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“Challenges to redesign Science for Science and Technology Policy in Japan”

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Outlines

- 1. Background**
- 2. Objectives**
- 3. What does Science of Science and Innovation Policy seek for?**
: The Role of “Science for STI Policy” in Society
- 4. What kinds of analytical frameworks should be developed?**
- 5. Current Stages and Future Challenges for Science for Science and Technology Policy**

1. Revolutionary Shifts of Scientific Disciplines and Technological knowledge since 19C~20C

: ▪ Development of systematization of science

▪ Divided science and academic disciplines

(science of electricity, thermodynamics, quantum dynamics, organic chemistry, etc.)

▪ Development of Science Linked Technologies

(Deepening information, Communication & Network Technology, Material sciences, Nano & Bio technology etc.)

▪ From Multi-disciplinary Sciences to Translational Sciences

(Rapid changes from ICT through IOP, IOT, to IOE)

Backgrounds (II)

- Economic and Social Structural Changes -

- ❑ Changes of Demographic Factor: Total population on the earth will be more than 90 billion in the middle of 21st century, facing to rapid increases in the developing countries, and the aging problem in the developed country.



Population in size and location, Labor mobility, Income distribution, Fiscal balance and social security system, international competitiveness and trade imbalance etc.

- ❑ Capital flow will be expected to mobilize and activate around the world in the borderless business society.



Increasing necessities of the international coordination among countries in economic and diplomatic policy.

- ❑ Information Technology and development of the software will be enlarging the information flow around the world and expanding the perception gaps among countries and races among different religions and histories.



Realizing the perception gaps, diversifying a sense of values and increasing conflicts domestically and internationally among individuals and among agents

How can we confirm mutual understanding in the diversification of the society ? How can we create and solve various problems efficiently and implement the new social value in the world.

Background (III) Requirement to redesign STI Policy After the Great East Japan Earthquake

- ❑ Lost of the reliability of the scientists
- ❑ Poorness of the risk communication between government officials, academic communities and between government and public.
- ❑ Demand for policy reappraisal to ensure a safe and secure society, stable energy supplies and the dissemination of renewable energy.
- ❑ High expectations of the role of Science and Technology to address social issues facing Japan in order to recover from the disaster and promote sustainable growth and development of the social and economic circumstances.
- ❑ Need to conduct serious and objective reviews of previous policies to rethink the proper role of Science and Technology, and to identify a vision and strategy detailing how science and technology can contribute to society.



Now is the time to promote the "Science of STI Policy" to advance evidence-based policy formation.

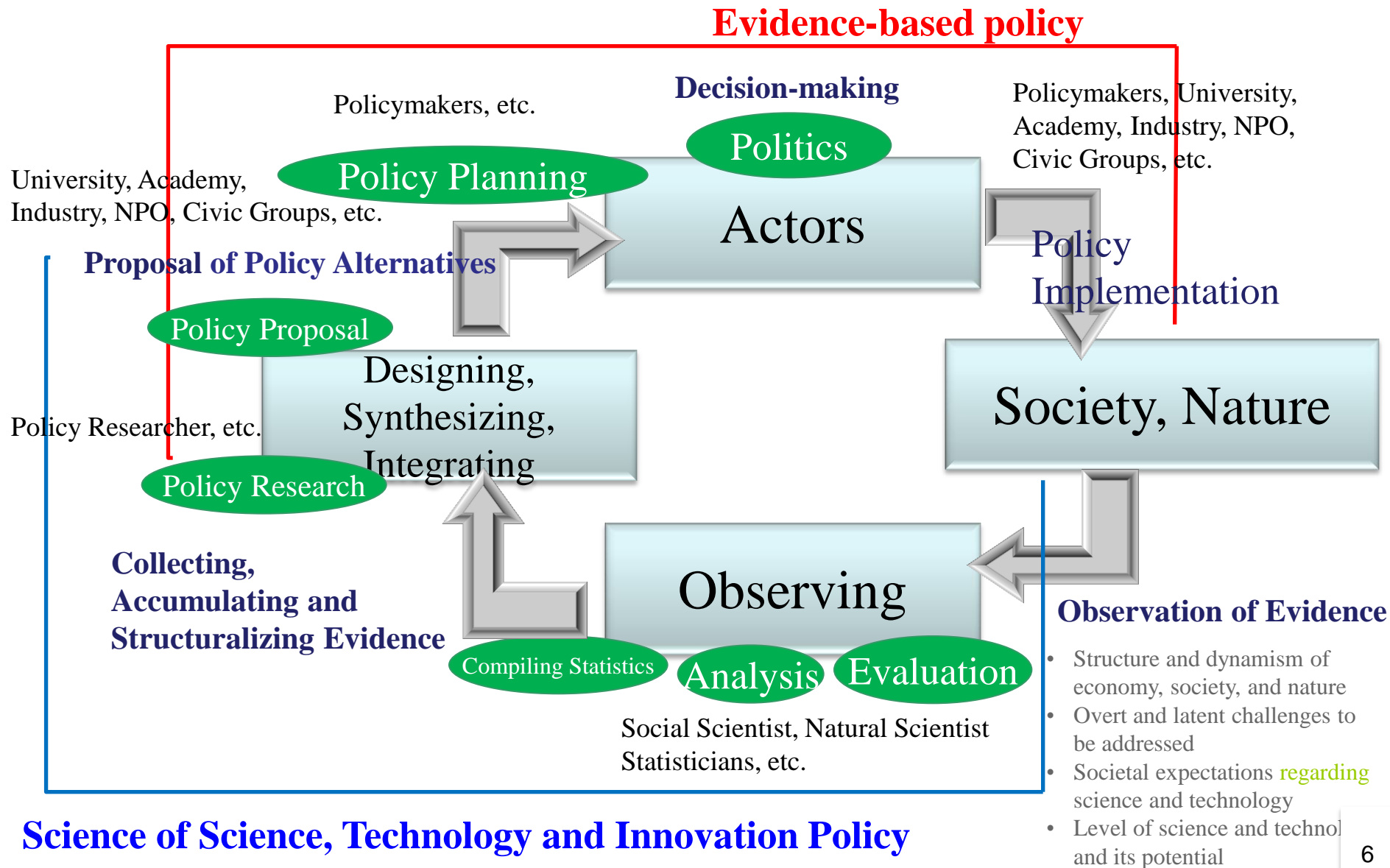
Targets : Development of the Science of “Science, Technology and Innovation Policy”

- ❑ Growing expectations for Science, Technology and Innovation (STI) to cope with societal challenges - responding appropriately to economic and social structural changes. **Evidence-based policy formation**, involving a more rational process, is required.
- ❑ Deepening the understanding of the processes involving Science, Technology and Innovation, and visualizing the social and economic impact of STI policy.
- ❑ The results must be utilized in actual policy formation, **ensuring transparency indecision-making in order to provide accountability to the public.**

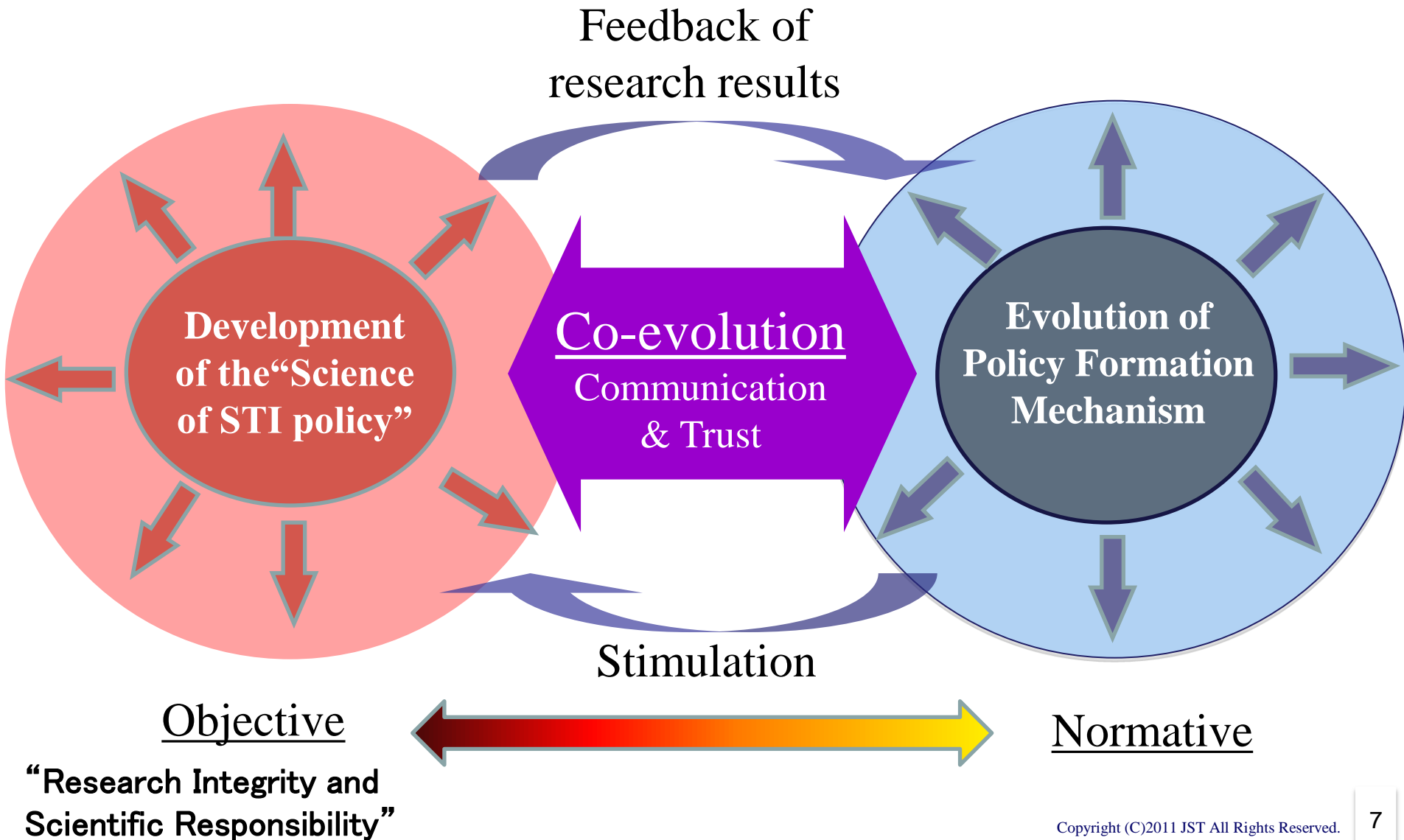


Developing the “Science of STI Policy” to realize evidence-based policy formation.

The role of the “Science of STI policy” in society



Co-evolutionary development of the “Science of STI Policy” and the “Policy Formation Mechanism”



What kinds of analytical frameworks should be developed?

- ① Scientific elucidation of present, past innovation process and mechanism

Holistic views/frameworks are required, as innovation occurring not only in R&D sites but spans over various areas of economies.

- ② Assessment of economic and social impacts of innovation in the future

- **To identify pressing social needs that demand on-going research and development.**
- **To explore potentially fertile relationships, or “seeds,” where research can be matched with social needs.**
- **To develop social systems where these “seeds” are incubated and mothered to maturity, yielding clear social and economic value.**

Measurement and quantitative assessment of the above processes is much needed

Social Needs

Knowledge Stock

Human
Capital

Tangible/Intangible
Capitals

Social
System
Market Structure,
Culture ...

Innovation Process

Process Innovation
Marketing Innovation
Organization Innovation
Product Innovation

Economic and
Social Value

Technology
Adoption and Diffusion

Technology

Creation of
Science
Knowledge

Scientific Discovery



Public & Private
R&D

Research
Institutions
University
Private
Companies ...



Corresponding Data

Social Needs

Knowledge Stock Data

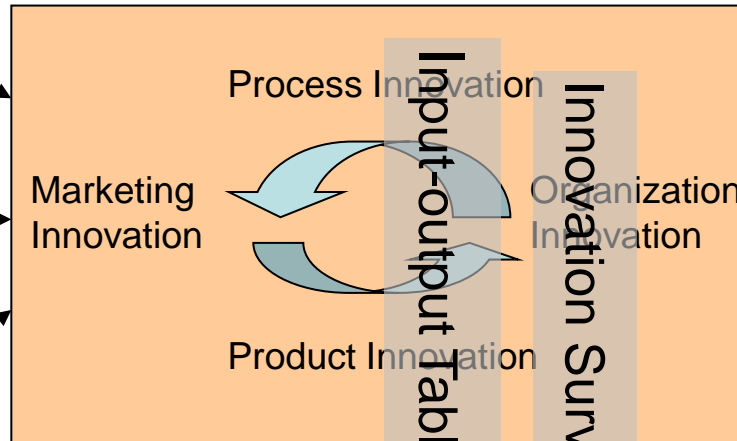
Human Capital

Tangible/Intangible Capitals

Social System

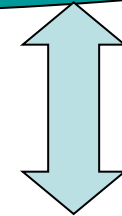
Market Structure, Culture ...

Innovation Process in Market



Micro enterprise data

National Accounts



Economic and Social Value

R&D statistics

Technology Adoption/Diffusion

Technology Flows

Technology



Public & Private R&D

Research Institutions
University
Private Companies ...

▪ **Science Innovation:**

New scientific knowledge and technologies that are created and discovered by investing R&D in the scientific fields.

“How to encourage knowledge-based innovation? ”

“ How to measure the accumulation of knowledge stock and account for the progress of productivity.”

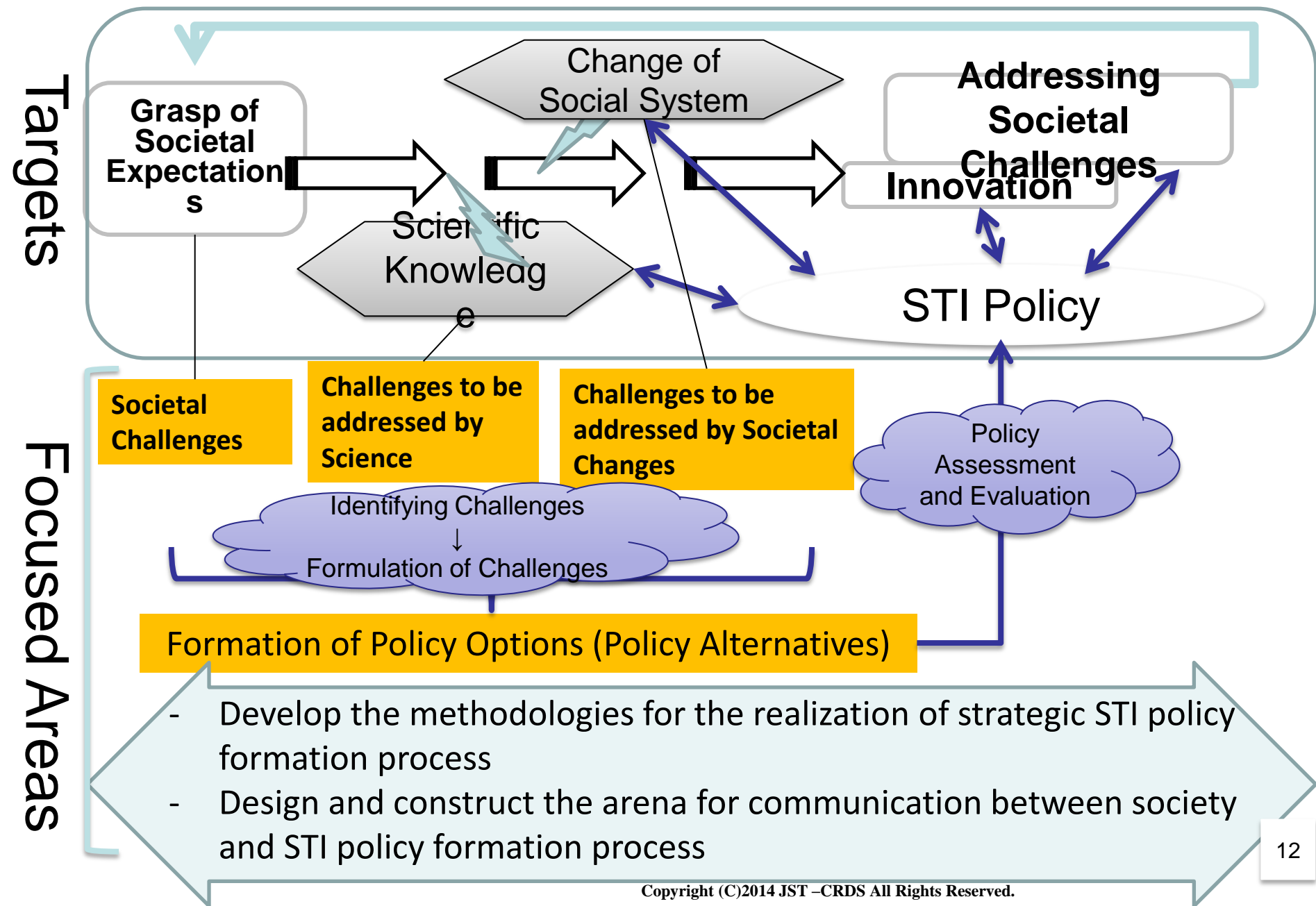
▪ **Social System Innovation:**

Social system changes by which new scientific knowledge is installed in society and creates the new social value.

“How to promote social system innovation?”

“How to quantify the impact on society?”

Current Stages and Future Challenges for Science of STI



Thank you for your attention !