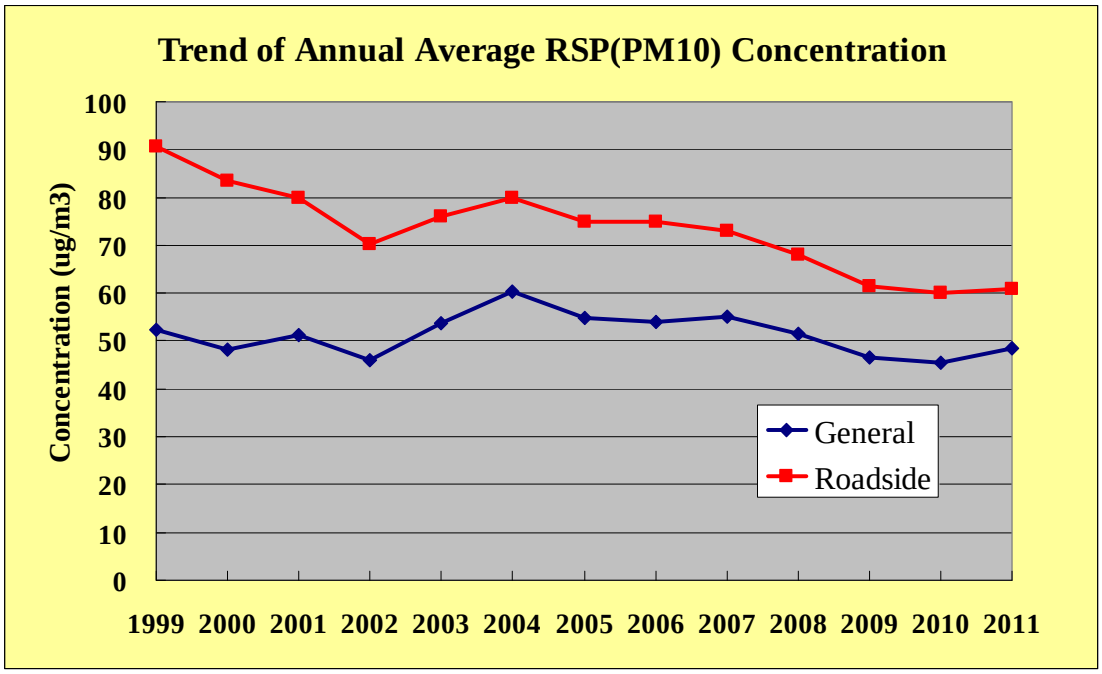
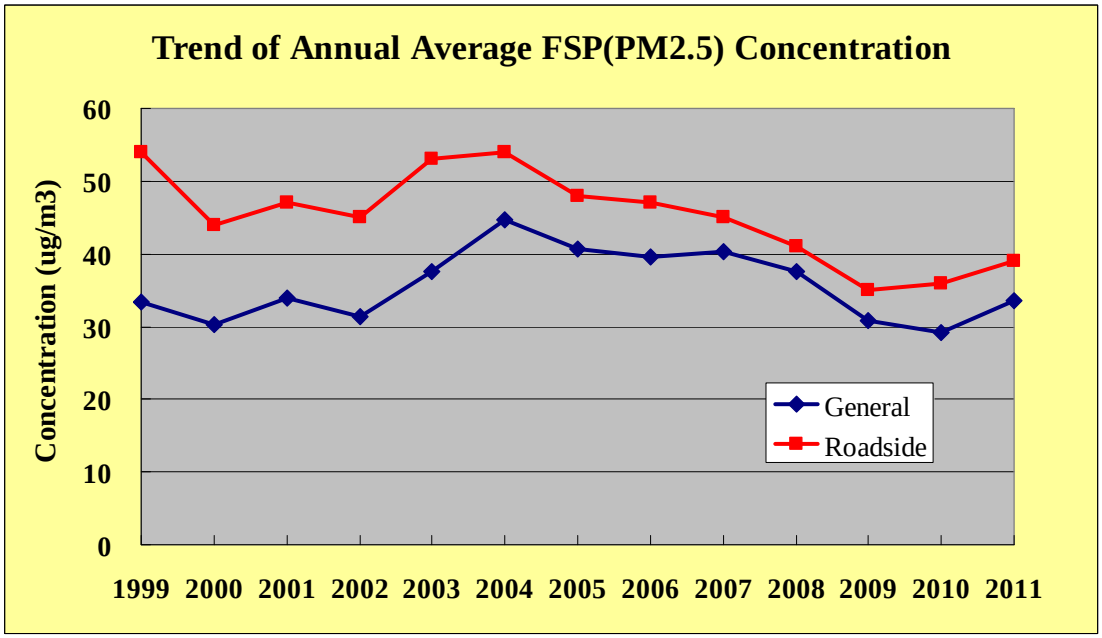
**Legislative Council**
**Panel on Environmental Affairs**
**Subcommittee on Improving Air Quality**
**Responses to the Follow-up Actions (Items (3))**
**Arising from the Discussion at the Meeting on 27 June 2012**

**(3) To provide the monitoring results of respirable suspended particulates (PM10) and fine suspended particulates (PM2.5) for the period from 1999 to 2011. To also advise how these monitoring results could translate to the proposed new Air Quality Objectives for PM10 and PM2.5.**

The annual averages of PM10 at various air quality monitoring stations from 1999 to 2011 and the compliance status of these stations with the annual and daily (24-hours) PM10 standards under the proposed new AQOs are shown in Table A. The results for PM2.5 are appended in Table B.

It is noted from the charts below that, over the past years, the PM10 and PM2.5 levels at roadside have been reduced due to the implementation of a host of vehicle emission control measures such as the incentive schemes to switch diesel taxis and light buses to liquefied petroleum gas vehicles, requiring older diesel vehicles to install particulates reduction devices, tightening of vehicle fuel and emission standards, tightening the control of smoky vehicles, etc.. The ambient PM10 and PM2.5 concentrations have also dropped in recent years due to joint efforts taken by both Hong Kong and Guangdong Provincial Governments, such as the retrofitting of power plants with flue-gas desulphurization device, implementation of more stringent vehicle fuel and emission standards, phasing out of highly polluting facilities in the Pearl River Delta, etc..




However, it remains major challenges to meet the proposed new AQOs, as reflected by the exceedance of the proposed new standards for PM10/PM2.5 at various air quality monitoring stations as shown in Table A and B, due to both regional and local sources. Our particulates levels have been under strong regional influence. The emissions of particulates of Hong Kong and the Pearl River Delta region are in the proportion of 1:99. Hong Kong and the Guangdong Provincial Government have been implementing various

measures to improve regional air quality, and it takes time for the concentration of suspended particulates to improve progressively. The introduction of standards on PM10 and PM2.5 under the new AQO would serve as a starting point and will be subject to review in future.

On our local front, to further reduce particulate emission and achieve the proposed new AQOs, we will strive to take forward the 22 air quality improvement measures, including tightening the emission caps of power plant and vehicle emission standards, early retirement of aged/heavily polluting vehicles, requiring ocean-going vessels to switch to 0.1% sulphur diesel while at berth, tightening the emission control of vehicle emissions through remote sensing and dynamometer tests, wider use of hybrid/electric vehicles etc.

## Table A –

**Annual Mean of PM10 for Air Quality Monitoring Stations (1999-2011)**

**and Their Compliance with the Annual and Daily PM10 Standards under the Proposed New AQOs**

| Station | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Central / Western | Annual Mean ($\mu g/m^3$) | 53 | 50 | 54 | 41 | 53 | 59 | 54 | 53 | 53 | 51 | 47 | 47 | 50 |
| | Daily exceedance | 19 | 16 | 27 | 6 | 27 | 31 | 33 | 24 | 32 | 22 | 9 | 14 | 15 |
| Eastern | Annual Mean ($\mu g/m^3$) | 47 | 42 | 46 | 42 | 49 | 54 | 49 | 47 | 49 | 46 | 43 | 43 | 43 |
| | Daily exceedance | 11 | 8 | 10 | 9 | 17 | 16 | 22 | 17 | 19 | 9 | 7 | 8 | 2 |
| Kwai Chung | Annual Mean ($\mu g/m^3$) | 56 | 51 | 53 | 48 | 56 | 62 | 58 | 58 | 60 | 52 | 47 | 45 | 48 |
| | Daily exceedance | 20 | 7 | 15 | 11 | 23 | 39 | 31 | 22 | 39 | 20 | 6 | 7 | 9 |
| Kwun Tong | Annual Mean ($\mu g/m^3$) | 52 | 52 | 56 | NA | 54 | 61 | 56 | 55 | 53 | 47 | 48 | 47 | 49 |
| | Daily exceedance | 16 | 14 | 19 | 15 | 24 | 27 | 33 | 25 | 24 | 10 | 8 | 9 | 6 |
| Sham Shui Po | Annual Mean ($\mu g/m^3$) | 56 | 52 | 54 | 50 | 55 | 60 | 56 | 55 | 57 | 53 | 47 | 48 | 51 |
| | Daily exceedance | 16 | 15 | 18 | 16 | 24 | 26 | 32 | 24 | 39 | 19 | 10 | 7 | 9 |
| Tsuen Wan | Annual Mean ($\mu g/m^3$) | 54 | 50 | 53 | 51 | NA | 63 | 58 | 57 | 59 | 53 | 49 | 45 | 50 |
| | Daily exceedance | 21 | 9 | 18 | 12 | 27 | 44 | 36 | 26 | 39 | 15 | 8 | 6 | 9 |
| Shatin | Annual Mean ($\mu g/m^3$) | 51 | 46 | 49 | 45 | 53 | 59 | 53 | 52 | 52 | 50 | 45 | 45 | 47 |
| | Daily exceedance | 18 | 8 | 15 | 11 | 23 | 35 | 27 | 23 | 29 | 18 | 9 | 7 | 6 |
| Tai Po | Annual Mean ($\mu g/m^3$) | 54 | 48 | 50 | 46 | 54 | NA | 51 | 51 | 53 | 50 | 46 | 45 | 46 |
| | Daily exceedance | 17 | 8 | 21 | 13 | 23 | 24 | 21 | 25 | 30 | 15 | 7 | 8 | 4 |
| Tung Chung | Annual Mean ($\mu g/m^3$) | 48 | 45 | 49 | 46 | 54 | 62 | 57 | 56 | 54 | 52 | 46 | 45 | 47 |
| | Daily exceedance | 12 | 14 | 23 | 14 | 41 | 50 | 51 | 35 | 40 | 37 | 11 | 16 | 19 |

| Station | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yuen Long | Annual Mean ($\mu g/m^3$) | 62 | 56 | 57 | 53 | 61 | 71 | 62 | 62 | 64 | 60 | 51 | 49 | 54 |
| | Daily exceedance | 45 | 24 | 30 | 29 | 49 | 77 | 56 | 47 | 69 | 45 | 16 | 17 | 25 |
| Tap Mun | Annual Mean ($\mu g/m^3$) | 44 | 38 | 43 | 39 | 47 | 53 | 50 | 48 | 53 | 52 | 44 | 41 | 47 |
| | Daily exceedance | 12 | 8 | 5 | 5 | 16 | 18 | 18 | 17 | 27 | 19 | 8 | 6 | 7 |
| Causeway Bay (roadside) | Annual Mean ($\mu g/m^3$) | 105 | 101 | 97 | 80 | 81 | 88 | 84 | 83 | 85 | 79 | 71 | 66 | 66 |
| | Daily exceedance | 197 | 185 | 148 | 55 | 69 | 116 | 83 | 86 | 107 | 67 | 34 | 36 | 27 |
| Central (roadside) | Annual Mean ($\mu g/m^3$) | 76 | 66 | 70 | 68 | 77 | 77 | 72 | 75 | 68 | 63 | 58 | 59 | 62 |
| | Daily exceedance | 49 | 32 | 47 | 42 | 55 | 70 | 64 | 64 | 55 | 31 | 14 | 29 | 29 |
| Mong Kok (roadside) | Annual Mean ($\mu g/m^3$) | -- | -- | 73 | 63 | 70 | 75 | 69 | 67 | 66 | 62 | 55 | 55 | 55 |
| | Daily exceedance | -- | -- | 43 | 28 | 55 | 66 | 51 | 48 | 52 | 28 | 12 | 17 | 17 |

Notes:

The current Mong Kok roadside station came into operation in 2001.

-- Data not available.

**NA –** Data available are below the minimum data requirements for calculation of annual mean for the year.

The proposed new AQOs for for PM10 are :

| Averaging time | Proposed new AQO limit (µg/m3) | No. of exceedances allowed in a year |
|---|---|---|
| Annual | 50 | NA |
| 24-hour (daily) | 100 | 9 |

"Daily exceedance" means the number of days with the average daily PM10 concentration exceeding the daily (24-hour average) standard of 100 ug/m3 under the proposed new AQO. The new AQOs allow 9 exceedance of the daily limit in a year.

## Table B –

**Annual Mean of PM2.5 for Air Quality Monitoring Stations (1999-2011)**

**and Their Compliance with the Annual and Daily PM2.5 Standards under the Proposed New AQOs**

| Station | | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tsuen Wan | Annual Mean ($\mu g/m^3$) | 37 | 33 | 37 | 35 | N/A | 46 | 43 | 41 | 41 | 37 | 32 | 30 | 35 |
| | Daily exceedance | 13 | 6 | 11 | 10 | 18 | 42 | 34 | 20 | 29 | 18 | 8 | 6 | 3 |
| Tung Chung | Annual Mean ($\mu g/m^3$) | 32 | 32 | 35 | 32 | 40 | 47 | 40 | 40 | 39 | 37 | 30 | 29 | 32 |
| | Daily exceedance | 7 | 12 | 15 | 12 | 43 | 56 | 44 | 27 | 33 | 35 | 8 | 12 | 12 |
| Yuen Long | Annual Mean ($\mu g/m^3$) | -- | -- | -- | -- | -- | N/A | 42 | 43 | 43 | 41 | 33 | 32 | 36 |
| | Daily exceedance | -- | -- | -- | -- | -- | 40 | 41 | 38 | 45 | 28 | 8 | 7 | 12 |
| Tap Mun | Annual Mean ($\mu g/m^3$) | 31 | 26 | 30 | 27 | 35 | 41 | 38 | 34 | 38 | 35 | 28 | 26 | 31 |
| | Daily exceedance | 7 | 4 | 3 | 3 | 17 | 28 | 29 | 14 | 28 | 13 | 4 | 5 | 2 |
| Central (roadside) | Annual Mean ($\mu g/m^3$) | 54 | 44 | 47 | 45 | 53 | 54 | 48 | 47 | 45 | 41 | 35 | 36 | 39 |
| | Daily exceedance | 45 | 16 | 21 | 27 | 30 | 53 | 46 | 32 | 34 | 19 | 3 | 9 | 11 |

Notes:

We started measuring PM2.5 at the Tsuen Wan, Tung Chung, Tap Mun general air quality monitoring stations and the Central roadside station in 1999. The measurement was extended to Yuen Long station in 2005 and to all the remaining stations in 2012.

-- Data not available.

**NA –** Data are below the minimum data requirements for calculation of annual mean for the year.

The proposed new AQOs for for PM2.5 are :

| Averaging time | Proposed new AQO limit (µg/m3) | No. of exceedances allowed in a year |
|---|---|---|
| Annual | 35 | NA |
| 24-hour (daily) | 75 | 9 |

"Daily exceedance" means the number of days with the average daily PM2.5 concentration exceeding the daily (24-hour average) standard of 75 ug/m3 under the proposed new AQO. The new AQOs allow 9 exceedance of the daily limit in a year.