Introduction to Class Work

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Objectives

- This class work is **an interdisciplinary program** designed to help students integrate what they have been learning in the whole series of lectures through their experience in solving a practical problem in the area of environmental and energy policy.
- The objectives are three-fold:
  1) develop **an understanding of the multiplicity of values, norms, interests, incentives, and scientific information** that influence decisions on issues concerning energy and environment,
  2) learn to **critically examine the social, political, and economic contexts** for decisions on the issue of interest,
  3) engage in **interdisciplinary dialogue** and apply **systems thinking** to address current and projected problems in the areas of environmental and energy policy.

Exercise of policy evaluation for Fukushima "On-Site" waste disposal

■ Fukushima "On-Site" wastes

- Solid waste generated by the Fukushima Dai-Ichi nuclear power plant (NPP) accident contains radionuclides stemmed from damaged fuel, is likely to contain seawater, which came from tsunami and core cooling after the accident, has high dose rate, has varied contamination levels, has a large volume, etc., it has different characteristics (and uncertainties!) from other nuclear wastes generated in the conventional process at nuclear power plants.
- Therefore, R&Ds for its processing and disposing are in progress. And a study on managing and handling methods of solid waste throughout the process, from its generation in various types and storing to its processing and disposal, is carried out.

→Exercise to focus on fuel debris

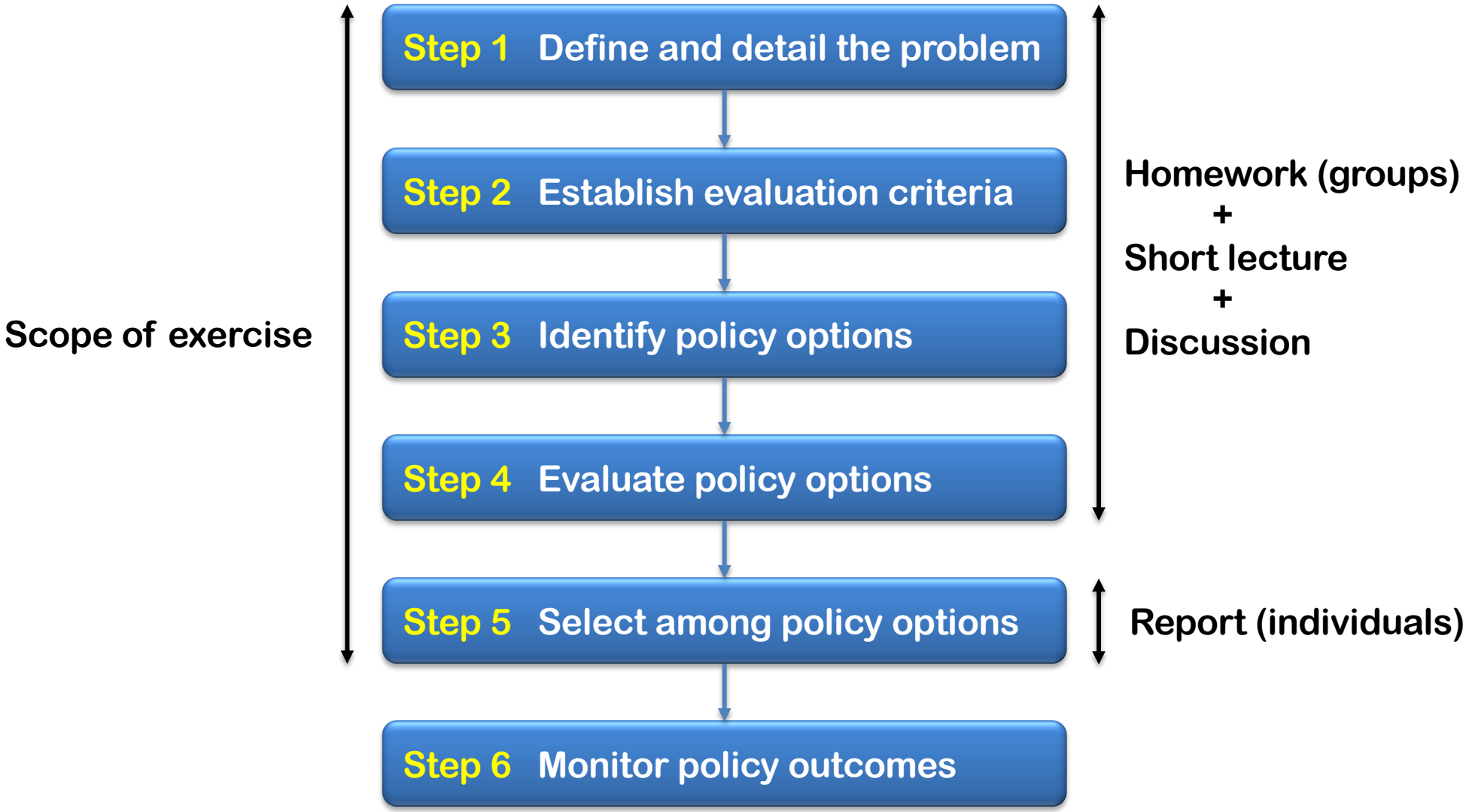
Exercise of policy evaluation for Fukushima "On-Site" waste disposal

Issues

- Local government in Fukushima officially refuses to host a repository, although it could be financially most efficient and probably safest. Then, where? Chance of volunteering community to appear seems unlikely (NIMBY). Moratorium in siting may delay recovery of local community and economy in Fukushima.
- Electric power generated at Fukushima NPP had been used in Tokyo and six prefectures in Kanto area (Fukushima is not included). Do they have any responsibility in siting a repository in addition to paying construction/operation cost through their electric fee? Is there anything they can do if a repository cannot be sited in Fukushima?
- Can Fukushima accident wastes be accommodated in the same repositories for other conventional nuclear wastes? Any additional risks associated with their characteristics different from others?
- Do we need to have one large repository, or can we have a number of smaller ones to share the burden geographically?
- Siting a repository is a one-off irreversible decision? Can we have time to build confidence while reserving chances to step back?

Challenge→Can we formulate a policy to tackle these issues?

Outline



Steps in policy formulation and evaluation

Homework: Group 1

- **Step 1　Define and detail the problem**
- **Prepare a 20-30 min. presentation covering the following;**
  - **Characteristics of fuel debris of many kinds, e.g., molten fuel, molten fuel merged with other metals, MCCI products**
  - **Road map** https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/index.html
  - **Legal framework, e.g., Act on compensation for nuclear damage**
  - **What do we need to do and when?**
- **Followed by a short (10 – 15 min.) lecture and discussion**

Homework: Group 2

- **Step 2　Establish evaluation criteria**
- **Prepare a 20-30 min. presentation covering the following;**
  - **Operational and long-term (>100 K years) safety**
  - **Risks associated with fuel debris, e.g., nuclear criticality, hydrogen gas generation**
  - **Cost**
  - **Other requirements (if any) from stakeholders, e.g., government, local communities in Fukushima, TEPCO and its customers, NDF, ENGO, academia**
  - **What is required to a ”good” policy?**
- **Followed by a short (10 – 15 min.) lecture and discussion**

Homework: Group 3

- Step 3 Identify policy options
- Prepare a 20-30 min. presentation covering the following;
  - Waste disposal concepts applicable to fuel debris, e.g., geological disposal system for HLW (high-level radioactive wastes) and SF (spent fuels), deep borehole disposal, https://www.osti.gov/servlets/purl/1420819, CARE, e.g., Kawamura, H., **McKinley, I.G.** (2013). Tailoring the CARE concept for practicality, safety and robustness. Proc. ICEM 2013.
  - Siting procedures in national programs for HLW/SF in Japan, Sweden, Finland, France, UK, etc.
  - Funding mechanisms
  - What can we do to tackle the problems?
- Followed by a short (10 – 15 min.) lecture and discussion

Homework: Group 4

- **Step 4 Evaluate policy options**
- **Prepare a 20-30 min. presentation covering the following;**
  - **”Hard” approaches such as Multi-Attribute Analysis and Analytic Hierarchy Process**
  - **“Soft” approaches such as Technology Assessment and Deliberative Polling**
  - **How can we score different policy options in a holistic manner?**
- **Followed by a short (10 – 15 min.) lecture and discussion**

Report: All

- Formulate more than two policy options (combination of disposal concept, siting procedure and funding mechanism for the fuel debris)
- Evaluate the policy options
- Select an option which you believe is the best and describe reason behind your choice

Time table

- ✓ 14:55 – 15:20 Group 1 Presentation (Step 1 Define and detail the problem)
- ✓ 15:20 – 15:30 Short lecture on Risk Governance
- ✓ 15:30 – 15:40 Discussion

- ✓ 15:40 – 16:05 Group 2 Presentation (Step 2 Establish evaluation criteria)
- ✓ 16:05 – 16:15 Short lecture on ELSI (Ethical, Legal and Social Implications)
- ✓ 16:15 – 16:25 Discussion

- ✓ 16:25 – 16:50 Group 3 Presentation (Step 3 Identify policy options)
- ✓ 16:50 – 17:05 Short lecture on Mechanism Design
- ✓ 17:05 – 17:15 Discussion

- ✓ 17:15 – 17:40 Group 4 Presentation (Step 4 Evaluate policy options)
- ✓ 17:40 – 17:50 Short lecture on Consensus Building
- ✓ 17:50 – 18:00 Discussion

- ✓ 18:00 – END Report (All)

※ Short break(s) depending on the progress.