

For Information
January 2010

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS
SUBCOMMITTEE ON IMPROVING AIR QUALITY**

**Progress of Measures
under Pearl River Delta Regional Air Quality Management Plan
to Achieve 2010 Emission Reduction Targets**

Purpose

This paper reports on the latest progress of implementation of measures, including those under the Pearl River Delta Regional Air Quality Management Plan (Management Plan), to improve air quality and meet the 2010 emission reduction targets.

Background

2. To improve regional air quality, the Hong Kong Special Administrative Region (SAR) Government reached a consensus with the Guangdong Provincial Government in April 2002 to reduce, on a best endeavour basis, the emissions of four major air pollutants, namely sulphur dioxide (SO₂), nitrogen oxides (NO_x), respirable suspended particulates (RSP) and volatile organic compounds (VOC) by 40%, 20%, 55% and 55% respectively in the Pearl River Delta (PRD) Region by 2010, using 1997 as the base year. Achieving these targets will significantly help to improve the air quality of the Region and relieve the regional smog problem.

3. Since September 2005, we have been providing biannual reports to the Panel on Environmental Affairs (EA Panel) on the progress of meeting the 2010 emission reduction targets. We last reported to the EA Panel in August 2009. This is the ninth progress report.

Progress of Emission Reduction

4. We are making good progress in the implementation of local emission reduction measures. Emission levels of all the four major

pollutants had dropped when compared with those in 1997. Details are as follows –

	Emission Level in 1997 (Tonnes)	Change in Emission Level during 1997-2008¹	Emission Reduction Target for 2010
SO ₂	66 200	-13%	-40%
NO _x	124 000	-29%	-20%
RSP	11 500	-54%	-55%
VOC	68 800	-50%	-55%

5. The two local power companies are on track for retrofitting their coal-fired power generation units with flue gas desulphurization (FGD) facilities in stages. We expect that the SO₂ emissions from the power sector will continue to drop in the run up to 2010.

Latest Measures to Control Emissions from Major Sources

Transport Sector

6. To further step up the local efforts in controlling emissions from the transport sector, we are rolling out the following initiatives –

- (a) we are making preparations to implement a statutory specification for pure motor vehicle biodiesel and the requirements for motor vehicle biodiesel blended with diesel from 1 July 2010;
- (b) we consulted the EA Panel in November 2009 on a proposal to further tighten the statutory standards of motor vehicle diesel and unleaded petrol to Euro V standards. We plan to introduce the enabling legislation into the Legislative Council (LegCo) in 2010 with the proposed commencement date being 1 July 2010;

¹ The percentage changes in emission levels between 1997 and 2008 are preliminary figures.

- (c) we are developing a proposal to strengthen the control of emissions from in-use petrol and liquefied petroleum gas (LPG) vehicles, including the use of roadside remote sensing equipment and dynamometers for emission testing;
- (d) we reported to the EA Panel on the revised proposal for banning idling vehicles with running engines in January and February 2009. We are drafting the enabling legislation according to the revised proposal and will table the Bill to LegCo for scrutiny when the drafting work is completed;
- (e) we are examining the feasibility of setting up a pilot “low emission zone” at one or more busy corridors to restrict franchised buses with high exhaust emissions from entering the zone, which will help to evaluate the effectiveness of the measure in improving roadside air quality;
- (f) we are drawing up a proposal to control the emissions of non-road mobile sources. We plan to consult the relevant trades in the first half of 2010;
- (g) we launched in end-August 2009 a nine-month trial of domestic ferries using ultra low sulphur diesel (ULSD). Subject to its findings, we would draw up a scheme to encourage ferry operators to switch to using ULSD; and
- (h) we are monitoring the supply of Euro V vehicles with the aim of introducing the Euro V emission standards as soon as practicable. Before the introduction, we will fully consult the transport trades.

7. In addition to the above, we have been implementing the following incentive schemes to promote a wider use of environmentally-more-friendly vehicles –

- (a) on the \$3.2 billion one-off grant scheme to encourage vehicle owners to replace their pre-Euro and Euro I diesel commercial vehicles with new vehicles, we issued a reminder in September 2009 to urge all the eligible vehicle owners to submit their applications for the grant by the application deadline, which falls on 31 March 2010, and are

sending another round of reminders to the remaining eligible vehicle owners. As at end-November 2009, we approved 13 050 applications. Since the introduction of the scheme, the number of on-road pre-Euro and Euro I diesel commercial vehicles has been reduced from about 58 500 to 39 100;

- (b) since April 2007, we have been providing a 30% reduction in First Registration Tax (FRT), subject to a cap of \$50,000 per vehicle, to encourage the use of environment-friendly private cars. As at end- November 2009, we approved 10 387 applications. Since the introduction of the scheme, environment-friendly private cars account for about 12% of first-registered private cars; and
- (c) since April 2008, we have reduced the FRT of environment-friendly commercial vehicles to encourage early take-up of these vehicles, which are currently pitched at the Euro V standards. As at end-November 2009, we approved 395 applications.

Power Sector

8. Power generation is the main source of air pollutant emissions in Hong Kong. To deliver the 2010 emission reduction targets, we have imposed emission caps on all power plants starting from 2005 and are progressively tightening them during licence renewals. We further brought the Air Pollution Control (Amendment) Ordinance 2008 through LegCo in July 2008 to give statutory effects to the emission caps for power plants in 2010 and beyond by a Technical Memorandum. The emission caps for 2010 were subsequently imposed on the two power companies during the licence renewal in 2008 and 2009.

9. To encourage Hongkong Electric (HEC) and CLP Power to take more proactive steps to reduce emissions and sustain strict compliance with the environmental requirements, we have set out a number of incentives and penalty arrangements in the new Scheme of Control Agreements signed with them in January 2008. These arrangements include –

- (a) linking the permitted rate of return of the two power companies to their environmental performance. A higher

rate of return will be provided for rewarding better than required performance in reducing emissions and improving air quality. Likewise, the new arrangements provide for financial disincentives in terms of a lower rate of return for emitting more pollutants than permissible; and

- (b) providing a higher rate of return to the power companies for their investment in renewable energy facilities and offering them a bonus in permitted return depending on the extent of renewable energy usage in their electricity generation.

10. Other major progress in reducing emissions from the power sector include the following –

- (a) in August 2008, the Hong Kong SAR Government signed a Memorandum of Understanding with the National Energy Administration to ensure a stable and long-term supply of nuclear electricity and natural gas from three different sources, namely offshore gas, piped gas and liquefied natural gas. In 2008, 32% of electricity generated by power plants in Hong Kong was gas-fired. To improve air quality and address the challenges posed by global warming, we will actively explore ways to accelerate the increasing use of clean energy by, for example, increasing the proportion of natural gas for local electricity generation to 50%. The proposal is one of the recommended air quality improvement measures in the review of the Air Quality Objectives, the progress of which is set out in paragraph 12;
- (b) on promotion of renewable energy, HEC is conducting Environmental Impact Assessment studies for developing commercial scale off-shore wind farms in Hong Kong waters while CLP was granted with an Environmental Permit on 4 August 2009 for their off-shore wind farm proposal off Sai Kung; and
- (c) both HEC and CLP Power are making good progress in retrofitting their power generation units with emission reduction facilities. The retrofit projects are expected to complete in phases between 2009 and 2011. HEC has completed the first stage of its retrofit programme for one coal-fired unit (i.e. retrofitting it with flue gas

desulphurization system and low nitrogen oxides burners) and the facilities are in operation starting from July 2009.

Other Sources

11. We have also taken the following new initiatives to control emissions from other sources –

- (a) we amended the Air Pollution Control (Volatile Organic Compounds) Regulation (Chapter 311W) in October 2009 to extend the control to other products with high VOC contents, including adhesives, sealants, vehicle refinishing paints, marine vessel paints and pleasure craft paints, to limit their VOC contents in phases from 1 January 2010; and
- (b) we also amended the Ozone Layer Protection (Products Containing Scheduled Substances) (Import Banning) (Amendment) Regulation in December 2009 to extend the banning of the import of controlled products to those containing HCFCs, CFC-metered dose inhalers and other portable fire extinguishers in phases from 1 January 2010.

Review of Air Quality Objectives

12. The public consultation on the Review of Air Quality Objectives (AQOs) ended on 30 November 2009. Some 2,200 completed questionnaires and written submissions have been received. We also held a public forum and met with various stakeholders including this Panel, the Advisory Council on Environment, the Sustainable Development Council, all 18 district councils, professional bodies, chambers of commerce, trade organisations, business groups, green groups and others. We are now studying carefully the views collected from the consultation, which will be fully taken into account in deciding on how best to update the AQOs and to develop a long-term air quality management strategy. We aim to report the findings of the consultation to the Subcommittee on Improving Air Quality in early 2010. Meanwhile, we are making progress on the implementation of those control measures that consensus has already been built up, including the mandatory implementation of Building Energy Codes and district cooling

system for Kai Tak Development as reported in the ensuing paragraphs.

Promotion of Energy Efficiency

13. Apart from controlling emissions at source, another effective way of reducing emissions is through enhancing energy efficiency and promoting energy conservation. In this regard –

- (a) we introduced the Buildings Energy Efficiency Bill into LegCo on 9 December 2009. The Bill aims to improve energy efficiency in new and existing buildings by mandating compliance with the Building Energy Codes;
- (b) we are continuing to promote the buildings energy efficiency funding schemes, with \$150 million and \$300 million allocated from the Environment and Conservation Fund, to subsidize qualified building owners in carrying out energy-cum-carbon audits and energy efficiency projects respectively. The Schemes have been opened for application since April 2009. Up to end-November 2009, 149 funding applications, amounting to \$30.4 million have been approved;
- (c) we have adopted a comprehensive target-based green performance framework for government buildings and set targets in various environmental aspects to promote environmental protection and energy conservation. We will also promote the use of energy efficient designs and technologies by means of demonstration projects;
- (d) we will implement a district cooling system at the Kai Tak Development to supply chilled water to buildings in the region for centralised air-conditioning;
- (e) we introduced a mandatory Energy Efficiency Labelling Scheme through the Energy Efficiency (Labelling of Products) Ordinance (Chapter 598), which came into effect in May 2008, to encourage the use of energy-efficient products. The initial phase of the Scheme which covers three types of product, namely room air conditioners,

refrigerating appliances and compact fluorescent lamps has been fully implemented since 9 November 2009. We have submitted to LegCo amendments to the Ordinance to introduce the second phase of the Scheme;

- (f) we are promoting the replacement of incandescent light bulbs by energy-efficient lighting installations through various means. We will consult the public on progressively restricting the sales of incandescent light bulbs through legislation; and
- (g) we are conducting consultancy studies on energy wastage arising from the excessive use of external lighting and will assess the feasibility of regulating external lighting by legislation.

Co-operation with Guangdong Province and Mainland

14. To achieve the 2010 emission reduction targets, the Guangdong Provincial Government is working in earnest to implement the control measures under the Management Plan. The emission reduction measures on the Mainland side focus on power plants, vehicles and the more polluting industrial processes. The key initiatives being implemented by Guangdong include –

- (a) introducing the updated Guangdong Emission Standards of Air Pollutants for Thermal Power Plants in August 2009 with a view to further tightening the air pollutant emission standards;
- (b) launching a policy for subsidizing the replacement of yellow-label vehicles (i.e., petrol vehicles with pre-National emission standard or below and diesel vehicles with National II emission standard or below) with new vehicles in September 2009;
- (c) extending the supply of National III standard motor fuels to Huizhou in July 2009 in addition to Shenzhen, Guangzhou, Dongguan, Zhuhai and Zhongshan; and

- (d) enhancing the implementation of vapour recovery system at petrol filling stations, oil depots and tanker trucks in Guangdong, with Shenzhen being the first to complete the work.

15. We are also working on the following joint initiatives with the Mainland authorities to improve regional air quality –

- (a) we are working with the Economic & Information Technology Commission of Guangdong Province (廣東省經濟和信息化委員會) to implement the five-year Cleaner Production Partnership Programme. The Programme aims to encourage and facilitate Hong Kong-owned factories operating in the PRD Region to adopt cleaner production technologies and practices, thereby reducing emissions and enhancing energy efficiency. So far, 404 applications have been approved under the Programme. In addition, both sides jointly launched the Hong Kong-Guangdong Cleaner Production Partners Recognition Scheme on 28 August 2009 to recognise and encourage the continued efforts of Hong Kong businesses in pursuing cleaner production. A presentation ceremony for the Hong Kong - Guangdong Cleaner Production Partners Recognition Scheme was held in Guangzhou on 25 November 2009 to award commendation to the first batch of Hong Kong - Guangdong Cleaner Production Partners;
- (b) at the 12th Plenary of the Hong Kong/Guangdong Cooperation Joint Conference held in Hong Kong on 19 August 2009, both sides signed the Environmental Cooperation Agreement between Hong Kong SAR and Guangdong, with a view to stepping up cooperation on environmental front. In respect of improving regional air quality, the two sides agreed to undertake a joint study on the post-2010 arrangement for air pollutant emission reduction in the PRD Region; and
- (c) on 23 October 2009, both sides jointly released a report on the monitoring results of the PRD Regional Air Quality Monitoring Network (Network) for the first half of 2009. We are gradually seeing the positive impact of the emission reduction efforts of both sides on regional air quality. The

results of the Network show that the SO₂ and RSP concentrations in the region in 2008 had dropped by 19% and 11% respectively as compared with 2007. In the first half of 2009, the SO₂ and RSP concentrations had further dropped by 33% and 9% respectively as compared with the same period in 2008. We aim to complete the report covering the whole year of 2009 in April 2010.

16. Details of the latest progress of the Hong Kong SAR Government and the Guangdong Provincial Government in implementing the emission reduction measures under the Management Plan are set out at **Annexes A to E**. Both sides are committed to meeting the 2010 emission reduction targets and will continue to implement the emission reduction measures under the Management Plan.

**Environment Bureau / Environmental Protection Department
December 2009**

**Pearl River Delta Regional Air Quality Management Plan
Enhanced Control Measures of the HKSAR**

Measures	Implementation Programme	Progress (Up to 30.11.2009)
Encourage replacement of diesel light buses with ones using clean fuel	Since 2002, the Government has offered incentives to diesel light bus owners to encourage replacement of diesel light buses with liquefied petroleum gas (LPG) or electric ones.	<p>The incentive scheme was introduced in August 2002 and completed by 31 December 2005.</p> <p>As at the end of November 2009, there were 2,669 public LPG light buses, accounting for approximately 61% of the entire public light bus fleet.</p>
Require retrofitting of particulate removal devices on pre-Euro diesel vehicles (Item completed)	With effect from 1 April 2007, pre-Euro diesel vehicles have to be installed with approved particulate removal devices.	<p>Financial assistance was provided in phases from December 2002 to December 2005 to retrofit pre-Euro heavy-duty diesel vehicles with catalytic converters. All together, about 36 500 eligible vehicles were installed with catalytic converters.</p> <p>Since April 2006, all pre-Euro heavy-duty diesel vehicles (including franchised buses), except those operate under long-idling situations (including lorries with cranes mounted, concrete mixers, pressure tankers and gully emptiers), were required to be installed with approved emission reduction devices. This requirement was extended to the “long-idling” vehicles since April 2007.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
Encourage vehicle owners to replace pre-Euro and Euro I commercial diesel vehicles with Euro IV models	A financial incentive scheme was introduced in the second quarter of 2007.	<p>The Government has offered a one-off grant for the period of 1 April 2007 to 31 March 2010 to vehicle owners to encourage the early replacement of pre-Euro and Euro I diesel commercial vehicles with new ones which comply with the statutory emission standards for newly registered vehicles (which is now the Euro IV emission standards).</p> <p>A total of 13,049 applications have been approved (as at the end of November 2009).</p>
Encourage members of public to use environmentally friendly private petrol vehicles	With effect from 1 April 2007, a 30% reduction in the First Registration Tax (FRT) was offered to the purchasers of environment-friendly private petrol vehicles, subject to a cap of \$50,000 per vehicle.	A total of 10,387 environment-friendly private petrol vehicles were approved under the scheme (as at the end of November 2009).
Encourage use of environment-friendly commercial vehicles	With effect from 1 April 2008, a reduction in First Registration Tax would be offered to the purchasers of environment-friendly commercial vehicles.	A total of 395 environment-friendly commercial vehicles were approved under the scheme (as at the end of November 2009).
Encourage the use of electric vehicles	To promote the use of electric vehicles (EV) in Hong Kong through a series of measures in 2009.	<p>The First Registration Tax for EV is waived for a period of 5 years till March 2014.</p> <p>The Government commenced a trial run of Mitsubishi EV in May 2009 and, together with the Municipal Government of Shenzhen, another trial run of BYD's dual-mode plug-in hybrid vehicle starting from July 2009. The Government has also decided to procure its first batch of Mitsubishi 'i MiEV totaling 10 units.</p> <p>The Government will collaborate with the two local power companies to launch a EV leasing scheme by end 2010, so that a wider</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		section of the community may gain access to EV driving experience.
Require drivers to switch off idling vehicles with running engines	Submission of the enabling legislation to the Legislative Council within 2009-10 legislative year for early implementation.	Result of public consultation concluded in March 2008 reveals that the public widely supports the proposal to require drivers to switch off idling vehicles with running engines through legislation. Taking into consideration the operational need of the transport trade, effectiveness of control measures on abating environmental nuisances as well as law enforcement issues, the Government revised the proposed exemption arrangements. The Government is preparing the enabling legislation and will introduce it to the Legislative Council in the 2009-10 legislative year for early implementation.
Strengthen control of emissions from petrol and LPG vehicles	To consult stakeholders on proposals to strengthen the control of emissions, including the use of roadside remote sensing device and chassis dynamometer for emission testing.	The Government will put forward a proposal to consult the stakeholders in 2010.
Tighten emission standard for in-use diesel vehicles	To study the further tightening of dark smoke emission standard for in-use diesel vehicles.	The Government will continue to study the matter, and aim to consult the transport trade in the 2009-10 legislative year.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
Enhance vapour recovery systems in petrol filling stations (Item completed)	The Air Pollution Control (Petrol Filling Stations) (Vapour Recovery) Regulation was amended in 2004 to require the recovery of petrol vapour emitted during vehicle refuelling at petrol filling stations, with effect from 31 March 2005.	Since 31 March 2005, all newly built petrol filling stations have to be installed with vapour recovery systems. Since 31 March 2008, all petrol filling stations have been retrofitted with such systems to recover petrol vapour emitted during refuelling.
Tighten motor fuel standard	The motor fuel standard was tightened to the Euro IV standard by 2005 (the motor diesel standard has already been tightened to the Euro IV standard since 2002). (Item completed)	The Euro IV petrol standard came into effect on 1 January 2005.
	To introduce the supply of motor vehicle fuels meeting the Euro V standard.	With effect from 14 July 2008, the duty rate for Euro V motor vehicle diesel has been waived to encourage the use of more environment-friendly fuels on the local market. The Government consulted the Panel on Environmental Affairs on a proposal to raise the vehicle fuel standard to the Euro V level (with 80% less sulphur content than Euro IV motor vehicle fuels) in November 2009.
	To develop specifications and regulations on the use of biodiesel as vehicle fuel in Hong Kong.	Consultation with the trades on the biodiesel specifications has been completed. The Government is preparing the necessary regulatory framework with a view to implementing the specifications and regulatory control in 2010.
Tighten emission standard for newly registered	The Euro IV emission standard was adopted since 2006. (Item completed)	The Euro IV emission standard was introduced on 1 January 2007 for all newly registered vehicles.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
vehicles	To follow the European Union in adopting the Euro V motor vehicles standard for tailpipe emissions.	The Government has been providing tax concessions on purchases of Euro V commercial vehicles since April 2008. Given the current supply situation of these vehicles in Hong Kong, we are not yet ready to follow EU to tighten the vehicle emission standard to Euro V level. The Government will keep in view the vehicle supply situation and tighten the emission standard as soon as practicable.
Low emission zone pilot scheme	To examine the feasibility of setting up a pilot low emission zone at busy corridors to restrict franchised buses with high exhaust emissions from entering the zone.	The study is in progress.
Use of cleaner fuels by ferries	To look into the use of cleaner fuels by local ferries.	The Government set up an inter-departmental working group in December 2007 to develop a trial scheme on the use of ultra low sulphur diesel [ULSD] (sulphur content not more than 0.005%) by local ferries. The trial was commenced in August 2009. The Government will map out the way forward having regard to the findings of the trial upon its completion in 2010.
Control emissions from off-road mobile sources operating within the airport and ports	To draw up measures, including formulation of emission standards, to control emissions from off-road mobile sources operating within the airport and ports (including mobile machinery and off-road vehicles).	The Government is considering the necessary control measures and will launch a trade consultation in 2010.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
<p>Reduce volatile organic compounds (VOC) emissions from printing process, paints and consumer products</p>	<p>To introduce legislation in 2004 or 2005 to require the labeling of VOC content on VOC products.</p> <p>(Item completed)</p> <hr/> <p>Legislation will then be introduced in phases to reduce the use of products with high VOC contents and to impose emission standards for the printing process.</p>	<p>Since 1 April 2007, the Government has enforced the Air Pollution Control (Volatile Organic Compounds) Regulation in phases to restrict the VOC content of architectural paints/coatings, printing inks and six major types of selected consumer products (i.e. air fresheners, hairsprays, multi-purpose lubricants, floor wax strippers, insecticides and insect repellents). Lithographic heatset printing machines are also required to be installed with emission control devices.</p> <p>The Regulation was amended on 14 October 2009 to extend the control to other VOC-containing products, including adhesives, sealants and vehicle refinishing paints, as well as vessel and pleasure craft paints. It will be implemented in phases starting from 1 January 2010.</p>
<p>Reduce emissions from power stations</p>	<p>Effective and flexible mechanisms will be set up to control the total emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and respirable suspended particulates (RSP) from power stations to achieve respective reduction targets by 2010.</p>	<p>The Government approved the emission reduction options set out in the financial plans of the two power companies in June 2005. CLP Power Hong Kong Limited (CLP) will provide desulphurization (FGD) systems and denitrification systems for four of its coal-fired generating units, each of 677MW. The two systems will be commissioned by phases between 2010 and 2011. In addition, CLP has been increasing the use of ultra low sulphur coal. Hong Kong Electric Co. Ltd. (HEC) will install low-NO_x burners and FGD systems for two of its coal-fired generating units, each of 350MW; and a FGD system for a coal-fired generating unit of 250MW. The first phase of HEC's installation works (including installation of FGD system and low-NO_x burner for a coal-fired generating unit of 350MW) had already been completed and was put into operation in July 2009. The remaining works will be completed by end</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		<p>2010.</p> <p>HEC had commissioned its first natural gas generation unit of 335MW in October 2006. The first commercial scale wind turbine power generation unit of 800kW was also commissioned in Hong Kong in February 2006.</p>
	<p>To control total emissions from power plants and allow emission trading.</p> <p>(Item completed)</p>	<p>Since August 2005, emission caps have been set and tightened progressively during the renewal of Special Process Licences (SPLs) for CLP's Castle Peak Power Station, Black Point Power Station and Penny's Bay Power Station as well as HEC's Lamma Power Station, with a view to reducing emissions for achieving the 2010 reduction targets.</p> <p>The Air Pollution Control (Amendment) Ordinance 2008 was enacted in July 2008. It provides for stipulating the emission caps for the power plants in Hong Kong in 2010 and beyond in the Technical Memorandum for Allocation of Emission Allowances in respect of Specified Licences. Power plants are also allowed to conduct emission trading as an alternative means for compliance with the emission caps.</p> <p>The Government promulgated the first Technical Memorandum for Allocation of Emission Allowances in respect of</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		<p>Specified Licences in December 2008. It provides a clear statutory framework for imposing the respective 2010 emission caps on the power companies.</p>
	<p>To promote the wider use of clean fuels.</p>	<p>The Memorandum of Understanding (MOU) signed between the Government and the National Energy Administration on 28 August 2008 ensures a continuous supply of nuclear electricity and natural gas to Hong Kong in the coming two decades, with a view to promoting wider use of clean fuels and reducing emissions from power plants. After signing the MOU, the Government and the energy enterprises on both sides have followed up on the implementation of the MOU. The Shenzhen-Hong Kong spur line of the Second West-East Natural Gas Pipeline and the liquefied natural gas (LNG) terminal in Shenzhen to be jointly constructed by energy enterprises of both sides are anticipated to be completed in 2013.</p> <p>In September 2009, the Government gave approval to CLP to extend the contract for supply of nuclear electricity from Daya Bay Nuclear Power Station (Daya Bay) for another term of 20 years from 7 May 2014 to 6 May 2034.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
<p>Reduce emissions from industrial and commercial processes</p> <p>(Item completed)</p>	<p>To mandate the use of ultra-low sulphur diesel (ULSD) in industrial and commercial processes.</p>	<p>LegCo passed the Air Pollution Control (Fuel Restriction) (Amendment) Regulation, which came into effect on 1 October 2008.</p>
<p>Enhance energy efficiency of buildings</p>	<p>To introduce mandatory implementation of the Building Energy Codes (BEC).</p>	<p>Public consultation on the proposal of mandatory implementation of BECs was completed on 31 March 2008. The Government introduced a Bill for the mandatory implementation of BEC to Legislative Council in early December 2009.</p>
	<p>To implement a comprehensive target-based green performance framework for government buildings.</p>	<p>The Government issued an internal circular in April 2009 on the implementation of a comprehensive target-based environmental performance framework in government buildings. Targets on various aspects of environmental performance have been set for new and existing government buildings. The Government will continue to implement this target-based framework and promote energy saving in government buildings.</p>
<p>Mandatory Energy Efficiency Labelling Scheme</p>	<p>To launch the Mandatory Energy Efficiency Labelling Scheme.</p>	<p>The Legislative Council passed the Energy Efficiency (Labelling of Products) Ordinance. The initial phase of the Mandatory Energy Efficiency Labelling Scheme, which covers three types of products including room air conditioners, refrigerating appliances and compact fluorescent lamps, came into operation in November 2009.</p> <p>The Government introduced in September 2009 amendments to the Energy Efficiency (Labelling of Products) Ordinance for including washing machines and dehumidifiers in the second phase of the scheme.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
<p>Encourage and facilitate adoption of cleaner production technologies and practices</p>	<p>A five-year programme to be launched to give professional and technical support to Hong Kong-owned factories in the Pearl River Delta (PRD) Region to adopt cleaner production technologies and practices.</p>	<p>Working with the Guangdong Provincial Economic & Trade Commission (now the Economic & Information Technology Commission of Guangdong Province, 廣東省經濟和資訊化委員會) and major Hong Kong industry associations, the Government launched the “Cleaner Production Partnership Programme” on 18 April 2008 to encourage and facilitate Hong Kong-owned factories in the PRD to adopt cleaner production technologies and practices.</p> <p>The Government and the Economic & Information Technology Commission of Guangdong Province (廣東省經濟和資訊化委員會) jointly launched the Hong Kong-Guangdong Cleaner Production Partners Recognition Scheme on 28 August 2009. The Scheme aims to recognize those Hong Kong-owned factories that have performed well in this area, and to encourage them to continue to pursue cleaner production.</p>

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

Measures	Implementation Programme	Progress (Up to 30.11.2009)
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 2008 was 0.715 tons of standard coal equivalent, down 4.32% as compared with that in 2007. The energy consumption per Industrial Added Value of Guangdong was 0.869 tons of standard coal equivalent, down 11.32% as compared with the 2007 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> <p>(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</p> <p>(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.</p> <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>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<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 7 million tonnes/year and finish construction of a number of natural gas power plants.</p>	<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>
	<p>To improve by 2005 the 500KV dual circuit annular core transmission grid to ensure transmission of electricity from western provinces.</p>	<p>The five AC and three DC main transmission channels from western provinces have been completed.</p>
	<p>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.</p>	<p>Being implemented.</p>
	<p>To gradually enlarge the scale of electricity transmission from western provinces to Guangdong.</p>	<p>Being implemented.</p>
<p>Control sulphur content of fuel</p>	<p>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).</p>	<p>Being implemented.</p> <p>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</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		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 9,660MW 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 closed down in 2007, 3,600 MW in 2008 and 1,900 MW in 2009 (Annex C).] As at end 2008, small thermal power generating units with a total capacity of 8,340 MW in the Province had been closed down.
	To install FGD systems at the power plants in Shajiao, Huangpu, Taishan and Zhuhai by 2005.	In 2008, generating units installed with FGD systems have increased by a capacity of 3,800 MW, amounting to a total capacity of 27,800 MW. Large scale thermal power generating units in Guangdong have all been equipped with FGD. (Item completed)
	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-NOx) combustion technologies in case of alteration or expansion.	Low-NOx 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-NOx combustion device at	Being implemented.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	existing coal-fired and oil-fired power plants.	
	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. The existing coal-fired generating units of capacity above 125MW had put in place continuous emissions monitoring system (CEMS) by end 2008, with a view to allowing the relevant authorities to have instant on-line access to the CEMS data.
	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 extra RMB 1.5 cents per unit when the electricity is sold to the power grid.
	To offer better sales terms (e.g. higher rates and grid connection priority) to power plants that are equipped with FGD and denitrification systems.	Extra RMB 1.5 cents per unit and grid connection priority have been offered to power plants with FGD systems. Better sales terms for power plants with denitrification systems are under preparation.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	To establish a province-wide quota administration system for total emissions of SO ₂ and to study the emissions trading mechanism of SO ₂ .	Being implemented.
	To implement more stringent air pollutant emission standards for thermal power plants.	The new “Guangdong Emission Standards of Air Pollutants for Thermal Power Plants” has been implemented to further tighten the air pollutant emission standards since August 2009.
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.	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 those having major impact on public livelihood must be installed with devices to purify cooking fumes.
	To tighten emission standards for local boilers by 2010, so as to reduce emissions from industrial boilers and other boilers (e.g. commercial boilers).	“The Guangdong Emission Standards of Air Pollutants for Boilers (Draft)”, which was released in August 2009, is expected to come into force by end 2010.
	To continue phasing out various production technologies and installations that have caused serious pollution by emitting SO ₂ , smoke and particulates.	To implement on a mandatory basis a system to phase out enterprises, various production technologies and installations that have caused serious pollution. 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

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		<p>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 were closed down by the end of 2008.</p> <p>Guangdong announced in January 2008 a plan to phase out all serious polluting cement plants in the province with a total production capacity of 38 million tonnes by 2010. Of these, a total production capacity of 28.53 million tonnes is located within the PRD Economic Zone (Annex D). As at the end of 2008, Guangdong had phased out cement plants with a total production capacity of 41.23 million tonnes.</p> <p>Guangdong announced in October 2007 a plan to phase out iron and steel plants (a total production capacity of 16 million tonnes) (Annex E) by end 2010. As at the end of 2008, Guangdong had phased out iron and steel plants with a total production capacity of more than 7 million tonnes.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<p>To actively study the technologies for controlling emission of NOx from stationary sources such as power plant boilers, industrial boilers and restaurant boiling water furnaces.</p>	<p>Emission of NOx 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>Reduce the emission of VOC</p>	<p>To replace by 2003 paints using VOCs with xylene as the main solvent.</p>	<p>Completed.</p> <p>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.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<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 trucks and petrol filling stations.</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> <p>Since 2009, the work plan for installing vapour recovery systems at petrol filling stations, oil depots and tanker trucks is being implemented in phases. The installation work in PRD region is expected to be completed by 2010 and for other areas in Guangdong by 2012.</p>
<p>Reduce tailpipe emissions from motor vehicles</p>	<p>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.</p> <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>Phase I of Shenzhen-Shenping Express has been commissioned. Rail system between Guangzhou and Zhuhai started construction in December 2005. The system, 144km in length with a maximum speed of 200km/hr, is expected to be completed by 2009.</p> <p><u>Shenzhen</u></p> <ul style="list-style-type: none"> - Formulated the “Medium to Long Term Planning for the Development of Clean Vehicles in Shenzhen”. - Drew up and implemented the 2003-2008 general work programme for the use of clean fuel in public transport vehicles. - 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. - Selected in January 2009 as one of the first pilot cities to demonstrate

Measures	Implementation Programme	Progress (Up to 30.11.2009)
		<p>and promote energy-saving vehicles and vehicles powered by new energy. Subsidies are provided to public service organizations to encourage purchase and use of energy-saving vehicles and vehicles powered by new energy</p> <ul style="list-style-type: none"> - A total of 50 new generation hybrid public transport vehicles were put in use in Shenzhen at the end of 2008. <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> - Active promotion of LPG public transport vehicles. There were 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. - New generation hybrid public transport vehicles started to run in Guangzhou in January 2008. <p><u>Huizhou</u></p> <ul style="list-style-type: none"> - From 1 August 2007, all new public transport vehicles are required to comply with the National III emission standard.
	<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</p>	<p>The National II emission standard was implemented in 1 July 2005.</p> <p>A recommended catalogue of motor vehicles complying with the National III emission standard was introduced on 1 July 2006 to encourage and support the sale, import, purchase and</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<p>region will meet tailpipe emission standard by 2005.</p>	<p>use of motor vehicles on the catalogue.</p> <p>Starting from 1 July 2008, all newly registered motor vehicles in PRD Region have to comply with National III emission standard.</p> <p>Starting from 1 July 2009, all newly registered motor vehicles in Guangdong Province have to comply with National III emission standard.</p> <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> - The requirement for all newly registered vehicles to comply with the National III emission standard was advanced to 1 September 2006. - The “blacklist” of vehicles with excessive emissions was first published on the Guangzhou Environmental Protection website in August 2007. <p><u>Shenzhen</u></p> <ul style="list-style-type: none"> - A catalogue of motor vehicles complying with the National III emission standard has been implemented since 1 July 2007. - A reporting and joint investigation system for smoky vehicles has been established.
	<p>To introduce subsidy policy for replacement of “yellow-label vehicles” (i.e. petrol vehicles with pre-National emission standard or below and diesel vehicles with National II emission standard or below).</p>	<p>The subsidy policy was rolled out in September 2009 to tie in with the national policy of subsidizing “replacement of old vehicles with new vehicles”. The policy offers subsidy to owners ranging from RMB 3,000 to 6,000 for vehicle replacement.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<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>Subsequent to the issue of a catalogue of motor vehicles complying with the National IV emission standard in July 2008, the Shenzhen Government aims to require newly registered motor vehicles to comply with the National IV emission standard by 1 January 2011.</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 being progressively implemented and improved. Non-compliance motor vehicles are prohibited from using the roads.</p> <p><u>Shenzhen</u></p> <p>The pollutant emissions inspection and mandatory maintenance system for motor vehicles has been implemented since 1 December 2007.</p>

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<p>To experiment a labeling 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>The environmental labeling system on in-use vehicles has been implemented in Guangdong since March 2009. A total of 3.04 million labels were issued as at end October 2009.</p> <p><u>Shenzhen</u></p> <ul style="list-style-type: none"> - An environmental labeling system for motor vehicles has been introduced. - Road use restriction measures for “non-green-label vehicles” have been further enhanced since 1 July 2009. The restriction zones for “yellow-label vehicles” are being gradually expanded. Shenzhen aims to restrict “yellow-label vehicles” from using main roads in city by 2011. - The vehicle inspection and environmental labeling management system established by the Ministry of Environmental Protection will be implemented by March 2010. <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> - Starting from 1 January 2008, motor vehicles are granted environmental labels in accordance with performance. - The national-wide vehicle inspection and environmental labeling system for motor vehicles will be introduced in March 2010.

Measures	Implementation Programme	Progress (Up to 30.11.2009)
	<p>To vigorously promote the sale of motor vehicle fuel complying with the National III standard in the province.</p>	<p>Guangdong Province 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 April 2007 and May 2008 respectively. From July 2008, the supply network has been expanded to cover Zhongshan, Dongguan and Zhuhai. It has been further expanded to cover Huizhou in July 2009. Guangdong is seeking to extend the supply of National III standard motor fuels to other cities in the PRD in 2010.</p>
	<p>To give consideration to advance introduction of the National IV standard motor fuel.</p>	<p>Preparation of fuel standard has been completed.</p>
	<p>To study ways to control the growth of motorcycles in key cities.</p>	<p>Motorcycles have been banned from entering the urban areas in Guangzhou and Dongguan since 1 January 2007 and 1 September 2007 respectively.</p>

Schedule for Closing Down
Major Small-scale Thermal Power Generating Units
in the Cities of Pearl River Delta Economic Zone
between 2006 and 2010

Cities	Capacity to be Closed Down (MW)	Time and Capacity (MW)			
		2007	2008	2009	2010
Guangzhou	2336	570	500	1265	-
Shenzhen	765	682	83	-	-
Zhuhai	229	-	229	-	-
Huizhou	250	-	250	-	-
Dongguan	350	-	-	350	-
Zhongshan	519	-	519	-	-
Foshan	2043	-	2009	34	-
Jiangmen	549	399	-	150	-
Zhaoqing	147	-	-	147	-
Total	7187	1650	3591	1946	-

**Schedule for Phasing Out Cement Plants
in the Cities of Pearl River Delta Economic Zone
during the 11th Five-year Plan Period**

PRD Cities	Capacity to be phased out (million tonnes)
Guangzhou	12.77
Shenzhen	-
Zhuhai	0.3
Huizhou	1.9
Dongguan	3.03
Zhongshan	0.29
Foshan	9.34
Jiangmen	-
Zhaoqing	0.9
Total	28.53

**Schedule for Phasing Out Iron and Steel Plants
in Guangdong Province
between 2007 and 2010**

Time	Production capacity of steel plants to be phased out (million tonnes)	Production capacity of iron plants to be phased out (million tonnes)
2007	3	0.1
2008	1.91	0.37
2009	2.77	-
2010	7.34	1.15
Total	15.02	1.62