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# The nuclear power debate after Fukushima: a text-mining analysis of Japanese newspapers

**Abstract:** This paper analyzes the debate on nuclear power after the Fukushima accident by using a text-mining approach. Texts are taken from the editorial articles of five major Japanese newspapers, *Asahi Shinbun*, *Mainichi Shinbun*, *Nikkei Shinbun*, *Sankei Shinbun* and *Yomiuri Shinbun*. After elucidating their different views on nuclear power policy, including general issues such as radiation risks, renewable energy and lessons from the meltdown, the paper reveals two main strands of arguments. Newspapers in favor of denuclearization appeal to “democratic values.” They advocate public participation in decisions on future energy policy and criticize the closed-off administration of nuclear energy. Meanwhile, pro-nuclear newspapers adopt a “technological nationalistic” stance, claiming that denuclearization will weaken Japan’s superiority in the field of nuclear power technology. In other words, the debate about the nuclear power is not merely about energy supply, but also about the choices facing Japanese society over visions for the future after the events of Fukushima.

**Keywords:** nuclear power, Fukushima accident, Japanese newspapers, text-mining

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## 1 Introduction

The debate over nuclear power has developed on an unprecedented scale in Japan since the meltdown in the Fukushima nuclear reactors on 11 March 2011. Caused by a tsunami that was triggered by an M9.0 earthquake off the north-eastern coast of Japan, this accident not only forced nearly 110,000 local residents to evacuate their houses, but also raised concerns over the radioactive contamination of food, water and air. The events of 3/11, as they have come to be referred to, have entailed huge controversies over future nuclear power policy and a sizeable no-nuke

movement. The Tokyo demonstrations for phase-out drew crowds of 60,000 on 19 September 2011<sup>1</sup> and 170,000 on 16 July 2012,<sup>2</sup> while every Friday since May 2012 protesters have gathered in front of the prime minister's office. When in Spring 2012 the last in-service reactors were shut down for regular inspections, Japan even experienced a short period without nuclear energy. However, in July 2012 the Japanese government ordered the restart of the Ōi nuclear plants, after new safety measures had been approved. This pursuit of nuclear energy has accelerated since the Liberal Democratic Party (LDP) returned to power in December 2012.

What has been discussed in the debate over nuclear power since the accident? Given the vast quantity of books and journal articles published thus far,<sup>3</sup> it is unrealistic to comprehensively scrutinize all available sources. Opinion polls seem a good way to get a general overview; however, they tell us only whether people are for or against nuclear energy and not how the debate has progressed. Taking these difficulties into account, this paper seeks to investigate the problem by using a text-mining approach. It analyzes a larger number of editorial articles on nuclear energy issues in five nationwide newspapers. The aim is to clarify the characteristics of the debate that emerged after the Fukushima accident.

The findings of this paper suggest that, at the general level, topics such as radiation, renewable energy, lessons from the accident and power saving, as well as public distrust, were widely discussed. Though all of these topics were featured by the five newspapers, this does not mean that the papers had the same views on future nuclear power policy. While *Asahi* and *Mainichi* advocated denuclearization, *Sankei* and *Yomiuri* opposed it. *Nikkei* took an intermediate position in upholding the continuation of nuclear power policy for stable electricity supply, while at the same time demanding market-based reform to rectify its management.

At the deeper level of the debate, namely the concrete question of whether to continue or phase-out nuclear power, this paper reveals that two kinds of social values were articulated. The denuclearization arguments appealed to the principles of “democracy” and advocated direct public participation in decisions on future energy policy, while reprimanding the closed-off and undemocratic administration of nuclear energy over the past decades. By contrast, the

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1 According to the organizers (police estimates 30,000) (*Asahi Shinbun*, 25 September 2011).

2 According to the organizers (police estimates 75,000) (*Asahi Shinbun*, 17 July 2012).

3 The catalogue of the National Diet Library of Japan shows that since 2011, 3,486 books have been published with the words “nuclear power” (*genshiryoku hatsuden*) in their titles, while the CiNii search engine for journal articles (<http://ci.nii.ac.jp>) identifies 3,072 articles during the same period (accessed 15 February 2015).

pro-nuclear arguments took a “technological nationalistic” stance, expressing greater concern over the diminution of Japan’s presence on the international stage in case of denuclearization. It was felt that Japan’s potential renunciation of its advanced technology would weaken its voice in the international political arena, where nuclear power and safety regulation are ever more in demand.

Intuitively it may seem that the debate is simply about the either/or of nuclear power. However, this paper uncovers a more nuanced aspect developing in the aftermath of the catastrophe. One side sees denuclearization as a path to more democratic governance, while the other opposes phase-out for fear of losing the lead in technology, to which strong value has been attached in Japan. In short, beyond the mere nuclear power policy, the tragic accident in Fukushima has triggered a broad debate over which course society should take.

To be sure, the pro-nuclear arguments stem in no small part from stakeholders’ interests. For those working for electricity companies, nuclear energy obviously is a matter of economic survival. However, these interests do not necessarily strike a chord with the majority of non-stakeholders. Hence the proponents of nuclear power try to associate their claims with values that resonate with a wider range of people, such as national pride in technology. Analyzing the discourses on nuclear power policy thus serves to uncover the various values that are upheld in contemporary Japanese society.

In recent years, political science, especially the field of International Relations, has focused much attention on the role of social values in legitimatizing political action (for example, Hurd 2007; Krebs and Jackson 2007; Schimmelfennig 2003). It has been suggested that “[j]ustification is literally an attempt to connect one’s actions with standards of justice or, perhaps more generically, with standards of appropriate and acceptable behavior” (Finnemore 2003: 15). That means, analysis that explores the defense of claims about any one issue depicts what is valid within a society. In this sense, investigating the anti-/pro-nuclear power arguments mirrors general trends in Japanese society after the Fukushima accident.

This paper proceeds in the following steps: The next section explains the methodological specifics of the text-mining approach, while Section 3 presents the outcomes of the quantitative analysis of editorial articles. This is supplemented by a qualitative investigation to explore the reasons for the articulation of specific social values in discussions of the phase-out versus continuation of nuclear energy. The concluding section summarizes the paper’s argument and assesses its findings in terms of a broader range of post-3/11 debates.

## 2 Method

Texts were taken from editorial articles of five major Japanese newspapers: *Asahi Shinbun*, *Mainichi Shinbun*, *Nikkei Shinbun*, *Sankei Shinbun* and *Yomiuri Shinbun* (henceforth *Asahi*, *Mainichi*, *Nikkei*, *Sankei* and *Yomiuri*). The articles are examined through text-mining. Using special software, a large sample of texts was tokenized (i.e., separated into words and morphemes)<sup>4</sup> to allow for subsequent analysis of frequently occurring vocabulary.

The choice of the five papers is founded on three grounds. First, they are nationwide newspapers with a large circulation (*Asahi* 7.95 million, *Mainichi* 3.41 million, *Nikkei* 3.01 million, *Sankei* 1.60 million, *Yomiuri* 9.91 million).<sup>5</sup> Second, they cover a sufficiently wide range of perspectives in the political spectrum: *Asahi* is generally considered left, *Mainichi* center-left, *Nikkei* center with a focus on economic issues, while *Sankei* and *Yomiuri* are known to be right-wing papers (see, e.g., Altman 1996: 181; Tanioka 2007: 53). Third, all five papers publish editorial articles on a regular basis – normally each two per day – which provides a sufficiently large number of articles over time to allow for a systematic analysis of the post-3/11 debate. It was decided to focus only on editorial articles because these are supposed to contain a clear statement about a paper’s own views on future nuclear policy.

All editorial articles that contained the term *genpatsu* [nuclear energy] were collected from the electronic archives of the five newspapers.<sup>6</sup> The timeframe was set from the day after the accident (12 March 2011) to 31 December 2012. The end of 2012 was a reasonable point to draw a line because a general election of the Lower House was held in this month, with nuclear power policy as one of the main agendas. The total number of analyzed editorials is 1,754 (*Asahi* 433, *Mainichi* 383, *Nikkei* 256, *Sankei* 346 and *Yomiuri* 336).

In order to analyze the vocabulary of the editorials, the frequency of occurrence of a given term is investigated. Only nouns were counted, because the meanings of all other parts of speech tend to be more difficult to identify out of context. In addition, frequently occurring words such as “accident” (*jiko*) or “earthquake” (*jishin*) were discarded because it appeared problematic to infer a clear implication as to the nuclear debate.

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<sup>4</sup> Japanese texts do not normally separate words by space, which is a prerequisite for text-mining. The software used to insert these spaces was ChaSen, a freely available program for morphophonemic analysis that can be downloaded from <http://chasen-legacy.sourceforge.jp> (accessed 10 February 2015).

<sup>5</sup> Data taken from <http://www.pressnet.or.jp/adarc/data/data03/01.html> (accessed 2 August 2013).

<sup>6</sup> The databases are Kikuzo II Visual (*Asahi*), Maisaku (*Mainichi*), Nikkei Telecom (*Nikkei*), The Sankei Archives (*Sankei*) and Yomidas Rekishikan (*Yomiuri*).

In order to avoid unnecessary diversification, some terms were categorized as thematic equivalents.<sup>7</sup> For example, *datsu-genpatsu* [denuclearization] has virtually the same meaning as *han-genpatsu* [anti-nuclear], *sotsu-genpatsu* [graduating from nuclear power] and *genpatsu zero* [zero-nuclear]. They were therefore summarized as one lexical item (cf. Table 1 for the complete list). Terms were counted in types, not tokens. That means, if a term (or its thematic equivalent) was referred to more than once in an editorial, it was still counted as one.

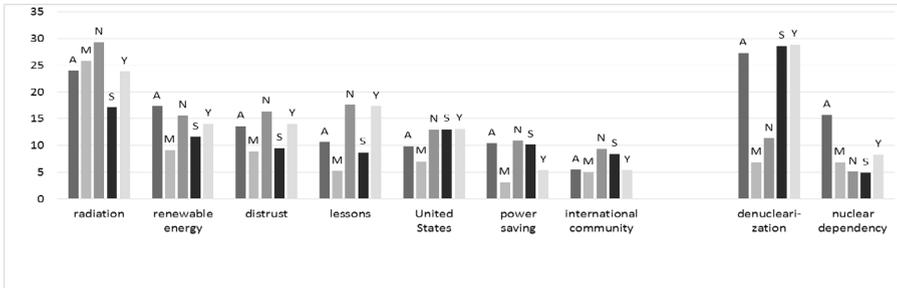
**Table 1:** List of thematic equivalents

denuclearization:	脱原発、減原発、反原発、卒原発、原発ゼロ
radiation:	放射能、放射能汚染、放射性物質、放射線量、放射性セシウム
renewable energy:	再生可能エネルギー、自然エネルギー、太陽光発電、太陽光、風力発電、地熱、バイオマス、水力
greenhouse effects:	温暖化、温室効果
power shortage:	電力不足、安定供給、電力供給、電力危機、電力需給
power industry reform:	電力改革、電力自由化、新規参入、地域独占、買収
nuclear village:	原子力カムラ、交付金
disclosure of information:	情報公開、情報開示
growth strategy:	成長戦略、空洞化、海外移転、海外転出
democracy:	民主主義、国民投票、住民投票
myth of safety:	安全神話、安撫神話、コスト安神話
nuclear technology:	原子力技術、原発技術、原子力関連技術
security:	安全保障、エネルギー安全保障
power bill:	電気料金、電力料金
distrust:	不信、不信感

### 3 Data analysis

Figure 1 gives the terms that were most commonly used in the four papers' editorials on nuclear energy. These include "radiation" (*hōshanō*), "renewable energy" (*saisei kanō enerugi*), "distrust" (*fushin*), "lessons" (*kyōkun*), "United States" (*Amerika*), "power saving" (*setsuden*), "international community" (*kokusai shakai*), as well as "denuclearization" (*datsu-genpatsu*) and "nuclear dependency" (*genpatsu izon*). This provides a first basic idea about the overall thematic scope of the analyzed editorials.

<sup>7</sup> Concerning general guidance for using the text-mining approach, see Matsumura and Miura (2009).



**Figure 1:** Terms used by all newspapers (% of articles; see Table 2). A = *Asahi*, M = *Mainichi*, N = *Nikkei*, S = *Sankei*, Y = *Yomiuri*

**Table 2:** Terms used by all newspapers (% of articles)

	<i>Asahi</i>	<i>Mainichi</i>	<i>Nikkei</i>	<i>Sankei</i>	<i>Yomiuri</i>
radiation	24.0	25.8	29.3	17.1	23.8
renewable energy	17.3	9.1	15.6	11.6	14.0
distrust	13.6	8.9	16.4	9.5	14.0
lessons	10.6	5.2	17.6	8.7	17.3
United States	9.9	7.0	12.9	13.0	13.1
power saving	10.4	3.1	10.9	10.1	5.4
international community	5.5	5.0	9.4	8.4	5.4
denuclearization	27.3	6.8	11.3	28.6	28.9
nuclear dependency	15.7	6.8	5.1	4.9	8.3

A closer look at the data shows that there were some considerable differences with respect to how these terms were used. For example, concerning “renewable energy,” *Asahi* saw it as a new “alternative” to reduce the dependence on nuclear power.<sup>8</sup> By contrast, *Yomiuri* cast doubt on its feasibility as a surrogate for nuclear power, due to “problems regarding performance, penetration level and cost.”<sup>9</sup> Likewise, *Asahi* touched upon the “lessons” of Fukushima to urge denuclearization,<sup>10</sup> while *Sankei*’s lessons learned from the accident were to “enhance safety regulations” of nuclear power plants to avoid future incidents.<sup>11</sup>

Another term that was commonly employed with different implications in pro- and anti-nuclear contexts was public “distrust.” While Prime Minister Naoto

<sup>8</sup> *Asahi*, 2 December 2011.

<sup>9</sup> *Yomiuri*, 27 May 2011.

<sup>10</sup> *Asahi*, 13 July 2011, *Mainichi*, 12 June 2012.

<sup>11</sup> *Sankei*, 27 June 2011, *Yomiuri*, 28 May 2011.

Kan's announcement of denuclearization (which was later qualified to be his personal view) was condemned by *Yomiuri* as an "irresponsible proposition" that was "amplifying public distrust of nuclear energy policy,"<sup>12</sup> *Asahi* described the restart of the nuclear reactor in July 2012 as "boiling the magma of distrust."<sup>13</sup> In the end, whatever stance the government appeared to adopt, it seems to have sparked criticisms from both pro- and anti-nuclear camps.

The last two terms in Figure 1, "denuclearization" and "nuclear dependency," also require careful attention since they were used both in positive and negative senses. *Asahi*'s repeated reference to these words is relatively straightforward. Just one month after the accident, it ran an editorial with the headline: "Let's steer toward denuclearization,"<sup>14</sup> followed by a vision of a "nuclear power free society" in July that year.<sup>15</sup> *Mainichi* is also an active proponent of denuclearization, although it utilized these terms less frequently. Almost at the same time as *Asahi*, it revealed its anti-nuclear stance with an editorial titled "Let's do a volte-face on [nuclear energy] policy,"<sup>16</sup> and one day later argued that "it is impossible to live with nuclear power plants in an earthquake country like Japan."<sup>17</sup> Both newspapers thus agreed that the "nuclear dependency" should be reduced.<sup>18</sup>

Similar views are difficult to find in *Nikkei*, *Sankei* and *Yomiuri*. These papers continued to uphold the nuclear power policy, with headlines such as "Back down on the zero-nuclear policy and remove concerns over electricity supply" (*Nikkei*),<sup>19</sup> "Don't be carried away by denuclearization" (*Sankei*)<sup>20</sup> and "Ditch denuclearization policy with no prospects" (*Yomiuri*).<sup>21</sup> In fact, they unanimously accused calls for reducing "nuclear dependency" of neglecting the influences on the economy.<sup>22</sup> In other words, even though *Nikkei*, *Sankei* and *Yomiuri* did use the terms "denuclearization" and "nuclear dependency," they assessed them in an entirely different, negative way. Thus we can summarize as follows:

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12 *Yomiuri*, 5 May 2012.

13 *Mainichi*, 31 July 2012.

14 *Asahi*, 11 April 2011.

15 This is not an editorial article, but one that appeared on the front page on 13 July 2011.

16 *Mainichi*, 15 April 2011.

17 *Mainichi*, 16 April 2011.

18 For example, *Asahi*'s article "Energy plan: find a way out of nuclear dependency" (12 May 2011) and the *Mainichi* headline "Renewable energy: it is possible to replace nuclear power" (3 August 2011).

19 *Nikkei*, 5 May 2012.

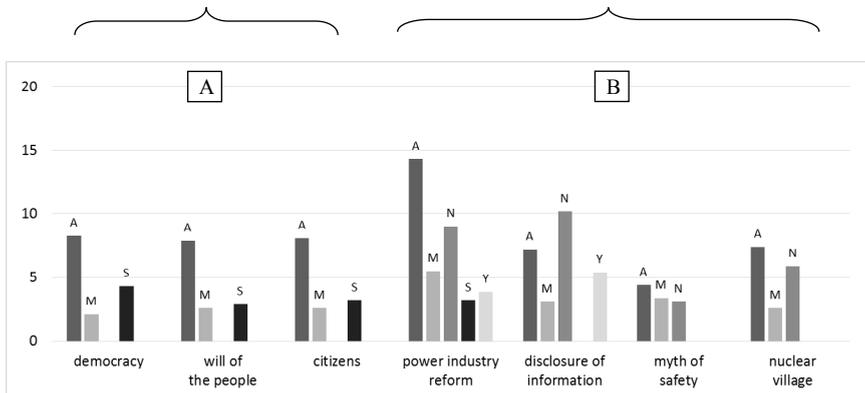
20 *Sankei*, 13 May 2011.

21 *Yomiuri*, 7 September 2011.

22 For example, *Nikkei*, 31 July 2011, *Sankei*, 15 July 2011, *Yomiuri*, 23 July 2011.

- *Asahi* and *Mainichi* in their editorials take anti-nuclear power views and want to see it phased out.
- *Nikkei*, *Sankei* and *Yomiuri* argue in favor of a continuation of nuclear power.

Taking into account the different perspectives expressed in the editorials, Figures 2 and 3 were designed to show some commonalities between the different papers. Figure 2 is divided into two groups. Group A lists common terms in the *Asahi*, *Mainichi* and *Sankei* editorials, again used with differing implications.



**Figure 2:** Terms mainly used in newspapers critical of nuclear power management (% of articles; see Table 3). Group A: Terms primarily used by *Asahi*, *Mainichi* and *Sankei*. Group B: Terms primarily used by *Asahi*, *Mainichi* and *Nikkei*. A = *Asahi*, M = *Mainichi*, N = *Nikkei*, S = *Sankei*, Y = *Yomiuri*

**Table 3:** Terms mainly used in newspapers critical of nuclear power management (% of articles)

	<i>Asahi</i>	<i>Mainichi</i>	<i>Nikkei</i>	<i>Sankei</i>	<i>Yomiuri</i>
democracy	8.3	2.1		4.3	
will of the people	7.9	2.6		2.9	
citizens	8.1	2.6		3.2	
power industry reform	14.3	5.5	9.0	3.2	3.9
disclosure of information	7.2	3.1	10.2		5.4
myth of safety	4.4	3.4	3.1		
nuclear village	7.4	2.6	5.9		

*Asahi* and *Mainichi* present their denuclearization arguments by touching upon “democracy,” “the will of the people” and “citizens.” For example, *Asahi* used the following headlines: “Nuclear power and the will of the people: let us make a choice”;<sup>23</sup> “Demonstrations for denuclearization: democracy starts working”;<sup>24</sup> and “Referendum: let us decide on future nuclear power.”<sup>25</sup> In these articles, grassroots movements to protest against nuclear power were favorably viewed as a form of participatory democracy.

*Mainichi* took a similar stance in declaring (coincidentally using the same headline as *Asahi*): “Nuclear power and the will of the people.”<sup>26</sup> Likewise, in an article titled “Reflect the will of the people: referendum is one of the political options,” it criticized the restart of nuclear power reactors as “not sufficiently considering the will of the people,”<sup>27</sup> while appreciating the style of a “deliberative opinion poll” (*tōgigata yoron chōsa*) on the issue as a way of “carefully reflecting what people think.”<sup>28</sup>

*Sankei*’s usage of these terms reveals a clear contrast. For instance, in an article entitled “Don’t leave fundamental national policy to referendum,” it contended that a referendum was “not suitable” for deciding on energy policy, because “it should be determined by coordinating complicating interests from the angle of national policy maneuvering.”<sup>29</sup> With reference to anti-nuclear demonstrations, it stated that “*representative democracy* allows politicians to make decisions at the national level; thus, they ordered the restart of Ōi nuclear reactors based on legal procedures.”<sup>30</sup> In short, unlike *Asahi*’s and *Mainichi*’s views on democracy, *Sankei* claimed that “leaving fundamental national [energy] policy to referendum would threaten smooth policy implementation and the representative democracy.”<sup>31</sup>

23 *Asahi*, 15 June 2011.

24 *Asahi*, 21 September 2011.

25 *Asahi*, 27 November 2012.

26 *Mainichi*, 31 July 2012.

27 *Mainichi*, 17 August 2012.

28 *Mainichi*, 24 August 2012.

29 *Sankei*, 10 June 2012. As shown in Table 1, “referendum” is counted as the equivalent of “democracy,” because both place importance on the process of reflecting the will of the people.

30 Emphasis added, *Sankei*, 4 August 2012. Also *Sankei*, 12 July 2011.

31 *Sankei*, 8 October 2011. Otherwise, these terms were mentioned in irrelevant contexts, because *Sankei*, the most strident critique of the DPJ (Democratic Party Japan) government, referred to what it called “the will of the people” to urge a snap election, cf. *Sankei*, 25 April 2011, 28 July and 22 September 2012.

Group B in Figure 2 lists the terms that *Asahi*, *Mainichi* and *Nikkei* have in common: “power industry reform” (*denryoku kaikaku*), “disclosure of information” (*jōhō kōkai*), “myth of safety” (*anzen shinwa*) and “nuclear power village” (*genshiryoku mura*). In this respect, *Nikkei* is in line with the anti-nuclear power newspapers, despite its opposition to a phase-out.

All three papers hurled criticism against the closed management of nuclear energy policy. Their editorials frequently refer to the “nuclear village,” or what Kingston (2012) has described as pro-nuclear institutions and individuals including “the utilities, nuclear vendors, bureaucracy, Diet (Japan’s parliament), financial sector, media and academia.” As Samuels (2013: 107) holds, “members of a collusive ‘nuclear village’ overestimated safety and underestimated risk because the regulators and the regulated had been in a conspiratorial embrace for decades.” Hence, the “myth of safety” (i.e., a claim that nuclear power was absolutely safe and a catastrophic accident was all but impossible) is lambasted by all three papers. The same papers also urge a reform of the power industry and the disclosure of information.

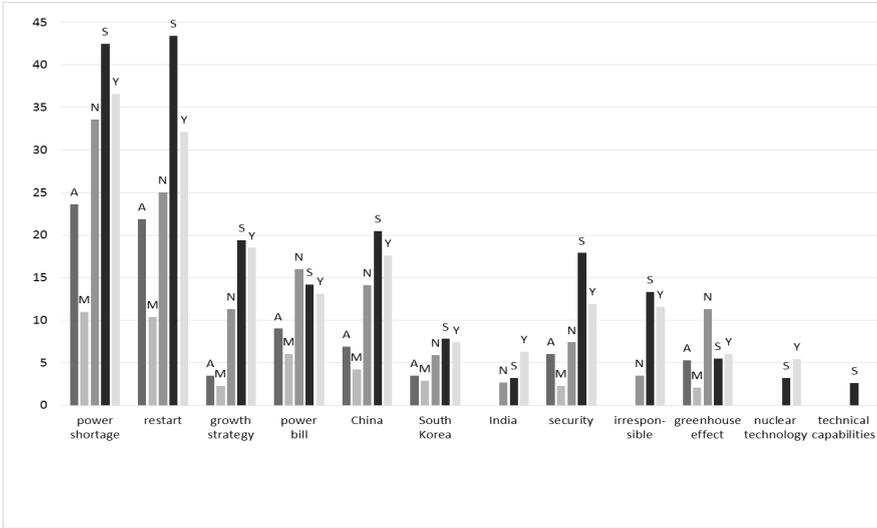
Their views can be summarized as follows:

- *Asahi* and *Mainichi* advocate denuclearization and criticize the closed-off management of nuclear power generation.
- *Nikkei*, despite its pro-nuclear energy view, criticizes its management in tandem with *Asahi* and *Mainichi*.

Figure 3 gives the terms most frequently used by the pro-nuclear newspapers. *Nikkei*, *Sankei* and *Yomiuri* showed much greater concern over “power shortages” (*denryoku busoku*) and a higher “power bill” (*denki ryōkin*) due to the shutting down of nuclear reactors. They strongly demanded “restart” (*saikadō*) of the out-of-service reactors. The term “irresponsible” was used to criticize the promotion of denuclearization.<sup>32</sup> Put another way, the influence on the economy was emphasized, as can also be understood from the frequent occurrence of the term “growth strategy” (*seichō senryaku*), which will be further explored in the next section.

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<sup>32</sup> For example, *Nikkei*, 7 September 2012; *Sankei*, 10 August 2012; *Yomiuri*, 20 August 2012. Although “irresponsible” is an adjective in English, the corresponding Japanese term *musekinin* is a noun.



**Figure 3:** Terms mainly used in the pro-nuclear power newspapers (% of articles; see Table 4). A = *Asahi*, M = *Mainichi*, N = *Nikkei*, S = *Sankei*, Y = *Yomiuri*.

**Table 4:** Terms mainly used in the pro-nuclear power newspapers (% of articles)

	<i>Asahi</i>	<i>Mainichi</i>	<i>Nikkei</i>	<i>Sankei</i>	<i>Yomiuri</i>
power shortage	23.6	11.0	33.6	42.5	36.6
restart	21.9	10.4	25.0	43.4	32.1
growth strategy	3.5	2.3	11.3	19.4	18.5
power bill	9.0	6.0	16.0	14.2	13.1
China	6.9	4.2	14.1	20.5	17.6
South Korea	3.5	2.9	5.9	7.8	7.4
India			2.7	3.2	6.3
security	6.0	2.3	7.4	17.9	11.9
irresponsible			3.5	13.3	11.6
greenhouse effect	5.3	2.1	11.3	5.5	6.0
nuclear technology				3.2	5.4
technical capabilities				2.6	

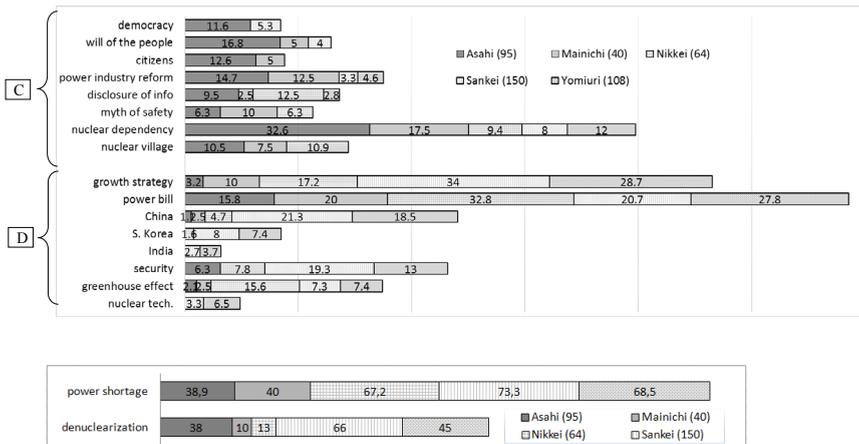
What is characteristic in *Sankei* and *Yomiuri* is that “China,” “South Korea,” “India,” “security” (here including “energy security”), “nuclear technology” and “technological capabilities” were more often referred to than in *Asahi* and *Mainichi*. As the occurrence of these last three terms indicates, the views of *Sankei* and *Yomiuri* are also different from that of *Nikkei*.

As will be explored later, these arguments were deployed in consideration of Japan’s international presence. It was argued that a phase-out of nuclear power would not only damage the Japanese economy, but also weaken its technological superiority and its say on the international stage, where nuclear energy is still in demand. In fact, as China, South Korea, India and other developing countries are planning to build a number of nuclear power plants in the future, it was argued that Japan’s advanced technology would be vital for the safety of international nuclear management. On the other hand, it is perhaps interesting to note that the terms “nuclear village” and “myth of safety” are not used by *Sankei* and *Yomiuri* at all (see Figure 2).

The discussion can be summarized as follows:

- *Sankei* and *Yomiuri* express support for nuclear power policy, with a stress on Japanese technology in this field. This differs from *Nikkei*’s support for purely economic reasons.

In order to cross-check the traits analyzed so far, we now focus on one key term in the debate, the “restart” (*saikadō*) of the reactors. Figure 4, compiled using the same dataset as above, shows which words were commonly co-occurring when the term was used in an editorial of the five newspapers.



**Figure 4:** Terms used in editorials about the “restart” (*saikadō*) of nuclear reactors (% of articles) (see the original data in Table 5). Group C: Terms mainly used in newspapers critical of nuclear management. Group D: Terms mainly used in the pro-nuclear power newspapers.

**Table 5:** Terms used in editorials about the “restart” (*saikadō*) of nuclear reactors (% of articles)

	<i>Asahi</i>	<i>Mainichi</i>	<i>Nikkei</i>	<i>Sankei</i>	<i>Yomiuri</i>
democracy	11.6			5.3	
will of the people	16.8	5		4	
citizens	12.6	5			
power industry reform	14.7	12.5		3.3	4.6
disclosure of information	9.5	2.5	12.5		2.8
nuclear dependency	32.6	17.5	9.4	8	12
myth of safety	6.3	10	6.3		
nuclear village	10.5	7.5	10.9		
growth strategy	3.2	10	17.2	34	28.7
power bill	15.8	20	32.8	20.7	27.8
China	1.1	2.5	4.7	21.3	18.5
South Korea			1.6	8	7.4
India				2.7	3.7
security	6.3		7.8	19.3	13
greenhouse effect	2.1	2.5	15.6	7.3	7.4
nuclear technology				3.3	6.5
denuclearization	38	10	13	66	45
power shortage	38.9	40	67.2	73.3	68.5

The terms “denuclearisation” and “power shortage” are shown separately because of their high percentages. Group C of Figure 4 contains the terms that were primarily used by the newspapers critical of nuclear management, whereas Group D gives the same data for the pro-nuclear power newspapers. As can be seen, “democracy,” “will of the people,” “citizens,” “power industry reform,” “disclosure of information,” “nuclear dependency,” “myth of safety,” and “nuclear village” were frequent when *Asahi*, *Mainichi* and, to some extent, *Nikkei*, discussed the issue of reactor restarts. In contrast, *Sankei*, *Yomiuri* and, in part, *Nikkei* more prominently used terms such as “growth strategy,” “power bill,” “China,” “South Korea,” “India,” “security,” “greenhouse effect” and “nuclear technology.”

Considering these findings, the views expressed in each newspaper can now be summed up as follows:

- *Asahi* and *Mainichi* argue for denuclearization. At the same time, they denounce the closed nuclear management of the past era and emphasize that democratic principles should determine future policy through direct public participation.
- *Nikkei* supports the idea of continuing the nuclear power policy, principally for economic reasons (along with *Sankei* and *Yomiuri*), but criticizes the way nuclear power has been managed (along with *Asahi* and *Mainichi*).
- *Sankei* and *Yomiuri* strongly advocate nuclear power policy. In addition to concerns over the influence on the economy due to power shortage, they

warn of a decline of Japan's presence and influence in the international sphere, arguing that in case of denuclearization it would be difficult to maintain the standard of nuclear technology or contribute to international regulations of nuclear safety.

As the newspapers did not change their views during the period examined, it is in order to regard the above trends as constant.

## 4 Different views on future nuclear policy

The previous section has shown that, in addition to the general topics discussed in the debate over nuclear energy, arguments about the future course of nuclear policy were articulated with reference to two overarching issues: democratic values, on the one hand, and the concerns over Japan's international presence on the other. This section explores why these arguments were put forward the way they were in order to justify the (dis)continuation of nuclear energy.

### 4.1 From the myth of safety to “neo-liberal democracy”? The anti-nuclear debate

The denuclearization argument started with the collapse of the “myth of safety” – the claim that nuclear power was so safely regulated that accidents could not happen. Fuelled by the chaotic mishandling of the Fukushima crisis,<sup>33</sup> criticisms were increasingly directed against the nuclear policy in general, and its handling by the members of the collusive “nuclear village” in particular. The “close ties between electricity companies, government agencies and academics”<sup>34</sup> were thought of as “the remote cause of the Fukushima meltdown.”<sup>35</sup>

The Fukushima accident thus entailed a comprehensive review of the past nuclear power policy within the society. This also brought to light a series of

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**33** It is reported that there were miscommunications between the government and TEPCO, missteps and mistakes in the initial response (see, e.g., Funabashi and Kitazawa 2012).

**34** *Nikkei*, 5 May 2012.

**35** *Nikkei*, 8 July 2011. It should be noted that the Nuclear Accident Independent Investigation Commission (2012: 16), which was set up under the Diet after the Fukushima accident, concludes that the accident was a “man-made disaster” (*jinsai*) resulting from the “collusion between the government, the regulators and TEPCO, and the lack of governance by said parties.”

setups in the historical records, in which electric power companies schemed to prevent anti-nuclear power questions in local briefing sessions.<sup>36</sup> In fact, such management was described as “uncovering the distortion in nuclear safety regulation in Japan”<sup>37</sup> and triggered “public distrust in electric companies with such an organizational culture.”<sup>38</sup> Furthermore, the flow of the so-called “nuclear money” was largely problematized, in which a colossal amount of subsidy came to be funneled into host communities since the enactment of the “Three Power Source Development Laws” (*Dengen Sanpō*) in 1974.<sup>39</sup> Hence, it was argued, “it is time to reconsider the structure of policy, which from the planning stage on makes local communities more dependent on nuclear industry through the influx of nuclear money.”<sup>40</sup>

*Asahi*, *Mainichi* and *Nikkei* tended to be very vocal in demanding reform of the nuclear industry. While it is true that *Nikkei* takes “pro-nuclear” views, it has at the same time made critical comments on the monopolized electricity industry and the opaque flow of the subsidy: “We have repeatedly opposed the zero-nuclear policy. However, whatever the reliance on nuclear power is, it is indispensable to review the power industry system by promoting market competition to increase options for consumers.”<sup>41</sup> In other words, *Nikkei* criticized the dysfunction of market mechanisms and urged deregulation to reduce electricity prices by allowing new entrants. Accordingly, one of the *Nikkei* editorials argues that “it is one of the Japanese tasks to construct a social system that facilitates the development of renewable energy technology and the efficient use of electricity as a model of a low-carbon society.”<sup>42</sup>

Whereas *Nikkei*'s concerns were based primarily upon economic grounds, *Asahi* and *Mainichi* appeal to democratic principles to realize denuclearization. *Asahi* is particularly cogent in this regard. Under the headline “Now time to re-

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36 For example, in June 2011, it was disclosed that Kyushu Electric Power, a member of the Federation of Electric Power Companies in Japan, ordered its workers to send e-mails to a local briefing session in support of the restart of the Genkai nuclear reactors in Saga Prefecture.

37 *Mainichi*, 9 August 2011.

38 *Asahi*, 22 July 2011.

39 According to Aldrich (2013: 263–264), the annual amount had grown from 99 billion yen to more than 970 billion yen by late 2010. Additionally, as Onitsuka (2011) explains, “local governments are provided with heavy government subsidies for the first five years after the start of construction, but once the plant begins operation, the amount of the subsidies plummets to a quarter of the initial amount.” Budgetary deficit in turn prompts them to set up new sites in expectation of additional subsidies, which Hasegawa (1999: 315–316) calls a cycle of “addiction.”

40 *Mainichi*, 30 October 2011.

41 *Nikkei*, 1 August 2012.

42 *Nikkei*, 8 May 2011.

forge democracy,” it questions “if it was only the nuclear village that should be blamed,” holding that “the repeated blunders [in response to the accident] after all lay in our attitude and apathy in leaving [nuclear policy] to someone else.”<sup>43</sup> That is to say, the absence of public/democratic monitoring of the nuclear management is considered one of the very causes of the disaster. In *Asahi*’s own words: “The lesson [that has to be learned from the meltdown] is that a free hand has been given to the government in dealing with nuclear power policy.”<sup>44</sup>

In order to rectify this problem, *Asahi* demands reforms in the electricity industry to let renewable energy into the market. This would “change the energy supply system from a dependent style [i.e., choosing an electricity company with no other option] to an independent style, in which people engage in how energy policy should be organized [i.e., their involvement in choosing an electricity supply among various options].”<sup>45</sup> In short, nuclear phase-out is expected to change the monopolized electricity industry and to achieve democratic governance of energy policy. Therefore, nuclear protest demonstrations were highly praised because they were viewed as a manifestation of people’s will “to choose the style of energy supply and accept its consequences at the same time.”<sup>46</sup> *Mainichi* takes a similar view in advocating a “referendum as an option” for deciding on future energy policy.<sup>47</sup>

Taking these debates into account, the characteristics of what Oguma (2011) calls “neo-liberal democracy” can be observed, namely, the mixture of economic (neo-)liberalism and democratic governance.<sup>48</sup> Since the meltdown, the nuclear power industry has been criticized for its closed, obscure management style, and there were demands for a restructuring in favor of market-based rationality and democratic monitoring. In other words, because the nuclear industry is too huge a project to run without subsidies, the resulting financial network has given rise to the collusive nuclear village, which has exaggerated its safety, hidden inconvenient information and managed nuclear power policy largely as it pleased. Against this backdrop, it is argued that market efficiency will establish sound democratic functions, as “by facilitating competition in power generation, elec-

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43 *Asahi*, 14 August 2011.

44 *Asahi*, 5 May 2012.

45 *Asahi*, 13 July 2011.

46 *Asahi*, 15 June 2011.

47 This is a headline of an editorial in *Mainichi*, 17 August 2012 (also see *Asahi*, 27 November 2011).

48 Oguma’s original term is “*shin jiyū minshushugi*,” translated as “new free democracy” in the English title, but as “neo-liberal democracy” in the English abstract. This paper adopts the latter expression.

tricity companies' reliance on nuclear power will cease if the investment in safety cannot be economically justified."<sup>49</sup>

The shock of the Fukushima accident caused huge anger among the Japanese public, and opened up the anti-nuclear debate on a nationwide scale. At the same time, critics expressed their grave distrust in the nuclear management, demanding more democratic governance through market mechanisms. Just as McCormack (2011: 233) remarks that “[t]he crisis is not just one of radiation, failed energy supply, possible meltdown, the death of tens of thousands, health and environmental hazard but of governability, of democracy,” the anti-nuclear debate revolves not merely around the problem of electricity, but also around how the society should be reoriented after the crisis.

## 4.2 From power shortage to Japanese nuclear technology? The pro-nuclear debate

The pro-nuclear power argument emerged due to concerns that a power shortage would cause significant damage to the Japanese economy. *Nikkei*, *Sankei* and *Yomiuri* adopted this stance, with all three papers condemning the zero-nuclear policy as “irresponsible” (see Figure 3). This prioritization of economic considerations is reflected in their repeated usage of the term “growth strategy.” This plan, deployed by the government *prior to* 3/11, identifies export of nuclear power reactors as one of the main objectives to stimulate the economy.

What is conspicuous in the editorials of the pro-nuclear newspapers *Sankei* and *Yomiuri* (as opposed to *Nikkei*) is a frequent mentioning of “China,” “South Korea,” “India,” as well as a high co-occurrence of the terms “security” and “nuclear technology.” Among these, “nuclear technology” appears to provide a clue to explaining these combinations. *Sankei* and *Yomiuri* express considerable alarm about the future decline of Japanese technology in the event of denuclearization, arguing that this will make it difficult not only to “train younger generation experts,”<sup>50</sup> but also to maintain what is referred to as “the highest standard” of technology in the world.<sup>51</sup>

<sup>49</sup> *Asahi*, 15 September 2012.

<sup>50</sup> *Sankei*, 3 June 2012, 20 August 2012, 8 September 2012, 11 November 2012 and 20 November 2012; *Yomiuri*, 13 March 2012, 7 April 2012 and 5 September 2012.

<sup>51</sup> *Sankei*, 6 May 2012. From this perspective, the accident in Fukushima was explained as being “the fault of the Mark I containment vessel, designed by [the US company] General Electric forty years ago” (Hara 2012: 46–47).

According to this argument, Japan first of all needs to develop more advanced technological skills for itself in order to decommission the damaged reactors in Fukushima, which is predicted to take more than forty years. Additionally, the world is still in need of nuclear power, with China, India, South Korea and other developing countries planning to construct new sites.<sup>52</sup> Hence, there will be great demand for Japanese nuclear technology. This can contribute to international nuclear safety regulations, which will “restore the confidence in Japan” lost after the 3/11 meltdown.<sup>53</sup> Considering the problem of proliferation of nuclear weapons, *Yomiuri* contends that “Japanese technology can also strengthen the NPT [Non-Proliferation Treaty] system” by preventing the use of spent nuclear fuel for military purposes.<sup>54</sup> By contrast, it is argued that the phase-out scenario will merely diminish Japan’s voice in international “security” (which is why the term is frequently mentioned in these papers; see Figure 3).<sup>55</sup>

From these discussions it can be contended that the pro-nuclear argument is constituted by concerns over Japan’s “international presence.” This implies that it is not only about boosting Japan’s economic competitiveness, but also about maintaining its global technological superiority. The latter claim appeals especially to national pride in the advanced technology that Japan has cultivated. Conversely, the scenario of denuclearization will force Japan to leave its legacy behind permanently. Given that technology is a field in Japan in which opinion polls indicate strong public trust,<sup>56</sup> such a discourse is employed to buttress the argument for nuclear power.

This relates to what Penney (2012) calls “technological nationalism,” or “assumptions of Japanese technological superiority” which have become “an even more important part of the world view of conservative nationalists.”<sup>57</sup> As

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52 *Sankei*, 7 April 2012, 17 August 2012, 5 September 2012; *Yomiuri*, 22 June 2011, 23 July 2011, 24 September 2011.

53 *Yomiuri*, 3 December 2011, 22 January 2012.

54 *Yomiuri*, 16 July 2011. Also *Yomiuri*, 13 March 2012.

55 *Sankei*, 6 May 2012. Also see *Sankei*, 15 September 2012, which warns of Japan’s isolation in case of denuclearization.

56 In the questionnaires in the opinion polls in 2010, 79.5% agreed that “Japanese technology is more advanced than that of other countries,” while 86.7% supported the view that “it is necessary to develop science technology to enhance international competitiveness” (Naikakufu 2010). Note that in a 2012 survey, people’s trust in “scientists” had dropped from 84.5% (October 2010) to 66.5% (January/February 2012) (MEXT 2012).

57 “Technological nationalism” is not to be confused with “techno-nationalism.” Samuels (1996) uses the latter to refer to a “national policy” that nurtures certain industries by acquiring foreign technology, distributing this know-how throughout the economy and developing a capacity to innovate and manufacture. Instead, Penney’s “technological nationalism” is more focused on conservative narratives to emphasize the superiority of a country.

he illustrates, the framing of technological nationalist arguments started in the recessionary 1990s, coinciding with China's economic rise. In face of the fact that economic competition is increasing in Asia and that Japan's GDP growth is no longer a given, it is conceivable that bringing Japan's national pride of its superiority in technology into such narratives would make the pro-nuclear argument more convincing.

In sum, the emphasis on nuclear technology depicts the present political and economic conditions in Japan. Just as in the "denuclearization" argument, the case for "continuation" of nuclear energy policy is presented not only from the angle of power shortage, but also as a vision for the future of Japan in the aftermath of the crisis.

## 5 Conclusion

This paper has investigated the post-3/11 debate on nuclear power in Japan. Using a text-mining approach, it drew on a larger sample of texts from editorial articles of five major newspapers. The results have shown that, behind general topics such as worries over radiation, power shortage and political distrust, denuclearization was argued in combination with criticism of the closed nature of nuclear management and a call for democratic governance through citizens' participation, as well as through market-based competition. Meanwhile, a pro-nuclear viewpoint was identified that was commonly nourished by fears of the loss of Japan's technological superiority and the consequent weakening of its influence in the international sphere.

The anti- and pro-nuclear arguments show clear traits of "neo-liberal democracy" and "technological nationalism," respectively. *Asahi*, *Mainichi* and *Nikkei* call for power industry reform based on market rationality, which they consider an important factor for a more democratic governance of energy policy. *Asahi* and *Mainichi* define their goal of denuclearization against the backdrop of democratic principles. Though *Nikkei* sees nuclear power policy as vital for the Japanese economy, its editorials are in line with those of *Asahi* and *Mainichi* in criticizing the closed-off management of nuclear energy. *Sankei* and *Yomiuri*, on the other hand, appeal to the lead of Japanese technology and call attention to the decline of Japan's international presence as a consequence of a phase-out of nuclear energy. As a result, we can say that liberal newspapers focus more on democratic aspects of "domestic" politics, whereas conservative newspapers write from a more "international" angle. In any case, both arguments are deployed in relation to social values that form different visions for the future of post-3/11 Japan.

The two lines of arguments can also be found outside the realm of newspaper articles. For instance, in an article titled “Democratize Japanese energy policy,” Iida (2011: 38; also see Iida 2012) uncovers the “undemocratic nature of Japanese nuclear policy,” which he criticizes “from a rational-economic perspective.” Hashiyama (2012) denounces the opaqueness of gigantic scientific projects subsidized by the government, while former Diet member Shūsei Tanaka (2011) sees the source of the problem in what he calls “pseudo-democracy.” At the same time, the people’s protest against nuclear power is seen as a movement to monitor electricity policy. Developing a renewable energy market is expected to increase choices on energy options and to gradually but steadily lead to a nuclear-free society (cf. Iida 2012; Ueda 2012).

Meanwhile, the potential role that Japanese technology can play in the international nuclear field is also articulated. Sawa (2011a; see also Sawa 2011b; Sawada 2011) holds that “nuclear power projects are expanding worldwide, especially in developing countries; thus, transferring Japanese nuclear technology to the world, with the lessons of Fukushima, can contribute to international nuclear safety regulation.” Toyoda (2011: 33; see also Toyoda 2010) questions “whether it is right to abandon the advanced technology, in which Japan excels, and let China have a lead in the nuclear market. ... [If denuclearization is chosen] all the Japanese have to be ready for the dark scenario that radiation could flow in with pollutants in yellow sand [from China].” In these contexts, too, Japan’s technological pride is invoked in order to justify the rationale for keeping nuclear energy.

To be sure, it is not true that these arguments emerged all out of a sudden after the Fukushima accident. Samuels (2013: 113) states that narratives since 3/11 have been consistent with “normal politics” and do not differ significantly from those produced before the Fukushima crisis. Indeed, the malfunction of democracy has long been debated, for instance, in relation to problems of bureaucrat-led politics, unstable governments and a high turnover of prime ministers. Likewise, it is not entirely new to hear of the increase in economic competition from South Korean and Chinese companies in the global market, while Japan has been suffering from a long-lasting recession.

Seen from a historical vantage point, however, the current nuclear debate substantially differs from its predecessors. Criticisms in previous times mainly focused on radiation risks and environmental protection, while support for nuclear energy was expressed for reasons of economic development and prosperity of the society (Oguma 2011: 6).<sup>58</sup> While these claims still apply to today’s

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**58** Concerning the history of Japanese nuclear movements, see Honda (2005). For a post-3/11 account, see Scalise (2013).

debates, there is a new stress on democratic governance on the one hand, and technological nationalistic aspects on the other. In this respect, the 3/11 catastrophe has made explicit what has been latently discussed in contemporary Japan even before Fukushima – the two contrary strands of neo-liberal democracy and technological nationalism.

**Acknowledgements:** The author would like to thank the editor and the two anonymous reviewers as well as Florian Coulmas, Taisuke Fujita, Frank Grüneisen, Phoebe Holdgrün and Axel Klein for their helpful comments on an earlier draft of this paper.

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