

# Key Figures 2005 on Science Technology and Innovation

## Wake-up Call for Knowledge Europe !

---

Commissioner Janez Potočnik

Brussels - 19 July 2005

# Time for Action !

---

- Common Target 3% of GDP
- Guidelines for Member States
- **European** market for R&D and technology
- **European** funding for R&D and innovation

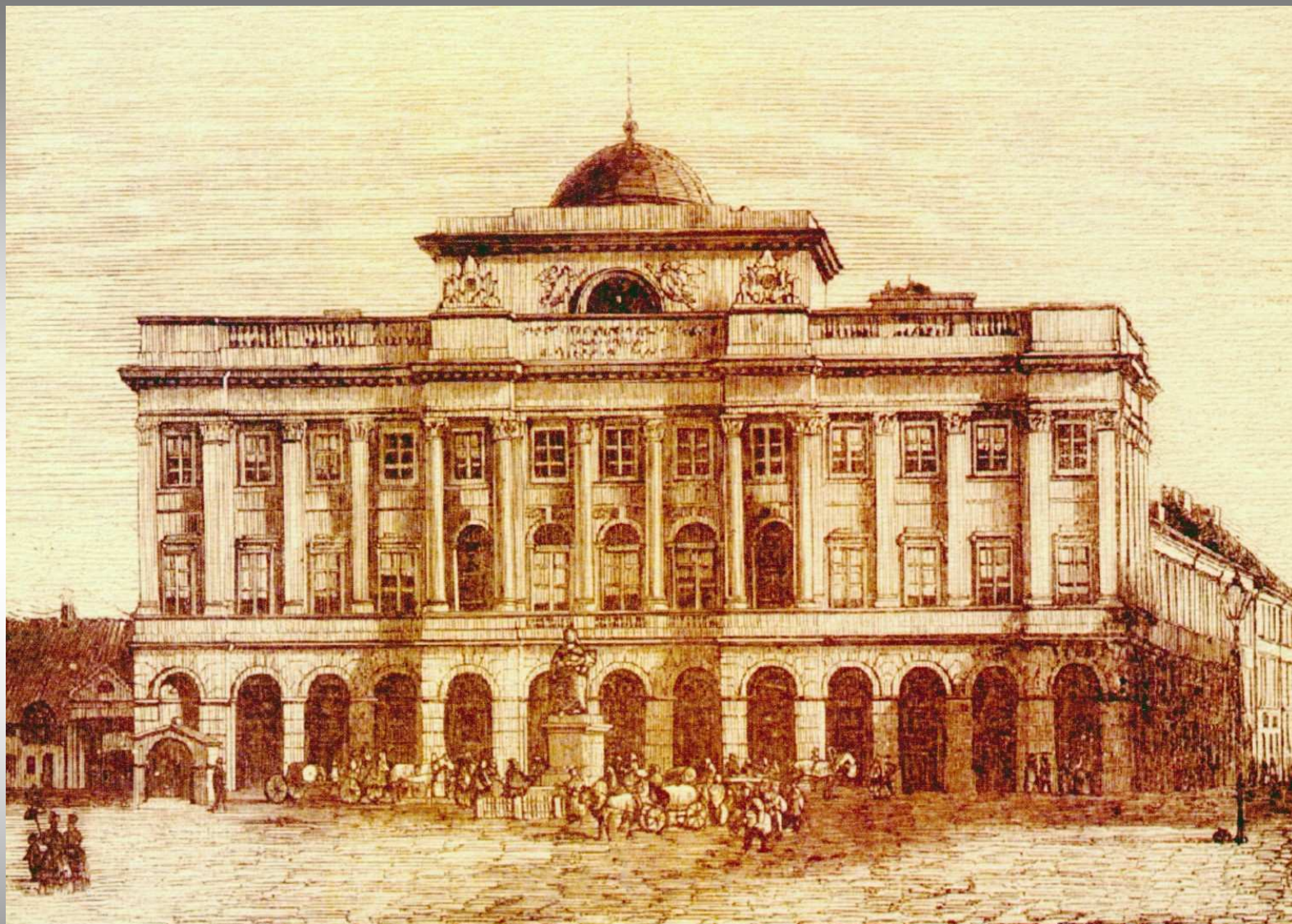
# **Policy for Science & Technology in KOREA**

**KOREA SCIENCE AND  
ENGINEERING FOUNDATION**



# Promotion of Basic Science

- Expand investment in basic research
  - **Portion of basic research in total R&D investment of \$12,150 million was 13% (\$1,580 million) in 2001**
  - **Portion of basic research in government's R&D budget of \$4,490 million was 19.5% in 2003. Will increase up to 25% by 2007**
- Increase support for basic research projects
  - **Activating creative research projects**
  - **Enhancing regional research capabilities**
  - **Supporting Center of Excellence in universities**



***"First the nation, and then freedom, first life and then comfort"***

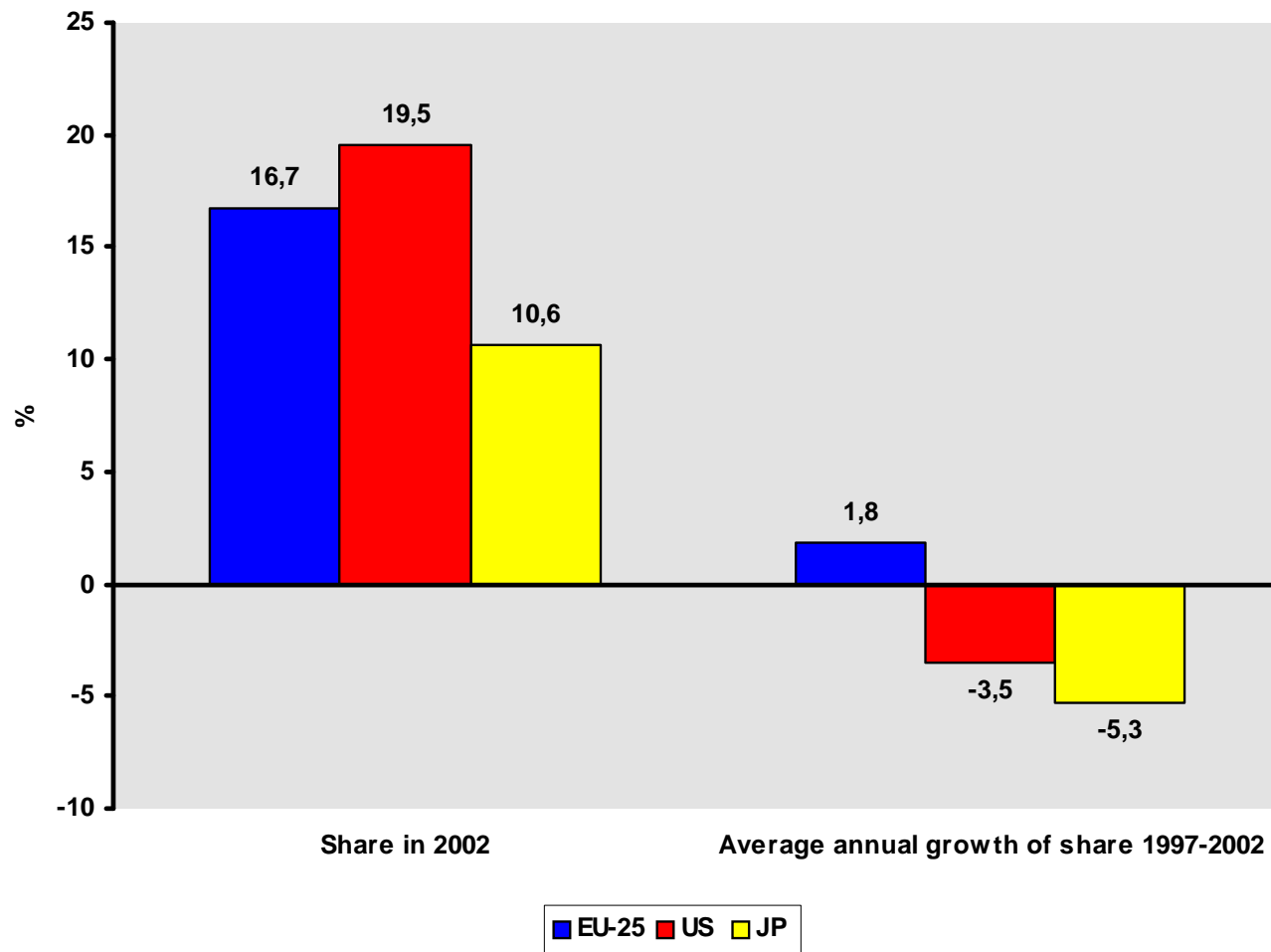
*Stanisław Staszic (1755-1826)*



David Gray / Reuters

# High-Tech Markets: catching up but still lagging behind

World share of exports of high-tech products (excluding intra EU-25 trade), 2002 and average annual growth of share, 1997-2002 (1)

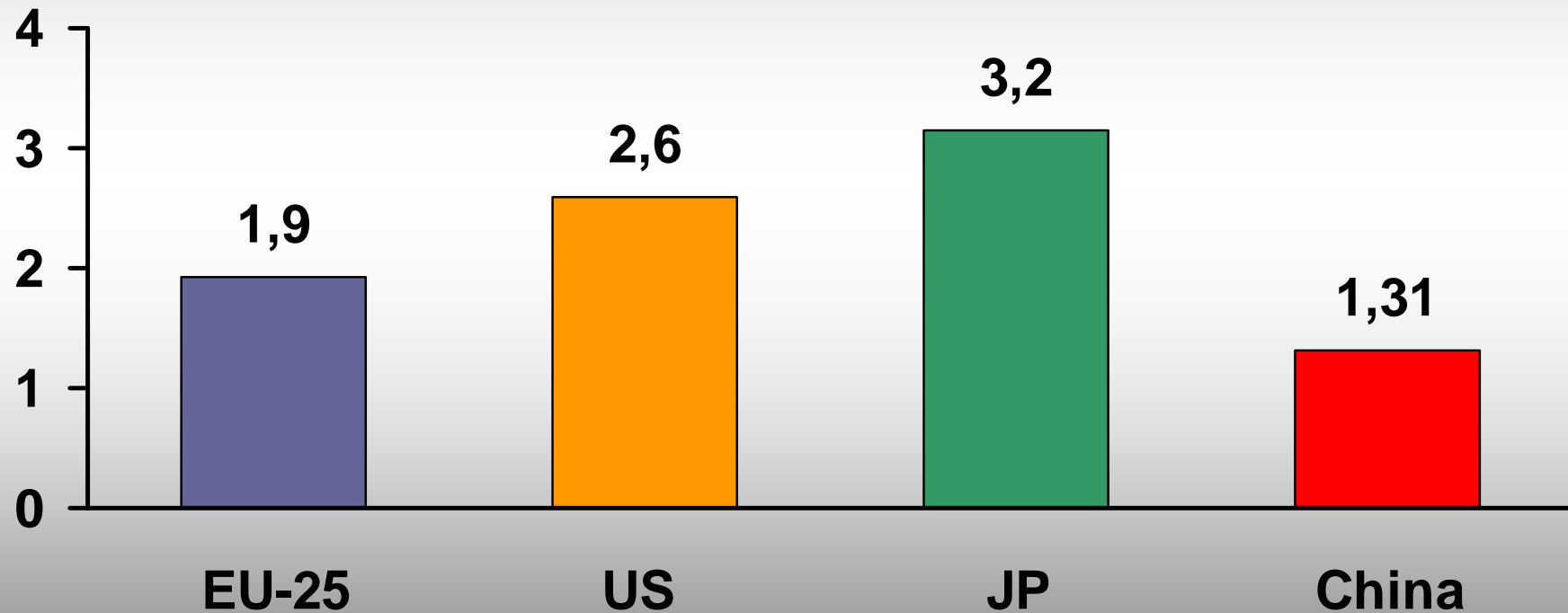


# ...But Losing the Keys of Future Growth

- 
- Investing in R&D
  - Attracting mobile R&D
  - Attracting researchers
  - Financing technology

# Europe Lags behind US and Japan

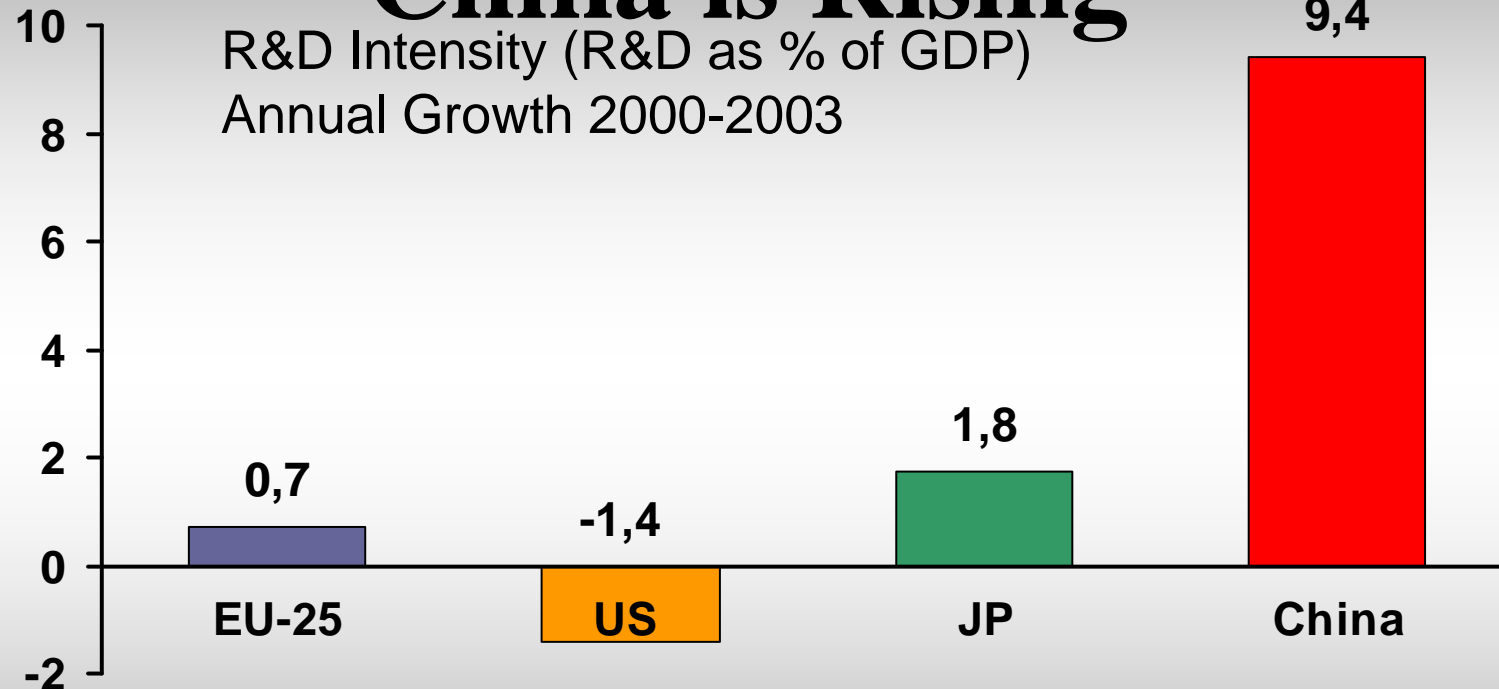
Total R&D expenditure (as % of GDP), 2003



# *Investing in R&D*

## **China is Rising**

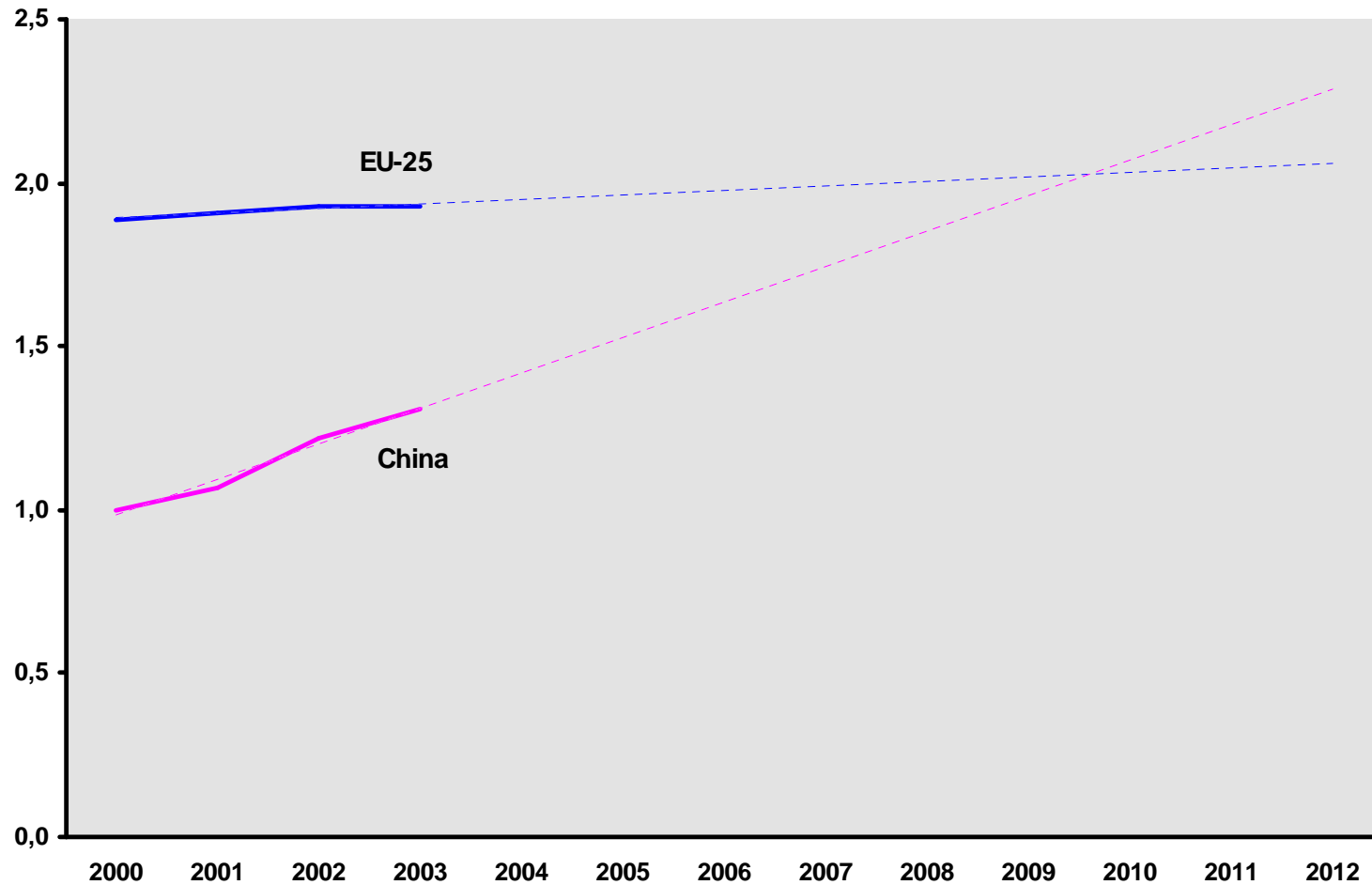
R&D Intensity (R&D as % of GDP)  
Annual Growth 2000-2003



- China R&D yearly growth 18.6%
- Ahead of Europe by 2010 ?

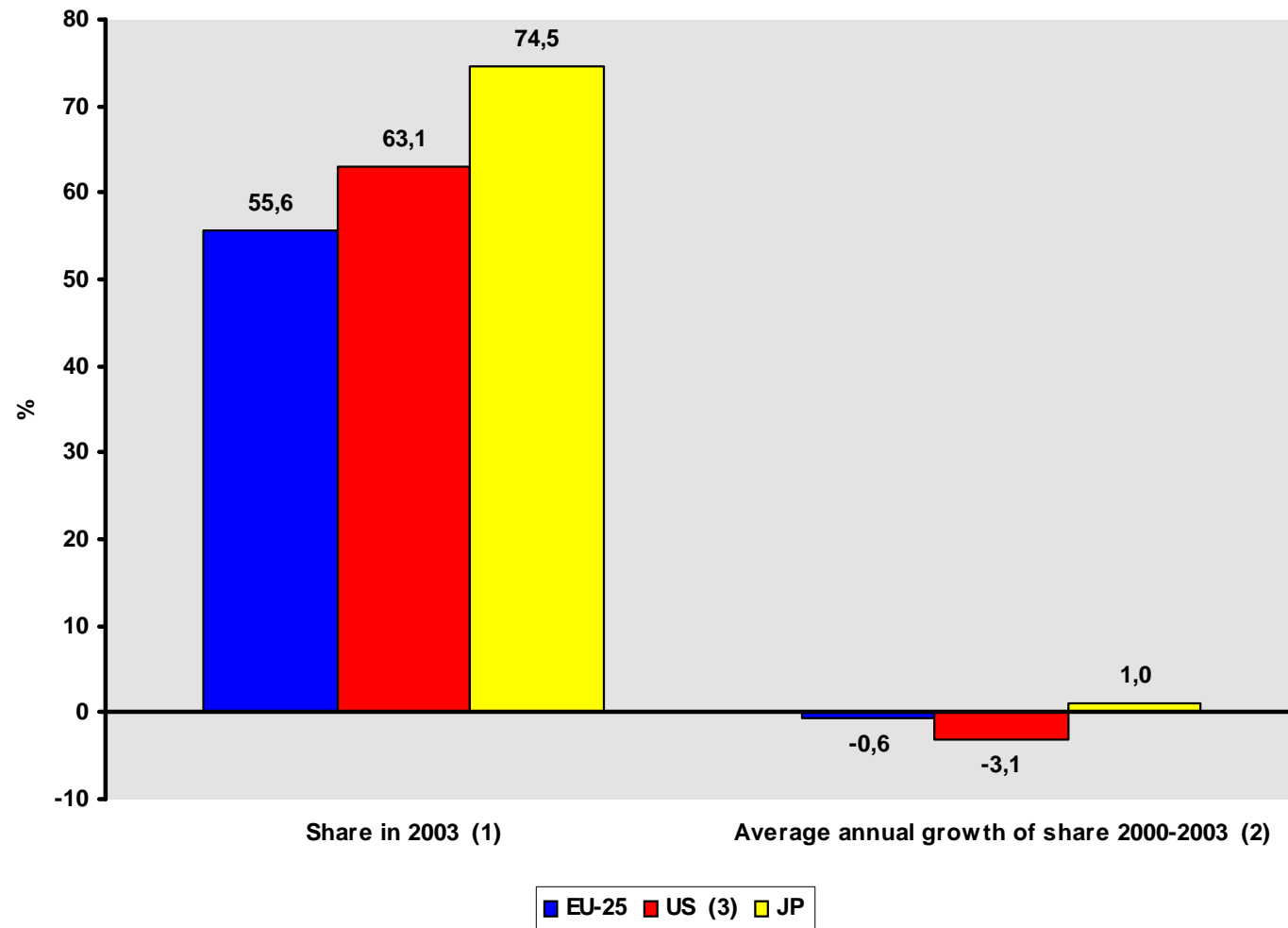
# China will catch up by 2010 ...

R&D intensity (R&D expenditure as % of GDP), 2000-2012  
(forecasted from 2003 on)



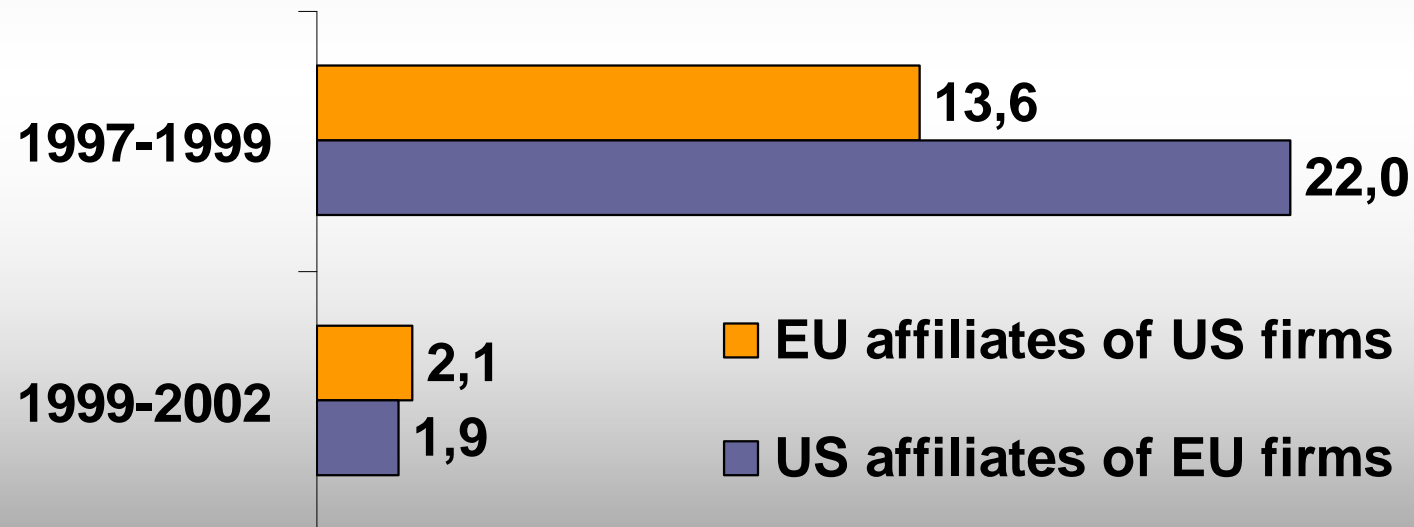
# Contribution from business sector is low and decreasing

Share of Total R&D expenditure financed by business enterprise  
2003 and average annual growth of share, 2000-2003



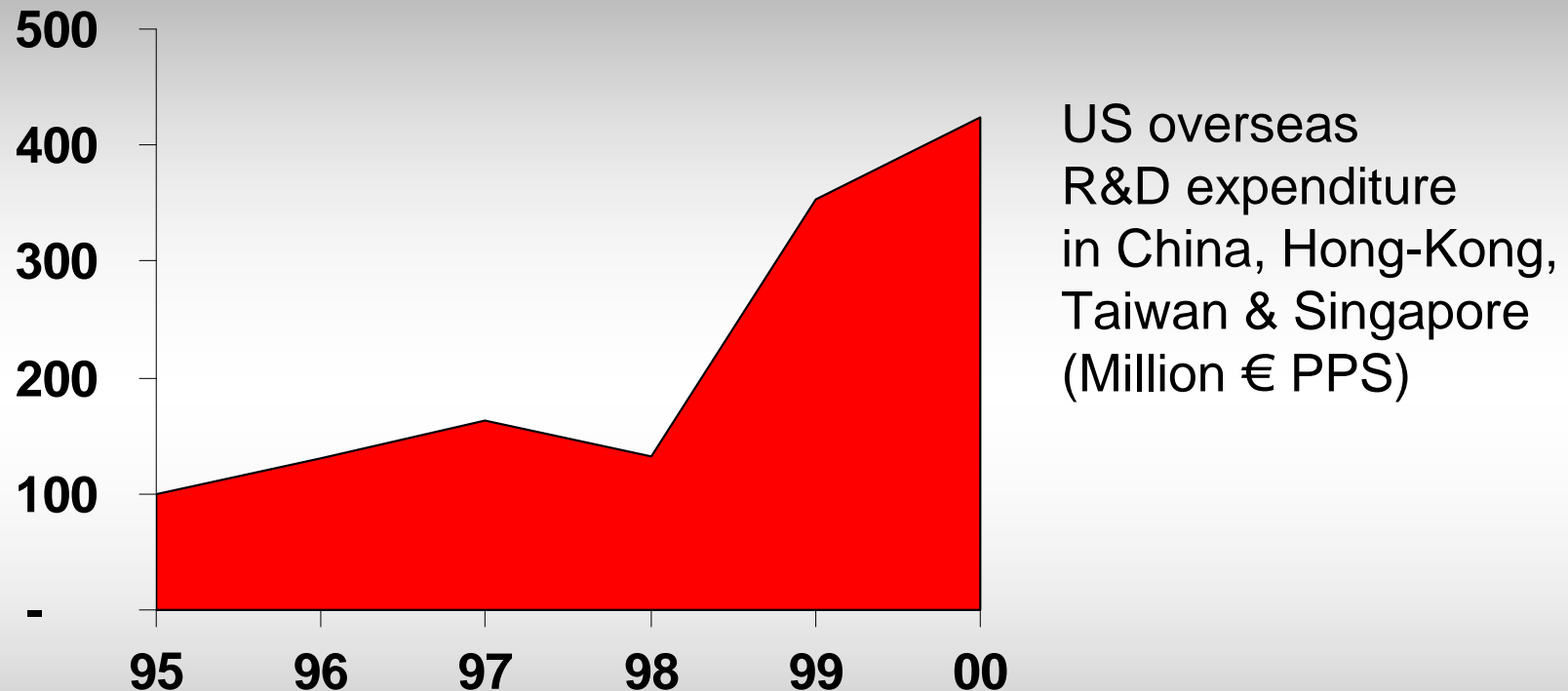
## America rather than Europe...

R&D expenditure of foreign affiliates,  
Average annual growth (in % from € PPS)



# Attracting Mobile R&D

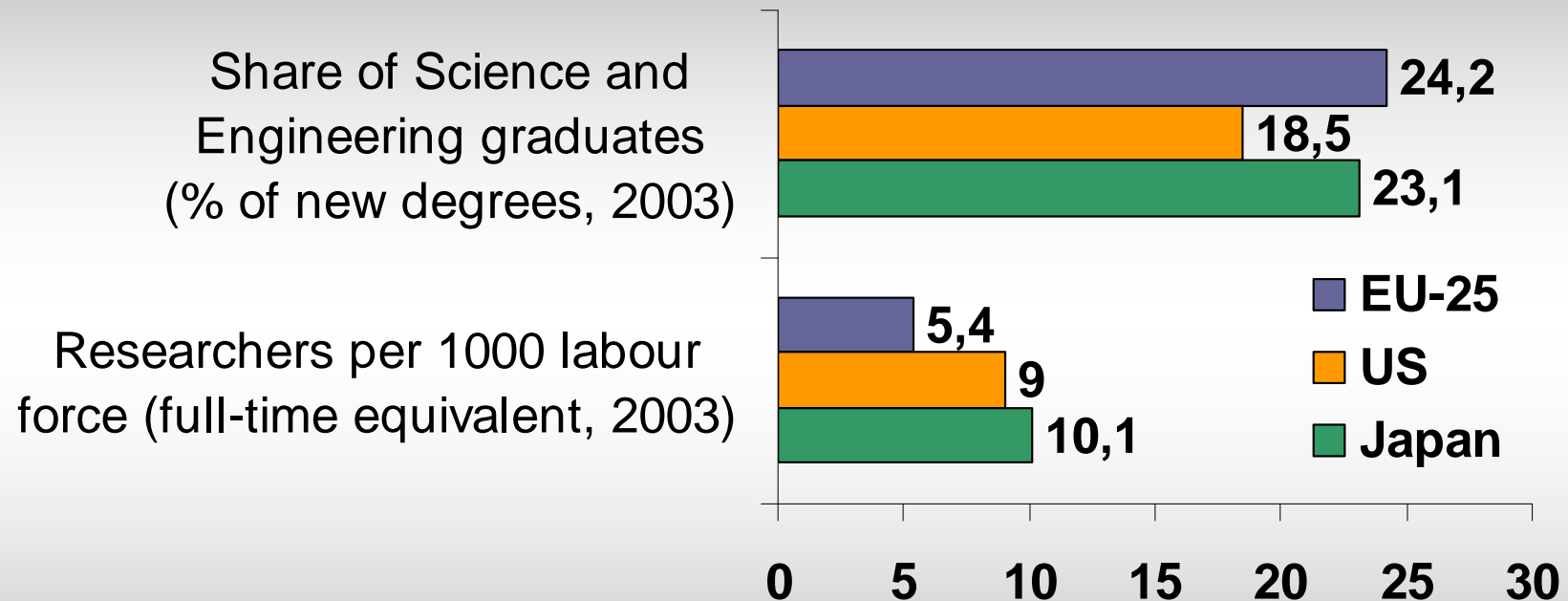
## ...Asia rather than both



- Low cost + high tech
- Dynamic technology and product markets

## Attracting Researchers

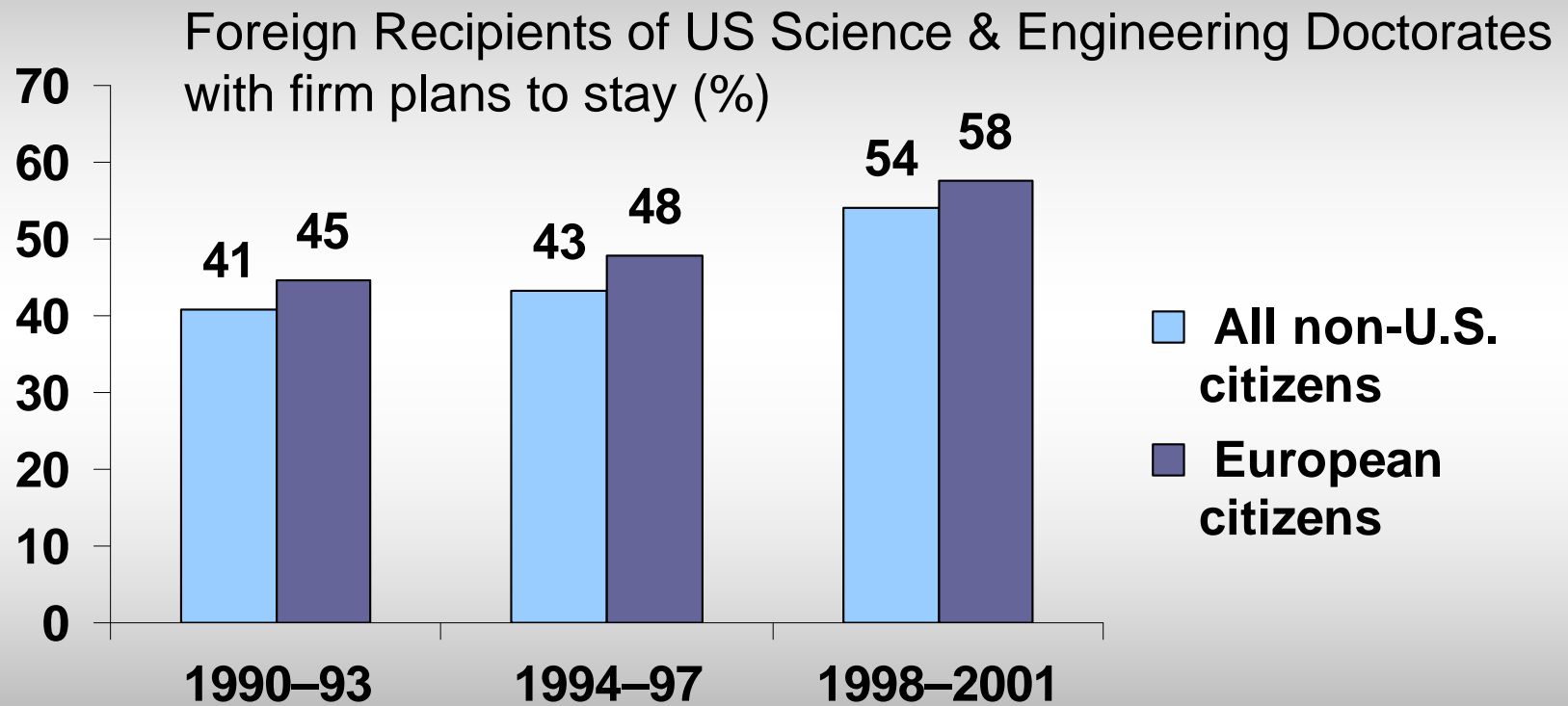
# Many Graduates – Few Researchers



- Mediocre career prospects
- Segmented labour markets

# Attracting Researchers

## One-way tickets to America

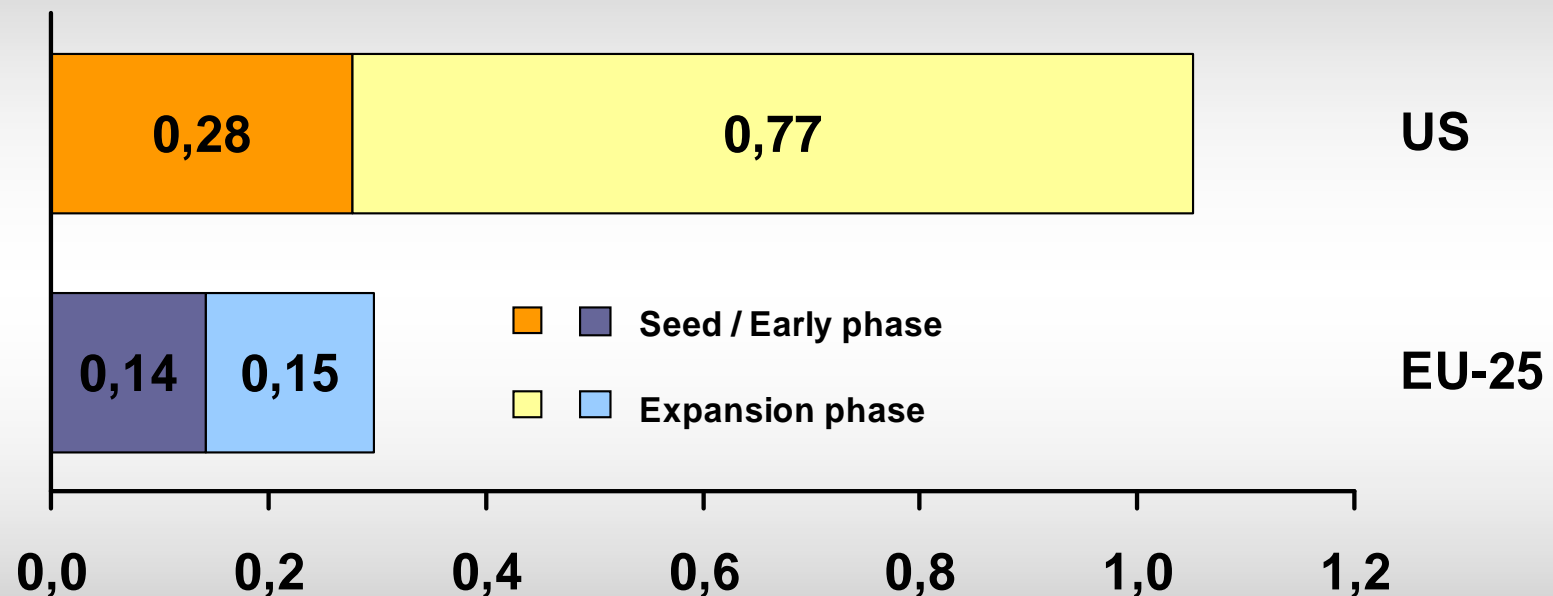


- More than wages : Opportunities

# Financing Technology

## Venture Capital needs Expansion

High-Tech venture capital by stage (per 1000 GDP, 2003)



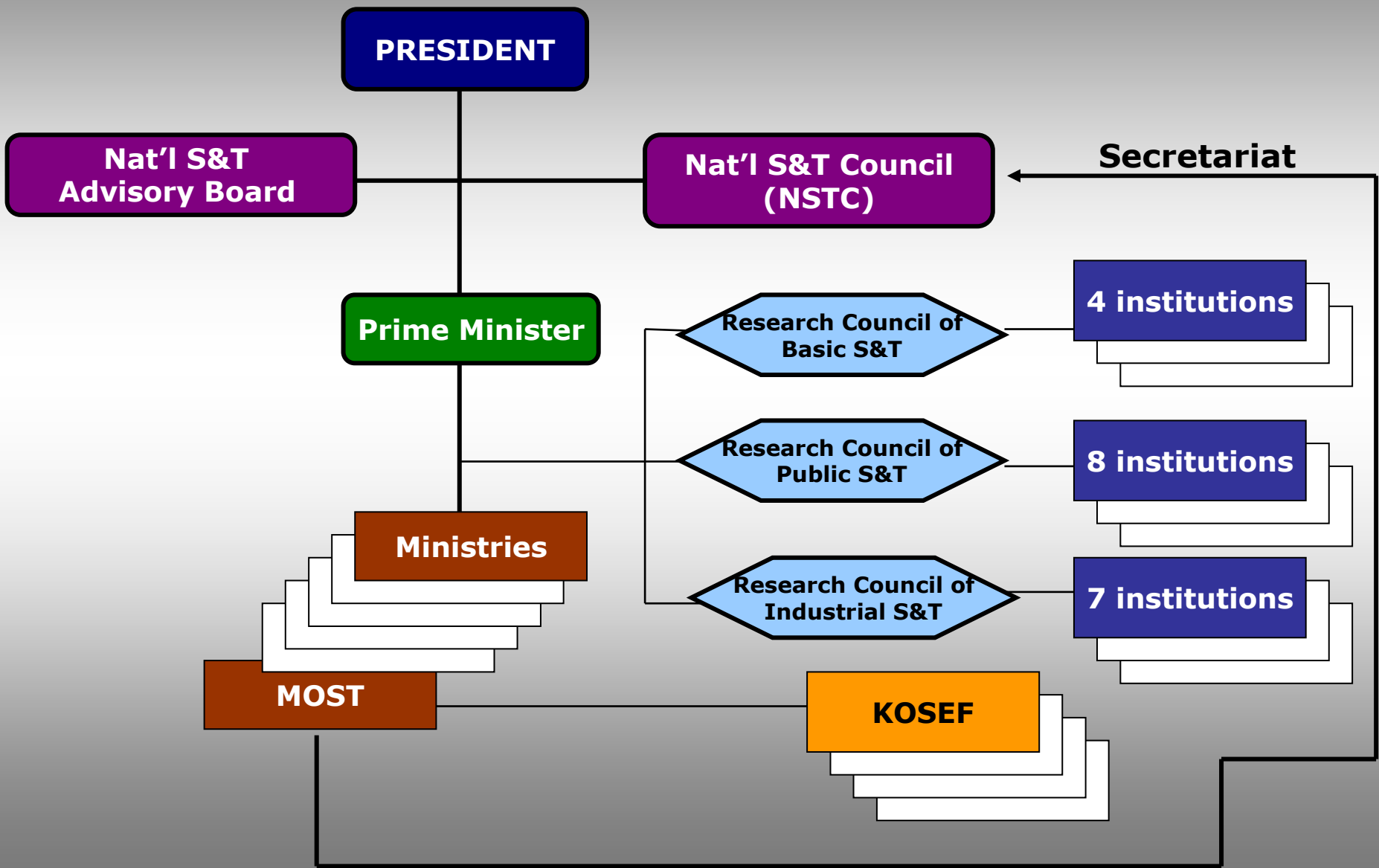
- Lacking technology champions
- Also public procurement, loans, etc.

# CONTENTS

- Present Status of Korean S&T
  - **S&T Administration System**
  - **National Standing of Korean S&T**
- Direction for Future Development
  - **Vision and Goals**
  - **Major Science and Technology Policies**

# Present Status of Korean S&T

# National S&T Administration System



# National Standing of Korean S&T

*Korean government emphasizes S&T for a successful transformation to a knowledge-based nation*

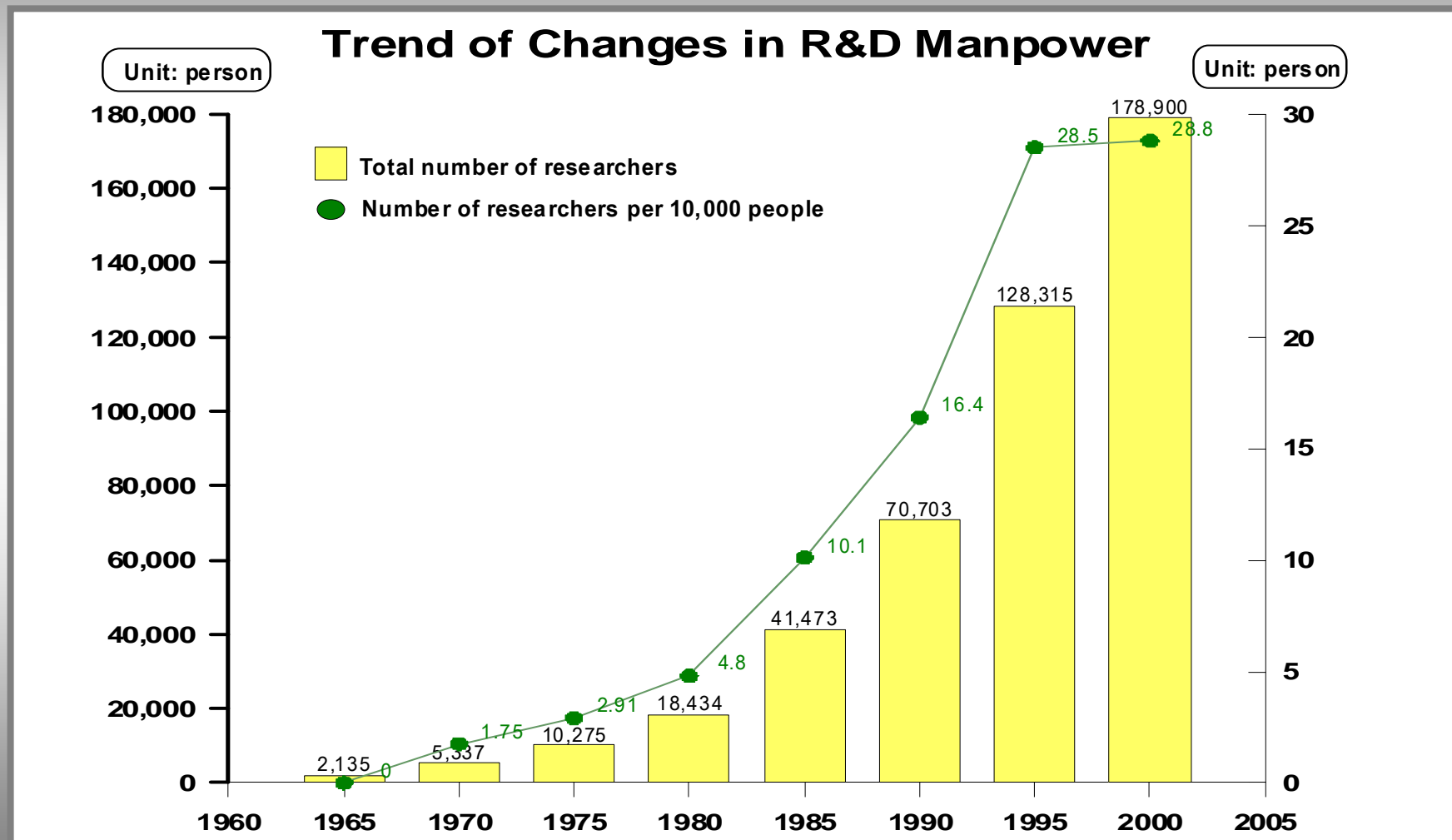
- Ranked No.1 in youth scientific abilities (2001, OECD)
- Ranked No.5 in S&T achievement index that incorporates patent registration and technology export performances of countries (2001, UNDP)
- Ranked No.10 in scientific and technological competitiveness among countries with a population of over 20 million (2002, IMD)

# R&D Investment

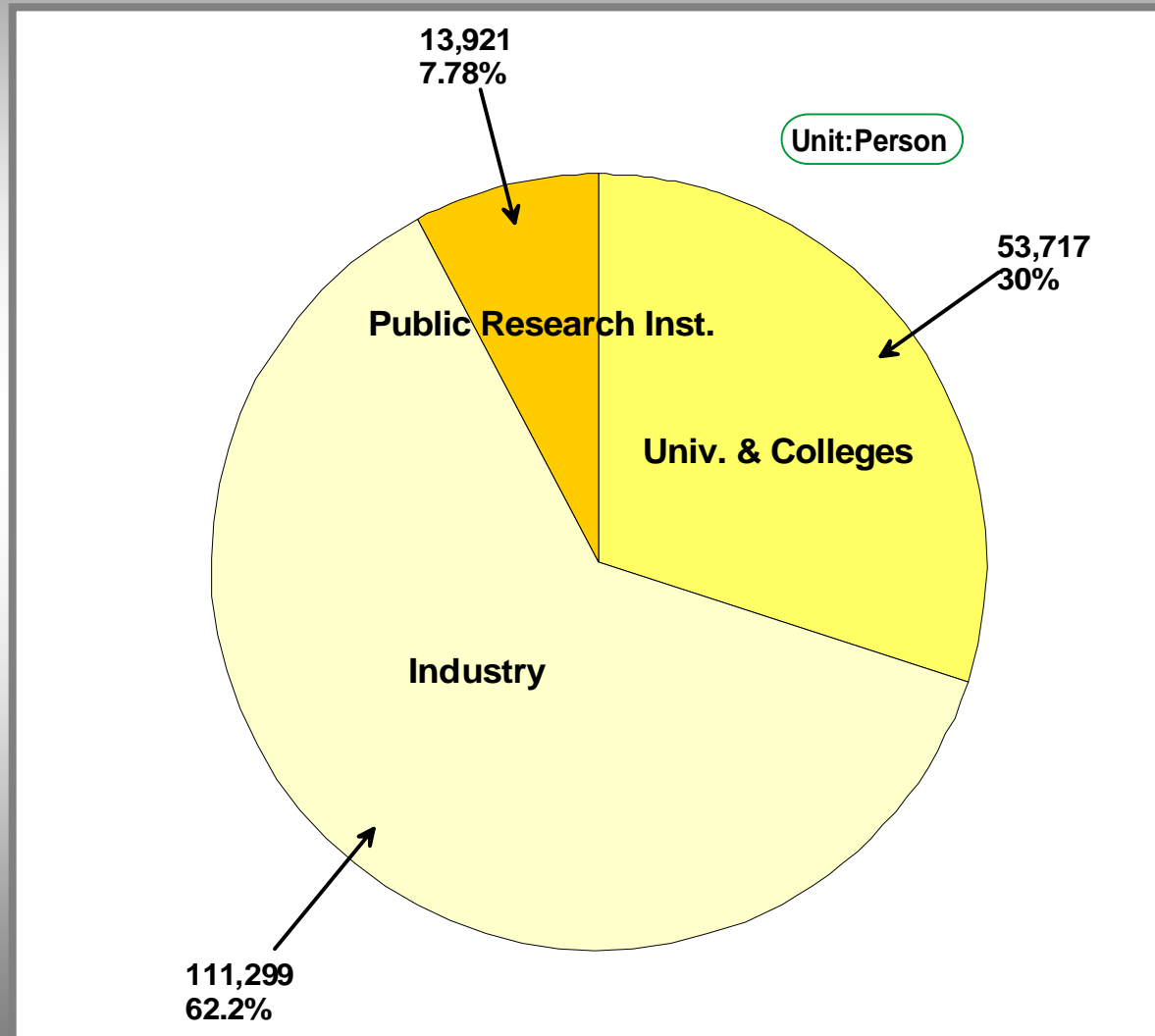
*In 2002 the government invested 44.6% of total national R&D Expenditure in the promising technologies : 22.5% in IT, 9% in BT, 5.5% in ET and 3.3% in NT*

- Total R&D Investment
  - **\$320 million in 1980 (0.56% of GDP)**
  - **\$12,150 million in 2001 (2.96% of GDP)**
- R&D Investment Share by Research Type in 2001
  - **Development Research : 62%**
  - **Basic Research : 13%**
  - **Application Research : 25%**

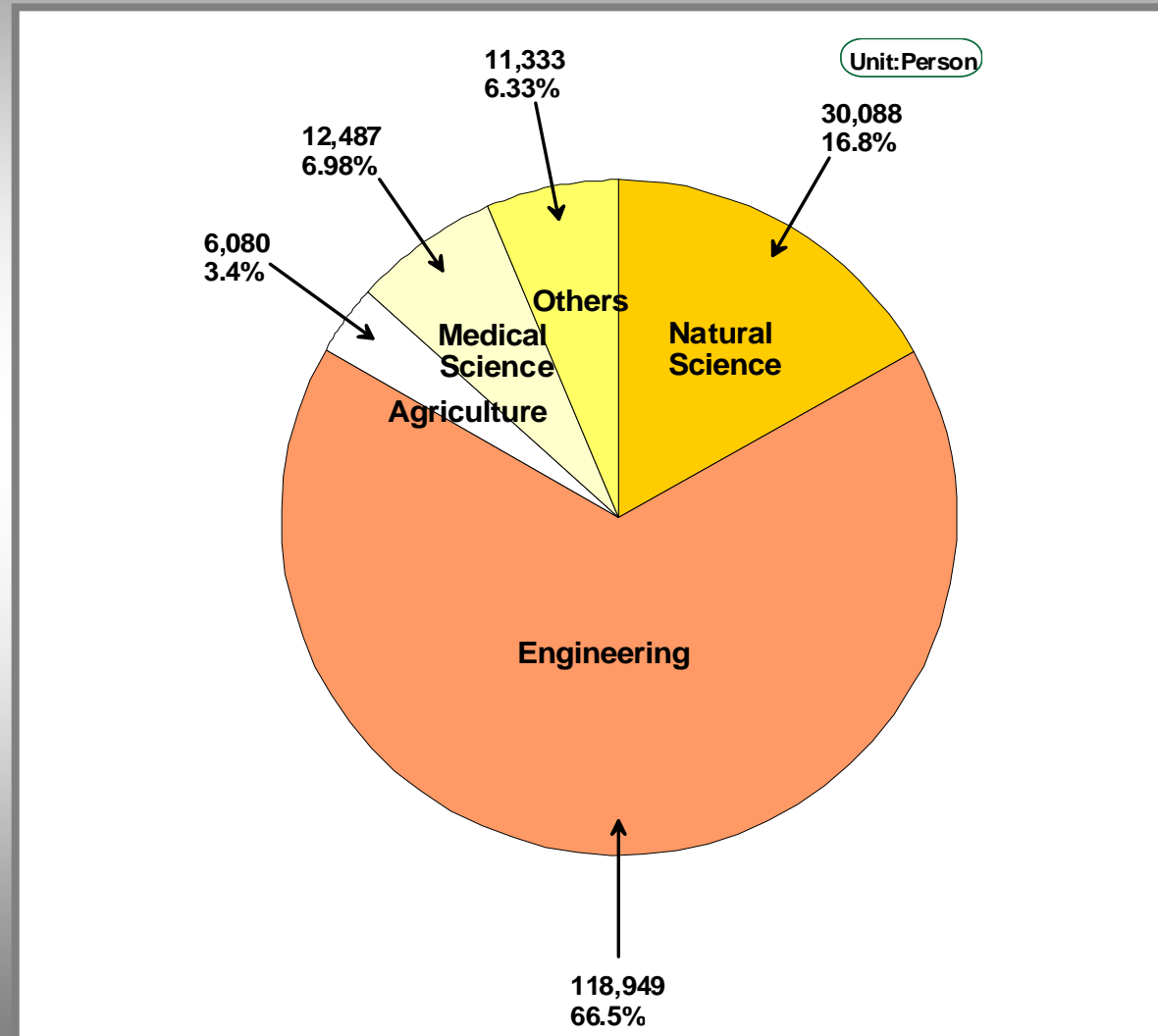
# Human Resources for R&D



# R&D Personnel in 2001



# Researchers by Major Field of Study in 2001



# Major Achievements in S&T

- Established global competitiveness in steel, shipbuilding, automobiles, and other industries
- Ranked No.1 in world market share in high-tech industries such as DRAM, TFT-LCD and CDMA
- Developed S&T into major contributor to Korean economy (Korea Development Institution)
  - **1970~1979 : 12.84%**
  - **1979~1990 : 18.70%**
  - **1990~2000 : 39.54%**

# Direction for Future Development

# Visions and Goals

*VISION 2025 : “Korea’s Long-term Plan for S&T Development”(1999) provides a roadmap for Korea’s advancement toward world’s 7<sup>th</sup> power in S&T by year 2025*

- By 2015 : Emerge as an R&D center of the Asia-Pacific region
- By 2025 : Establish world leadership in selected technology areas and attain world’s 7<sup>th</sup> power status in science and technology

# Korea's Science and Technology in the Year 2007: A VISION

2007

**National Renaissance based on S&T**  
**- A Stage of Creative Innovation and Growth -**

[R&D Investment] \$25.3 billion  
[Overseas Patents] 20,000

[Number of Researchers] 250,000  
[SCI Thesis] 133,000



**Science & Technology Oriented Society**

- Realize a knowledge, information and intelligence based society
- Pursue a society of healthy lives
- Realize a sustainable society
- Realize a value-creating industrial structure

- Promote basic science and research
- Develop creative S&T manpower
- Globalize R&D networks
- Promote regional innovation system
- Expand R&D investment and improve R&D efficiency



2001

**- Phase of Entering into Creative Technology Innovation -**

[R&D Investment] \$12.5 billion  
[Overseas Patents] 7,942

[Number of Researchers] 178,937  
[SCI Thesis] 14,673

# Promotion of National R&D

## Projects for New Growth Tech.

*Promotion of 10 industries and 80 technologies that will be the new engine of economic growth*

- 10 New Growth Industries
  - 1. Digital TV/Broadcasting**
  - 2. New Bio-Medicines Organs**
  - 3. Intelligent Robots**
  - 4. Next Generation Batteries**
  - 5. Next Generation Mobile Telecommunications**
  - 6. Intelligent Home Networking**
  - 7. Future Automobile Technologies**
  - 8. Digital Contents and Software Solutions**
  - 9. Next Generation Semiconductors**

# Shares of Key Technologies Development Plan

*Technology development plan will be set up and executed jointly by the government and private sectors from 2004 as national R&D projects according to priority*

- MOST
  - Core and Generic Technologies
- MOCIE & MOIC
  - Applied Technologies

# Basic Strategies for Developing Core and Generic Technologies

## Selection & Concentration

- Selection and Develop 80 key technologies
- Concentration of national R&D resources on the Selected Technologies
- Maximize achievements through innovative research management

## Develop Core Technologies that drive new growth

### Development of Creative High Quality Manpower

- Development of creative and qualified manpower who will lead technological innovation
- Promotion of regional research manpower
- Promotion of basic science and capacity building for innovation

### Efficient Innovation System

- Maximum utilization of global R&D networks
- Development of regional innovation system
- Establishment of partnership among industries, universities, research institutes and government agencies

# Expansion of National R&D Investment to Strengthen Potential for Growth

(Unit:\$ million)

	2003	2004	2005	2006	2007
% of R&D budget in total government budget	4.8%	5.2%	5.7%	6.3%	7.0%
Total government budget (estimate)	94,477	100,146	106,155	112,524	119,275
R&D budget (estimate) (Growth rate from the previous year)	4,490 (6.9%)	5,208 (16.0%)	6,046 (16.2%)	7,089 (17.2%)	8,349 (17.8%)

\*Note: Government budget assumed to increase 6% annually (growth rate for 2003 is actual)

# Reformation of National Innovation System

- Strengthen the coordination of national science and technology policies and R&D projects
- Improve the system for planning, management, evaluation, outcome diffusion of R&D projects
- Activate government supported research institutes

# Establishment of Global R&D Network

- Pursue strategic international projects
- Strengthen bases for international cooperation of science and technology
- Promote scientific cooperation among the Northeastern countries

# Support of R&D in Private Sectors

- Promote the development of industrial technologies
  - **Tax incentives**
  - **Military Service Exception for Technical Research Personnel**
- Activate private R&D organizations
  - **Industrial R&D Centers, Industrial Technology Research Associations, Industrial Research Clusters, etc.**

## Role of KOSEF

- **KOSEF's Total Budget** is **USD 380 million, 8.5% of Total Government Budget, in 2003.**
  - Total Government R&D Budget : USD 4,465 million
- In Major Programs, such as **Science Research Center(SRC), Engineering Research Center(ERC), Regional Research Center(RRC), Medical Science and Engineering Research Center(MRC), Advanced Basic Research Laboratory (ABRL), Core Basic Research Center (CBRC), Research Grants, Program for Leading Scientists, Program for Women Scientists, Program for Regional Scientists and Program for Young Scientists**, we receive 2,269 proposals and support 894 proposals.
  - Supporting rate is 39.4%
- Annually, **13,000 professors take part in KOSEF's evaluation programs.**
  - Around 30% of total professors take part in our programs.  
(Total professor major in Science and Engineering : )

Thank you!!!