi Temel teknoloji alanı

- **Ulusal teknolojiler (Risk teknolojileri)**
 - Deli dana, kuş gribi, gıda güvenliği
- **Küresel teknolojiler (Mega eğilimler)**
 - İklim değişikliği, çevre, gıda
- **Temel ve yakınsayan teknolojiler (Ulusal platform teknolojileri)**
 - Biyoçip, biyosensör, akıllı robot teknolojileri

577 Girişimi-Yedi Bilim ve Teknoloji Konusu

- Dünya kalitesinde insan kaynağı
 - Üniversitelerin kalitesinin artırılması
 - Talebe uygun insan kaynağı
- Temel araştırmanın desteklenmesi
 - Kamu araştırmalarında temel araştırma: %25 (2008) => %50 (2012)
- KOBİ'lerde inovasyonu desteklemek
 - KOSBIR desteklerini artırmak
 - Yeni teknoloji Start-up firma kurulmasını kolaylaştırmak

577 Girişimi-Yedi Bilim ve Teknoloji Konusu

- **Bilim ve Teknolojide küreselleşme**
 - **Denizaşırı araştırma laboratuvarlarını artırma**
 - **Stratejik ortaklıkları artırma**
- **Bölgesel inovasyon kapasitesini artırma**
 - **Bölgesel inovasyon kümeleri oluşturma (Daedeok)**
 - **Çevre üniversitelerde araştırmacıları destekleme**

577 Girişimi-Yedi Bilim ve Teknoloji Konusu

- **Bilim ve teknoloji altyapısının iyileştirilmesi**
 - Ortak kullanım merkezlerinin yaygınlaştırılması
 - FMH'nın üretimi ve kullanımının sağlanması
- **Bilim ve Teknoloji kültürünün yaygınlaştırılması**
 - Kore Bilim ve Yaratıcılık Vakfı
 - Bilim müzeleri
 - Araştırma etiğinin genişletilmesi

New Approach for Knowledge(or Innovation) Economy

Some Tools for New Approach (from linear innovation system to non-linear)

- NIS & RIS Strategies
- Clusters
- Internationalization
- Mode-2 Knowledge Production & Triple Helix in University-Industry Link (Technology Transfer Interfaces-Technopark, TTO, Incubator, UIJRC)

Can Korea Achieve This?

Phase-1- Conceptualize +

Phase-2- Design the structures +

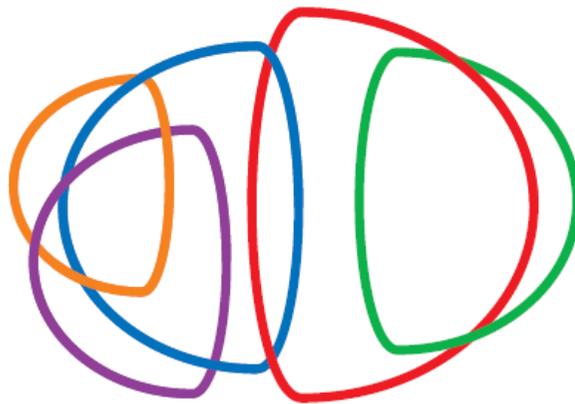
Phase-3- Establishment+

Phase-4-Create a critical mass (in progress....)

Some Examples

- 400 Incubators,
- Several Clusters (Wonju Medical etc.)

Daedeok Innopolis: “ a hope for Korea” opening a new future



DAEDEOK
INNOPOLIS



Industries



Academia



R&D Institutes



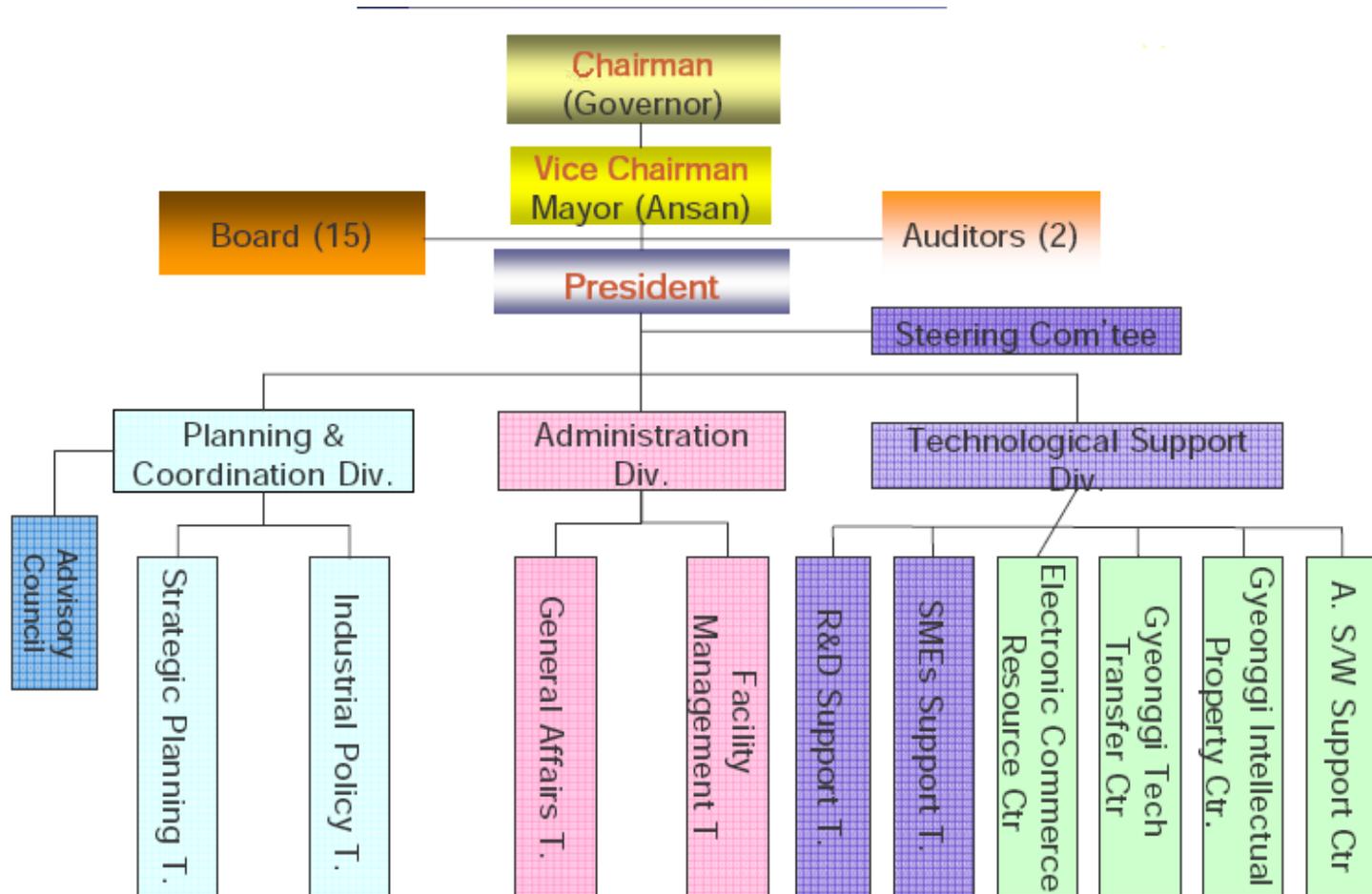
People



Government

Each color signifies the collaboration among industries, academia, R&D institutes, people and government of DAEDEOK INNOPOLIS

Gyeonggi Teknopark



History



Backgrounds

KIAT was recently established in May 2009 as a public institute under the Ministry of Knowledge Economy, according to the government's public institutes advancement plan.

It is one of two organizations which were established through the merger of **five former R&D financing institutions** under Ministry of Knowledge Economy,

It has **260 staff** and a **total budget of € 796 million**

Former Organizations

- Korea Industrial Technology Foundation (KOTEF)
- Korea Institute of Industrial Technology Evaluation and Planning (ITEP)
- Korea Materials & Components Industry Agency (KMAC)
- Korea Technology Transfer Center (KTTC)
- Institution for Information Technology Advancement (IITA)



**Merged
into**

Korea Institute for Advancement of Technology (KIAT)
Policy Research, HR Development, International Cooperation,
Mid & Long Term Planning for R&D, Commercialization,
Regional Innovation

KITECH-Korea Institute of Industrial Technology

An innovation leader in Manufacturing Technology & SMEs support

Major R&D Areas

Manufacturing System

Environment and Energy

Applied Robot Technology

Textile Materials

Production Technology

Manufacturing Processes

Advanced Materials

SME Supporting Activities

Business Incubation

Technology Transfer

Technology Support & Consulting

Personnel Technical Training

Pilot Plants Operation

KITECH-Korea Institute of Industrial Technology

Total Budget : USD 215 million (Exchange Rate: USD 1 = 1,000 Kwon)

- **Income : 27% Government grant; 73% Contract basis**

Personnel: 443 persons (inc. 235 Ph.D.)

- **R&D (373 persons) & Administration (70 persons)**

New Programs for Quality Improvement:

- **Six Sigma**

- **T-Wave 10**

(Technology – Worldwide, Arrangement, Valuation, Education 10)

KITECH-Korea Institute of Industrial Technology

2007 Performance

- License/Royalty: Contracted (USD 4.2 mil), Income (USD 3.3 mil)
- Patent (Applied) : 216 (Domestic) & 24 (Int'l)
- Paper (SCI/Other) : 436 (Published articles)
- Conference Presentation : 1,204 (Domestic & Int'l)
- Technology Support case: 42,670(Testing), 22,576(R&D),
3,647(Technology information)
- Technology Transfer : Royalty free & bearing(550 cases)
Enterprises(754 companies)

KITECH-Korea Institute of Industrial Technology

Major Accomplishments

Development of HDTV receiver(1990~1994)

- HDTV receiver prototype and main parts development

Development of 350Km/h high-speed train(1996~2002)

- Concept design, evaluation tech., and engineering

Development of high-precision intelligent molding process system (1999~2002)

- World's first asymmetric complex pressing technology

Development of intelligent expert system for casting & heat treatment (2001~2003)

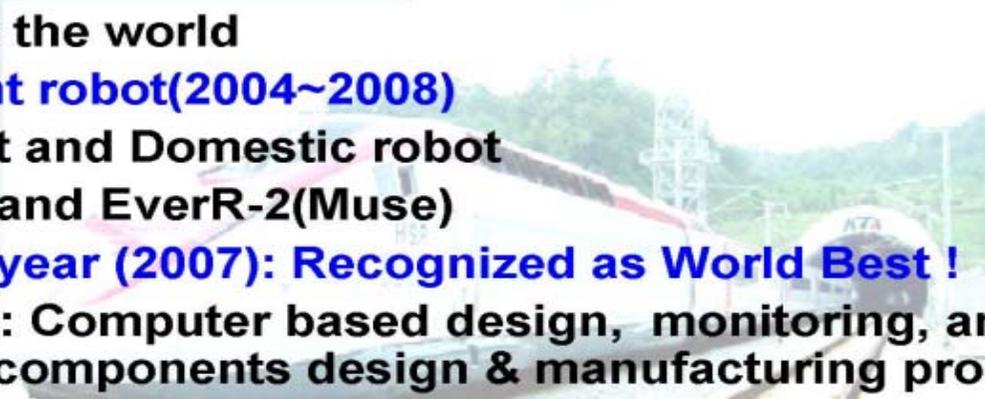
- 1st in Korea and 4th in the world

Development of intelligent robot(2004~2008)

- Disaster rescue robot and Domestic robot
- EveR series: EveR-1 and EverR-2(Muse)

Top Brand Project of the year (2007): Recognized as World Best !

- Cyber Engineer U24 : Computer based design, monitoring, and correction system for components design & manufacturing process



KITECH-SME Support Performance- 2008

Category	Support Item	No. of Cases	Total
Technology support	Prototyping	19,710	62,674
	Testing/ analysis	41,889	
	Corrections	1,075	
Guidance/ consulting	Tech guidance	1,755	5,779
	Tech consulting	4,024	
Tech info servicing	Seminars/ workshops	61	1,607
	Tech info services	1,500	
	Tech publications	12	
	Other	34	

Korean Atmosphere To Do so...

- Motivation
- Discipline
- Coordination and synchronization
- Umbrella laws

“Nothing is ready-made;
everything is to be made.”
(Hilary Putnam, 1983)

Teşekkürler....

Mahmut Kiper

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TÜRKİYE TEKNOLOJİ GELİŞTİRME VAKFI

20.yıl
1991 - 2011