

US STI Policy: *Continuity and Change*

October 24, 2003

Presented at

STEPI Forum

**Korea Science and Technology Policy Institute (STEPI)
Seoul, Republic of Korea**

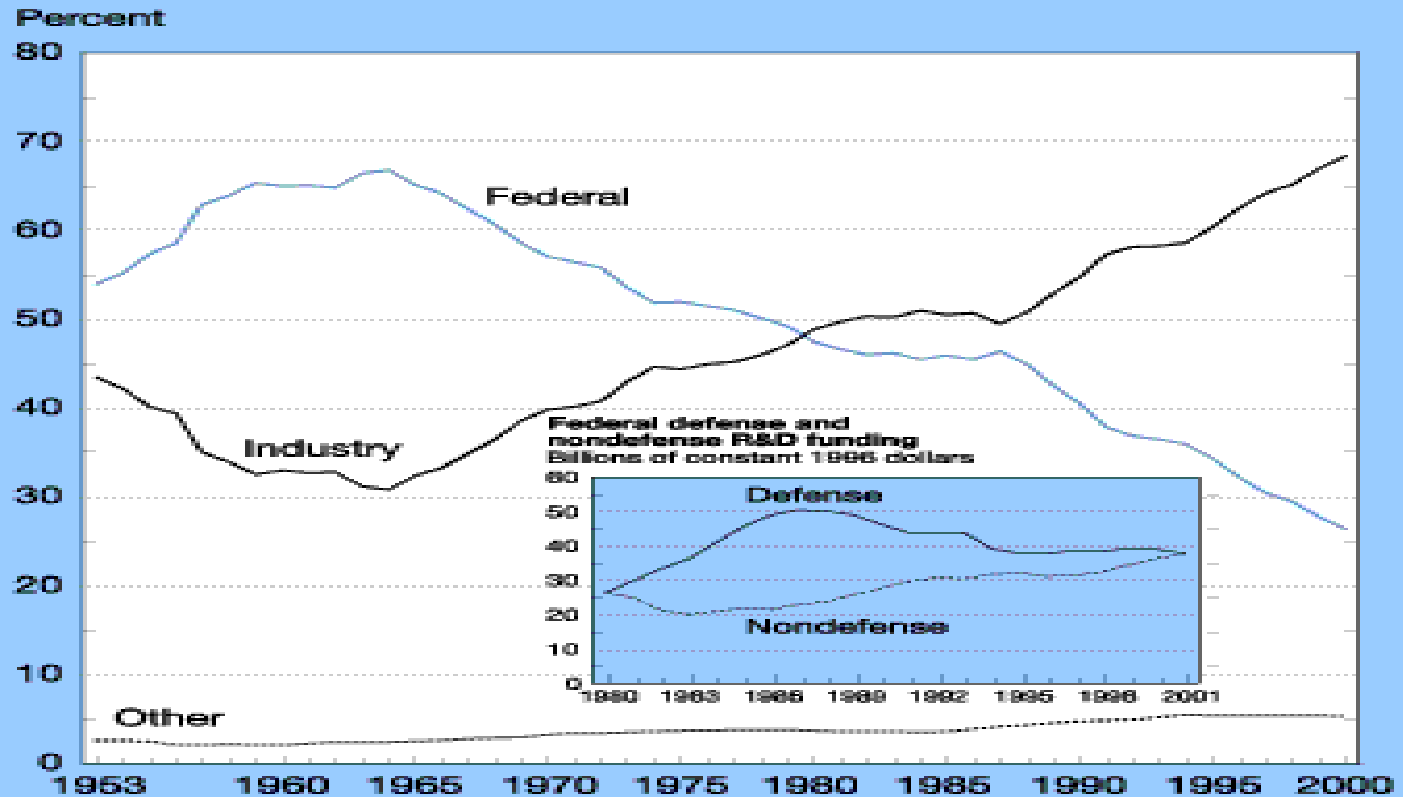
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Paradigm Shifts in Techno-Economic Environment

- ❑ Technological Advancement**
 - ICT (IT), Biotech. (BT), New Materials, Nanotech (NT)
 - ‘infrastructural’ & ‘fluid’ characteristics
- ❑ Globalization**
 - deregulation & liberalization policies
 - advancement of transportation & ICT
- ❑ Industrial Governance Structure**
 - global competition (role of MNEs)
 - network-based competition
 - increasing role of service sector
- ❑ Knowledge-base Economy**
 - from ‘brick-and-mortar’ economy to KBE
 - knowledge is recognized as the most important factor
 - codified knowledge vs. tacit knowledge : learning capacity
- ❑ Theoretical Developments**
 - evolutionary/institutionalist framework
 - induce STI policy changes

National R&D Exp. by source

Overview Figure 15.
**National R&D expenditures, by source of funds:
1953–2000**

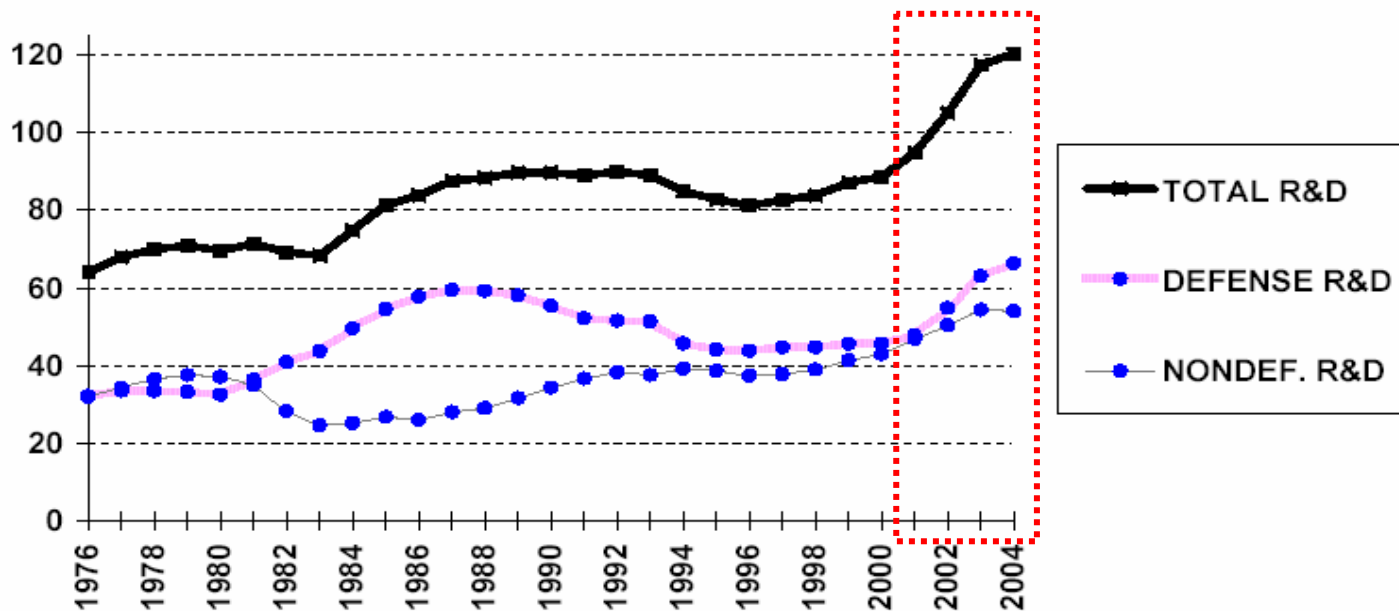


See appendix tables 4-5 and 4-26.

Science & Engineering Indicators – 2002

Trends in Federal R&D, 1976-2004

Trends in Federal R&D, FY 1976-2004
in billions of constant FY 2003 dollars

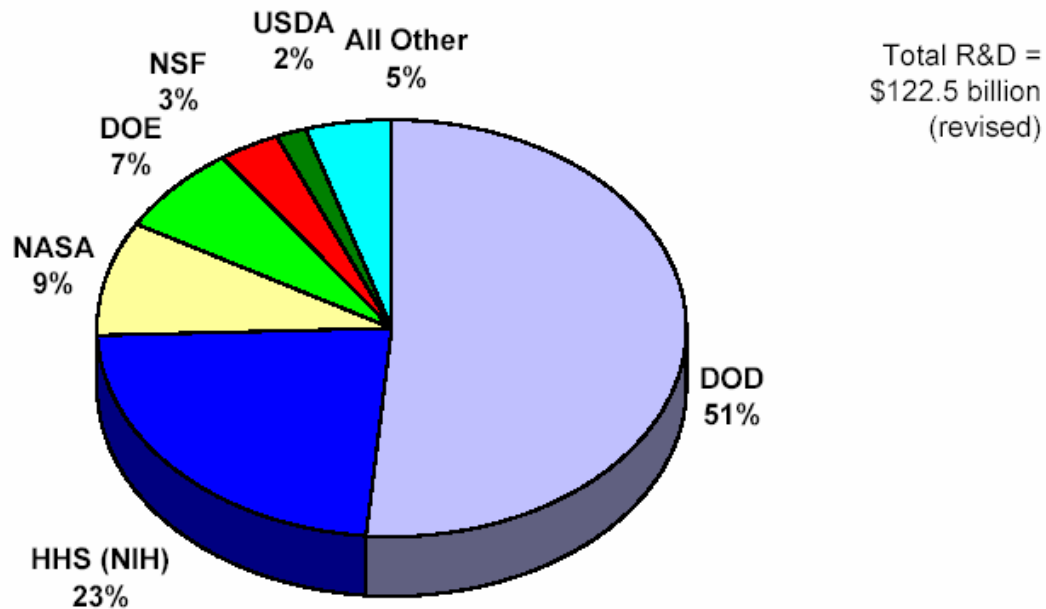


Source: AAAS analyses of R&D in *AAAS Reports VIII-XXVIII*. FY 2004 figures are President's request; FY 2003 figures are AAAS estimates of final FY 2003 appropriations.
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Federal R&D Exp. by Agency (FY2004: requested)

Total R&D by Agency: FY 2004 Proposed
Budget Authority in billions of dollars

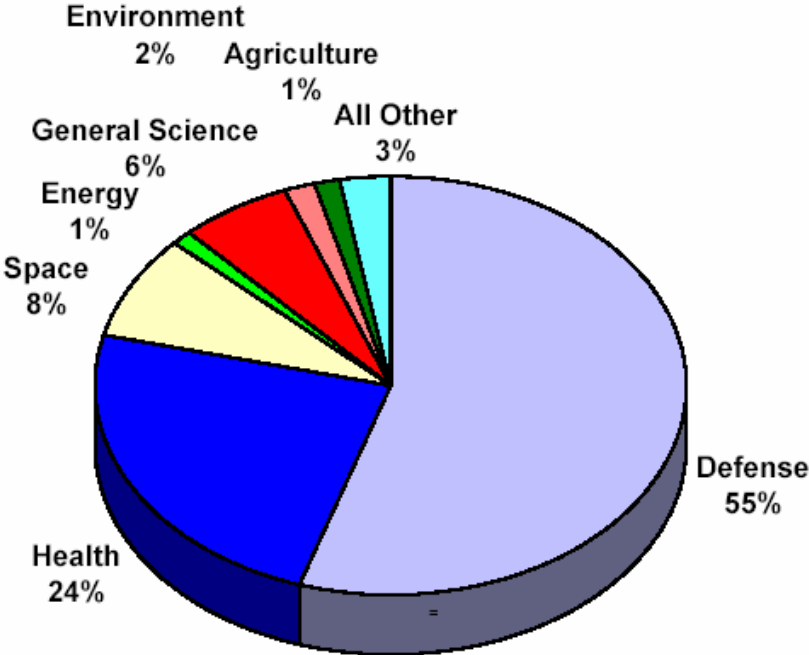


Source: AAAS, based on OMB R&D Budget Data and agency estimates for FY 2004.
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Federal R&D Exp. by Function (FY2004: requested)

Major Functional Categories of R&D FY 2004 President's Budget



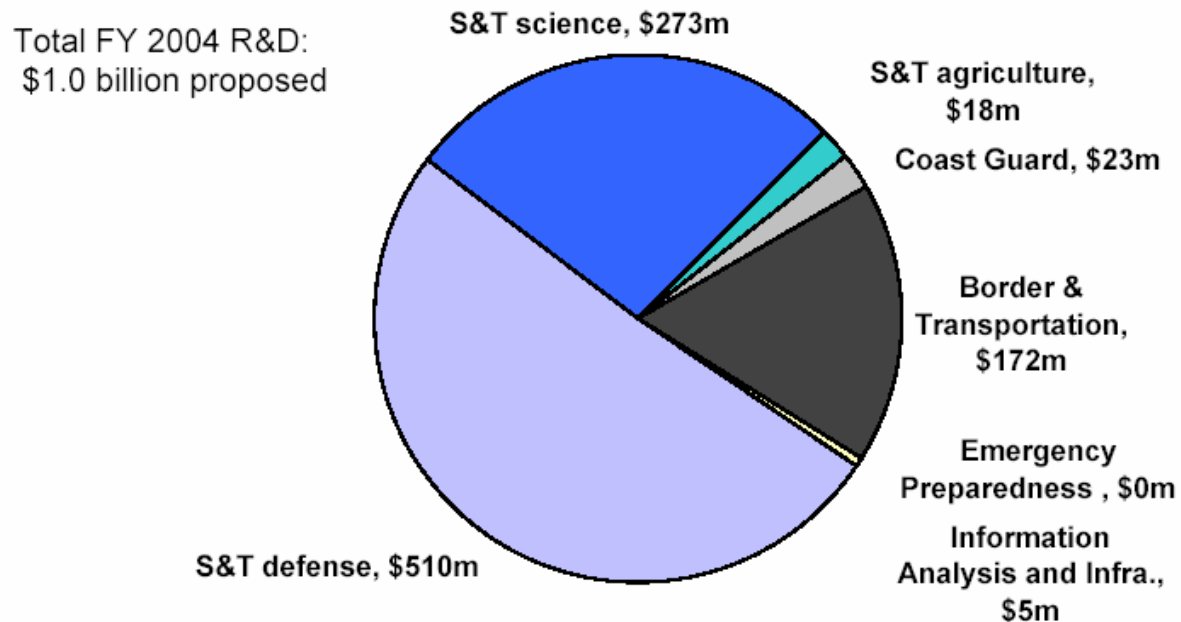
TOTAL R&D=
\$122.5
BILLION
(revised)

* - includes natural resources R&D
Source: AAAS, based on OMB and agency budget data.
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New Player: DHS

Dept. of Homeland Security R&D: President's FY 2004 Budget



Source: OMB data for R&D in FY 2004.
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Evolution of the US S&T Policy

- ❑ Mission-Oriented Science Policy: up to 1970s**
 - Mission-oriented
 - Science-focused

- ❑ Technology Policy: 1980s**
 - Competitiveness Crisis
 - Technology-focused

- ❑ Balanced Innovation Policy: 1990s**
 - Balanced Demand and Supply Policy
 - Lax Antitrust / Strict IPR

- ❑ Revisited Mission-Oriented Policy: Bush Adm.**
 - 9/11 Attack
 - Mission of Antiterrorism

Continuity: US Public R&D Programs

☐ Mission-Oriented

- Defense**
- Health**
- Basic Research**

☐ Science Emphasis

- Vannevar Bush (1945)**

☐ Pluralistic System

- Occasional National Emergencies and Needs**
- Space (1960s)**
- Competitiveness Crisis (1980s)**
- Anti-terrorism (Current)**

☐ Fragmented Structure

- DOD, NASA, DOE, NSF, NIH**

Change: US Public R&D Programs

□ Emerging emphasis of more coordination

➤ Interagency R&D Programs

- R&D for Combating Terrorism**
- National Nanotechnology Initiative**
- Networking and Information Technology R&D**
- Molecular-level Understanding of Life Processes**
 - Plant Genomes**
 - Domestic Animal Genomes**
 - Microbe Project**
- Environment and Energy**
 - Climate Change**
 - Environmental Observations**
 - Hydrogen Fuel R&D**

*** Coordination at OSTP/NSTC/OMB**

Continuity: US Evaluation Practices

□ Peer Review

- **Extensive use of expert review**
- **Qualitative evaluation**

□ Pluralism

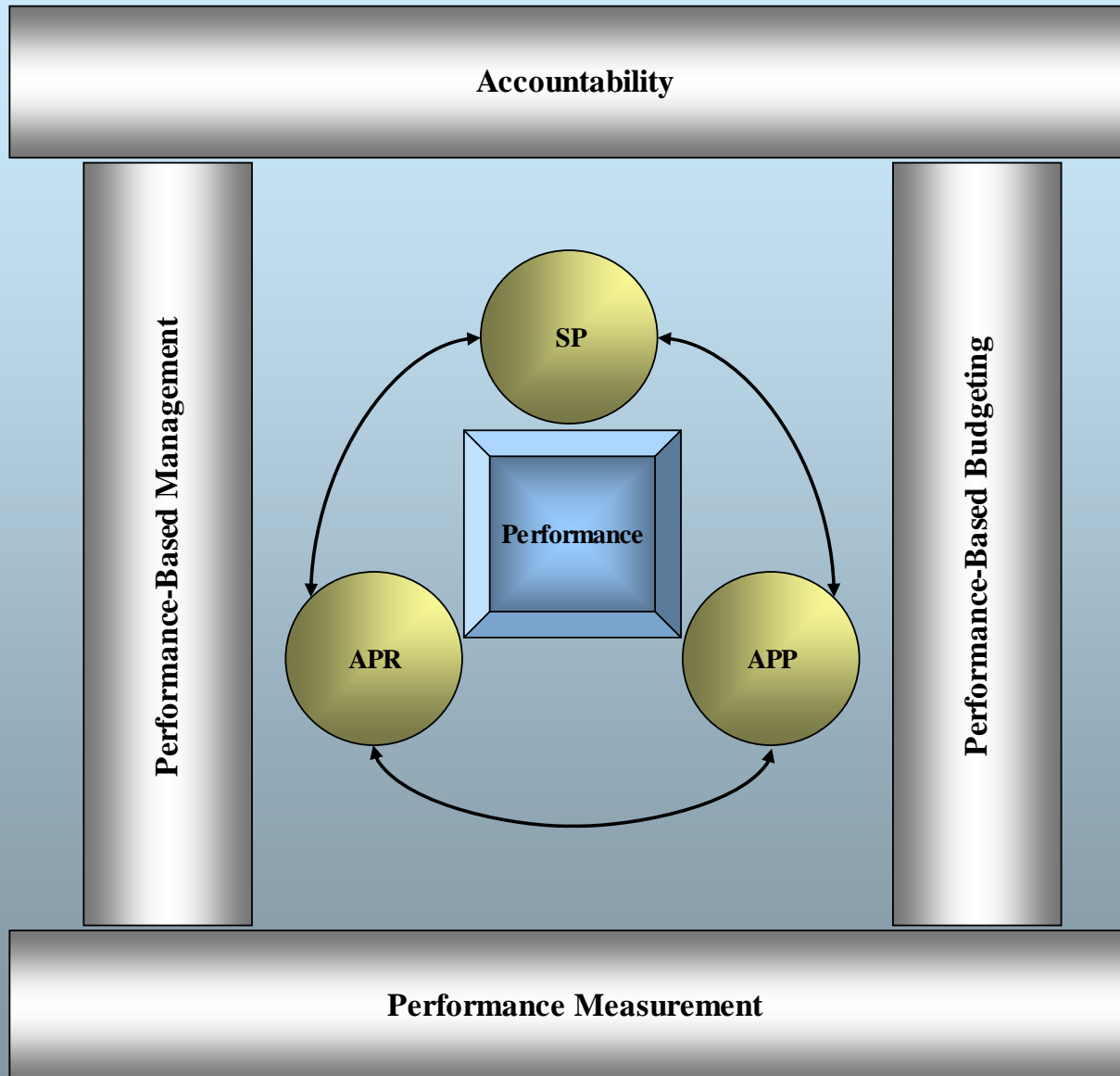
- **Decentralized system**
- **Evaluation practices vary at each agency**
- **Ad hoc evaluation by:**
 - **task forces**
 - **consulting firms**
 - **academic researchers**
 - **individual agencies**

Change: US Evaluation Practices

- ☐ Need for Systemic Appraisal**
 - Accountability on Public R&D Programs**
 - Performance-based Management**
 - Performance-based Budgeting**
 - Requires Performance Measurement**

- ☐ Mechanisms**
 - Reinforcing Implementation of GPRA**
 - President's Management Agenda**
 - Program Assessment Rating Tool (PART)**

Change: Government Performance Result Act (GPRA)



Change: Program Assessment Rating Tool (PART)

**OMB Guidelines for assessing all Fed. Programs (including R&D)
in following four criteria:**

(Will apply to all Federal Programs by 2006)

- Program Purpose/Relevance/Federal Role (20%)**
- Strategic Planning (10%)**
- Program Management (20%)**
- Program Results (50%)**



**First Evaluation Workshop
December 4 & 5**

@ The George Washington University

Need for International Evaluation Network

**WREN aims to expand “World Research Evaluation Network”
CISTP will be the Center of new WREN**

- Cross-Check of Evaluation Criteria**
- Co-Development of Advanced Measurement Tools**
- Exchange of Best Evaluation Practices**
- Exchange of Evaluation Experts**

Related References

- Son, Byoung-ho, et al. (forthcoming), “Priority-setting and Budget Coordination of Interagency R&D Programs in the US,” KISTEP Report, conducted at CISTP**

- Hwang, Yongsoo, et al. (2002), “Techno-Economic Paradigm Shift and Evolution of STI Policy in Korea and the United States,” STEPI Report, conducted at CISTP
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- Lee, Jang-Jae, et al. (2001), “Evaluation System of the US Public R&D Programs under the GPRA,” KISTEP Report, conducted at CISTP**

- Lee, Jang-Jae (2003), “PBM of Public R&D Programs and Implication of GPRA,” Presentation at STEPI Forum
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