

立法會

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Panel on Environmental Affairs

Meeting on 17 July 2017

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 control of air pollution from electricity generation through Technical Memoranda for Allocation of Emission Allowances in Respect of Specified Licences ("TMs"). It also gives a brief account of the views and concerns expressed by Members in relation to the issuance of the Fifth and Sixth TMs in 2015 and 2016.

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

¹ Under section 37B of APCO, TM is not subsidiary legislation but is required to be published in the Gazette and tabled at 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). Pursuant to section 30B(1) of APCO, non-compliance with the emission caps is an offence liable on a first conviction to a fine of \$30,000 in respect of each tonne in excess of the relevant allowed emission; and on a second or subsequent conviction to a fine of \$60,000 in respect of each tonne in excess of the relevant allowed emission plus imprisonment for six months.

Section 26G(2) stipulates that in making emission allocations, SEN should have regard to the following:

- (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 is 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. 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. Six TMs were issued from 2008 to 2016 as follows:

- (a) the First TM, issued in 2008, set the emission allowances for the emission years between 2010 and 2014; and
- (b) the Second to Sixth TMs were issued in 2010, 2012, 2014, 2015 and 2016 to tighten the emission allowances with effect from 1 January 2015, 1 January 2017, 1 January 2019, 1 January 2020 and 1 January 2021 respectively.²

Increasing electricity generation through the use of natural gas

4. The Administration announced during the public consultation on "Future Development of the Electricity Market" in 2015 that it 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. It was envisaged that the two power companies would need to build a small number of additional gas-fired generating units ("gas-fired units") in order to increase the use of natural gas to achieve the carbon intensity reduction target of 50%-60% by 2020.

² Compared to the emission caps set out in the First TM for 2010, the emission allowances of SO₂, NO_x and RSP will be reduced by 72%, 52% and 56% respectively in 2021 under the Sixth TM.

5. In connection with the above, the Hongkong Electric Company, Limited ("HKE") has started the construction of two new gas-fired units (known as "L10" and "L11") at the Lamma Power Station Extension, which are expected to be commissioned in 2020 and 2022 respectively. It is estimated that with the new L10 and two existing gas-fired units, HKE will be able to achieve the 50% gas generation target in 2020.³

6. In December 2016, the Executive Council approved the construction of a new gas-fired unit (known as "D1") at the Black Point Power Station by CLP Power Hong Kong Limited and Castle Peak Power Company Limited (collectively referred to as "CLP"). It is expected that D1 will be commissioned in end 2019 and, together with eight existing gas-fired units, CLP can achieve a gas generating ratio of about 49% in 2020.⁴

7. According to the Administration, when determining the emission allowances for the two power companies under the latest TM (i.e. the Sixth TM), it had taken into account (a) the progress of implementing the fuel mix plan for 2020, (b) practicability to maintain the current import of 80% of nuclear output from Daya Bay Nuclear Power Station to CLP after 2018, and (c) projected local electricity consumption for 2021. The Administration also advised that it would review the Sixth TM in 2017 when more information on the availability of the new gas-fired units is available.

Major views and concerns expressed by Members

8. The Panel on Environmental Affairs ("EA Panel") was consulted on the issuance of the Fifth and Sixth TMs at the meetings on 29 September 2015 and 24 October 2016 respectively. A subcommittee of the Legislative Council was formed in October 2015 to examine the Fifth TM. Related issues were also brought up during examination of the Estimates of Expenditure 2017-2018. Member's major views and concerns are summarized in the ensuing paragraphs.

Emission caps for fine particulates and carbon dioxide

9. Members enquired about the feasibility of setting emission caps for fine particulates ("PM2.5") and carbon dioxide ("CO₂"), and of using carbon sequestration technology to capture and store CO₂ produced during electricity

³ Currently, on a total electricity sent-out basis, the fuel mix for HKE is 66% coal and 34% gas.

⁴ Currently, on a total electricity sent-out basis, the fuel mix for CLP is 42% coal, 25% gas and 33% nuclear.

generation. The Administration advised that local power plants adopted wet flue-gas desulphurization systems to reduce SO₂ emission and the treated flue-gas was wet. The water droplets could dissolve some of the PM_{2.5}, rendering these particles not collected by the PM_{2.5} particle-sizing device for measurement. As there was not any reliable method to measure PM_{2.5} in a stack where water droplets were present, the Administration considered it not practicable at this stage to set limits on PM_{2.5} emissions from local power plants.

10. As regards CO₂ emissions, the Administration advised that there was no proven practicable technology for controlling such emissions from power generation, and hence it was not feasible to set emission caps for CO₂ in a TM at this stage. The carbon intensity reduction target would be achieved mainly by increasing the use of natural gas for electricity generation. Regarding the emerging carbon sequestration technology, the Administration pointed out that the technology commonly involved the injection of CO₂ into the ground such as deep geological formations or declining oil fields. As there was a lack of deep underground caverns in Hong Kong for storing captured CO₂, it was questionable whether the said technology could be deployed in Hong Kong.

Monitoring of compliance

11. Members sought details on the mechanism to monitor the two power companies' compliance with the TM in force, and reduction of emissions from the power sector. The Administration responded that power plants had to install and use online continuous emission monitoring systems that complied with international standards, and transmit their real-time emission data to the Environmental Protection Department ("EPD") for monitoring air pollutant emissions from their generating units. In addition, power plants had to submit emission data regularly to EPD for scrutiny and verification by an independent and authorized checker to ensure data accuracy. EPD also conducted regular inspections of power plants to check the operation of their pollution control equipment and examine the emission data of their generating units on-site. The Administration also advised that, compared with the emission levels in 2005, SO₂, NO_x and RSP emissions of the power sector were decreased by 90%, 45% and 74% respectively in 2016.

Tariff implications

12. Members enquired about the potential impact on electricity tariffs arising from the construction of new gas-fired units and replacement of some old power generation units by the two power companies.

13. The Administration pointed out that electricity tariffs were determined having regard to a number of factors, such as the fuel mix plan for 2020, future fuel costs, and the permitted rate of return ("RoR") of the two power companies. As the permitted RoR was reduced under the new Scheme of Control Agreements ("SCAs") signed between the Government and the two power companies on 25 April 2017,⁵ this would help alleviate the tariff impact to be brought by the provision of additional gas-fired units in future.

Latest development

14. The Administration will brief EA Panel on the review of the Sixth TM at the meeting on 17 July 2017.

Relevant papers

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

Council Business Division 1
Legislative Council Secretariat
11 July 2017

⁵ The new SCAs will take effect from 1 October 2018 for CLP and 1 January 2019 for HEC, and will both expire on 31 December 2033.

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

List of relevant papers

Date	Event	Paper
29 September 2015	Special meeting of Panel on Environmental Affairs	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)) Minutes of special meeting (LC Paper No. CB(1)55/15-16)
28 October 2015	The Fifth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences was tabled at the Legislative Council	Fifth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences Legislative Council Brief Legal Service Division Report (LC Paper No. LS4/15-16)
4 December 2015	House Committee	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)
24 October 2016	Meeting of Panel on Environmental Affairs	Administration's paper on "Review of the Fifth Technical Memorandum for Allocation of Emission Allowances for Power Plants" (LC Paper No. CB(1)19/16-17(03)) Administration's follow-up paper (LC Paper No. CB(1)236/16-17(02)) Minutes of meeting (LC Paper No. CB(1)210/16-17)

Date	Event	Paper
26 October 2016	The Sixth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences was tabled at the Legislative Council	Sixth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences Legislative Council Brief Legal Service Division Report (LC Paper No. LS6/16-17)
5 April 2017	Special meeting of Finance Committee for examination of Estimates of Expenditure 2017-2018	Written questions raised by Members and Administration's replies (Reply serial number: ENB096 and 109)

Other relevant documents:

Government bureau	Document
Environment Bureau	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" issued on 23 September 2016 (File Ref : ENB CR 2/4576/08 (16) Pt.18)
Environment Bureau	Legislative Council Brief on "Proposal of constructing a new gas-fired generating unit by CLP Power Hong Kong Limited and Castle Peak Power Company Limited to implement the 2020 Fuel Mix" issued on 13 December 2016 (File Ref: ENB CR 1/4576/08 (16) Pt.19)