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for its meeting on 14 April 2000

Addressing The Air Pollution Problem in Hong Kong

Purpose

This paper provides a summary of the efforts made by LegCo Members together with the Administration to address the air pollution problem in Hong Kong. It also provides background information on the specific problems being considered by Members in the Council and in committees.

Background

2. Protection of the air quality in Hong Kong has always been high on the agenda of the Legislative Council, even as far back as the early 1990s. The subject has been reviewed by the Panel on Environmental Affairs on a regular basis and also jointly with the Panel on Transport when emissions from vehicles and the development of an environmentally sustainable transport system are discussed. To reiterate the importance Members of the Council had attached to the subject of air quality, three motions were carried in the Council between 1995 and 1998 urging Government to take expeditious actions to improve air quality.

3. Measures to improve air quality are considered at the following three levels:

(a) street level -- emissions from vehicles;

(b) ambient level -- power stations, industry, ships and construction sites; and

(c) regional level -- acid rain, haze and smog due to developments locally in neighbouring regions.

Street level pollution

Emission from diesel vehicles

4. In Hong Kong, the street level pollution is serious and has therefore become the prime target for action. Motor vehicle emission standards in Hong Kong have been tightened progressively since 1992 for both diesel and petrol vehicles. Diesel vehicles, which account for 98% of the respirable suspended particulates and 85% of the nitrogen dioxide emitted from motor vehicles, are identified as the main cause of Hong Kong's street level pollution.

5. All legislative proposals put before the Council in the past decade to apply more stringent emission standards to diesel vehicles were passed with full support. Today, Hong Kong is one of the few Asian cities which have adopted the most stringent emission standards, which are comparable to Europe and USA. The emission standards generally represent the current best available emission control technologies and is supplying automobile diesel with sulphur content of 0.05% limit. New heavy duty diesel vehicles have been subject to emission standards equivalent to the Euro I starting from 1995 and Euro II since 1997. New light duty diesel vehicles have been subject to Euro I since 1995 and to Euro II in two phases: 1998 and 1999. However, the question of removing existing diesel vehicles from the roads has continued to be a subject of concern.

6. In 1995, when the Government published its consultation paper on "Further Proposals to Reduce Emissions from Diesel Vehicles", it proposed a mandatory scheme to replace by phases light-duty diesel vehicles with petrol vehicles. This mandatory scheme however sparked off strong objection from the transport trade.

7. The Panel on Environmental Affairs and the Panel on Transport of the former Council jointly held a series of meetings to solicit views from interested parties. To address the concerns of the trade, the Panels urged the Administration to further examine ways to resolve the differences in opinion among the various parties, in particular on operating cost estimates. A motion was also passed by the former Council on 13 December 1995 to urge the Government to replace the mandatory scheme of phasing out diesel vehicles of four tonnes or below with incentive measures to attract owners of diesel vehicles to change to petrol vehicles on a voluntary basis, as well as expeditiously explore other more effective and acceptable measures.

8. In September 1996, the Administration set up an interdepartmental working group to study the feasibility of replacing diesel vehicles with clean gaseous fuelled vehicles. Amongst other findings, the working group concluded that liquefied petroleum gas (LPG) vehicles were a practicable clean alternative to diesel vehicles and that they were safe and technically feasible in Hong Kong. Before launching a 12-month trial of LPG taxis in late 1997, the Administration sought the views of members of the Panel on Environmental Affairs and the Panel on Transport on how the trial scheme could best proceed.

9. After the 1997 handover, the Panel on Environmental Affairs and the Panel on Transport of the Provisional Legislative Council continued to monitor the subject. The interim findings of the LPG Taxi Trial Scheme had proved that the switch to LPG was technically practicable and commercially viable. The Panels therefore urged the Administration to speed up introduction of LPG taxis on a large scale and consider extending the use of LPG to other types of vehicles.

10. The Panel on Environmental Affairs and the Panel on Transport of the first Legislative Council of the HKSAR also spared no efforts in following through the ways to tackle the deteriorating local air quality.

In 1998-99 session, while supporting the launch of LPG taxi scheme, the Panels stressed the need to provide financial incentives to motivate taxi drivers to replace the diesel fleet, to put in place adequate supporting measures, including LPG filling stations, workshops and mechanics for servicing LPG taxis and to keep the price of automobile LPG and the operating cost of LPG taxis at reasonable levels to facilitate conversion.

11. On 25 November 1998, the Council passed a motion to urge the Government to expeditiously formulate long term and comprehensive measures to improve the air quality. The measures proposed included offering adequate financial incentives to encourage the taxi trade to switch to the use of LPG expeditiously, examining the feasibility of introducing LPG or other environmentally-friendly fuels for use by other types of vehicles, conducting researches on mechanical installations that can reduce exhaust emissions, enhancing vehicle maintenance standards, and studying the feasibility of introducing pollution-free public transport, etc.

12. During the debate, individual Members specifically put forward the following suggestions to the Administration for consideration:

(a) introducing natural gas and other cleaner fuels for vehicles;

(b) improving air quality through town planning and environmental protection, such as reducing the need to use transport between home and work, designating pedestrian precincts during holidays, tree-planting, etc.;

(c) making more use of electric-driven modes of transport; and

(d) considering the rejuvenating energy policy covering solar energy and wind as well as a reform of power generation facilities with new innovative environmental technologies.

13. In October 1999, LegCo Members in the debate on the Motion of Thanks to the Chief Executive's Policy Address welcomed Government's policies to combat pollution caused by diesel vehicles. Members fully supported Government's plans to provide grants to assist owners to switch to LPG vehicles, to launch trial schemes for LPG light buses and for

installing particulate traps in pre-Euro standard diesel light vehicles and catalytic converters in old medium and heavy diesel vehicles. Members also welcomed the offer of incentives to LPG suppliers to construct a network of LPG filling stations and Government's plan to organize training courses for LPG vehicle mechanics. Members however considered the Government's targets of reducing emission by 60% by 2003 and 80% by 2005 not ambitious enough.

14. Since December 1999, the Panel on Environmental Affairs and the Panel on Transport have held three joint meetings to review the aspects of vehicle maintenance and vehicle testing in the control of diesel vehicles, as well as other measures to control emissions from diesel vehicles. The Panels also examined at one of the joint meetings on the development of an environmentally sustainable transport system in the context of the Third Comprehensive Transport Study.

Emission from petrol vehicles and other control measures

15. For petrol vehicles, all newly registered vehicles have been required since 1992 to install a 3-way catalytic converter to achieve a reduction of up to 90% emissions of carbon monoxides, nitrogen dioxides and hydrocarbons. Leaded petrol has also been banned for supply or sale since April 1999.

16. As regards other control measures, the Administration has also undertaken to take the following actions:

(a) imposing the most stringent practicable requirements for the emissions of newly registered vehicles and for cleaner auto fuel as soon as these are commercially available in Hong Kong;

(b) securing the co-operation of franchised bus companies for some 2000 buses which do not meet the Euro II emission standards to be retrofitted with diesel catalysts over the next 2 years;

(c) launching a trial of diesel catalysts on Government heavy vehicles;

(d) requiring all commercial vehicles to have smoke checks during their roadworthiness inspections;

(e) operating a smoky vehicle control programme and introducing an advanced smoke test (by way of a dynamometer) for diesel vehicles;

(f) monitoring the development of advanced technology on emission control;

(g) supporting local institutions in search of emission-reducing technology and conducting trials on light diesel vehicles;

(h) using the Government fleet to set an example for improving environmental performance;

(i) enhancing enforcement and public education;

(j) giving priority for efficient, environmentally friendly transport modes such as railways and greater emphasis on pedestrian facilities; and

(k) exploring the feasibility of introducing trolley buses to Hong Kong.

17. Nevertheless, Members remain concerned about the pace in implementing concrete measures to abate vehicle-induced problems. In January and April 2000, the Panel on Environmental Affairs urged the Administration to expedite introduction of legislation proposal to increase the fixed penalty for smoky vehicles.

Ambient level pollution

18. According to the Administration, the measures taken during the past decade to reduce emission from industries and power generation have been extremely successful. The use of gas instead of coal in power generation has significantly reduced emissions.

19. The emission of dust from construction activities does not only raise the level of particulates in air but it also causes nuisances to people nearby. In June 1997, with the Air Pollution Control (Construction Dust) Regulation coming into effect, a package of dust control measures has been put into implementation aiming at reducing emissions by up to 80%. These measures include installation and proper operation of dust control systems, enclosing dusty materials and stockpiles or spraying them with water or dust suppression chemicals, treating unpaved surfaces, and implementing good on-site housekeeping measures.

20. To cater for works already contracted for before the Regulation came into effect, the concerned works and construction sites were exempted from the requirements for a year. Furthermore, in response to the trades' concerns for the possible difficulties for minor road works to comply with the requirements, a 6-month tune-in period for the trade to familiarize themselves with the requirements of the Regulation was allowed.

Regional level pollution

Deteriorating photochemical smog

21. At regional level, photochemical smog has been found to be deteriorating in recent years. Ozone, being the major component of photochemical smog, reached the highest hourly average concentration of 314mg/m³ in 1996 as compared with the Air Quality Objective of 240mg/m³. The annual average concentration of ozone also increased from 18mg/m³ in 1990 to 30mg/m³ in 1997. Hong Kong's visibility also deteriorated significantly during the same period, possibly due to the photochemical smog problem.

22. The deterioration of the photochemical smog problem is also a matter of concern to the Guangdong Authorities. In Guangdong, the pollution problem of nitrogen oxides was becoming more serious in the region. The level of nitrogen oxides recorded in 1997 in six places, namely Guangzhou, Foshan, Zhuhai, Dongguan, Shenzhen and Jiangmen, were found not in compliance with the national standard. In Guangzhou,

the level of total respirable suspended particulates was also not in compliance with the national standard.

23. Photochemical smog is different from other air pollutants as it is not directly released into the atmosphere from pollution sources. It is formed under sunlight through a series of complicated chemical reactions among a mixture of gases emitted from different sources. The whole process takes some time to complete, and as the gases disperse during the formation period, the area affected by photochemical smog is usually much more extensive and is farther away from the pollution sources. Main classes of such gases include nitrogen oxides and volatile organic compounds, the sources of which are emissions from fuel-consuming industrial plants or vehicles and facilities like food industries, chemical plants and landfills.

Joint efforts with the Guangdong Authorities

24. Air quality in the Pearl River Delta Region is one of the subjects considered by the Hong Kong-Guangdong Environmental Protection Liaison Group. A motion was passed by the Provisional Legislative Council on 19 November 1997 to urge the Government to, inter alia, enhance the function and transparency of the Liaison Group and promote co-operation with the Mainland in cross-region environmental protection programme relating to air quality.

25. The Panel on Environmental Affairs noted in 1998 that to tackle the problem, Guangdong had established the environmental objectives of implementing initial control of air pollutants released from vehicles by 2000, and effective control of air pollution problem caused by vehicle emissions by 2010. All petrol vehicles in Guangzhou and Shenzhen are now using unleaded petrol, and vehicles using LPG are now on trial. The banning of leaded petrol will be extended to the whole Guangdong Province in 2000. In addition, the State will also devise a series of control measures, including imposing more stringent emission standards for newly manufactured vehicles, promoting the phasing out of out-dated manufacturing technologies and industries, introducing legislation on the control of motor vehicle emissions, and mandatory disposal of aged vehicles, etc.

26. In January 1998, Guangdong and Hong Kong agreed on the need to study jointly into the air quality in the region. In August 1998, they endorsed proposals by an Expert Group comprising professionals from both Guangdong and Hong Kong on the work required, including the conduct of a joint study on the air quality in the region.

27. In October 1998, the Finance Committee approved a commitment of $15 million for engaging consultants to undertake the "Study on Acid Rain Pollution and its Control Measures". The Guangdong Authorities, on the other hand, proceeded with the other part of the joint study at their own cost -- "Study of Nitrogen Dioxide, Photochemical Smog and Particulates and their Control Measures". The studies aim at collecting information on present air quality, pollution sources and projections on socio-economic growth in the region as well as additional data on the temporal and spatial distribution of pollutant concentration. They would also assess the effectiveness of pollution control measures to be undertaken jointly by the Guangdong and Hong Kong Authorities.

28. Both studies commenced in April 1999 for completion by end 2000. The Expert Group will meet regularly to examine reports produced and exchange views. Both sides will also provide the necessary information, assistance, advice and findings to support the other side's topical study. The outcome of the studies, which will have to be approved by the Liaison Group, will assist in the formulation of future control strategies to tackle air pollution in the region.

The way forward

29. Members may wish to note that environmentalists and academics have also taken great interest in the subject. In December 1999, the Hong Kong University of Science and Technology organized a workshop on Air Pollution in the Pearl River Delta. Papers presented at the workshop covered a wide range of subjects, such as emissions of ozone and volatile organic compounds produced by dry-process laser printers, transport of air pollutants and their flow pattern around buildings with different Height/Width ratio, etc. These papers are interesting food for

thought in considering how the quality of air can be preserved or even improved in the process of rapid economic development.

30. At the recent special meetings of the Finance Committee on the examination of the Draft Estimates of Expenditure 2000-01, Members urged the Administration to keep a close watch of the development of technologies in this area. They also asked the Administration to be more open-minded in the introduction of more environmentally friendly vehicles already tested in other places, such as electric-driven motor vehicles or hybrid cars, and provide incentives and supportive facilities to encourage the development of these new technologies and industries in Hong Kong.

Members' Advice

31. Members may wish to note the background information provided in this paper and follow up at the relevant Panels.

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