

**Confirmed Minutes of the 224<sup>th</sup> Meeting of  
the Advisory Council on the Environment (ACE)  
held on 5 June 2017 at 2:30 pm**

**Present:**

Prof Nora TAM, BBS, JP (Deputy Chairman)

Dr Billy HAU

Dr HUNG Wing-tat, MH

Prof LAU Chi-pang, JP

Ms Julia LAU

Dr Michael LAU

Mr Andrew LEE

Prof Kenneth LEUNG

Mr Anthony LOCK

Ir MA Lee-tak, SBS

Ir Michelle TANG

Dr Eric TSANG

Mr Luther WONG, JP

Mrs Alice CHEUNG, JP (Secretary)

**Absent with Apologies:**

Mr Stanley WONG, SBS, JP (Chairman)

Ir Cary CHAN

Prof Albert LEE

Ir Prof Irene LO

Prof John NG

Ir Conrad WONG, BBS, JP

Prof Jonathan WONG, MH, JP

Mr Simon WONG, JP

Prof WONG Sze-chun, BBS, JP

**In Attendance:**

Mr Donald TONG

Permanent Secretary for the Environment/Director of  
Environmental Protection

Ms Lily YAM

Assistant Director of Planning/Technical Services,  
Planning Department (PlanD)

Mr Simon CHAN

Assistant Director (Conservation), Agriculture,  
Fisheries and Conservation Department (AFCD)

Miss Heidi LIU

Principal Information Officer, Environmental Protection  
Department (EPD)

Ms Becky LAM

Miss Dora CHU

Miss Apple LEUNG

Chief Executive Officer (CBD), EPD

Executive Officer (CBD) 1, EPD

Executive Officer (CBD) 2, EPD

**In Attendance for Item 3:**

Mr Dave HO

Mr LAU Man-pang

Assistant Director (Air Policy), EPD

Principal Environmental Protection Officer (Air Policy),  
EPD

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Action

The Deputy Chairman informed Members that she would preside the meeting on behalf of the Chairman who was currently out of town. Apologies of absence had been received from Ir Cary Chan, Prof Albert Lee, Ir Prof Irene Lo, Prof John Ng, Mr Simon Wong, Prof Wong Sze-chun, Ir Conrad Wong and Prof Jonathan Wong.

**Item 1 : Confirmation of the draft minutes of the 223<sup>rd</sup> meeting held on 8 May 2017 (Closed-door session)**

2. The draft minutes were confirmed without amendment.

**Item 2 : Matters arising (Closed-door session)**

3. There was no matter arising from the minutes of the last meeting.

**Item 3 : Review of the Sixth Technical Memorandum for Allocation of Emission Allowances for Power Plants**  
*(ACE Paper 11/2017)*

4. The Deputy Chairman informed Members that the paper sought Members' views on the proposal to further tighten emission allowances for power plants starting from 1 January 2022 by way of issuing a new Technical Memorandum (TM) under Section 26G of the Air Pollution Control Ordinance (APCO) (Cap. 311). The discussion would be divided into the Presentation cum Question-and-Answer Session and the Internal Discussion Session.

5. The Deputy Chairman invited Members to declare interest. A Member declared that he was engaged in a consultancy project commissioned by the CLP Power Hong Kong Limited (CLP). The Deputy Chairman decided that the

Member could stay on and continue to participate in the discussion.

*[The presentation team joined the meeting at this juncture.]*

### **Presentation cum Question-and-Answer Session (Open session)**

6. Mr Dave Ho introduced the background of the TMs for allocating emission allowances for power plants. By way of a powerpoint presentation, Mr Lau Man-pang briefed Members on the legal framework and approach adopted in the review of the Sixth TM for allocation of emission allowances for power plants. He sought Members' support on the proposal to further tighten the emission allowances by way of issuing a new TM (i.e. the Seventh TM) starting from 1 January 2022 under the APCO.

### ***Retirement of coal-fired generating units***

7. In response to a written question on the retirement of existing coal-fired generating units raised by a Member before the meeting, Mr Lau Man-pang explained that the designed service life of coal-fired generating units was around 35 to 40 years. However, the actual retirement schedule was subject to many factors, including the future electricity demand, change in fuel mix, operating conditions and environmental performance of the units. Currently, CLP and the Hongkong Electric Company, Limited (HEC) each had eight coal-fired generating units.

8. Given that the designed service life of coal-fired generating units was around 35 to 40 years, a Member anticipated that quite a few of them would retire in the coming five to ten years. He suggested that a study on the impact of the retirement of these coal units especially on the electricity tariff should be conducted so as to enable better planning.

9. Mr Donald Tong said that CLP and HEC would include in their five-year development plans their proposals to phase out coal-fired generating units for the consideration of the Environment Bureau (ENB). Under the Hong Kong Climate Action Plan 2030+, Hong Kong would continue to phase down its remaining coal plants as they reach their normal retirement life within the next decade or so and replace them with gas-fired generating units or generating facilities using non-fossil fuels. While natural gas was a cleaner form of energy compared to coal, its increasing use in electricity generation was most likely to lead to an

increase in tariff. The Government would take into account the tariff impact as well as the need to maintain a reliable and stable electricity supply in the future development of electricity generation.

10. A Member was concerned about the reliability of natural gas supply and suggested that a certain percentage of power generation by coal be retained in the energy mix as contingency in case there were any interruptions in the supply of natural gas.

### ***Allocation of emission allowances***

11. In reply to a Member's question regarding the formulae for allocating the emission allowances to the power plants, Mr Dave Ho explained that the emission allowances to be allocated to power plants comprised two parts. The first part was the projected emissions under the adoption of Best Practical Means (BPM) requirements while the second part was the emissions that could be offset by renewable energy (RE) sources. The formulae had already taken into account the anticipated RE intake levels, i.e. 2 gigawatt hour (GWh) for HEC and 100 GWh for CLP. As the amount of energy obtained from RE sources could vary depending on meteorological conditions (e.g. the duration of sunshine for solar photovoltaic power, the strength and duration of the wind for wind energy), the formulae included variables for adjusting upwards or downwards the emissions from coal-fired generating units to account for the deviation of the actual RE intake in that year from the anticipated level.

### ***New technology to reduce emissions***

12. A Member opined that in addition to using gas for power generation, EPD should keep in view the latest technology and explore the adoption of clean alternatives such as nuclear and solar energy with a view to reducing the emission of pollutants, in particular nitrogen oxide (NO<sub>x</sub>) and carbon dioxide (CO<sub>2</sub>). Mr Dave Ho said that it was the Government's policy not to approve new coal plants from 1997 and that new power generation units might be gas-fired units or other cleaner alternatives, if any.

13. A Member sought information on the emission efficiency of each power plant in terms of NO<sub>x</sub>, sulphur dioxide (SO<sub>2</sub>) and respirable suspended particles (RSP) emissions per GWh of electricity generated. Mr Dave Ho advised that the emission efficiency factors of coal-fired-units had been embedded in the formulae

of allocation of emission allowances for the power plants (paragraph 18 of the paper), which were the coefficients of the variables for adjusting the emissions from coal plants due to actual RE intake. He elaborated that the emission factors were affected by the design of the coal units as well as the adoption of BPMs. The power companies had undertaken extensive retrofits in coal-fired units in the past to reduce the emissions and fulfil BPM requirements in the previous TMs. Further retrofit was not practicable owing to the technical and spatial constraints, and it might not be cost effective to retrofit units that would retire soon. Hence the change in fuel mix for power generation would be the key measure to further reduce power plant emissions. EPD had also taken into account new technologies when determining the emission allowances for the two power companies under the new TM. For instance, selective catalytic reduction device would be required for new gas-fired units which could effectively reduce the emission of NO<sub>x</sub> by about 90%. There was also new technology to upgrade the efficiency of existing gas-fired units with improvement in NO<sub>x</sub> emission by about 30%. In fact, one of the eight gas-fired units of CLP had been upgraded, and two additional ones would be upgraded progressively by 2018.

14. In reply to a Member's question regarding the feasibility of upgrading all existing gas-fired units, Mr Dave Ho said that the upgrading work would require the concerned gas-fired units to cease operation for some seven months which would impose constraints in the operation of power plants. He also said that whether the existing gas-fired generating units could be upgraded would depend on the availability of such technology from the suppliers and it might not be cost-effective to upgrade aged units that would retire shortly. Mr Ho reassured Members that EPD would keep in view the latest technological developments in electricity generation and their applicability to Hong Kong.

### ***Emission cap on PM<sub>2.5</sub>***

15. In reply to a Member's enquiry regarding the regulation of the emission of PM<sub>2.5</sub>, Mr Dave Ho explained that the major obstacle to setting an emission cap for PM<sub>2.5</sub> was the lack of a reliable method to measure its concentration in a wet stack as PM<sub>2.5</sub> was water-soluble. For this reason, the United States and the European Union had not capped the PM<sub>2.5</sub> emission of their coal-fired power plants. It should be noted that measures to control the emission of PM<sub>10</sub> could also help reduce PM<sub>2.5</sub> emissions as the latter was a major component of PM<sub>10</sub>. Also, the setting of emission caps on NO<sub>x</sub> and SO<sub>2</sub> emissions from power plants could also help control PM<sub>2.5</sub>, as such gas pollutants could be transformed into nitrate and

sulphate particulates in the atmosphere and therefore reducing these pollutants would help reduce PM<sub>2.5</sub>.

### ***Renewable energy***

16. A Member asked whether the existing financial incentives were adequate to motivate the power companies to develop and increase the intake of RE, and whether RE would be developed as one of the main energy sources to reduce the emission of pollutants. Mr Dave Ho said that given the small area of Hong Kong, the room for developing big RE facilities would be limited. Nevertheless, the power companies had commissioned studies to developing wind farms at two locations in Hong Kong. Apart from the technical feasibility, the development of wind farms would also have to take into consideration the impact on the electricity tariff, and hence it was yet to be accounted for in the TM.

17. A Member suggested the Government set up a task force or advisory committee to oversee the implementation of more proactive measures and setting of targets for the development of RE. Mr Dave Ho said that, in an effort to drive RE development, Feed-in Tariff (FiT) and RE certificates would be introduced under the post-2018 Scheme of Control Agreements (SCA) signed between the Government and the power companies to encourage the private sector and the community to invest in distributed RE for which surplus energy could be sold to the power companies at a rate higher than the normal electricity tariff rate.

18. With reference to the Hong Kong Climate Action Plan 2030+, Mr Donald Tong supplemented that the estimated share of RE including wind, solar and waste-to-energy might reach 3 to 4% of the energy mix by 2030. He also mentioned that under the new SCA, incentives would be offered to the power companies for achieving targets on the volume of RE generated by RE systems in their respective service area. ENB would take into account all relevant factors, including tariff impact, when assessing the RE investment proposals by the power companies. Mr Tong further said that the Government had earmarked \$500 million to implement energy saving projects and \$200 million to install RE facilities in Government buildings. The RE targets for Government buildings had also been upgraded, which included the target to allocate at least 10% of available roof space to incorporate RE technologies, electricity consumption powered by RE in new Government buildings was increased to 1.5% for new schools and educational buildings, and 25% for general public lighting in new open space and public park projects. In an effort to promote the concept of RE to the public,

Government bureaux/departments (B/Ds) had been invited to install display panels to show the amount of RE generated at prominent locations. Examples included the display of RE collected by the pilot floating photovoltaic (PV) system at Shek Pik Reservoir.

19. A Member appreciated the introduction of the FiT and RE certificates which was a major breakthrough that could encourage the community to generate and sell RE to the power companies in the context of the new SCA. Considering the slow progress of the development of the wind farms, the Member opined that greater financial incentives might have to be introduced to promote the use of RE.

20. In response to the enquiry on the percentage contribution of RE out of the total electricity output for HEC, Mr Lau Man-pang said that the Lamma Winds and photovoltaic system at Lamma Power Station could generate around 2 GWh electricity annually, which was far below the total electricity output of HEC of about 12,000 GWh in 2016.

### **Conclusion**

21. The Deputy Chairman concluded that Members were supportive of the proposed Seventh TM and thanked the representatives of EPD for their presentation.

*[The presentation team left the meeting at this juncture.]*

### **Internal Discussion Session (Closed-door session)**

22. A Member enquired and Mrs Alice Cheung replied in the affirmative that TMs would continue to be the main instrument for controlling emissions from the power stations in the foreseeable future. Mrs Cheung said that the Government introduced amendments to the APCO in 2008 which empowered the Secretary for the Environment (SEN) to cap the emission of specified pollutants by power plants. Section 26G(4) of the APCO stipulated that an allocation of emission allowances made by the TM in relation to an emission year could only take effect at least four years after the commencement of the TM making the allocation.

23. Considering that the most effective measures had already been used to fulfil the previous TMs, a Member opined that there was little room for further tightening the emission allowances. He suggested the Government keep in view

of the development of advance technologies and/or cleaner fuels to further reduce the emissions from power plants.

24. With reference to Section 26G(2) of APCO, Mrs Alice Cheung said that SEN would adhere to the BPM requirements for preventing emissions when setting the emission caps. EPD would keep in view the latest technological development in electricity generation, such as retrofitting, upgrading and adopting new techniques where appropriate.

25. The Deputy Chairman considered that the imminent retirement of coal-fired units would provide an opportunity for further tightening the emission allowances. She agreed that the TM was an effective mean to capping the emissions of power plants and should continue to be used in the foreseeable future.

#### **Item 4 : Any other business (Closed-door session)**

##### *Studies on the development potential of sites on periphery of country parks*

26. As the Government announced that it had invited the Hong Kong Housing Society (HKHS) to undertake technological and ecological studies of the two areas in Tam Lam and Shui Chuen O, a Member suggested that relevant Government B/Ds should report the matter to ACE and consult the latter on any related issues. If the Government decided to proceed with the development of these sites, he considered that more information about the development proposals should be made available to ACE.

27. A Member echoed and suggested that the scope of the studies conducted by the HKHS be provided to ACE given that the studies would determine whether the concerned sites were suitable for development. He opined that when conducting ecological studies on the sites, assessment in relation to the ecosystem functions should be included in addition to assessing the diversity and determining the existence of rare species and important habitats.

28. In view of the widespread public attention on the issue, a Member expressed support that the matter should be discussed at ACE with a view to making more information available to the public.

29. Mr Donald Tong explained that as stated by the Chief Executive in the 2017 Policy Address, the community should give consideration to allocating a



small proportion of land on the periphery of country parks with relatively low ecological and public enjoyment value for purposes other than real estate development, such as public housing and non-profit-making elderly homes. The studies to be conducted by the HKHS were only preliminary studies to consider the feasibility of public housing development in two areas: one in Tai Lam covering some 20 hectares of Tai Lam Country Park and the other in Shui Chuen O covering some 20 hectares Ma On Shan Country Park. Further detailed information about the studies was not available at this stage.

30. Mr Donald Tong further said that the conduct of the studies by HKHS did not mean that the Government had agreed to develop the country park land mentioned in the studies for public housing developments. Even if the sites were found to be feasible for public housing development after the studies, the Government would need to consider a host of factors including environmental impact, community views, etc. If the Government decided to proceed with the development of these sites, the applicable statutory processes under the Country Parks Ordinance (Cap. 208), the Town Planning Ordinance (Cap. 131) and the Environmental Impact Assessment Ordinance (Cap. 499), etc. would have to be followed. Mr Simon Chan echoed that the purpose for the studies was to provide an objective basis for public discussion. Given that the studies were at a preliminary stage, no concrete or detailed information of the studies was available.

31. Mr Donald Tong further advised that in the past few years, the Government had incorporated suitable enclaves into country parks, thus increasing the total area of country parks by 38 hectares. He assured Members that the Government was committed to environmental protection and ecological conservation, seeking to strike a balance between development and conservation.

32. A Member declared that she was a Member of the HKHS. She understood that the studies undertaken by the HKHS were still at an initial stage, and the applicable statutory procedures and provisions would not be undermined.

33. Considering the public interest and resources that would be involved in the development proposals, a Member considered that public consultation to gauge consensus in the community was important. A Member suggested the Government consider adopting the principle of “no-net-loss” or land exchange to guarantee no loss in country park area and functions. Another Member, however considered that the application of land exchanges with “no-net-loss” to country parks should be carefully examined as it might have negative impacts on the

current pace of designation and development of country parks in Hong Kong.

34. On whether the HKHS should be invited to brief the ACE on the studies, Mr Simon Chan said Members might consider if it was useful to invite the HKHS to report to ACE at this stage, adding that the ecological and conservation values of the two concerned sites could not be assessed without first collecting the ecological baseline from the studies. A Member said that regard had to be made to the scope of environmental issues that would fall within ACE's advisory capacity. A Member suggested and another Member concurred that if the ACE decided to invite the HKHS to brief it on the studies, or invite relevant Government bureaux and departments to brief it on any development proposals on the sites concerned, it would be helpful to make available beforehand to the parties concerned a list of information that Members would like to know so as to ensure a more gainful exchange.

35. There was no other business for discussion at the meeting.

**Item 5 : Date of next meeting (Closed-door session)**

36. The next ACE meeting was scheduled for 3 July 2017 (Monday). Members would be advised on the agenda in due course.

**ACE Secretariat**

**July 2017**