

Absorptive capacity for energy policymaking: A case of energy-economic modeling

Masahiro Sugiyama, Policy Alternatives Research Institute, The University of Tokyo,
+81-3-5841-0933, masahiro_sugiyama@alum.mit.edu

Overview

In the modern world, policymakers increasingly face a formidable task of applying knowledge about complex and uncertain socioeconomic systems. With the tighter integration of science into our daily lives and the explosion of scientific research, policymakers need a higher level of *absorptive capacity* (Cohen and Levinthal 1990; Harvey et al. 2010) to effectively mobilize relevant knowledge to address pressing policy issues. And according to this theory, policymakers must be engaged in research or possess some research capabilities to maintain absorptive capacity.

Energy policymaking is no exception to this rule. Energy scenarios produced by energy-economic models and integrated assessment models have been a vital tool for assisting energy policymaking, for instance in the context of climate change mitigation (see Krey 2014 for a review). Because of their complexity and uncertainties, their implications are, however, difficult to appreciate without appropriate absorptive capacity.

Anecdotes suggest that there may be a difference in absorptive capacity between Japan and the West. A case in point is Model Intercomparison Projects (MIPs) (see Fawcett et al., 2014 for a recent historical account of various activities). The United States has been a leader in this research area, and Europe has rapidly been catching up with its own efforts. It is then surprising that Japan has had no academic MIP intended to inform energy/climate policymaking up to this date. A number of scenario intercomparison projects have been conducted, but none of them was performed as a rigorous, academic exercise.

In this paper, I compare how three countries/regions (Japan, USA, and the European Union) have been applying energy scenarios to energy policymaking and seek to identify the lessons for Japan. In explaining the difference, I show the usefulness of the absorptive capacity construct to examine the science-policy interface in energy policy.

Methodology

In addition to the literature review, I have conducted semi-structured interviews with more than 20 experts and policymakers either face-to-face or by telephone/teleconference. Table 1 summarizes the interviewee's affiliations (more than one person have been interviewed for some organizations). Each interview lasted for about 40 minutes.

In the interview, I posed the questions on the following: (1) number of researchers/policymakers, (2) their professional backgrounds (education and field of expertise), (3) funding, (4) relationship between researchers and policymakers, and (4) typical career path (including rotation within an organization), among others.

Table 1. List of affiliations of interviewees.

Japan	USA	Europe
Ministry of Economy, Trade, and Industry (METI)	Department of Energy (DOE)	European Commission Directorate-General for Climate Action
Ministry of the Environment (MOE)	Environmental Protection Agency (EPA)	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Research Institute of the Innovative Technology for the Earth (RITE)	Stanford University	European Commission Joint Research Centre
National Institute of Environmental Studies (NIES)	Electric Power Research Institute (EPRI)	Potsdam Institute for Climate Impact Research (PIK)
Institute of Energy Economics, Japan		Mercator Research Institute on Global Commons and Climate Change
Keio University		
Japan Center for Economic Research		

Results

In the United States and Europe, the most notable is a series of projects under the auspices of the Energy Modeling Forum (EMF). The EMF 22 project, for instance, analysed policy proposals before the 2009 Copenhagen climate conference. They analysed global, US, and European scenarios. More recently, the EMF 24 and EMF 28 provided policy inputs for the US and Europe before the Paris conference in 2015, respectively.

In Japan, there were also serious efforts in the run-up to the 2009 United Nations climate negotiation. The *Chuki Mokuhyo Kento Inikai* (a committee to examine the mid-term goal)¹ was set up to facilitate the process. After brief but intense work by multiple modelling groups, the government announced a set of possible, six target levels of emissions reductions, with economic cost estimates and other indicators. It was followed by townhall meetings throughout the country and opinion polls. The aim of the whole process was to facilitate political discussions, which is laudable, but their work resulted only in PowerPoint slides and documents for the governmental committee.

Next, I summarize the key differences of Japan compared to the USA and Europe, as identified from the interviews.

- 1) **Weak backgrounds in energy-economic knowledge.** A Ph.D. in economics is not a prerequisite for being an effective policymaker, but such qualification does help government officials appreciate delicate inner workings of energy-economic models. In Japan, a vast majority of civil servants hold either a bachelor's or master's degree, not a Ph.D., even in the sections of ministries responsible for domestic climate policy. In contrast, about half of the officials at the US and Europe counterpart sections do have Ph.D. degrees, especially in economics. In addition, Japanese bureaucrats have a regular (usually two-year) rotation system, whereas many in America and Europe work on a single issue for a long time, accumulating expertise and building a network.
- 2) **Few interactions between communities of policymakers and researchers.** While it is true that some researchers interact with policymakers very frequently, there is only a low level of interaction between civil servants and scientists at the community level in Japan. Unlike the USA and Europe, Japanese governmental officials rarely attend EMF workshops, for example.
- 3) **Lack of studies on the effective use of energy scenarios in policymaking.** There are studies and guidelines on the best practices of using scenarios in a policy setting in the USA and Europe, but such studies are almost non-existent in Japan.

The above points combine to suggest Japan's weak absorptive capacity in energy policy.

One should be careful when interpreting this result, however. Absorptive capacity is only one of many factors that affect policymaking, and should not be directly equated to effective policymaking. Nonetheless, it is an important component and there is a room for improvement in Japan's energy policymaking.

Conclusions

This year marks the fifth anniversary of the Great East Japan Earthquake and the related disaster at the Fukushima Daiichi Nuclear Power Plant in March 2011. Many issues abound still in the realm of energy policy. The Japanese policymakers and citizens deserve more solid information for energy policymaking. Japan can learn from the USA and Europe to improve its policy process by adopting some of their best practices.

Acknowledgment

This work was supported by JSPS KAKENHI Grant Number JP15K20923.

References

- Cohen, W. M., and Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128 - 152.
- Fawcett, A. A., Clarke, L. E., and Weyant, J. P. (2015). Introduction to EMF 24. *The Energy Journal*, 35, S11, 1-7.
- Harvey, G., Skelcher, C., Spencer, E., Jas, P., and Walshe, K. (2010). Absorptive capacity in a nonmarket environment: A knowledge-based approach to analyzing the performance of sector organizations. *Public Management Review*, 12, 77 - 97.
- Krey, V. (2014). Global energy-climate scenarios and models: a review. *Wiley Interdisciplinary Reviews: Energy and Environment*, 3(4), 363-383.

¹ https://www.env.go.jp/earth/ondanka/mid-target/exam_prog.html, accessed May 19, 2016.