

**Pearl River Delta Regional Air Quality Management Plan  
Enhanced Control Measures of Guangdong Provincial Government**

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
Use cleaner energy	To reduce gradually the energy consumption per 10,000 Yuan GDP. To establish by 2010 a diversified energy production and supply system that is safe, stable, economical, efficient and clean.	<p>The energy consumption per 10,000 Yuan GDP of Guangdong for 2007 was 0.747 tons of standard coal equivalent, down 3.15% as compared with that in 2005. The energy consumption per 10,000 Yuan GDP is expected to decrease by 16% in 2010 (as compared with 2005 level).</p> <p>To reduce reliance on more polluting fuel like coal and oil, Guangdong is developing two new natural gas projects apart from the Guangdong Liquefied Natural Gas (LNG) Project –</p> <ul style="list-style-type: none"> <li>(a) CNOOC Zhuhai Natural Gas Pipeline Project, with a capacity of about 1.19 million tonnes/year, utilizes natural gas from the South China Sea since February 2006; and</li> <li>(b) Zhuhai LNG Receiving Station Project, with a capacity of 3 million tonnes/year for Phase I, is expected to be commissioned partially by 2010.</li> </ul> <p>The power plants that have been converted to the use of natural gas as fuel include Zhongshan Hengmen Power Plant, Zhuhai Hongwan Power Plant (since February 2006) and Shenzhen Nanshan Power Plant (since April 2007).</p>
	To construct natural gas trunk pipeline and the associated works. To complete Phase I in 2005 that will have a capacity of 3 million tonnes/year. In 2009, to complete Phase II that will increase the total capacity to 6 million tonnes/year and finish construction of a number of natural gas power plants.	<p>The capacity of Guangdong LNG Project Phase I has been expanded from 3 million tonnes/year to 3.7 million tonnes/year and gas supply was started in mid 2006. The total capacity for Phase II will be expanded to 7 million tonnes per year.</p> <p>Four newly built natural gas power plants (with a total of 11 generating units) have all been commissioned in 2006 and 2007. Residents in Shenzhen, Guangzhou, Dongguan and Foshan can also use natural gas supplied through pipeline network.</p>

Measures	Implementation Programme	Progress (Up to 30 November 2008)
	To improve by 2005 the 500KV dual circuit annular core transmission grid to ensure transmission of electricity from western provinces.	The five AC and three DC main transmission channels from western provinces have been completed.
	To rationalize the distribution of new power stations. Apart from proper construction of generating units for combined heat and power supply and those thermal power plant projects which have been reported to the State for planning and building, no more new coal-fired and oil-fired power plants will be planned for building in the PRD Region.	Being implemented.
	To gradually enlarge the scale of electricity transmission from western provinces to Guangdong.	Being implemented.
Control sulphur content of fuel	To control the use of high sulphur fuel (sulphur content of coal and fuel oil should be below 0.8% in the acid rain control zone by 2005).	Being implemented.  By 2010, enterprises which have not installed desulphurization system would have their fuel sulphur content controlled at below 0.7% for coal and below 0.8% for fuel oil. Those not meeting the limits would need to use sulphur fixing agents or sulphur removal agents.
Reduce emissions from coal-fired and oil-fired power stations	To phase out small-scale thermal power generating units. Power plants with a capacity equal or above 300 MW to account for over 70% of the total installed capacity in the region in 2005, which is 35% higher than that in 2000.	The Guangdong Provincial Government announced its plan in March 2007 to close down small thermal power generating units with a total capacity of 9 660 MW in the Province by the end of 2010, including those with a total capacity of about 7 100 MW in the PRD Economic Zone. [Units of about 1 600 MW to be closed down in 2007, 3 600 MW in 2008 and 1 900 MW in 2009 ( <b>Annex C</b> ).]

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	To install FGD systems at the power plants in Shajiao, Huangpu, Taishan and Zhuhai by 2005.	FGD systems have already been installed (including works pending official check and acceptance) for generating units with a capacity of around 25 200 MW, thereby reducing the annual SO <sub>2</sub> emission by more than 750 000 tonnes. In addition, generating units of around 915 MW are being retrofitted with this system. Upon completion of the latter in end 2008, large scale thermal power generating units in Guangdong will all be equipped with FGD.
	To require all oil-fired and coal-fired generating units of capacity above 125MW to be equipped with FGD systems by 2007.	
	To require all coal-fired and oil-fired power plants to adopt low nitrogen oxides (low-NO <sub>x</sub> ) combustion technologies in case of alteration or expansion.	Low-NO <sub>x</sub> combustion technologies have already been required at all units in case of alteration or expansion.
	To require all coal-fired and oil-fired power plants under construction, alteration or expansion to install flue gas denitrification systems.	Being implemented.
	To promote the installation of low-NO <sub>x</sub> combustion device at existing coal-fired and oil-fired power plants.	Being implemented.  Guangzhou Ruiming Power Plant and Hengyun Power Plant D had installed de-denitrification systems. Tenders are being invited for installation of denitrification systems at Guangzhou Zhujiang Power Plant (Unit 4) and Shenzhen Mawan Power Plant (Unit 1).
	To study the feasibility of installing flue gas denitrification systems for existing power plants.	Development and Reform Commission of Guangdong Province has issued the relevant policy document and notification on the need for existing power plants to install denitrification systems.
	To require all power plants under construction, alteration or expansion to install FGD equipment, particulate removal devices and automatic continuous emissions monitoring system.	Being implemented. Power plants are required to put in place continuous emission monitoring system (CEMS) by end 2008, with a view to allowing the relevant authorities to have instant on-line access to the CEMS data.

Measures	Implementation Programme	Progress (Up to 30 November 2008)
	To enhance technological improvements of existing power plants and to implement cleaner production. Newly built power plants have to meet the advanced standard on cleaner production in the country.	Being implemented.
	To materialize the subsidization policy for thermal power plants to desulphurize by giving concessions, support and assistance in land acquisition for desulphurization systems and import of essential equipment so as to facilitate the full implementation of desulphurization projects.	From 1 July 2006, power plants with desulphurization system receive an extra RMB 1.5 cents per unit when the electricity is sold to the power grid.
	To establish a province-wide quota administration system for total emissions of SO <sub>2</sub> and to study the emissions trading mechanism of SO <sub>2</sub> .	Being implemented.
Control emissions from industrial boilers and industrial processes	To phase out coal-fired boilers with a capacity of less than 2 tonnes/hour in the urban areas of cities. By 2005, to stop using such coal-fired boilers in build-up areas of key cities. To require all large and medium-size industrial boilers to install desulphurization systems or adopt clean combustion technologies to reduce emissions.	<p>The operation of coal-fired boilers of less than 2 tonnes/hour has been largely phased out in the urban areas of cities in the region. Removal devices for particulates must be installed onto all industrial boilers. Restaurants located in sensitive areas and restaurants the operation of which would seriously affect public production must be installed with devices to purify cooking fumes.</p> <p><u>Guangzhou</u> As at the end of November 2008, 8 532 catering businesses had switched to clean energy uses; 4 371 had installed fumes abatement facilities. The use of clean energy by large catering businesses in the developed urban area had reached 94.13%.</p>

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	<p>(New item included in 2008) To tighten emissions standards for local boilers by 2010, so as to reduce emissions from industrial boilers and other boilers (e.g. commercial boilers).</p>	<p>Being prepared.</p>
	<p>To continue phasing out various production technologies and installations that have caused serious pollution by emitting SO<sub>2</sub>, smoke and particulates.</p>	<p>To implement on a mandatory basis a system to phase out enterprises, various production technologies and installations that have caused serious pollution.</p> <p>In principle, no construction of new cement plants and extension of cement plants will be planned in the PRD Region. Future development will focus on projects of new dry-type cement plant with daily production capacity of more than 4 000 tonnes. Projects of new dry-type rotary kiln cement plant with daily capacity of 2 500 tonnes and below will be prohibited.</p> <p>Programmes are being implemented to phase out high energy consuming and highly polluting cement plants, production lines of vertical kilns, dry hollow kilns, Lepol kilns and wet process kilns.</p> <p>The relocation project of Guangzhou Cement Plant, completed by end 2005, was estimated to reduce particulate emissions in the Region by approximately 3 000 tonnes/year.</p> <p>Some cement production units located in Sanshui area in Foshan City were closed down by the end of 2007. All existing vertical kiln cement production units will be closed down by the end of 2008.</p> <p>Guangdong had phased out cement plants with a total production volume of 24.7 million tonnes by end 2007. Guangzhou, Foshan, Dongguan, Shenzhen, Zhongshan and Zhuhai will close down all serious polluting cement plants by end 2008. Guangdong announced in January 2008 a plan to phase out all serious polluting cement plants in the province (a total</p>

Measures	Implementation Programme	Progress (Up to 30 November 2008)
		<p>production volume of 38 million tonnes) during the 11<sup>th</sup> five-year Plan period, amongst which, a total production volume of 28.53 million tonnes is located within the PRD Economic Zone (<b>Annex D</b>).</p> <p>Guangdong announced in October 2007 a plan to phase out iron and steel plants (a total production volume of 16 million tonnes) (<b>Annex E</b>) by end 2010</p>
	<p>To actively study the technologies for controlling emission of NO<sub>x</sub> from stationary sources such as power plant boilers, industrial boilers and restaurant boiling water furnaces.</p>	<p>Emission of NO<sub>x</sub> from stationary sources such as electricity station boilers, industrial boilers and restaurant boiling water furnaces will be under control in 2010.</p>
	<p>Location and planning of industries causing serious pollution will be strictly determined and administered centrally. The system of environmental assessment of construction projects will be enhanced.</p>	<p>Being implemented.</p>
	<p>For industrial sectors such as petrochemicals, steel, non-metallic mineral products, paper and paper products, textile and dyeing, technological improvement at existing enterprises will be enhanced and cleaner production will be implemented. New projects have to meet the advanced standard on cleaner production in the country.</p>	<p>Being implemented.</p>
	<p>Initiate tasks for vapour recovery at petrol filling stations, tanker trucks and oil depots. To fully implement motor fuel vapour emission standard for all oil depots, tanker</p>	<p>Guangdong announced in March 2008 a plan to complete vapour recovery work at oil depots, tanker trucks and petrol filling stations in the major PRD cities by end 2010.</p>

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	trucks and petrol filling stations.	
Reduce emission of volatile organic compounds (VOC)	To replace by 2003 paints using VOCs with xylene as the main solvent.	Completed. Since 1 January 2006, all water-based paints and adhesives are required to comply with the technical requirement of environmentally friendly products. All water-based paints and adhesives bearing an environmentally friendly label have to comply with the VOC content limit.
	(New item included in 2008) To strengthen implementation of cleaner production standards for printing and paint industries, within the PRD Economic Zone to reduce VOC emission.	Being implemented.
Reduce tailpipe emissions from motor vehicles	To commence the construction of a regional rapid light-rail system by 2005. To construct expressways in major cities, such as the district expressway in Southern Guangzhou and the Shenzhen-Shenping Express Trunk Road.	Phase I of Shenzhen-Shenping Express has been commissioned. Rail system between Guangzhou and Zhuhai started construction in December 2005. The system, 144 km in length with a maximum speed of 200 km/hr, is expected to be completed by 2009.

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	<p>To develop green transport by implementing clean vehicle action programmes in major cities of the region. To encourage the use of clean fuels, develop electric vehicles, actively promote the use of advanced clean fuel motor vehicles and step up the development of public transport.</p>	<p><u>Shenzhen</u></p> <ul style="list-style-type: none"> <li>(a) Formulated the “Medium to Long Term Planning for the Development of Clean Vehicles in Shenzhen”.</li> <li>(b) Drew up and implemented the 2003-2008 general work programme for the use of clean fuel in public transport vehicles.</li> <li>(c) The National III emission standard has been implemented ahead of schedule for newly purchased public transport vehicles as well as replacements. In 2007, the number of replacements amounted to 1 874, making a total of 8 702 public transport vehicles complying with the National III emission standard in the city.</li> <li>(d) A total of 50 new generation hybrid public transport vehicles are planned to run in Shenzhen by the end of 2008.</li> </ul> <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> <li>(a) Active promotion of LPG public transport vehicles. There are over 6 700 LPG-driven public buses in Guangzhou, accounting for 80% of all public buses in the city (as at the end of 2007). The 16 700 taxis in the city have largely been converted into LPG taxis. At present, there are 28 LPG refilling stations.</li> <li>(b) New generation hybrid public transport vehicles started to run in Guangzhou in January 2008.</li> </ul> <p><u>Huizhou</u></p> <p>From 1 August 2007, all newly added public transport vehicles are required to comply with the National III emission standard.</p>



<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	<p>To require all new motor vehicles to fully meet emission standards. To step up annual inspection and on-road spot checks of in-use vehicles. To strengthen the control of in-use vehicles to ensure that over 90% of motor vehicles in the cities within the region will meet tailpipe emission standard by 2005.</p>	<p>The National II emission standard has been adopted since 1 July 2005.</p> <p>A recommended catalogue of motor vehicles complying with the National III emission standard has been introduced on 1 July 2006 to encourage and support the sale, import, purchase and use of motor vehicles on the catalogue.</p> <p>Starting from 1 July 2008, all newly registered motor vehicles in Guangdong Province have to comply with National III emission standard.</p> <p><u>Guangzhou</u></p> <p>(a) The requirement for all newly registered vehicles to comply with the National III emission standard has been advanced to 1 September 2006.</p> <p>(b) From January to September 2008, spot checks were conducted on a total of 7 411 motor vehicles. 1 581 motor vehicles were required to carry out maintenance repairs within the specified period.</p> <p>(c) The “blacklist” of vehicles with excessive emissions was first published on the Guangzhou Environmental Protection website in August 2007.</p> <p><u>Shenzhen</u></p> <p>(a) A catalogue of motor vehicles complying with the National III emission standard has been implemented since 1 July 2007.</p> <p>(b) A reporting and joint investigation system for smoky vehicles has been established.</p>

Measures	Implementation Programme	Progress (Up to 30 November 2008)
	<p>To study the feasibility of advancing the implementation of National IV emission standard for light-duty vehicles by 2010.</p> <p>To study the feasibility of advancing the implementation of National V emission standard for heavy-duty vehicles by 2010.</p>	<p>Preparatory work is being conducted.</p>
	<p>To strengthen management on regular inspections of in-use motor vehicles to make sure that the required environmental performance is met.</p>	<p>The in-use motor vehicles inspection/maintenance system is progressively implemented and improved. Non-compliance motor vehicles are prohibited from using the roads.</p> <p><u>Shenzhen</u> The pollutant emissions inspection and mandatory maintenance system for motor vehicles is implemented since 1 December 2007.</p>
	<p>To experiment a labelling system on the environmental categorization of in-use vehicles in key cities, and to regulate and restrict vehicles of certain categories using the road according to the ambient air quality.</p>	<p><u>Shenzhen</u> An environmental labelling system for the categorization of motor vehicles has been introduced.</p> <p><u>Guangzhou</u></p> <p>(a) Starting from 1 January 2008, motor vehicles are granted environmental labels in accordance with performance.</p> <p>(b) As at September 2008, a total number of 448 150 environmental labels were issued to vehicles, accounting for 41% of all vehicles in the city.</p>
	<p>(New item included in 2008) To establish a provincial-wide inspection and information management network for motor vehicles.</p>	<p>To be completed by December 2010.</p>

<b>Measures</b>	<b>Implementation Programme</b>	<b>Progress (Up to 30 November 2008)</b>
	To vigorously promote the sale of motor vehicle fuel complying with the National III standard in the province.	<p>Guangdong Province has already announced the local National III standard for motor fuel in August 2006.</p> <p>The extension and reconstruction project of Sinopec's Guangzhou subsidiary was commissioned on 9 September 2006. The company is now capable of producing motor fuel complying with the National III standard.</p> <p>All petrol filling stations in Shenzhen and Guangzhou have been supplying National III standard motor fuels since 16 April 2007 and 1 May 2008 respectively. From 1 July 2008, the supply network has been expanded to cover Zhongshan, Dongguan and Zhuhai.</p>
	(New item included in 2008) To give consideration to advance introduction of the National IV standard motor fuel.	Being implemented.
	To study ways to control the growth of motorcycles in key cities.	Motorcycles have been banned from travelling in the urban areas in Guangzhou and Dongguan since 1 January 2007 and 1 September 2007 respectively.

**Environment Bureau  
January 2009**