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By Fax
(Fax: 2869 6794)

24 June 2009

Legislative Council Secretariat
Legislative Council Building
8 Jackson Road, Central, Hong Kong
(Attn.: Ms. Debbie Yau, Clerk to Subcommittee)

Dear Ms. Yau,

Subcommittee on Air Pollution Control (Volatile Organic Compounds) (Amendment) Regulation 2009

Second meeting on 26 June 2009

We refer to your letter of 12 June 2009 on the captioned, and are pleased to provide the below information requested in your letter:

1. Information on the outcome of implementation of measures and programmes to reduce volatile organic compound (VOC) emissions, to illustrate how the reduction target, from the emission level of 68 800 tonnes of VOC per year in 1997 to 31 000 tonnes per year by 2010, could be met (see Attachment 1).

2. A rank order list of locally available products with high VOC content, which should include products under the Air Pollution Control (Volatile Organic Compounds) Regulation and Air Pollution Control (Volatile Organic Compounds) (Amendment) Regulation 2009 (the Amendment Regulation), and if appropriate, cleansing detergents for external walls of buildings (see Attachment 2).

3. Information on the measures and programme adopted or to be adopted by the Guangdong Provincial Government vis-à-vis those in Hong Kong to reduce VOC emissions, including progress of implementation and achievements of VOC emission reduction (see Attachment 3).

4. Explanation about why VOC emissions from power stations were not subject to statutory control (see Attachment 4).

5. Information on the way forward after implementing the Amendment Regulation and meeting the VOC emission reduction target in 2010 with a view to further improving the air quality of Hong Kong, including proposed measures and the environmental/health/economic benefits to be attained (see Attachment 5).

6. Information on the results of the Administration's review on the need to impose liability on the retailers subsequent to the operation of the Air Pollution Control (Volatile Organic Compounds) Regulation (see Attachment 6).

Please contact the undersigned if you want further information.

Yours sincerely,

(Joe Fong)
Senior Environmental Protection Officer
for Director of Environmental Protection

Internal
AD(AP)
P(AP)

Attachment 1

Outcome of implementation of measures and programmes to reduce volatile organic compound (VOC) emissions, to illustrate how the reduction target, from the emission level of 68,800 tonnes of VOC per year in 1997 to 31 000 tonnes per year by 2010, could be met

To achieve the VOC emission reduction target of 55% by 2010, we have implemented the following control measures:

Controlling Emissions from Motor Vehicles

(i) We implemented a programme to tighten the emission standards of newly registered motor vehicles in tandem with the European Union. The programme contributes to the VOC emission reduction by about 1,000 tonnes a year, and the details are as follows:

- Implemented Euro II and III vehicle emission standards for newly registered vehicles in 1997 and 2001, respectively.

- From 1999, newly registered vehicles are required to comply with new evaporative emission standards.

- In 1999, Euro I emission standards for newly registered motorcycles was implemented. In 2007, Euro III emission standard for newly registered motorcycles was implemented.

- In 2006, we started implementing Euro IV vehicle emission standards for newly registered vehicles.

- Starting from 1 April 2007, a one-off grant is being provided to encourage vehicle owners to replace early their pre-Euro and Euro I diesel commercial vehicles with those compliant with the prevailing emission standard, which is Euro IV emission standard.

- We planned to follow EU to implement Euro V motor vehicle fuel standards and Euro V vehicle emission standards.

Recovery of Petrol Vapour

(ii) In April 1999, we implemented the Air Pollution Control (Petrol Filling Stations) (Vapour Recovery) Regulation to require recovery of petrol vapour from unloading operation. This measure was estimated to reduce 270 tonnes VOC emissions a year.

(iii) In 2004, we amended the Regulation to require the recovery of petrol vapour emitted during vehicle refuelling at petrol filling stations, with effect from 31 March 2005. This measure was estimated to reduce 740 tonnes VOC emissions a year.

Control of VOC emissions from Products and the Printing Industry

(iv) Since 1 April 2007, we have enforced the Air Pollution Control (Volatile Organic Compound) Regulation in phases to restrict the VOC content of architectural paints/coatings, printing inks and six major types of selected consumer products (i.e. air fresheners, hairsprays, multi-purpose lubricants, floor wax strippers, insecticides and insect repellents), and require lithographic heatset printing machines to install with emission control devices starting from 1 January 2009. The control was estimated to reduce 8,000 tonnes VOC emissions a year.

Proposed Further Control of VOC Emissions from Products

(v) We proposed to amend the Air Pollution Control (Volatile Organic Compounds) Regulation to extend the scope of products controlled to vehicle refinishing paints, vessel and pleasure craft paints, and adhesives and sealants to restrict their VOC contents with effect from 1 January 2010 in phases. We estimate the extended control will reduce about 700 tonnes VOC emissions a year which is needed for achieving the 55% emission reduction target by 2010.

2. The table below illustrates how the 55% VOC emission reduction target is achieved, with the reductions bring about by the measures and programmes already introduced and planned to reduce VOC emissions:-

Emission Sources	**VOC Emission (tonnes/year)**[1]		
	1997	**2007**	**Projected 2010**[2]
Public Electricity Generation	357	435	435
Road Transport	16,500	7,770	6,770
Navigation	229	265	265
Civil Aviation	656	296	296
Other Fuel Combustion	2,360	1,160	1,160
Petrol Filling Stations	1,120	179	77
Other Non-combustion[3]	47,600	29,600[4]	22,000[5]
Total	**68,800**	**39,700**	**31,000**

Notes:

[1] The total emission might be different from the sum of individual categories because of rounding off of data.

[2] No activity growth has been assumed for the emission projection of 2010.

[3] Other non-combustion sources include paints and coatings, printing, adhesives, sealants, consumer products, pesticides, etc.

[4] The implementation of the Air Pollution Control (Volatile Organic Compounds) Regulation which restricted the VOC content of hairsprays and printing inks effective from 1 April 2007 would contribute to a reduction of about 1,100 tonnes of VOC emission resulting in 29,600 tonnes of VOC emission in 2007. Without this control, the VOC emissions in 2007 would be 30,700 tonnes.

[5] This emission of 22,000 tonnes can only be achieved if a further 700 tonnes of VOC emission is reduced by implementing control of VOC contents in vehicle refinishing paints, vessel and pleasure craft paints, adhesives and sealants proposed in the amendment regulation with effect from 1 January 2010 in phases.

Attachment 2

A rank order list of locally available products with high VOC content, which should include products under the Air Pollution Control (Volatile Organic Compounds) Regulation and Air Pollution Control (Volatile Organic Compounds) (Amendment) Regulation 2009, and if appropriate, cleansing detergents for external walls of buildings

The rank order of locally available products with high VOC content according to the annual emission are listed in the below Table:-

Products	Regulated in Hong Kong	Regulated in California[1]	VOC Content (g/L)	VOC Emissions (tonnes/year)
Consumer Products				**11,027**[2]
Hairsprays	Yes	Yes	400 – 776	4,395
Air Fresheners	Yes	Yes	Negligible – 1,000	2,409
Insecticides	Yes	Yes	4 – 792	1,269
Insect Repellents	Yes	Yes	512 – 680	1,021
Multi-purpose Lubricants	Yes	Yes	450 – 700	543
Floor Wax Strippers	Yes	Yes	45 – 54	526
Underarm Deodorants	No	Yes	10 – 992	149
General Purpose Degreasers	No	Yes	10 – 990	147
Fabric Protectants	No	Yes	710	139
General Purpose Cleaners	No	Yes	30	96
Personal Fragrance Products	No	Yes	790 – 800	90
Automotive Engine Degreasers	No	Yes	120 – 889	47
Tire Sealants and Inflators	No	Yes	450 – 920	46
Charcoal Lighter Materials	No	Yes	1,000	39
Automotive Windshield Washer Fluids	No	Yes	450 – 1,000	38
Paint Strippers	No	Yes	888 – 941	19
Aerosol Paints	No	Yes	536 – 682	16
Automotive Brake Cleaners	No	Yes	920 – 975	15

Products	Regulated in Hong Kong	Regulated in California[1]	VOC Content (g/L)	VOC Emissions (tonnes/year)
Antiperspirants	No	Yes	30 – 763	13
Floor Polishers/Waxes	No	Yes	860 – 864	10
Silicone-based Multi-purpose Lubricants	No	Yes	950	Negligible
Paints				**9,532**
Architectural Paints	Yes	Yes	100 – 770	8,832
Vehicle Refinishing Paints	Proposed	Yes	436 – 790	360
Vessel and Pleasure Craft Paints	Proposed	Yes	250 – 613	340
Printing				**4,797**
Printing Ink and Printing Process	Yes	Yes	30 – 650	4,797
Adhesives & Sealants				**920**
Adhesives and Sealants	Proposed	Yes	Negligible – 851	920
Pesticides for Agricultural/Industrial/Institutional Use				**281**
Pesticides	No	Yes	Negligible – 890	281

Notes:

[1] For paints and printing, the products are regulated in some major air districts in California, particularly those with more serious air pollution problem, such as South Coast and Bay Area Air Quality Management Districts. These major air districts have the most comprehensive coverage of control due to their air pollution problem while smaller districts with less air pollution problem would have fewer products under control.

[2] More than 90% VOC emission of 11,027 tonnes from high VOC containing consumer products has already been controlled by implementation of the Air Pollution Control (Volatile Organic Compounds) Regulation since 1 April 2007.

2. The other products which would cause VOC emissions are thinning solvents. Their emissions have been controlled by limiting the VOC contents in products under "a ready to use condition" and are not separately included as a product in the above list. It is, however, noted that California (South Coast Air Quality Management District) has just adopted a new regulation in March 2009 to control VOC contents of thinning solvents. As this new control would affect the use of almost all paints, printing inks, sealants, adhesives and many consumer products, there is a need to study and confirm the feasibility under local conditions and have detailed consultation with concerned trades before similar

control could be proposed.

3. For cleansing detergents for external walls of buildings, they are water-based products with low VOC contents. It is not considered necessary to include as a control product under the Regulations.

Attachment 3

Measures and programme adopted or to be adopted by the Guangdong Provincial Government vis-à-vis those in Hong Kong to reduce VOC emissions, including progress of implementation and achievements of VOC emission reduction

In April 2002, Hong Kong and Guangdong agreed to reduce the emissions of four major air pollutants in the region, with the emission level of volatile organic compounds (VOC) to be reduced by 55% by 2010, using 1997 as the base year. To achieve the 2010 emission reduction targets, both sides jointly drew up and have been implementing the Pearl River Delta Regional Air Quality Management Plan (RAQMP). Key measures have been undertaken by Guangdong under the RAQMP to reduce VOC emissions in the PRD region. They include tightening emission standards of newly registered vehicles to National III standards, implementing an environment labeling pilot system for vehicles, restricting the growth of motorcycles at key cities, stepping up annual inspections and on-road spot checks on vehicles, and strengthening implementation of cleaner production standards for printing and paint industries, etc.

2. To further improve regional air quality, the Guangdong Provincial Government introduced in March this year the "Measures for Prevention and Control of Air Pollution in the Pearl River Delta Region of Guangdong Province (廣東省珠江三角洲大氣污染防治辦法)". Key measures for reducing VOC emissions include:

(a) implementing comprehensive vapour recovery system at petrol filling stations, oil depots and tanker trucks at major PRD cities by the end of 2010;
(b) phasing out paint and coating products with high VOC content;
(c) studying measures to encourage the production and sale of low VOC content products, including pesticide sprayers, cleansers, adhesives and hair styling gels, etc.;
(d) requiring industries (including vehicle manufacturing and repairs, petrochemical processing, furniture production, shoe production, printing, electronic products manufacturing and garment dry cleaning) to control fugitive VOC emissions in

accordance with relevant technical standards and specifications; and

(e) prescribing the discharge limits and methods in respect of oily fume, smoke and particulate emissions from catering operators in urban areas.

3. In addition, actions are being taken by Guangdong authorities to forbid straw burning and the agricultural use of highly toxic pesticides such as methamidophos. Integrated utilization management method for agricultural waste is adopted, and the use of effective, low toxicity and low residue pesticides is being promoted.

4. For vehicle paints, the Ministry of Environmental Protection has promulgated a guideline on "Clean Production Standard – Automobile manufacturing (Painting)" in 2006 for implementation on 1 December 2006 to promote the use of water-based vehicle paints.

5. In respect of regional air quality improvement cooperation, at the 11th Joint Hong Kong - Guangdong Cooperation Conference held in August 2008, the Chief Executive and the Guangdong Governor reaffirmed the commitment to meeting the mutually agreed 2010 emission reduction targets.

Attachment 4

Why VOC emissions from power stations were not subject to statutory control

Given the highly effective fossil fuel combustion inside the steam boilers and gas turbines used in thermal power stations, the emissions of VOC from power generation are of very small quantities. In 2007, the emission of VOC from power sector was 435 tonnes accounting for about 1.1% of the territory emissions in Hong Kong. The emission trend of the VOC emission from power sector between 2002 and 2007 are tabled below for reference-

Year	2002	2003	2004	2005	2006	2007
VOC Emission from power sector (tones/year)	342	376	384	409	416	435
Total VOC emission in Hong Kong (tones/year)	44,500	44,200	44,300	41,800	41,000	39,700
% of VOC emission from power sector	0.8%	0.9%	0.9%	1.0%	1.0%	1.1%

2. Owing to the very low level of emissions, VOC emissions from power plants is currently not a concern in Hong Kong. In other advanced countries like the United States and European Union, VOC emissions from fossil fuel fired steam boilers and gas turbines are also not subjected to any emission control limits in view of the very low emissions as a result of their highly efficient combustion.

Attachment 5

Way forward after implementing the Amendment Regulation and meeting the VOC emission target in 2010 with a view to further improving the air quality of Hong Kong, including proposed measures and the environmental/health/ economic benefits to be attained

The Environmental Protection Department has commissioned a comprehensive study to review Hong Kong's Air Quality Objectives (AQOs) and develop a long-term air quality management strategy. The review is near completion. The consultant carrying out the study has proposed a series of measures to further improve the air quality so as to achieve the proposed new AQOs for Hong Kong. The proposed measures are listed in **Annex**.

2. Assuming that the Guangdong side continues to align itself with the best practices to curb emissions and implementation of the proposed measures, the consultant's modeling result has demonstrated that the proposed new AQOs are achievable. Implementation of these proposed measures would incur an annualized cost of about HK$ 596 million to the society, which is significantly lower than the anticipated benefit of $1,228 million per year mainly due to improvement of public health and savings in energy costs. Item 9 in the Annex concerns the initiative to strengthen VOC control for non-architectural coatings, including vessel paints, pleasure craft paints, vehicle refinishing paints, adhesives and sealants, which are essentially the same as that proposed under the Amendment Regulation. This initiative is estimated to result in 700 tonnes reduction in VOC emissions, with a benefit-cost ratio at a relatively high level of 6.9.

3. In addition, California (South Coast Air Quality Management District) has just adopted a new regulation in March 2009 to control VOC contents of thinning solvents from 2010 onwards. There is an opportunity to have further reduction in VOC emissions from thinning and cleaning solvents. While the control on use of thinning and cleaning solvents is worth exploring, we need to study and confirm the feasibility under local conditions and have detailed consultation with concerned trades before we can prepare the plan for the control.

Annex

Control Measures to Further Improve the Air Quality and Achieve the Proposed new AQOs

Emission Capping and Control

1. Increase ratio of natural gas in local electricity generation to not less than 50% with additional emission abatement measures
2. Early retirement of aged / heavily polluting vehicles (pre-Euro, Euro I and Euro II commercial diesel vehicles and franchised buses)
3. Earlier uptake of latest Euro standard for Euro III diesel commercial vehicles
4. Wider use of hybrid / electrical vehicles or other environmentally friendly vehicles with similar performance
5. Ultra low sulphur diesel for local vessels
6. Selective catalytic reduction for local vessels
7. Electrification of aviation ground support equipment
8. Emission control for off-road vehicles / equipment
9. Strengthening VOC control (non-architectural coatings, adhesives and sealants)

Transport Management

10. Low emission zone (banning pre-Euro, Euro I , Euro II and Euro III commercial vehicles) for Central, Mong Kok and Causeway Bay
11. Car-free zone / pedestrianisation scheme for Central, Mong Kok and Causeway Bay
12. Bus route rationalization

Infrastructure Development and Planning

13. Expand rail network
14. Cycling network to major public transport hubs

Energy Efficiency Measures

15. Mandatory implementation of Building Energy Codes
16. Energy efficient electrical appliances for domestic use
17. LED or equivalent alternatives for street lighting
18. Tree planting / roof-top greening
19. District cooling system for Kai Tak Development

Attachment 6

Results of the Administration's review on the need to impose liability on the retailers subsequent to the operation of the Air Pollution Control (Volatile Organic Compounds) Regulation

Currently, a total of 54 types of regulated products had already been subject to control under the Air Pollution Control (Volatile Organic Compounds) Regulation by phases since 1 April 2007. Up to the end of May 2009, we have conducted about 590 inspections to retail outlets and collected more than 990 samples of regulated products for analysis. There are only a few suspected cases of VOC non-compliant regulated products sold at the retail shops and the retailers had provided information, including that relating to the importers, for further investigation.

2. There was no evidence of retailers knowingly selling illegal products and the retailers were cooperative to provide information for the enforcement staff to trace the importers. Also, retailers or wholesalers who have imported or smuggled non-compliant products for sales or use in Hong Kong would themselves become importers of the regulated products and would be liable under the Regulation. Based on the enforcement experience and existing mechanism, controlling the source of supply (i.e. at the importer and manufacturer levels) is already effective for ensuring compliance to the Regulation. Therefore, we consider that it is not necessary to impose liability on retailers at present, but will continue to monitor and review the situation.