

LEGISLATIVE COUNCIL BRIEF
Air Pollution Control Ordinance (Cap. 311)

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

INTRODUCTION

Pursuant to section 26G of the Air Pollution Control Ordinance (Cap. 311) (the Ordinance), the Secretary for the Environment (the Secretary) has made the "Third Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" (the Third TM) at **Annex** to tighten the emission allowances for the two power companies with a view to improving air quality. The emission allowances apply to three types of air pollutants, i.e., sulphur dioxide (SO₂), nitrogen oxides (NO_x) and respirable suspended particulates (RSP), to be allocated in respect of each specified licence to conduct electricity works for each emission year from 1 January 2017.

JUSTIFICATIONS

2. Section 26G(2) of the Ordinance provides for the Secretary to allocate the emission allowances for each type of specified pollutant allocated in respect of each specified licence to conduct electricity works by a technical memorandum¹ (TM).

3. In 2010, the Secretary issued the "Second Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" (the Second TM) to allocate emission allowances in relation to each emission year commencing on and after 1 January 2015 for each of the electricity works of the two power companies. To meet the emission allowances, both power companies need to maximise the use of their existing gas-fired generation units and prioritise the use of their coal-fired generation units that have been retrofitted with advanced emission abatement equipment. After reviewing the Second TM, we have found scope to further reduce the emission allowances for the two power companies starting 1 January 2017 as long as they continue their efforts to use low emission coals as far as possible, upkeep the performance of the existing advanced emission abatement equipment, and take up the surplus of electricity generated from renewable energy (RE) and waste-to-energy facilities (WTE), on top of their efforts to meet the emission allowances in the Second TM.

¹ Section 26G(2) of the Ordinance provides that in making an allocation of emission allowances, the Secretary shall-

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

4. For RE and WTE, other than the Lamma Winds and thin film photovoltaic solar system for the Hongkong Electric Co., Ltd. (HEC) and the landfill gas utilization plant of the South East New Territories Landfill to the grid of the CLP Power Hong Kong Limited (CLP), new WTE facility (e.g. the sludge treatment facility at Tuen Mun) will come into operation in late 2013. Since the power sector could reduce its electricity generation by tapping into these alternative sources, their emission allowances could be reduced accordingly. In view of our established policy to encourage maximizing the use of natural gas for electricity generation and that the natural gas-fired generation units need to be fully operated under the "take-or-pay" natural gas supply contracts, the displaced electricity generation will be taken as from the coal-fired generation units. As such, the emissions to be avoided for each unit of electricity tapped from RE and WTE would be equal to the unit emissions from all coal-fired generation units of the respective power companies. We would hence deduct such emissions to be avoided by the anticipated annual electricity intake of RE and WTE (i.e., sent-out of 2 GWh and 21 GWh for HEC and CLP respectively) from the emission allowance allocations according to the unit emission factors for coal-fired generation units and the amount electricity generation reduced.

5. The generation of RE and WTE could be affected by exogenous factors, e.g. changes in weather patterns and the heat contents of the refuse or sludge respectively, we will provide a mechanism in the Third TM for ascertaining the emission allowances according to the actual annual intake of the electricity generated from RE and WTE based on the unit emission factors mentioned in paragraph 4 above. Thus, the quantities of emission allowance to be allocated from 2017 onwards under the Third TM to each of the existing power plants will be determined by the following formula:

	Emission allowances to be allocated and ascertained
=	Emission allowances that are required with the use of best practicable means at anticipated annual electricity intake of RE and WTE
plus /minus	Emission allowances to be added / deducted due to deviation of the actual annual intake of RE and WTE from the anticipated annual intake (i.e., sent-out of 2 GWh and 21 GWh for HEC and CLP, respectively) in accordance with the unit emission factors of coal-fired generation units

THE THIRD TECHNICAL MEMORANDUM

6. Having regard to the relevant provisions in the Ordinance, the practicability of the two power companies continuing their efforts to use low emission coal as far as possible, upkeeping the performance of their emission abatement equipment, and taking up of RE and WTE on top of the efforts to meet the emission allowances in the Second TM, we will impose via the Third TM the following specific emission allowances for each of the electricity works of the two power companies in relation to

the emission years from 1 January 2017 onwards upon the actual annual intake of RE and WTE is ascertained –

Table 1(a): Lamma Power Station and Lamma Power Station Extension

	Quantity of Emission Allowance for 2017 and thereafter
SO ₂	$5\,200 + (2 - A) \times 0.614$
NO _x [[@]]	$9\,450 + (2 - A) \times 0.941$
RSP	$250 + (2 - A) \times 0.027$

Table 1(b): Black Point Power Station

	Quantity of Emission Allowance for 2017 and thereafter
SO ₂	1 440
NO _x [[@]]	4 140
RSP	110

Table 1(c): Castle Peak Power Station

	Quantity of Emission Allowance for 2017 and thereafter
SO ₂	$3\,757 + (21 - B) \times 0.367$
NO _x [[@]]	$12\,358 + (21 - B) \times 1.208$
RSP	$389 + (21 - B) \times 0.038$

Table 1(d): Penny Bay's Gas Turbine Power Station [#]

	Quantity of Emission Allowance for 2017 and thereafter
SO ₂	2
NO _x [[@]]	2
RSP	1

[[@]] Expressed as nitrogen dioxide

[#] As the Penny's Bay Gas Turbine Power Station is for emergency and peak-opping purposes, the projected SO₂, NO_x and RSP emissions for the purposes are one to two tonnes.

where -

- A is the aggregate of total net sent-out electricity output (in GWh) from individual RE and WTE to the electricity grid of Lamma Power Station and Lamma Power Station Extension in the emission year; and
- B is the aggregate of total net sent-out electricity output (in GWh) from individual RE and WTE to the electricity grid of Castle Peak Power Station in the emission year.

7. If the estimated annual generation from RE and WTE to the grids of HEC and CLP are at sent-out of 2 GWh and 21 GWh respectively for the concerned emission year, the total emission allowances to be allocated for the power sector would be 10,399 tonnes for SO₂, 25,950 tonnes for NO_x and 750 tonnes for RSP. As compared with the emission allowances allocated under the Second TM, the new set of emission allowances will see a tightening of 17% for SO₂, 6% for NO_x and 10% for RSP.

Table 2: Emission Allowances for Existing Electricity Works in 2017 at Anticipated Annual Intake of RE and WTE (i.e., sent-out generation of 2 GWh and 21 GWh for HEC and CLP respectively)

		SO ₂	NO _x ^[@]	RSP
HEC	Lamma Power Station and Lamma Power Station Extension (mixed fuel)	5 200 (-23%)	9 450 (-6%)	250 (-17%)
CLP	Black Point Power Station (gas-fired)	1 440	4 140	110
	Castle Peak Power Station (coal-fired)	3 757 (-12%)	12 358 (-8%)	389 (-7%)
	Penny's Bay Gas Turbine Power Station (oil -fired)	2	2	1
	Total of CLP's Power Stations	5 199 (-9%)	16 500 (-6%)	500 (-6%)
Power Sector		10 399 (-17%)	25 950 (-6%)	750 (-10%)

^[@] Expressed as nitrogen dioxide

Note: The figures in brackets are the percent reduction comparing with the emission allowances stipulated in the Second TM.

8. In line with the existing practice, the Third TM sets out the maximum emission allowances equivalent to approximately one percent of the total emission allowances for the entire power sector in respect of each of the specified pollutants for possible new electricity works. To cater for the intake of RE and WTE by new electricity works to reduce the generation requirement, the formulae for allocating the emission allowances in respect of each of the specified pollutants for the possible new electricity works, with respect to the same reference installed capacity adopted in both First and Second TMs, i.e., 300 MW, for emission years starting from 2017 are –

Table 3: New Electricity Works

	Quantity of Emission Allowance for 2017 and thereafter
SO ₂	$90 \times (C/300) \times (D/12) - E \times 0.047$
NO _x ^[@]	$230 \times (C/300) \times (D/12) - E \times 0.120$
RSP	$7 \times (C/300) \times (D/12) - E \times 0.004$

^[@] Expressed as nitrogen dioxide

where –

- C is the total installed capacity (in MW) of the New Electricity Works; or 300 (i.e., reference installed capacity), whichever is smaller;
- D is the total number of months in the emission year after the commencement of operation of the New Electricity Works and part of a month is taken as a full month in the determination; and
- E is the aggregate of total net sent-out electricity output (in GWh) from individual RE and WTE to the electricity grid of the New Electricity Works in the emission year.

9. To enable timely revision of the emission allowances, the Third TM will be reviewed no less than once every two years.

LEGISLATIVE TIMETABLE

10. The Third TM will be published in the Gazette on 19 October 2012 and tabled at the Legislative Council for negative vetting on 24 October 2012. Subject to the negative vetting by the Legislative Council, the new set of emission allowances will take effect at least four years after the commencement of the Second TM, i.e., starting from the emission year of 2017 in accordance with section 26G(4) of the Ordinance.

BASIC LAW AND HUMAN RIGHTS IMPLICATIONS

11. The Third TM is in conformity with the Basic Law, including the provisions concerning human rights.

ENVIRONMENTAL AND SUSTAINABILITY IMPLICATIONS

12. As compared with the emission allowances set under the Second TM for 2015 onwards, the Third TM will see a tightening of 17% for SO₂, 6% for NO_x and 10% for RSP starting from 2017. The reduction will help improve local air quality given that emissions from the power sector accounts for 50%, 25% and 16% respectively of the territory-wide emissions of these pollutants in 2010.

13. The overall share of natural gas in the combined fuel mix of the two power companies for local electricity generation under the Third TM will be roughly maintained at the same level as the Second TM (i.e., natural gas in the fuel mix of local electricity generation will be about 50% by 2015). It tallies with the proposal in the Air Quality Objectives Review to raise the power sector's fuel mix ratio in local electricity generation to 50% for natural gas.

14. Achieving better air quality for Hong Kong through statutory control on power plants' emissions is in line with the sustainability principles of seeking opportunities to enhance the quality of our living environment that promotes and protects the physical health of the people of Hong Kong.

TARIFF IMPLICATIONS

15. Achieving the new emission caps as set out in the Third TM does not involve any new capital investment by power companies. As for fuel cost, while the Third TM will not have any major impact on the fuel mix of power companies as compared with the Second TM, actual fuel cost would be subject to international market price. The power companies will present their tariff assessment to the Administration in accordance with the prevailing regulatory mechanism under the Scheme of Control Agreement.

FINANCIAL AND CIVIL SERVICE IMPLICATIONS

16. The Third TM will not incur additional financial implications for the Administration. Enforcement of the emission caps for power companies will be carried out by existing staff of the Environmental Protection Department.

CONSULTATION

17. We have consulted the two local power companies on the tightening of the emission allowances and advised them of the new set of emission allowances and the method for ascertaining the allocations with respect to the actual intake of electricity from RE and WTE in the relevant emission year. Both of them consider the proposed new emission allowances extremely challenging but are prepared to take on the challenge to support the Administration's objective to continuously reduce emissions.

18. The Panel on Environmental Affairs of the Legislative Council was consulted on the new set of emission allowances on 4 July 2012. There was no objection to the proposal but some Panel members were concerned about the tariff impact of the increased use of natural gas for power generation. The Administration has explained that the proposal via the Third TM will not increase the use of natural gas for power generation as compared with the Second TM. In any case, the actual fuel cost would be subject to international market prices and the power companies would present their tariff assessment to the Administration in accordance with the prevailing regulatory mechanism under the Scheme of Control Agreement.

19. The Advisory Council on the Environment was consulted on the proposed Third TM on 15 October 2012. Members supported the proposal.

PUBLICITY

20. A press release will be issued on the date of gazette of the Third TM. A spokesman will be made available for media enquiries.

ENQUIRY

21. For any enquiry relating to this brief, please contact Mr. W C Mok, Assistant Director of Environmental Protection (Air Policy), at 3509 8618.

Environmental Protection Department
October 2012

**THIRD TECHNICAL MEMORANDUM
FOR ALLOCATION OF EMISSION ALLOWANCES
IN RESPECT OF SPECIFIED LICENCES**

WONG Kam-sing
SECRETARY FOR THE ENVIRONMENT

This Technical Memorandum is published under Section 37B(1) of the Air Pollution Control Ordinance (Cap. 311) and shall commence to have effect in accordance with Section 37C of that Ordinance.

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**THIRD TECHNICAL MEMORANDUM
FOR ALLOCATION OF EMISSION ALLOWANCES
IN RESPECT OF SPECIFIED LICENCES**

1. PRELIMINARY

1.1 *Citation and Commencement*

This Technical Memorandum is the third technical memorandum issued pursuant to Section 26G of the Ordinance and may be cited as the "Third Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences". This Technical Memorandum shall come into operation in accordance with Section 37C of the Ordinance.

1.2 *Application and Scope*

This Technical Memorandum sets out the quantity of emission allowances for each type of specified pollutant allocated in respect of each specified licence and the allocation principles and determination method of the quantity of emission allowances to be allocated for each and every emission year from 1 January 2017. The allocation of emission allowances set out or determined under the Second Technical Memorandum for each and every emission year from 1 January 2017 is superseded by this Technical Memorandum.

1.3 *Interpretation*

In this Technical Memorandum, unless the context otherwise requires, the following definitions apply-

"Authority" (監督) has the same meaning as in the Ordinance.

"Electricity Works" (電力工程) means the process of Electricity Works specified in item 7 of Schedule 1 to the Ordinance.

"Emission allowance" (排放限額) has the same meaning as in the Ordinance.

"Emission year" (排放年度) has the same meaning as in the Ordinance.

"Existing Electricity Works" (現有電力工程) means the Electricity Works conducted in any of the following power stations in respect of which a valid specified licence is in force on the commencement date of this Technical

Memorandum-

- (a) Lamma Power Station and Lamma Power Station Extension at Lot 1934 and Lot 2200, DD 3, Po Lo Tsui, Lamma Island;
- (b) Black Point Power Station at Yung Long Road, Lung Kwu Tan, Tuen Mun, New Territories;
- (c) Castle Peak Power Station at Lung Yiu Street, Tuen Mun, New Territories; and
- (d) Penny's Bay Gas Turbine Power Station at Lot 23, DD 256, Penny's Bay, Lantau Island, New Territories.

"New Electricity Works" (新電力工程) means any Electricity Works, other than the Existing Electricity Works, which comes into existence after the commencement of this Technical Memorandum.

"Ordinance" (條例) means the Air Pollution Control Ordinance (Cap. 311).

"Electricity generation for local consumption" (供本港使用電力) means the gross electricity generation of the Electricity Works concerned minus the electricity sales for export outside the Hong Kong Special Administrative Region irrespective of whether the export sales are directly conducted by the subject specified licence holder or indirectly dealt with by other dealers.

"Renewable Energy System" (可再生能源系統) means an electricity generation system employing solar, wind, biomass, hydro, tidal, wave, geothermal or energy from waste (including landfill gas or sewage gas) that provides electricity to the grid.

"Second Technical Memorandum" (第二份技術備忘錄) means the "Second Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" published in the Gazette under Section 37B(1) of the Ordinance on 15 October 2010 as amended by the resolution of Legislative Council published in the Gazette on 10 December 2010, which came into operation in accordance with Section 37C of the Ordinance.

"Secretary" (局長) has the same meaning as in the Ordinance.

"Specified licence" (指明牌照) has the same meaning as in the Ordinance.

"Specified licence holder" (指明牌照持有人) has the same meaning as in the Ordinance.

"Specified pollutant" (指明污染物) has the same meaning as in the

Ordinance.

2. ALLOCATION OF EMISSION ALLOWANCES

2.1 The quantity of emission allowances for each type of specified pollutant allocated to each specified licence of Existing Electricity Works for each and every emission year from 1 January 2017 shall be determined by the formulae in the respective tables as follows-

(a) Lamma Power Station and Lamma Power Station Extension

	2017 and thereafter
Sulphur dioxide	$5\,200 + (2 - A) \times 0.614$
Nitrogen oxides ⁽ⁱ⁾	$9\,450 + (2 - A) \times 0.941$
Respirable suspended particulates	$250 + (2 - A) \times 0.027$

(b) Black Point Power Station

	2017 and thereafter
Sulphur dioxide	1 440
Nitrogen oxides ⁽ⁱ⁾	4 140
Respirable suspended particulates	110

(c) Castle Peak Power Station

	2017 and thereafter
Sulphur dioxide	$3\,757 + (21 - B) \times 0.367$
Nitrogen oxides ⁽ⁱ⁾	$12\,358 + (21 - B) \times 1.208$
Respirable suspended particulates	$389 + (21 - B) \times 0.038$

(d) Penny's Bay Gas Turbine Power Station

	2017 and thereafter
Sulphur dioxide	2
Nitrogen oxides ⁽ⁱ⁾	2
Respirable suspended particulates	1

⁽ⁱ⁾ Expressed as nitrogen dioxide

where –

- A is the aggregate of total net sent-out electricity output (in GWh) from the Renewable Energy Systems to the electricity grid of Lamma Power Station and Lamma Power Station Extension in the emission year; and
- B is the aggregate of total net sent-out electricity output (in GWh) from the Renewable Energy Systems to the electricity grid of Castle Peak Power Station in the emission year.

2.2 The quantity of emission allowances for each type of specified pollutant allocated to each specified licence of New Electricity Works for each and every emission year from 1 January 2017 shall be determined by the formulae as follows-

	2017 and thereafter
Sulphur dioxide	$90 \times (C/300) \times (D/12) - E \times 0.047$
Nitrogen oxides ⁽ⁱⁱ⁾	$230 \times (C/300) \times (D/12) - E \times 0.120$
Respirable suspended particulates	$7 \times (C/300) \times (D/12) - E \times 0.004$

⁽ⁱⁱ⁾ Expressed as nitrogen dioxide

where –

- C is the total installed capacity (in MW) of the New Electricity Works; or 300, whichever is smaller;
- D is the total number of months in the emission year after the commencement of operation of the New Electricity Works and part of a month is taken as a full month in the determination; and
- E is the aggregate of total net sent-out electricity output (in GWh) from the Renewable Energy Systems to the electricity grid of the New Electricity Works in the emission year.

2.3 The Authority shall make the allocation of emission allowances for each type of specified pollutant in relation to each specified licence in respect of electricity generation for local consumption.

2.4 For the purposes of determination of the quantity of emission allowances referred in sections 2.1 and 2.2, the aggregate of the total net sent-out electricity output from the Renewable Energy Systems in the emission year is to be rounded up to the next whole number.

2.5 The quantity of emission allowances determined in this Technical Memorandum for allocation to a specified licence shall be rounded up to the next whole number.

2.6 Unless otherwise provided or required in the Ordinance or its subsidiary legislation, the Authority shall allocate to each specified licence the respective quantity of emission allowances set out or determined in accordance with this Technical Memorandum for each and every emission year from 1 January 2017.

2.7 The Secretary shall review the quantity of emission allowances for each type of specified pollutant for each specified licence set out or determined in accordance with this Technical Memorandum not less than once every two years after the commencement of this Technical Memorandum.