

# T08P07 / Nuclear Power after Fukushima

**Topic :** T08 / Policy Discourse and Critical Policy Research

**Chair :** Shunsaku Komatsuzaki - komatsuzaki@civil.t.u-tokyo.ac.jp

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## GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

The 2011 Tohoku earthquake and tsunami in Japan, followed by the Fukushima Daiichi nuclear power plant disaster, keenly evoked people's fear of nuclear power and clearly made it much more difficult for the Japanese to consider the problem of radioactive waste, even though the disaster produced a huge amount of additional radioactive waste to be managed. Many countries promoted nuclear power for a solution to climate change and/or national energy security before the accident in Fukushima, which was called "nuclear renaissance". Despite the disaster in Fukushima, some nuclear power stations have been restarted in Japan and new plants are planned in UK and emerging countries. Nuclear policy must be determined based on a wide consideration of its advantages and concerns. Especially, it must be understood that nuclear power generation involves the "back end" of nuclear fuel cycle as the case in Fukushima reminds us. Should we utilize nuclear power generation? How can we design and implement comprehensive nuclear policy from the front to back end which is both socially and technically accepted? In what process can experts and citizens work together on nuclear policy? And, what triggers the agenda-setting for nation-wide debate on nuclear policy?

Nuclear policy is a serious issue to be discussed at both the domestic and international levels. Some of the newly planned nuclear power plants will be built by emerging countries, such as China and Korea. Westinghouse, one of the major producers of nuclear plant, was acquired by Japanese Toshiba. The decommissioning of the Fukushima Daiichi nuclear power plant is supported by French AREVA. Some countries have even sought an "export" of radioactive waste or a joint repository, which might be reasonable for a country with the very small amount of waste. And, the disaster in Fukushima, as well as the past Chernobyl case, aroused attention to possible influence over surrounding countries. International Atomic Energy Agency (IAEA) has been acting as the world's center for cooperation in the peaceful uses of nuclear technology, but does it effectively facilitate the international debate on nuclear energy at the present time? How can the domestic and international aspects of the issue connected? What determines the threshold of stakeholder?

This panel aims at obtaining a general picture of this wide-ranging policy field to identify critical issues, especially (re-)emerging ones after Fukushima, to be addressed by experts in public policy and/or by taking an interdisciplinary approach. The panel invites both papers providing theoretical framework and ones from the practical perspective so that we can explore relevant policies based on a long-term vision. The panel also seeks papers that deal with cases or issues about nuclear policy in Asia, which has the rapidly growing demand and concerns of nuclear power including radioactive waste management.

## CALL FOR PAPERS

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How can we design and implement comprehensive nuclear policy from the front to back end which is both socially and technically accepted? In what process can experts and citizens work together on nuclear policy? What triggers the agenda-setting for nation-wide debate on nuclear policy? How can the domestic and international aspects of the issue connected? What determines the threshold of stakeholder?

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## Session 1 Nuclear policy in Japan after Fukushima

Friday, June 30th 08:15 to 10:15 (Block B 4 - 4 )

### Discussants

Raul Lejano - lejano@nyu.edu - New York University - United States

### **When Do People Feel Radioactive Waste Disposal in their 'Backyard'? Results from Online Survey in Japan**

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Even after Fukushima accident, many issues on radioactive waste management have not been invoked in political discussion in Japan. Siting of final disposal facilities of high-level radioactive waste (HLW) is one of such issues which remained to be solved. Since the only candidate town withdrew its application for the feasibility study, final disposal facilities of HLW have not been agreed on. Why wasn't the agenda on nuclear waste disposal set in Japan even after critical incidents like the earthquake and the nuclear accident? People's attitudes called NIMBY (not-in-my-backyard) is considered to be one of the important factors that make the social agreement difficult.

In order to move this agenda forward with involving all the nations into discussion of HLW disposal, the Japanese government launched a new selection process of HLW disposal sites in 2015. The process categorizes ALL the regions in the country into three types depending on the scientific possibilities of siting final disposal facilities. Specialists have been working on categorization of the regions into the three levels of possibilities, and the results will be published in map by early 2017. Is their new attempt of involvement of all the nations into the discussion effective in pushing the agenda forward? To answer this question, we need to investigate peoples' attitudes toward HLW disposal siting showing several scenarios of the places future HLW disposal facilities site, and in situations where the siting of HLW disposal facilities near their residents is realistic and unrealistic.

Making use of the new selection process and its forthcoming publication of the worked results mentioned above, we conduct online questionnaire survey before and after publication of the map. We report the results of our analysis on the difference in attitudes toward HLW disposal sites before and after their residential areas are actually focused as candidates for the future disposal sites and among regions.

### **Citizen science as an emerging key pillar for nuclear energy policymaking and governance**

Shoko Tanaka - stanaka0627@gmail.com - Japan Forum on International Relations - Japan

The nuclear accident in Fukushima has left detrimental effects in the spheres of environment, health and political economy of the region and beyond. However, from sociological perspectives the event is significant in that it has given rise to citizen science in nuclear field. For instance, a global volunteer-centred citizen science project Safecast has played a key role in nuclear data collection and dissemination since the accident in Fukushima. Several citizen-led groups such as Citizen-Scientist International Symposium on Radiation Protection and Citizens' Radioactivity Measurement Station have been established, opening a scope for civil participation in discussing contingencies of nuclear energy management.

In light of booming citizen science as such, however, the field of their influence has been limited to raising public awareness about the issues at stake. Indeed, the fact that the initiatives are led by lay citizens, which is the very principle of citizen science, is likely to curtail their importance in political arena. Meanwhile, recent years have seen increasing number of scholarly works that investigate into general citizen science practice in relation to regional or state governances and policies. This trend is telling to further observe because not only it better delivers the importance of citizen science but also it is this elaborated inter- and trans-disciplinary approaches that

enable citizens to make their voices heard to policymakers.

Hence, the paper observes and analyses the intersections between citizen science and academia, and reflects on the ways in which this joint research platform can interact with policymakers. The paper learns from a case study of Germany's energy transition in 2011 where, as a response to the accident in Fukushima, the Chancellor Angela Merkel called for a group of academics to form Ethics Commission for a Safe Energy Supply. It also employs qualitative research methods and synthesises studies that concern citizen science, Science and Technology Studies, and several discussion papers issued subsequent to the forums or conferences organised by citizen science groups in Japan.

In so doing, the paper illuminates citizen science as an emerging key pillar for mapping nuclear energy policymaking and governance. That enables to suggest that, together with academia and policymakers, it is this social dynamics that helps enhance effectiveness and democracy in nuclear energy management. Thus, the paper contributes to the discussions that the panel unfolds by elaborating how citizen science can help nuclear energy management be more responsible and democratic to civil society. The finding follows the idea of mutual shaping by extension, and yet the paper highlights citizen science as the leading player insofar as nuclear field is concerned.

### **Long-term and Cross-sectoral Management of Interconnected Events: The Case of the Fukushima Nuclear Accident**

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Six years after the severe accident unfolded at the Fukushima Daiichi NPS, the nuclear emergency declaration announced in March 11, 2011 still continues, and we face a wide range of hurdles that should be overcome at both onsite and offsite. Viewing nuclear power regulation in Japan after the Fukushima nuclear disaster, while tightening up an independency of the safety regulatory body through institutional reform, assignment of the role and responsibility between the central and local government do not change at all, that is, the government's roles in nuclear power policy and its implementation are limited, rather local government plays a key role substantially. For example, as of January 2017, two PWR plants only are in commercial operation again through the Nuclear Regulatory Authority's examination of conformity with new nuclear safety standards. The Fukushima nuclear disaster still yields the ripple effects through the fabric of society, and brings about a wicked problem with huge impacts. Among others, Japan's energy transition policy aiming at low carbon society tends to deviate politically and now at crossroad.

After the Fukushima disaster, the Tokyo Electric Power Company has been coping with compensation payments to victims and treatment of increasing contaminated water as a pressing challenge by organizational reforms and temporal financial support through NDF (Nuclear Damage Compensation and Decommissioning Facilitation Corporation), which is an authorized corporation based on special law. And recently, expert panel meeting in METI announced that total expense of dealing with the accident will likely balloon from the current estimate into a double, about 22 trillion JPY. Therefore, METI-led reform plan including realignment of the major utilities' nuclear power divisions, new scheme for burden sharing of compensation payment using liberalized electricity retail market etc., is under discussion.

Most of cascading events originated in the Fukushima nuclear disaster are not the "unexpected" or "unforeseeable" consequences. Nuclear power in Japan has been tightly and complexly interlinked with and interdependent on socio-economic-political activities and has also produced nested or collective interests everywhere. The present crisis results from not only a lack of realization of the above-mentioned but also inaction of continuous consideration and undertaking about behaviors of interconnected socio-economic-political system accompanied by changes of endogenous conditions. It is a critical deficit of risk governance in modern society. So far the Fukushima problems have been addressed by the restricted stakeholders in the limited contexts such as nuclear safety regulation and nuclear energy policy without including the relevant policy domains. TEPCO and the government have taken actions with a myopic view/ framing in worrying too much about loss of societal trustworthiness, while evading realistic estimates and deliberations about future scenarios including wild card scenario. As a result, policy options for dealing with our challenges become to be limited, consequently resilience of policy lost. Focusing on short-term consequences or impacts could enhance certainly the political feasibility of decision tactically, but it is needed to construct long-term and cross-sectoral framing/management of interconnected events in order to reconstruct resiliently sustainable energy system.

### Session 2 Deliberation on risk and NIMBY facility

Friday, June 30th 10:30 to 12:30 (Block B 4 - 4)

## Discussants

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## Risk discourses and governance of high-level radioactive waste storage in Taiwan

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Nuclear waste disposal and nuclear decommissioning problems have become one of the most important issues for those nuclear countries. The nuclear disaster in Fukushima have called attention to nuclear hazards and are regarded as the revival of antinuclear campaigns in Taiwan. The Democratic Progressive Party (DPP) government has vowed to phase out nuclear power by 2025. The two reactors of the No. 1 nuclear power plants in New Taipei City are scheduled to decommissioned in 2018 and 2019 respectively. The spent fuel rods produced in the plant's lifespan of 40 years are to be moved to a dry cask storage facility because the spent fuel pools at the first nuclear power are unable to store all the rods. Taiwan's dry cast storage facility is now being built as a midterm storage site at the nuclear power plant. The state-run Taiwan Power Co. (Taipower) plans to store high-level radioactive waste in steel cylinders surrounded by concrete shells placed indoors as a temporary solution until a permanent depository is constructed. The Atomic Energy Council has approved the first-phase of the dry storage facility project at the first nuclear power plant in Shimen, New Taipei. However, the New Taipei City government has not yet issued a soil conservation certificate.

An increasing number of studies have emphasized that decision-making processes should be established based on social discussions and local participation. Policy scholars indicate that the quality of the solution to a perceived social problem depends on the adequacy of its framing. This paper examines how policy stakeholders and local residents frame the issue of dry storage facility project at the first nuclear power plant, the process of consultation and the roles of institutional mechanisms in decision-making processes. The research methods adopted include documentary analysis and in-depth interviews. This paper shows how policy stakeholders and local residents frame the controversial project differently as well as the competing knowledge claims among policy actors. Taipower puts emphasis on the safety of the dry storage facility, and that their scientific survey and impact assessment have considered the potential impacts of a tsunami and mudslides. Instead, ENGOs and local activists tend to hold the position of precautionary principle and express their concerns about the uncertainty of radioactivity risks to the environment and public health and the unknowns. ENGOs and local activists pointed out that it lacks long term investigation on the impacts of nuclear power plants on human health and socio-psychological impacts. They questioned the credibility of safety design of the dry storage facility and suggested seeking another safer site. Some local residents and NGOs are concerned that the government has not yet guarantee when to complete site selection of a permanent repository and remove nuclear waste. While some local residents expressed their concerns about safety issues, other residents tend to focus on reasonable compensation and job opportunity during the decommissioning process.

Various participatory mechanisms have been implemented in central and local governance, including Environmental Impact Assessment, public hearings, consultation meeting, expert committee on nuclear safety and health, citizen forum on Internet. While the consultation processes provide opportunities for concerned members of the local residents and ENGOs to voice their opinions, mechanisms are expert-focused and seen to be a mere formality. The case of nuclear waste storage controversy in Taiwan illustrates the problems of knowledge gap and the top-down procedures in nuclear waste governance and challenges that Taiwan faces in moving toward a nuclear-free country. The government needs to create suitable processes of interactive communication and meaningful public deliberation, integrate local and social concerns as well as technical criteria in policy decision-making and build institutional trust in the siting process.

## Suppression or Concession: The Strategies of Local Governments to Response Public Opposition to Nuclear Projects in China

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China has set an ambition to develop nuclear power to address climate change and energy shortage problems. However, After the Fukushima nuclear accident, the nuclear program becomes a new cause of NIMBY movements in China, which has been a constraint for the Chinese government to develop nuclear power recently. Thus, Chinese local governments seek adequate responses to deal with these conflicts, for instance by ignoring criticism and sticking to initial decisions, by suppressing protests, or by compromising. In this study, we focus on the roles and behavior of local governments in the process of nuclear program siting and explore their strategies

of dealing with public opposition to nuclear programs.

We conduct multiple case study design and choose four cases as evidence, Lufeng nuclear power project, Jiangmen nuclear fuel project, Taipingling nuclear power project and Dalian nuclear irradiation project. Accordingly, **we find four types of strategies for local governments to deal with public opposition**: the first strategy is **concession**, which means that the local government meets residents' demand unconditionally and cancel the nuclear program; the second is **conditional concession**, suggests that the local government makes tweaks to program siting or suspends the program but also punishing some protestors and squash opposition; the third can be called "**cold treatment**", this means the local government ignores the opposition and just lets time dilute it; the fourth is **suppression**, namely riding over all objections and punishing protestors.

Our evidence shows that the different strategies are affected by **the degree of public opposition** as well as **the risk perception of the local government**. The fierce opposition can cause great pressure to the local government and force the local government make concessions. The small-scale opposition, in contrast, may be ignored or suppressed. Meanwhile, the strategy choice of the local government is intimately related to the government's risk perception on the nuclear program. When the local government thinks the potential social risk of the program is high, it may prepare in advance for the public protests so that the government can keep the control of society. These findings increase our understanding of the mechanisms underlying the governance of public acceptance of nuclear technology in China and may inform Chinese governments and non-state actors who are seeking ways to deal adequately with them.

### **An Analysis of the Political Process of the Radioactive Waste Management in UK: Focusing on the Public Deliberation**

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The management of radioactive waste is, both politically and socially, a difficult problem that many countries face today. The waste must be managed in some way and the related policies are to be decided in the public acceptance, but striking phrases such as "nuclear dumps" make people worried and frightened.

After the attempt to site a disposal facility of the radioactive waste in the United Kingdom met with a failure in 1997, they adopted a new siting process with Public Deliberation. Participatory activities of the Committee of Radioactive Waste Management (CoRWM) ended up with agreement about recommendations for the radioactive waste management policies, and the West Cumbria Managing Radioactive Waste Safely Partnership (MRWS Partnership) conducted meetings at Cumbria County, which had expressed its interests to the siting process. These attempts were, however, again unsuccessful faced with the opposition of the candidate municipality in 2013, even though the effectiveness of Public Deliberation is pointed out by case-studies of other countries? The objectives of this study are, thus, to clarify the reason why the siting process wasn't successfully achieved, focusing on the role of Public Deliberation, and to draw lessons for its use in the radioactive waste management in UK and, furthermore, in other countries.

In order to determine the essential factors to this case, causality analyses were conducted which explore the relation between the events and the attitudes of people, followed by the interpretation of the process adopting a psychological model for evocation of individual's anxiety.

As a result, the essential factors to the two cases are respectively extracted: the secret site screening and Cumbria being the single candidate for the case in 1997, Cumbria being the single candidate, the power of final decision making of the Cumbria County Council and insufficient participation of chancellors in the work of Public Deliberation for the case in 2013. The attitude formation of chancellors in the second case, especially during the work of MRWS Partnership, can be interpreted as in a peripheral route in the psychological model: A behavior to avoid being involved in the activities and seek a reliable person.

The examination of the practice of Public Deliberation in the UK shows that, even if the participatory activity is well performed as itself, the absence of the final decision makers in the activity and their thinking in the peripheral route leads the process to halt. Thus, a lesson to utilize the Public Deliberation in projects which aim at the public acceptance can be drawn: The participation of final decision makers in the activity is crucial, as well as the management of the situation that permits to continue the dispassionate discussion.