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Nuclear decision-making in Hong Kong: A background paper

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This paper is work-in-progress and the authors welcome constructive feedback.

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Preface

This background paper represents work in progress. It is part of the early outputs derived from a Public Policy Research Project titled “Effective governance for energy security in Hong Kong: improving public engagement and public trust in nuclear decision-making” (HKU7005-PPR-11), which is undertaken for the Research Grants Council of Hong Kong to inform decision-making for nuclear power.

For more details about this research project and our related publications, you may visit our project website: <http://www.kadinst.hku.hk/nuclear/index.html>.

Abstract

Nuclear power has played an important role in Hong Kong's energy management system since the 1990s when the city began to import nuclear power from neighbouring Guangdong province. The energy source has attracted intensive public attention in Hong Kong in recent years following the Fukushima nuclear accident in March 2011. The government's proposal to increase the use of nuclear power from the current 23% to 50% by 2020 – a major energy policy change which was announced in September 2010, only six months before the Fukushima accident took place – has become a subject of debate. It is in this context that this background paper offers some initial analysis of the key issues of public concern on nuclear power, the trends in, and effectiveness of, public engagement as a way to improve nuclear power decision-making in Hong Kong since 1980s to 2012.

1. INTRODUCTION

The threats of global warming and increasingly expensive fossil fuels have prompted many nations and cities to reconsider the development of nuclear power to enhance energy security. Worldwide, nuclear expansion plans have been introduced in not only developing countries such as China and India but also developed countries. At present 63 nuclear power reactors are under construction, 160 planned and 329 proposed, adding to the existing 430 commercial nuclear power reactors currently operating in 31 countries with a total installed capacity of 372,000 MW (World Nuclear Association, 2012).

In Hong Kong, the government's first climate change strategy released in September 2010 has proposed an increase in the use of nuclear power as a source of electricity from the current 23% to 50% by 2020. However, nuclear power as a key low-carbon energy strategy poses challenges to policy-makers in this city. Worldwide, the choice of nuclear power and siting decisions often trigger a public outcry and result in significant project delays. Nuclear decision-making touches upon issues that are not limited to technological concerns, but extend to economic, social, environmental and governance issues. The Fukushima nuclear accident in Japan in March 2011 dramatically impacted on public perceptions of nuclear power worldwide. While some countries such as Germany have introduced policies that mark a shift away from nuclear energy, others such as China have decided to implement its nuclear expansion plan but with some adjustment after months of review (GO, 2012). In Hong Kong, amidst heightened concerns about nuclear risks the discussion on the future energy fuel mix has been reopened under the leadership of a new government which took office in June 2012 (Cheung, 2012; Environment Brueau, 2012).

Nuclear decision-making often poses challenges to policy-makers for a number of reasons. Firstly, different stages in the life-cycle of nuclear power, from uranium extraction, power generation and to waste disposal have given rise to public concerns over a broad range of issues including the legitimacy of the use of nuclear power, managing nuclear risks, siting of new nuclear plants, and disposal of radioactive waste. Secondly, nuclear decision-making is often controversial. Public and political views may be divergent but there is clearly a need to reach consensus. Thirdly, nuclear decision-making often involves shifting priorities in energy policy-making. Since the early 2000s, nuclear power has become an attractive energy option for many countries as an effective means to mitigate carbon emissions. But following the Fukushima nuclear accident in 2011, many of those pro-nuclear energy strategies came under urgent review amidst public concerns about nuclear risks.

It is in this context that this working paper aims to assist Hong Kong to improve nuclear decision-making as a mechanism to better manage nuclear risks. Our analysis gives particular attention to how and to what extent public engagement and trust may be the key processes in effective nuclear decision-making. Specifically we attempt to answer three questions:

- What are the problem characteristics of nuclear decision-making in Hong Kong?
- To what extent are current nuclear decision-making processes in Hong Kong effective in terms of public engagement and trust building?
- How can nuclear decision-making be improved?

The paper is organised as follows. The following section provides an overview of major developments of nuclear power in Hong Kong since the 1980s. It then examines the characteristics of nuclear decision-making in Hong Kong which may present special challenges to policy-makers. This is followed by a section which identifies the key issues of

public concern regarding nuclear power and trends in public engagement as a way to address these public concerns in Hong Kong. This paper concludes by providing a preliminary evaluation of the effectiveness of the Hong Kong approach to engaging the public in nuclear decision-making. We also offer some policy recommendations.

2. NUCLEAR POWER IN HONG KONG

2.1. Nuclear power developments in Hong Kong

Although nuclear power became a major policy issue in the West as early as in the 1970s, it was not until the early 1980s that it was first seriously considered as an energy option in Hong Kong. In 1980, the China Light and Power (CLP) officially proposed to the Hong Kong government its plan to import nuclear power from Daya Bay in Shenzhen to supply electricity to Hong Kong (Lam, 1996; World Bank, 2000). In 1994, CLP started to import nuclear power from Daya Bay Nuclear Power Station (DBNPS). At present nuclear power contributes about 23% of the total electricity consumption of Hong Kong while coal contributes to 54% and natural gas 23% (Environment Bureau, 2010b). A more recent development is the government proposal to expand the use of nuclear power as part of the fuel mix. In September 2010, the government launched its public consultation on a climate change strategy – the first of its kind in Hong Kong – in which it proposed to increase the use of nuclear power from the present 23% to 50% by 2020.

Table 1. Major nuclear events in Hong Kong

1980	CLP proposed to import nuclear power from Guangdong to Hong Kong
1994	CLP started to import nuclear power from Daya Bay Nuclear Power Station to Hong Kong
September 2010	HK government announced its proposal to increase the use of nuclear power to 50% by 2020 in its first public consultation paper on climate change strategy.

2.2. The Daya Bay Nuclear Power Station (DBNPS)

The DBNPS is located in Shenzhen, Guangdong - about 50 km to the northeast of Tsim Sha Tsui in Hong Kong. It uses nuclear technology and turbines from France and the UK. It consists of two 984-MW Pressurized Water Reactors (PWRs) (HKNIC, 2011), generating more than 14 billion kWh per year (CLP, 2010). About 70% of the electricity generated by DBNPS is exported to Hong Kong, which accounts for 23% of the total electricity consumption in Hong Kong (HKNIC, 2010). The original supply contract, on the basis of which CLP is supplied with 70% of the nuclear electricity generated from Daya Bay, was due to expire in May 2014. An agreement was signed in September 2009 to extend the contract to another term of twenty years from May 2014 to May 2034 (CLP, 2009; HKNIC, 2010; HKSAR Government, 2009).

The power plant was developed by a joint venture between the Guangdong Nuclear Power Joint Venture Company Limited (GNPJVC) and the Hong Kong Nuclear Investment Company Limited (HKNIC), which own 75% and 25% of the equity respectively (HKNIC, 2012). Back in the 1980s, CLP's investment in nuclear power was motivated by the need to diversify its fuel mix to mitigate the impact of oil shocks in the wake of the oil crises in the 1970s (World Bank, 2000). But in recent years, environmental benefits of nuclear power in terms of carbon reduction have reinforced CLP's interest in this energy option. It has been

reported that the DBNPS can avoid 7.5 million tonnes of CO₂ emissions per year, and has led to a cumulative reduction of 110 million tonnes of carbon emissions in Hong Kong since 1994 (Lancaster, 2010). The plant is also of political significance and was a strategic move on the part of the Chinese government in its power sector. The DBNPS was not only the first commercial nuclear power station in China, but also one of China's most important early international joint ventures (HKNIC, 2010). This project was also CLP's first expansion outside Hong Kong's geographical territory (HKNIC, 2010).

2.3. Some characteristics of energy and nuclear decision-making in Hong Kong

Located on the southeast coast of China, Hong Kong has a population of 7 million people and extends over a geographical area of about 1,104 km² (CSD, 2012). Hong Kong is a Special Administrative Region of China. It enjoys a relatively high degree of autonomy in executive, legislative, and judicial matters under the authority of China's central government (Conney, 1997). The "one country, two systems" political framework that has governed central-local relations since the return of Hong Kong to Chinese sovereignty in 1997 has led to complex and dynamic interactions between the Mainland central government, the Guangdong government, and the Hong Kong government in all major policy areas including energy (Chow, 2001; Lo, 2008; Mah, van der Vleuten, Hills, & Tao, 2012).

Electricity in Hong Kong is supplied by two utilities, China Light and Power (CLP) and Hongkong Electric (HKE). Both are privately-owned, vertically integrated, and operate as geographical monopolies (Chow, 2001; Lo, 2008). In Hong Kong, the philosophy of laissez-faire capitalism underpins the economy and many public policies. Government tends to rely on private sector actors to lead the way and to shape major energy decisions (Lo,

2008), including whether to expand the use of nuclear power.

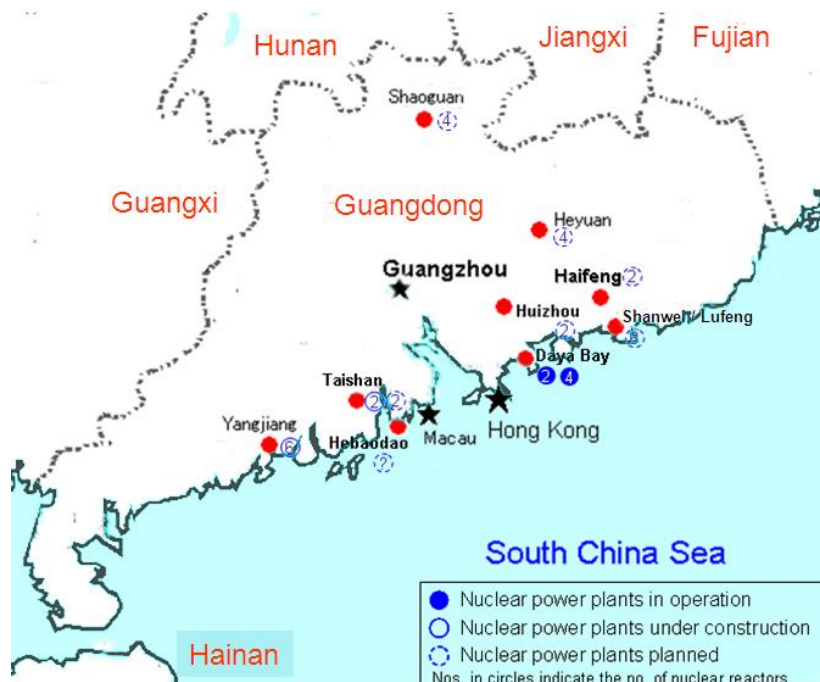
The stakeholder landscape of the electricity sector is also highly dynamic. While the Hong Kong government and the two power companies are the key decision-makers, the Mainland central government and the Guangdong government also have important roles to play. In addition, civil society in Hong Kong has been increasingly active in recent years and this has given rise to more active roles for legislative councillors, political parties, environmental groups as well as the media (Oxfam, 2010).

The cross-border dimension of nuclear power in Hong Kong, and the associated equity and risk management issues, are particularly important and rather distinctive features of nuclear issues in Hong Kong. Apart from importing nuclear power from Guangdong, Hong Kong depends on the Mainland to handle the radioactive waste. While 70% of the electricity generated from Daya Bay nuclear power plant is supplied to Hong Kong, the resulting nuclear waste, which amounts to about 75 tonnes each year, is stored and handled by facilities in the Mainland (Kadak, 2006; WNA, 2013). The low- and medium-level radioactive wastes are being stored and disposed of at a regional facility in *Beilong* (北龍) in Shenzhen. The spent high-level nuclear waste is stored in fuel storage pools at the reactor sites in Daya Bay. When these pools fill up, the wastes are transported to a reprocessing centre in Lanzhou, in central Gansu province (WNA, 2013) (Kadak, 2006).

The nuclear development plan in Guangdong is also highly relevant to perceptions of nuclear risks in Hong Kong. At present there are two nuclear stations in operation (six reactors with a total capacity of 6,108 MW) in Guangdong that are located within 50 km of Hong Kong (CLP, 2010; WNA, 2013). Two further nuclear plants are under construction (eight reactors with a

total capacity of 10,004 MW) (WNA, 2013), and another 7 are proposed in Haifeng, Hebaodao, Heyuan/Jieyang, Huizhou, Lufeng, Shaoguan, Taishan (Unit 3 &4) (20 reactors with a total capacity of 24,500 MW)¹ (WNA, 2013) (Figure 1). A recent proposal to build a uranium processing plant in Jiangmen, Guangdong, has attracted wide media coverage in Hong Kong (Wong & Chan, 2013) and is another illustration of the prominence and sensitivity of cross-border issues in the nuclear debate in Hong Kong. A study published in *Nature* found that Hong Kong is one of the worst affected areas of nuclear risks in the world (Butler, 2011). This study, conducted by *Nature* and Columbia University, provided a population analysis on nuclear risks globally, and found that Hong Kong is exposed to high nuclear risks because of its proximity of nuclear power plants in neighbouring Guangdong province.

Figure 1. Nuclear power plants in Guangdong



Source: Map compiled by authors with data retrieved from WNA website <http://world-nuclear.org> (dated 8 August, 2013)

¹ Data relating to the number of reactors and the installed capacity of the proposed Hebaodao nuclear plant is not included because it is not publicly accessible.

Another characteristic of nuclear decision-making in Hong Kong is the relatively passive role of the Hong Kong government in a cross-border notification system. An official notification mechanism for nuclear contingencies has been jointly established by the Guangdong government and the Hong Kong government (Emergency Support Unit, 2012). Under this mechanism, the Hong Kong government has appointed two government officials as representatives in the Board of HKNIC (HKSAR Government, 2010), and is updated on the operation of the DBNPS once a month.

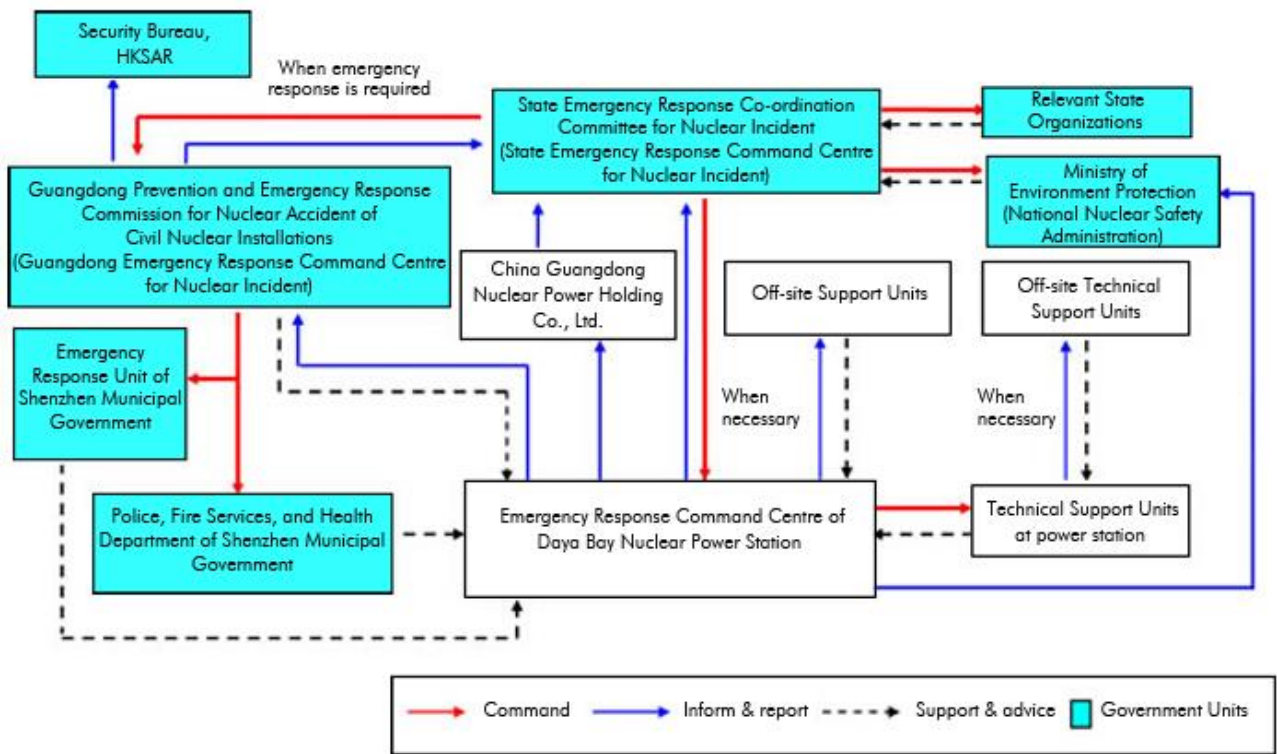
The Hong Kong government has assumed a relatively passive role under this mechanism. Although it can request the HKNIC to provide it with an investigative report when a nuclear incident occurs (Mingpao, 2010, November 16; Oriental Daily, 2010, November 16), generally, the Hong Kong government is passively notified by the Guangdong government in case of emergency events in the nuclear power plant. In events of an “off-site Emergency”, the Guangdong authority is required to immediately inform the Security Bureau (SB) of the Hong Kong government (HKNIC Website, 2012). SB is then required to determine the appropriate level of activation of the Daya Bay Contingency Plan, and to direct and coordinate the HKSAR Government’s response (Emergency Support Unit, 2012).

Table 2. Classification of emergency situations in Daya Bay Nuclear Power Station

Classification of emergency situation	Descriptions
Emergency Standby	Safety levels may be reduced at the plant
Plant Emergency	Radiological consequences of the emergency are confined to a section of the plant
Site Emergency	Radiological consequences of the emergency are confined to the site
Off-Site Emergency	Radiological consequences of the emergency extend beyond the site boundary

(Panel on Security, 2011)

Figure 2. An organisation chart of the information flow for nuclear events at the Daya Bay Nuclear Power Plant requiring emergency responses



(HKNIC Website, 2012)

3. PUBLIC ENGAGEMENT IN NUCLEAR DECISION-MAKING IN HONG KONG

3.1. Public concerns about nuclear power in Hong Kong

Nuclear power has been an important and controversial component of the local energy system in recent decades. Since the 1980s, there have been several periods of heightened concern about nuclear power in Hong Kong. The first period was the 1980s when public opposition to CLP's plan to import nuclear electricity intensified in the wake of the Chernobyl accident. Public opposition was marked by major demonstrations in 1986 when a million Hong Kong residents signed a petition against the construction of the plant itself. This opposition was in part provoked and sustained by safety concerns arising from the earlier nuclear accident at Chernobyl (Hsiao et al., 1999; Kadak, 2006). Some legislators criticised the Hong Kong government for not disclosing the relevant data to the public in relation to the purchase of nuclear electricity from Guangdong (Liu & Lee, 1999).

The second period is more recent and occurred during the 1990s and 2000s, and was marked by a series of minor nuclear incidents after CLP started to import nuclear electricity in 1994. The public were concerned about the safety of this energy option, as well as the transparency of the notification mechanism that was jointly established by the governments across the border (L.C. H. Chow, 2011; HKSAR Government, 1999, 2009a, 2010a; Panel on Security, 2011). It is important to note that a lack of public trust in the nuclear plant operators and the Guangdong government emerged as a major issue in this period.

The third period can be identified from September 2010 onwards. Although public opposition to nuclear energy had seemed to wane somewhat in early 2000s, it re-emerged in late 2010 when the government proposed in a climate change consultation paper to increase the use of

nuclear energy from the current 23% to 50% by 2020 as a key mitigation measure. The Fukushima nuclear accident in March 2011, only three months after the consultation ended, further intensified public opposition to the nuclear option (Mah et al., 2012).

Table 3 below summarises these three stages of public concerns about nuclear power. The nature, scope, and scale of these concerns varied and evolved over time. It is also important to note that these concerns are not limited to technological issues, but extend to economic, social, environmental, as well as regulatory issues. Specifically, as well as reservations about the safety of nuclear power, the public were also concerned about the unfair distribution of costs and benefits involved, the credibility of scientific information, inequity that is associated with the disposal of nuclear wastes that can remain radioactive for many generations, and transparency of information. The public also showed a lack of trust in the nuclear plant operators and the governments across the border. The plant operators were seen as not being able to safeguard public interests when their private interests suggest otherwise. There was also public distrust in the competence of the governments in Hong Kong and in the Mainland in regulating and managing nuclear risks.

Table 3. The three main stages of public concerns about nuclear power in Hong Kong

Time period	Key nuclear developments/ events	Major concerns	Sources
1980s	CLP announced its plan to import nuclear power from Daya Bay; the construction of Daya Bay Nuclear Power Station; the Chernobyl nuclear accident (1986)	Nuclear safety; nuclear proliferation; the legitimacy of increasing the use of nuclear power (the necessity of the use of nuclear power was questioned); transparency of nuclear decision-making; lack of trust in the competence of the Chinese government to build and operate nuclear power plant safely.	Chiu & Lui, 2000; Gallagher, 1999; Liu & Lee, 1999
1990s & 2000s	CLP imported nuclear electricity, starting from 1994; minor nuclear incidents were reported.	Safety; transparency; lack of trust in the operators and the governments across the border in relation to the notification mechanism.	Chow, 2011; HKSAR Government, 1999, 2009,2010a; Panel on Security, 2011
From September 2010 onwards	In late 2010, the Hong Kong government proposed to increase the use of nuclear power.	Before Fukushima: Costs and reliability; the effectiveness of nuclear as a mitigation to climate change impacts; nuclear waste, inter-generational justice. After Fukushima: Safety; leakage of radioactive materials; lack the trust in the Hong Kong government in managing and regulating nuclear risks.	(Chung, Pang, Lee, & Chan, 2011; Civic Exchange, 2010; Civic Party, 2011; HKRA, 2011)

3.2. Public engagement for nuclear decision-making in Hong Kong: Major developments and trends

The public in Hong Kong has been engaged in nuclear decision-making over recent decades. Such engagement approaches varied across time and were of different scales. Generally, such engagement activities have tended to be more inclusive and transparent in recent years when compared with those back in the 1980s.

In the 1980s, the decision to use nuclear power in Hong Kong was made in a relatively closed decision-making system that was dominated by the Mainland central government, Guangdong government, Hong Kong government and the power companies. Public consultation that could have engaged the public and facilitated constructive dialogue was very limited at that time. The public instead tended to express their concerns in a confrontational manner. A million Hong Kong residents signed a petition against the construction of the plant (Hsiao et al., 1999; Kadak, 2006). Such opposition was widely reported in local media, and was in part provoked and sustained by safety concerns arising from the earlier nuclear accident at Chernobyl disaster (Hsiao et al., 1999; Kadak, 2006). On the other hand, the Legislative Council at that time was concerned about nuclear issues. As well as participating in the debates in the Legislative Council, some councilors participated in fact-finding trips and visited the nuclear power plant in Daya Bay (Legislative Council, 1986; Yee & Wong, 1987).

Approaches to engaging the public relating to nuclear decision-making have tended to become much more inclusive and transparent in recent years. The 2010 consultation on Hong Kong's climate change strategy is a good example to illustrate such changes (Environment Bureau, 2010a). During the three-month consultation period that started in September and

ended in December, there were two main public engagement activities. These were the release of a consultation document, and a special legislative meeting. There were also a number of post-consultation engagement activities that included another special legislative meeting held in April 2011, four month after the end of the consultation period, and a stakeholder workshop held by the Environment Bureau to invite views on the future fuel mix in Hong Kong. These engagement activities are summarised in Table 4 below.

In addition to these engagement activities, there were other activities that included:

- Meetings held by the Panel on Security of the Legislative Council relating to the notifications mechanism between the Hong Kong and Guangdong governments on nuclear incidents in DBNPS;
- A meeting held by the Advisory Committee on the Environment relating to the consultation document on the climate change strategies;
- Forums organised by think-tanks (such as Civil Exchange), academics (such as City University of Hong Kong and the University of Hong Kong) and professional associations;
- Public surveys conducted by think-tanks (e.g. Civil Exchange), NGOs (e.g a joint survey was conducted by WWF, Greenpeace and Friends of the Earth), research associations, and political parties (e.g. Civic Party).

Table 4. Major public engagement activities related to the Consultation on Hong Kong's Climate Change Strategy and Action Agenda

Engagement exercises	When	Who included	What included	How included
1. Release of a consultation document - Online survey - Dedicated website - Technical workshops	September – December 2010 (consultation period)	<ul style="list-style-type: none"> ● Environment Bureau (EB) and Environmental Protection Department (EPD) ● The commissioned consultants ● NGOs ● Business and professional associations ● The public at large 	<p>Public views were invited to comment on the following:</p> <ul style="list-style-type: none"> ● The proposed increase of the use of nuclear power from 23% to 50% by 2020 ● The proposed sectoral strategies to be adopted by transport, building and appliance, power generation, waste management ● The scenario analysis <p>Workshops were held on these themes: climate change study, mitigation, vulnerability and adaptation</p>	<ul style="list-style-type: none"> ● Consultation paper announced in the media ● Public comments via mail, email and fax ● Online survey (57 responses) ● 5 technical workshops (150 attendees in total) ● Informative website
2. Special legislative meeting: Public Consultation on Hong Kong's Climate Change Strategy and Action Agenda	26 Nov, 2010	<ul style="list-style-type: none"> ● EB and EPD ● Legislative councilors ● NGOs ● Academics ● Power companies ● Stakeholder associations 	<ul style="list-style-type: none"> ● To make nuclear choices ● Nuclear concerns were discussed. These include necessity, safety, cost, reliability, environmental impacts, siting, public awareness 	<ul style="list-style-type: none"> ● This was a special meeting held by the Legislative Council's Panel on Environment Affairs
3. Special legislative meeting: "Proposal to Increase the Share of Nuclear Power in the Fuel Mix"	29 Apr, 2011	<ul style="list-style-type: none"> ● Same as above 	<ul style="list-style-type: none"> ● Same as above 	<ul style="list-style-type: none"> ● This was a special meeting held by the Legislative Council's Panel on Environment Affairs
4. Workshop: Future energy fuel mix	31 Oct, 2012	- EB	Discuss the prospects of future energy fuel mix	<ul style="list-style-type: none"> ● A stakeholder workshop ● About 100 attendees representing about 70 parties from local utilities, tertiary institutions and environmental concern groups (HKSAR Government, 2012; Mingpao, 2012, November 1; Oriental Daily, 2012, November 1; Ta Kung Pao, 2012, November 1)

3.3. An evaluation of the effectiveness of engaging the public for nuclear decision-making in Hong Kong: the case of the 2010 consultation on Hong Kong's climate change strategy

The 2010 consultation on Hong Kong's climate change strategy merits an evaluation because it is one of the most important engagement activities relating to nuclear choices in Hong Kong in recent years. One feature of the participatory approach of this consultation is the important role of a consultancy study which forms the basis of the government's pro-nuclear proposal presented in the consultation document.

The consultancy study "A Study of Climate Change in Hong Kong – Feasibility Study" was commissioned by the Environmental Protection Department in 2008. The 78-page final report, with three appendices that have about 450 pages, was released in early December 2010, which is less than a month before the closing date of the consultation on 31st December, 2010. This study integrates both technical analysis and feedback from major stakeholders to assess implications and to make recommendations. Three scenarios are analysed in the report, proposing to either double, increase nuclear use by half, or keep the current level by 2050. Various implications of increasing the use of nuclear are discussed in the report, such as environmental impacts on air quality and carbon emissions, effects on future electricity price, necessary engineering and infrastructural projects. The effectiveness of these three scenarios is evaluated in terms of energy, environmental, and economic cost and benefits. Scenario 3 (i.e. to increase the use of nuclear power to 50%) was chosen by the government and presented as the proposed climate change strategy for Hong Kong (Environment Bureau, 2010b).

It is important to note that engaging the public was a key element of the consultancy study. A

number of stakeholder engagement activities took place during the study period to allow public participation. These include five public workshops on related topics, and the establishment of a project internet website. In two of the workshops, the public was invited to discuss and provide comments on the existing and potential mitigation policies and measures. The public did raise some concerns over the siting of new nuclear capacity, the procedures for importing nuclear energy, and who will be involved in decision making regarding to this issue (ERM, 2010).

Generally, the 2010 climate change consultation was inclusive in a number of ways. Firstly, the proposed strategy was based on the findings of the consultancy study, which, as noted, placed emphasis on engaging the public. Secondly, diverse stakeholder groups and the public at large were invited to offer feedback on the consultation documents. There are however a number of major limitations in the consultation process.

The first limitation is that there was a lack of comprehensive information. One example is that the full costs of different scenarios were not evaluated. The consultancy study provides a detailed analysis of the scenarios' impacts on the air quality and carbon emissions in Hong Kong. In total, seven pages in the main report and seven pages in the appendix are devoted to the discussions on potential impacts on air quality. For example, the effects of each scenario on carbon emissions are analysed at different levels – gross changes, per GDP, per capita, and by sectors. The expected changes in emissions are also estimated for four major pollutants, namely SO₂, NO_x, PM₁₀, as well as CO_{2e}. However, other environmental impacts such as nuclear waste disposal, and carbon emissions associated with the infrastructure construction needed for nuclear and natural gas capacity expansion are not discussed as part of the environmental impact analysis. Another example relates to the analysis on social implications of the scenarios. Public perceptions and acceptability would be an important element of a

social feasibility assessment of these scenarios. However, the social implications of public concerns over safety risks of radioactive releases, energy security issues associated with the growing dependence on imported electricity, as well as the lack of effective management and information disclosure systems relating to nuclear power are not discussed in the consultancy report.

Another major limitation is relating to timeliness of making useful information accessible to the public. The three-month consultation began in September 2010 and at that time a 64-page consultation document was released to the public. The 78-page full report of the consultancy study was not made available for public access until early December, when there was less than a month left for public consultation. An early release of the consultancy report would have allowed the public to gain access to useful information in order to make informed decisions, as well as to provide constructive feedback.

4. DISCUSSIONS AND POLICY IMPLICATIONS

We would like to highlight a number of observations concerning nuclear decision-making in Hong Kong as follows:

1. Since the 1980s when CLP first announced its plan to import nuclear electricity from Guangdong province, nuclear power has remained one of the most controversial energy options in Hong Kong and has provoked considerable local public opposition over recent decades. Local concerns about nuclear power are many. These are not limited to technological and safety issues, but include the accountability of nuclear power plant operators as well as the regulatory competence of the Chinese and Hong Kong governments.

There has been public distrust in the key decision-makers in nuclear-related policies in Hong Kong, including the Hong Kong government, the power companies, nuclear plant operators, as well as some nuclear experts (including some members of the Energy Advisory Committee which is the government think-tank on energy issues).

2. Nuclear issues in Hong Kong are cross-border in nature. Whatever Hong Kong's future energy choices (i.e. to expand or reduce the use of nuclear power, or retain the current level of usage), the SAR is and will continue to be exposed to a similar level of nuclear risks because of its proximity to Guangdong which will be implementing its nuclear expansion plans. In other words, scaling down the use of nuclear power in Hong Kong may not be effective in reducing the nuclear risks to Hong Kong people.
3. Current public engagement systems relating to decision-making concerning nuclear power are ineffective. The recent 2010 consultation on Hong Kong climate change strategy failed to provide comprehensive information in a timely manner to the public.

Our observations have policy relevance in Hong Kong. We have three policy recommendations:

1. A participatory approach to nuclear decision-making is needed. Decision-making processes need to be transparent and open so that they can effectively invite and incorporate public inputs for better policy decisions. Better information about the risks and benefits involved, as well as better understanding of the concerns of different stakeholder groups and the reasoning of their views are some of the priority areas that should be considered in any nuclear-related engagement exercises.

Problems of public distrust require adequate attention in nuclear decision-making in Hong Kong and a wide range of non-technical concerns also need to be addressed. It is important to note that concerns about the credibility of some nuclear experts in Hong Kong – who are often relied by the Hong Kong government in nuclear-decision-making through for example the Energy Advisory Committee – need to be properly addressed. The commissioning of independent studies or investigations, for example, may improve the credibility of expert inputs.

2. In consideration of the nuclear expansion plan in Guangdong, Hong Kong should assume a more proactive role in contributing to the management and regulation of the nuclear industry in the Mainland. Major stakeholders in Hong Kong, including the government, nuclear experts, academics, NGOs, as well as the general public, can assume various but complementary roles. For example, while the government and nuclear experts can work more closer with the Mainland authorities to strengthen regulatory systems, academics in Hong Kong can develop joint programmes with universities in the Mainland to help train up nuclear professionals. The NGOs, media, and the general public in Hong Kong on the other hand can continue to apply pressure to help improve transparency and accountability of management and regulatory systems.
3. The government needs to improve the design of public engagement to enhance its effectiveness and credibility. Ensuring public access to comprehensive and objective information in a timely manner is one of the prioritised areas.

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