

Report on the Public Consultation on Future Fuel Mix for Electricity Generation in Hong Kong

PURPOSE

This Annex reports on the feedbacks and comments we received during the public consultation on future fuel mix for electricity generation in Hong Kong conducted from 19 March to 18 June 2014.

BACKGROUND

2. The “fuel mix” for electricity generation means the mix of energy sources used to generate electricity. Hong Kong does not have any indigenous resources for electricity generation and has been meeting its electricity demand through importing fuel for local electricity generation or importing electricity from the Mainland. In 2012, coal dominated the overall fuel mix in Hong Kong (53%), followed by nuclear electricity imported from the Daya Bay Nuclear Power Station (DBNPS) in the Mainland (23%), natural gas (22%), and oil and renewable energy (RE) (2%).

3. In order to facilitate timely planning of necessary infrastructure to meet the future electricity demand when existing coal-fired generating units start to retire from 2017, and to achieve the environmental targets we have set for 2020 in respect of reducing carbon intensity and air pollutant emissions, we conducted a review of the future fuel mix for electricity generation, and launched a three-month public consultation.

4. We put forward two fuel mix options for public consultation. The first option was "grid purchase", under which importing electricity through purchase from the Mainland power grid (i.e. the China Southern Power Grid) was proposed. The second option was "local generation", under which use of more natural gas for local generation was proposed. The consultation document set out the analysis of the benefits and drawbacks of these two fuel mix options against the four energy policy objectives and some other key considerations, including implications for the post-2018 electricity market, diversification, flexibility in scaling up future supply and possible impact on local employment.

5. In order to encourage the public and stakeholders to provide their views and comments on this important matter, radio and TV APIs were launched and advertisements placed on newspapers to publicise the public consultation, and a total of 30 discussion forums and meetings were held with various stakeholders to solicit their views. We also consulted the Legislative Council (LegCo) Panel on Economic Development, the Energy Advisory Committee (EnAC) and the Advisory Committee on the Environment (ACE).

6. Having consolidated the opinions received, we set out the key findings in the ensuing paragraphs.

KEY FINDINGS OF THE PUBLIC CONSULTATION

Total Number of Responses

7. To facilitate the public to provide their feedbacks, a standard response form was included in the public consultation document, which asked them to indicate if they support the two options, show their preference over the two options, and provide other comments and suggestions.

8. We received a total of 86 128 submissions, of which 84 839 were from individuals and 1 289 from groups and organisations. 2 188 submissions are anonymous submissions. Their inclusion would not have any material impact on the outcome of the overall analysis. Meanwhile, we notice that 1 256 and 155 emails of the same content came from two accounts and one submission was attached with 293 signatures, most of which had no personal particulars. These three cases were treated as three submissions only.

9. Among the submissions, 136 were excluded from our analysis as there was internal inconsistency, e.g. indicating both support and objection to the same option, or supporting option 2 and objecting to option 1 in question 1, but preferring option 1 over 2 in question 2. There were a total of 582 late submissions received during the one-month period after the end of the consultation period, which were also excluded from our analysis.

Analysis of the Responses

Support for the two options

Consultation question 1: How do you view each of the two fuel mix options with regard to safety, reliability, cost, environmental performance and other relevant considerations?

10. The first question asked the respondents to indicate if they support or do not support each of the two fuel mix options. If they do not support any of the two options, they are invited to indicate the reasons by ticking the boxes next to the four energy policy objectives of safety, reliability, affordability and environmental performance, or specifying other reasons. A total of 85 651 responses were received, with 84 436 coming from individuals and 1 215 being corporate responses.

Option 1

11. Limited number of respondents supported the “grid purchase” option. On the other hand, the majority of respondents did not support this option. “Reliability” was the most common reason given by respondents in objecting to this option. Most of the respondents who did not support this option included “Reliability” as a reason for not supporting this option, although most of the respondents gave multiple reasons. Many respondents also quoted “Environmental Performance”, “Safety” and “Affordability” as reasons for objection.

12. Limited number of respondents indicated that they had some other reasons objecting to the “grid purchase” option, but most of them did not specify the reasons or merely repeated the four energy policy objectives. Among those who gave a specific reason, most of them were worried that Hong Kong would lose control and regulation of the power sector. Some other more notable reasons were –

- (a) *Over dependency on the Mainland* – some respondents considered that as electricity is an essential utility, Hong Kong should strive for self-sufficiency through local generation and avoid over dependency on the Mainland.
- (b) *Displacement effect* – some respondents expressed concerns that importing electricity would lower Hong Kong’s own emissions at the expense of the Mainland and neighbouring regions.

- (c) *Implications for local employment and career development* – some respondents considered that the “grid purchase” option would reduce the scale of local electricity generation by the two power companies, thereby affecting local employment opportunities and career development of engineers in the electricity supply sector.

Option 2

13. A majority of respondents, for both individual and corporate responses, supported the “local generation” option. Limited number of respondents did not support this option. Among them, the majority cited “Affordability” and half of them cited “Reliability” and “Safety” as reasons for objection. Some respondents mentioned they opposed this option on other grounds but did not specify the reasons.

14. Of all the submissions, most supported either the “grid purchase” option or the “local generation” option. Only a small fraction supported both options, or opposed to both.

Preferred option

Consultation question 2: Which of the two fuel mix options do you prefer? Why?

15. The respondents were asked to indicate their preference over the two fuel mix options, and state the reasons. A total of 84 340 responses to this question were received, with 83 163 coming from individuals and 1 177 being corporate responses.

16. A majority of the respondents preferred "local generation" over “grid purchase”. “Reliability” was the most frequently cited reason for their preference with the majority of those who preferred option 2 picking this reason, followed by “Environmental Performance”, “Safety” and “Affordability” in that order. Slightly over half preferred “local generation” on the ground of all the four major policy objectives.

17. Some other reasons given for their preference for “local generation” include -

- (a) pursuing the "grid purchase" option would have a negative impact on local employment and career development of those in the power sector;

- (b) importing electricity would render Hong Kong losing control and regulation of power supply; and
- (c) “grid purchase” would cause Hong Kong to be over-reliant on the Mainland.

18. Limited number of respondents preferred the “grid purchase” option, with more than half of them choosing all four energy policy objectives as the reasons. “Affordability” and “Environmental Performance” were slightly more frequently cited than the other policy objectives as the reasons for support. Other reasons given for their preference for “grid purchase” include -

- (a) there would be a higher possibility to introduce competition to the local electricity market under the “grid purchase” option; and
- (b) importing electricity would help diversify our fuel mix and minimise the reliance on a single type of fuel.

19. Of those who preferred “local generation”, most of them did not support “grid purchase”, and vice versa. Only a few who preferred “local generation” also supported “grid purchase”. Regarding the small fraction of respondents who supported both options, most of them preferred “local generation”; the same pattern is observed in respect of the small number of respondents who objected to both options.

Other comments

20. Other than showing their support or otherwise for the two fuel mix options and their preference, some 5 400 respondents also provided specific comments and suggestions in the submissions. The major views expressed are set out below –

- (a) *Promotion of RE* – there were about 3 000 submissions suggesting that the Government should consider further promoting the use of RE in Hong Kong. While acknowledging the lack of indigenous resources in Hong Kong and the impracticality for RE to assume a higher portion of the fuel mix, they considered that the estimate of 1% of RE by 2020 was too pessimistic.
- (b) *Displacement of pollutants* – there were about 1 300 submissions suggesting that the fuel mix of the Mainland power plants was no cleaner than that in Hong Kong. Importing electricity from the Mainland would be tantamount to displacing or exporting the

pollutants from local power generation to the Mainland. About half of these respondents held the view that importing electricity from the Mainland would lead to more coal-fired power generation therein.

- (c) *Promotion of Integrated Gasification Combined Cycle (IGCC)* – some 1 200 submissions suggested that IGCC be promoted in Hong Kong, which was a technology to gasify coal before its combustion for power generation to enhance efficiency and reduce air pollutant emission.
- (d) *Loss of control and regulation* – about 1 000 submissions expressed worries that Hong Kong would lose control and regulation of the electricity imported from the Mainland under the “grid purchase” option, including control of reliability and contingency arrangement, control of the cost of generation in the Mainland, tariff of imported electricity, engineering regulation, control of generation fuel mix, control and certainty on emission performance, etc.
- (e) *Promotion of demand side management* – about 600 submissions suggested that demand side management should be further promoted. A slower or even negative growth of electricity consumption would help reduce the need for natural gas for power generation thereby minimizing our use of highly-priced fuels.
- (f) *Implications for local employment and career development* – some 400 submissions considered that importing electricity from the Mainland would constrain future development of the two local power companies, thereby affecting the employment opportunities of local engineers and other practitioners in the power sector.
- (g) *Over reliance on the Mainland/Self-sufficiency* – about 300 submissions suggested that Hong Kong should continue to rely mainly on local electricity generation rather than relying on the Mainland for power import, as we have the capability to be self-sufficient.
- (h) *Introducing competition to the market* – some 200 submissions suggested that having more local generation would add constraints to introducing competition to the electricity market.

They considered that the Government should consider introducing competition to the electricity market. Enhancing interconnection of the two local power companies through the “grid purchase” option could help achieve that goal.

- (i) *Use of nuclear power* – some respondents considered that Hong Kong should gradually phase out the use of nuclear power, while some considered that given the excellent track record of the DBNPS in providing reliable and reasonably priced electricity to Hong Kong, the Government should consider importing additional nuclear power from existing nuclear plants in the Mainland or even from new plants, as a means to mitigate future tariff increase and lower the emission from power generation.

Major Views of Stakeholder Groups

21. Most of the feedbacks presented above were received by means of the standard response form. Some 100 written submissions with elaboration of views and comments from various groups and organisations were also received. In addition, we attended 30 fora and discussion sessions to discuss with various stakeholder groups the fuel mix options and solicit their views. We consulted the LegCo Panel on Economic Development at its meeting on 12 May 2014 to listen to the views of the deputations, and another meeting on 26 May 2014 to discuss with Members. We also consulted the EnAC and the ACE on the fuel mix options. The major views received are set out below.

Power companies

22. The CLP Power (CLP) considered that in planning for the future fuel mix, it is important to preserve the flexibility and optionality. It suggested a phased and flexible approach, which combines both “grid purchase” and “local generation” option. More specifically, CLP reckoned that the “local generation” option would provide more certainty in terms of maintaining electricity supply reliability as well as improving environmental performance; while the “grid purchase” option had the potential to provide more opportunities in the longer term for importing electricity of lower carbon as the Mainland’s reliability continues to improve. It proposed to start early on the planning of the “local generation” option to meet Hong Kong’s electricity needs by building a small number of new local gas units, commence a detailed study for the “grid purchase” option, and review future electricity demand and relative energy costs before determining a firm fuel mix ratio.

23. The Hongkong Electric (HKE) considered that the “local generation” option clearly prevailed over the “grid purchase” option when assessed against the Government’s four energy policy objectives and other major considerations. In terms of reliability, “grid purchase” was untested whereas the “local generation” option could certainly help maintain the high reliability of power supply. In respect of environmental performance, the “grid purchase” option would only transfer the emissions from Hong Kong to the Mainland and the imported electricity from the Mainland would likely be generated from coal. On the other hand, coal generation would be replaced by gas generation under the “local generation” option, which would help reduce emissions not only in Hong Kong but also in the region. On affordability, HKE opined that the “grid purchase” option would eventually render Hong Kong becoming a captive buyer, losing bargaining power for fair, reasonable and competitive import electricity prices. Regarding gas price for local generation, HKE considered that gas prices had come down from their historical peaks and would likely be stabilised at the present level with room for reduction.

24. As regards other criteria for assessment, HKE opined that “grid purchase” did not assist in diversifying Hong Kong fuel’s mix as the fuel used to generate the imported electricity would likely be coal. “Local generation” was also more flexible in scaling up future supply, while “grid purchase” was a rigid option in adapting to changes in future demand, due to its huge infrastructure development and long lead time for construction. It also reckoned that option 1 would not bring any meaningful competition as it would end up with a single bulk supply from the CSG. Overall, HKE considered that Option 2 should be adopted.

LegCo and political parties

25. Majority of the submissions from political parties and LegCo Members commented that there was not enough information for making a considered choice; more information on the two fuel mix options, such as the generation costs and the supply reliability of the Mainland power sector, should be provided. Most did not express clear preference over the two options, while there were a few submissions in support for “local generation”, slightly more than those for “grid purchase”.

26. Most of the submissions acknowledged the importance of supply reliability and doubted if the high level of reliability could be maintained under the “grid purchase” option. On environmental performance, there

was a majority view that the “grid purchase” option would displace pollutant emissions to the Mainland. Some criticised that the Government had failed to propose a reduction of the share of nuclear energy in the fuel mix, and the proposed “grid purchase” option would in effect increase the use of nuclear power. Some reckoned that importing electricity from the Mainland would affect the career development of local professionals in the power sector. On the other hand, some suggested using more nuclear power to mitigate pressure on future tariff while preserving supply reliability.

27. Most submissions agreed that the “local generation” option would increase Hong Kong’s reliance on natural gas, the price of which was highly volatile. It also required capital investments on new gas units, which would have tariff implications. There was a suggestion that the power companies should source natural gas globally to reduce reliance on a single source, and the Government should study the feasibility of developing LNG infrastructure to enhance energy security and support diversification of gas sources.

28. Most submissions suggested that the Government should consider actively promoting RE, in particular waste-to-energy, and continue to take the lead in promoting energy efficiency and conservation.

29. Some submissions commented on the future development of electricity market. There were views that the permitted return should be lowered in the next SCAs and the power companies should be asked to shoulder part of the fuel costs. Some suggested that the Government should proceed with the segregation of generation and transmission businesses and enhancing interconnection between the two power companies in order to open up the electricity market.

Business sector

30. There was a general preference for local generation for its well-tested reliability. Concerns were expressed over the “grid purchase” option, and some suggested that the Government should conduct a detailed study on the relevant technical and financial arrangements. Majority of the respondents stressed the importance of maintaining a high level of supply reliability, which was vital to business operations. They noted that Macao was not a good comparison as it might not require the same level of supply reliability. They had doubts on the reliability of the electricity supply from the Mainland, especially when the

Government did not have direct control over the generation and transmission of electricity from the Mainland. On the environmental front, some doubted that the “grid purchase” option would likely result in higher emissions in the Mainland as the fuel source of the imported electricity was not specified. The marginal fuel type would likely be coal, and it was unclear if the coal plants in the Mainland would adhere to the same stringent emission control as that in Hong Kong. The possible displacement effect was also mentioned in a number of submissions.

31. On affordability, many submissions noted that there was insufficient information on the cost comparison between the two fuel mix options, as well as the cost of and funding arrangement for the cross-boundary infrastructure. The mechanism for regulating the price of imported electricity was unclear and Hong Kong might become a captive buyer in the long run. Respondents were generally concerned about the likely increase in electricity tariff in future. Some suggested that LNG facilities might be considered to assist the power companies to gain access to international gas sources.

32. A few submissions suggested that given the imported nuclear power from the DBNPS had a proven record of supplying reliable and affordable power to Hong Kong, consideration should be given to increase the share of nuclear power in our future fuel mix. Many respondents suggested that more RE including waste to energy should be adopted.

Professional bodies and think tanks

33. There was a general preference for local generation as it could ensure supply reliability, although some submissions commented that both options had their own drawbacks. Most of the respondents stressed the importance of maintaining a high standard of supply reliability. Some commented that the “grid purchase” option depended on the security of the Mainland transmission network, which would be susceptible to extreme weather events. In case of emergency, it would be difficult for a local backup generating unit to kick-in. Some noted that the experience of Macao might not be directly relevant. Some groups suggested that a detailed study should be conducted to look into the various issues pertaining to the “grid purchase” option, such as the funding arrangement for constructing the necessary cross-boundary transmission line, means to ensure reliability, operational arrangement, etc. A few submissions reckoned that importing electricity from the Mainland would cause Hong Kong to lose its self-reliance.

34. On environmental performance, most respondents considered that the "grid purchase" option merely outsourced electricity generation to the Mainland, while more local generation by gas would be more preferable for emission reduction at source. Majority of the respondents believed that under the "grid purchase" option, Hong Kong would have no control of the cost of generation in the Mainland and might become a captive buyer with no bargaining power on the price of import. They acknowledged that the "local generation" option had the drawback of high gas price, with some suggesting that this might be mitigated by having an LNG terminal in Hong Kong. They also suggested that the "local generation" option could be deployed in incremental steps to preserve flexibility.

35. Some groups were open to the use of nuclear energy and suggested that consideration be given to increase its share in the fuel mix. Quite a number of groups suggested that the Government should step up efforts on promoting RE (including the construction of offshore windfarms and the promotion of distributed electricity generation) and energy efficiency.

36. Some of the respondents held the view that the long-term fuel mix was closely related to the future development of the electricity market and the regulatory framework, and suggested that the Government should lay out its plan for the latter and the implementation details.

Green groups and NGOs

37. Most of the green groups and NGOs did not support either option, with some explicit reservations over the "grid purchase" option. On environmental front, there was a general view that as the fuel mix of the imported electricity from the Mainland was not specified, it was unclear if it would be cleaner than that produced locally. Importing electricity under such mode would mean displacing emissions from Hong Kong to the Mainland. Some went further to suggest that we should import RE from the Mainland or make sure that for every quantum of electricity imported from the Mainland, an equal amount of RE would be generated. A few submissions also expressed concern about the reliability of importing electricity from the Mainland.

38. Most respondents suggested that the Government should be actively promoting the use of RE. Some advocated the setting of a specific RE target, while some suggested that the generation and

transmission businesses of the power companies should be separated and access to the grid should be provided to distributed RE to promote its development. Another clear view held by the groups is that energy efficiency and conservation should be more vigorously promoted to reduce energy consumption. A possible measure is to introduce progressive tariffs for non-domestic consumers. Many respondents in this group suggested that we should not increase the use of nuclear energy. Some said that the price setting mechanism under the SCAs should be reviewed.

Environment Bureau
March 2015