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

Background brief

Purpose

This paper provides background information on the Fifth Technical Memorandum for Allocation of Emission Allowances in respect of Specified Licences ("Fifth TM"), and gives a brief account of the views and concerns expressed by Members on the subject in the 2013-2014 and 2014-2015 legislative sessions.

Background

Emission caps for the electricity sector

2. The Air Pollution Control Ordinance (Cap. 311) ("APCO") empowers the Government to set emission caps for power plants¹ 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 TM². Section 26G(2) stipulates that in making emission allocations, SEN should have regard to three considerations —

¹ There are four power plants in Hong Kong at present, i.e. Lamma Power Station and Lamma Power Station Extension, Black Point Power Station, Castle Peak Power Station and Penny's Bay Gas Turbine Power Station.

² 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 Interpretation and General Clauses Ordinance (Cap. 1).

- (a) the best practicable means for preventing the emission of a specified type of pollutant;
- (b) whether the emission of that type of pollutant would be, or be likely to be, prejudicial to health; and
- (c) the attainment and maintenance of any relevant air quality objective.

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

3. Four TMs were issued in 2008, 2010, 2012 and 2014 respectively as follows —

- (a) the First TM set the emission allowances for the emission years between 2010 and 2014;
- (b) the Second TM tightens the emission allowances starting from 1 January 2015;
- (c) the Third TM further reduces the emission allowances starting from 1 January 2017; and
- (d) the Fourth TM promulgates the new emission allowances to take effect from 1 January 2019³. Section 2.7 of the Fourth TM requires SEN to review the emission allowances in 2015.

Review of fuel mix for power generation

4. In order to meet electricity demand in the long run and improve the environment, the Government launched in March 2014 a three-month public consultation on the Future Fuel Mix for Electricity Generation for Hong Kong⁴. Having regard to public views and comments received at the public consultation, the Government plans to increase the proportion of natural gas generation to around 50% in 2020, and, subject to a reasonable import price, to maintain the

³ Under the statutory requirement in 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.

⁴ Two fuel mix options were put forward for public consultation. The first option is "grid purchase" under which electricity will be imported through purchase from the Mainland power grid (i.e. the China Southern Power Grid). The second option is "local generation" which proposes the use of more natural gas for local generation.

current interim measure of importing 80% of nuclear output⁵ from the Daya Bay Nuclear Power Station ("DBNPS") so that nuclear import would account for around 25% of the total fuel mix. Furthermore, subject to public views on the tariff implications, the Government is prepared to consider developing more renewable energy ("RE"), and will also enhance efforts to promote energy saving. The remaining electricity demand will be met by coal-fired generation.

The Fifth Technical Memorandum for Allocation of Emission Allowances in respect of Specified Licences

5. The Fifth TM was published in the Gazette on 23 October 2015 and tabled before the Legislative Council ("LegCo") on 28 October 2015 for negative vetting. The Fifth TM seeks to allocate for each emission year from 1 January 2020 the quantities of emission allowances for the specified pollutants for each of the four existing power plants and possible new electricity works in Hong Kong. It also requires SEN to review in 2016 the quantity of these emission allowances.

6. Compared with the emission allowances for 2019 set under the Fourth TM, the Fifth TM will see a further tightening of 17% for both SO₂ and NO_x as well as 16% for RSP for the electricity sector.

Members' views and concerns

7. On 6 October 2014 and 29 September 2015, the Panel on Environmental Affairs was consulted on the review of the Third and Fourth TMs. A subcommittee of LegCo was formed in October 2014 to examine the Fourth TM. Questions relating to emissions from power plants were raised by Members during examination of the Estimates of Expenditure 2015-2016. The major views and concerns expressed by Members are summarized in the ensuing paragraphs.

Emission caps under the Fifth TM

8. Members did not raise any objection to the proposal under the Fifth TM as it would further reduce the emission allowances for SO₂, NO_x and RSP starting from 2020 as compared with the emission allowances for 2019 under the Fourth TM. Some Members, however, sought elucidation about the discrepancies between the emission caps for the two power companies.

⁵ In addition to the original agreement to import 70% of the electricity output of DBNPS, CLP Power Hong Kong Limited had made arrangement with DBNPS to import an additional 10% of nuclear power for a period of four years from 2015 to 2018 as an interim measure.

9. The Administration advised that, in determining the new emission allowances for the Hongkong Electric Company, Limited ("HEC"), the Administration had factored in the projected reduction in electricity demand on Hong Kong Island in 2020 and the commissioning of a new gas-fired electricity generation unit ("gas-fired unit") in 2019 which would enhance HEC's emission reduction efficiency. Given the steady electricity demand in Kowloon and the New Territories, the reduction for CLP Power Hong Kong Limited ("CLP") would be contingent upon the continuation of additional nuclear power import from DBNPS.

10. The Administration further advised that as the addition of gas-fired units by CLP would depend on the outcome of the Environmental Impact Assessment ("EIA") study which was underway⁶, the potential effect of these new units on emission reduction by the power company would not be reflected in the Fifth TM. Instead, this would be taken into account in the review for the next TM in 2016 when more information on the capacity and timing of completion of the gas-fired units would be available.

11. Members had sought the Administration's assessment of the effectiveness of previous TMs to reduce emissions from power plants. The Administration advised that according to the emission data in 2013⁷, the emission levels of SO₂, NO_x and RSP from the power plants were reduced by 81%, 26% and 60% respectively as compared to 2005⁸. Compared to the emission caps set out in the First TM for 2010, the overall emissions of SO₂, NO_x and RSP from the electricity sector would drop by 63%, 40% and 44% respectively in 2019 and beyond.

Scope of specified pollutants in TMs

12. Noting that Hong Kong's Air Quality Objectives ("AQO")⁹ currently covered seven air pollutants (i.e. SO₂, NO_x, RSP, fine suspended particulates ("PM2.5")¹⁰, carbon monoxide, ozone and lead), Members enquired whether the

⁶ The EIA study is being undertaken by CLP for installing additional gas-fired units with a view to increasing the use of natural gas for generation in response to government's fuel mix plan for 2020.

⁷ According to the Administration, emission data for the power sector in 2014 were being verified when the relevant information on assessment of the effectiveness of TMs was provided to LegCo in March 2015 for examination of Estimates of Expenditures 2015-2016.

⁸ The Administration started in 2005 through specified process licensing mechanism to set emission allowances for power plant emissions.

⁹ AQOs are drawn up in accordance with the recommendations of the World health Organization as well as the standards of other advanced places, and updated on 1 January 2014.

¹⁰ PM2.5 is a fraction of RSP (also known as PM10).

Administration would consider imposing caps on more types of pollutants such as carbon dioxide ("CO₂") and PM2.5 from power plants. The Administration advised that it was the international practice to set limits on the emission of SO₂, NO_x and RSP from power plants, but not CO₂ as there was currently no practicable technology available for controlling CO₂ emission, and reduction in CO₂ emission could only be achieved by adjusting the fuel mix.

13. As regards capping the emission of PM2.5, the Administration advised that the emission caps for RSP set in the TMs could effectively limit the emission of PM2.5 from power plants. Also, the emission control technologies on particulate matters installed in the major coal-fired generation units in CLP and HEC would also reduce the emission of PM2.5. Since the measurement of PM2.5 for power plants was still under development, it would not be practicable to set limits on PM2.5 emissions at this stage.

Energy conservation for power companies

14. Some Members suggested setting energy conservation targets for the power companies and including such requirements in future TMs, so as to press the power companies to step up efforts in energy conservation. The Administration advised that in setting the emission caps for the two power companies, it had already taken into account the projected local electricity consumption. In parallel, the energy efficiency and conservation initiatives being taken forward by the Government would help reduce electricity consumption.

15. The Administration further advised that the Scheme of Control Agreements ("SCAs") included financial incentives to encourage energy saving by the power companies. As the current SCAs would expire in 2018, the Administration would discuss with the power companies on the regulatory arrangements for the electricity market, including how the power companies should help promote their energy efficiency performance.

Fuel mix and diversification of fuel sources

16. Since electricity generation was the major emission source of SO₂, Members enquired whether the two power companies could increase the use of low-sulphur coal for power generation. There was also a suggestion that the Administration should promote a greater use of RE instead of increasing the share of nuclear power in the future fuel mix having regard to the safety hazards imposed by nuclear power.

17. The Administration pointed out that while using low-sulphur coal would generate less emission of pollutants, such coal had relatively low

electricity output and its burnt residues would accelerate the wear and tear of the mechanical parts of a coal-fired generation unit. In making emission allocations, the Administration would keep abreast of technology development for reducing the emission of the three specified pollutants. The Administration would also take into account the views received during the public consultation on the "Future Development of the Electricity Market" which ended on 30 June 2015 in considering how to further promote energy efficiency and RE.

18. Some Members were concerned that over-reliance on Mainland natural gas supply might increase the susceptibility of electricity tariffs to the price volatility of natural gas. The Administration explained that apart from importation through China's West-East Gas Pipeline II, the two power companies had been importing gas from Yacheng gas field off Hainan Island, as well as liquefied natural gas from Australia and Qatar. The Administration would assess the merits of new natural gas supply proposals submitted by the power companies having regard to all relevant factors.

Tariff implications

19. Members were concerned that the further tightening of the emission allowances for power plants might have tariff implications, and urged the Administration to strike a proper balance between tightening the emission allowances for power plants and any possible impact on electricity tariff. The Administration advised that although public affordability of electricity tariff was not one of the three considerations provided for in APCO in making emission allocations, the Administration's energy policy was to ensure that the energy needs of the community were met safely and reliably at reasonable prices while minimizing the environmental impact of electricity generation.

Latest development

20. At the House Committee meeting on 30 October 2015, Members agreed to form a Subcommittee to examine the Fifth TM.

Relevant papers

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

**Subcommittee on Fifth Technical Memorandum for Allocation of
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List of relevant papers

Date of meeting	Event	Papers
6 October 2014	Panel on Environmental Affairs	<p>Administration's paper on "Review of the Third Technical Memorandum for Allocation of Emission Allowances for Power Plants" (LC Paper No. CB(1)2028/13-14(01))</p> <p>Updated background brief on "Technical Memorandum for Allocation of Emission Allowances in respect of Specified Licence" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)2028/13-14(02))</p> <p>Minutes of special meeting (LC Paper No. CB(1)125/14-15)</p> <p>Administration's supplementary paper (LC Paper No. CB(1)64/14-15(01))</p>
28 November 2014	House Committee	<p>Report of the Subcommittee on Fourth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences (LC Paper No. CB(1)282/14-15)</p>
30 March 2015	Special meeting of the Finance Committee for examination of Estimates of Expenditure 2015-2016	<p>Written questions raised by Members and Administration's replies (Reply serial numbers: ENB 051 and 392)</p>

Date of meeting	Event	Papers
29 September 2015	Panel on Environmental Affairs	<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 Licence" 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>
28 October 2015	Introduction of the Fifth Technical Memorandum for Allocation of Emission Allowances in respect of Specified Licences into the Legislative Council	<p>The Fifth TM</p> <p>Legislative Council Brief (no file reference provided)</p> <p>Legal Service Division report (LC Paper No. LS4/15-16)</p>