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For information

**Promotion of Cleaner Production
in the Pearl River Delta Region**

PURPOSE

This paper briefs Members on a proposed five-year Cleaner Production Partnership Programme (CPPP) for promoting cleaner production (CP) technologies and practices¹ amongst Hong Kong-owned² factories in the Pearl River Delta (PRD) region.

BACKGROUND

2. The air quality problem facing Hong Kong is both local and trans-boundary in nature. The Guangdong Provincial Government and the Government of HKSAR (HKSARG) are embarking upon a host of measures to cut down air emissions in order to achieve the 2010 emission reduction targets jointly agreed by both sides.

3. There are more than 56,000³ Hong Kong-owned factories operating in the

Footnotes:

¹ Cleaner production approach is a preventive, integrated strategy that is applied to the entire production cycle to increase productivity by ensuring a more efficient use of raw materials, energy and water, and to promote better environmental performance through reduction at source of waste and emissions.

² An enterprise registered in Hong Kong under the Business Registration Ordinance (Chapter 310).

³ As advised by the Department of Foreign Trade and Economic Cooperation of Guangdong Province, the current figure of HK-owned factories in Guangdong is 56,000. In Federation of Hong Kong Industries' report "Made in PRD" published in April 2007, it is also estimated that Hong Kong-funded enterprises and Hong Kong-funded enterprises in other contractual forms (OCFs) approximately accounted for 55,200

PRD region. Their operation has brought about huge production capacity, major employment opportunities and phenomenal economic growth. Yet their production processes and the large amount of energy consumed by their operation contribute to the discharge of air pollutants, including sulphur dioxide, nitrogen oxides and volatile organic compounds, in the region. Apart from the joint efforts of the Guangdong Provincial Government and HKSARG, the Hong Kong business community therefore also has a major role to play in enhancing the environmental performance of the industries in the PRD region. The business community has generally recognized its crucial role in this respect and has launched a number of voluntary initiatives in recent years, including the Clean Air Charter initiated by the Hong Kong Business Coalition on the Environment and the Hong Kong General Chamber of Commerce (HKGCC), and the One-One-One (One Factory-One Year-One Environmental Project) Programme by Federation of Hong Kong Industries (FHKI), to encourage their members to reduce emissions through energy efficiency and CP practices.

4. Consultation with the industry has, however, indicated that many Hong Kong-owned factories in PRD do not have a clear understanding of what CP practices are. Nor do they have adequate access to technical know-how and support to take concrete actions. Although there are many environmental technology (ET) service providers that offer packaged improvement systems and services, the industry generally lacks confidence in employing these service providers for want of independent verification to confirm the actual environmental benefits. The above-mentioned initiatives launched by the business community, because of their nature, do not always provide to the industries the required technical support and know-how in applying cleaner production technologies and practices, especially those that are specific to particular industry sectors.

5. To speed up the adoption of energy efficiency and CP practices by Hong Kong-owned factories in the PRD region, the Environmental Protection Department (EPD) commissioned Hong Kong Productivity Council (HKPC) to launch a CP Technical Support Pilot Project in November 2006. The project has the support of the major trade and industrial associations. Response from the industry sector has been positive. HKPC has completed preliminary CP assessment for 15 participating factories and worked with four short-listed factories for detailed assessment and implementation of recommended CP measures. The project has successfully engaged the industry and aroused their awareness by demonstrating with real case examples that CP is not only practicable but, in many cases, would also bring about economic

manufacturing enterprises and 57,500 factories in PRD (Section 3.2, page 47 refers).

benefits through reduction in energy and material consumption and emissions treatment costs. It has also confirmed that the industry would welcome and adopt CP practices and technologies if their effectiveness and benefits could be demonstrated and verified. Some examples are set out below –

- (a) a metal works factory has reduced its consumption of paint and solvent by 18% by switching to the use of high volume low pressure paint spraying guns. By adopting various cleaner production measures, the factory achieves an estimated reduction of 50 tonnes in volatile organic compounds (VOC) emission; and
- (b) a printing factory cuts its electricity bill by about RMB 50,000 a year by the installation of a more energy efficient lighting system with a return period of about two years. By making use of the waste heat from water-cooled chillers for producing hot water for dormitory use, the factory can save a further RMB 80,000 a year.

6. Building on the success of the pilot project, the Chief Executive announced in the 2007 Policy Address that Government would further commission the HKPC to launch a five-year programme to provide professional advice and technical support on CP to Hong Kong-owned factories in the PRD region.

THE PROPOSAL

Objective

7. The overall objective of the proposed five-year CPPP is to encourage and facilitate Hong Kong-owned factories in the PRD region to adopt CP technologies and practices. They could make positive contribution to a cleaner environment by reducing air emissions through –

- (a) optimising the operation of the furnaces, boilers and ancillary generators and adopting affordable desulphurisation and particulate control systems;
- (b) minimizing VOC emissions through switching to the use of low VOC emitting alternatives and practices and adopting affordable VOC control systems; and
- (c) improving energy efficiency thereby reducing air pollutants generated from fuel combustion and power plants.

Guiding Principles

8. The following guiding principles have been adopted in designing the programme—

- (a) the programme will focus on encouraging and facilitating HK-owned factories in PRD region to contribute to a cleaner environment by reducing air pollution/emissions and enhancing energy efficiency;
- (b) targeted sectors and participating factories are to be selected by taking into consideration, *inter alia*, the level of their power consumption and emissions, and potential in achieving environmental improvement;
- (c) participation by factories should be voluntary and by application;
- (d) the findings of and experience gained by adopting CP technologies and practices will be shared by the trades;
- (e) the benefits of the cleaner production technologies and practices so pursued under this programme will be verified so that factories and the trades would be encouraged to adopt such technologies and practices on their own;
- (f) there will be no direct subsidy on the cost of hardware or installation of cleaner production equipment exclusively for the use by the factories concerned;
- (g) ET service providers will be encouraged to participate in carrying out the programme activities (e.g. conducting on-site improvement assessment and demonstration projects); and
- (h) credible mechanisms on monitoring and control would be drawn up to ensure best use of public money.

Targeted Approach

9. The programme will target at industry sectors which –

- (a) involve production processes resulting in substantial emission of air pollutants;

- (b) use large quantities of potentially environmentally damaging chemicals or materials;
- (c) consume large quantities of fuel and energy; and
- (d) have a good potential for achieving environmental improvement.

10. We have initially identified eight industry sectors which have contributed to air pollutant emissions to various extent and are most likely to yield positive improvement. They are, namely, textiles, non-metallic mineral products, metal and metal products, food and beverage, chemical products, printing and publishing, furniture and paper/paper product manufacturing. It is estimated that there are close to 15,000 Hong Kong-owned factories in these eight sectors in the PRD region.

11. In selecting participating factories, due consideration will be given to the need in creating a “critical mass” while maintaining a balanced participation from all the targeted industry sectors; and also the geographical spread of the selected factories. Priority will be given to –

- (a) small and medium-sized enterprises (SMEs)⁴ which might not have adequate technical expertise or resources to identify or implement CP technologies and practices;
- (b) factories with production processes that are representative or common to the specific trade sector, and have the potential for environmental improvements. Their participation will help create a multiplying effect to incentivize other factories in the same trade to adopt CP measures; and
- (c) factories which have indicated a willingness to pursue CP technologies and practices.

Key Initiatives

12. Key initiatives of the programme include –

- (a) *awareness promotion* – this will comprise structured briefings, study

⁴ An enterprise as defined in footnote 1, which as a manufacturing business employs fewer than 100 persons in Hong Kong; or a non-manufacturing business which employs fewer than 50 persons in Hong Kong.

missions, training seminars and workshops, conferences and exhibitions, in Hong Kong, Shenzhen, Dongguan, and other cities in the PRD region as necessary. Information brochures and posters will be distributed. These activities will be organised to proactively seek the support of relevant trade associations with a view to reach out to the target factories effectively. A dedicated CP website together with an enquiry hotline will be set up to enhance information dissemination and facilitate sharing of successful experience. The objective is to enhance the awareness and knowledge of owners/operators of Hong Kong-owned factories in the region about the programme and, more importantly, the available CP technological and process options in enhancing energy efficiency and mitigating emissions. Participation in the awareness promotion activities will normally be free of charge;

- (b) *on-site improvement assessment for about 800 to 1,000 factories (subject to response)* - HKPC, in conjunction with other ET service providers, will provide guidance and conduct on-site assessment for participating factories to identify and analyse the problems they face and propose practical improvement solutions. While the focus is on energy efficiency and reduction of air pollution, an all-rounded assessment to cover other areas of improvement such as waste or water treatment can also be provided for. Participants will be asked to indicate their follow-up actions after on-site assessment. Successful examples and experience in the application of CP technologies and good practices adopted by the participating factories will also be collated and reported for sharing purposes. The assessment costs will be shared between the Government and the participating factories on a fifty-fifty basis, with participating factories paying 50% of the cost as participating fee and Government sponsoring the other 50%, subject to a ceiling of \$15,000. Any cost exceeding the ceiling will have to be met by the participating factories;
- (c) *demonstration projects* – to help factories overcome any confidence barrier they may have in investing in CP technologies, HKPC will work closely with ET service providers to conduct some 90 selected demonstration projects to demonstrate the effectiveness, actual cost involved and potential financial return of CP technologies through installation of equipment and/or modification of production processes.

The cost will again be shared between participating factories and Government on a fifty-fifty basis. The average contribution of Government funding is estimated to be around \$160,000 per project. Depending on the merit of the technology, the funding ceiling for individual projects may be reviewed by the future Project Management Committee (PMC) as necessary during the implementation of the programme (please refer to para.16 for details). Participating factories will be required to share the findings of the demonstration projects and experience gained with other factories. The focus will be on emission reduction, improving energy efficiency and pollution control. Each type of project will be carried out, if possible, in factories with different scale of operation or different practices to verify the applicability of the concerned technologies under different circumstances. In the process of selecting participants, consideration will be given to whether the production operation of the factory is typical of its trade, the potential for improvements, commitment of the factory concerned, and the likelihood of creating a “critical mass” while maintaining a balanced participation from all the targeted industry sectors; and

- (d) *verification of the effectiveness of the improvement projects* – for those factories which have followed up at their own costs the recommended improvement measures in (b) above, HKPC will provide an independent third-party service to verify the effectiveness of the improvement projects. Other factories that have also carried out improvement projects (e.g. on the advice of consultants whom they engaged at their own costs) may also apply. This service will be critical to the success of the whole programme, as it will help reinforce the participating factories’ confidence in investing in CP technologies and, through reporting and sharing of the verification results, inspire other factories to follow suit. The initial quota for verification service is 500. Subject to response, the number can be increased to cover up to 1,000 factories. It is suggested that this service be provided free of charge to participants for small and medium scale improvement projects, while for large projects the contribution from the Government for the verification will be capped to a ceiling of \$15,000 per project.

Programme Implementation

13. The programme would straddle over a five-year period. An experienced programme management team will be established within HKPC to co-ordinate and run the programme. HKPC will appoint a senior staff as the Programme Director to lead the management team. He will be supported by a dedicated full-time Programme Manager (PM) with extensive experience in environmental improvement in industrial operation to oversee the daily operation of the programme. The PM will be assisted by a programme officer and two support teams based in PRD (each comprising one programme co-ordinator and two programme assistants), one in Shenzhen and the other in Dongguan, to take up local liaison work and co-ordinate all the programme activities. A quality assurance support team will also be established in the HKPC to ensure effective implementation of the key programme initiatives.

14. Given the scope of the programme, HKPC will work closely with other ET service providers in both Hong Kong and PRD to take forward the proposed awareness promotion activities, on-site assessments and technology demonstration projects. Seminars and professional development sessions will be organized by HKPC for ET service providers to facilitate their participation in this programme. ET service providers that are interested in participating in the programme may register their intention with HKPC after project funding is approved by the Legislative Council (LegCo). They will be invited to submit relevant information including, *inter alia*, their company structure, areas of expertise and interest, past experience in undertaking environmental improvement works for industries, etc. The quality of the work undertaken by ET service providers under this Programme will be monitored and evaluated by HKPC's quality assurance support team.

15. EPD will also actively support the programme by closely liaising with the relevant Guangdong authorities, including the Guangdong Provincial Economic and Trade Commission, to secure their collaboration in providing the necessary support, advising on the relevant Mainland policies, rules, regulations, CP standards/requirements, and participating in the related publicity and awareness promotion activities. EPD will deploy a dedicated professional team led by a senior Environmental Protection Officer to render support to the programme.

Control and Review Mechanism

16. A Project Management Committee (PMC) will be set up to oversee the implementation of the programme. The PMC will be led by EPD and comprise representatives from the Trade and Industry Department, HKPC and the four major trade and industry associations, namely, the HKGCC, FHKI, the Chinese Manufacturers' Association of Hong Kong (CMA) and the Chinese General Chamber of Commerce (CGCC). Other departments such as the Innovation and Technology Commission, related organisations and/or experts would be invited to join as co-opt members on a need basis. To ensure the best use of public money, credible mechanisms on monitoring and control, as well as project assessment and overall evaluation of its effectiveness will be put in place. For instance, HKPC will be invited to draw up an annual implementation plan, and will be required to submit regular progress reports to the PMC at least on an annual basis. In the progress reports, HKPC will have to provide information such as implementation progress, problems encountered, remedial measures taken to tackle problems, and interim findings and evaluation of the project, etc.

17. Objective indicators will be devised by the PMC in consultation with HKPC and the industries, against which the effectiveness of the project will be closely monitored and assessed. Surveys will also be conducted to track the awareness and taking up of cleaner production technologies and practices by factories in the PRD region. The Administration will report annually to the LegCo Panel on Environmental Affairs on the progress of the programme to ensure transparency and public accountability.

18. To enhance the monitoring of the programme activities, HKPC will carry out spot checks on the participating factories and EPD will also arrange factory visits as part of overall programme monitoring. To avoid duplication in the source of funding, in vetting project applications, due consideration will be given to whether the proposed project has alternative source of funding support or whether the proposed project should be more appropriately funded by other sources. HKPC will be required to submit annual and final audited accounts for the operation of the programme audited by an independent auditor. Funding from the Government will be disbursed to HKPC annually, and the disbursement will be contingent upon submission of an annual financial estimate and annual implementation plan by the HKPC.

19. Based on the guiding principles and criteria set out in paras. 8 to 11 above,

the PMC will –

- (a) determine the mechanism for inviting interested factories to participate in the programme;
- (b) draw up objective criteria for selection of factories for undertaking on-site assessment, demonstration projects and verification of the effectiveness of the improvement projects;
- (c) vet, approve, review and monitor the implementation of these projects;
- (d) regularly review and monitor the overall progress of the programme; and
- (e) evaluate the effectiveness of the programme and, if required, propose measures to improve the operation of the programme.

Timing

20. Upon confirmation of Government funding, HKPC will need around three months to carry out various preparation tasks, such as drawing up detailed programme plans, liaising with the relevant Mainland authorities, setting up the offices in PRD, identifying and recruiting suitable staff and liaising with ET service providers to participate in the programme. Assuming funding approval by the Finance Committee in January 2008, we aim to launch the programme in April 2008 (please see **Annex A** for details).

Expected Benefits

21. Successful implementation of the programme would deliver the following direct benefits to the participating factories in the region-

- (a) providing first hand knowledge and advice on the adoption of CP technologies and practices for about 15,000 management personnel, owners and operators of factories in the PRD region;
- (b) providing a dedicated CP portal on practical guidance and case examples of CP technologies and process options for the targeted industry sectors to facilitate sharing of experience and good practices amongst factories;
- (c) on-site assessment services provided for 800 to 1,000 participating

factories to assist them in identifying measures to reduce energy consumption and pollutant emissions, as well as any cost saving opportunities;

- (d) sponsoring some 90 demonstration projects to help demonstrate possible means for factories to adopt practicable CP technologies and process options amongst the targeted industry sectors; and
- (e) providing independent verification services for 500 to 1,000 applications on effectiveness evaluation of CP improvement projects to help inspire factories' confidence on and reinforce their commitments in CP investments.

22. Through participation of the programme, the Hong Kong-owned factories in the PRD region would gain the know-how in reducing energy consumption and cutting emissions of air pollutants. They can also enjoy direct economic benefits and productivity gains by means of reducing electricity and fuel consumption. These efforts will also help Hong Kong businesses in the industrial upgrading process promoted by the National 11th five year Plan and the Mainland's policy on processing trade. Through experience sharing and other awareness promotion activities to publicize the success stories, the programme will incentivize other factories to adopt cleaner production technologies and practices, thereby fostering the development of a sustainable culture of cleaner production in the region. Ultimately, this will bring about environmental, economic and social benefits in terms of more energy-efficient operations, better air quality and improved public health.

23. The programme is also expected to create both business and job opportunities for the local environmental technology industry by boosting the confidence of technology users and better information exchange. We will encourage the ET service industry, which comprises some 170 firms providing environmental consultancy services, technology solutions on energy efficiency, emissions reduction and pollution control etc., to take part in the programme. Through participation in the promotion activities, on-site assessments and demonstration projects, the programme will help open up an attractive market for the interested ET service providers in the design and implementation of CP technology solutions for all factories operating in the region. In addition, the programme will also provide a platform for further collaboration between the governments of Hong Kong and the Guangdong Province, businesses and the environmental service industries on both sides to promote environmental business opportunities in Guangdong and beyond.

HKPC as the Implementation Agent

24. HKPC is considered best placed to implement this programme for the following reasons–

- (a) it is a statutory organization specifically set up to provide technical support to the Hong Kong industry and enhance its international competitiveness. As a statutory organization, its main activities include providing environmental technology support in green manufacturing, efficient energy and resource usage, compliance with environmental legislation and standards, as well as environmental methods and technology transfers;
- (b) with more than 25 years' experience in providing technical support to the industry in environmental protection aspects, HKPC has developed extensive expertise in industrial pollution prevention, cleaner production and energy efficiency. This has been fully demonstrated in the successful implementation of the pilot project;
- (c) HKPC has built up extensive network relations with different trades in the manufacturing sector. It has been widely recognized as a reliable source of technical expertise and professional assistance. The wide network, mutual trust and long partnership established with the manufacturing sector are essential in inspiring the confidence of the prospective participants in the programme; and
- (d) the programme involves partnership with ET service providers in delivering the support services and technology solutions to a large number of targeted factories. As a public organization, HKPC is best placed to implement the programme to give an impartial assessment on the selection of ET service providers; and avoid any potential conflict of interest which might arise should the programme be led by an environmental project consultant or service provider from the private sector.

CONSULTATION

25. We consulted the four major industry and trade associations, namely, the HKGCC, FHKI, CMA, CGCC, in October 2007 on the proposed five-year Cleaner

Production Partnership Programme. A consultation forum with the ET service sector was conducted in November 2007 with the attendance of the Hong Kong Environmental Industry Association and the Environmental Contractors Management Association, as well as professional institutes, environmental consultants and contractors. All the trade associations and the ET service sector welcome the Administration's initiative and support the proposed programme which would facilitate Hong Kong-owned factories in PRD region to take on board cleaner production to help alleviate regional air pollution problem. Their comments have been reflected as far as possible in the current design of the programme, e.g. scope of the programme, cost sharing arrangement, funding ceiling, as well as industry sectors to be targeted. We shall continue to liaise and work with the trade associations, the ET service sector and other concerned parties in drawing up the implementation details prior to formal launch of the programme.

26. We also consulted the LegCo Panel on Environmental Affairs about the proposal on 17 December 2007. In general, the Panel expressed support for the proposed programme. Members noted the requirements for monitoring the progress of and the feedback on the programme activities and requested the Administration to report annually to the Panel regarding the implementation progress of the programme. We shall seek funding support from the LegCo Finance Committee on 11 January 2008.

FINANCIAL AND CIVIL SERVICE IMPLICATIONS

27. The total Government funding required for the proposed five-year CPPP is \$93.06 million as detailed in **Annex B**. Participating factories will contribute around \$30 million through the cost sharing arrangements for on-site improvement assessment and technology demonstrations. The cost-sharing arrangement is proposed to maintain a balance between government support and participating factories' commitment. As an implementation agent, HKPC will contribute \$11.4 million in terms of professional manpower support, office rentals and other ancillary, technical and support services.

28. EPD will absorb work related to implementation of this programme with its existing resources. The total staff cost and departmental expenses are estimated to be \$2.46 million per year at 2007-08 level.

ADVICE SOUGHT

29. Members are invited to note and give comments on the proposal as set out in paras. 7 to 24 above.

**Environmental Protection Department
January 2008**

Implementation Schedule

Stage	Activities	2008											
		Q1			Q2			Q3			Q4		
Preparatory Stage	Setting up programme management team at HKPC	→											
	Preparing detailed programme planning	→											
	Liaison with industries and ET service providers and Mainland authorities	→											
	Formation of Project Management Committee and consideration of work plan etc	→											
	Preparation for official launch of Programme	→											
Official Launch of Programme	Official launch				↓								
Implementation Stage	Meeting of Project Management Committee to vet submission of funding applications etc						↓			↓			↓
	Awareness promotion												→
	On-site improvement assessment												→
	Demonstration projects												→
	Verification of performance of improvement projects												→

**Estimated Cost Breakdown for
the 5-year Cleaner Production Partnership Programme**

	Funding by Government (HK\$ million)	Contributions by HKPC (HK\$ million)	Contributions by Industry (HK\$ million)	Total Cost (HK\$ million)
1. PROGRAMME MANAGEMENT				
Programme Director (25% staff time)	0.00	3.66	0.00	3.66
Programme Manager	6.94	0.00	0.00	6.94
Programme Officer	0.00	1.47	0.00	1.47
Mainland Programme Supporting Staff (6 nos.)	3.81	0.00	0.00	3.81
HK Office Accommodation & Administration	0.00	1.62	0.00	1.62
Mainland Office Accommodation	1.08	0.00	0.00	1.08
Sub Total	11.83	6.75	0.00	18.58
2. AWARENESS PROMOTION				
Events Planning & Logistics	2.00	0.23	0.00	2.23
Dedicated website, enquiry hotline, guidebooks development	3.22	0.00	0.00	3.22
Trainers/Speakers' Fees	2.80	0.70	0.00	3.50
Organisation & Publicity Expenses	4.83	0.00	0.00	4.83
Sub Total	12.85	0.93	0.00	13.78
3. ON-SITE IMPROVEMENT ASSESSMENT				
On site assessment and advisory services [1]	17.00	0.00	15.00	32.00
Programme Quality Assurance Team (PQAT) [2]				
Assessment Team Leader	6.94	0.00	0.00	6.94
Assessment Officer (3 nos.)	7.44	3.72	0.00	11.16
Sub Total	31.38	3.72	15.00	50.10
4. DEMONSTRATION PROJECTS				
Project Implementation Costs [3]	20.00	0.00	15.00	35.00
5. PERFORMANCE VERIFICATION SERVICE				
Project Implementation Costs [4]	17.00	0.00	0.00	17.00
TOTAL	93.06	11.40	30.00	134.46

Remarks

- [1] Including costs for procuring hardware & software for on site measurement and assessment uses.
- [2] PQAT covers the monitoring of both on-site improvement assessment services and the implementation of demonstration projects.
- [3] Including cost budgeted for development/adaptation of low-cost pollution control technologies for local application.
- [4] Including costs for procuring equipment and systems for data collection and analyses.
