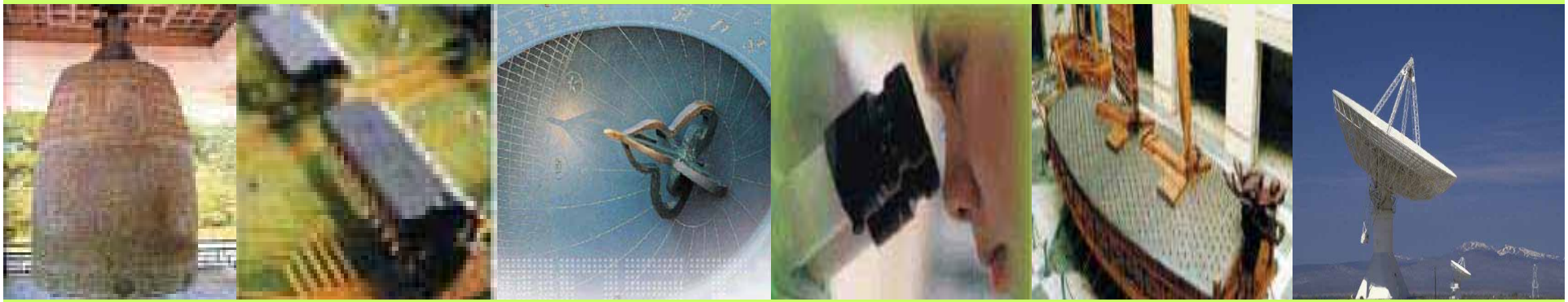

National Innovation and Promotion Policies for S&T in Korea

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Ⅰ. Roles of S&T in the 21st Century

1.Evolutionary Directions for the 21st Century

Revolutionary changes are likely to stem from paradigm shifts, and include structural changes in our lifestyles and value systems, as well as vast transformations in our economic and industrial systems.

Paradigm shifts to come will likely include:

- **Advent of a knowledge-based information society**
- **Attainment of unlimited competition for national competitiveness**
- **Creation of a new value system for personalization & diversification**

2. Roles & Development Patterns of S&T

S&T in the 21st Century as

- Driving force behind the changes in every facet of society & life
- Motivator that reinvents national wealth, improves the quality of life, and heightens the stature of nations
- Basis of sound decision-makings & risk minimization

Characteristic Development Patterns of S&T include

- Acceleration of the merging & integrating process of S&T
- Attainment of matured stages of systemization & intellectualization
- Shortening of the technology life cycle
- Development of extreme technology

Devotion of National Efforts to Developing Technologies

3.Paradigm Shift in S&T

Strong manufacturing (production) capability

→ **Int'l Front-runner of Technology in Strategic Areas**

Development of world-class products, based on fundamental technologies from overseas

→ **Generating World-class Products by some Local-invented Fundamental Technologies**

- Promotion of S&T community through enhancing capability, setting institutions, etc.

  → **Close Ties with Socio-economic Sectors & Active Utilization of Accumulated S&T Capabilities**

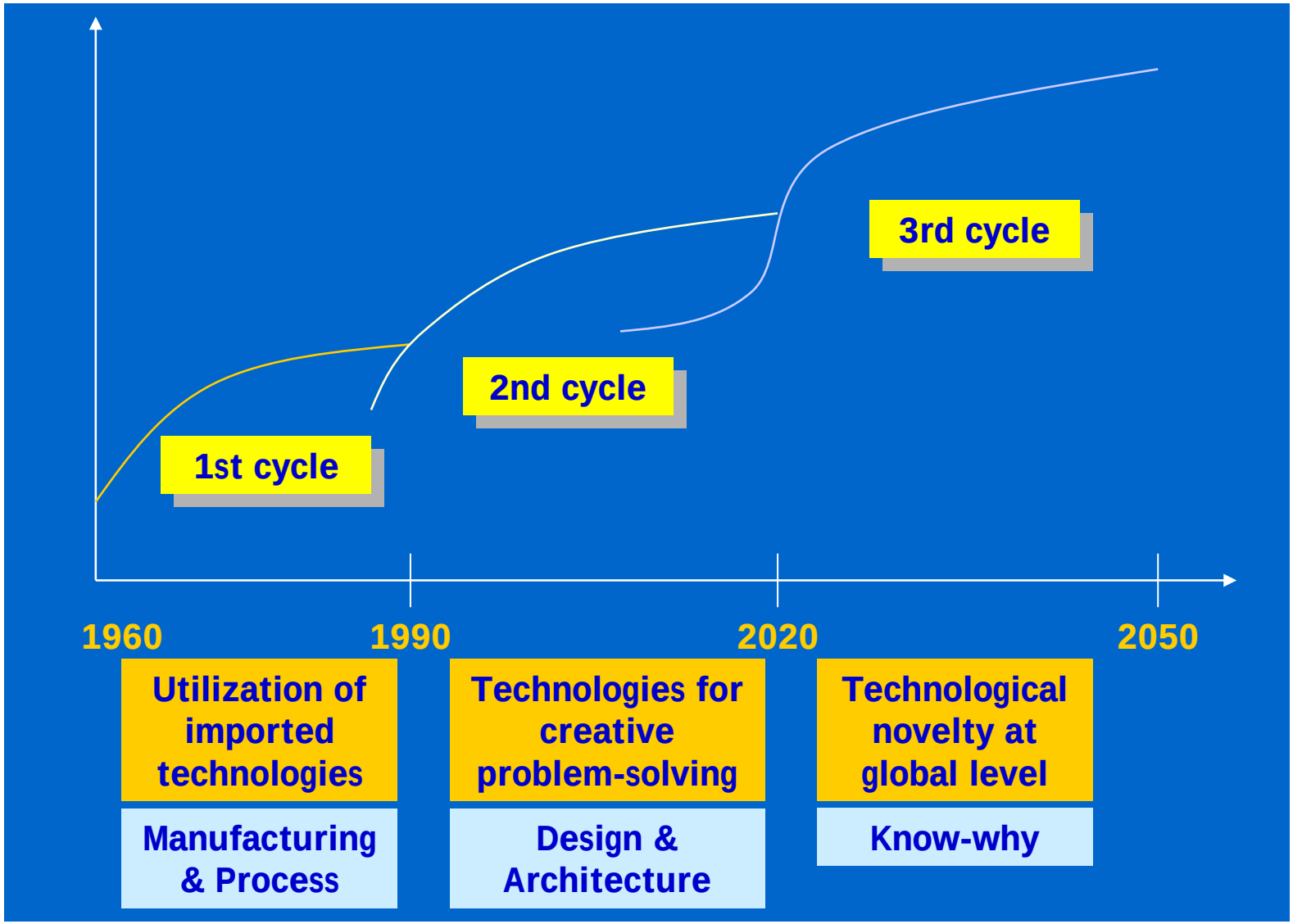
- S&T as a supporting element to economic growth

  → **S&T as a Key Driving Force to Economic Progress & Societal Development**

- S&T as an instrument or tool to achieve other objectives

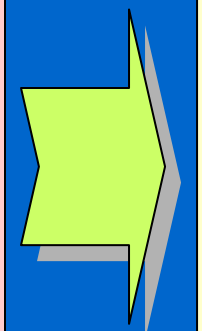
  → **S&T as a Social Institution in Life & Social Culture**

Long-term Prospects of Technological Trajectories



Transformation of national Innovation System

- Catch-up regime
- Quantity of resources
- Manufacturing technologies
- R&D funding
- Cultivation of R&D actors
- Establishment of institutions
- Government-led system
- Unbalance among sectors
- Centralized system
- Promotion of S&T



- Knowledge generation
- Quality of resources
- Fundamental technologies
- R&D infrastructure
- Networks of R&D actors
- Advancement of institutions
- Private sector-led system
- Balance among sectors
- Decentralized system
- Beyond S&T

Ⅱ. Brief History of Korean Economic Development

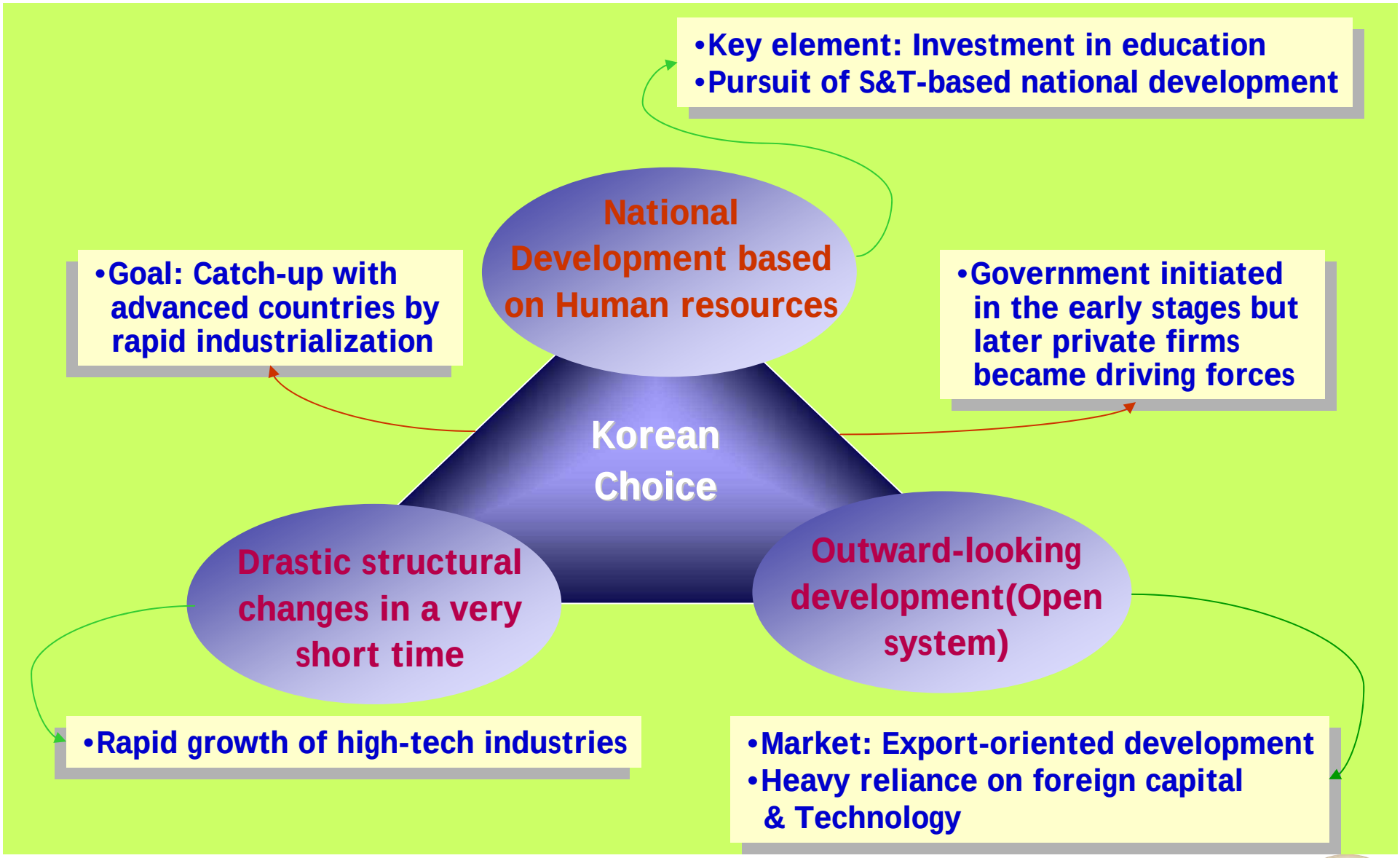
1. Features of Korea

Geo-political and Geo-economic Features of Korea

- **Geo-politically**, Korea is a small divided country bordering with super-powers, namely, China, Russia, and Japan
  - ⇨ International relations have been the key to national security and welfare

- **Geo-economically**, Korea is a small land(99 ㎢) with poor natural resource and extremely high population density
  - ⇨ Poor resource base, small domestic market
  - ⇨ Human resource is the only asset for national development

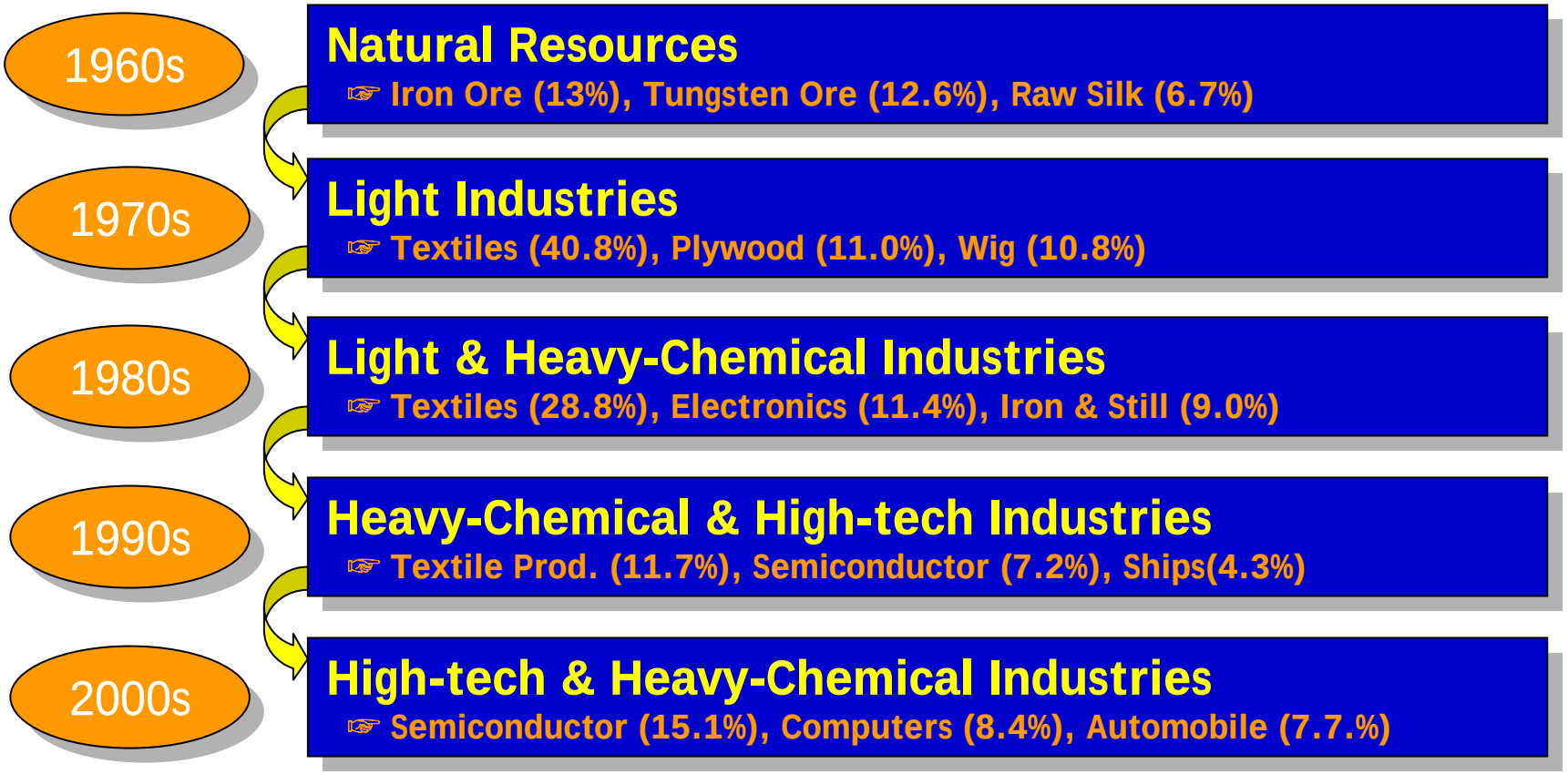
2. Key Features of Economic Growth of Korea



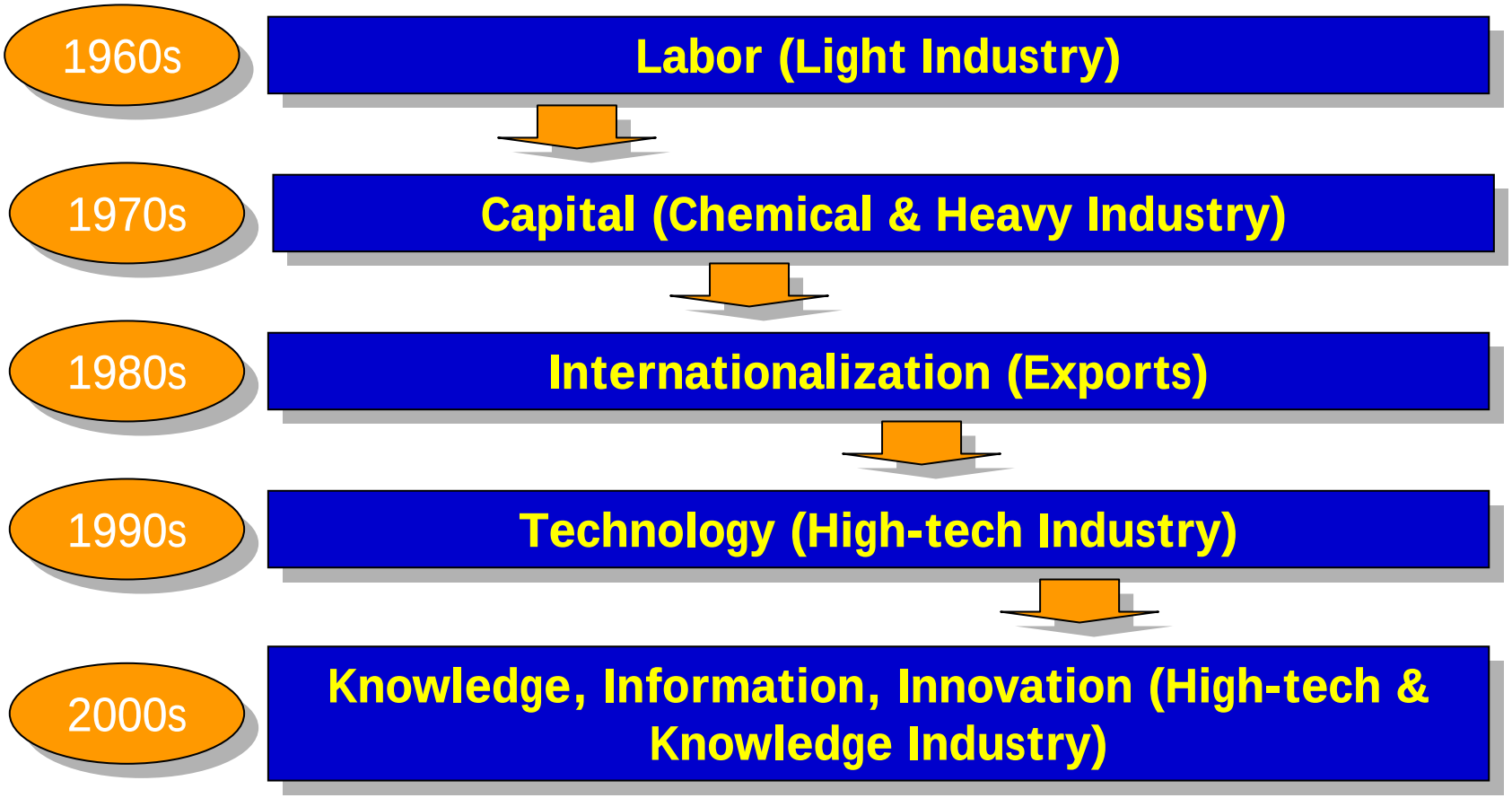
Profile of Korean Economy

	1960	1970	1980	1990	2003
Population (1000)	25,012	32,241	38,124	42,869	48,289
GDP (US$, Billion)	2	8	62	253	721
Growth Rate of GDP(%)	2.2	17.2	21.8	20.6	4.8
GDP per capita (US$)	80	248	1,632	5,900	15,059
Trade Balance (US$, Million)	-65	-596	-4,384	-2,003	14,990
Exports (US$, Million)	32	660	17,214	63,124	193,817
Imports (US$, Million)	97	1,256	21,598	65,127	178,827

Changes of Korean Top Ten (10) Exports



Pivotal Sources of Economic Growth



Ⅲ. Evolution of Korean S&T Policies

1. Historical Overview of Major S&T Policy

1960's	• Establishment of KIST (1966), MOST (1967) • S&T Promotion Act (1967)
1970's	• Establishment of GRIs in the field of chemical & heavy industries from mid-1970s • Construction of Daeduk Science Town (Started in 1974)
1980's	• Launching of the national R&D program (1982) • Promoting private firm's research institutes by reforming financial & tax incentives to stimulate R&D investment
1990's	• Promotion of university research: SRC, ERC, etc. • Introduction of new types of nat'l R&D programs - Highly Advanced Nat'l Program, The 21st Century Frontier R&D Program. • Establishment of inter-ministerial coordination body: NSTC

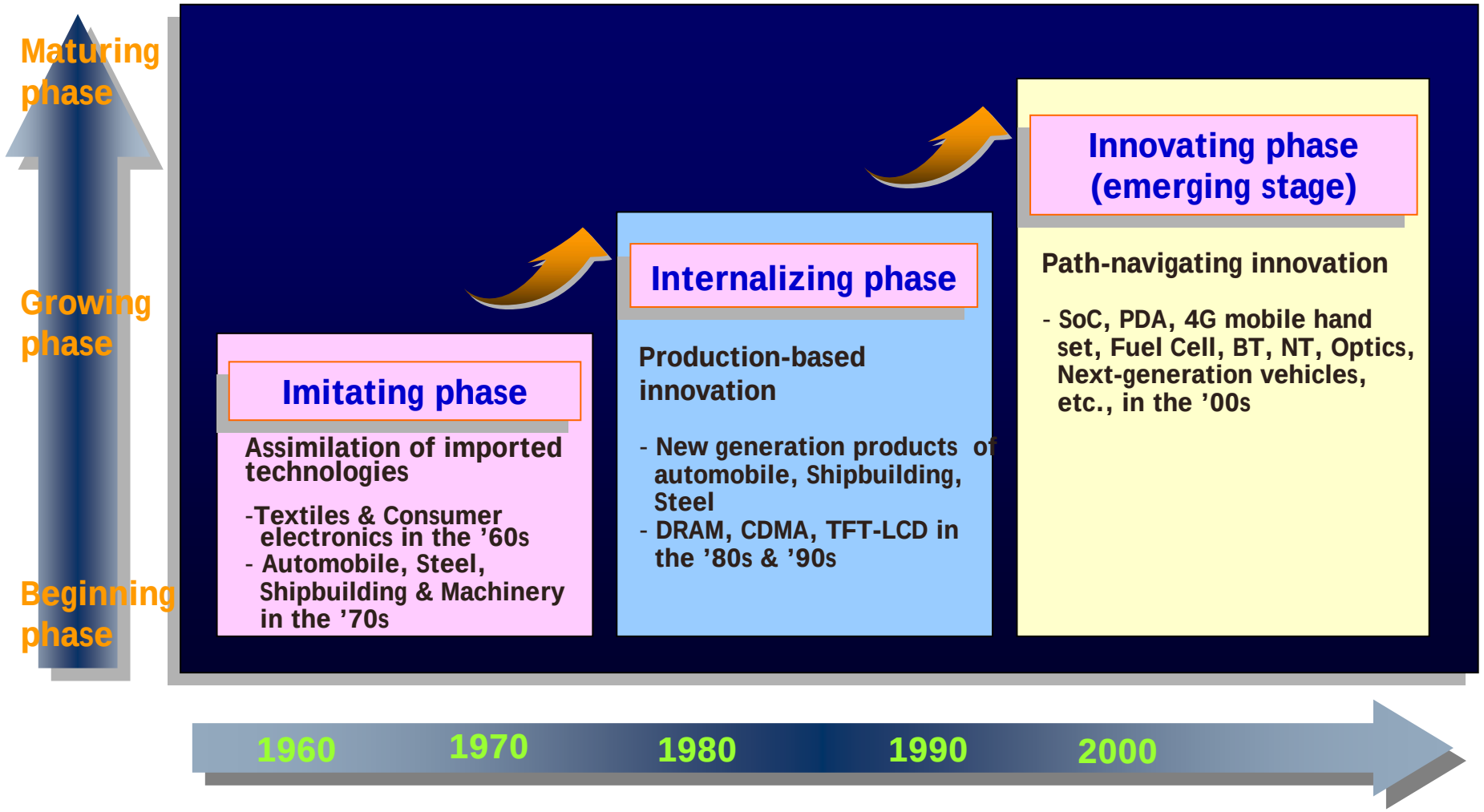
2. Characteristics of S&T Policies

Objectives:

- Catching-up advanced countries as early as possible
- Support for industrial & economic growth
- Promotion of private sector-led system

- Dominant supply-side policy
- Rapid structural transformation
- Priority setting: Center of excellence
- Growth-oriented than efficiency in investment
- Strong support of the President

3. Traces of Technological Innovation



4. Growth of S&T Community in Korea

Key Features

- Rapid increase of R&D resources: investment & manpower
- Human resource development
- Technology import & active in-house R&D to match with imported technology
- Strongly application-oriented: production process
- Government initiated in the early stages, but since the mid-1980s, private sector has been leading
- Implantation of western systems
- Active role of expatriates
- Pan-national support to S&T

Major R&D Statistics

	1963	1970	1980	1990	2003
GERD (US$, Million)	4	33	428	4,676	15,999
Gov't vs. Private	97:3	71:29	64:36	19:81	25:75
R&D/GDP (%)	0.25*	0.38*	0.77*	1.87	2.64
Researcher (Persons)	-	5,628	18,434	70,503	151,254 (†)

GERD: Gross Expenditure on R&D
* R&D/GNP
† Full time equivalent

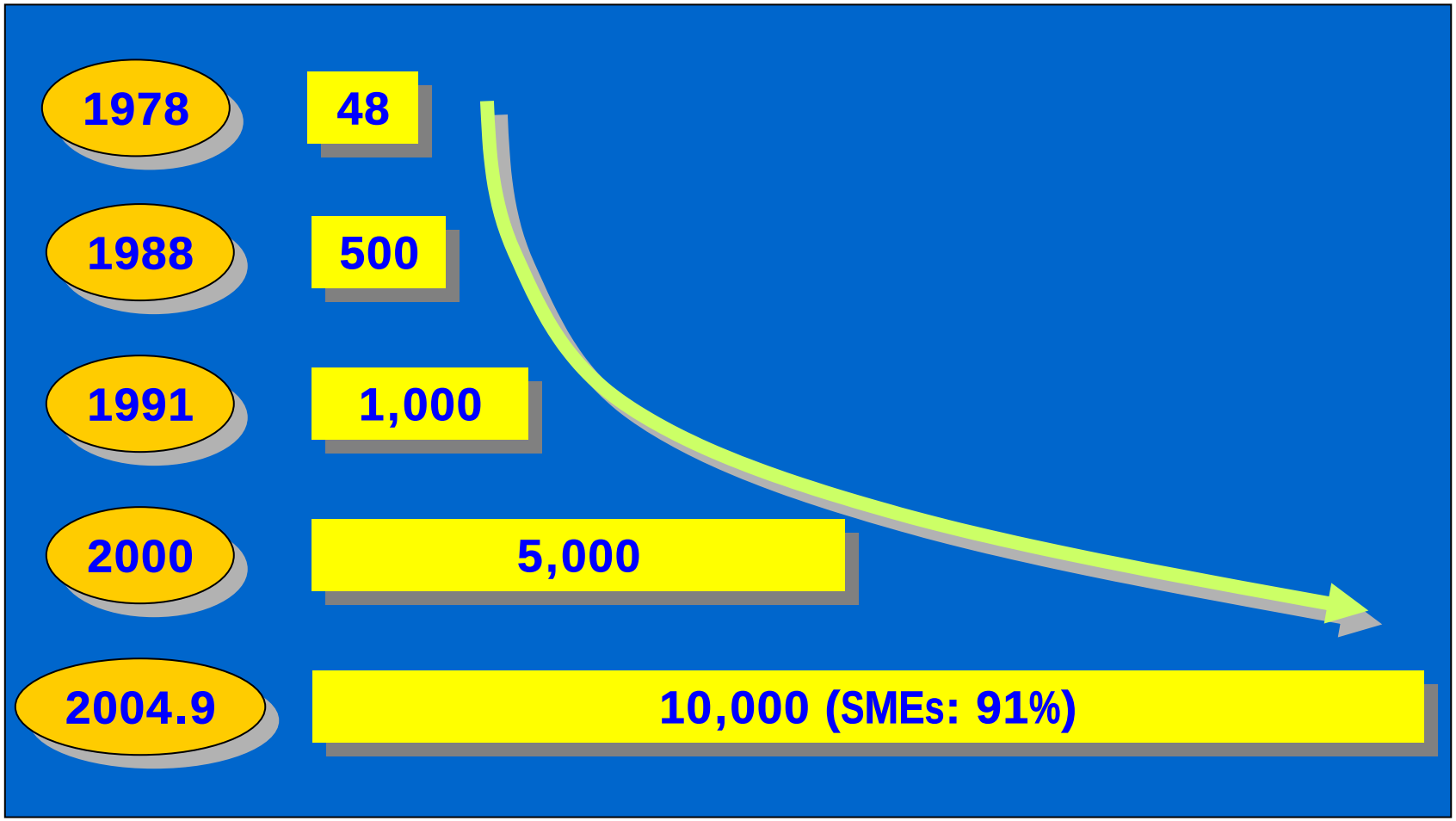
Evolution of R&D System: Ratio of GERD (%)

	1970	1975	1980	1985	1990	2003
Public institute (GRIs)	83 (25)	66 (27)	50 (27)	25 (20)	22 (16)	14 (13)
University	4	5	12	10	7	10
Company	13	29	38	65	71	76
Total	100	100	100	100	100	100

Evolution of R&D System: Ratio of Researchers (%)

	1970	1975	1980	1985	1990	2003 (FTE)
Public institute (GRIs)	43 (9)	30 (8)	25 (13)	18 (11)	15 (8)	9 (8)
University	36	44	47	36	30	17
Company	21	26	28	46	55	74
Total	100	100	100	100	100	100

Corporate Research Institutes (number)



Academic Papers: SCI

	1999	2000	2001	2002	2003
Number	11,076	12,245	14,673	15,873	18,635
Increase (%)	15.8	10.8	19.8	8.2	17.4
Share (%)	1.21	1.33	1.60	2.1	2.29
Rank	16	16	15	14	14

Overseas Patents: U.S.A., Registration

	1990	1995	2000	2001	2002	2003
Number	224	1,166	3,331	3,546	3,755	4,198
Rank	17	8	8	8	7	5

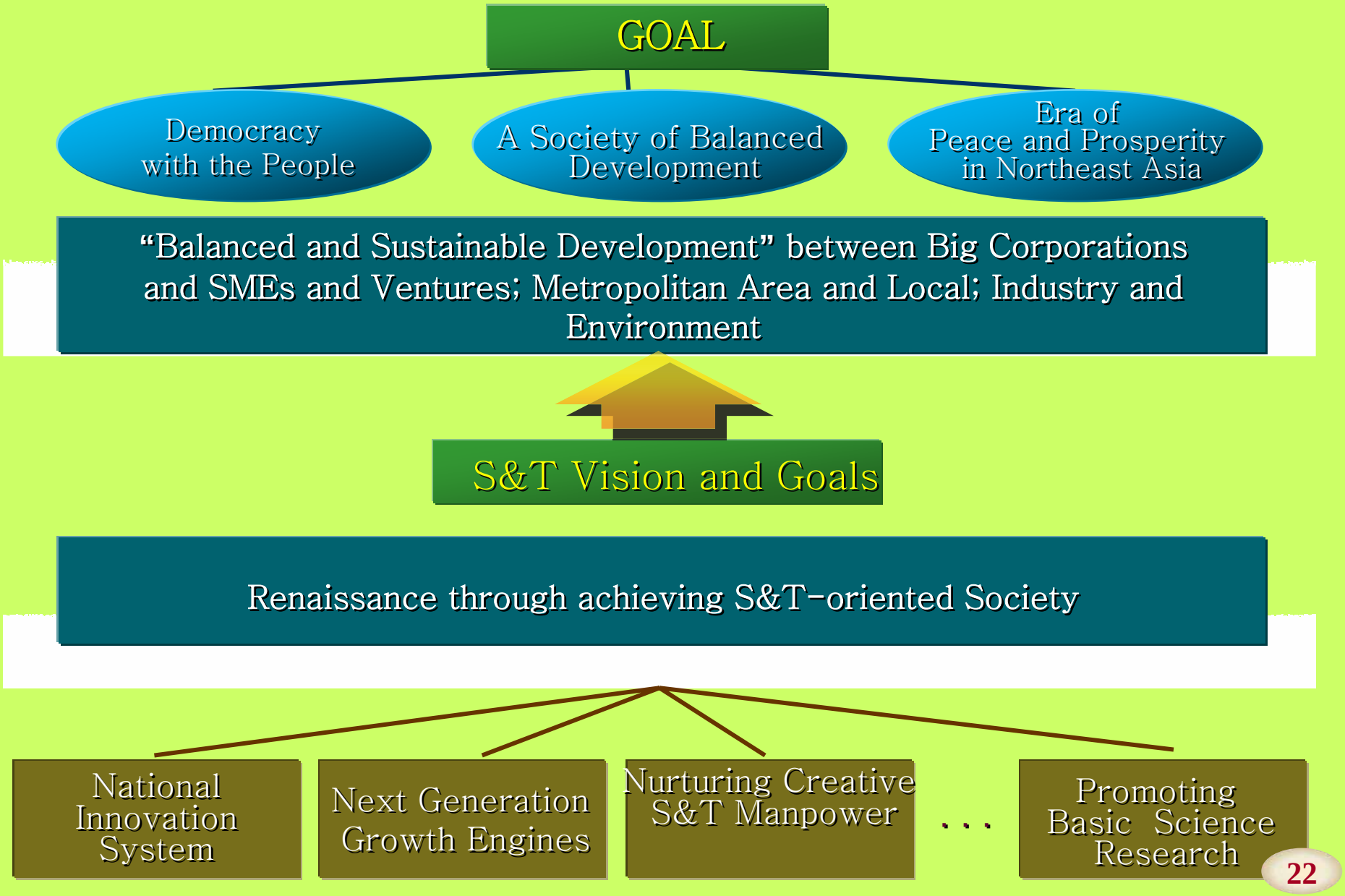
Current Status of Korea's S&T Capabilities: IMD(2004)

	Index	Rank
Total expenditure on R&D (US$ millions), 2002	13,849	7
Total expenditure on R&D (% of GDP)	2.53	10
Business expenditure on R&D (US$ millions), 2002	10,152	6
Total R&D personnel nationwide (FTE per 1000 people), 2002	189.9	7
Total R&D personnel in business enterprise (FTE per 1000 people),2002	118.2	7
Number of patents granted to residents (average1999-2001)	29,363	3
Number of patents secured abroad by country residents, 2001	7,157	12
Patents granted to residents/ R&D personnel in business (1000s), 2001	186.6	3
High-tech export (US$ millions), 2002	46,438	9
Internet Users (number of internet users per 1000 people), 2003	605.1	5
Broadband subscribers (number of subscribers per 1000 inhabitants), 2002	218.4	1
Overall ranking : Technological Infrastructure 8, Scientific Infrastructure 19		

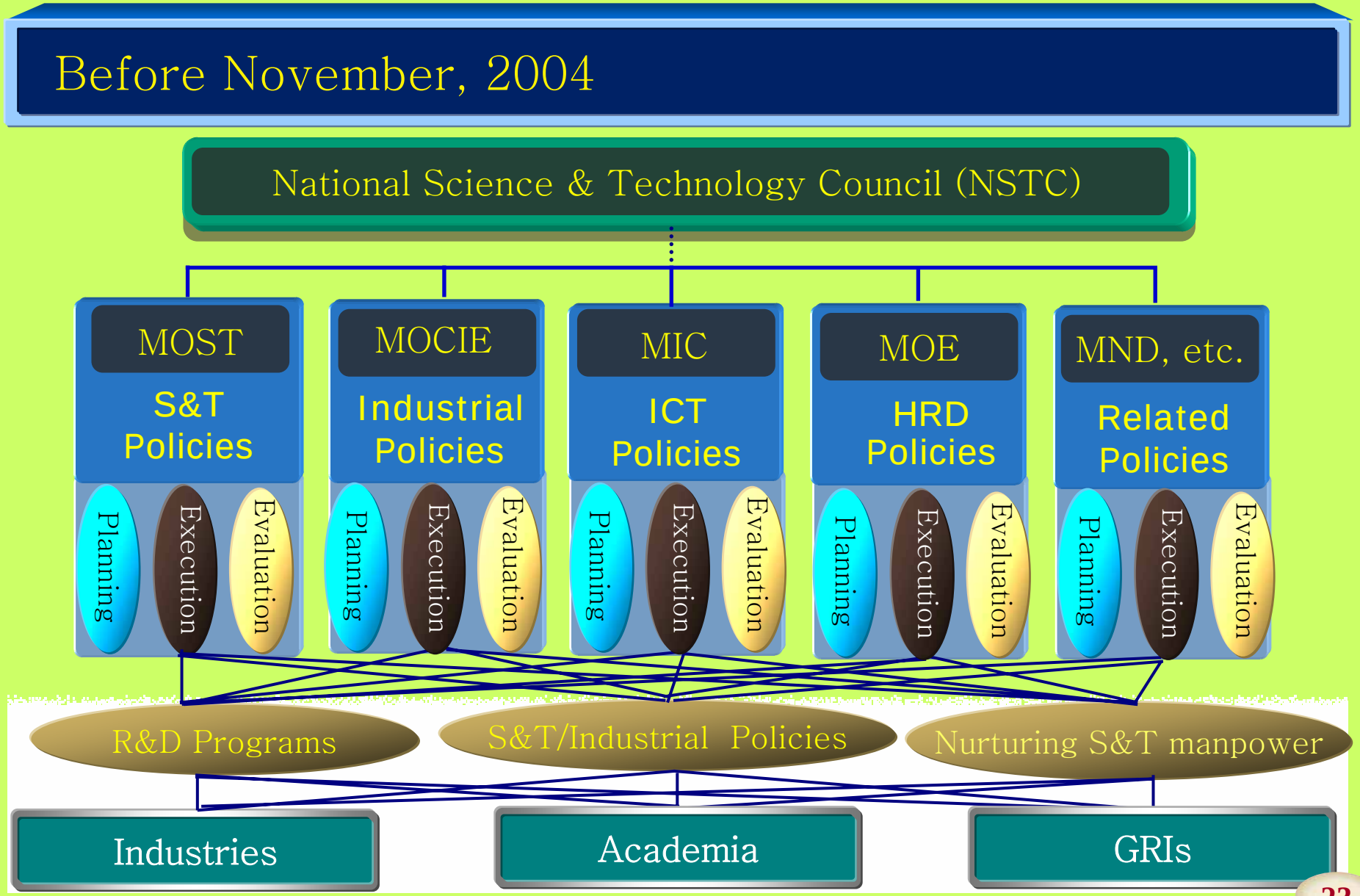
* Scientific competitiveness among countries with a population of over 20 million

Ⅳ. Major S&T Innovation Policies In Korea

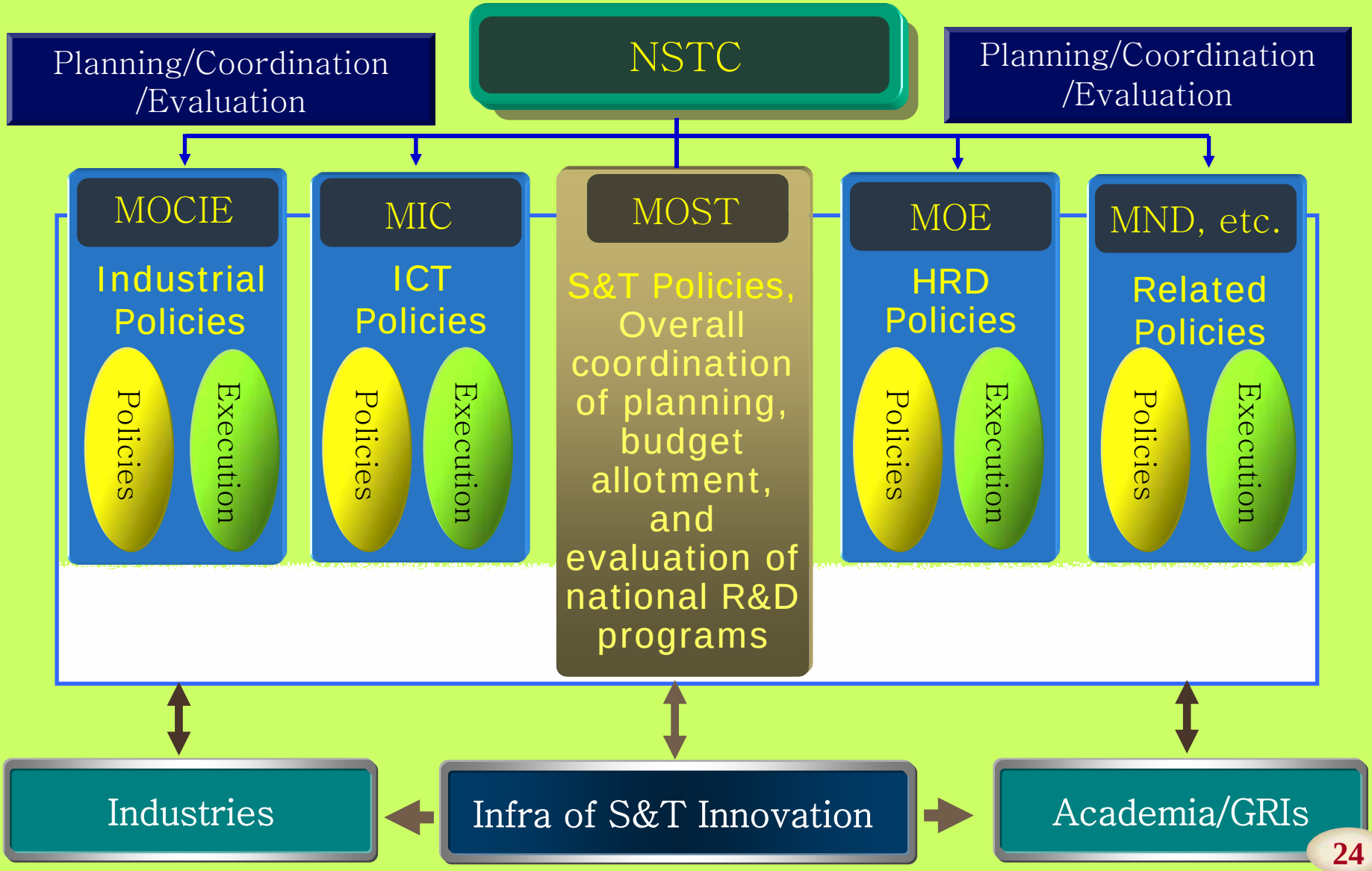
1) S&T Vision and Policy Goals



2) Reorganization of Administrative System for S&T



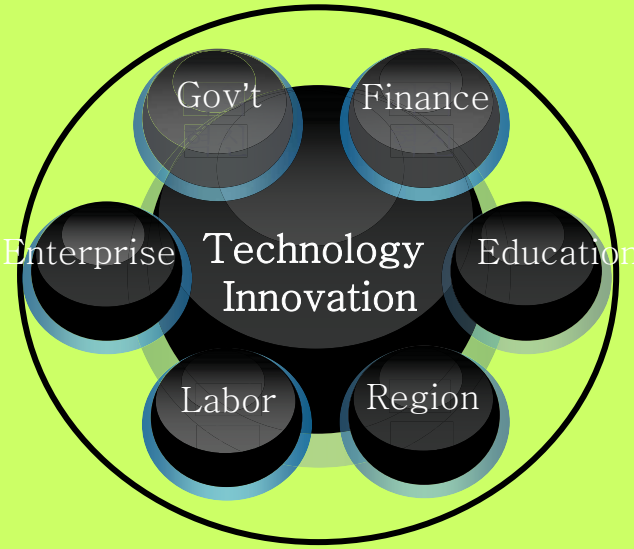
After November, 2004



3) Refurbish National Innovation System

Innovation-led Growth

- **Highly-developed Leading Industry**
- **Creating New Knowledge Industry**
- **Nurturing Knowledge-based Industry**



- Technology Innovation will lead economic growth and urge every sector of society to innovate

➡ New National Innovation System

List of Priorities for Establishing National Innovation System

Securing Quality Manpower for Technology Innovation

Strengthening SMEs as Foothold of Innovation-led Economic Growth

Promoting Economic & Social Contribution through Industrializing Outcomes from Technology Innovation

Efficient Technology Innovation between Public and Private Sector → Strengthening NSTC

4) Promotion of Nat'l R&D Projects for New Growth Engine

Promotion of 10 Industries & 80 Technologies

To prompt the national per capita income, the Korean government selected 10 new growth industries and 80 technologies in July 2003, which will play the role of cash cow and lead job creation for the next 5 to 10 years

5) Promotion of Regional S&T Innovation Capability

Realization of Balanced Development of National Land Through Developing Local Strategic Innovation Bases

- To increase the portion of regional R&D in the government's R&D budget from 53.2% in 2002 to 65% by 2007
- To expand support for regionally specialized R&D projects by increasing RRCs from 57 in 2003 to 100 by 2007, and by executing a regional R&D cluster program
- To relocate GRIs to regions that are perfect matches for them, establish local branches of GRIs, and establish local GRIs
- To foster major high-tech science complexes, including Daeduk Science Town, as regional hubs of R&D

6) Korea as a Player of Peace & Prosperity in NE Asia

Pursuing the development of a regional system for S&T cooperation in Northeast Asia

- To contribute to organizing regional collaboration to deal with the issues of regional concerns, such as cross boundary pollutions, migratory resource management, the marine environment, infectious diseases, and energy.

Host a Korea-Japan-China S&T Ministers' Meeting early next year

- To build up a consensus on regional cooperation and to discuss specific action programs that include a regional program for joint research, exchange of scientists & engineers, and joint utilization of research facilities.


Thank you.
Science and Technology:
It is our future.
END