Environmental Protection Department

Agreement No.
CE57/2006 (EP) Review
of the Air Quality
Objectives and
Development of a Long
Term Air Quality
Strategy for Hong Kong
- Feasibility Study

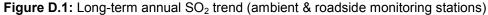
Appendix D

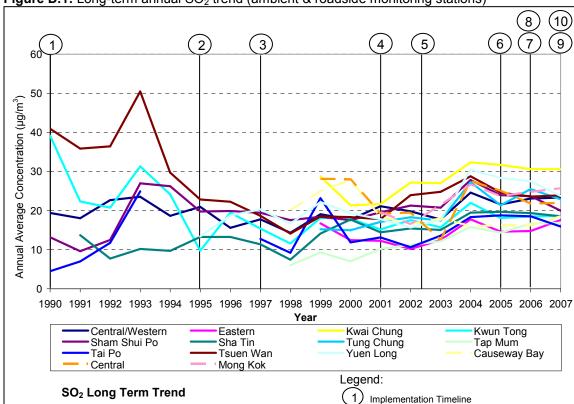
Air Quality Trend (1990 – 2007)



D1 Air Quality Trend

D1.1 Sulphur Dioxide

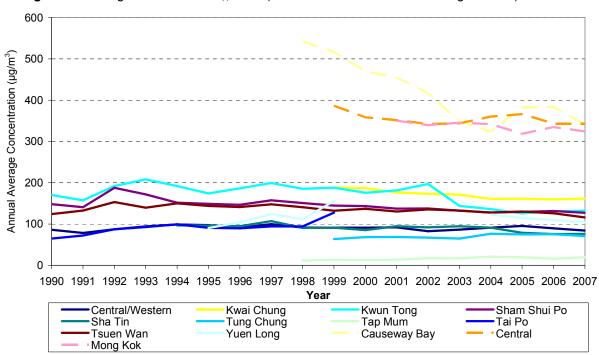


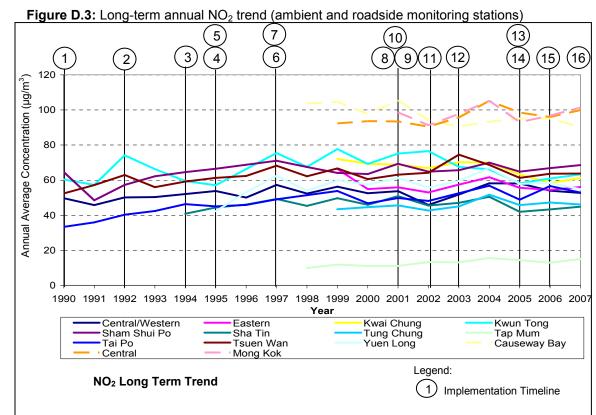


- 1. 1990 Enforcement of Air Pollution Control (Fuel Restriction) Regulations. The Regulations prohibit the use of high sulphur content solid and liquid fuel for commercial and industrial appliances.
- 1995 The permitted sulphur content of motor diesel fuel was reduced to 0.2 per cent.
- 3. 1997 New power plants operation was subject to more stringent control. Clean gaseous fuels were required to consume for power production.
- 4. 2001 The permitted sulphur content of motor diesel fuel was further reduced to 0.035 per cent.
- 5. 2002 The motor diesel fuel was tightened to the Euro IV standard (i.e. "ultra low sulphur diessel" level), which caps the sulphur content at 0.005%.
- 6. 2005 Total emission control was imposed on all power plants in Hong Kong upon license renewal of the plants, in addition to limiting only the concentration of pollutants in the emissions.
- 7. 2006 EPD granted the Environmental Permits on 25 April 2006 & 2 October 2007 for Hong Kong Electric Company Limited (HEC) to retrofit flue gas desulphurisation (FGD) system to two 350 MW coal-fired units (units L4 and L5) and one 250 MW coal-fired unit (unit L2) in Lamma Power Station. HEC commissioned its first gas-fired unit by end June 2006 and put it into commercial operation in October 2006. HEC commissioned the first local commercial scale wind power station on Lamma Island in February 2006.
- 8. 2006 For CLP Power Hong Kong Limited (CLP), EPD granted the Environmental Permit on 10 November 2006 for its retrofit project of FGD and selective catalytic reduction (SCR) systems to four 677 MW coal-fired units (units B1 to B4) in Castle Peak Power Station;
- 9. Tax incentive to introduce Euro V diesel.

D1.2 Oxides of Nitrogen / Nitrogen Dioxide

Figure D.2: Long term annual NO_X trend (ambient and roadside monitoring stations)

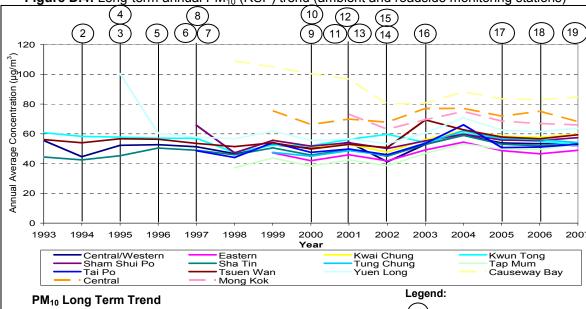




- 1. 1990 Enforcement of Air Pollution Control (Fuel Restriction) Regulations. The Regulations prohibit the use of high sulphur content solid and liquid fuel for commercial and industrial appliances.
- 1992 Enforcement of Air Pollution Control (Vehicle Design Standards) (Emission)
 Regulations. The Regulations sets out the emission standards for newly registered
 vehicles.
- 3. 1994 Enforcement of Air Pollution Control (Motor Vehicle Fuel) Regulation. The Regulation sets out the specifications of liquid motor vehicle fuel to be used in motor vehicles and prohibits the sale of leaded petrol.
- 4. 1995 The permitted sulphur content of motor diesel fuel was reduced to 0.2 per cent.
- 5. 1995 All newly registered vehicles were to comply with Euro I emission standards that were implemented in phases.
- 6. 1997 All newly registered vehicles were to comply with Euro II emission standards that were implemented in phases.
- 7. 1997 New power plants operation was subject to more stringent control. Clean gaseous fuels were required to consume for power production.
- 8. 2001 All newly registered vehicles were to comply with Euro III emission standards implemented in phases.
- 2001 All newly registered taxis are required to use cleaner liquefied petroleum gas (LPG) or petrol to eliminate diesel fuel use.
- 10. 2001 The permitted sulphur content of motor diesel fuel was further reduced to 0.035 per cent.
- 11. 2002 The motor diesel fuel was tightened to Euro IV standard (i.e. "ultra low sulphur diessel" level), which caps the sulphur content at 0.005%.
- 12. 2003 All Pre-Euro light diesel vehicles up to 4 tonnes were required to have an emission reduction device for licence renewal.
- 13. 2005 Amendment of the Air Pollution Control (Motor Vehicle Fuel) Regulation. The unleaded petrol specifications will be tightened to Euro IV level
- 14. 2005 Total emission control were imposed on all power plants in Hong Kong upon license renewal of the plants, in addition to limiting only the concentration of pollutants in the emissions.
- 15. 2006 All newly registered vehicles were to comply with Euro IV emission standards that were implemented in phases.
- 16. 2007 All pre-Euro diesel vehicles have to be installed with approved emission reduction devices; EPD launched a new programme to provide one-off grant totalling HK\$3.2 billion to encourage owners of 74,000 old diesel commercial vehicles to replace their old vehicles; EPD offer a 30% reduction in first registration tax to encourage the use of environment-friendly petrol private cars, subject to a ceiling of HK\$50,000 per car;

D1.3 Particulate Matter

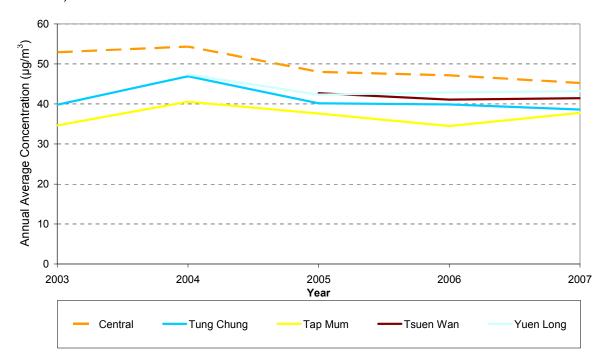
Figure D.4: Long-term annual PM₁₀ (RSP) trend (ambient and roadside monitoring stations)



1) Implementation Timeline

- 1992 Enforcement of Air Pollution Control (Vehicle Design Standards) (Emission) Regulations. The Regulations for the first time sets out the emission standards for the newly registered vehicles.
- 1994 Enforcement of Air Pollution Control (Motor Vehicle Fuel) Regulation. The Regulation sets out the specifications of liquid motor vehicle fuel to be used in motor vehicles and prohibits the sale of leaded petrol.
- 1995 The permitted sulphur content of motor diesel fuel was reduced to 0.2 per cent.
- 1995 All newly registered vehicles were to comply with Euro I emission standards that were implemented in phases.
- 5. 1996 - Enforcement of Air Pollution Control (Open Burning) Regulation. The Regulation prohibits open burning of construction waste, tyres and cables for metal salvage, and controls other open burning activities by permit system.
- 1997 All newly registered vehicles were to comply with Euro II emission standards that were implemented in phases.
- 1997 Enforcement of Air Pollution Control (Construction Dust) Regulation. The Regulation 7. requires contractors to take dust reduction measures when construction work is being carried
- 8. 1997 – New power plants operation was subject to more stringent control. Clean gaseous fuels were required to consume for power production.
- 2000 Incentivised the use of Ultra-Low Sulphur Diesel, whose sulphur content does not exceed 0.005%, by motor vehicles.
- 10. 2000 LPG Taxi Programme
- 11. 2001 All newly registered vehicles were to comply with Euro III emission standards (Private Cars for Euro IV) implemented in phases.
- 2001 All newly registered taxis are required to use cleaner liquefied petroleum gas (LPG) or petrol to eliminate diesel fuel use.
- 2001 The statutory sulphur content of motor diesel fuel was further reduced to 0.035 per cent.
- 14. 2002 The motor diesel fuel was tightened to Euro IV standard (i.e. an "ultra low sulphur content").
- 15. 2002 LPG / Electric Light Bus Programme 16. 2003 All Pre-Euro light diesel vehicles up to 4 tonnes were required to have an emission reduction device for licence renewal.
- 17. 2005 Total emission control was imposed on all power plants in Hong Kong upon license renewal of the plants, in addition to limiting only the concentration of pollutants in the emissions.
- 18. 2006 All newly registered vehicles were to comply with Euro IV emission standards that were implemented in phases.
- 19. 2007 All pre-Euro diesel vehicles have to be installed with approved emission reduction devices; EPD launched a new programme to provide one-off grant totalling HK\$3.2 billion to encourage owners of 74,000 old diesel commercial vehicles to replace their old vehicles; EPD offer a 30% reduction in first registration tax to encourage the use of environmentfriendly petrol private cars, subject to a ceiling of HK\$50,000 per car;

Figure D.5: Long-term annual trend of $PM_{2.5}$ (FSP) (ambient and roadside monitoring stations)



D1.4 Ozone

Figure D.6: Long-term annual ozone trend (ambient monitoring stations)

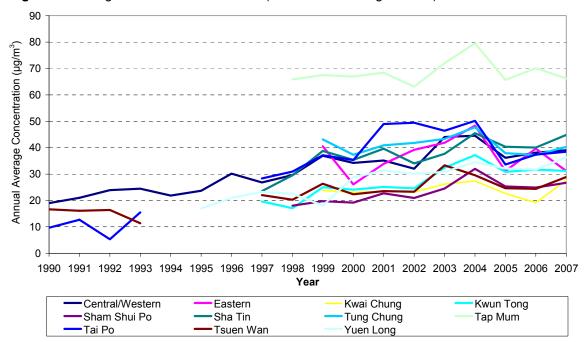
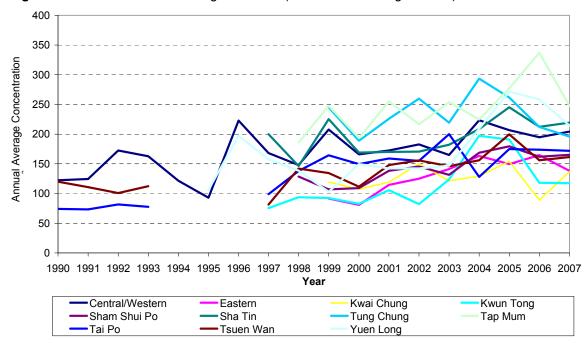
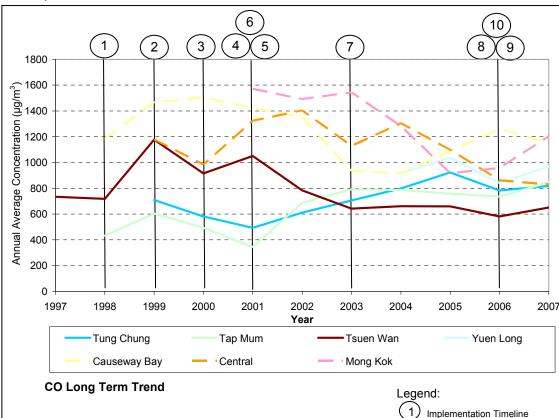


Figure D.7: Short-term 8-hr average O3 trend (ambient monitoring stations)



D1.5 **Carbon Monoxide**

Figure D.8: Long-term annual carbon monoxide trend (ambient and roadside monitoring stations)



(1)

- 1998 Enforcement of Air Pollution Control (Vehicle Design Standards) (Emission) Regulation. The Regulation introduces more stringent emission standards for diesel private cars to restrict registration to those of emission performance comparable to pertrol private cars in respect of nitrogen oxides and particulates, and for light duty diesel vehicles, other than taxis.
- 1999 Enforcement of Air Pollution Control (Vehicle Design Standards) (Emission) Regulations. The Regulation introduces more stringent emission standards for diesel vehicles and new evaporative emission standards for petrol vehicles.
- 3. 2000 - Incentivised the installation of emission reduction devices in pre-Euro diesel vehicles (starting firstly with those weighing up to four tonnes).
- 2001 All newly registered vehicles were to comply with Euro III emission standards 4. implemented in phases
- 2001 Motor vehicle fuel requirements were tightened to meet Euro III emission 5. standards.
- 6. 2001 – All newly-registered taxis were required to be fuelled by LPG or petrol.
- 2003 All pre-Euro diesel vehicles not more than four tonnes were compulsorily required to be retrofitted with emission reduction devices.
- 2006 All newly registered vehicles more than 3.5 tonnes were required to meet Euro IV emission standards.
- 2006 Implementation of Air Pollution Control (Emission Reduction Devices for Vehicles) (Amendment) Regulation 2005. The Regulation requires all pre-Euro diesel vehicles, except long idling ones, to be installed with approved emission reduction devices.
- 10. 2006 All newly registered vehicles not more than 2.5 tonnes were required to meet Euro IV emission standards.

D1.6 Lead

Figure D.9: Long-term annual Lead trend (ambient and roadside monitoring stations)

