

**For information on
23 October 2015**

FINANCE COMMITTEE

Promotion of Future Industrial and Economic Development by the Innovation and Technology Bureau

PURPOSE

At the meetings of the Finance Committee (FC) on 18 July and 16 October 2015, some Members raised questions on the relationship between technology and the manufacturing industry, and whether the manufacturing industry could make a fresh start in Hong Kong through technological development. Other Members also asked whether the Government had any corresponding measures and supporting initiatives to promote the development of the manufacturing industry and technology. This note aims to brief Members on the importance of innovation and technology (I&T) to the future development of industry and other economic sectors in Hong Kong, as well as other major work of the Innovation and Technology Bureau (ITB).

BACKGROUND

2. Industrial and technological development complement each other and are closely related. I&T is a key driver to new products and new industries. Innovative production technologies and new materials enable the industry to manufacture products more efficiently with higher added value as well as using less resources, which are conducive to the sustainable growth of the economy. In addition, the rise of new technologies and emerging industries could create new jobs and bring more diversified employment opportunities, avoiding an excessive uniformity of our economic structure.

3. Leveraging technology to promote industrial development in Hong Kong has over the years been one of the objectives of the Government in promoting the development of I&T. We have introduced various policies in the past. For instance, following the recommendations submitted by the Chief Executive's Commission on Innovation and Technology led by the late Professor Chang-Lin TIEN in 1999, we merged the Provisional Hong Kong Science Park Company Ltd., the Hong Kong Industrial Estates Corporation and the Hong Kong Industrial Technology Centre Corporation in 2001 to establish the Hong Kong Science and Technology Parks Corporation (HKSTPC), with a view to creating a vibrant I&T ecosystem and fostering exchanges and

collaboration among stakeholders through the provision of one-stop research facilities and services, so as to upgrade the technology level of our industry. It provides a comprehensive range of services to cater for the needs of our industry at various stages, which include –

- (a) premises and services in the Science Park (HKSP) for applied research and development (R&D) activities;
- (b) land in the three Industrial Estates (IEs) administered by the HKSTPC for production processes; and
- (c) offices in the InnoCentre for design talents to spur the development of high value-added design and creative industries.

4. In order to explore further development opportunities, the Government had, in conjunction with the HKSTPC, reviewed the utilisation and long-term development direction of the HKSP and IEs (the Review). In April 2015, we reported to the Panel on Commerce and Industry (C&I Panel) the Review and the relevant recommendations. The HKSTPC will take a more proactive role in promoting the development of I&T in addition to the provision of infrastructure, facilities and support services. The Corporation will strengthen its connection with innovators, government agencies, investors and the industry; foster collaboration with international and local universities and research institutions across different technological disciplines; and continue to promote innovative development by creating an inspiring and vibrant ecology and offering custom services to I&T companies at different R&D stages.

5. We also set up five R&D Centres¹ in 2006 to drive and co-ordinate applied R&D in selected focus areas and to promote commercialisation of R&D results and technology transfer. In general, the performance of the R&D Centres during the period is satisfactory. They have taken up a significant role as the focal point for technology collaboration among the Government, industry, academia and research sector. They have obtained increasing support from the industry as demonstrated by a higher level of industry contribution over the years, exceeding the latest target of 20%. In terms of commercialisation, individual R&D Centres have started receiving more income other than industry sponsorship, including contract service income, licensing fees and royalties. They have also gradually made a name as the trusted R&D partner in their respective sectors. In June 2015, we reported to the C&I Panel the work of the five R&D Centres. The C&I Panel supported the proposal to extend the operation of the R&D Centres for four more years until 31 March 2021, in order to enable the R&D Centres to

¹ The five R&D Centres are (i) Automotive Parts and Accessory Systems R&D Centre; (ii) Hong Kong Applied Science and Technology Research Institute; (iii) Hong Kong Research Institute of Textiles and Apparel; (iv) Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies; and (v) Nano and Advanced Materials Institute.

continue with their work, map out long-term goals and directions and enter into longer-term collaborative agreements with their partners.

6. On financial support, the Government established the \$5 billion Innovation and Technology Fund (ITF) in 1999 to finance projects that facilitate technology upgrading in manufacturing and services industries and promote innovation. The Government has introduced a number of improvement measures over the years to strengthen ITF's support to the industry on technology upgrading and efficiency enhancement. For instance, we extended the ITF funding scope in 2014 to cover more downstream R&D and commercialisation activities (such as system integration) with a view to exploiting the technological edge of local industries. We obtained the approval of the FC in February 2015 for the injection of \$5 billion into the ITF to provide sustained and comprehensive support for I&T development.

7. We anticipate that, after the establishment of the ITB, through the infrastructure and supporting services of the HKSTPC and Hong Kong Cyberport Management Company Limited (Cyberport), R&D Centres and resources of the ITF, etc., we can strengthen the cooperation among stakeholders, including the Government, industry, academia and research sector, for example through alignment or collaboration in R&D directions or programmes as well as enhancement of communications with the industry. This will enable us to promote commercialisation of R&D results and raise the technology level and competitiveness of the industry in a more systematic and organised manner.

GLOBAL TREND OF “RE-INDUSTRIALISATION”

8. In the wake of several global financial crises in recent years, many countries in the world are looking for new economic growth points, and “re-industrialisation” has become the development strategy to enhance their economic competitiveness. These countries generally recognise the importance of re-establishing local manufacturing industries, in particular high-end manufacturing based on artificial intelligence, data analysis and Internet of Things (IoT). For instance, the United States (US), Germany and China rolled out plans to cultivate advanced manufacturing industry in 2011, 2013 and 2015 respectively. They include the US's “Advanced Manufacturing Partnership”, Germany's “Industry 4.0”, and China's “Made in China 2025”. While these countries' policy indicators and specific measures differ, they have the following in common –

- (a) promoting the further deployment of innovative and high technologies to spearhead the development of the manufacturing industry;

- (b) creating a smart and environmentally friendly manufacturing industry; and
- (c) using information and communications technology (ICT) as well as IoT technology as the backbone to connect human beings, systems, objects and machines to produce service-oriented products.

9. Industrial development in Hong Kong is often faced with issues such as shortage of land and high labour costs. As such, “re-industrialisation” would be possible and feasible in Hong Kong if we develop future industry opportunities and, upgrade and transform our traditional industrial sector by focusing on high value-added production and facilities. On the other hand, Hong Kong would not be able fully engage in all categories of high-end industries. In our preliminary view, we have the potential to develop, based on our existing foundation, in the direction of robotics and medical technologies as well as technologies related to ageing population.

HONG KONG’S INDUSTRIAL DEVELOPMENT

10. The social and economic structure of Hong Kong and the Mainland have changed substantially over the past thirty odd years. In the 1980s and 1990s, Hong Kong’s manufacturing sector was still dominated by light industry which was labour-intensive. With the reforms and opening-up as well as availability of labour resources in the Mainland, starting from 1980s, many Hong Kong manufacturers have gradually relocated their production processes to the Mainland, particularly in the Pearl River Delta (PRD) region, resulting in decreasing economic output of our manufacturing industry. However, the rapid development in the Mainland has stimulated the vibrant development of our services industry. Nowadays, our services industry’s contribution to the gross domestic product (GDP) has risen from 68.3% in 1980 to 92.9% in 2013, with the combined GDP contribution by the four traditional industries, comprising the financial services, trading and logistics, professional and producer services, and tourism, amounted to 57.8%. In contrast, Hong Kong industry’s contribution to GDP has continued to drop from 22.8% in 1980 to 1.4% in 2013.

11. Although industrial production processes are no longer clustered in Hong Kong, our industrialists still have world-class factories in different places like the PRD region and Southeast Asia. Professionals from different sectors continue to contribute to our economy through switching from manufacturing to the export of knowledge and services

12. However, we are aware that the industrial sector has reflected to us from time to time in recent years that, with rising labour as well as other costs in the Mainland, some Hong Kong businessmen have been considering whether to move their production back to Hong Kong. The “Made in Hong Kong” brand may also be attractive in certain cases. These factors have brought about good opportunities for “re-industrialisation” of Hong Kong.

REVISED INDUSTRIAL ESTATE PROGRAMME

13. To embrace the future industrial development in Hong Kong, we reviewed the existing IE Programme last year and have modified the admission criteria and changed the business model, so as to make the best use of our scarce IE land resources to meet demand and increase our investments in I&T to maintain our international competitiveness. In the future, the IEs will favour I&T industries which are vital to the sustained growth of our economy, and the entire value chain from R&D, prototyping, product design, production, testing and distribution, administration to marketing and branding will be covered so that a “through-train model” can be provided. The conceived new industries will not involve mass heavy production processes, and will be mainly technology industries where Hong Kong enjoys development advantages such as information technology (IT), medical and healthcare, new materials, automated and mechanical high-end manufacturing industry, etc.

14. On the business model, the HKSTPC will in the future mainly build and manage specialised multi-storey industrial buildings for rent to multi-users, instead of granting the sites to single users for building their own factories. Only in exceptional case will the HKSTPC grant sites on long leases to meritorious applicants for building standalone factories. We hope this arrangement can provide sufficient flexibility to accommodate the future industrial development in Hong Kong.

15. The new IE policy can enhance the institutional and resources capability of the IEs to provide stronger support to the development of our science, innovation and technology based industries and create favourable conditions for “re-industrialisation” in Hong Kong. Since I&T application is one of the most effective means to add value to products and services as well as enhance the competitiveness of a developed economy, the new IE policy should be able to bring forth positive economic impacts to Hong Kong.

16. On the promotion of employment, the current worker density of the IEs is 70m²/worker, which is lower than the worker density for General Industrial Use (35m²/worker) as set out in the “Hong Kong Planning Standards and Guidelines”. At present, there are a total of about 28 200 working staff in the IEs. We expect that the worker density of the specialised multi-storey industrial buildings will be higher than the current situation and the increased

floor area can enhance employment opportunities in the IEs. Moreover, we also expect that these new manufacturing activities can stimulate the processes that are not located in the IEs, such as R&D and product design of the upstream industries as well as sales, marketing and logistics of the downstream industries. This would increase the number of jobs in these other sectors.

WAY FORWARD FOR INDUSTRIAL AND ECONOMIC DEVELOPMENT

17. At present, there is a total of 9.03 hectares² of vacant industrial sites in the three IEs, which could be used to develop these specialised multi-storey industrial buildings. The HKSTPC plans to develop three to four pilot projects on the vacant sites or sites surrendered by the grantees in the three existing IEs in the next few years. We reported to the C&I Panel in April this year the revised policy, and Members were generally supportive of the proposal. The HKSTPC is carrying out detailed studies on the economic benefits and relevant financial arrangements.

18. The implementation of the revised IE Programme is only part of our efforts in promoting “re-industrialisation” in Hong Kong. We will still require in-depth deliberation and discussion by the Government and relevant stakeholders on how we can leverage Hong Kong’s unique foundation and advantages, excellent global outlook and networks, close proximity to the Mainland market and the opportunity arising from the restructuring of the Mainland manufacturing industry to embrace the advent of high-end industries. The ITB will be the most appropriate to provide dedicated leadership in this respect. We expect that the ITB will need to focus much effort in inter-departmental and cross-sectoral follow-up work, and to review from time to time the directions and effectiveness of its policies.

OTHER MAJOR WORK OF THE ITB

(i) Nurturing Talents and Fostering an I&T Culture

19. Talents are sources of innovative ideas. Hong Kong has a steady supply of science, technology and engineering graduates as well as a large pool of local and overseas professional talents. We would like to continue fostering collaboration between universities and the industry to extend our talent pool. For instance, the Internship Programme under the ITF has been operating smoothly and is welcomed by applicants as shown by the steady number of applications received in recent years. This programme provides the younger generations with more exposure to I&T and encourages them to

² Excluding sites that may be surrendered by the grantees.

explore their interest and start a career in R&D. We also launched the Technology Start-up Support Scheme for Universities in September 2014 to provide an annual funding of up to HK\$24 million to six local universities to encourage their students and professors to start technology businesses and commercialise their R&D outcomes. To cultivate young IT professionals and even entrepreneurs, the Office of the Government Chief Information Officer (OGCIO) has selected eight secondary schools as partner schools to provide intensive IT enrichment training to Secondary Two to Secondary Six students for four cohorts from the 2015/16 school year to the 2022/23 school year. The training can nurture the students' interest in science and research as well as inspire their logical thinking and creative problem solving ability in students' formative years.

20. Apart from the incubation programmes set up by the HKSTPC and Cyberport to support technology start-ups, many local private incubators have in recent years been providing such services as financing and management to assist technology entrepreneurs in their vulnerable inception stages so that they can thrive. The OGCIO organises the annual Hong Kong ICT Awards, aiming at recognising and promoting outstanding ICT inventions and applications, thereby encouraging innovation and excellence among Hong Kong's ICT talents and enterprises in their constant pursuit of creative and better solutions to meet business and social needs. The ITB will in future need to consider, amongst other issues, how to integrate public and private resources to enhance the support to Hong Kong's technology talent pool, encourage innovation and reinforce Hong Kong's innovation capability.

21. To attract the younger generation to consider pursuing I&T as a career, fostering an I&T culture in the community is also very important. At present, the Innovation and Technology Commission organises an annual InnoTech Month which comprises InnoCarnival, roadshows, exhibitions, seminars, guided tours, workshops, talks, technology competitions, and industry conferences and seminars to arouse the interest of the general public in I&T. We also support relevant competitions such as the Hong Kong Student Science Project Competition and Joint School Science Exhibition, and provide recognition to outstanding science undergraduates in local universities and encourage them to pursue I&T as a career through the Innovation and Technology Scholarship Award Scheme. To further foster an I&T culture would also be an important part of the ITB's future work.

22. With the establishment of the ITB, we will continue to adopt the above strategies to facilitate the development of science and technology manpower. We will watch closely the developments in various emerging technologies, such as big data analytics, e-commerce, financial technology, robotics and medical technologies, etc. and will maintain closer links with the industry with a view to providing appropriate training and sharing experience with the practitioners.

(ii) Promoting Market Development

23. While public R&D funding on its own can help raise the level of R&D activities, translation of R&D results into social and economic benefits requires private sector investments. We are mindful that Hong Kong's private sector R&D expenditure is lower than that of other developed economies, and it is most important to encourage private enterprises to invest in R&D and commercialise R&D results. We launched the Enterprise Support Scheme in April 2015 to provide stronger support for private enterprises to conduct in-house R&D activities. Companies registered in Hong Kong, regardless of size, are eligible to apply. The HKSTPC also established a Corporate Venture Fund in July 2015 to co-invest in promising technology start-ups that are incubatees or graduates of its incubation programmes or its current tenants, so as to fill the funding gap encountered by local technology start-ups, particularly in the seed stage to growth (Series A round) stage.

24. Apart from this, we launched the R&D Cash Rebate Scheme in 2010 to reinforce the research culture among enterprises. Companies conducting applied R&D projects with the support of the ITF or in partnership with designated local research institutions may receive a 30% cash rebate of their R&D investments.

25. The ITB will review the existing measures and further enhance the local I&T ecosystem by capitalising on the areas where Hong Kong has a competitive edge and benchmarking against best overseas practices and policies.

(iii) Smart City Development

26. Hong Kong is a smart city. Government departments as well as public and private organisations are adopting sensor and IoT technologies in various fields, including traffic, warehouse and energy management, etc. For instance, Transport Department deploys sensors at busy roads for the collection of real-time transport data, Drainage Services Department uses intelligent ultrasonic sensors to detect water levels in manholes of different types of drains for prioritising maintenance and cleaning works to minimise flooding risks, the Civil Engineering and Development Department also uses sensors for landslide monitoring to protect public safety.

27. To enhance the efficacy of city management, the latest Digital 21 Strategy, entitled "Smarter Hong Kong, Smarter Living", proposes to further develop smarter city technologies and infrastructure. To this end, the OGCIO encourages government departments to deploy sensors, IoT and big data analytics where possible, and to share the information and data collected. With the establishment of the ITB, we will further strengthen the sharing of information and data among departments to enhance the efficiency of

government operations and decision-making, so as to provide quality public services; and to encourage public and private enterprises to join hands with us to build a smarter Hong Kong.

(iv) Use of IT in the Government

28. The OGCIO all along promotes and facilitates Government bureaux and departments (B/Ds) to use IT to deliver efficient and effective public services which bring convenience and better quality of life to the public. With the increasingly fast changing technology environment, B/Ds need to regularly review their IT systems and formulate strategic IT plan and the upgrade / replacement programme for their IT systems in alignment with their business objectives and actual needs. Where necessary, B/Ds can seek funding for the upgrade / replacement project from the FC or the Administrative Computer Projects Committee under the OGCIO. The OGCIO uses various channels, including seminars, meetings and workshops, to introduce new IT products and solutions to the IT staff of B/Ds and, where necessary, give advice in resolving compatibility issues. The ITB will lead the OGCIO in ensuring the delivery of effective e-Government services and the wider adoption of IT within the Government for the delivery of joined up e-Government services that are convenient to use by the public.

CONCLUSION

29. Members are invited to note the Government's response on the importance of I&T to the future industrial and economic development of Hong Kong and how the ITB would promote Hong Kong's I&T development in the future, as well as to support the funding proposal for the establishment of the ITB so as to enable Hong Kong to fully capitalise on the opportunities brought about by technological developments.

**Commerce and Economic Development Bureau
October 2015**