



# Democratic innovations as a party tool: A comparative analysis of nuclear energy public participation in Taiwan and South Korea

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## ABSTRACT

Our paper critically assesses the trajectories of nuclear energy policy-making in Taiwan and South Korea through the lens of state-led democratic innovation. Nuclear energy is as controversial as the associated decision-making highly political, raising concerns with democratic participation. Generally, deliberative polls and referenda are considered more bottom-up and grassroots approaches to resolving complex energy issues. In Taiwan and South Korea, however, the state plays a key role in deciding what issues and decisions should be debated, and exercises control over the interpretation of the results. The strong state and centralised decision-making over energy policy means the processes in Taiwan and Korea differ markedly from Western energy transitions. These approaches not only undermine the credibility of the participatory process and the quality of civic engagement, but further polarise public opinion. The overall aim in producing this paper is to identify the how democratic participation differs between established Western democracies and East Asia's new democracies, and to investigate how deliberative polls and referenda were used not as a means to reflect public opinions on energy policy, but as a conduit for political actors to promote their own political agendas.

## 1. Introduction

Taiwan and South Korea depend heavily on imported energy, with over 90% of their energy being imported. Thus, both countries began developing civil nuclear energy programs in the 1970s. Taiwan's anti-nuclear movement developed alongside its democratisation, and has been the longest lasting and arguably the most successful social movement in Taiwan. In 2016, the current Democratic Progressive Party (DPP) government pledged to make Taiwan nuclear-free by 2025, while the pro-nuclear camp initiated a referendum against the government's energy policy, which it won resoundingly. Nevertheless, the Taiwan government continues to pursue nuclear phase-out despite the referendum results.

In South Korea, nuclear energy issues have been dominated by economic and security concerns. Nuclear energy is also considered a source of national pride for South Korea, as was demonstrated in its exporting of nuclear technology to the United Arab Emirates (UAE). Nonetheless, President Moon Jae-In initiated a deliberative poll on the construction of nuclear power plants following his inauguration in order to legitimise his long-term nuclear phase-out policy (Jang, 2017).

Against this backdrop, we have seen controversies around democratic participation, especially the notion of a state-led "democratic innovation". Generally, deliberative polls and referenda are considered bottom-up approaches to solving complex energy issues. However, in the context of state-led public participation, ruling parties play key roles in deciding how debate over these issues should proceed and control the interpretation of the results. State-led democratic innovations not only weaken citizen participation but further polarise public opinion.

We constructed an analytical framework based on state-led democratic innovation to understand the patterns of public participation in energy policy making. Also, we show how the public officials determine the subjects, objects, and models of participation within energy politics. This study aims to identify how ruling parties use deliberative polls and referenda to achieve their goals, especially in the context of East Asia's new democracies. In this sense, we examined closely how notions of democratic decision making with respect to nuclear energy in Taiwan and South Korea differ from those in Western democracies given that these democratic innovations ended up serving political purposes and policy legitimacy despite being presented with a pretext of empowering citizens (Gherghina, 2019b; Kwok et al., 2017, p. 57).

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## 2. Democracy and nuclear energy

Nuclear power is a complex economic, social, political, and technological issue, and the democratic implications for nuclear energy have long been discussed. Welch (1977) argued that nuclear energy is a product of government design, promotion, and subsidy, implied that the state dominated and centralised nuclear energy policy. Influential factors identified by Sovacool and Valentine (2010) and Valentine and Sovacool (2010) also show that the development of nuclear energy is embedded in economic growth, technology advancement, civil activism and more recently the decrease of greenhouse gases (Neumann et al., 2020).<sup>1</sup> Recent discussion on decision making to promote nuclear energy as a means of reducing carbon emissions could be destructive with respect to renewable energy. Johnstone et al. (2017) argue that the decision on UK nuclear energy policy had less to do with democracy than with promoting the interests of incumbents. Had the decision been made in the public interest, democratic qualities could have been the deciding factor. Johnston and Stirling (2020) argue that Germany, which is more capable in developing nuclear energy than the UK,<sup>2</sup> decided to cease nuclear energy operations due to its decentralised political institutions, consensual decision making, strong anti-nuclear movement and influence of the Green Party. Neumann et al. (2020) analyse democracy and nuclear power in 166 countries through the period of 1960–2017. In terms of democracy and public participation, their findings suggest that countries in which political and public debates are limited would be more likely to introduce nuclear energy as the limitation makes it easier to implement governmental programmes which are contradictory to the public interest. However, allowing governments and technocrats to wield decisive power over decisions certainly could undermine democratic participation (Neumann et al., 2020).

In the context of East Asia, the development nuclear energy has occurred where the developmental state directs economic development and nuclear energy provided stable and reliable power for export-oriented industries. Despite Sovacool's (2010) suggestion that renewable energy is less costly and more environmentally friendly, in authoritarian Asian countries secrecy and centralised decision making, alongside economic, social and national security issues, have secured the interests and development of nuclear energy (Jasanoff and Kim, 2009; Sovacool and Valentine, 2012; Park and Sovacool, 2018; Kim and Chung, 2018). Deep-rooted cultures of dominating centralised states have made it extremely difficult for environmental-friendly administrations to implement their nuclear-free agenda.

Current energy transitions in Taiwan and Korea reveal how incumbent regimes exert influence to suppress renewable energy development (Geels, 2004; Meyer, 2021) and manipulate democratic innovations, such as deliberative polls and referenda, through market control lobbying. Strong links between conservative politicians, bureaucrats, and the electrical utilities purposefully ignored civil activism to constrain debate on nuclear issues at the local level. Even now, the Moon's liberal administration is finding it difficult to shift policy in South Korea (Kim and Chung, 2018), and policy stakeholders in Taiwan are engaged in a fierce power struggle (Huang and Chen, 2021a).

In the discussion above, we found that transiting from nuclear to renewable power requires overcoming massive challenges, especially given the strong, centralised states of Asia developmental states like those in Taiwan and South Korea. Democratic decision making is a key

<sup>1</sup> These factors are: strong state direction in economic development; centralization of national energy policy; promoting technological progress as national revitalization; strong technocratic domination on policy decisions; subordination of challenges to political authority; low levels of civic activism and reduction of greenhouse gases.

<sup>2</sup> Johnston and Stirling (2020) suggested that in terms of market condition, penetration of nuclear power, capability of nuclear engineering and availability of national renewable sources.

means of reaching a consensus and mediating competing interests. While the energy transition is intended to help establish a more diverse and decentralised energy system, it is worthwhile examining democratic innovations such as deliberative polls and referenda and to see how these democratic innovations can help in achieving consensual decisions.

### 2.1. Democratic innovations as a party tool

The extant literature provides evidence on how democratic innovations affect citizen empowerment and civic competencies.<sup>3</sup> There are good reasons for confirming the importance of the state apparatus in democratic innovations. Most obviously, states still matter. Nation-states remain significant in regulating, administering, redistributing, and knowing the environment. Governments exercise discretion in their calls for democratic innovations. The operation of “top-down” democratic innovations is entirely dependent on the willingness of empowered political actors.<sup>4</sup>

Politics often gets in the way of public participation. A variety of political calculations enter into a government's decision to call a referendum on a particular issue, and in such circumstances governments seldom take a neutral position.<sup>5</sup> Civic participation has become a political debate rather than an issue of democracy (Eckerd and Heidelberg, 2020).

Ruling parties obviously play an essential role.<sup>6</sup> Our findings will show that the role of citizens in policy decision-making is limited (Fraune and Knodt, 2017), and often fails to have a significant impact on final policy outcomes. The role of citizens and their impact will depend on the specifics of the design of the participatory process structured by the ruling party (Chilvers and Pallett, 2018, pp. 9–10; Fung, 2015; Stirling, 2014).

The transformation of the political systems in Taiwan and South Korea from authoritarianism to democracy has resulted in much interest in the notion of democratic innovations.<sup>7</sup> As such, our conviction is that democratic innovations have the potential to cure diverse democratic malaises—but the realisation of this potential is highly dependent on the way in which these processes are designed and controlled by political elites (Cheneval and el-Wakil, 2018; Gherghina, 2019a).<sup>8</sup>

It is true that there are many reasons why politicians would initiate a

<sup>3</sup> For example, as Landemore (2018) stated that referenda initiated by governments are often intended to validate laws or policies the power holders intended to push through anyway, rather than genuinely engage and empower the people.

<sup>4</sup> Therefore, as many scholars have argued, the impacts of civic engagement on policy developments are scarce and institutions remain tools to be deployed in political struggle (Heffron and Haynes, 2014; Michels, 2019; Michels and Binnema, 2019; Nemčok and Spáč, 2019).

<sup>5</sup> Thus, participation has essentially become another part of administrative decision-making rather than a catalyst for real dialogue between citizens and their government. In the case of a citizen-initiated referendum, political leaders have the arbitrary power to refuse to accept the outcome of a non-binding vote.

<sup>6</sup> Ruling parties obviously play an essential role in the state apparatus, structuring political interactions, establishing legal and policy frameworks backed by coercive power, and deploying economic and administrative resources through taxes/expenditures and their apparatus (Duit et al., 2016). When governing political parties have the power to determine if and when citizen participation takes place, the decision to engage the public maybe a matter of political calculation.

<sup>7</sup> Most democratic innovations have been employed for instrumentally for political ends and been shown to play marginal roles.

<sup>8</sup> For example, referenda are prone to manipulation through the wording of questions, the timing of a vote, its subject matter, whether or not it is actually held, and the interpretation of the results (Walker, 2003).

democratic innovation.<sup>9</sup> Additionally, deliberation undermines the democratic quality of the overall system, while deliberative institutions are all too easily hijacked by people with intense preferences and disproportionate resources (Shapiro, 2017).

In our case study of Taiwan and South Korea, environmentally friendly governments faced difficulties realising their nuclear phase-out agenda and sought a public consensus through democratic innovations: a deliberative poll and a referendum.<sup>10</sup> On this view, we should not expect a “genuine” reflection of public will, but rather “a manufactured will” that reflects politicians’ calculations and should be interpreted as such (Fishkin and Mansbridge, 2017, p. 7; Gherghina, 2019b). This is especially so in energy policy, where so long as the state frames the issue as national policy, strong state presence and domination is evident. The consensual or majoritarian decision making in energy is just a tool for government to realise its policy goals. Thus the different experiences of energy transition in Western democracies and Asian developmental states are not absolute, but relative.

### 3. Research methods and design

To clarify the role of political parties in the energy transition, in this section we briefly justify our case selection and outline our method of data collection.

#### 3.1. Case study description

Despite common energy security needs and US support for the peaceful use of nuclear energy, nuclear power policies and the nuclear industries in the Taiwan and South Korea have followed completely different development paths. South Korea is among the world’s most prominent nuclear energy countries and exports its technology widely. Furthermore, social contention about safety of nuclear power plant remains a local issue, and an anti-nuclear movement was relative slow to develop. In contrast, Taiwan does not possess a nuclear industry value chain. Anti-nuclear activism developed in close partnership with the struggle for democratisation, and nuclear power evolved as not just a controversial issue but a nationally significant one. The shock of the Fukushima incident seems to have brought about meaningful change in Taiwan, however, South Korea is unlikely to move away from its reliance on nuclear energy (Kim and Chung, 2018).

Historically, South Korea and Taiwan developed similar energy systems and primarily depended on fossil fuels, and in the search for alternative energy sources, renewable energy sources have long attracted considerable attention. Furthermore, the Fukushima nuclear catastrophe underscored the imperative to find alternatives to nuclear power (Chen et al., 2014), and these countries identified renewable energy development as a means of not only mitigating the negative impacts of fossil fuel use, but to strengthen their national energy security. Accordingly, their renewable energy markets have been expanding.

In this vein, the governments of both South Korea and Taiwan continue to play central roles in energy transition through strategic manipulation of the processes of democratic innovation. In order to better understand how these states have used democratic tools to achieve political goals, case studies of a referendum in Taiwan and a

<sup>9</sup> Politicians would initiate a democratic innovation in order to avoid making difficult decisions on controversial issues; to legitimise a policy; to block a majority preference by setting a super-majority threshold for adoption (Hollander, 2019; Rahat, 2009; Gherghina, 2019b).

<sup>10</sup> However, entrenched centralised, state-dominance over decision-making together with party interests resulted in a failure to facilitate the thorough, long-term and open discussions that would lead to consensual decision making. Instead, both governments took the advantage of strong, centralised states to initiated processes over which they exercised total control, and to retain final authority over the decision. Please refer to discussion for more details.

deliberative poll in South Korea are compared. Previous studies have predominantly focused only on such transitions in Western countries. Our piece contributes to the existing literature by providing a timely cross-national comparison of democracy and nuclear power with a focus on two Asian countries. We argue that the specific character of energy transitions in South Korea and Taiwan can be understood in the context of the developmental state’s legacy, which can be characterised by the presence of a strong state (Kalinowski, 2020).

Rather than reflecting the direct power of the people, democratic innovation practices in Taiwan and South Korea are controlled by, and serve the interests of, political elites – most notably the executive. This article analyses their democratic innovations and identifies how political parties use the implementation of these tools solely for their own purposes. Our piece confirms that the state still matters in economic development (Wong, 2004). Thus the legacies of the developmental state continue to define many aspects of the political-economic landscape in East Asian countries.

#### 3.2. Data collection and analysis

Focusing on the evolution of referenda and deliberative polling in Taiwan and South Korea, this paper investigates how the state manipulates democratic innovation processes. For this, we adopted a comparative case study approach. Case study research is particularly appropriate for situations in which the examination and understanding of context is important; the more our research seeks to explain how and why some processes or phenomena occur, the more that case study research will be relevant.

Our research is based on qualitative interviews conducted in 2017 and 2018 in Taiwan and South Korea. We critically assess the trajectories of nuclear energy decision making. Our investigation focused on the deliberative poll conducted in South Korea on the construction of the Shin-Kori No.5 and 6 nuclear power plants by Moon’s administration in 2017, and the referendum in Taiwan held on November 24, 2018. We undertook in-depth interviews with key stakeholder groups including anti- and pro-nuclear activists. In-person interviews promote understanding of an advocates’ knowledge and attitudes regarding participatory democracy. First, the authors employed a purpose sampling strategy in order to identify the key stakeholder groups involved with the referendum and deliberative democracy. Thirteen face-to-face interviews were conducted with respondents from major stakeholder groups in Taiwan and South Korea. These actors directly engaged in the design, development and implementation democratic innovation process in both countries. The approach allows for useful insights into the key issues, as voiced by relative key players.

Elite interviews are especially useful for revealing the black box behind the policy process (Lee, 2021). In some cases, collecting data from civil society stakeholders playing different roles in the process can itself be a novelty (Sovacool et al., 2018). Based on secondary materials, we determined first round potential interviewees. Subsequently, other interviewees were identified based on the snowball technique. The interviews lasted between 60 and 90 min, were recorded with the permission of the interviewees, with the languages of the interviews being Mandarin and Korean. There still maybe limitations or biases in the selection of those we interviewed, but we aimed to study in-depth how and why politicians and political parties have used innovative democratic practiced as political tool to serve their own interests. Also, we sought to cover a wide range of different perspectives. From the evidence, we inductively developed a narrative linking our major explanations to theories on democracy and nuclear power. A list of the interviewees is provided in Appendix 1.

### 4. The history of the nuclear debate in Taiwan

Since Taiwan’s first nuclear power plant began operation, there has been ceaseless debate over nuclear energy. Fig. 1 shows the historical

*Historical Development of Nuclear Debate in Taiwan, 1978-2017*

Year	Events
1978	First Nuclear Power Plant (NPP1) commissioned.
1981	Second Nuclear Power Plant (NPP2) commissioned.
1984	Third Nuclear Power Plant (NPP2) commissioned.
1994- 1998	Four referenda were held in Gongliao, Taipei County, Taipei City, and Yilan County respectively on NPP4. Over 70% were opposed to the construction of the Fourth Nuclear Power Plant (NPP4).  The ruling KMT at that time would not recognise the result. Between 1992 and 1996, the bills for the budget of NPP4 faced strong challenges.
1999	Construction of NPP4 commenced.
2000	The DPP won the presidential election and halted construction of NPP4. The KMT claimed

**Fig. 1.** Historical development of nuclear debate in Taiwan, 1978–2017.

Sources: Authors, adopted from Ho (2003); Shih and Wang (2013); Sun (2013); Gold (2014).

development of the nuclear debate in Taiwan. The issue of nuclear energy is highly partisan. Nuclear energy was initiated during the long rule of the Nationalist Party (Kuomintang, KMT), which remains a proponent of nuclear power, while the ruling DPP (long the opposition party) adopted an anti-nuclear position as part of its campaign against KMT authoritarianism during democratisation. Since then, the anti-nuclear

camp has become one of the strongest bases of support for the DPP.

#### 4.1. The critical juncture in Taiwan's nuclear debate

Under the leadership of Tsai Ing-Wen, the DPP promised a vision of a “nuclear-free homeland” after winning the presidential election at the

	the decision was illegal and threaten to censure or impeach the president.
2001	Under the pressure from industry and the KMT, the DPP government resumed construction of NPP4.
2002	The Basic Environmental Act was passed by the DPP government. “Nuclear Free” appeared in a government document for the first time.
2011	Revival of the anti-nuclear movement after Fukushima Nuclear Incident.
2012	The KMT responded for the first time to calls for establishing a Nuclear Free zone.  In the 2012 presidential election campaign, the DPP presidential candidate Tsai Ing-Wen declared support for ending nuclear power by 2025. The KMT responded to the issue by saying it would reconsider the use of nuclear energy.
Feb 2013	KMT Prime Minister Jiang Yi-huah announced that a national referendum on NPP4 would be

Fig. 1. (continued).

beginning of 2016. The phrase “nuclear-free homeland 2025” was also stipulated in an amendment to the Electricity Act (EA) which was approved by the Legislative Yuan and went into effect in January 2017. It serves as a legal foundation for a nuclear phase-out by 2025. The decommissioning of nuclear power plants began in 2018 and continued in 2019.

#### 4.2. Referenda in 2018

In March 2018, pro-nuclear groups and KMT legislators challenged the DPP’s nuclear-free position, proposing two energy-related referenda. Moreover, Nuclear Mythbusters, a pro-nuclear group, proposed a referendum to abolish the policy of phasing out nuclear energy by 2025 as stipulated in the Electricity Act (EA). All three energy referenda passed

	held.
March 2013	KMT legislators proposed a referendum on NPP4: “Do you agree that the construction of the Fourth Nuclear Power Plant should be halted and that it not become operational?”
March 2013	More than 68,000 Taiwanese people joined demonstrations across Taiwan in a campaign to stop the construction of NPP4 immediately and to decommission the existing nuclear power plants.
September 2013	The referendum proposal was withdrawn in the legislature due to conflict within the KMT.
April 2014	The first-ever victory of anti-nuclear camp in Taiwan.  The KMT halted the construction of NPP4 after a social movement and a large demonstration against NPP4.  The government also promised a national referendum before the facility started operation.

Fig. 1. (continued).

(Fig. 2), including Proposition 7 against air pollution; Proposition 8 against the Shenao coal-fired power plant; and Proposition 16 to repeal the nuclear phase-out by 2025.

#### 4.3. The referendum to repeal the 2025 nuclear-free homeland in Taiwan

For our case study in Taiwan, we focus solely on Proposition 16. We

critically assessed government intervention in the process before and after this referendum. In this regard, our research identified four examples in which the government deliberately prevented this referendum from being established and disregarded the result of public poll.

First, the Central Electoral Commission (CEC), which is the competent authority for national referenda, asked the proposers to change the main text of this referendum in May 2018. This move by the CEC raised

May 2016	The DPP won the presidential election and a majority of seats in the Legislative Yuan.  The DPP began its energy transition agenda.
January 2017	The DPP government amended the Electricity Act, which clearly stated a nuclear phase-out by 2025.

Sources: Authors, adopted from Ho, 2003; Shih and Wang, 2013; Sun, 2013; Gold, 2014.

Fig. 1. (continued).

concerns over its neutrality. The CEC asked the proposers to eliminate the phrase “restart the nuclear power plant” on the basis that this referendum should solely be on the law itself and shall not be related to legislative principles for laws as these two types of referenda would have different legal effects (Liao, 2018).<sup>11</sup> However, the pro-nuclear camp claimed that after people voted to repeal the act concerning stopping nuclear power facilities, “restarting the nuclear power plant” would naturally follow. The pro-nuclear camp reluctantly changed the text in order to meet the requirements of CEC, hoping this referendum could be held in November 2018.

While the anti-nuclear camp was relatively silent, the pro-nuclear camp thus criticised the CEC for deliberately blocking the establishment of this referendum: “[The CEC] said the public hearings were needed and then asked us to revise the wording which we did. They just tried to delay the whole process and not allow this referendum to be held together with the local election in November (Chen, 2018).”

As a matter of fact, the CEC acted legally as the referendum act clearly states that referenda shall be limited to one case or issue.<sup>12</sup>

<sup>11</sup> Article 30 of the Referendum Act states: If the proposal of a referendum is adopted, the election commission shall publicize the result of the referendum within seven days after the voting is finished, and the following provisions shall govern.1For the proposal of a referendum of law or autonomous regulations, the original law or autonomous regulations shall lose its force from the third day counted from the day of public notice.2For a proposal of initiative of the legislative principles for a law or autonomous regulations, the Executive Yuan or the municipal or county (city) government shall study a proposal of the related laws or autonomous regulations within 3 months and send it to the Legislative Yuan or the municipal or county (city) council for deliberation. The Legislative Yuan or the municipal or county (city) council shall complete the procedure of deliberation before the adjournment of the next session.3For a proposal of a referendum of an important policy, the President or the authority shall take necessary disposition to realise the content of the proposal of a referendum.4For a referendum under the Constitution, the Legislative Yuan shall consult the President for publication.

<sup>12</sup> Article 9, Referendum Act: The proposal of a referendum case is limited to one case or one issue.

Ironically, another civil group also proposed a referendum that included the wording of its subsequent result and it went through without any questions from the CEC (Liao, 2018).<sup>13</sup> The pro-nuclear camp strongly criticised the CEC’s position stating, “If the Taiwan Medical Alliance for Labour Justice and Patient Safety (TMAL)’s proposal went through without any problem but ours required a public hearing be held and its wording be revised, I suspect the government [the CEC] already had a predetermined view of our proposal.”<sup>14</sup> The discussion above shows that the CEC seemed stricter towards this nuclear energy referendum which was contradictory to current government policy. However, it also raised concerns about the CEC’s neutrality.

Second, in September 2018, the CEC rejected more than 24,000 endorsements gathered by proponents of the nuclear energy referendum – an action which was possibly lacked legal grounds (Chou and Liu, 2018). According to the referendum act, 281,745 endorsements are required for a referendum to be established. The pro-nuclear camp had delivered nearly 314,482 to the CEC on 6 September, 2018 (Liu, 2018). To be on the safe side, the pro-nuclear camp wished to submit an additional 24,000 endorsements but these were rejected. Interestingly, according to a report by Storm Media, a CEC representative was recorded telling the proposers over the phone on 12 September that the CEC would accept additional endorsements, but when the pro-nuclear camp supplied the additional 24,000 to the CEC, they were meant by a closed the door (Chou, 2018). One nuclear scientist criticised CEC’s measure by stating, “It’s obviously a political issue. They kept moving up the deadline for us from 14 to 10 September and now they rejected our endorsements on 13 September (Shellenberger, 2018).” This scholar also questioned the measures of the CEC and the government by stating that energy is a very important issue: “You [the DPP government] do not hold the public consultation on the energy issue. Therefore, we initiate this referendum to give citizens another option. But then you stop us.”<sup>15</sup>

<sup>13</sup> Taiwan Medical Alliance for Labour Justice and Patient Safety (TMAL) proposed the following referendum: “Do you agree to repeal the Provision of Paragraph 2 and Paragraph 3 of Article 34 of the of Labour Standard Act? So that Labour should work in shifts and every shift should have 11 h in between?”

<sup>14</sup> Interview T6: a professor who is also a member of pro-nuclear Non-Governmental Organisation (NGO).

<sup>15</sup> Interview T8: a professor who is also a member of pro-nuclear NGO on 28 September 2018.

## List of Energy Referenda in Taiwan, 2018

	For	Against	Invalid	Total
Proposition 7: Do you agree “to reduce by 1% year by year” the electricity production of thermal power plants?	7,955,753 79.04%	2,109,157 20.96%	715,140	10,780,050
Proposition 8: Do you agree to the establishment of an energy policy to “stop construction and expansion of any coal-fired thermal power plants or generator units (including the Shen Ao Power Plant currently under construction)”?	7,599,267 76.4%	2,346,316 23.59%	823,945	10,769,528

Fig. 2. List of energy referenda in Taiwan (2018).  
Sources: Central Electoral Commission (2018).

However, the CEC issued a statement claiming that there is little flexibility under the law and that it is impossible for the CEC to accept additional endorsements. On the other hand, the pro-nuclear camp claimed that the CEC’s refusal was illegal as the law does not prohibit submitting additional endorsements. The pro-nuclear camp was left embittered and filed a lawsuit in administrative court and the founder of Nuclear Mythbusters began a hunger strike in protest against the CEC.

On 12 October, 2018, after carefully examining each endorsement, the CEC officially announced that this referendum proposal did not meet the threshold, as it fell 2,326 signatures short of meeting the required 281,745. By law, the proposers would be allowed one month to gather

enough signatures to have the proposal established. The pro-nuclear camp criticised the ruling DPP for directing the CEC to block this referendum and claimed they would not submit additional endorsements. Despite the CEC’s official announcement, on 12 October, 2018, the administrative court issued a statement ordering the CEC to accept the 24,000 endorsements the pro-nuclear camp wished to submit in September. The pro-nuclear camp supplied these endorsements and the proposed referendum was eventually passed by the CEC on 23 October (Liu and Hsu, 2018).

Throughout the process, the DPP government saw the referendum as a direct challenge to its nuclear-free policy. One resource economist

Proposition 16:	5,895,560	4,014,215	922,960	10,832,73
Do you agree to repeal Article 95 Paragraph 1 of the Electricity Act: “Should nuclear-energy-based power generating facilities stop running by 2025”?	59.49%.	40.51%	;	

Fig. 2. (continued).

argued that the DPP not only failed to resolve the nuclear energy issue, but fostered greater conflict among the pro- and anti-nuclear sides: “The DPP did not try to build trust between pro- and anti-nuclear sides, resulting in the current situation in which everyone fights against each other.”<sup>16</sup> An anti-nuclear scholar also argued that the current government’s decision-making process on nuclear energy policy, including the process of reviewing the referendum proposal, lacked transparency.<sup>17</sup> It is rather obvious that government interference was quite strong, and it was left to the judiciary to act as final arbitrator, resolve the situation, and bar the government from intervening further.

Third, the DPP government deliberately downplayed the referendum result, ignoring public opinion and undermining democratic participation. The referendum to repeal the paragraph about being nuclear-free by 2025 in Article 95 of the Electricity Act passed with 59.49% of the vote, and the paragraph lost legal effect three days later. Controversially, a government spokeswoman confirmed on 25 November, 2018 that the government would persist with its policy of phasing out nuclear energy by 2025 (Tsai and Yen, 2018). Furthermore, in an interview conducted by the *China Times*, an official from the Bureau of Energy (BOE) interpreted the result of the referendum on nuclear energy as merely to abolish the timetable to be nuclear free by 2025 and not a mandate for the reintroduction of nuclear energy (Wang, 2018). Naturally, the pro-nuclear camp was disappointed with the government’s response; speaking to the media, representatives accused the government of being irrational and declaring war on the majority of the people (Thomas, 2018).

DPP government announcements reflect its political calculation and strong commitment to making Taiwan nuclear free by 2025. The ruling DPP opted to pursue its political interests rather than accede to public opinion because of the historically strong ties between the anti-nuclear camp and the DPP. Speaking on the DPP’s anti-nuclear position, an energy journalist stated, “Energy has become a political issue and a

belief of the DPP.”<sup>18</sup> In the end, the Ministry of Economic Affairs (MOEA) confirmed that it would not extend the lifespan of the nuclear power plants; the last license to operate a nuclear plant in Taiwan will run out in 2025.

As for the pro-nuclear camp, they claimed the referendum result was just the first step and initiated another referendum to restart NPP4 in order to overturn the 2025 nuclear-free homeland policy of the DPP government. A nuclear scientist said of their campaign strategy, and the DPP’s energy decision-making, “Our first step was to abolish the nuclear-free 2025 paragraph in the law, and now we focus on restarting the NPP4. We had quite a hard time because we directly challenged the ruling DPP. But in the end, the future of our nation should not become the fight between those for and against nuclear energy.”<sup>19</sup>

Lastly, the DPP amended the Referendum Act on 18 June, 2019, in order to limit future democratic participation. Of the ten referenda put to voters on 24 November, 2018, seven that went against current government policy passed. Again, instead of acceding to public opinion, the DPP chose to amend the Referendum Act. Under the new amendment to the act, referenda will no longer be held at the same time as a general election. Instead, referenda have been designated to be held on the fourth Saturday in August every 2 years (Maxon, 2019).

Civic groups accused the government of acting recklessly, as the new amendment will lower the turnout rate and make it more difficult for a referendum to pass. In a news conference held by the Taiwan Citizen Participation Association, members of civic groups said they believed the turnout rate will be significantly lower when only a referendum is held. They admitted it is very difficult to mobilise people to go to vote merely for a referendum unless it is an issue about which they care very deeply. One of the members stated: “The change is expected to drastically reduce the turnout rate at polling stations, making it extremely difficult for any referendum to pass (Maxon, 2019).” They argued that the new amendment showed that the government of Taiwan was

<sup>16</sup> Interview T2: a resource economist who is also a member of pro-nuclear NGO on 8 June 2018.

<sup>17</sup> Interview T1: an anti-nuclear scholar on 29 May 2018.

<sup>18</sup> Interview T4: a journalist on 25 September 2018.

<sup>19</sup> Interview T6: a professor who is also a member of pro-nuclear NGO on 26 September 2018.

backsliding on democracy and if the government were concerned over the prolonged voting process, it should increase the number of polling stations and staff (Maxon, 2019).

The discussion above provides clear examples of how, in Taiwan, the government put its political interests first and worked to frustrate a referendum contrary to their policy goals. In the next section, the case of South Korea will be discussed, focusing on the historical development of the nuclear debate in South Korea and analysing the process of the deliberative poll on the construction of Shin-Kori power plants No. 5 and 6.

## 5. South Korea's nuclear energy debate

Of all the nations that initiated construction of nuclear power plants in the 1970s, only South Korea succeeded in acquiring the necessary nuclear technologies and developing its own nuclear power plant model. In the 1970s, during a heightening security crisis, the Park Chung-Hee administration promoted the development of nuclear weapons, and consequently, which subsequently drove the development of the country's nuclear power industry (Min, 2004; Kim, 2001). In the 1980s, the economic features of the nuclear power industry, such as expansion of

### *Historical Development of the Nuclear Debate in South Korea, 1978-2017*

Year	Events
1978	Kori Nuclear Power Plant No. 1 commissioned.
1987- 1988	The opposition Peace Democratic Party led by Kim Dae-Jung opposed the construction of Hanbit Nuclear Power Plants No. 3 and 4.  However, their focus was on the safety of nuclear power plants due to the Chernobyl accident and the corruption of Chun Doo-Hwan's administration in relation to these nuclear power plants.
1989	The anti-nuclear movement succeeded in preventing the construction of Yeongdeok Radioactive Waste Disposal Site.
1990-1991	The anti-nuclear movement succeeded in preventing the construction of Anmyeon Island Radioactive Waste Disposal Site.

**Fig. 3.** Historical development of the nuclear debate in South Korea, 1978–2017.

Sources: Kim (2011); Ku (2012); Ku and Hong (2013); Yun (2015); Kim and Shim (2016); Choi and Lee (2017); Hong (2017); Hong (2018).

2003	The anti-nuclear movement peaked in 2003 as it succeeded in preventing the construction of nuclear power plants and the Buan Radioactive Waste Disposal Site.
2005	Roh Mu-Hyeon's administration confirmed the construction of a low- and mid-level radioactive waste disposal site in Gyeongju through a referendum.  Following this, the anti-nuclear movement declined rapidly.
2009	Lee Myeong-Bak's conservative administration took power in 2009 and closed the mechanism for anti-nuclear organisations to participate in energy governance.
2011	Revival of the anti-nuclear movement after Fukushima Nuclear Incident.
2012	In the general election and presidential election, all major parties except the Conservative Ruling

Fig. 3. (continued).

the power supply and fostering of the nuclear power industry, were emphasised more than its military and security features. Consequently, South Korea accumulated nuclear power plant technologies in a short period of time, pursued a policy of nuclear power plant expansion, and developed its own power plant model. This entire process was led by the government of South Korea and the publicly-owned Korea Electric Power Corporation (KEPCO) (Choi et al., 2009; Park, 1992; Sung and

Hong, 1999; Valentine and Sovacool, 2010).

South Korea's anti-nuclear movement arose in response to the 1986 Chernobyl nuclear accident, and strengthened by the country's democratisation in 1987. However, between that time and the introduction of the Moon Jae-in administration in 2017, nuclear energy policies were not considered an important part of the political agenda in electoral competitions. Fig. 3 shows the historical development of the nuclear

	<p>Party (Saenuri Party) made denuclearisation pledges.</p> <p>The Saenuri Party won the general election and presidential election.</p>
May 2017	<p>Democratic Party candidate Moon Jae-In won the presidential election.</p> <p>The Moon administration began its denuclearisation and energy conversion programs.</p>
June 2017	<p>At the ceremony of the permanent suspension of Kori No. 1, President Moon Jae-In promoted denuclearisation and announced that he would publicise the suspension of the construction of Shin-Kori Power Plants No. 5 and 6.</p>

Fig. 3. (continued).

debate in South Korea.

### 5.1. A critical juncture in South Korea's nuclear debate

After the Fukushima nuclear accident in 2011, the anti-nuclear movement in South Korean society was strengthened again. Nevertheless, no major changes were made to the government's nuclear energy policy (Jin, 2012; Park, 2015; Yun, 2015). After Democratic Party candidate Moon Jae-In was elected president in May 2017, the South Korean government began to move away from a policy of nuclear expansion and initiated a new policy stance of denuclearisation and energy conversion.

### 5.2. Deliberative poll in 2017

At the ceremony of the permanent suspension of Kori No. 1 on June

19, 2017, President Moon Jae-In stressed denuclearisation and announced that he would push for the suspension of the construction of Shin-Kori power plants No. 5 and 6. He then stated that he would accept the decision of the deliberative poll unconditionally rather than treat it simply as a reference.

What is notable here is that such matters as the practice of publicising, selection of the agenda, and specific investigation into the rules of publicising were planned by the Blue House and executed by the Prime Minister's Office.<sup>20</sup> First, the Moon Jae-In administration did not go through formal or informal consultation with the denuclearisation movement camp before publicly announcing the aforementioned plan.

<sup>20</sup> Interview K1: members of an Environmental Non-Governmental Organisation (ENGO) on 9 July 2018 (Seoul); Interview K5: a member of an ENGO on 13 July 2018 (Seoul).

The anti-nuclear organisations wanted to include the youth and future generations, local residents of nuclear power plant areas, and residents of Milyang in the citizen participation group to secure a representative nature in the deliberative poll, giving weight to the youth and residents of the areas around nuclear power plants. However, this demand was not accepted.<sup>21</sup>

Second, the government limited the deliberative agenda to “whether to resume the construction of the Shin-Kori No. 5 and 6,” which was a minor issue, instead of “whether to use nuclear energy.”<sup>22</sup> During the presidential election campaign, as a candidate Moon Jae-in promised to suspend the construction of the Shin-Kori No.5 and 6 and to consider No. 3 and 4 as issue on which to deliberate, but when he took office, the process rates of No. 3 and 4 were over 90%, and those of No. 5 and 6 were around 30%. Considering this situation, the government decided to continue construction of No. 3 and 4 and consider No. 5 and 6 as issues for deliberation after internal discussion.<sup>23</sup>

Lastly, the government did not consult with denuclearisation organisations in the process of establishing and setting basic rules for public debate, including the three-month public debate period. Despite the fact that some National Assembly members from the Democratic Party of Korea, which is the ruling party, support a denuclearisation policy, the ruling party did not play any significant role in regard to the deliberative poll.<sup>24</sup> Moreover, a three month-deliberative poll period was decided upon, so that the schedule of the Ministry of Trade, Industry and Energy (MOTIE) to complete the draft of “The 8th Basic Plan for Long-term Electricity Supply and Demand (2017–2031)” by the autumn of 2017 was not interrupted.<sup>25</sup>

From the standpoint of the denuclearisation organisations, acceptance of the public debate requested by the Moon Jae-In administration could be interpreted as acceptance of a pledge to back off from denuclearisation; also, there was a risk of uncertainty in the conclusion. Furthermore, the complexity of the economic, environmental and industrial issues made denuclearisation problematic; but abandoning construction of Shin-Kori No. 5 and 6 was made still more difficult by the composition of the legislature and the media landscape, neither of which were favourable to the cause of denuclearisation (Lee, 2018).

Although the public debate over denuclearisation was determined by the government, the process was controlled by the public debate committee made up of nine members. How the committee designed and controlled the public debate process was able to have a significant impact on the final decisions, and the committee sought to present itself as impartial by having members take a neutral position toward denuclearisation. A list of candidates was given to both pro and con groups, and each made lists of those they would prefer to exclude. In their place, they recruited people with expertise in areas such as conflict management and survey statistics to lead the public debate. In this respect, fairness among those for and against could be secured within the sphere of public debate. However, since the pro-nuclear group had been unilaterally disseminating information beneficial to themselves, with the help of funding, friendly groups of experts and the media, the denuclearisation group was relatively disadvantaged in the debate (Hankyoreh, 2017; Lee, 2018).

Of the 471 citizens who participated in the public debate, 59.5% chose to resume construction, while 40.5% chose to stop construction. At the same time, 53.3% of the participants chose to reduce the

country’s reliance on nuclear power, while 35.5% favoured the status quo, and 9.7% wanted to expand nuclear power. On October 24, 2017, the government accepted the conclusions of the citizen participants, announcing that Shin-Kori No. 5 and 6 would resume construction, and that it would continue to pursue a policy of denuclearisation.

The public debate over Shin-Kori No. 5 and 6 has significant meanings in various respects: delegating the final decision to citizens; overcoming the professionals’ view that was critical of civic participation in the nuclear power plant issues; and confirming the high-level of deliberation in citizens participating in the public debate. These are significant in terms of the development of democracy, especially deliberative democracy, in South Korean society. At the same time, however, it revealed several conditions including the lack of time for sufficient deliberation, insufficient representativeness of the participants, and a non-level playing field (in other words, the pro-nuclear group, having superior dominance in finances and manpower, can easily shape public opinion), all of which need to be corrected in order to settle the culture of deliberative democracy in South Korea (Lee, 2018).

It is still unclear how the public debate over Shin-Kori No. 5 and 6 will affect denuclearisation and energy conversion in the long term. There is a positive effect that the comprehension level of Korean citizens about the nuclear power plant was enhanced in the process of the deliberative poll, but there is also criticism that the Moon Jae-in administration took advantage of the deliberative poll to avoid political liability for withdrawing the campaign promise to halt the construction of Shin-Kori No. 5 and 6.<sup>26</sup> Indeed, there have been continuous struggles over nuclear policy. For example, in Taiwan, pro-nuclear activists won a landslide victory in Taiwan’s 2018 referendum. In November 2018, a council of 210 pro-nuclear professors and opposition party (Liberty Korea Party) legislators viewed this as an opportunity and challenged the Moon Jae-In administration’s nuclear policy and proposed a referendum to abolish the policy of phasing out nuclear energy. However, the Moon Jae-In administration rejected the proposal, and said the result of the referendum against Taiwan’s nuclear phase-out will not affect the government’s policy on its own nuclear phase-out (An et al., 2018).

In addition, conflicts between the central government and nuclear host communities are likely to become increasingly serious. According to North Gyeongsang Province, the operation rate of nuclear power plants has fallen since the Moon administration was inaugurated, resulting in a significant reduction in local tax revenue. Five heads of local governments in North Gyeongsang Province requested the resumption of the construction of the Shin-Hanul nuclear power plant units No.3 and 4. However, the South Korean MOTIE remarked that the loss of tax revenue in North Gyeongsang Province is temporary. Regarding the demand for the resumption of the construction of Shin-Hanul units No. 3 and 4, MOTIE explained, “The government has already set a policy direction that it will not build, and the final decision will be made by Korea Hydro & Nuclear Power (KHNP)” (Son, 2018). On the other hand, the KHNP worried about the possibility of Doosan Heavy Industries & Construction, a major supplier of reactors for the KHNP, filing a lawsuit if it were to cancel the projects. Moreover, Doosan had already spent 700 billion won (\$571 million), including 490 billion won to build the two reactors. Given this, while the government announced its intention to suspend construction of Shin-Hanul No. 3 and 4 during the public debate, KHNP used the term “deferment” instead of “cancellation” (Chun, 2020; Heo, 2020).

Nevertheless, it is clear that the Moon Jae-In administration has pivoted from a policy of nuclear expansion to one of denuclearisation. The government, which announced during the public debate its intention to suspend construction of new nuclear power plants after Shin-Hanul No. 3 and 4, also announced an Energy Conversion Roadmap to reduce the number of nuclear power plants to 14 by 2038 on October 24,

<sup>21</sup> Interview K2: a member of an ENGO on 9 July 2018 (Seoul); Interview K3: a professor from Hanshin University who is also a member of ENGO on 12 July 2018 (Seoul); Interview K5: a member of an ENGO 13 July 2018 (Seoul).

<sup>22</sup> Interview K5: a member of an ENGO 13 July 2018 (Seoul).

<sup>23</sup> Interview K2: a member of an ENGO on 9 July 2018 (Seoul).

<sup>24</sup> Interview K1: members of an ENGO on 9 July 2018 (Seoul); Interview K4: A professor from Seoul National University who is also a member of ENGO on 12 July 2018 (Seoul).

<sup>25</sup> Interview K1: members of an ENGO on 9 July 2018 (Seoul).

<sup>26</sup> Interview K5: a member of an ENGO on 13 July 2018 (Seoul).

2017. In addition, on December 20, 2017, the Moon Jae-In administration announced its Implementation Plan of Renewable Energy (2030), which will increase the share of electricity generated by renewable energy by 20% by 2030 (Choi, 2017). It also advanced the 8th Basic Plan for Long-term Electricity Supply and Demand (2017–2031), which lays out its vision of denuclearisation, the shuttering of coal-fired plants, and expansion of renewable energy to improve environmental impact and safety – a significant departure from prior plans focused on the stability of supply and economic feasibility (MOTIE, 2017).

## 6. Discussion

Our case studies of Taiwan and South Korea show that nuclear energy presents a very complex issue in both countries, including the safety, cost, supply of electricity, and carbon emissions. It is rather difficult for both countries to completely abandon the nuclear option.

Both in Taiwan and South Korea, the construction of nuclear energy began in an era of authoritarian rule characterised by centralised politics and limited participation. This is consistent with Neumann et al.'s (2020) finding that less free political environments enhance the probability that nuclear energy will be employed. The development of nuclear energy in both countries also characterises the concept of the Asia developmental state in the centralised political system (Lee, 2021). In these regards, nuclear energy served as the basis for more advanced economic development and introduced path dependencies and nuclear lock in for both countries.

A dominant state and centralised decision making on nuclear energy (and energy policy more generally) have established interest structures surrounding nuclear energy stakeholders including the government (Kim and Chung, 2018), making energy transition even more difficult to achieve. In both countries, environmental-friendly administrations faced strong opposition from incumbents, unions, and industries (Huang and Chen, 2021a; Lee, 2021). The results of 2017 deliberative polls in South Korea, and 2018 referendum in Taiwan, highlight the difficulties in breaking through interest structures around nuclear energy.

In Western democracies, such as Germany, energy decision making is more consensual thanks to long-term debate and civil society discussions. Interestingly, in Taiwan and South Korea, nuclear-sceptic administrations, instead of turning to the diffusion and decentralisation of decision-making power, utilised dominate state power to realise their nuclear phase-out agenda through a careful manipulation of deliberative polls and referendum. Consequently, these democratic innovations remained under the thumb of the state. For both Taiwan and South Korea claiming to have learned from the experience of *Energiewende*, this not only makes it harder to transition from decentralised energy system, but weakens value of democratic participation.

In South Korea, the change of presidential administration in 2017 saw anti-nuclear advisors displace incumbent pro-nuclear experts (Lee, 2021). Similarly, in Taiwan, anti-nuclear ENGOs – long-standing allies of the DPP – were brought into the energy decision-making process (Huang and Chen, 2021b). Both countries, then began to strategically broadly promote renewable energy projects. In these instances, state-led concentration on renewable energy facilities resulted in processes which differed markedly from the Western experience in terms of diffuse, community-based, and localised renewable development, undermining public participation and resulting in further disputes (Huang and Chen, 2021b).

However, the referendum in Taiwan and deliberative poll in South Korea also contribute to democracy consolidation in both countries. Generally, democratic innovations such as referenda and deliberative democracy are considered supplementary to representative democracy in promoting direct public participation resulting in better decision making, and hence as improving the quality of democracy. Issues such as energy transition can be conducted from the bottom up, and with a community-based approach, in order to avoid more polarisation of the public sphere.

That said, in Taiwan and South Korea, we see the opposite. Both the relatively environmentally friendly Tsai and Moon administrations would like to push through their green agenda and finally resolve the nuclear energy issue. However, in environmental regulation, these democratic regimes continue to show signs of a dominant central state that not only plays a significant role as regulator, but also a player in deciding which issues will be delegated to democratic innovations, and who will have the final say on the results.

Our first finding revealed that these governments fully control the issue and dominate the process in delegating certain issues for such direct democratic fora as referenda and deliberative polls. The general public can initiate a referendum or lobby the government to ask it to hold deliberative discussions, however the government remains free to ignore public opinion even at the ballot box. In Taiwan's case, although the legislature has significantly amended the Referendum Act to allow a less strict threshold for initiation of a referendum by the members of the public, the referendum proposal on nuclear power and its endorsements continued to be strictly reviewed by the CEC. It is unknown if this is because this referendum ran contrary to government policy, however, the process obviously weakened public participation, hindered democracy, and aroused distrust and displeasure among the general public.

On the other hand, in South Korea, Moon's administration has the absolute power to decide what issues would be delegated to the public to decide. As a result, Moon retreated from his election campaign to conduct a deliberative poll to resolve the conflicts surrounding construction of the Shin-Kori nuclear power plants No. 5 and 6. In addition, the Moon government fully controlled the process, public debate, and agenda setting by establishing a nine-member committee. Although this effort made the discussion more efficient and focused, they also limited democratic public participation and weakened the quality of the decision making.

Our second finding concerns the idea that both governments in Taiwan and South Korea acted as players and regulators in both direct democracy practices in which they have the final say in interpreting the result. This dual role weakens the effectiveness of democratic participation and undermines democracy. In Taiwan, after losing the nuclear power referendum, the DPP government weakened the Referendum Act in May 2019, and followed up by having the MOEA and officials from BOE announce that 'nuclear-free 2025' would remain government policy (Chen and Chung, 2019).

In South Korea, Moon's move to conduct a deliberative poll on resuming construction of Shin-Kori No. 5 and 6 could be read as less consequential as neither result would harm the regime. Several of our interviewees confirmed that the government regularly declared its denuclearisation position during the deliberative process, however, in light of the threat of North Korea, and given the demands of economic growth, and pride in the export of nuclear technology to UAE, the South Korean public was less keen to go nuclear-free. Therefore, the Moon administration could test public opinion about nuclear energy during his honeymoon period and, if the public supported resumption of construction, the government could easily claim that they followed the public opinion to shift the official denuclearisation position while maintaining the ultimate goal of denuclearisation. This explains why the Moon administration held to the nuclear-free position, but unlike Tsai's administration in Taiwan, did not give a timetable.

Our last finding suggests that in determining how the government would act, political considerations were of primary importance rather than reaching a satisfactory resolution to the complex energy issues facing both Taiwan and South Korea. Our case studies in Taiwan and South Korea show that the ruling parties in each case seized upon democratic innovations as means by which to realise their own ends rather than to support meaningful public participation.

Our research suggests that in the context of environmental regulation and in the political situation in East Asia, democratic innovation and direct democracy practices are less likely to result in better decision

making. Instead, these tools are like to be applied by governments to fulfil their own political interests. As a result of state domination of the process and freedom to interpret the results, direct democracy can paradoxically undermine the quality of democracy.

## 7. Conclusion and policy implications

Our research suggests that although Western democracy theory suggests that more public participation will lead to better policy quality and legitimacy, our case studies of nuclear energy in the context of the Asian environmental state indicates the opposite. We observed strong state domination and centralised decision making on nuclear energy in Asia developmental states such as Taiwan and South Korea and conclude that the state still plays a substantial role and will continue to dominate in the process. The difference lies in whether the system promotes greater decentralised and consensual, or centralised and pre-determined decision making.

Our case studies on the deliberative poll in South Korea and the referendum on the nuclear phase-out in Taiwan showed high state control over the public participation process and undermined the result of the democratic process of public participation. This reveals the legacy of authoritarian rule as well as the mentality of environmental regulators, in which the state guides economic, environmental and social development.

The study confirms that when the state acting as both regulator and player, public participation schemes will be less democratic and less effective than they ought, and that the ruling party may very well subvert the process for its own ends. As a result, these practices only are insufficient to resolve disputes over nuclear energy, but can further polarise public opinion. This situation leaves citizens locked out of meaningful participation.

While it is difficult to breakthrough from government domination, where complex issues such as nuclear energy are concerned, there are three policy implications that civic groups and decision makers, including government officials, should advocate for when incorporating the key elements of democratic participation into the decision-making process.

First, the legal effect of direct democracy should be institutionalised. As it is, a government can accept the results of these democratic innovations to avoid legislative oversight and yet subvert the popular expressed will. In Taiwan, despite the fact that the referendum act set out the legality of this referenda, the government still acted contrarily. In South Korea, the results were not legally binding, and therefore the government need not adhere to the results of the deliberative process. To work through these difficulties, any issue that could be delegated for decision through direct democracy should be better defined and constantly reviewed by the legislature. In addition, in order to respect public opinion, it is particularly important that there be a mechanism by which the government is obliged to comply with the result of these direct democracy practices. Failing that, should the executive refuse to respect the will of the people, cabinet members should resign in protest. Exacting a price for undemocratic acts would alter the political considerations that we saw lead to interference in processes of democratic innovation.

## Appendix 1. List of face-to-face interviews

code	Interviewee background	Date of interview
K1	This is a group interview three environmental activists of an Environmental NGO (ENGO) based in South Korea	9 July 2018
K2	A professor from Chungbuk National University who is also a member of ENGO	9 July 2018
K3	A professor from Hanshin University who is also a member of ENGO based in South Korea	12 July 2018
K4	A professor from Seoul National University who is also a member of ENGO based in South Korea	12 July 2018
K5	ENGO based in South Korea	13 July 2018

(continued on next page)

Second, in the case of nuclear power, meaningful access to information require that information not only be available, but disseminated to local communities in order to inform people about the latest developments, and extending public discourse to all those affected. It also means ensuring that people understand the information, including the pros and cons of each and every energy option, because nuclear power is very complex and technical, and even when information does reach local communities, people might not be able to grasp the significance or implications for them. Scientists and local people may use very different terminology when they describe the same nuclear issues.

Last, building trust between citizens and the government is not an easy task. The way in which the Taiwan government responded to the referendum result is troubling because it not only damages the public trust but also lowers the political effectiveness of public participation which may result in the public being less likely to participate in public affairs. On the other hand, in South Korea, despite the government totally controlling the process, the deliberative process more or less gradually built trust among the government, the anti-, and pro-nuclear sides. The more open the government, the more trust can be built and the more people are willing to join in the public participation process. By doing so, it will improve the decision-making quality and consolidate democracy in both countries.

After Fukushima, South Korea and Taiwan have witnessed a more intense debate over the subject of nuclear energy. Employing democratic innovation practices to resolve the issue of nuclear energy with strong dominance of the government in a centralised decision-making political system proved to be less democratic. It is a general pattern in Asia developmental state where state-led democratic innovation will serve for the interest of the ruling party. Our study draws upon the characteristics of decision making in nuclear energy in the context of the Asia developmental state. This research can contribute to the broad discussion on public participation. However, as our research merely focus on the national level, we hope to spur more discussion on energy decision making in different types of democracies and in different layer of governance.

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## CRediT authorship contribution statement

**Gillan Chi-Lun Huang:** Conceptualization, Methodology, Writing – original draft, Supervision. **Rung-Yi Chen:** Conceptualization, Methodology, Writing – original draft. **Byung-Bae Park:** Conceptualization, Methodology, Writing – original draft.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(continued)

code	Interviewee background	Date of interview
T1	Anti-nuclear scholar who is also a member of ENGO based in Taiwan	29 May 2018
T2	Resource Economist who is also a member of pro-nuclear NGO	8 June 2018
T3	ENGO based in Taiwan	14 August 2018
T4	A Journalist	25 September 2018
T5	Local NGO based in Gongliao District, New Taipei City, Taiwan	14 September 2018
T6	A professor who is also a member of pro-nuclear NGO based in Taiwan	26 September 2018
T7	Environmental NGOs (ENGOs) based in Taiwan	27 September 2018
T8	A professor who is also a member of pro-nuclear NGO based in Taiwan	28 September 2018

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