

For Information
July 2007

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

**Progress of Measures to Improve Air Quality
(Including Those Measures Taken by the Two Power Companies
to Meet the Government's Emission Reduction Targets by 2010)**

Purpose

This paper reports to Members the latest progress of measures to improve air quality (including those taken by the two power companies) to meet the Government's emission reduction targets by 2010.

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 emission of four major air pollutants, namely sulphur dioxide (SO₂), nitrogen oxides (NO_x), respirable suspended particulates (RSP) and volatile organic compounds (VOCs) by 40%, 20%, 55% and 55% respectively in the region by 2010, using 1997 as the base year. Achieving these targets will not only enable Hong Kong to meet its air quality objectives (AQOs), but also significantly improve the air quality of the Pearl River Delta (PRD) and relieve the regional smog problem.

3. On 29 September 2005, we informed Members of the progress of measures being pursued by both sides for meeting the 2010 emission reduction targets. At the meeting, Members requested the Administration to provide six-monthly reports on the progress of meeting the 2010 emission reduction targets and the relevant measures taken by the two power companies.

4. Subsequently, the Administration provided progress reports to Members in January and August last year and January this year. This paper is the fourth progress report.

Progress of Reducing Emissions and Latest Measures In Hong Kong

Progress of Emission Reduction

5. We are making good progress in the implementation of local emission reduction measures. Except for SO₂, whose emission level has increased due to a rise in the use of coal in power generation in recent years, the emission levels of all other pollutants have dropped when compared with those in 1997. Details are as follows:

	Emission Level in 1997 (tonnes)	Change in Emission Level during 1997-2005	Emission Reduction Target for 2010
SO ₂	64 500	+31%	-40%
NO _x	110 000	-15%	-20%
RSP	11 200	-36%	-55%
VOCs	54 400	-26%	-55%

Latest Measures

6. To further step up local efforts in emission reduction, the Chief Executive announced a series of new initiatives in his 2006 Policy Address. We have been implementing these initiatives progressively:

- (a) On 1 April 2007, we launched a one-off grant scheme with \$3.2 billion to encourage car owners to replace their pre-Euro and Euro I commercial diesel vehicles with Euro IV models as early as possible. If all these vehicles, which total about 74 000, are replaced, it is expected that the emissions of NO_x and RSP in Hong Kong will be reduced by 10% and 18% respectively. As at the end of June, 727 applications have been received under this scheme, of which 563 have been approved.
- (b) With effect from 1 April 2007, a 30% reduction in First Registration Tax, subject to a cap of \$50,000 per vehicle, has been granted to buyers

of environment friendly private cars so as to encourage their use. As at the end of June, the Government has received 1 224 applications, of which 1 183 of them have been approved.

- (c) We plan to consult the public within this year on enacting legislation for switching off idling engines.

7. Apart from the above, we have extended the mandatory requirement of installing emission reduction devices to long idling pre-Euro diesel vehicles from 1 April 2007. Since then, all pre-Euro diesel vehicles are required to install emission reduction devices.

8. Starting from 1 April 2007, we have been enforcing a new legislation in phases to impose statutory limits on the VOC contents of paints, printing inks and six broad categories of specified consumer products (namely hairspray, air freshener, insecticide, insect repellent, floor wax stripper and multi-purpose lubricant) and implementing the mandatory requirement of installing emission reduction devices for certain printing processes. Upon full implementation of the legislation, it is expected that VOC emission will be reduced by 8 000 tonnes.

9. Power generation is the largest local source of SO₂ emission. We have therefore imposed emission caps on power plants and will tighten them progressively. The Chief Executive has stressed in his 2006 Policy Address that we should not allow these firm targets to be compromised in any way. At our current negotiations with the power companies on the post-2008 Schemes of Control, we have also made clear that environmental requirements will be a major focus. The permitted rates of return of the power companies will be linked to their achievement of the emission caps.

10. So far we have made the following progress on reducing emission from the power sector this year –

- (a) On retrofit projects, Environmental Permits were granted to the Hong Kong Electric Company Limited (HEC) and the China Light & Power Hong Kong Limited (CLP) for their reduction retrofit projects in April and November 2006 respectively. HEC has awarded the procurement contract and the major retrofit contract for its flue gas desulphurisation system. CLP is now vetting the detailed layout plan and has awarded some major works contracts;

- (b) On the wider use of natural gas, we granted in April 2007 the Environmental Permit to CLP for the proposed liquefied natural gas (LNG) receiving terminal, with conditions including stringent environmental requirements and mitigating measures. The Government will also consider the feasibility of having gas supply from other natural gas/LNG projects in the region. At this moment, we have not yet made any decision on CLP's natural gas supply proposal. We will carefully examine the proposal and will agree to it only if CLP can prove that all the relevant considerations are reasonable and acceptable; and
- (c) On promoting renewable energy, CLP was granted the Environmental Permit in March 2007 for launching the commercial scale wind turbine pilot demonstration at Hei Ling Chau. According to the Environment Impact Assessment report submitted by CLP, the target commissioning date for the wind turbine unit is 2008.

11. The Environmental Protection Department awarded a consultancy agreement to Ove Arup & Partners Hong Kong Ltd in June 2007 to undertake a comprehensive study so as to draw up a new set of AQOs and devise a relevant long-term management plan. The study will make reference to the new Air Quality Guidelines of the World Health Organization and the recent research findings in air quality in advanced countries. It will also evaluate carefully the need and justifications for revising Hong Kong's AQOs, taking into account local factors and considerations. The study will provide detailed information on required specific measures and their implications, as well as the available options for achieving any new AQOs. The study is expected to be completed by the end of 2008. We will then launch a thorough public engagement process with a view to finalising the new AQOs and the required long-term strategy on air quality management within 2009. We have set up an Advisory Panel to guide the study and ensure that it is being properly conducted. It comprises members from the Advisory Council on the Environment, experts from different sectors, academics of relevant disciplines and representatives from relevant bureaux of the Government. A summary of the study is at **Annex** (English version only).

Co-operation with the Mainland

12. Maintaining a close partnership with the Mainland authorities is crucial to achieving the 2010 emission reduction targets. In the past six months, the Guangdong Provincial Government made much progress in continuing to implement the enhanced control measures under the "Pearl River Delta Regional

Air Quality Management Plan”.

13. According to the information provided by the Guangdong Province, its total installed capacity of power generation at the end of 2005 was about 48 000 MW, of which 28% and 16% were from oil-fired and small thermal power generating units respectively, while the others were from coal-fired, nuclear energy, hydro-electric and wind power generating units. In March 2007, the Guangdong Provincial Government announced its plan to close down 133 groups of small thermal power generating units with a total capacity of 9 660 MW, including those in the PRD Economic Zone with a total capacity of some 6 500 MW, by the end of 2010.

14. On 30 January 2007, the environmental protection authorities of the Guangdong and Hong Kong governments announced the implementation framework of the “Emissions Trading Pilot Scheme for Thermal Power Plants in the Pearl River Delta Region”. Through the use of market force and the flexibility of emissions trading, this platform will allow power plants in both places to actively participate in identifying cost-effective emission reduction options on a voluntary basis. Emission of air pollutants in the region will be reduced by means which meet the interests of various parties. On 18 May 2007, the two sides held a meeting with power companies of the PRD region in Guangzhou to explain the details of the implementation framework and promote exchange of views amongst the power plants and the governments of both places.

15. On 24 April 2007, the two sides announced the 2006 report on the monitoring results of the Pearl River Delta Regional Air Quality Monitoring Network. It is expected that the monitoring results for the first half of 2007 will be announced this October.

Environmental Protection Department
July 2007

Agreement No. CE 57/2006 (EP)
Review of the Air Quality Objectives and Development of
a Long Term Air Quality Strategy for Hong Kong –
Feasibility Study

Brief

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BRIEF

1. Introduction

- 1.1 This Brief is to be read in conjunction with the Memorandum of Agreement, General Conditions of Employment for a Feasibility Assignment, Special Conditions of Employment and Schedule of Fees.

2. Description of the Project

- 2.1 The Air Pollution Control Ordinance (APCO) empowers the Government to establish Air Quality Objectives (AQO) that should be achieved and maintained in order to promote the conservation and best use of air in the public interest. By making references to research results done mainly in the United States (US), a set of AQO comprising seven major air pollutants has been established since 1987. The current AQO and their achievement status are at **Appendix A**.
- 2.2 Scientists and professionals around the world have been making continuous efforts to identify new benchmarks for clean air so as to enable governments to draw up plans and measures to improve air quality. Hong Kong has been monitoring these international developments closely.
- 2.3 Recent scientific research findings have suggested that particulate matters smaller than 2.5 microns (PM_{2.5}) have more direct health effects than particulate matters of larger sizes. Moreover, air pollution effects on health may occur at concentration levels lower than previously known. In view of such findings, the need for introducing a new set of air quality standards for particulate matters smaller than 2.5 microns and revising the current air quality guidelines and standards for other pollutants has been under examination by a number of countries including the US, the member states of the European Union (EU) and the World Health Organisation (WHO).
- 2.4 On 21 September 2006, the US Environmental Protection Agency (US EPA) tightened its 24-h PM_{2.5} standard from 65µg/m³ to 35µg/m³ but extended the compliance date for this standard from 2015 to 2020, and revoked its PM₁₀ annual standard. The US EPA is now in the process of revising its ozone standards which are expected to be available by March 2008. The EU issued a draft directive in September 2005 on ambient air quality, which includes a proposed PM_{2.5} annual average standard set to take effect in 2010 and to be achieved by 2015. In the first reading of the directive on 26 September 2006, the European Parliament voted to allow member states to postpone compliance with existing limit values on air pollutants for up to four years beyond 2010 and called for the new PM_{2.5} limits due to enter force in 2010 to be made non-binding until 2015. The draft directive still needs to go through further negotiation process and will not be finalized until 2007.

- 2.5 The WHO announced a new set of Air Quality Guidelines (AQG) on 5 October 2006 to update the European WHO Air Quality Guidelines as well as to extend the AQG for global application. In view of the stringency of the updated guidelines, the WHO has also recommended in the updated AQG interim targets for countries to progressively improve the air quality.
- 2.6 The new WHO AQG have provided a scientific basis for supporting the development of air quality policies and management strategies in various parts of the world for the purpose of protecting human health. The WHO has pointed out that the actual air quality standards set in each country will vary according to the approach adopted for balancing health risks, technological feasibility, economic considerations and various other political and social factors, which in turn will depend on, among other things, the level of development and national capability in air quality management. The guideline values recommended by WHO acknowledge this heterogeneity and, in particular, recognize that when formulating policy targets, governments should consider their own local circumstances carefully before adopting the guidelines directly as legally based standards.
- 2.7 A comparison of our current AQO and the new WHO AQG is given in **Appendix B**. The new WHO AQG are much more stringent than our current AQO. In a recently published consultation document, the United Kingdom (UK) Government considers it is not practical to fully achieve the recommended WHO guideline values everywhere in the UK up to 2020. For some air pollutants, e.g. particulates, the estimated time frame for their achievement in the UK is 2050.
- 2.8 In Hong Kong, regional smog problem and local street-level pollution are the two major air pollution issues. Despite the success of the comprehensive motor vehicle emission control programme to reduce very substantially the local emissions, the background air quality of the region, however, has been worsening. The new WHO AQG cannot be met even at Tap Mun, the background air quality monitoring station. It shows that even if the emissions in Hong Kong were to be eliminated completely, the new WHO AQG still may not be met. The achievement of the new WHO AQG will thus require comprehensive, and possibly very drastic measures to be taken not only in Hong Kong, but also in the Mainland over the long term.
- 2.9 Measures required may include the extensive use of cleaner power generation technologies and fuels, cleaner mass-transit and transportation systems, cleaner production technologies, very efficient energy saving technologies as well as an urban form designed to permit and promote the use of these technologies. Some of these technologies required may be very costly or are still being developed overseas. Adopting these measures will have far reaching impact on a wide range of policy areas including energy, transportation, industrial production, urban planning, conservation and people's way of life.
- 2.10 In view of the above, the development of a set of revised AQO for Hong Kong and the strategies and implementation plans for their achievement in the long term must be supported by a thorough examination of the facts and options. It is also expected that the new AQO and the required strategies and plans can be finalised only with a comprehensive public engagement process seeking the necessary community consensus and support.

3. Objectives of the Assignment

- 3.1 The objective of the study (hereafter referred to as “the Study”) is to assess the need for and the implications of revising Hong Kong’s AQO as well as to identify options and propose alternative strategies and plans needed for achieving the revised AQO. Findings and options identified will be used for a comprehensive public engagement process for finalising action on the new AQO and the required long-term strategy on air quality management.

4. Description of the Assignment

- 4.1 Under this Assignment the Consultants are required to carry out a detailed feasibility study to assess the need for and the implications of revising Hong Kong’s AQO as well as to identify options and propose alternative strategies and plans needed for achieving the revised AQO. The scope of the Study covers the following–
- (a) review and characterize the current state of air quality in Hong Kong, including the prevailing exposure levels, developing trend, major pollution sources and origins, the impacts of external and non-anthropogenic sources on Hong Kong’s air quality, as well as policies, programmes and legislation in place for controlling air pollution and the costs and implications due to air pollution;
 - (b) examine and make reference to the different reasoning of the WHO and the US EPA in devising their respective air quality guidelines or standards, including concrete research results on long-term and short-term health impacts;
 - (c) use methods including air modelling to assess air quality under different scenarios and with mitigation measures adopted; to recommend specific measures required and options available to achieve interim targets and the standards if the new WHO AQG are to be adopted; to examine in depth the need for co-operation with neighbouring cities and provinces;
 - (d) assess the implications of implementing the measures identified under different options, including economic and social costs, the time required for introducing the measures, the need to work with the Mainland and other air quality management authorities outside Hong Kong as well as impacts on other policy areas such as energy, transportation, industrial development, urban planning and conservation;
 - (e) derive practicable options to revise Hong Kong’s AQO, including whether it is necessary to have different targets for roadside air quality, and to identify strategies and measures required in the form of action plan to achieve the revised AQO, with implications identified for each option, so as to facilitate public participation and comments; and
 - (f) review the need and means to harmonize air quality monitoring data and air pollution indices with other economically advanced cities to facilitate fair comparison.

5. Deliverables

- 5.1 As part of the Study, the Consultants shall produce the following Deliverables –
- (a) 25 copies of the Inception Report referred to in Clause 6.7.1 (f) of this Brief;

- (b) 25 copies of the Review Report referred to in Clause 6.9 of this Brief;
 - (c) 50 copies of the Draft Final Report referred to in Clause 6.16 of this Brief;
 - (d) 50 copies of the Revised Draft Final Report referred to in Clause 6.18 of this Brief;
 - (e) 50 copies of the Final Report referred to in Clause 6.19 of this Brief; and
 - (f) 25 copies of the Monthly Report referred to in Clause 9.1 of this Brief.
- 5.2 All reports, technical notes and working papers shall be first in draft. A period of 2 weeks shall then be allowed for circulation of the reports, technical notes and working papers to the concerned parties for comments. The Consultants shall provide responses within 1 week from receipt of the comments. Unless specified otherwise, within 2 weeks from receipt of comments, the revised version with the incorporation of comments where appropriate and written response to comments as appendix shall be issued by the Consultants and submitted to the Director's Representative.
- 5.3 Unless specified otherwise, the Consultants shall provide the Employer with one copy in editable electronic format for both text and image with latest version of software approved by the Director's Representative and hard copies of every report, technical notes, working papers, plans, drawings, written responses and other written documents as may be required under the Assignment, and one copy in electronic format and hard copies of such documents in the revised form.
- 5.4 Notwithstanding the Study Programme in Clause 8 of this Brief, the Consultants shall, during the Study period, produce such other reports on the Study as may be necessary, taking into consideration the comments made by the Director's Representative. Comments on the reports will be passed to the Consultants for consideration and incorporation in the subsequent reports as appropriate.
- 5.5 The content and format of all deliverables prepared by the Consultants shall be subject to the satisfaction of the Director's Representative.
- 5.6 The Consultants shall prepare the required reports and documents in accordance with the following "green" measures
- (a) All Reports, Technical Notes, Working Papers and other relevant documents including their draft forms should be submitted in A4 size printed on both sides of recycled paper and accompanying drawings should be of convenient sizes but not exceeding A3 size format unless otherwise specified in this Brief or approved in writing by the Director's Representative. The use of recycled paper with not less than 50% recycled materials and not exceeding 80gsm shall be used as a general rule. Bleached papers should not be used if possible. The logo of recycled paper should be printed in a prominent area of the reports.
 - (b) Excessive use of plastic laminates, glossy covers or double covers shall be avoided as far as possible and use of recyclable non-glossy art board paper as document covers shall be encouraged.
 - (c) Excessive white space around the borders and in between the paragraphs of all documents prepared by the Consultants shall be avoided. As a general rule, a margin

of 2 cm should be sufficient. Report should be of single line spacing on both sides of the paper.

- (d) The number of pages can be reduced by reducing the size of typeface(font). For example, "Times Roman" or "C.G. Times" font size not exceeding 10 characters per inch (cpi) or equivalent to point 12 cpi shall be used in balancing legibility and clarity against the waste reduction objective. The appearance and readability of the document can be improved by using two columns where the font size used is 12 points.

- 5.7 The submitted Deliverables shall become the properties of the Government of the Hong Kong Special Administrative Region. The Consultants shall draw to the Director's Representative's attention any Deliverables that are under licence and any pre-existing copyright or patent on any Deliverables and any other restriction whatsoever affecting his use of the same and to establish the existence of any licence, copy right, patent or restriction.
- 5.8 All working papers and reports shall be made available to Working Group members at least two weeks in advance of the Working Group meetings.

6. Services to be Provided by the Consultants

- 6.1 The Consultants shall carry out the duties as set out in the General Conditions of Employment and as amplified, extended and stipulated in this Brief.
- 6.2 The Consultants shall comply with all reasonable instructions of the Director's Representative and with all relevant circulars, guidelines, standing instructions and technical memoranda as directed by the Director's Representative.
- 6.3 The services to be provided by the Consultants shall include such additions, modifications and exceptions as agreed between the Director's Representative and the Consultants.
- 6.4 The Consultants shall give due consideration to all planning, environmental, engineering, economic, transport, drainage impact, land, utilities, safety, security, legal, social, operational, contractual and financial implications of their proposals and recommendations.
- 6.5 The Consultants shall engage expert sub-consultants such as legal, health, air modelling, social, economic and financial specialists if no such in-house resource is available. The sub-consultant or the Consultants' in-house advisor shall be qualified professional and required to provide professional expert advice as necessary or directed by the Director's Representative for satisfactory completion of the Assignment.
- 6.6 The Study shall be conducted in three stages, namely the Inception Stage, the Review Stage and the Formulation of Recommendation Stage as stipulated in Clauses 6.7 to 6.19 of this Brief.

The Inception Stage

- 6.7 The Inception Stage comprises the preparation of a report to illustrate the approach, methodology, evaluation techniques and quality assurance regime to be adopted, work programme with major work tasks identified as well as organization and staffing of the Study

team in order to address all the aspects as described in the scope as set out in Clause 4.1 of this Brief above and to fulfill the objective of the Study.

6.7.1 In the Inception Stage, the Consultants shall complete the following tasks –

- (a) to report on the Consultants' understanding and appreciation of the objective of the Study;
- (b) to report on the Consultants' approach and methodology to be adopted for the Study for the agreement of the Director's Representative;
- (c) to identify the major tasks of the Study;
- (d) to prepare a work programme with schedule of the submission of reports and documents;
- (e) to prepare the organization and staffing of the Study team including the curricula vitae of the key Study team members; and
- (f) to prepare an **Inception Report** in English, based on Clause 6.7.1(a) to (e) of this Brief above, for submission to the Director's Representative for comments.

The Review Stage

6.8 In the Review Stage, the Consultants shall complete the following tasks –

- (a) the Consultants shall collect and review literatures, research results, data, international practices and current knowledge on health effects of air pollution at different levels and time averages as well as the latest development in air quality standards in other countries in particular air quality standards/guidelines review results of the EU, US, Asian countries and WHO, including their rationale and differences in devising their respective air quality guidelines or standards, for use in analyses to be conducted as well as for supporting the options and recommendations of the Study;
- (b) the Consultants shall collect and review all the available air quality information as well as assess and characterize the current state of air quality in Hong Kong including the prevailing exposure levels, developing trends and contributing factors as well as the costs and implications due to air pollution;
- (c) the Consultants shall identify and characterize the major pollution sources including external and non-anthropogenic sources that may affect the air quality of Hong Kong for better understanding of the spatial distribution of these major pollution sources, their significance and their emission characteristics;
- (d) the Consultants shall collect and review the plans, programmes, policies and local legislation for the control of air pollution;
- (e) the Consultants shall take into account the findings, results, and conclusions covered in Clause 6.8 (b), (c), and (d) of this Brief for projection of future emission of air pollutants that may have a significant influence on the air quality of Hong Kong; and
- (f) the Consultants shall review the need and means to harmonize Hong Kong's air

quality monitoring data and air pollution index reporting with other economically advanced cities to facilitate fair comparison.

- 6.9 The Consultants shall compile a **Review Report** on the findings, results and conclusions covered in Clause 6.8 of this Brief for comments and approval by the Director's Representative.

The Formulation of Recommendation Stage

- 6.10 Based on the projected future emission of air pollutants covered in Clause 6.8 (e) of this Brief, the Consultants shall project and estimate the future air quality of Hong Kong under different development scenarios up to 2047 by using appropriate methods including modelling.
- 6.11 Based on the findings of the Review Report and the projected future air quality covered in Clause 6.10 of this Brief, the Consultants shall identify and evaluate measures required and options available to adopt and achieve a new set of AQO by examining the following factors –
- (a) application of the latest WHO AQG to Hong Kong including the new WHO interim targets;
 - (b) the local situation and the prevailing exposure levels;
 - (c) practicability of the new standards needed;
 - (d) the constraints in controlling compliance owing to significant regional and transboundary component of measured concentrations;
 - (e) source control measures/initiatives;
 - (f) abatement strategies, control policies/scenarios and regulatory impact;
 - (g) social and economic implications and benefits, including cost-benefit and the effects on the long term economic and social development of Hong Kong if the AQO are tightened up;
 - (h) the society's acceptance of the new standards with emphasis on the cost that the public have to pay and willing to pay to achieve such standards;
 - (i) impacts on other policy areas;
 - (j) legal implications;
 - (k) transitional arrangements from changing the existing AQO to the new set of AQO; and
 - (l) comments, suggestions and views received during the Study, including those from the Public Forum on Review of Air Quality Objectives held by the Advisory Council on the Environment on 18 September 2006 and the meeting of the Panel on Environmental Affairs of the Legislative Council on 27 November 2006.

- 6.12 The Consultants shall, based on the findings in Clause 6.11 of this Brief, evaluate the need and justifications for revising Hong Kong's air quality objectives, including whether it is necessary to devise different targets for roadside air quality, according to the principles recommended by WHO and analyze the implications of introducing and achieving a new set of AQO including a new PM2.5 standard.
- 6.13 The Consultants shall identify and evaluate measures required and options available for Hong Kong to achieve the new set of AQO as recommended in Clause 6.12 of this Brief. The Consultants shall also assess the implications of implementing the measures identified under different options including economic and social costs, the time required to implement the measures, the need to work with air quality management authorities outside Hong Kong as well as impacts on other policy areas such as energy, transportation, industrial development, urban planning and nature conservation.
- 6.14 The Consultants shall recommend action plans and practicable measures needed to be taken at various levels and sources including working in conjunction with neighbouring cities, provinces and countries with specific targets and time schedules to improve air quality in order to meet the new set of AQO. The recommendations should be backed up by robust scientific and technical analysis and followed by legislative proposals for those measures to be taken, which allow for economic development while moving towards sustainable air quality.
- 6.15 The Consultants shall design and assist the Government in implementing a strategy and programme for consulting the relevant stakeholders both inside and outside the government including the general public in the Public Engagement Process to be conducted after the completion of the Study.
- 6.16 After completing the tasks required under Clauses 6.8 to 6.15 of this Brief, the Consultants shall produce a **Draft Final Report** in English and Chinese, covering the findings, results and recommendations of the Study required under Clauses 6.8 to 6.15 of this Brief.
- 6.17 The Consultants shall conduct surveys to gauge the support and opinion from the public and relevant stakeholders on the revised set of AQO and options, action plans and measures recommended in the Draft Final Report. In the surveys, the Consultants shall obtain representative opinion from the public and relevant stakeholders with the number of responses of no less than 1000 which should have adequate representation of the age and gender distribution.
- 6.18 The Consultants shall respond to all comments received on the Study within the Study period and from the opinion surveys conducted under Clause 6.17 of this Brief and carry out further work if necessary so as to address the comments and incorporate necessary changes to the Draft Final Report to produce a **Revised Draft Final Report** in English and Chinese.
- 6.19 Upon acceptance of the Revised Draft Final Report, the Consultants shall produce a **Final Report** in both English and Chinese with an executive summary each (in both English and Chinese) for submission to the Director's Representative.
- 6.20 As and when required by the Director's Representative, the Consultants shall, during the period of the Study, report, attend at presentations, briefing or discussion sessions held in connection with the preparation of the draft reports.

- 6.21 The Consultants shall, during the period of the Study, provide presentations and briefing sessions to the Director's Representative, Study Management Group, Steering Committee, Working Group held in connection with the Study as required by the Director's Representative to present programme, progress and the findings and recommendations of the Study. The Consultants shall absorb cost and expenses for all these presentations and briefing sessions as well as other progress meetings, technical meetings, and liaison meetings with relevant departments and authorities into the fee proposal.
- 6.22 The Consultants shall attend up to 40 external meetings to brief/explain the findings and recommendations of the Assignment on the request of the Director Representatives during the Public Engagement Process. Such request shall be confirmed in writing to the Consultants by the Director's Representative prior to a date three months after the final submission of the deliverables required under the Assignment. Further attendance at more than the said number of external meetings shall be paid for as additional service. The external meeting shall include meetings with Advisory Council on the Environment, the Legislative Council and its Panels, the District Councils, public meetings or forums with relevant stakeholders. The Consultants shall also allow fees for all progress meetings, technical meetings and liaison meeting with relevant departments or authorities including the Study Steering/Working Groups and Study Management Group meetings, in the fee proposal. These meetings shall not be considered as part of the external meetings.
- 6.23 The Consultants shall collect, compile and respond to all the comments and queries received in the external meetings or forums held under Clause 6.22 of this Brief for submission to the Director's Representative.
- 6.24 The Consultants shall report to the Director's Representative or any other delegated person on day-to-day administration of the Study and shall attend, serve or report to progress meetings at monthly or any other intervals as agreed with the Director's Representative.
- 6.25 The Consultants shall communicate and correspond direct with relevant Government bureaux/departments/agencies, and all other parties involved in this project to obtain information in connection with the Study. Any problems in communication or liaison should be referred to the Director's Representative for assistance. Any correspondence, notes or minutes arising from this communication or liaisons shall be copied to the Director's Representative. In particular, the Consultants will be required to liaise with and seek input from the specialist groups of the Environmental Protection Department (EPD) as appropriate, and consultation may be required with relevant bureaux/departments and agencies.

7. Response to Queries

- 7.1 The Consultants shall respond to queries under Clause 20 of the General Conditions of Employment raised prior to a date three months after the final submission of the deliverables required under the Agreement at no additional charge to the Assignment. Such date shall be confirmed in writing to the Consultants by the Director's Representative. Further requirement of such services beyond the said period shall be paid for as additional work.

8. Programme of Implementation

- 8.1 The date for commencement of the Agreement is _____ 2007.

8.2 The Study will be completed within 18 months from the due date for commencement of the Agreement. The Consultants shall produce, within this period, a Final Report.

8.3 The Study shall be completed in accordance with an agreed Study programme, subject to the condition as set out in Clause 8.2 of this Brief. The key dates for the completion of reports for the Study shall be in accordance with the following -

	Reports to be Submitted	Date
(a)	Submission of an Inception Report referred to in Clause 6.7.1 (f) of this Brief	Within 5 weeks from the due date for commencement of the Agreement
(b)	Submission of a Review Report referred to in Clause 6.9 of this Brief	Within 3 months from the due date for commencement of the Agreement
(c)	Submission of a Draft Final Report referred to in Clause 6.16 of this Brief	Within 14 months from the due date for commencement of the Agreement
(d)	Submission of a Revised Draft Final Report referred to in Clause 6.18 of this Brief	Within 16 months from the due date for commencement of the Agreement
(e)	Submission of a Final Report referred to in Clause 6.19 of this Brief	Within 18 months from the due date for commencement of the Agreement

8.4 Pursuant to Clause 26(B) of the General Conditions of Employment, the Consultants shall submit the draft Study programme and revised draft Study programmes and the Director Representative shall agree, or instruct, within the following periods –

Submission of the draft Study programme:	Within 2 weeks from the due date for commencement of the Agreement as part of the draft Inception Report
Comments/agreement of the draft Study programme:	Within 2 weeks from receipt of the draft Study programme or instruction for submission of revised draft Study programme
Submission of revised draft Study programme:	Within 2 weeks from receipt of comments/instructions of the Director's Representative

8.5 The draft Study programme and revised draft Study programmes shall detail the activities to be carried out, target dates for particular tasks and any decisions dates that may be required for the uninterrupted progress of the Assignment. The Consultants shall discuss with the Director's Representative during the above periods to agree the timing of submission of

reports, other documents and plans for each of the main elements of the Assignment, for inclusion in the draft programme and revised draft programme.

- 8.6 The Consultants shall endeavour to ensure that the Study is carried out in accordance with the programme and shall submit regular reviews as part of the progress reports referred to in Clause 9 of this Brief.

9. Progress Reports

- 9.1 The Consultants shall submit to the Director's Representative progress reports within the first five working days of each month, or at such regular intervals as may be agreed with the Director's Representative from time to time, on all aspects of the Services relating progress to the programme referred in Clause 8 of this Brief. The reports shall include a list of those parts of Services the execution of which is behind the programme, together with proposals to expedite progress, so as to complete the work on time. The reports shall also include updated expenditure forecasts in accordance with Clause 10 of this Brief. The content and form of such reports shall be subject to the satisfaction of the Director's Representative.

10. Financial Management

- 10.1 At monthly intervals or at such other intervals as the Director's Representative may require, the Consultants shall submit a report on the current and forecast expenditure on the Assignment and the fees due to the Consultants, in a form to be agreed by the Director's Representative.

11. Standards and Specifications

- 11.1 The Consultants shall adopt such standards and specifications as are in current use by Government departments or, if the same does not exist, British Standard Codes of Practice and Specifications.
- 11.2 Should suitable standards or specifications do not exist or for which the current standards or specifications appear to require modification or if by the adoption of current standards or specifications the Consultants would incur additional expenses not within reasonable contemplation, the Consultants shall submit recommendations on appropriate alternative standards or specifications to the Director's Representative for agreement.
- 11.3 The Consultants shall comply with and observe all Ordinances, by-laws, regulations and rules for the time being in force in the Hong Kong SAR.

12. Director's Representative

- 12.1 The Director's Representative as defined in the General Conditions of Employment shall be the Assistant Director (Air Policy) of the Environmental Protection Department or such other person as may be authorised by the Director in writing and notified to the Consultants. The Director's Representative may delegate any of the powers and functions vested in him to other officers. If the Consultants are dissatisfied with a decision or instruction of any such officer the matter shall be referred to the Director's Representative for a ruling.

- 12.2 During the course of the Agreement the Consultants shall report direct to the Director's Representative.

13. Control of the Project and Assignment

- 13.1 On commencement of the Assignment, the Consultants shall notify the Director's Representative the name of the Project Director and the Project Manager for the Assignment.
- 13.2 The Assignment shall be directed and supervised by the Director's Representative and will be managed by a Study Management Group and a Working Group formed within the Government. These Groups shall be the forum for liaison within Government bureaux/departments/agencies, providing guidance to the Consultants, and for commenting and reviewing on the work and outputs of the Study.
- 13.3 A Steering Committee, comprising representatives from relevant policy bureaux/departments/agencies, members of the Advisory Council on the Environment as well as relevant experts and academics, may be set up by the Director's Representative to guide the Study. The Consultants shall be required to attend meetings held by the Steering Committee.
- 13.4 The Director's Representative may set up additional working groups or committees as may be necessary to consider the submissions of the Consultants. The Consultants shall be required to attend all progress meetings held by these working groups or committees.

14. Information and Facilities Provided by the Employer

- 14.1 All available information relevant to the Assignment as listed below will be provided to the Consultants. One copy of each of the documents as needed will be supplied free of charge by the Director's Representative on request from the Consultants, except those currently available from the Publication Sales Section of the Information Services Department. In the case of plans and drawings, one transparency and two prints of each plan or drawing shall be provided free of charge if requested by the Consultants.
- Air Quality Reports - Air Quality in Hong Kong 1996 to 2005
 - Air Pollutants Emission Inventory 1990 to 2004

15. Consultants' Office and Staffing

- 15.1 The Consultants shall give an assurance that each of the collaborating parties involved in the Assignment are bound to be undertaking and shall comply with the requirements of this Brief until satisfactory completion of the Assignment .
- 15.2 The Consultants shall maintain for the duration of this Agreement an office in Hong Kong under the control of the Project Director of the Consultants who shall be responsible for the Project. The Project Director shall have adequate authority and sufficient professional, technical and administrative support staff in all relevant disciplines to ensure progress to the satisfaction of the Director's Representative. The Project Director shall have specific expertise, detailed knowledge and poise in connection with the Assignment, and shall be able

to convincingly present and defend the Assignment's findings and conclusions in appropriate public forums.

- 15.3 The Consultants shall provide the staff and manpower input in accordance with the Technical Proposal made at the tender stage, which shall have a detailed organization chart showing the management setup, the staff including all the collaborating parties, and the division of responsibilities. The Director's Representative shall have the right to check the time-log record of the Consultants' staff deployed for the Assignment. Failure of the Consultants to adhere to his staffing proposal made at the tender stage with a demonstrably adverse on performance shall be reflected in the performance assessment of the Consultants.
- 15.4 Other than in exceptional circumstances, no changes to the key staff in the Technical Proposal will be permitted during the progress of the Assignment. Should a change be necessary, the Consultants shall seek prior approval in writing, informing the Director's Representative the circumstances that require the change and providing information on any replacement proposed. In the event, for reasons beyond their control, the Consultants are unable to provide or maintain any key staff in the Technical Proposal, they shall report to the Director's Representative as soon as practicable and propose for the Director's Representative's approval a substitute staff. The proposed substitute staff shall have qualification and experience comparable with the staff who is leaving the study team.

16. Specialist and Sub-consultant Services

- 16.1 The Consultants shall provide all specialist and sub-consultant services required for the satisfactory completion of the Assignment. No additional fees or expenses for the provision of such services rendered locally or overseas shall be payable by the Employer except as otherwise provided for in the Schedule of Fees.

17. Surveys

- 17.1 One velograph and two prints of topographical mapping at 1:20,000, 1:5,000 and 1:1,000 scales prepared by the Survey and Mapping Office of the Lands Department, where available for the area covered by the Project of which the Assignment forms a part, can be obtained free of charge on application to the Director's Representative. All field survey work required for the proper execution of the Assignment shall, unless otherwise provided for in the Agreement, be the responsibility of the Consultants. A copy of field notes, field data and resultant plans arising from these surveys shall be handed over to the Director's Representative upon completion of the Assignment. The accuracy as well as presentation of these surveys shall be of a standard agreed by the Director's Representative.

18. Insurance

- 18.1 The amount of insurance cover to be maintained in accordance with sub-clause (A) of Clause 47 of the General Conditions of Employment shall be equal to the Lump Sum Fee, subject to a minimum of \$2 million and a maximum of \$50 million.

~ End of Brief ~

Appendix A**The Current Hong Kong AQO and Achievement Status**

Pollutants	Averaging Time	Air Quality Objectives (µg/m ³)	Measured Concentrations in 2005 (µg/m ³) (In bracket is/are the station(s) where the highest data was/were recorded)		Status of Achievement	
					% of AQO at Highest Concentration	Evaluation of Achievement
Sulphur Dioxide (SO ₂)	1-hour	800	General Station	453 (Tap Mun)	57	Well achieved
			Roadside Station	476 (Mong Kok)	60	Well achieved
	24-hour	350	General Station	138 (Yuen Long)	39	Well achieved
			Roadside Station	114 (Mong Kok)	33	Well achieved
	Annual	80	General Station	32 (Kwai Chung)	40	Well achieved
			Roadside Station	25 (Central)	31	Well achieved
Nitrogen Dioxide (NO ₂)	1-hour	300	General Station	309 (Central/Western)	103	Not achieved yet
			Roadside Station	345 (Central)	115	Not achieved yet
	24-hour	150	General Station	147 (Tung Chung)	98	Achieved
			Roadside Station	195 (Causeway Bay)	130	Not achieved yet
	Annual	80	General Station	65 (Sham Shui Po)	81	Achieved
			Roadside Station	99 (Central)	124	Not achieved yet
Respirable Suspended Particulates (RSP)	24-hour	180	General Station	217 (Tung Chung)	121	Not achieved yet
			Roadside Station	191 (Causeway Bay)	106	Not achieved yet
	Annual	55	General Station	62 (Yuen Long)	113	Not achieved yet
			Roadside Station	84 (Causeway Bay)	153	Not achieved yet
Total Suspended Particulates (TSP)	24-hour	260	General Station	322 (Kwai Chung)	124	Not achieved yet
			Roadside Station	205 (Mong Kok)	79	Achieved
	Annual	80	General Station	104 (Yuen Long)	130	Not achieved yet
			Roadside Station	112 (Mong Kok)	140	Not achieved yet
Ozone (O ₃)	1-hour	240	General Station	365 (Tap Mun)	152	Not achieved yet
Carbon Monoxide (CO)	1-hour	30,000	General Station	5730 (Tung Chung)	19	Well achieved
			Roadside Station	4370 (Central)	15	Well achieved
	8-hour	10,000	General Station	4541 (Tung Chung)	45	Well achieved
			Roadside Station	3693 (Central)	37	Well achieved
Lead (Pb)	3-month	1.5		0.069 (Tsuen Wan, Annual average)	5	Well achieved

Comparison of HK AQO and WHO Air Quality Guidelines in $\mu\text{g}/\text{m}^3$

	Averaging Time	HK AQO	WHO AQG 2000	New WHO AQG Global Update 2005 ⁽¹⁾
Sulphur Dioxide	10-minute	-	500	500
	1-hour	800 (3 exceedances per year)	-	-
	24-hour	350 (1 exceedance per year)	125	20 (IT-1: 125, IT-2: 50)
	Annual	80	50	-
Total Suspended Particulate	24-hour	260 (1 exceedance per year)	-	-
	Annual	80	-	-
Respirable Suspended Particulate (PM ₁₀)	24-hour	180 (1 exceedance per year)	No guideline values are recommended but provided the dose response relationships.	50 (IT-1: 150, IT-2: 100, IT-3: 75)
	Annual	55	-	20 (IT-1: 70, IT-2: 50, IT-3: 30)
Fine Suspended Particulate (PM _{2.5})	24-hour	-	No guideline values are recommended but provided the dose response relationships.	25 (IT-1: 75, IT-2: 50, IT-3: 37.5)
	Annual	-	-	10 (IT-1: 35, IT-2: 25, IT-3: 15)
Nitrogen Dioxide	1-hour	300 (3 exceedances per year)	200	200
	24-hour	150 (1 exceedance per year)	-	-
	Annual	80	40	40

	Averaging Time	HK AQO	WHO AQG 2000	New WHO AQG Global Update 2005 ⁽¹⁾
Ozone	1-hour	240 (3 exceedances per year)	-	-
	8-hour	-	120	100 (High levels : 240, IT-1: 160)
Carbon Monoxide	15-minute	-	100,000	
	30-minute	-	60,000	
	1-hour	30,000 (3 exceedances per year)	30,000	
	8-hour	10,000 (1 exceedance per year)	10,000	-
Lead	3-month	1.5	-	-
	Annual	-	0.5	-

Notes:

(1) As published by WHO on 5 October 2006. IT stands for interim target.