S&T Strategy and Foresight Activities in Japan

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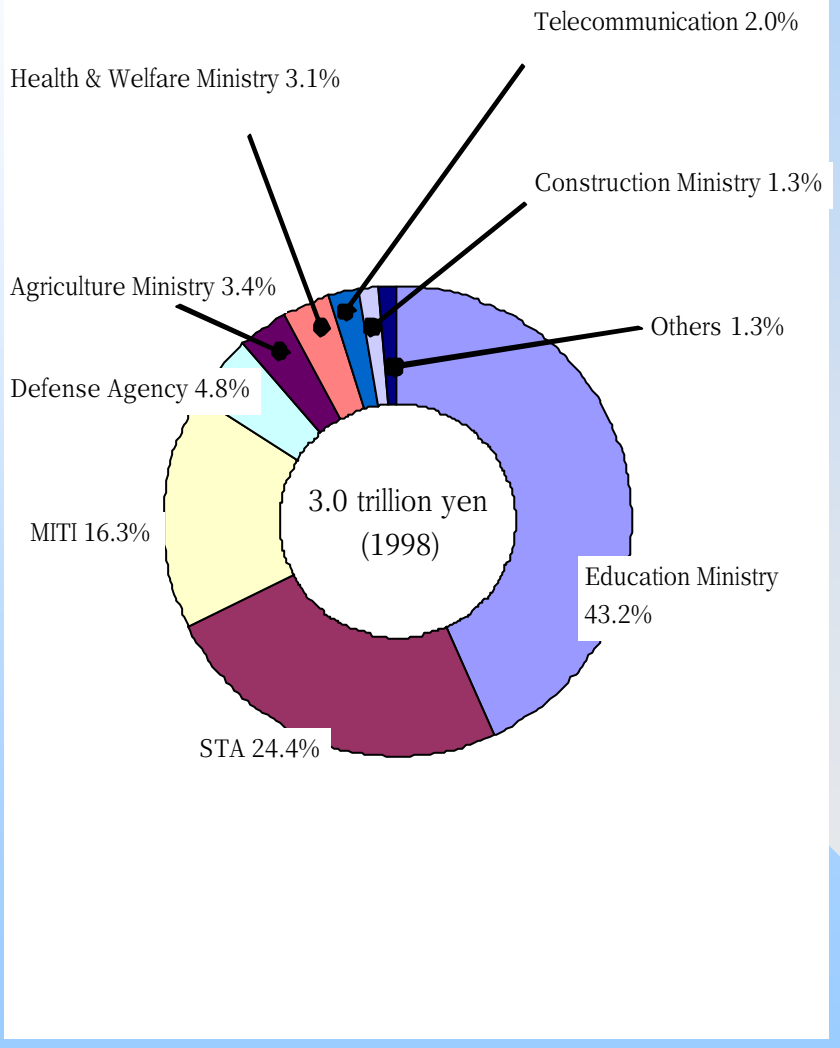
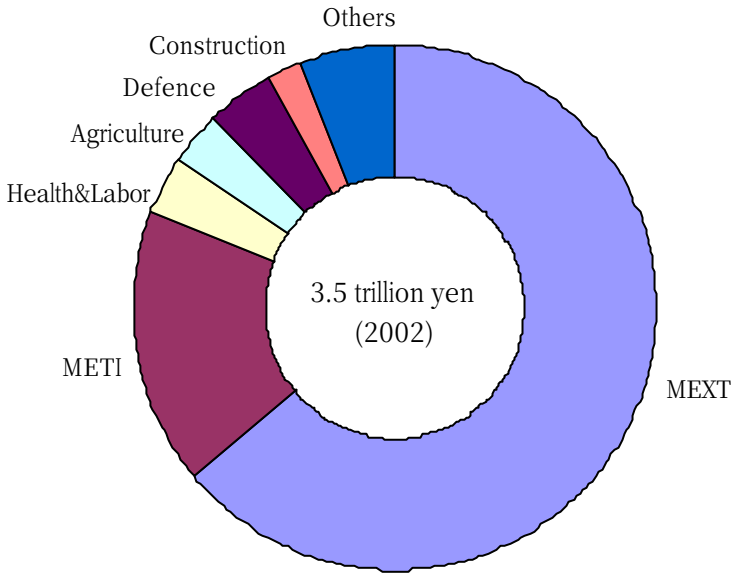
Outline

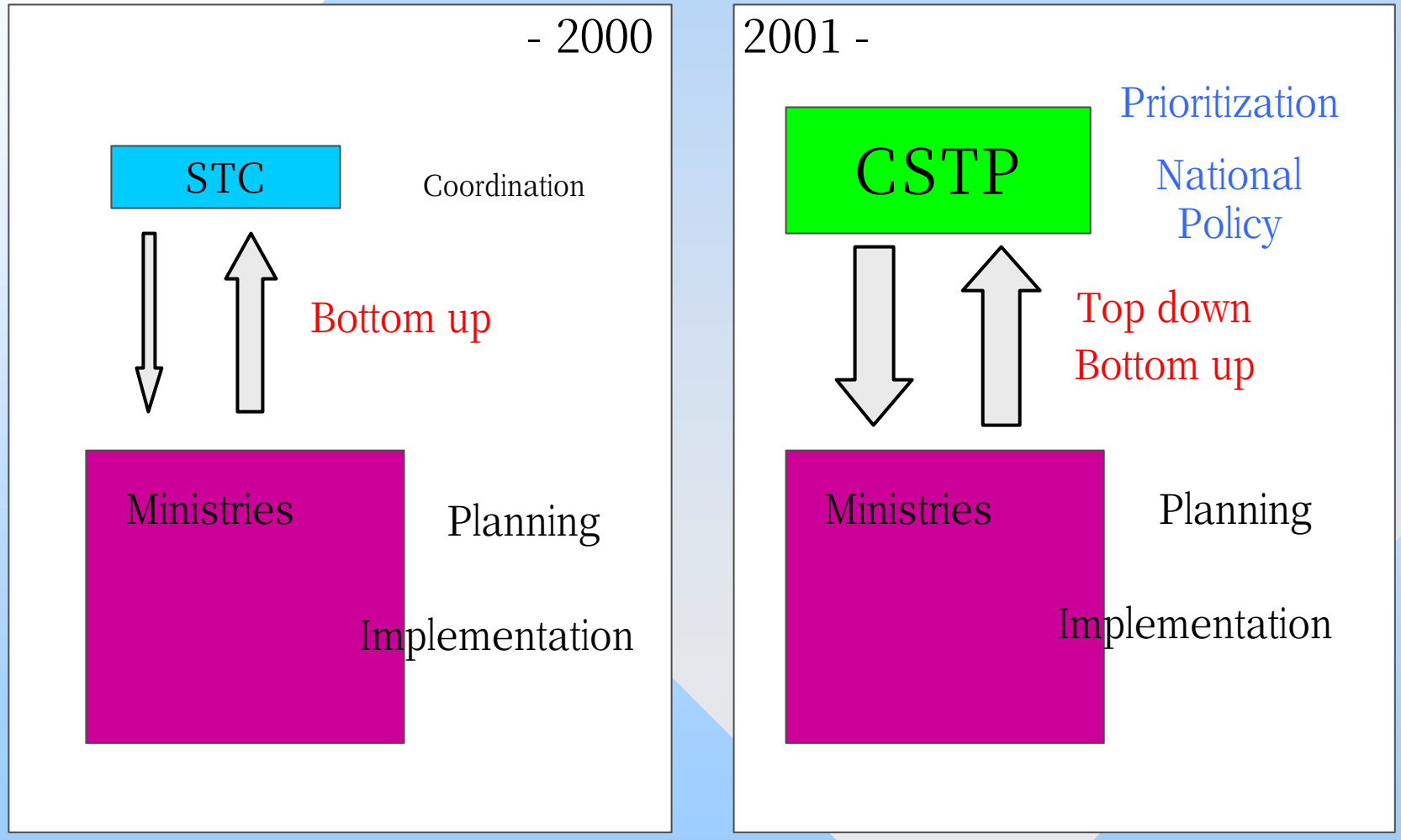
1. Political Backgrounds of S&T
2. Review of Past Foresight
3. STFC of NISTEP
4. Future project

S&T Budget

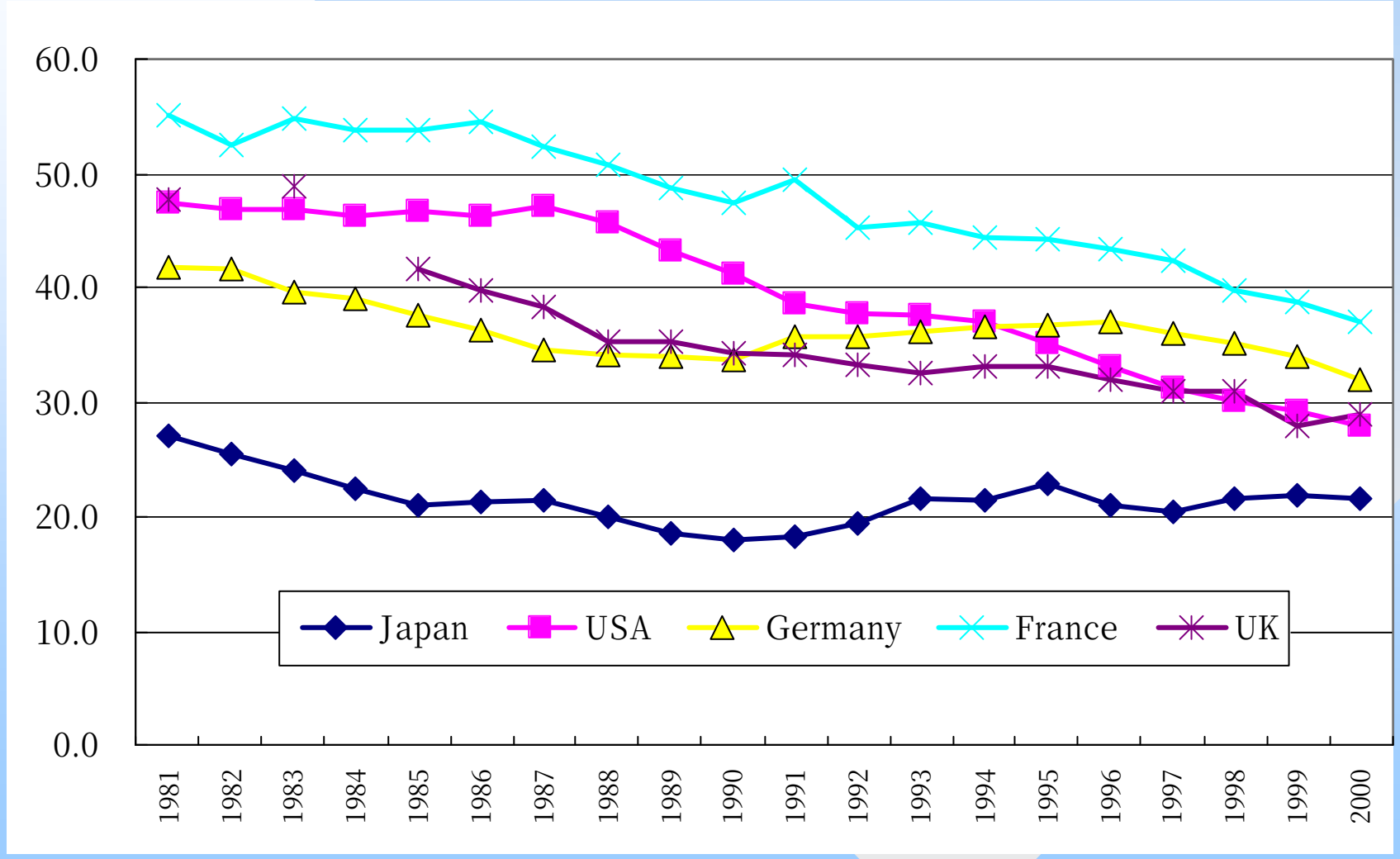

Telecommunication 2.0%
Health & Welfare Ministry 3.1%
Construction Ministry 1.3%
Agriculture Ministry 3.4%
Others 1.3%
Defense Agency 4.8%
3.0 trillion yen
(1998)
MITI 16.3%
Education Ministry
43.2%
STA 24.4%


Others
Construction
Defence
Agriculture
Health&Labor
3.5 trillion yen
(2002)
METI
MEXT

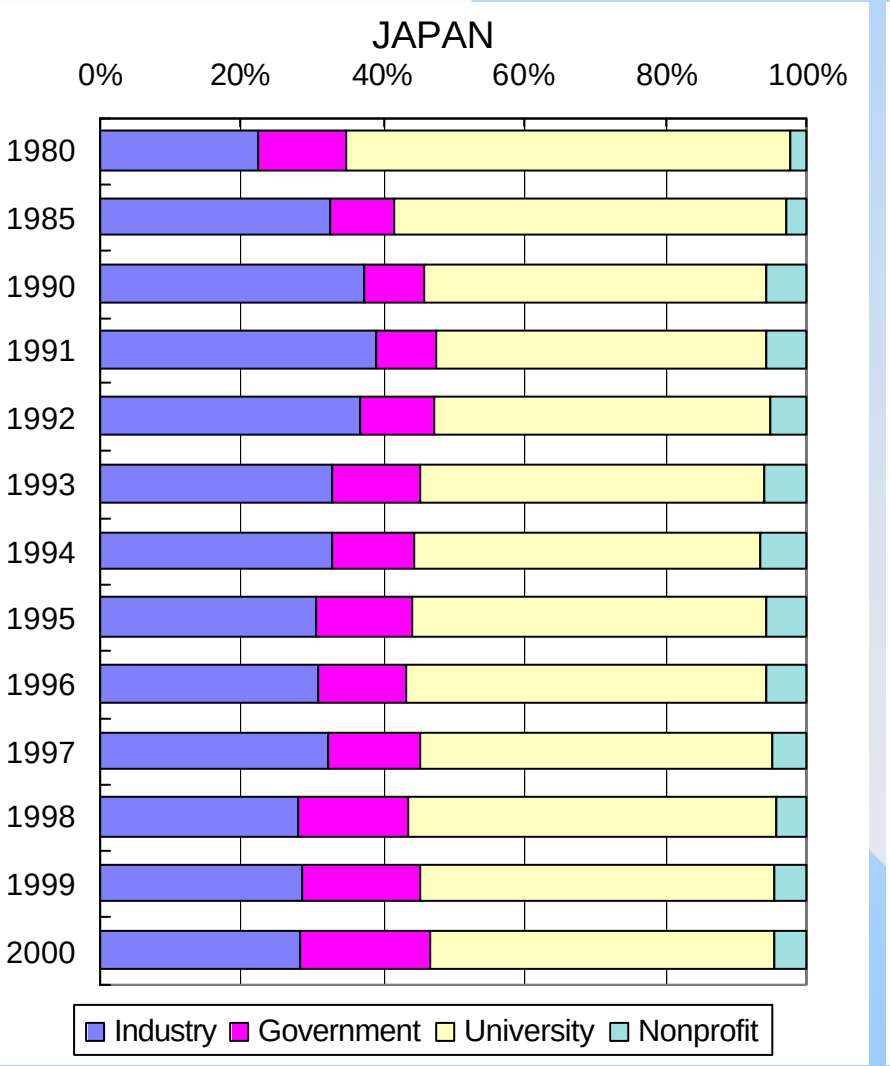
Political Structure

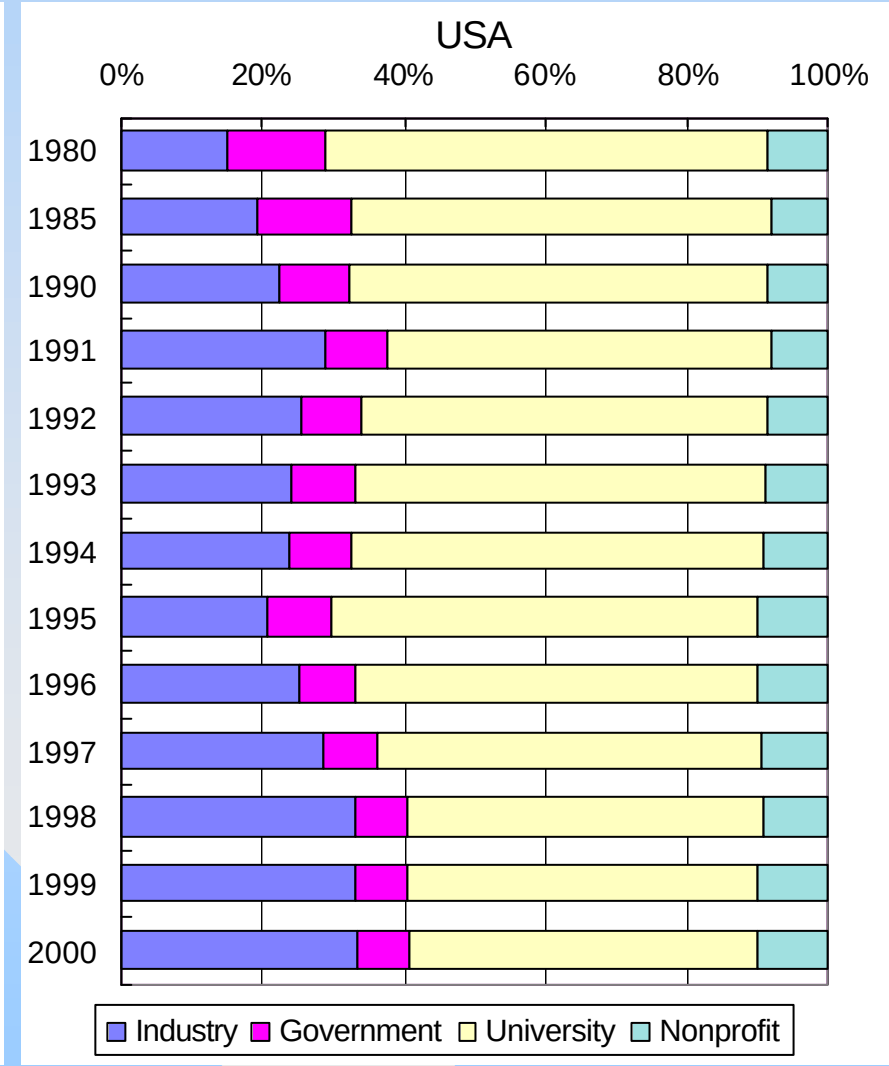


Government's Share of R&D Expenditure

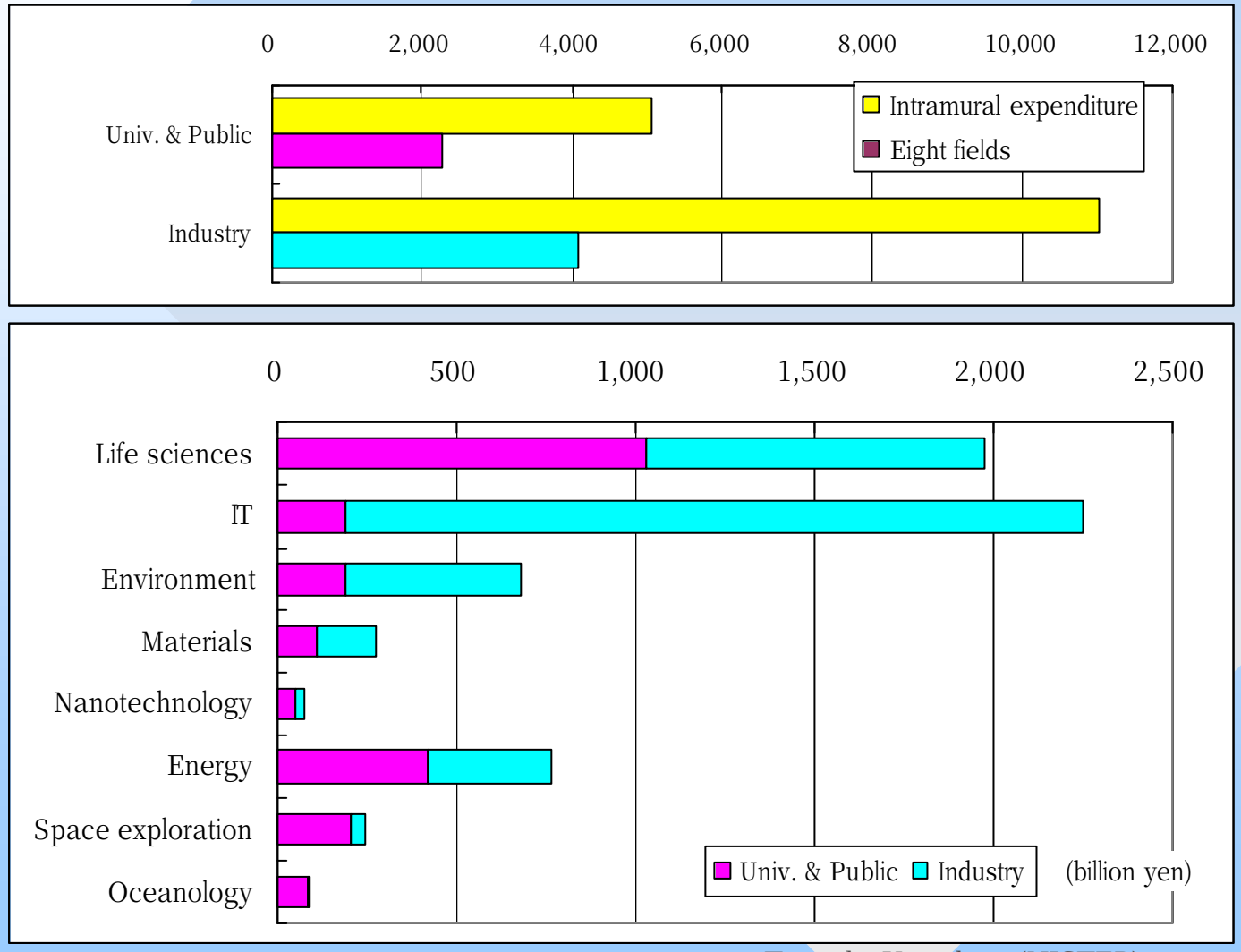


Basic Research by Sector





R&D Expenditure by Fields (2001)



Japanese Technology Foresight in 1970s and 1980s

- Japan was on the catch up process
- To form common vision/consensus on future priority and perspective
- To lead industry through “long term visions”
- Moderate link to government’s S&T policy
  - Indirect effects to R&D resources allocation

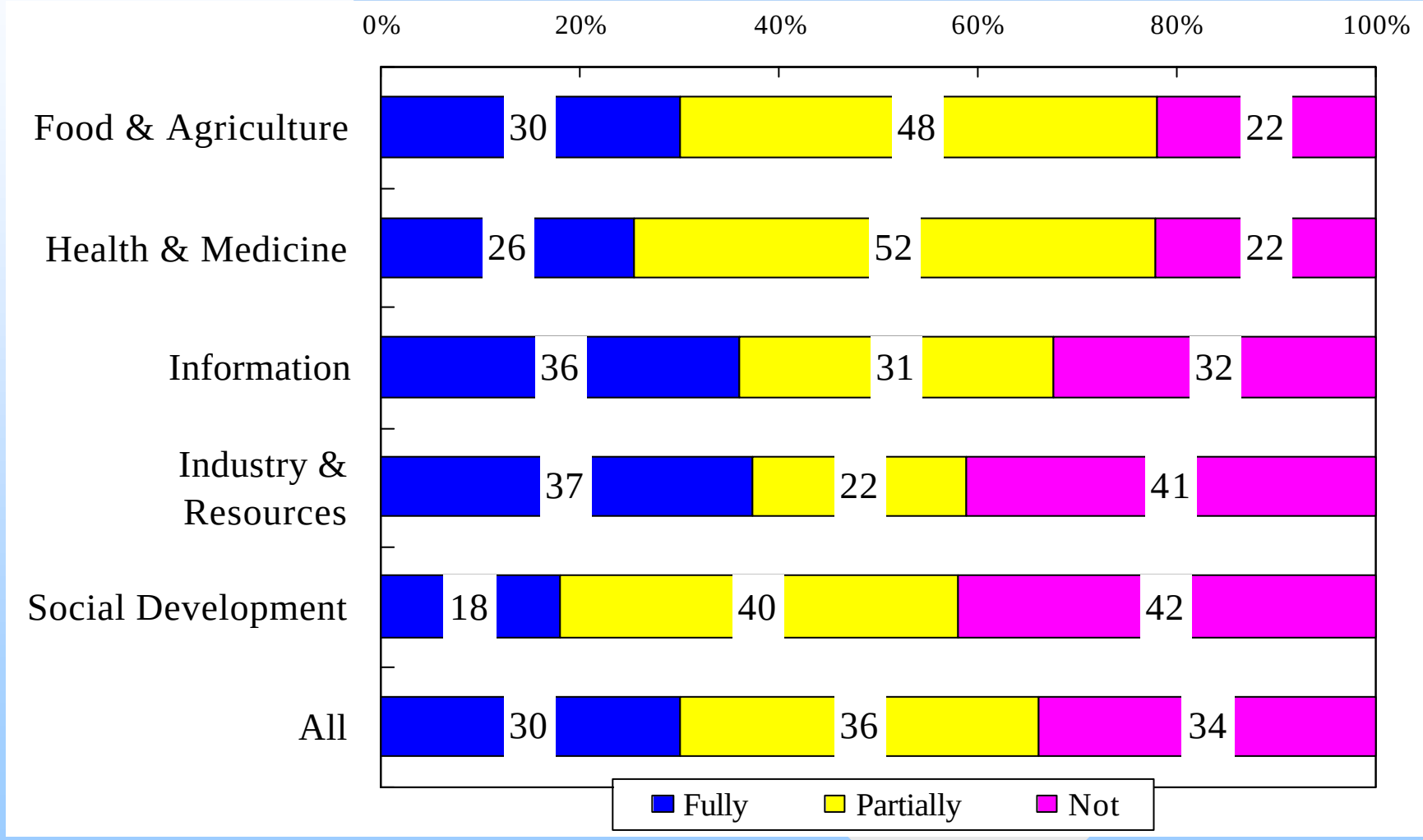
Structure of National Foresight

- **Holistic** NISTEP
  DELPHI
- **Macro-level** Ministries
- **Meso-level** Groups of companies
- **Micro-level** Individual companies and research institutes

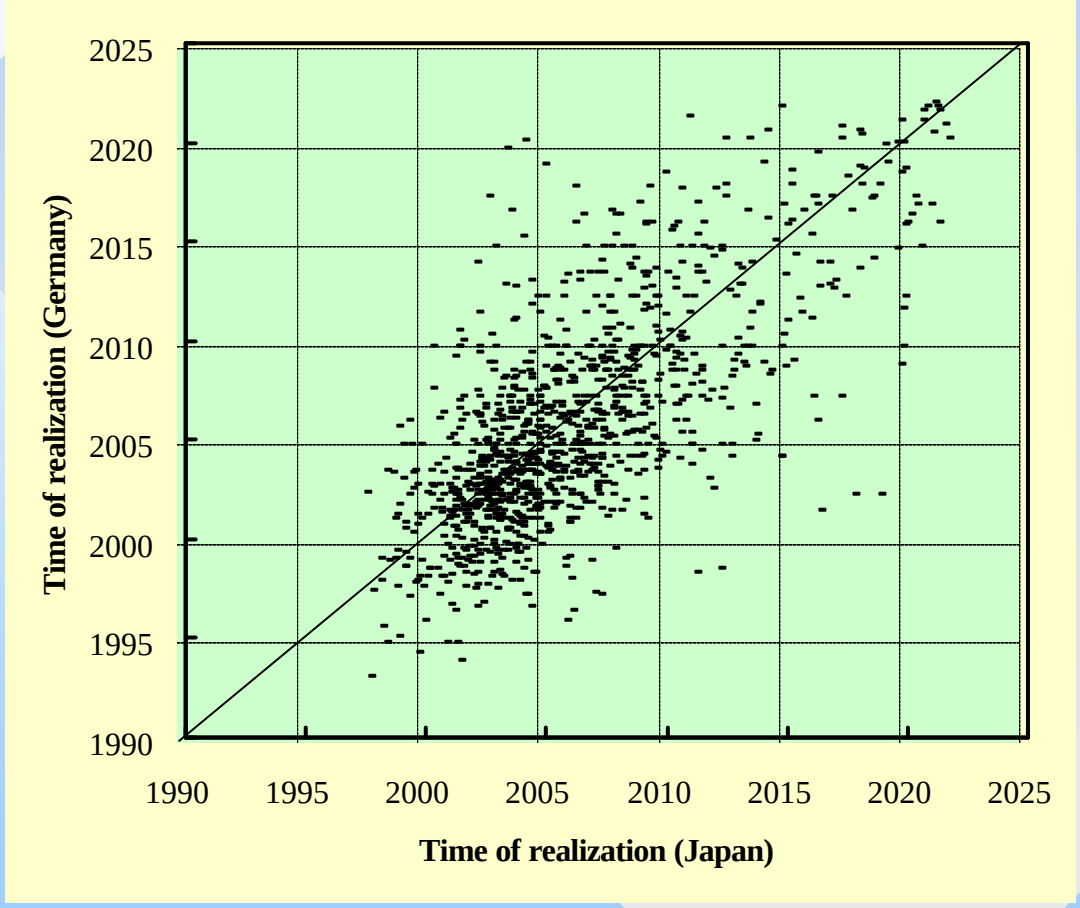
History of Japanese Delphi Survey

NO.	Survey Year	Fields	Topics	Experts
1	1970-1971	5	644	2482
2	1976	7	656	1316
3	1981-1982	13	800	1727
4	1986	17	1071	2007
5	1991	16	1149	2385
6	1996	14	1072	3586
7	2000	16	1065	3106

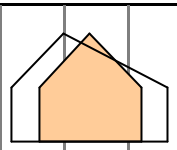
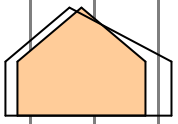
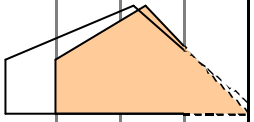
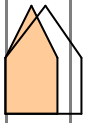
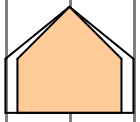
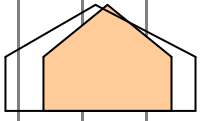
Evaluation of First Survey (1971)



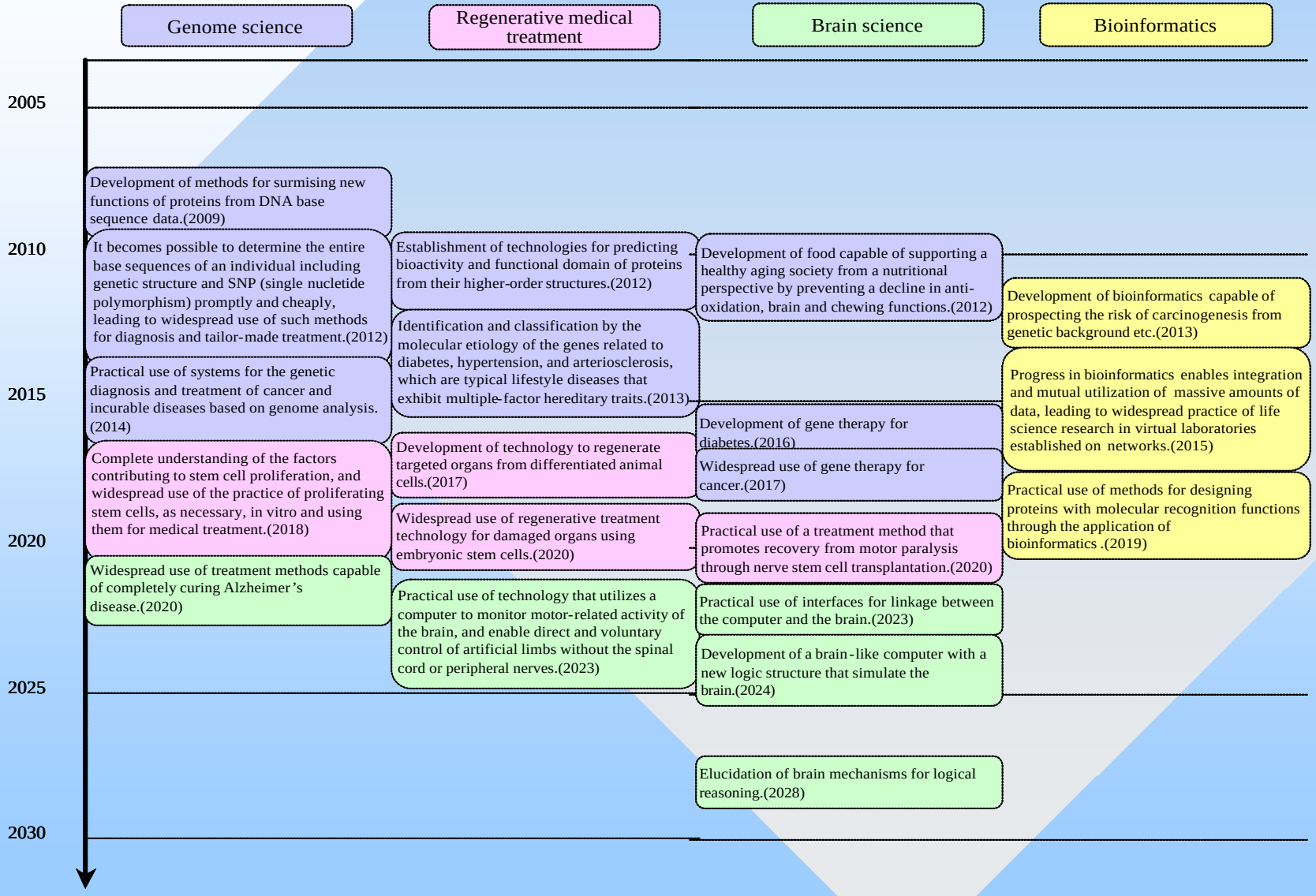
Japanese and German Time of Realization (Japanese 92 & German 93)



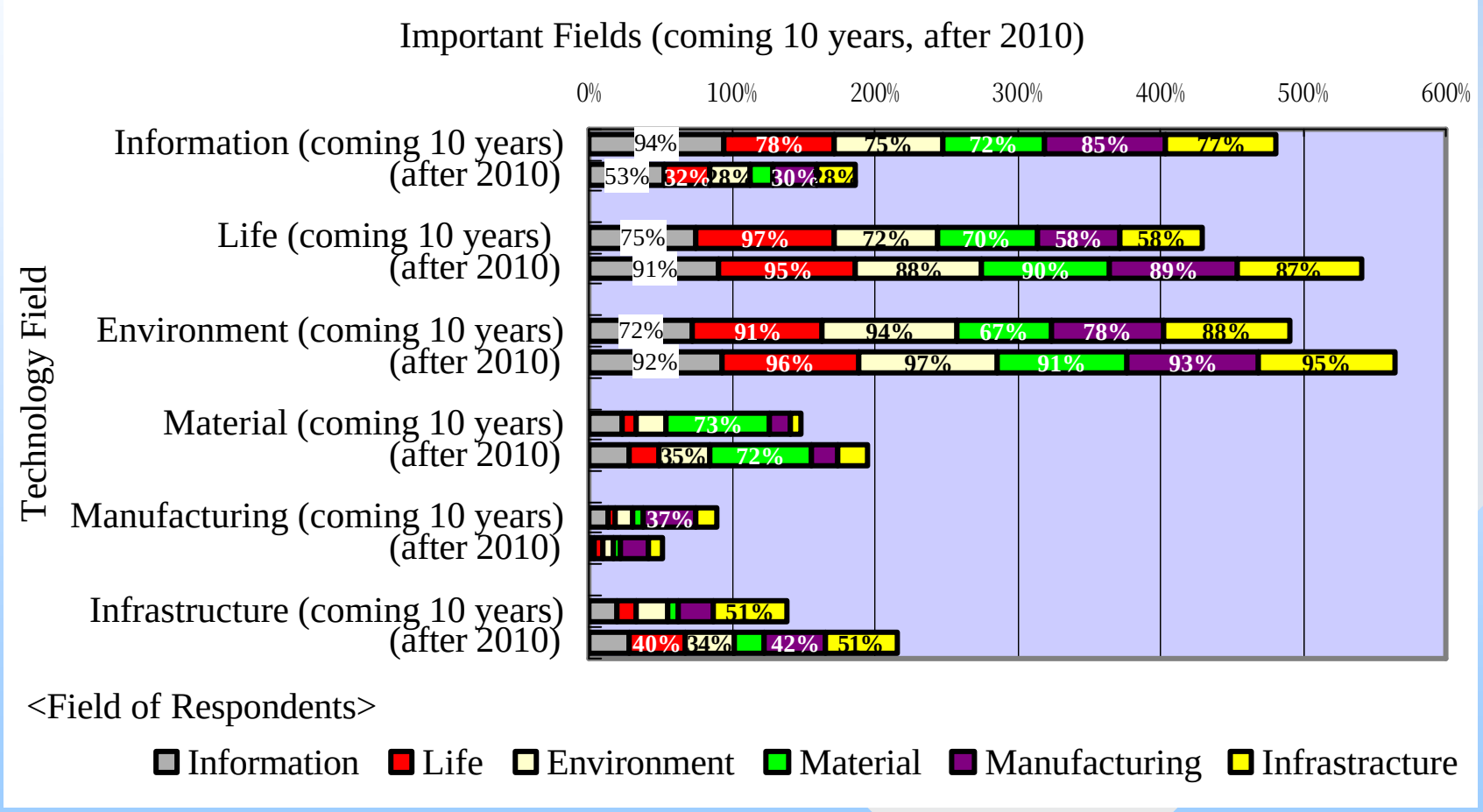
Examples of Delphi Topics

Topics	Number of respondents	Importance Index	Time of realization (2001 2006 2011 2016 2021 2026)	Never	Don't know
Elucidation of carcinogenic mutation mechanisms.	113	88		2	6
Development of drugs capable of preventing the occurrence of certain types of cancer.	212	87		2	5
Development of technology capable of forecasting the occurrence of major earthquakes (magnitude 7 or above) several days in advance.	102	92		29	14
Practical use of a highly secure next-generation internet that allows the transmission of real-time information, leading to the implementation of internet-based telephone services and motion video broadcasts.	232	92		0	1
Practical use of large-area amorphous silicon solar cells with a conversion efficiency of more than 20%.	144	91		1	7
Widespread use of non-fossil energy sources (wind, geothermal, solar (photovoltaic/solar thermal) and waste heat) in all areas of life including household, industry and transportation.	93	94		1	10

Development in Life Science



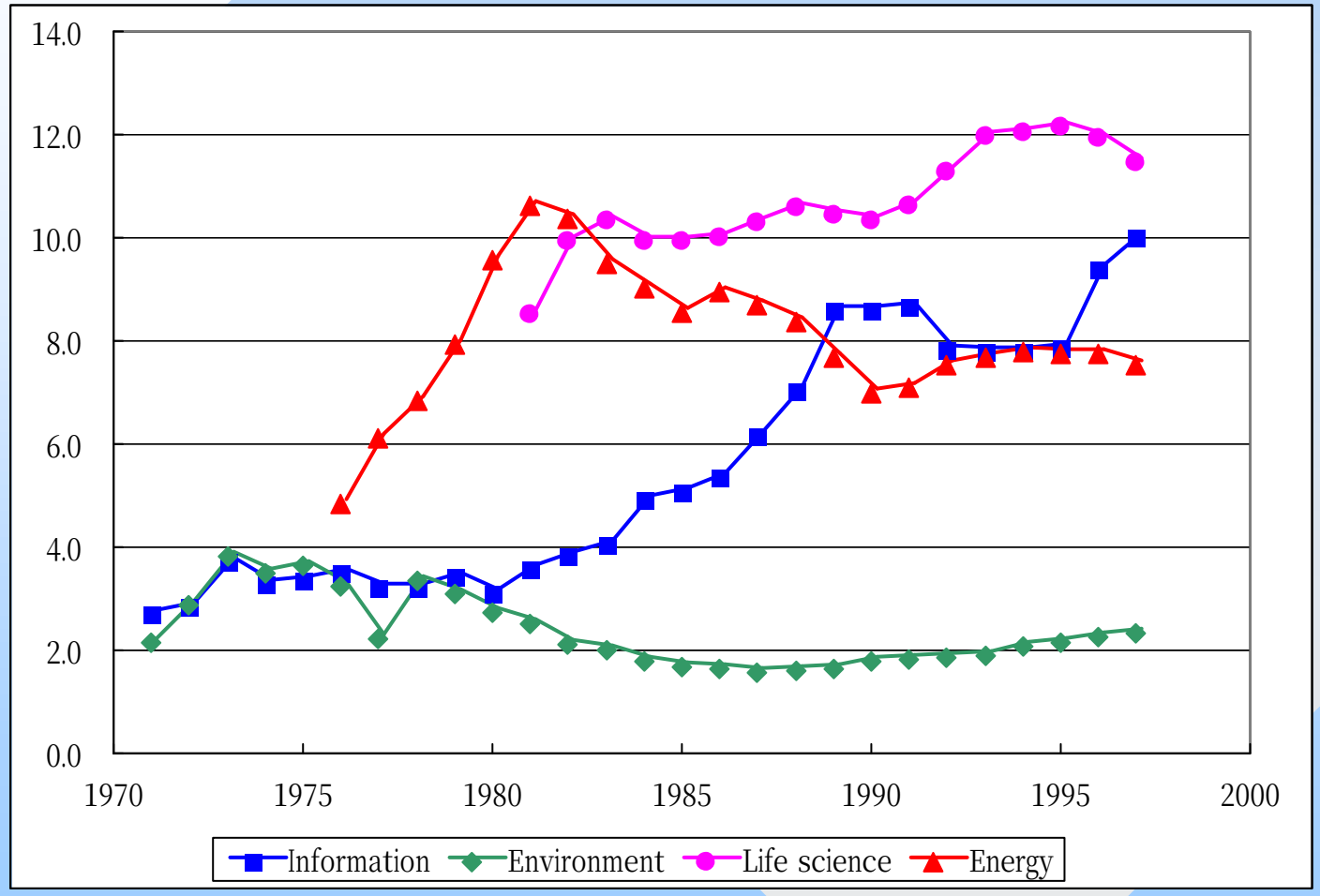
Important fields in “coming 10 years” and “after 2010”



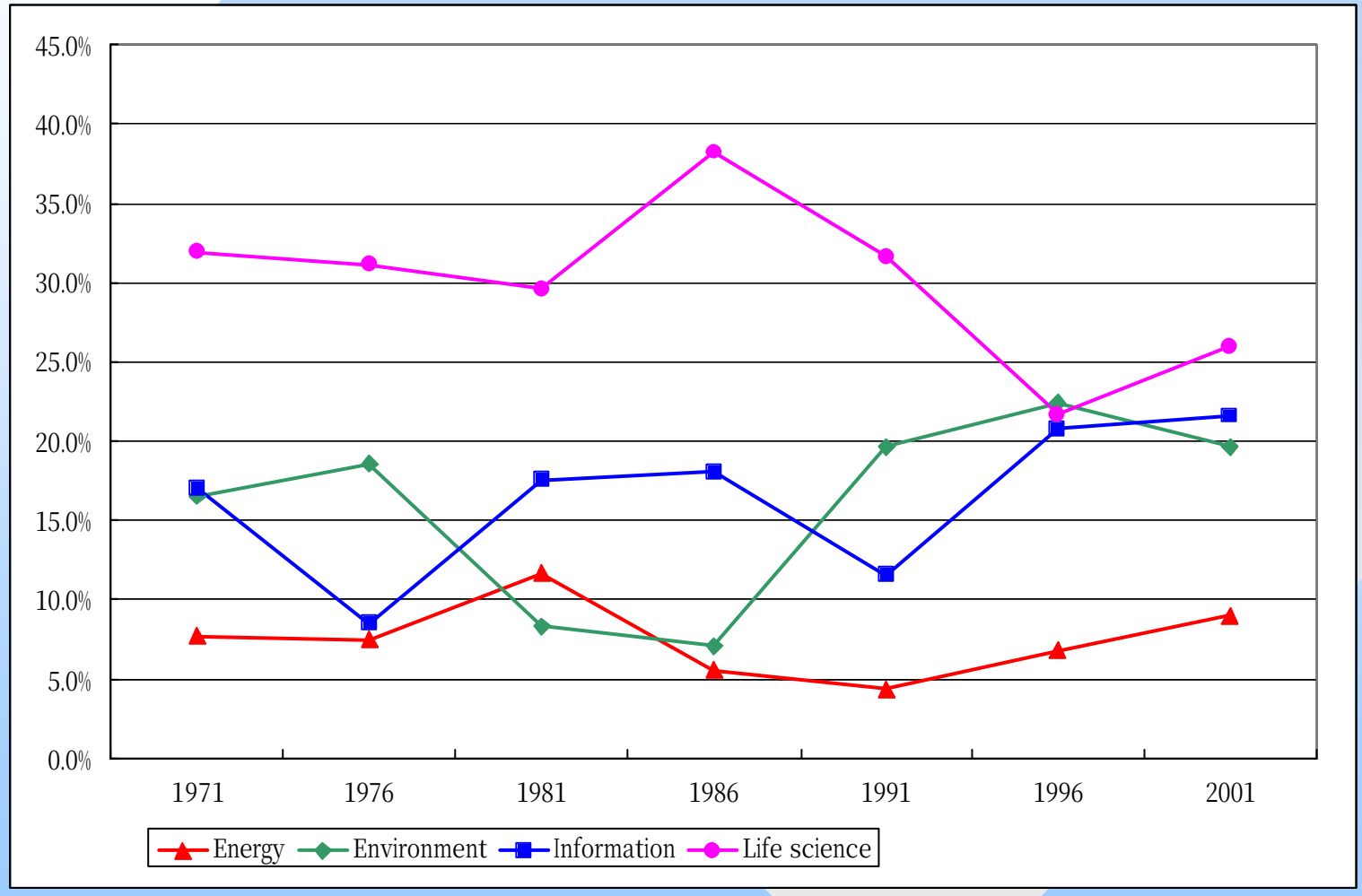
Categorization of the most Important 100 topics

Category	7th survey	6th survey	5th survey
Environment	27	25	28
Information	19	24	10
Life Science	28	17	37
Natural Disaster	8	11	9
New Energy	9	11	6
Others	9	12	10

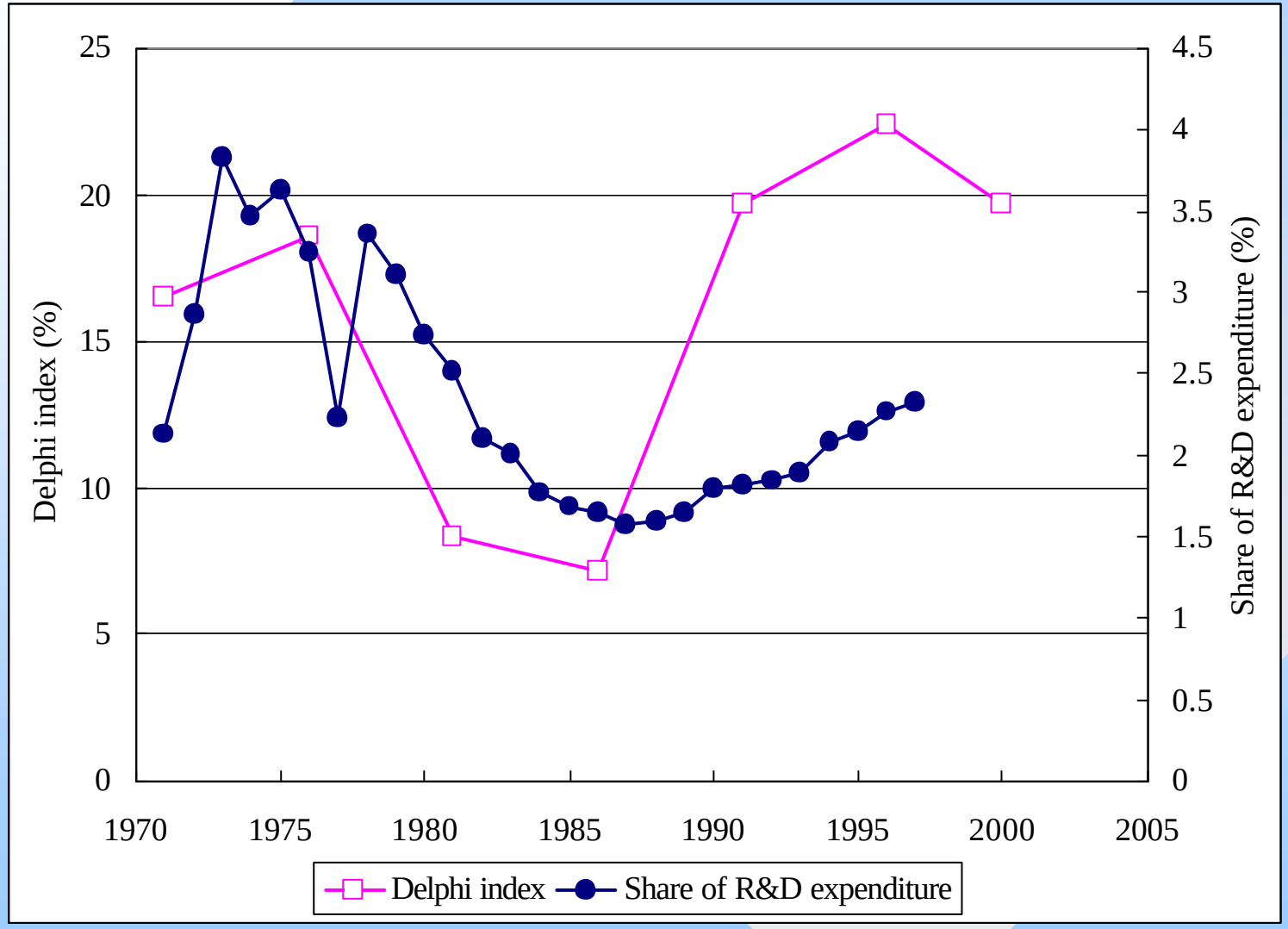
Trends in National R&D Investment by Area



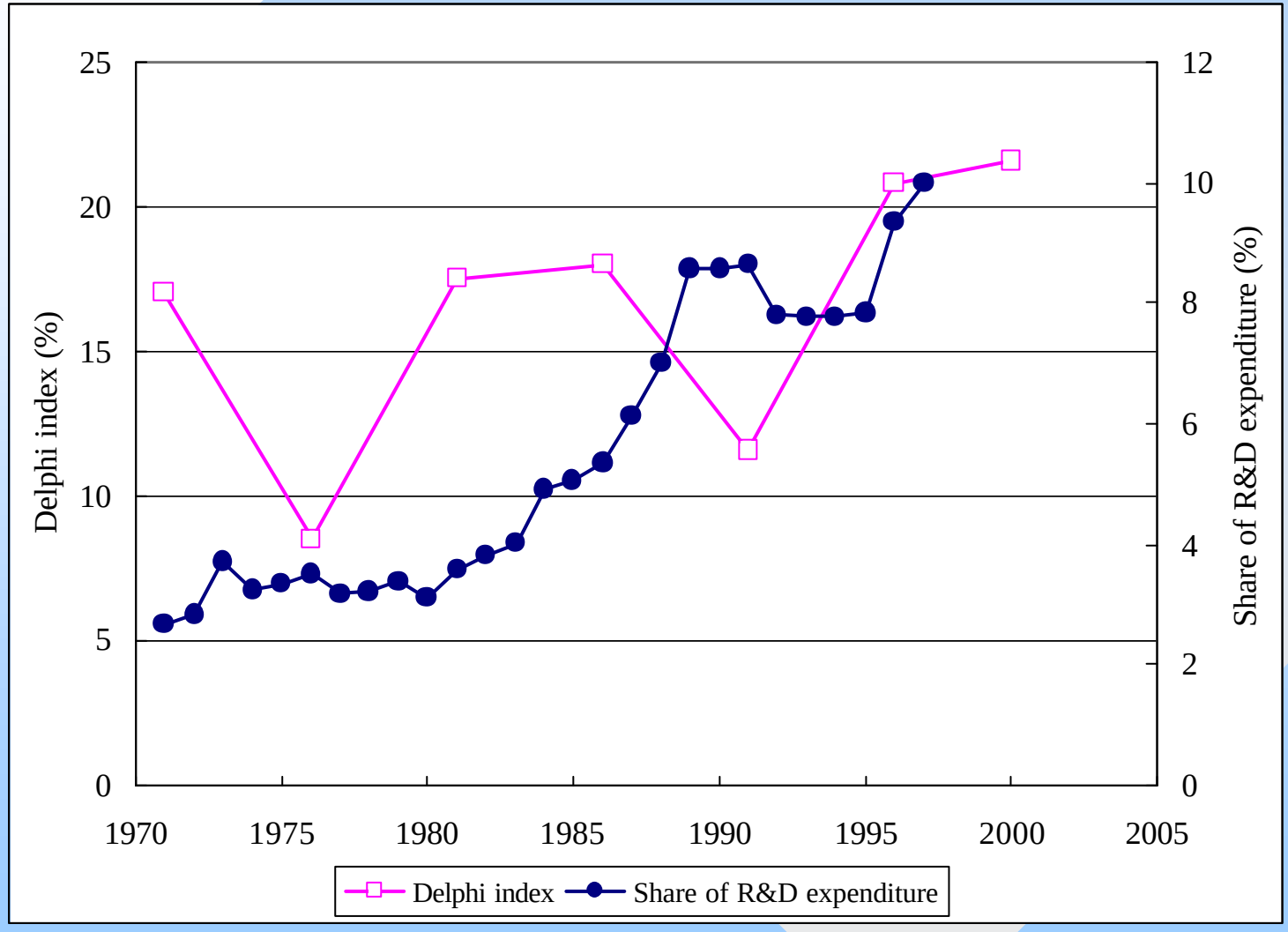
Trends in the Delphi Index by Area



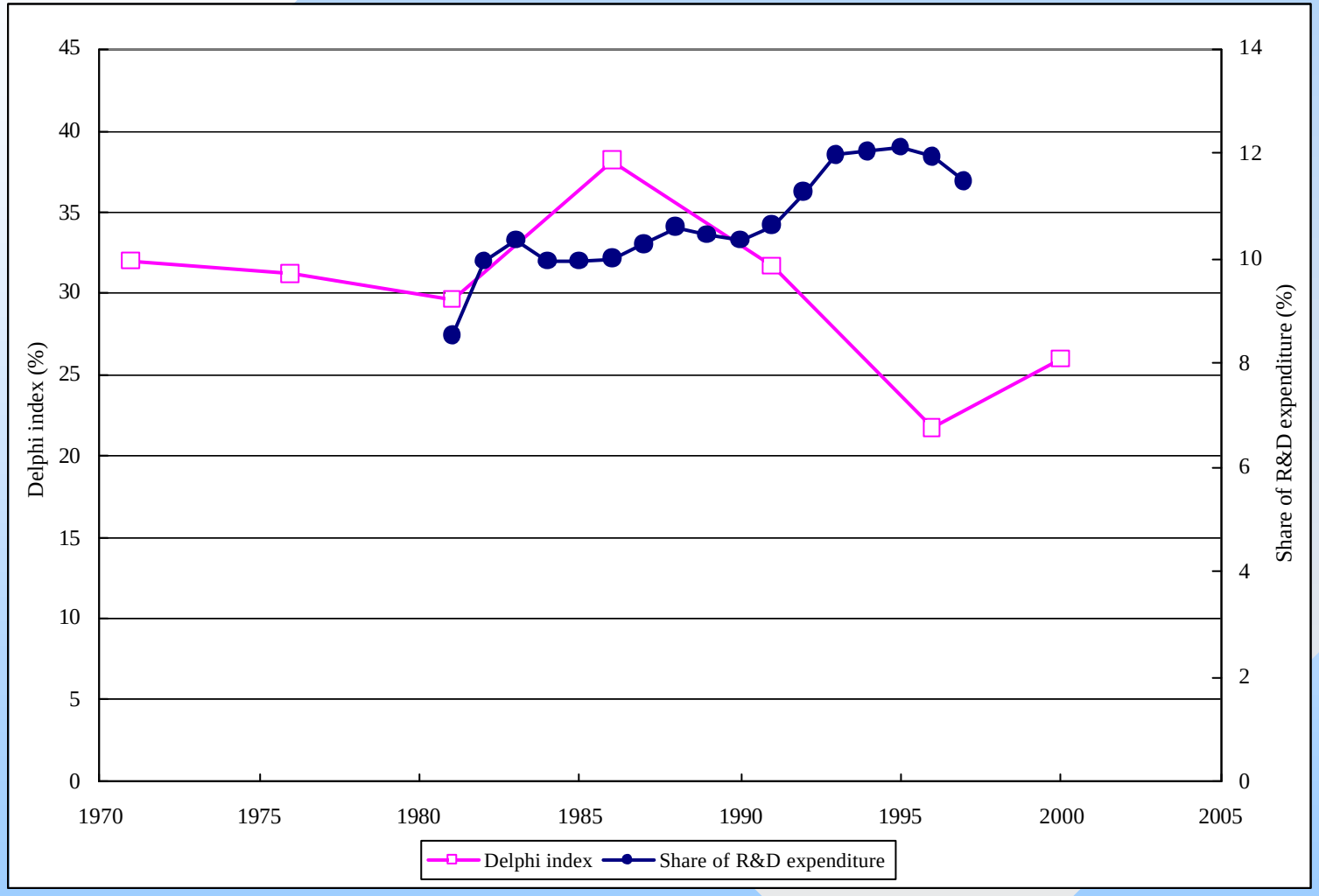
Environment



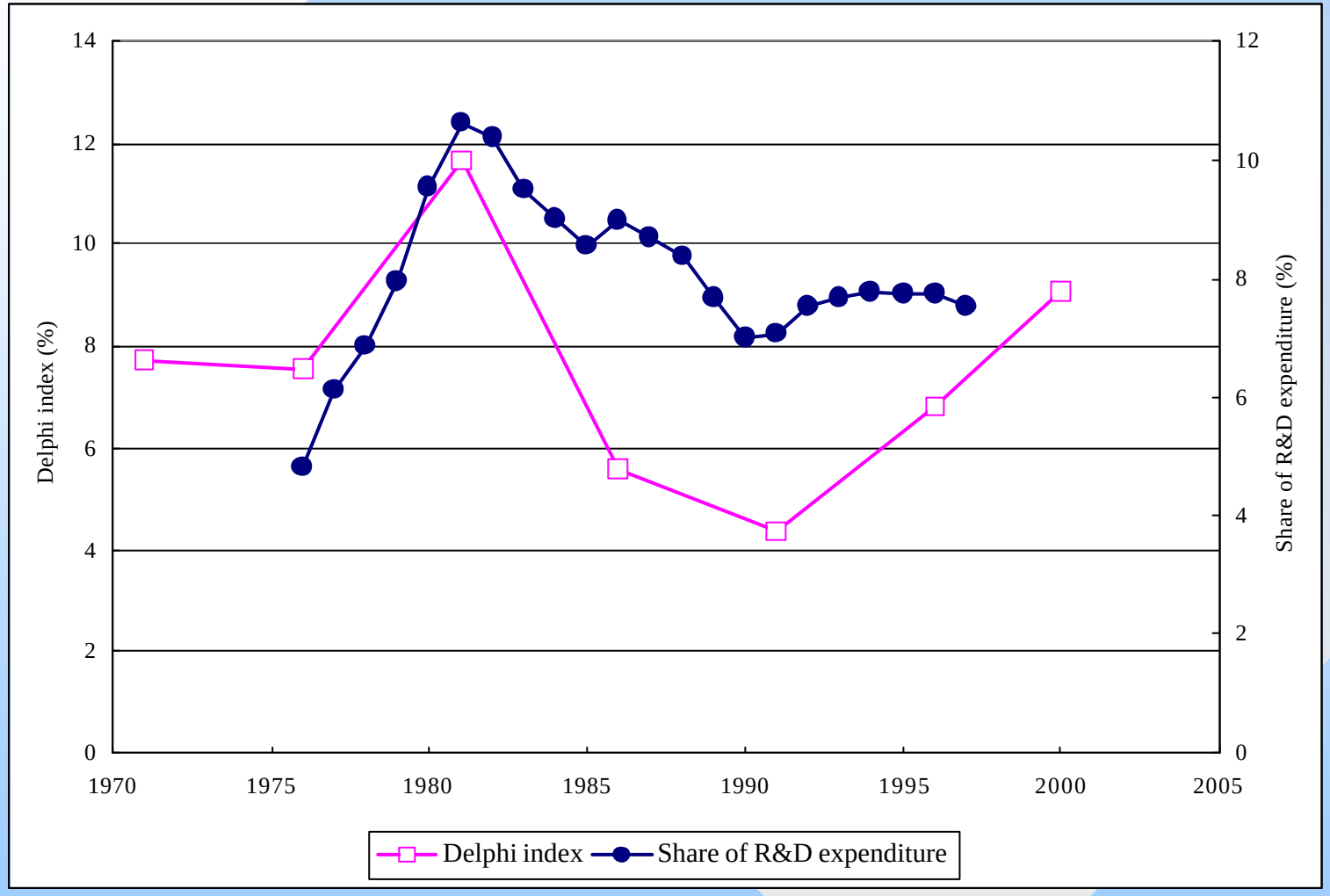
Information



Life Science



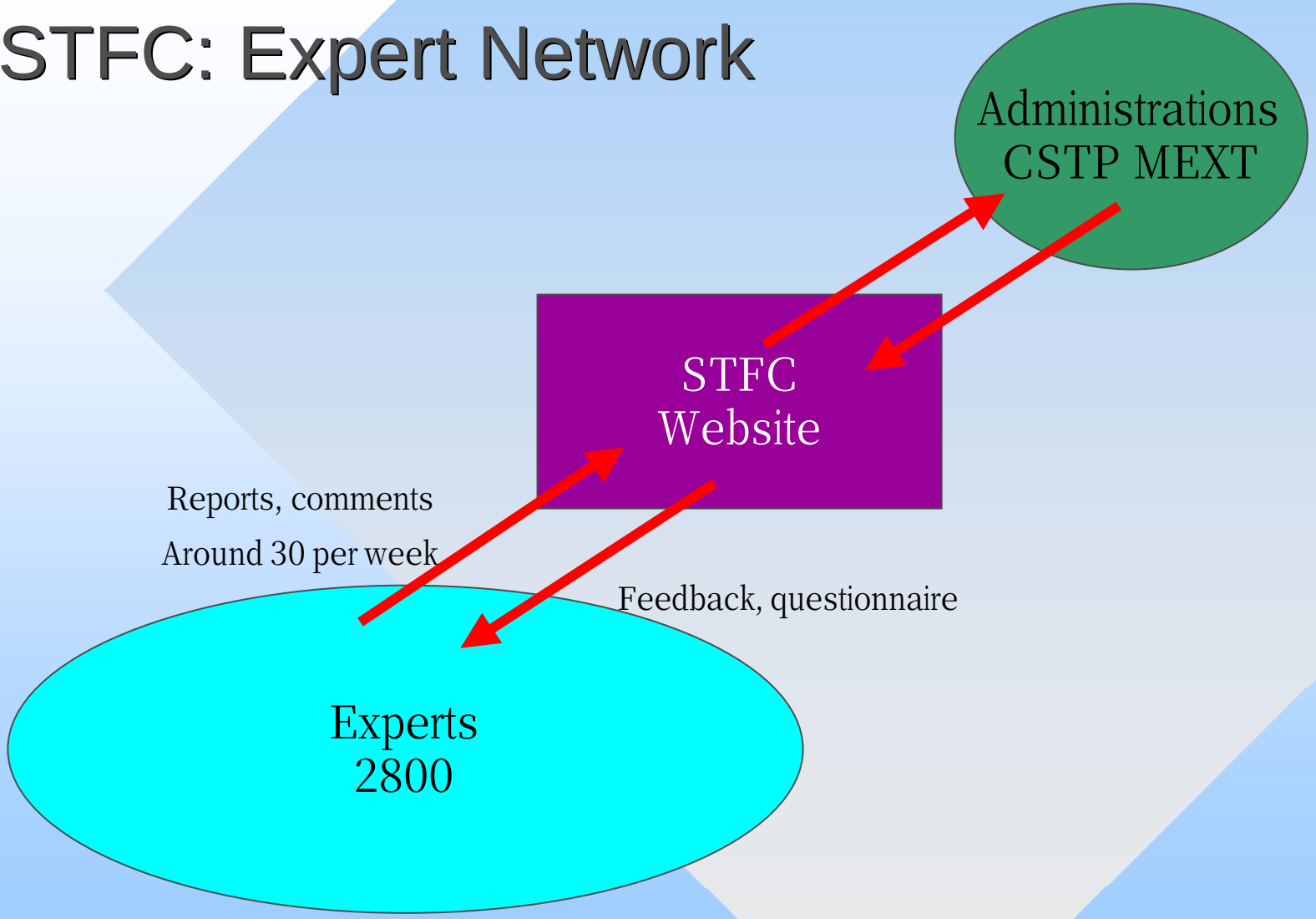
Energy


14
12
10
8
6
4
2
0
Delphi index (%)
12
10
8
6
4
2
0
Share of R&D expenditure (%)
1970
1975
1980
1985
1990
1995
2000
2005
Delphi index
Share of R&D expenditure

Science and Technology Foresight Center (STFC)

- Mission
  - To support decision makers in government
- Structure
  - STFC Researchers
    - Various backgrounds
    - From ministry, university and industry
  - Affiliated Fellow
  - STF Network members
    - Various fields and sectors

STFC: Expert Network

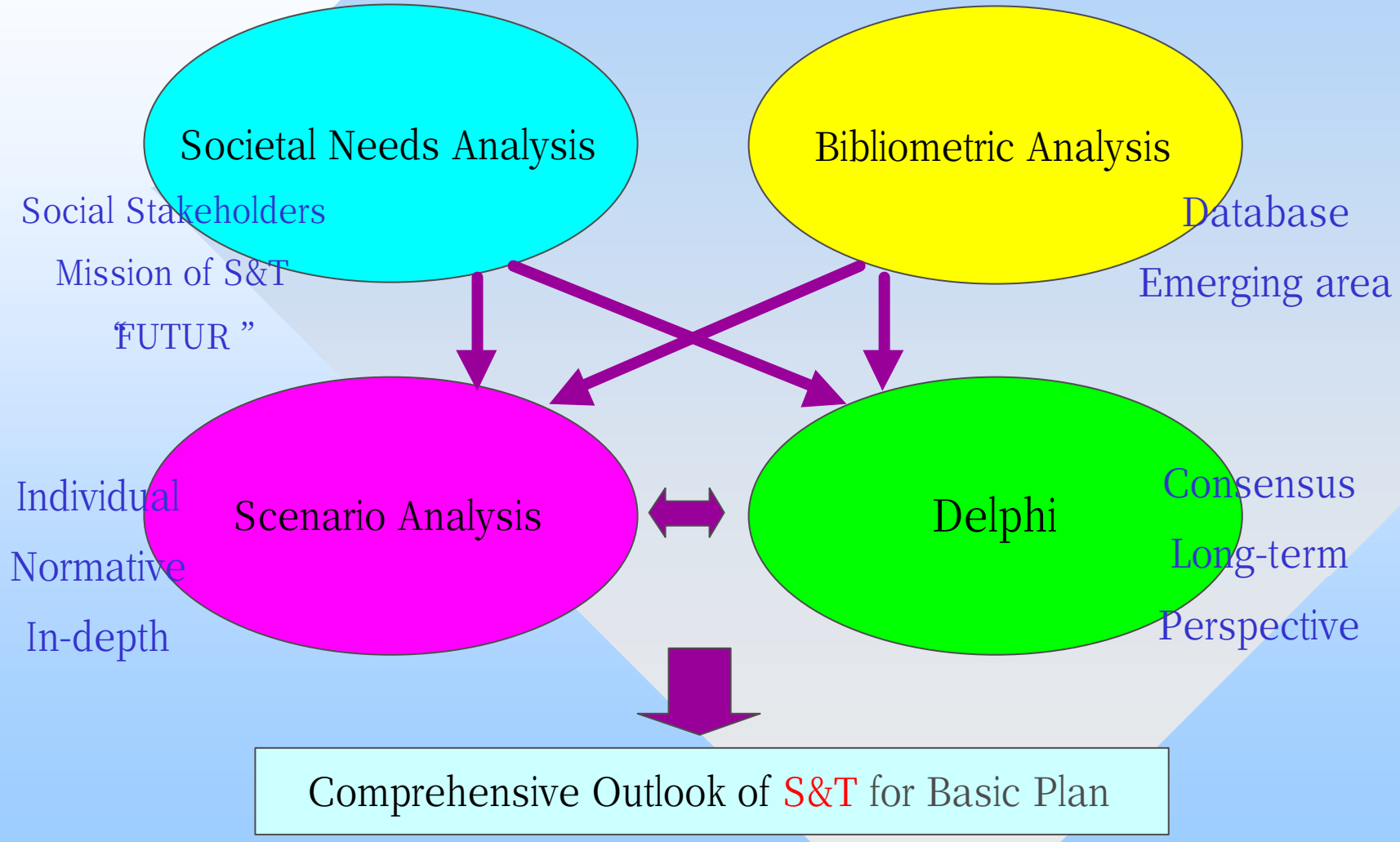


Science & Technology Trends (J & E)

Requirements for Next Foresight

- Positive inputs to S&T top-down prioritization
  - Penetration / Consensus
  - Normative View
  - Outlook of S&T and in-depth study of key areas
- Linkage to political process
  - Participatory approach
  - Mission analysis
  - Synchronization to political process

Structure of the Foresight Program



Concluding Remarks

- Accumulation of experiences for 30 years
- Assessed effectiveness and limits of Delphi approach
- Change of S&T backgrounds
- Foresight program to meet political and socioeconomic requirements