# For discussion 25 June 2018

# LEGISLATIVE COUNCIL PANEL ON ENVIRONMENTAL AFFAIRS

# LATEST PROGRESS OF THE CLEANER PRODUCTION PARTNERSHIP PROGRAMME

## PURPOSE

This paper reports on the progress of the Cleaner Production Partnership Programme (the Programme) for the period from 15 June 2015 to 31 March 2018.

# BACKGROUND

2. The Environmental Protection Department (EPD) launched the Programme in April 2008 in collaboration with the Economic and Information Commission of Guangdong Province (GDEIC)<sup>1</sup>. The Programme aims to encourage and facilitate Hong Kong-owned factories in Guangdong and Hong Kong to adopt cleaner production (CP) technologies and practices through funding support and technology promotion activities, thereby improving the regional environment.

3. In light of the environmental benefits brought by the Programme, the Government committed \$150 million in 2015 to extend the Programme for five years from 15 June 2015 to 31 March 2020. This phase of the Programme continues to cover the entire Guangdong Province and Hong Kong, with a focus on the promotion of new technologies for reducing emissions of volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>), which are the culprits of the smog problems of the Pearl River Delta (PRD) region. The Hong Kong Productivity Council (HKPC) is the implementation agent of the Programme.

<sup>&</sup>lt;sup>1</sup> GDEIC is the lead department of the Guangdong Provincial Government for promoting voluntary cleaner production amongst enterprises and factories in Guangdong.

4. The Programme comprises four key initiatives, namely Annex A (details are at **Annex A**)–

- (a) on-site improvement assessment for participating factories;
- (b) demonstration projects on CP technologies and practices;
- (c) trade-specific promotion and publicity activities by trade and industry organisations (the Organisation Support Initiative (OSI)); and
- (d) cross-trade technology promotion activities;

## MANAGEMENT OF THE PROGRAMME

5. A Project Management Committee (PMC) has been set up to oversee the implementation of the Programme. The PMC comprises representatives from four major chambers of commerce (i.e. the Chinese General Chamber of Commerce, the Chinese Manufacturers' Association of Hong Kong, the Federation of Hong Kong Industries and the Hong Kong General Chamber of Commerce), an academic, as well as representatives from EPD, Trade and Industry Department and Innovation and Technology Commission. During the report period, the PMC held eleven meetings to provide steer to the operation of the Programme and scrutinise funding applications.

# PROGRESS DURING 15 JUNE 2015 – 31 MARCH 2018

## **On-site Assessments, Demonstration Projects and OSI Activities**

6. As at 31 March 2018, the cumulative number of applications approved for on-site assessments, demonstration projects and OSI activities since the beginning of the current phase of the Programme are set out in the table below.

	Approved Applications/Activities (as at 31 March 2018)			
	2015/16	2016/17	2017/18	Cumulative Total
On-site Assessments	100	127	105	332
Demonstration projects	35	51	62	148
OSI activities	17	25	25	67

7. On-site assessments were conducted for 332 factories in the report period to identify areas for improvement with proposed practical solutions. These assessments focused on reduction of air pollutants emission, energy efficiency as well as effluent reduction and control.

8. Among the 148 demonstration projects approved in the report period, 62 involved technologies on reduction of air pollutants emission, 61 on energy efficiency and 25 were on effluent reduction and control. As at 31 March 2018, 41 of these demonstration projects were completed and evaluated by HKPC, which contribute to annual reduction of VOC by 170 tonnes, sulphur dioxide by 188 tonnes, NOx by 378 tonnes, and effluent discharge by 13,146 tonnes. The annual energy saving amounts to about 15 tera-joules. The remaining 107 demonstration projects are in progress. A summary of the key types of technologies demonstrated under the Programme is at **Annex B**.

9. Regarding OSI activities, 11 projects were approved involving 67 trade-specific promotion activities undertaken in the report period. These activities, organised by the trade and industry associations, included factory visits and seminars, sectoral trade exhibitions, as well as production of videos and guidebooks for wider adoption of CP technologies and practices. A total of about 80,000 participants joined the promotion activities. HKPC has conducted quality checks for OSI activities to ensure that the implementation of the OSI activities was in accordance with the plan specified in the approved applications and of acceptable quality.

# **Cross-Trade Technology Promotion Activities**

Annex B

10. To facilitate sharing of experience and successful cases under the Programme with the industry sector, and their appreciation of CP technologies and practices, apart from supporting non-profit-making trade and industry associations to carry out trade-specific promotion and publicity activities (i.e. the OSI activities highlighted in paragraph 9 above), we also directly organised various kinds of cross-trade technology promotion activities for Hong Kong-owned factories. As at 31 March 2018, we organised 124 such activities, attracting more than 9,200 participants under the new phase. These 124 promotion activities included 52 factory visits which were organised for factory owners and staff to view the completed demonstration projects and other successful CP technologies on-site and 5 on participation in environmental exhibitions to showcase the CP technologies. Feedback collected from the participants indicated that these promotion activities were effective in enhancing their CP awareness and in general they were impressed by the effectiveness of CP technologies under demonstration and would consider adopting the technologies in their operations.

11. The Programme was widely publicised through various channels including interviews and reports by the media as well as briefings for the trade and industry associations. We established a logo for the Programme and distributed promotional leaflets for publicising the Programme. An online CP toolbox was also developed and posted on the Programme website operated by HKPC, with a view to facilitating and encouraging factories to adopt CP technologies. In addition, 86 case reports on completed demonstration projects or verified technologies were produced and publicised on the Programme website. The website serves as an open platform on CP related materials for sharing with industries. HKPC also operates three enquiry hotlines to enhance information dissemination and sharing of the related experience.

# PARTNERSHIP WITH ENVIRONMENTAL TECHNOLOGY (ET) SERVICE PROVIDERS

12. With rich experience and expertise in various areas of CP technologies, ET service providers rendered professional advice and technical services to the participating factories in the design and implementation of CP technology solutions for conducting on-site assessments and demonstration projects. As at 31 March 2018, a total of 255 ET service providers were registered under the Programme. Amongst them, 110 were based in Hong Kong, 139 in Guangdong and six in other regions. HKPC has conducted quality checks on the work of ET service providers from time to time with a view to ensuring the quality of the registered ET service providers.

# **COLLABORATION WITH MAINLAND AUTHORITIES**

13. The Programme has fostered regional collaboration with the relevant Mainland authorities in reducing pollution arising from industrial activities. We have worked with the nine PRD municipalities in publicising the Programme and promoting CP. As at 31 March 2018, a total of 29 publicity events were jointly organised with the Mainland authorities to reach out to Hong Kong-owned factories in Guangdong.

14. The Hong Kong-Guangdong Cleaner Production Partners Recognition Scheme (the Scheme) continued to be jointly organised with GDEIC under the new phase with the award presentation ceremony held annually. The ninth presentation ceremony for the Scheme was held on 27 October 2017 as a parallel event to the Eco Expo Asia 2017 in Hong Kong. A total of 184 enterprises were commended as Hong Kong-Guangdong Cleaner Production Partners to recognise their efforts in pursuing CP. About 300 representatives from the Hong Kong and the Guangdong governments, trade and industry associations, manufacturing industries, supply chains and ET service sector participated in the event.

15. Promoting CP has been one of the priority areas of work in Hong Kong-Guangdong cooperation to improve the regional environment. To strengthen the cooperation and exchanges on CP, the two sides signed a Hong Kong-Guangdong Cooperation Agreement on Cleaner Production in A Hong Kong-Guangdong Joint Working Group on Cleaner 2014. Production (JWGCP) was also established under the Hong Kong-Guangdong Co-operation Joint Conference. The fourth meeting of the JWGCP was held on 27 October 2017. At the meeting both sides agreed on the 2018 work plan which focused on promoting the use of energy saving technologies by high energy consumption industries, adopting CP technologies to reduce volatile organic compounds (VOC), and encouraging Hong Kong-owned enterprises to participate in training related to acceptance procedures for cleaner production audit and undertake cleaner production audits.

# MID-TERM REVIEW

16. We conducted a mid-term review earlier this year on the Programme's implementation progress, outreaching efforts and resources deployment with a view to assessing the effectiveness of the activities organised in enticing factories to participate in the Programme. EPD will

shortly report the following major findings of the mid-term review to the PMC:

- (a) the textile and printing industries have high participation on OSI applications while four other industries, namely food and beverage, paper and paper products, non-metallic products and furniture, have not yet applied funding for OSI projects;
- (b) among the nine PRD cities, Zhongshan, Zhuhai and Zhaoqing had relatively low participation rates of on-site assessments and demonstration projects; and
- (c) there was a growth in the number of registered ET service providers. More than half of the newly registered ET service providers had implemented at least one approved funding project.

17. Based on the findings of the review, we will step up publicity and promotional activities, such as deploying more resources to promote the Programme to the concerned industry sectors and cities with lower participation rates, further publicising success stories in deploying cleaner production technologies, and enhancing communication and cooperation with registered ET service providers, in order to maintain the good momentum of the Programme and encourage greater participation by Hong Kong-owned factories.

# WAY FORWARD

18. The current phase of the Programme will come to end in March 2020. We are considering further arrangement of the Programme and will consult the trade and other stakeholders and report to this Panel at a suitable juncture.

## **Environmental Protection Department June 2018**

#### Annex A

### **Cleaner Production Partnership Programme**

The Programme aims to encourage and facilitate Hong Kongowned factories in Guangdong and Hong Kong to adopt CP technologies and practices with focus on reduction of air pollutants emission, energy efficiency and effluent reduction and control, thereby contributing to improving the regional environment. The Programme targets at eight industry sectors, i.e. textiles, non-metallic mineral products, metal and metal products, food and beverage, chemical products, printing and publishing, furniture and paper/paper product manufacturing.

# **Key Initiatives**

2. The key initiatives in the new phase (from 15 June 2015 to 31 March 2020) of the Programme include –

- (a) *on-site improvement assessment:* to assist *about 625 factories* to identify and analyse the problems they face and propose practical improvement solutions. The Government sponsors 50% of the assessment cost, subject to a ceiling of \$28,000;
- (b) demonstration project: to support around 225 projects to demonstrate the effectiveness of CP technologies through installation of equipment and/or modification of production processes. The Government sponsors 50% of the project cost, subject to a ceiling of \$330,000;
- (c) organisation support initiative: to support trade and industry associations to carry out around 100 – 130 trade-specific promotion and publicity activities. The Government sponsors up to 90% of the project cost and the applicant has to contribute at least 10% of the project cost; and
- (d) cross-trade technology promotion: to organise around 110 140 activities, mainly to facilitate sharing of knowledge and successful experience in adoption of CP technologies and practices. These activities comprise seminars, workshops, factory visits, conferences and exhibitions, in Hong Kong or key industrial cities of the Guangdong Province;

#### Annex B

#### **Cleaner Production Technologies Demonstrated Under the Cleaner Production Partnership Programme**

The key CP technologies demonstrated under the Programme during the report period are summarised below.

## (a) **Reduction of air pollutants emission**

- to reduce VOC emissions through the use of ultraviolet (UV) cured coating system, automatic enclosed screen printing system, membrane press machine, centralised low-VOC dampening solution, burn-off ovens, water-based flexographic printing machines, cryogenic condensation technology, iron carbon micro-electrolysis, low temperature plasma, UV degradation, catalytic oxidation, chemical scrubbing, electrostatic precipitation technologies, Zeolite adsorption and activated carbon adsorption, or bio-filtration; and
- to reduce other air pollutants (including SO<sub>2</sub> and NOx) emission through the adoption of infrared (IR) heating furnace, oxy-fuel combustion technology, flue gas recirculation (FGR), selective non-catalytic reduction (SNCR), natural gas-fired heating system, wet spraying scrubber with quicklime or high-temperature heat pumps with automatic control.

## (b) **Energy Efficiency**

• to optimise the overall energy efficiency of the factory through the applications of central control and monitoring system (CCMS), turbine driven boiler feed pump, centralised refrigerated fresh air dehumidifier, phase change material (PCM) cooling thermal storage or flash steam recovery system ;

- to save energy through the use of non-invasive electromagnetic scale control system, thermal installation cover on rotary cylinder dryer, automatic cartooning and film wrapping machines, on-line dryer fabrics cleaner, back press turbine, centralised air-conditioning system with phase change material cooling thermal storage, timeprogrammed dyeing system, automatic paint spraying and curing system, servo motor control, variable speed drives, energy efficient infrared heating coils, energy efficient rotary screw air compressor, oil-free magnetic-bearing centrifugal blower, water bath vaporiser or split module adsorption dryer; and
- to reclaim waste heat through the use of waste heat recovery system on production machinery, compressed air system or exhaust system.

# (c) Effluent reduction and control

- to reduce water and chemical consumptions through the use of fabric dyeing machine, dry cleaning machine with cleaning agent vapour recovery system, vertical continuous plating technology, or jeans denim laser engraving machine;
- to recycle wastewater and/or production materials through the use of inline acidic/alkaline etchant regeneration and copper recovery system, on-line recirculating de-smear solution filtration system, electrically driven membrane, ceremic nanofiltration (NF) membrane or nano activated carbon adsorption;
- to enhance treatment efficiency of wastewater through the use of jet aerator system, or non-invasive electromagnetic scale control system; and
- to reduce the amount of waste chemicals through the use of etching solution electrolysis regeneration, side stream pipeline electro-adsorption control system, or photo-Fenton treatment.

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