

立法會
Legislative Council

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Panel on Environmental Affairs

Subcommittee on Improving Air Quality

Minutes of meeting
held on Thursday, 26 May 2011, at 8:30 am
in Conference Room A of the Legislative Council Building

Members present : Hon Audrey EU Yuet-mee, SC, JP (Chairman)
Hon Miriam LAU Kin-ye, GBS, JP
Hon Jeffrey LAM Kin-fung, SBS, JP
Hon KAM Nai-wai, MH
Hon Cyd HO Sau-lan
Hon CHAN Kin-por, JP
Hon IP Wai-ming, MH
Hon Tanya CHAN

Members absent : Hon LEE Wing-tat
Hon CHAN Hak-kan

Public officers attending : **For item I**

Dr Kitty POON
Acting Secretary for the Environment

Mr Carlson K S CHAN
Deputy Director of Environmental Protection (3)
Environmental Protection Department

Mr MOK Wai-chuen
Assistant Director (Air Policy)
Environmental Protection Department

Mr Edmond HO
Principal Environmental Protection Officer (Mobile
Source Control)
Environmental Protection Department

Attendance by invitation : For item I

School of Public Health and Primary Care, The
Chinese University of Hong Kong

Professor TIAN Lin-wei
Assistant Professor

Clerk in attendance : Miss Becky YU
Chief Council Secretary (1)1

Staff in attendance : Mrs Mary TANG
Senior Council Secretary (1)2

I. The trend of primary nitrogen dioxide emissions from vehicles

Presentation by researchers from the School of Public Health and
Primary Care, The Chinese University of Hong Kong
(LC Paper No. CB(1) 2241/10-11(01) — Submission from
Professor TIAN Lin-wei and
Professor Ignatius YU Tak-sun)

Meeting with the Administration
(LC Paper No. CB(1) 2291/10-11(01) — Administration's paper on
primary nitrogen dioxide
emissions from vehicles)

The Subcommittee deliberated (Index of proceedings attached in
Annex).

2. The Administration was requested to provide a comparison table showing the improvements in emission performance of Euro II to VI diesel vehicles if these were retrofitted with selective catalytic reduction devices.

3. Members agreed that a report on the work of the Subcommittee recommending the re-appointment of the Subcommittee in the 2011-2012 legislative session should be submitted for consideration by the Panel in due course.

II. Any other business

4. There being no other business, the meeting ended at 10:45 am.

Council Business Division 1
Legislative Council Secretariat
10 August 2011

Panel on Environmental Affairs

Subcommittee on Improving Air Quality

**Proceedings of the meeting
on Thursday, 26 May 2011, at 8:30 am
in Conference Room A of the Legislative Council Building**

Time marker	Speaker	Subject(s)	Action required
<i>Agenda Item I - The trend of primary nitrogen dioxide emissions from vehicles</i>			
000037 - 003826	Chairman Prof TIAN Lin-wei	<p>Prof TIAN's presentation on his submission entitled "Retrofit or renew the old diesel fleet: the nitrogen dioxide (NO₂) pollution in Hong Kong" (LC Paper No. CB(1) 2241/10-11(01)) -</p> <p>(a) it was NO₂ which was of public health relevance, not nitrogen oxides (NO_x) as regulated by Euro emission standard;</p> <p>(b) diesel oxidation catalyst (DOC) increased NO₂ emissions because it was intentionally produced as an oxidant;</p> <p>(c) selective catalytic reduction devices (SCR) might also increase NO₂ emissions due to an increased share of NO₂ in NO_x;</p> <p>(d) as Euro IV and V buses did not perform better than Euro III buses in terms of NO₂ emissions, there was no point in retrofitting Euro III vehicles to meet Euro IV standard;</p> <p>(e) the right way to control NO₂ was to drastically reduce NO_x to Euro VI level, and share of NO₂ in total NO_x emissions; and</p> <p>(f) should expedite the replacement of Euro III vehicles with Euro VI models rather than retrofitting them with DOC and SCR.</p>	
003827 - 005432	Chairman Administration	<p>Administration's response (LC Paper No. CB(1) 2241/10-11(01)) -</p> <p>(a) roadside NO₂ could be emitted directly by vehicles or could be formed after the</p>	

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		<p>further oxidation of nitric oxide (NO) also emitted from vehicles.</p> <p>(b) apart from NO_x (a collective term of NO and NO₂), there was a need to reduce respirable suspended particulates (RSP) emissions from diesel vehicles in order to improve roadside air quality;</p> <p>(c) advanced economies adopted technologies to reduce the emissions of both RSP and NO_x at the same time;</p> <p>(d) studies conducted in Belgium revealed that retrofitting of SCRs in Euro II and Euro III diesel vehicles, coupled with diesel particulate filter (DPF), were able to reduce both RSP and NO_x emissions to meet Euro IV and Euro V standards respectively;</p> <p>(e) programme had been in place to retrofit diesel particulate filter (DPF)-equipped buses with SCRs to reduce NO_x emissions; and</p> <p>(f) Euro VI diesel vehicles were still under development and would not be commercially available until 2014 the earliest. Besides, SCR would continue to be a key emission control technology to help vehicles meeting the much tightened NO_x emission standard of Euro VI.</p>	
005433 - 010612	Chairman Ms Cyd HO Prof TIAN Lin-wei	<p>Ms Cyd HO's views -</p> <p>(a) need to explain the effects of diesel emissions on overall air quality;</p> <p>(b) need to publicize findings of overseas studies on air quality control; and</p> <p>(c) more information should be provided on proper management and maintenance of diesel vehicles.</p> <p>Prof TIAN Lin-wei's explanation -</p> <p>(a) there were primary and secondary NO₂</p>	

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		<p>emissions, the former were mainly from local roadside emissions while the latter from regional sources involving photochemical oxidation of NO to NO₂ promoted by ambient concentration of ozone;</p> <p>(b) while Belgium studies had indicated that retrofitting of diesel vehicles with SCR was effective in reducing RSP and NO₂ emission, studies conducted by other European countries had raised concerns about the effectiveness of SCRs; and</p> <p>(c) the use of Euro VI diesel vehicles was advocated as retrofitting of Euro II and III with SCRs to meet Euro IV standard was not enough for the protection of public health.</p>	
010613 - 012104	Chairman Ms Miriam LAU Administration	<p>Ms Miriam LAU's concerns -</p> <p>(a) while the level of NO_x was seen to have reduced in recent years, there had been an increase in the level of NO₂ which had given rise to health concerns; and</p> <p>(b) whether it was justified to proceed with the SCR retrofitting programme and if so, whether there were any targets for NO₂ reduction.</p> <p>Administration's explanation -</p> <p>(a) the decreasing trend of NO_x concentration was partly attributable to the tightening of vehicle emission standards over the years,</p> <p>(b) the increasing trend of NO₂ concentration could be attributable to the use of DOCs/DPFs which were effective in reducing RSP emissions from diesel vehicles but would increase direct emissions of NO₂;</p> <p>(c) the depletion of catalytic converters of high-mileage vehicles, such as taxis and public light buses, would result in more NO_x emissions alongside other</p>	

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		<p>pollutants, such as volatile organic compounds;</p> <p>(d) ambient concentrations of ozone could promote photochemical oxidation of NO to NO₂ at roadside;</p> <p>(e) as SCRs were able to reduce both NO_x and NO₂ emissions, retrofitting of Euro II and III with SCRs could meet Euro IV and V standards respectively; and</p> <p>(f) it would be difficult to set a target on the reduction in the roadside NO₂ level and more efforts would be needed to strengthen emission control.</p>	
012105 - 013059	Chairman Prof TIAN Lin-wei Administration	<p>Chairman's enquires on -</p> <p>(a) the adverse effects of NO₂;</p> <p>(b) the effectiveness of SCRs; and</p> <p>(c) the means to ensure effective maintenance of vehicles to reduce NO₂ emissions.</p> <p>Prof TIAN Lin-wei's explanation -</p> <p>(a) exposure to NO₂ had both long and short-term health effects. Children and elderlies were particularly vulnerable to NO₂ as it would aggravate existing pulmonary diseases;</p> <p>(b) NO₂ could reduce lung functions of infants and children;</p> <p>(c) increased NO₂ levels could increase morbidity and death rate of cardiovascular and respiratory diseases; and</p> <p>(d) there were no data as to whether NO₂ or RSP was more damaging.</p> <p>Administration's response -</p> <p>(a) SCR would be able to reduce 60% of NO_x in tailpipe emissions;</p>	

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		<p>(b) retrofitting Euro II and III buses with SCR could upgrade their NO_x emission performance to Euro IV and V level respectively;</p> <p>(c) tests using sensors and portable emission measurement systems would be performed to assess the emission performance of vehicles;</p> <p>(d) guidelines on Liquefied petroleum gas vehicle maintenance would be worked out in consultation with the transport trades; and</p> <p>(e) efforts would be made to monitor the NO_x emission performance of vehicles.</p>	
013100 - 013850	Chairman Mr KAM Nai-wai Administration	<p>Mr KAM Nai-wai's enquiry/view -</p> <p>(a) whether the Administration would consider replacing polluting vehicles, given the concerns over the effectiveness of SCR,; and</p> <p>(b) should expedite the introduction of a new set of Air Quality Objectives (AQOs).</p> <p>Administration's response -</p> <p>(a) SCR was a practical way to reduce NO_x emissions pending the introduction of Euro VI vehicles, which could only be commercially available by 2014/2016;</p> <p>(b) feasibility studies on the retrofitting of SCR would be conducted before this was implemented on a wider scale; and</p> <p>(c) discussion would be held within the year on the introduction of new set of AQOs.</p>	
013851 - 014838	Chairman Ms Cyd HO Prof TIAN Lin-wai Administration Ms Miriam LAU	<p>Ms Cyd HO's enquiries/views -</p> <p>(a) whether it was worthwhile to proceed with SCR, and whether there were other practical alternatives to reduce NO₂ emissions other than replacement with Euro VI models;</p>	The Administration to provide a comparison table showing the improvements in emission

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		<p>(b) need to provide a comparison table showing the improvements in emission performance of Euro II to VI diesel vehicles if these were retrofitted with SCRs; and</p> <p>(c) whether the Administration would still have the resources to proceed with the replacement with Euro VI vehicles by 2014/2016 if it had already spent too much on SCR retrofitting.</p> <p>Prof TIAN Lin-wei's response -</p> <p>(a) while there were benefits in retrofitting Euro III buses with DPF and SCR, the benefits might not be sufficient; and</p> <p>(b) more efforts were needed to reduce NO₂ emissions.</p> <p>Administration's response -</p> <p>(a) retrofitting with SCRs could be able to reduce tailpipe NO_x emissions by 60%;</p> <p>(b) it would be more cost-effective to retrofit the 3 000 plus Euro II and III buses with SCRs to meet Euro IV and V standards respectively than replacing them given the high replacement costs;</p> <p>(c) SCR retrofitting was necessary pending the introduction of Euro VI vehicles; and</p> <p>(d) the Chief Executive had announced in the 2010-2011 Policy Address that additional requirements would be imposed upon expiry of the current franchise in the next few years requiring bus companies to switch to zero emission buses or the most environment-friendly buses when replacing existing ones, taking into account the feasibility and affordability of bus operators and passengers.</p>	<p>performance of Euro II to VI diesel vehicles if these were retrofitted with SCRs.</p>

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014839 - 020019	Chairman Ms Miriam LAU Administration	<p>Ms Miriam LAU's views/concerns -</p> <p>(a) the Administration should consider buying out all pre-Euro and Euro I diesel vehicles so that they would be removed from the roads permanently;</p> <p>(b) SCR might not be able to perform well under the urban driving conditions in Hong Kong, which was quite different from the motor-way type driving in Belgium where the studies on the effectiveness of SCR were conducted; and</p> <p>(c) how to address the concern about increase in NO₂ emissions despite the decrease in total NO_x emissions.</p> <p>Chairman's requests -</p> <p>(a) Prof TIAN to provide other overseas studies on the effectiveness of SCR; and</p> <p>(b) the Administration to explain why it had only made reference to the studies on SCR in Belgium and not other places.</p> <p>Administration's clarification -</p> <p>(a) it would not be practicable to set targets for reduction of NO₂ as unlike NO_x, NO₂ was not a regulated pollutant in vehicle emission standards adopted by the European Union, USA and Japan;</p> <p>(b) retrofitting with SCR would not only reduce tailpipe NO_x emissions by 60% but also NO₂ emissions; and</p> <p>(c) the emission performance of both new and retrofitted vehicles would be adversely affected in urban driving conditions.</p>	
020020 - 021000	Chairman Mr Jeffrey LAM Prof TIAN Lin-wei Administration	<p>Mr Jeffrey LAM's concerns/enquiries -</p> <p>(a) while the levels of RSP and sulphur dioxide had been decreased, the level of</p>	

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		<p>NO₂ was on the rise;</p> <p>(b) the other emissions sources of NO₂ apart from vehicles; and</p> <p>(c) the basis upon which Prof TIAN's disagreement with the findings of the Belgian studies on the effectiveness of SCR in reducing NO₂ emissions was arrived at.</p> <p>Prof TIAN Lin-wei's response -</p> <p>(a) the predominant source of NO₂ was from local vehicle emissions; and</p> <p>(b) the performance of DOC differed from SCR in terms of reduction in emission levels of pollutants.</p> <p>Administration's clarification -</p> <p>(a) the studies conducted in Belgium included testing of vehicle emission performance under urban driving as well as motorway driving conditions;</p> <p>(b) reference had also been made to studies on the successful reduction in vehicle emissions retrofitted with SCR conducted in London; and</p> <p>(c) apart from vehicle emissions, NO₂ could be generated in processes involving combustion.</p>	
021001 - 021410	Chairman Mr KAM Nai-wai Ms Cyd HO Mr Jeffrey LAM	Members' agreement that a report on the work of the Subcommittee recommending the re-appointment of the Subcommittee in the 2011-2012 legislative session should be submitted for consideration by the Panel on Environmental Affairs in due course.	