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Panel on Environmental Affairs

Meeting on 24 October 2016

**Updated background brief on "Technical Memorandum for Allocation of
Emission Allowances in Respect of Specified Licences"
prepared by the Legislative Council Secretariat**

Purpose

This paper provides updated background information on the development of the Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences ("TM"), and gives a brief account of the views and concerns expressed by Members in relation to the last review of TM in 2015.

Background

Emission caps for the power sector

2. The Air Pollution Control Ordinance (Cap. 311) ("APCO") empowers the Government to set emission caps for power plants for improving air quality in Hong Kong. Section 26G of APCO provides for the Secretary for the Environment ("SEN") to allocate emission allowances for three specified pollutants, i.e. sulphur dioxide ("SO₂"), nitrogen oxides ("NO_x") and respirable suspended particulates ("RSP"), for power plants by way of a TM.¹ Section 26G(2) stipulates that in making emission allocations, SEN should have

¹ Under section 37B(6) of APCO, TM is not subsidiary legislation but is required to be published in the Gazette and tabled in the Legislative Council, and is subject to a scrutiny mechanism similar to that provided under section 34 of the Interpretation and General Clauses Ordinance (Cap. 1).

regard to three considerations, i.e. the best practicable means for preventing the emission of a specified type of pollutant, whether the emission of that type of pollutant would be, or be likely to be, prejudicial to health, as well as the attainment and maintenance of any relevant air quality objective. In accordance with section 26G(4) of APCO, an allocation of emission allowances made by a TM in relation to an emission year can only take effect at least four years after the commencement of the TM making the allocation.

Previous Technical Memoranda for Allocation of Emission Allowances in Respect of Specified Licences

3. The following five TMs were issued:
 - (a) the First TM issued in 2008 set the emission allowances for the emission years between 2010 and 2014;
 - (b) the Second, Third and Fourth TMs respectively issued in 2010, 2012 and 2014, correspondingly tightened the emission allowances with effect from 1 January 2015, 1 January 2017 and 1 January 2019; and
 - (c) the Fifth TM issued in 2015 promulgated the new emission allowances to take effect from 1 January 2020.

Construction of additional gas-fired generating units

4. The Government conducted the public consultation on "Future Fuel Mix for Electricity Generation" in 2014 and announced during the public consultation on "Future Development of the Electricity Market" in 2015 that the Government had determined to increase the percentage of gas generation of the two local power companies to around 50% of the total fuel mix for electricity generation in 2020 with a view to meeting the pledged environmental targets for 2020. The Government mentioned in the two consultation documents that it envisaged the two power companies would need to build a small number of additional gas-fired generating units in order to increase the use of natural gas to achieve the carbon intensity reduction target of 50%-60% by 2020.

5. When the emission allowances for the two power companies under the Fifth TM were being formulated in 2015, the CLP Power Hong Kong Limited ("CLP") was undertaking an Environmental Impact Assessment study for installing new gas-fired generating units at its Black Point Power Station. Since the addition of new gas-fired generating units will affect the fuel mix for

electricity generation and hence emissions in future years, the Administration has undertaken to review the TM again in 2016 when more information on the timing of the availability and capacity of the new gas-fired generating units become available.²

Deliberations of the Subcommittee

6. On 29 September 2015, the Panel on Environmental Affairs ("the Panel") was consulted on the review of the Fourth TM and on the then proposed new TM (i.e. the Fifth TM). A subcommittee of the Legislative Council was formed in October 2015 to examine the Fifth TM. A question relating to emissions from power plants was raised by a Member during examination of the Estimates of Expenditure 2016-2017.

7. Members in general welcomed the measure to further tighten the emission of the specified pollutants from electricity generation, which was vital to achieving the new Air Quality Objectives ("AQOs") by 2020.³ Other major views and concerns expressed by Members are summarized in the ensuing paragraphs.

Scope of specified pollutants in Technical Memoranda

Setting emission caps for PM2.5⁴

8. Noting that PM2.5 was included in the measurement of air pollutants for compilation of the Air Quality Health Index and the regular monitoring of certain pollutants by the general and roadside air quality stations, Members enquired about the feasibility of setting emission caps for PM2.5 in respect of power plants under TMs.

9. The Administration advised that unlike the measurement of ambient PM2.5 concentrations, there were no established methods for measuring PM2.5 concentrations in a stack where water droplets were present. As local power plants adopted wet flue-gas desulphurization systems to reduce SO₂ emission

² Section 2.7 of the Fifth TM requires SEN to review the emission allowances in 2016.

³ AQOs are benchmarked against a combination of interim and ultimate targets under the World Health Organization's Air Quality Guidelines. The Administration is conducting a review of the current AQOs and plans to report the review findings to the Panel in mid-2018.

⁴ PM2.5 is a fraction of RSP (also known as PM10).

and the treated flue-gas was wet, the water droplets could dissolve some of the PM2.5, rendering these particles not collected by the PM2.5 particle-sizing device for measurement. Without a reliable measurement method, the Administration considered it not practicable at this stage to set limits on PM2.5 emissions from local power plants.

Reducing carbon emission

10. Members expressed concern that electricity generation had remained the largest source of local greenhouse gas ("GHG") emissions (mainly in the form of carbon dioxide ("CO₂")) in Hong Kong.⁵ Stressing the need to meet the challenge of climate change, Members urged the Administration to consider more proactive ways to de-carbonize, including setting limits for CO₂ emissions from power plants, and to study the feasibility of applying in the electricity sector the "carbon capture and storage" technology, i.e. trapping CO₂ produced by power plants and then storing it.

11. The Administration explained that there was currently no practicable technology available for controlling CO₂ emissions from power generation and hence CO₂ reduction could only be achieved by adjusting the fuel mix, such as by increasing the use of cleaner fuel (e.g. natural gas) and decreasing the use of fuel with higher carbon contents (e.g. coal). Regarding the emerging "carbon capture and storage" technology to sequester CO₂ emissions, the Administration pointed out that this technology commonly involved the injection of CO₂ into the ground such as deep geological formations or declining oil fields. It was questionable as to whether this method could be deployed in Hong Kong given the physical constraints, let aside the substantial energy and storage costs concerned.

Formula for allocating emission allowances

12. Under the formula for determining emission allowances, if the actual intake of renewable energy ("RE") turns out to be larger than assumed, the emission allowances will be lowered. Members expressed concern that this might in effect disincentivize the power companies from developing more RE. Members suggested the Administration incorporate incentives into the formula to encourage energy saving by the power companies, or set energy conservation targets in TMs.

⁵ According to the "Hong Kong Climate Change Report 2015" released by the Environment Bureau on 6 November 2015, Hong Kong's annual GHG emissions in 2012 was 43.1 million tonnes of Carbon Dioxide Equivalent or about six tonnes per capita.

13. The Administration explained that TMs were meant to control the emission of specified pollutants from power plants whereas energy saving initiatives or RE development by the power companies should be dealt with in other contexts, including the Scheme of Control Agreements ("SCAs") between the Government and the power companies.⁶

14. Members asked about how the emission allowances for a particular emission year could be rectified if the electricity demand in that year had been under- or over-estimated. The Administration advised that electricity demand projections would take into account factors such as major growth in demand arising from infrastructure developments, and the energy efficiency and conservation initiatives taken by the Government and other sectors. The Administration would consider the best available information at the time of each TM review for setting new emission caps.

Effectiveness of Technical Memoranda in reducing emissions of specified pollutants

15. Members had enquired about the effectiveness in reducing emissions of the specified pollutants from power plants by means of TMs. The Administration advised that compared to 2005, the emission levels of SO₂, NO_x and RSP from power plants in 2015 were reduced by 91%, 44%, and 75% respectively. Compared to the emission caps set out in the First TM for 2010, the overall emissions of SO₂, NO_x and RSP would drop by 69%, 50% and 54% respectively in 2020 and beyond.

Latest development

16. On 13 September 2016, the Executive Council approved the construction of a new gas-fired generating unit (i.e. L11) by the Hongkong Electric Company, Limited, which is expected to commission in January 2022. As regards CLP's plan to construct a new gas-fired generating unit at its Black Point Power Station, the relevant project proposal is being reviewed by the Government and CLP.

⁶ The current SCAs provide the two power companies with financial incentives in respect of energy saving and energy audits, as well as RE development. The Administration launched in March 2015 a public consultation on the Future Development of the Electricity Market in Hong Kong. Having regard to the views received from the consultation, the Administration has commenced discussion with the power companies on a new set of SCAs, which is to be finalized before the current ones expire in 2018.

17. The Administration will brief the Panel on the review of the Fifth TM at the meeting on 24 October 2016.

Relevant papers

18. A list of relevant papers is set out in the **Appendix**.

Council Business Division 1
Legislative Council Secretariat
20 October 2016

**Technical Memorandum for Allocation of Emission Allowances
in Respect of Specified Licences**

List of relevant papers

Committee	Date of meeting	Paper
Panel on Environmental Affairs	29 September 2015	<p>Administration's paper on "Review of the Fourth Technical Memorandum for Allocation of Emission Allowances for Power Plants" (LC Paper No. CB(1)1260/14-15(01))</p> <p>Updated background brief on "Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)1260/14-15(02))</p> <p>Minutes of special meeting (LC Paper No. CB(1)55/15-16)</p>
House Committee	4 December 2015	<p>Report of the Subcommittee on Fifth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences (LC Paper No. CB(1)238/15-16)</p>
Special meeting of the Finance Committee for examination of Estimates of Expenditure 2016-2017	6 April 2016	<p>A written question raised by a Member and Administration's reply (Reply serial number: ENB 366)</p>
/	23 September 2016*	<p>Legislative Council Brief on proposal of constructing a new gas-fired generating unit by the Hongkong Electric Company, Limited to implement the 2020 fuel mix (File Ref: ENB CR 2/4576/08(16) Pt.18)</p>

*Date of issuance