

Out of sight, out of mind? Investigating the longitudinal impact of the Fukushima nuclear accident on public opinion in the United States

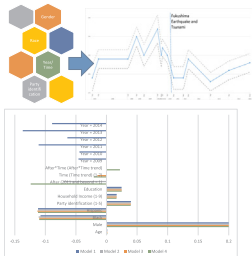
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ABSTRACT

Public opinion on nuclear accidents has important implications regarding energy planning and policy making. However, the long-term impacts of these event on citizens' opinions is unclear. This question assumes relevance especially in the context of rising citizen involvement in development and decision making. This study compiles and examines seven years of public opinion survey data to investigate whether there was a long-term change in support for nuclear energy in the US following the Fukushima nuclear accident in Japan. The analysis uses a logistic regression model to estimate the long-term trends in opinion on nuclear power among the US public and its major drivers. Results show that public support for nuclear energy has not rebounded to its pre-accident levels. While it isn't clear whether the accident in Fukushima was the only driving factor, there has been a gradual decline in support following the incident, suggesting that short-term negative changes in public support for nuclear power have long-term consequences for energy policy. These findings have implications for policymakers since short-term impacts can be mitigated but long-term opposition is more difficult to address, especially in the context of developing countries that are investing in nuclear energy to meet growing demand.

1. Introduction

The risks and benefits of nuclear energy continue to be a popular topic of debate among the United States public. Major incidents like the Arab Oil Embargo, the Three Mile Island accident, and the Chernobyl disaster affect the overall sentiment towards nuclear facilities and act as

focusing events where the issue is brought to the forefront and is in the public's psyche. In particular, due to their potentially disastrous consequences, accidents in nuclear facilities have been known to impact public opinion at least in the short-term.

The Three Mile Island incident in Pennsylvania in 1979 resulted in a decrease in support for nuclear energy which was sustained for over 2

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years (Rosa and Dunlap, 1994). Another indication of the salience of the disaster was the press coverage it received in over 1200 newspaper articles written over the next year.¹ Likewise, domestic support for nuclear energy in the US declined after the 1986 Chernobyl disaster, although support for nuclear power was already on a downward trend (Rosa and Dunlap, 1994). The most recent major nuclear accident was at the Fukushima Daiichi nuclear plant in Japan in 2011 when an earthquake, 9.1 in magnitude, hit off the eastern coast of the Oshika Peninsula in Japan. The resulting 40.3-meter high tsunami caused massive humanitarian and economic damage (Hasegawa et al., 2015; Hiraoka et al., 2015; Tanigawa et al., 2012). The impact of the immediate damage notwithstanding, a more long-term effect of the tsunami was to be witnessed on the Fukushima Daiichi nuclear power plant which was hit by a 15-meter high wave (WNA, 2017), and went through a series of losses until it was shut down in the following days. The incident was followed by a flurry of news reports both locally and internationally, leading countries to rethink their energy strategies, adversely affecting the nuclear renaissance that had started in countries across the world in the 2000s (Goodfellow et al., 2011; Siegrist and Visschers, 2013).

This paper examines the public response to adding nuclear power capacity in the US with the aim of finding whether the 2011 earthquake in Japan fundamentally affected the support for nuclear power generation in the US. The analysis is based on a repeated cross-section dataset compiled from public opinion surveys conducted by the Pew Research Center over the period 2008–2014. The next section describes the literature on public opinion, and the specific analysis of the Fukushima disaster. This is followed by a discussion of the data and methodology of this paper, and the results. The subsequent sections expound on the conclusions and briefly discuss the potential future work.

2. Literature

Establishment of nuclear facilities is often classified as locally unwanted land use (LULU) and suffers from ‘not in my backyard’ or NIMBY sentiments wherein the local communities around the facilities object to their development (Benford et al., 1993; Greenberg, 2009b; Jenkins-Smith et al., 2011). Another relevant stream of literature emerges from agenda setting in public policy where Baumgartner and Jones (1993) examine the use of images and their interaction with different venues to alter policies.

Public opinion on nuclear energy has been analyzed in detail in the literature and can broadly be assessed in two ways: examining opinions on nuclear energy specifically in the context of major incidents or accidents, and seeking opinions on nuclear energy (or atomic power) in general. The following sub-sections expound on these.

2.1. Emerging implications of the Fukushima meltdown

Nearly six years after the event, news from Fukushima continues to emerge. News coverage includes a report of the first thyroid cancer case linked to the nuclear disaster (Jiji, 2017), rising costs of clean-up (Obayashi and Hamada, 2016), and radiation implications on the western continental United States (Tan, 2016). The impact of the disaster brought discussions of safety and even the necessity of investing in nuclear power to the forefront.

In the immediate aftermath, Japan switched off all its nuclear generation capacity, consequently losing 30% of its power generation capacity by 2013 (IEA, 2016a). While some of these plants are gradually being put back online, questions regarding the role of nuclear energy, its long-term safety, and the need to continue depending on it and

investing in it are still key areas of debate in Japanese energy policy. In fact, the accident and its outcomes are now driving the country to reconsider its energy strategy (Komiya and Fujii, 2017; Vivoda, 2012). Hayashi and Hughes (2013) find that radical shifts in energy policy following the Fukushima accident are unlikely to happen, however, the accident is likely to raise the costs of building and operating these plants. These concerns are pertinent for the global economy as well. The World Energy Outlook for 2016 projects global demand for energy to rise by 30% by 2040 in its main scenario (IEA, 2016c). Coupled with this rising demand, there is also a pressing need to move away from fossil fuels due to the climate implications of conventional sources of energy and nuclear power presents an option to fill this gap (Bickerstaff et al., 2008; Sailor et al., 2000). Currently, nuclear power contributes just under 5% of the global energy (as of 2014) but this share is expected to grow as more nuclear power plants come online (IEA, 2016b). At the time of going into publication, there were 453 operable nuclear reactors around the world and 56 new plants under construction (PRIS, 2018). Most of this new construction is concentrated in Asia with China and India leading the numbers. With this increase in nuclear power generation capacity, public support and/or objection to setting up the power plants, particularly in their vicinity, plays an important role in determining the extent to which these objectives of capacity expansion can be met (Greenberg, 2009b). This is particularly relevant given the realized need to enhance public participation in developmental decision-making and accepting technology (Durant, 1999).

2.2. Role of public opinion

Public opinion plays an important role in determining the course of development and investment in large infrastructure projects, especially in the case of large energy facilities (Boholm and Lofstedt, 2013). Public opinions against nuclear power plants (Benford et al., 1993), hydro-power dams, and more recently, unconventional hydrocarbon extraction (such as fracking) (Boudet et al., 2014; Smith and Ferguson, 2013), carbon capture and storage facilities (Krause et al., 2014), and even renewable energy have affected the adoption of these technologies all across the world (Dimitropoulos and Kontoleon, 2009). Of these, public opinion on nuclear power appears to be particularly driven by the perception of the threat of accidents in energy facilities (Kim et al., 2013; Komiya and Fujii, 2017). Furthermore, global movements against nuclear power have affected public opinion on nuclear facilities at large. And finally, since nuclear power is cognitively connected to weapons and has intense historical images associated with it, public opinion on the siting of nuclear facilities of any kind can be affected negatively by this association between weapons and nuclear facilities in general (Rosa and Dunlap, 1994).

2.3. Public opinion after accidents

The results on nuclear energy preferences in the aftermath of large accidents are mixed. In their analysis of three decades of public perception of nuclear power following an accident, Rosa and Dunlap (1994) find that in the long-term, the ‘rebound hypothesis’ does not hold true and that support for nuclear power typically does not return to the pre-accident levels. The authors also point out that contextualization of the question is an important aspect of survey design, i.e. whether the response is elicited with a reference to the country’s energy problems, or the risk of nuclear power. In the 1970s, issues of the energy crisis (due to the Arab oil embargo) were prominent whereas, after the Three Mile Accident in 1979, factors of risk played heavily on the respondents’ psyche. These “focusing events” (Latré et al., 2017) have implications on public opinion. However, it remains to be seen whether these cognitive effects last longer than in the immediate period after the event. In a review of public opinion after the Chernobyl accident, Renn (1990) finds that support for nuclear energy declined in almost all countries for which the data was available.

¹ Based on a Lexis Nexis search for newspaper articles with the term “Three Mile Island” for the period March 28, 1979 to March 28, 1980.

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