Technology Foresight in S&T Policy Making
-Korean Experiences-

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KISTEP is a government-affiliated institute under the Ministry of Science and ICT (MSIT) specializing in S&T planning, coordination and R&D evaluation.
KISTEP provides the future vision, strategies and guidelines for the entire national R&D system

1. Foresight and Future Strategy for S&T
2. S&T Policy Planning and Coordination
3. Feasibility Study on Government R&D Programs
4. Budget Allocation and Coordination of Government R&D Programs
5. Evaluation of Government R&D Program Performance
6. Global Cooperation & Collaboration
Role of Foresight Exercise in Korea (1)

- Policy informing function
- Policy advisory function
- Policy facilitating function

Past...

- Horizon Scanning
- Foresight
- Strategy/Policy

- Identification/monitoring
- Evidence gathering
- Problem Setting (Agenda setting)
- Problem Solving (policy definition, Implementation)

- Catch-up Economy
- Top-down approach to policy making
- For given Problem, solve it (creatively considering Korean Context)
Recently...

**Horizon Scanning**
- Identification/monitoring
- Evidence gathering

**Foresight**
- Problem Setting (Agenda setting)

**Strategy/Policy**
- Problem Solving (policy definition, implementation)

- Many foresight exercises has been performed by various ministries
  - Technology foresight activities from MSIT, R&D related ministries, and R&D agency
- Still fragmented/weak linkage to Action (Strategy and Planning)
  - Linear thinking in policy formulation
  - National technology foresight exercise is somewhat linked to R&D policy
National S&T Planning in Korea

• “S&T Basic Plan” is set up every 5 year
  – The national strategic technologies in the S&T basic plan were decided by reflecting the future technologies

- Technology Foresight
  - Future Prospects
  - Future Technologies

- Mid- & Long-term S&T Development Strategy
  - Core Technologies
  - Strategic Roadmap

- S&T Basic Plan
  - S&T Development Strategy of New Administration

- Technology Assessment
  - Influence of Technology on Society, Environment, etc.

- Technology Level Evaluation
  - Technology Level

Next Administration
1. National Technology Foresight in Korea

- S&T basic Law: Article 13
- Every 5 years (by KISTEP)
- 1½~2 year project
- Provide the vision and direction of emerging S&T areas – identify new technologies that may have high potentials for growth of national wealth and betterment of quality of human life
- Implement it into S&T basic plan
History of National TF Activities in Korea

1993-1994
- 1st TF
  - Brainstorming
  - Delphi

1998-1999
- 2nd TF
  - Brainstorming
  - Delphi

2003-2004
- 3rd TF
  - Horizon scanning
  - Delphi
  - Scenario writing

2003-2004 (revised)
- Horizon scanning
- Delphi
- Scenario writing

2010-2011
- 4th TF
  - Horizon scanning
  - Delphi
  - Scenario writing

2010-2011
- Horizon scanning
- Big data analysis
- Delphi
- Tipping points

2015-2016
- 5th TF

2nd S&T Basic Plan (2008~2012)
3rd S&T Basic Plan (2013~2017)
4th S&T Basic Plan (2018~2022)
Future technologies were selected in the consideration of S&T development as well as future needs.
Application of Future Technologies to the 3rd S&T Basic Plan

- National strategic technologies of the 3rd S&T basic plan were decided by referring future technologies of the 4th TF
  - The 652 future technologies of the 4th TF went through a reviewing process by committees related to the national R&D budget and R&D-related ministries
  - 120 national strategic technologies were confirmed and reflected in the third S&T Basic Plan

National strategic technologies are determined by considering economic growth and quality of life as well as government’s role.
2. Technology assessment (TA) in Korea

- S&T basic Law : Article 14 Cause 1
  - “Government should evaluate the effects of new S&T developments in the areas of society, economics, culture, ethics, and environment and take into account the assessment results…”

- TA is carried out by KISTEP annually
  - 2006: Nanomaterials, Stem Cell, Ubiquitous Computing Technology
  - 2007: Technology which corresponds to the Climate Change Agreement
  - 2014: Unmanned Vehicle, 2015: Artificial Intelligence, Gene Editing
  - 2016: Virtual Reality & Augmented Reality
  - 2017: Bio-Artificial Organ

- Offer enhancing measures for positive impact as well as preventative measures for the potential to cause adverse effects

- Future technologies of TF can be used as candidate technologies when selecting a target technology for Technology Assessment
The TA Process in Korea:

1. **Selection of subjects**
2. **Assessment (Two Track)**
   - Expert panel
   - Citizen panel
3. **Draft document**
4. **Final document**

- Proposals are submitted to the committee from S&T community, NGOs, ministries, etc.
- The committee decide the priority of subjects to be tackled.
- Prediction of future technology development
- Analysis and evaluation of consequences
- Consideration of political options, etc.

**Expert & stakeholder review**
(public hearing, etc)
Utilization of TA results

- TA results have been utilized by related ministries
- Conceptual utilization
  - Indirect use, less tangibly connected to specific use, general enlightenment
  - Ex) 2013 Smart Network; respond to invasion of privacy and cyber terror → MSIT; Use the results to revise the information and security law and to expand the certification of ISMS (Information Security Management System)
- Instrumental utilization
  - Direct and specific use
  - Ex) 2013 3D printing; human resources development and acceptance improvement → MOTI; Use the results to construct the manufacturing innovation center
- Symbolic utilization
  - Use of TA results to legitimate and sustain predetermined positions
  - Ex) 2006 UCT; respond to information gap and inequality → MSIT; Use the results to expand free public Wifi zone and to increase the support of internet use of information alienated class
Conclusions

- Technology foresight and Technology assessment become important policy tools in S&T policy
  - Results of TF have been applied to the S&T Basic Plan
  - Results of TA have been applied to policies of related ministries
- There are also invisible impacts in the S&T community
  - Sharing responsibility, development of networks, integrated understanding of future challenges, development of foresight culture…
Thank You!

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