

**Confirmed Minutes of the 198th Meeting of
the Advisory Council on the Environment
held on 12 May 2014**

Present:

Prof Paul LAM, JP (Chairman)
Prof CHAU Kwai-cheong, JP (Deputy Chairman)
Dr Gary ADES
Dr Dorothy CHAN, BBS
Dr Billy HAU
Dr HUNG Wing-tat, MH
Prof LI Xiang-dong
Mr Anthony LOCK
Prof Nora TAM, BBS, JP
Dr Alfred TAM
Dr Eric TSANG
Prof Jonathan WONG, MH
Mr Luther WONG
Prof Ray YEP
Prof Ignatius YU
Mr Andrew LAI (Secretary)

Absent with Apologies:

Mr Oscar CHOW
Prof FUNG Tung
Prof John NG
Miss Yolanda NG, MH
Dr Carrie WILLIS, SBS, JP
Ms Pansy YAU
Dr Eric YIP

In Attendance:

Ms Anissa WONG, JP	Permanent Secretary for the Environment/ Director of Environmental Protection
Mr Y K CHAN	Assistant Director (Conservation), Agriculture, Fisheries and Conservation Department (AFCD)
Mr Silas LIU	Acting Assistant Director of Planning/Technical Services, Planning Department (PlanD)
Ms Kelly CHAN	Senior Information Officer 1, Environmental Protection Department (EPD)
Miss Evelyn LEUNG	Chief Executive Officer (CBD), EPD

Ms Joanne CHIN
Ms Daicie TONG

Executive Officer (CBD), EPD
Executive Manager (CBD), EPD

In Attendance for Item 2:

Mr LIU Ming-kwong,
Vincent, JP

Deputy Secretary for the Environment

Mr NG Man-kit, Donald

Principal Assistant Secretary for the
Environment (Electricity Reviews), Environment
Bureau (ENB)

Action

Item 1 : Matters arising from the minutes of the 197th meeting held on 9 December 2013

The Chairman informed Members that the minutes of the 197th meeting held on 9 December 2013 had been confirmed via paper circulation in February 2014 and uploaded on the Council's website for public information.

2. The Chairman advised that the report on ACE's briefing session held on 18 January 2014 for key stakeholders would be discussed in the closed session under "Any Other Business".

Item 2 : Public Consultation on the Future Fuel Mix for Electricity Generation

(ACE Paper 2/2014)

3. The Chairman said that the discussion would be divided into two parts. The Presentation and Question-and-Answer Session would be opened to the public while the Internal Discussion Session which would remain closed.

[The presentation team was invited to join the meeting at this juncture.]

Presentation Session (Open Session)

4. The Chairman welcomed Mr Vincent Liu and Mr Donald Ng of the Environment Bureau (ENB) to join the meeting. Mr Ng first gave a powerpoint presentation on the public consultation on the future fuel mix for electricity generation with reference to the following key aspects in the consultation document –

- Reasons for change
- Planning horizon and current fuel mix
- The two proposed fuel mix options and major considerations
- Comparison of the two options

5. Mr Ng elaborated that while Option 1, i.e. purchase of grid power

from the Mainland, proposed to import electricity from the China Southern Power Grid Co. Ltd. (CSG), the option would also require local power companies to increase power generation by natural gas. The major difference between the two proposed options was the respective roles to be played by imported grid power under Option 1 vis-à-vis local generation by natural gas under Option 2. The three-month public consultation would close on 18 June 2014.

Question-and-Answer Session (Open Session)

6. Members had raised a number of questions and views/concerns on the two proposed fuel mix options which were summarized under the following themes –

I. Purchase of grid power from the Mainland

(A) Reliability

7. A Member said that grid purchase had not been tested in Hong Kong. He opined that there might be a higher risk of power failure as Hong Kong had no control/monitoring over electricity supply from CSG. Besides, CSG might not give priority treatment to Hong Kong in face of competing demands. He also questioned the rationale of local power companies providing back-up generation capacity to cater for emergency given the high costs involved. Some other Members raised the same questions.

8. A Member considered said that as the community had little knowledge on power supply in the Mainland and the fuel mix involved, further information should be solicited from CSG on its fuel mix and the environmental performance of individual power plants. There would be environmental gains if Hong Kong could designate purchase from those power plants which used cleaner and greener fuel to generate electricity. He said that there should be a new regulatory regime on importing electricity from CSG, similar to the Scheme of Control Agreements (SCAs) which the Government currently had with the two local power companies, i.e. the Hong Kong Electric (HKE) and the China Light and Power (CLP). Two Members echoed the same view. One of the Members also asked about the role of the Government in terms of the negotiation leverage. She advised that in the case of Macau, it was the Macau Electricity Co. and not the Macau Government which signed the agreement for importing electricity from CSG.

9. In response, Mr Vincent Liu advised that CSG was expected to have surplus capacity and hence could have sufficient electricity to meet Hong Kong's demand in the run up to 2020. He cited the case of CSG currently supplying electricity to Macau. Information from the Macau Government showed that CSG had a good track record with a high reliability level of 99.999%, which was comparable to that in Hong Kong. The unit electricity price was also set at a reasonable level. Macau indeed progressively increased the proportion of imported electricity from CSG from around 10% initially to

the current 90%. It showed clearly that the Macau Government and the community at large were satisfied with CSG's performance. The reliability level of CSG power network in other major metropolitan areas in the Mainland such as Guangdong and Shenzhen was above 99.9%, which represented a 70% improvement over the last few years. Mr Liu said that if Hong Kong was to import electricity from CSG, the reliability performance of CSG was expected to improve further in 10 years' time. The Government would negotiate with CSG and stipulate all the necessary requirements, including a reliability level which must not be lower than what Hong Kong was currently getting from HKE and CLP. The Government would also endeavour discussions at the Central Government level to secure stable electricity supply to Hong Kong.

10. As regards the electricity back-up arrangement, Mr Liu explained that the system would be similar to the current arrangement as there were already back-up facilities run by HKE and CLP. The cost of grid purchase from CSG had already factored in the cost of back-up facilities. The actual back-up arrangement would be subject to further discussion with the relevant stakeholders, which would include building new back-up facilities, replacing coal-fired plants with gas-fired plants, or extending the operation cycle of existing back-up facilities.

11. On the regulatory regime, Mr Liu explained that power supply of CSG came from different sources and it would not be possible to identify the source of the electricity imported under the grid purchase option. Grid purchase was preferred over purchase from a designated source or power plant(s) as it would facilitate Hong Kong to have a more diversified fuel mix. In case of transmission or operation failure of any one power plant within the grid, there would be continued power supply from other sources in the grid to ensure an uninterrupted electricity supply to Hong Kong. If grid purchase was selected, agreement would be entered with CSG to stipulate the tariff setting mechanism and the required reliability level. The Government would play a role in the negotiation process to ensure that the outcome would serve the best interest of Hong Kong.

12. Ms Anissa Wong added that the public was familiar with local power generation, which could partly explain why the Government had initially received more feedback supporting Option 2. She advised that although grid purchase proposed under Option 1 was untested in Hong Kong, the practice was well established and widely adopted in other parts of China as well as in many other countries.

(B) Cost and affordability

13. A Member suggested that the Government should set up a clear mechanism to administer and monitor the cost of imported grid power. Another Member opined that CSG should provide more information on the future electricity cost of grid purchase so that the public could exercise an informed choice for selecting the preferred fuel mix option. A Member shared a similar concern over the calculation of unit electricity cost to be paid by

individual households.

14. Mr Donald Ng explained that the information provided in the consultation document was about the magnitude of cost implication under the two options. Both options were compared basing on the projected unit cost of electricity generation rather than the actual tariff as the latter could not be ascertained at this stage. Mr Vincent Liu confirmed that the unit cost of the two options were comparable. The unit cost in grid purchase had made reference to the electricity price paid by Macau to CSG, the cost of grid purchase and the price associated in building cross-border infrastructure. The unit cost in local generation had included the natural gas price and the cost of building gas generating units and the associated facilities. Detailed feasibility study would be conducted if it was decided to go for Option 1. He stressed that the Government was mindful that the cost of grid purchase should not exceed the cost of local generation. Should Option 1 prove not viable, the Government could switch back to the local generation option in good time.

15. Mr Ng pointed out that regardless of the fuel mix option to be taken, electricity would cost more than what the public were currently paying as Hong Kong would be reducing the use of less expensive but more polluting coal. Either option would involve substantial capital investment in new transmission infrastructure or new generation facilities as the case might be. The Government's preliminary estimate was that the unit grid import cost under Option 1 and unit gas cost under Option 2 would roughly double the unit generation cost over the five years from 2008-2012. There should not be much price differential between the two options.

(C) Environmental performance

16. A Member opined that while importing electricity from the Mainland would allow Hong Kong to meet the higher carbon emission reduction targets, the resultant displacement effect of shifting the air pollutant emissions across the border would be morally unsound. He opined that the coal plants of CSG must be dirtier than those in Hong Kong. Once the power entered the grid, there would be no distinction of energy generated by clean or dirty fuel, and Hong Kong could not claim to be using the cleaner portion of the electricity supply. Further, Hong Kong had no control over CSG to generate cleaner energy. A Member also asked for information on any major projects which would increase the supply of electricity from hydro or nuclear power. On this, a Member pointed out that while hydro power had a lower carbon footprint, it was widely accepted that the mode of generation was environmentally and ecologically not friendly. He asked for information on the fuel mix of CSG, e.g. use of renewable energy (RE) such as solar and wind power and the respective contribution in CSG's overall electricity supply.

17. A Member noted that the source of power generated was indistinguishable under the grid system. The Government should provide more information on CSG's fuel mix position to facilitate the public to select the option which would demonstrate a better carbon footprint. Another

Member echoed that there should be more information from CSG on the actual fuel mix and the level of carbon emission reduction that could be achieved. A Member considered that the Government should also define the carbon footprint for monitoring the performance of CSG in that respect.

18. On the concern over displacement effect, Mr Liu assured that the effect would be minimal as the current electricity demand in Hong Kong would only account for less than 2% of CSG's overall power supply. It was expected that the proportion of Hong Kong's demand would even drop further in future. He reiterated that the fuel mix of CSG was relatively clean, with non-fossil fuel accounting for over 40% including those generated from hydro, nuclear and wind power. That compared favourably with Hong Kong's current situation as the proportion of non-fossil fuel stood at 25%. Having regard to the national policy to increase the use of cleaner energy, the proportion of non-fossil fuel in CSG was expected to increase in future. That said, grid purchase from CSG should not result in significant rise in the overall carbon emission in the neighboring areas.

[Post-meeting note: Latest information from CSG indicated that the non-fossil fuel of CSG would make up of more than 50% of the installed capacity of CSG and the proportion of coal generation would reduce significantly from 2020 onwards.]

19. As regards the percentage of carbon emission reduction, Mr Liu advised that imported grid power under Option 1 was estimated to reduce carbon intensity by about 60% when compared to 2005 when the entire grid power infrastructure was in place by 2023. By comparison, local natural gas generation under Option 2 would reduce carbon intensity by about 50% by 2020, meeting the lower bound of the reduction targets.

II. Requirement on land resources viz. increase in use of natural gas for power generation

20. A Member said that as the local power companies would be required to supply 60% gas-fired electricity under Option 2, she was concerned on the scale of magnitude or resources required in Hong Kong in terms of additional land to support the construction of gas generating units. This was of particular importance as land supply was a hot topic in the community. A Member echoed the same view. She particularly asked about the extent of the land requirement for building new gas power plants beyond 2020 which was only five years from now.

21. A Member pointed out that there would be a 10% differential in respect of coal power generation proposed between Option 1 and Option 2. He was concerned that if Option 2 was selected, the local power companies might need to build new coal-fired power plants given the retirement schedule of the existing facilities in Hong Kong in the next 10 years.

22. Mr Vincent Liu replied that no extra land would be required as the two power companies had sufficient land resources to develop additional gas generating units. Regarding the exact land requirement in the longer term, it would depend on future electricity demand. He advised that the proposed 20% proportion from coal power under Option 2 would include the use of RE as far as practicable. He further advised that HKE and CLP were not allowed to build new coal-fired power generating units since 1997. As the life expectancy of a power plant was 30-35 years, these power plants would be retired in phases starting from 2017.

III. Possibility of increasing use of renewable energy

23. A Member opined that the Government failed to give a clear vision on the sustainability development of Hong Kong in future. He said that with the higher electricity prices and more active energy conservation campaigns in recent years, Hong Kong would witness a gradual drop in power demand. He suggested that the Government should assume a more aggressive position to promote the use of RE in Hong Kong and to define RE as an independent fuel mix option for the public to select. He said that the Government should ensure Hong Kong moving towards a more sustainable society and the environmental requirements should meet the best standard of the world.

24. A Member asked about the proportion of energy to be contributed by wind farms, solar energy and other forms of renewable sources from CSG. A Member also asked if CSG had solid plans to increase the proportion of RE in their overall fuel mix and the types of RE to be introduced in the coming years. Both suggested the Government to consider investing more in research and development of RE locally to reduce reliance on imported power.

25. Ms Anissa Wong explained that the potential for using RE locally was limited. She said that assuming Hong Kong would have “waste-to-energy” facilities from incineration and sludge treatment in the coming years, the energy so generated would only meet about 1% of the overall electricity demand locally in early 2020s. Unless there was a breakthrough in technology, it would be difficult to develop RE in a massive scale.

26. Mr Vincent Liu supplemented that, in line with the national energy policy, the proportion of non-fossil fuel in the overall fuel mix of CSG was estimated to be over 50% in 10 years’ time. The Government was aware that CSG had plans to increase the percentage of RE in their overall fuel mix such as hydro power and wind power. Mr Donald Ng informed members of the RE projects being planned by CSG.

IV. Diversification of electricity supply

27. The Chairman said Hong Kong had no indigenous resources for power generation. While there were comments that it might be risky for Hong Kong to rely on grid power from the Mainland, it was equally not healthy for Hong Kong to be reliant on natural gas supply from other jurisdictions. A Member added that irrespective of the fuel mix option to be selected, Hong Kong would move for an increasing share of electricity generated by natural gas in the coming years. The Government should endeavour to secure guarantee with the Mainland authority that there would be steady supply of natural gas to the local power companies so as to maintain stability of supply as well as the fuel costs. A Member said that Hong Kong also imported liquefied natural gas from Australia.

28. Mr Vincent Liu said that the established practice was that the power companies contracted the fuel supply themselves. Currently, the bulk of natural gas supply was from the Mainland. He said that regardless of the fuel mix option to be opted for, Hong Kong would have a certain level of reliance on fuel supply from the Mainland. An obvious advantage of imported grid power under Option 1 was that Hong Kong could be less exposed to the fluctuation in the global price of natural gas, which had tripled from USD6 to USD18 - 20 in the past few years.

V. Flexibility in scaling up future supply

29. A Member said that the remarkable social and economic developments in China in the past decades had resulted in an immense increase in the Mainland's domestic electricity demand, which in turn could affect CSG's electricity supply to Hong Kong. A Member also enquired on whether and how a possible drop in electricity demand could be factored in when fixing the rate/volume of power supply with CSG. He quoted the experience in the agreement entered for the supply of water from Dongjiang (東江). A Member commented that the grid purchase agreement should be signed between CSG and the local power companies instead of the Hong Kong Government. This would help ensure that the level of local power generation could be adjusted to complement the grid purchase in coping with fluctuations in electricity demand.

30. Ms Anissa Wong clarified that irrespective of the fuel mix to be opted for, Hong Kong had to project its electricity demand based on the available information and best assessment at the time. For Option 2 on local natural gas generation, the capital investment in building new gas generating units would form the basis for calculating the permitted returns under the current SCAs. Should there be an over-projection on electricity demand, the local power companies would have an over-investment and the consumers eventually would have to shoulder the increased unit costs. There would not be substantial difference between the two fuel mix options as far as projecting the electricity demand was concerned. As grid purchase would entail the construction of

new cross-border infrastructure, it would not be economical if Hong Kong would only import an insignificant volume of electricity from the grid.

31. Mr Vincent Liu supplemented that taking into account the 9% annual growth rate of electricity generated by CSG in the last few years, CSG should have surplus electricity by 2020. Hence the availability of supply should not be a problem. He stressed that if grid power purchase under Option 1 was opted for, further implementation details would have to be further worked out. Taking the example of Macau as a reference, there should be certain flexibility in the demand requirement.

VI. Introduction of competition in local electricity market

32. A Member opined that there should be flexibility in the fuel mix for introducing more competitors, locally or across the border, so long as the fuel types to be used were clean and price-competitive.

33. Ms Anissa Wong said that Hong Kong now relied on HKE and CLP for power supply. Selecting Option 2 would not change the situation. She cautioned that there would be land constraints in introducing a third supplier locally. There had been calls in the community for introducing more competition in the market. One of the merits of Option 1 was that it would provide more room for us to consider introducing competition at the generation level in the future.

VII. Conclusion

34. Members noted that the Government should consider the feasibility and implications of various options that members of the public might suggest. The Government should also explore the use of more RE and take into account sustainability issues for a more diversified and healthy development of the electricity market in Hong Kong.

35. The meeting agreed that each of the two proposed fuel mix options had their own benefits and limitations. It would only be appropriate for ACE to set out and submit to the Government all the issues, views and concerns raised. The discussion so far had not suggested any indication on the preferred option by ACE. Members considered that the views/concerns expressed at the meeting could assist the Government to further consider the various long-term issues at stake, viz. (i) benefits and constraints in increasing the proportion of natural gas in the overall fuel mix; (ii) pace of phasing out coal from the fuel mix; and (iii) more exploration on the use of RE in Hong Kong.

Item 3: Any other business

“Report on Briefing Session by the ACE held on 18 January 2014”

36. The Chairman informed the meeting that a briefing session was held

on 18 January 2014 for key stakeholders on ACE's role and functions. The feedback was positive. The views/suggestions raised by participants and ACE's initial response made at the briefing were summarized in a report and circulated to Members for reference.

Meeting of EIASC on the EIA report on "Expansion of Hong Kong International Airport into a Three-Runway System"

37. The Chairman informed Members that EIASC had selected the EIA report on "Expansion of Hong Kong International Airport into a Three-runway System" (i.e. the Third Runway) for submission to ACE. The Airport Authority Hong Kong (AAHK) was expected to submit the EIA report to EIASC in late July/early August 2014. Given the complexity of the project, EIASC would likely have to hold more than one meeting in mid-August before consolidating its recommendations on the report for discussion by the full Council. EIASC would discuss the structure of meetings when it met on 19 May.

38. In view of the substantial public interests on this project, the Chairman encouraged Members who were not EIASC Members to join the discussions at the EIASC stage. This would enable ACE to have a more focused and comprehensive discussion when the full Council met to consider the EIASC's recommendations and tendered its comments to the Director of Environmental Protection under the EIA Ordinance.

39. The Chairman also informed the meeting that AAHK had approached him to suggest organizing a briefing session for ACE Members. He had declined the suggestion as that would set a precedent for other EIA project proponents to make similar requests with ACE during the EIA process. Instead, he had reminded AAHK of the Council's suggestion at the meeting in October 2012 that the Authority should organize public engagement sessions to collect public views after the EIA report was exhibited for public inspection. ACE Members could attend these sessions in their personal capacity and hear comments/arguments from all interested parties.

Item 4 : Date of next meeting

40. The Chairman informed Members that the next meeting was scheduled on 16 June 2014. Members would be informed of the agenda in due course.

[Post-meeting note: The meeting was cancelled. Members will be advised on the next meeting in due course.]

**ACE Secretariat
June 2014**