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Legislative Council of the Hong Kong Special Administrative Region

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Delegation of the Panel on Commerce and Industry

Report on the duty visit to Israel to study the country's experience in promoting the development of innovation and technology industry and re-industrialization

22 to 28 July 2017

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CHAPTER 1 — INTRODUCTION

1.1 Purpose of the report

1.1.1 This report aims to provide the findings and observations of a delegation formed by the Panel on Commerce and Industry ("the Panel") of the Legislative Council after its duty visit to Israel[1] from 22 to 28 July 2017 to study the country's experience in promoting the development of innovation and technology ("I&T") industry and re-industrialization.

1.2 Background of the visit

1.2.1 I&T have been two key drivers of economic development and competitiveness, tremendously improving the efficiency and performance of enterprises which in turn contributing to the sustainable growth of an economy. The latest development of I&T has reflected the growing importance attached by the Hong Kong Special Administrative Region ("HKSAR") Government to the nurturing of I&T to turn Hong Kong into a knowledge-based economy that thrives as an I&T hub in the region.

1.2.2 In the 2013-2014 session, members of the Panel, in view of the Administration's proposal for setting up a new Innovation and Technology Bureau ("ITB"),[2] discussed whether to conduct a duty visit to study the experience of other countries in fostering the development of related strategies of I&T. Of the three countries selected for discussion, namely, South Korea, Belgium and Israel, members considered that Israel, though a small country with a population size comparable to that of Hong Kong, had developed into a world-recognized high-tech and innovation hub. Given the similarities between Hong Kong and Israel in terms of population size and the lack of natural resources, members were of the view that the experience of Israel would provide useful reference for Hong Kong in furthering I&T development, and agreed at the meeting on 18 March 2014 to

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1 Israel is located in the Middle East along eastern coastline of the Mediterranean Sea, bordered by Egypt, Jordan, Lebanon, and Syria. With a land area of 20 330 square kilometer, Israel is made up of six administrative districts.

2 The Innovation and Technology Bureau ("ITB") was established on 20 November 2015.

conduct a duty visit to Israel from 3 to 8 August 2014. The proposed duty visit was approved by the House Committee ("HC") on 20 June 2014. However, in view of the then continuous security concerns in the region, the delegation decided on 11 July 2014 not to proceed with the proposed duty visit.

1.2.3 In the 2016-2017 session, the Consul General of the State of Israel in Hong Kong Special Administrative Region and Macao Special Administrative Region ("Consul General of Israel") invited the Panel to re-consider conducting a duty visit to Israel. At the Panel meeting on 21 March 2017, members agreed to accept the invitation by the Consul General of Israel and undertake the subject duty visit. Members also agreed that the visit be open to non-Panel Members for participation and ITB be invited to nominate officials from relevant departments, such as the Innovation and Technology Commission ("ITC"), to join the visit with a view to facilitating Members' understanding of the applicability of Israeli Government's experience in Hong Kong, and advising the delegation on issues relating to the development of I&T industry as and when necessary.

1.2.4 In accordance with rule 22(v) of the House Rules,[3] HC, at its meeting held on 16 June 2017, gave permission to the Panel to undertake the duty visit to Israel.

1.3 Objectives of the visit

1.3.1 The objectives of the duty visit were for the delegation to:

(a) study the experience of the Israeli Government and obtain first-hand information on the policies, initiatives and legislations relevant to the promotion of industrial research and development ("R&D") and facilitation of the growth of I&T industry and re-industrialization; and

[3] Rule 22(v) of the House Rules provides that "[s]hould any Panel consider it necessary to undertake any activities outside Hong Kong under the name of the Panel of the Council, the prior permission of [HC] shall be sought… …".

(b) meet and exchange views with the relevant Israeli Government authorities involved in the formulation, implementation and monitoring of policies on I&T, as well as representatives of technology transfer companies ("TTCs") affiliated with leading universities and research institutions, venture capital companies, multinational corporations, technology companies, industry association and technological incubators, etc.

1.4 Membership of the delegation

1.4.1 The delegation comprised the following nine Members:

Panel members

Hon WU Chi-wai, MH (Delegation leader and Chairman of the Panel)
Hon Paul TSE Wai-chun, JP
Hon MA Fung-kwok, SBS, JP
Hon Charles Peter MOK, JP
Ir Dr Hon LO Wai-kwok, SBS, MH, JP
Hon CHUNG Kwok-pan

Non-Panel Members

Dr Hon Helena WONG Pik-wan
Hon Alvin YEUNG
Dr Hon Junius HO Kwan-yiu, JP

Delegation members at the Knesset (Israeli Parliament).

1.4.2 At the invitation of the Panel, ITB nominated two officers from ITC, i.e. Prof YUE On-ching, Science Advisor, and Dr Cecilia PANG Wai-bing, Biotechnology Director, to join the visit. The expenses incurred by the two officers for the visit were borne by the Administration. Mr Desmond LAM, Clerk to the Panel, Ms Connie HO, Senior Council Secretary, and Ms Gary CHAN, Senior Public Information Officer, also accompanied the delegation throughout the visit.

1.5 Visit programme

1.5.1 The visit to Israel was conducted from 22 to 28 July 2017. Setting off from Hong Kong on the evening of 22 July 2017, the delegation arrived in Israel the next day morning and commenced its five-day visit to meet with Israeli Government officials, Members of the Israeli Parliament

and representatives of I&T and TTCs. The delegation ended its duty visit to Israel in the afternoon of 27 July 2017 and returned to Hong Kong on the same evening. The detailed visit programme and a list of organizations and representatives met by the delegation are in **Appendices I and II** respectively.

CHAPTER 2 — INNOVATION AND TECHNOLOGY INDUSTRY IN HONG KONG

2.1 Overview

2.1.1 In 1998, the first-term HKSAR Government decided to explore the development of the I&T industry as new dynamics of economic growth. The then Chief Executive ("CE"), Mr TUNG Chee-hwa, in his 1998 Policy Address, mapped out a blueprint for the I&T development with policy initiatives of establishing a HK$5 billion Innovation and Technology Fund ("ITF") and Hong Kong Applied Science and Technology Research Institute ("ASTRI"). In July 2002, the Commerce, Industry and Technology Bureau was established to assume policy responsibilities for the formulation and implementation of policies and measures to promote I&T development in Hong Kong.[4]

2.1.2 In the years to follow, various administrations of the HKSAR Government continued to make effort on investing in necessary infrastructure required, providing funding support, and reforming the government structure to drive forward the development of I&T. In 2006, the HKSAR Government started to put more emphasis on technology transfer and commercialization, with the establishment of five Research and Development Centres to coordinate and undertake applied R&D in selected focus areas. In 2015, it went further to establish ITB with the responsibility of formulating and implementing holistic I&T policies. Before that, Hong Kong had not had such a high-level government bureau specifically responsible for formulating and implementing the I&T policy.

2.1.3 Throughout the years, Hong Kong has also established a range of support infrastructure conducive to technological upgrading and the growth of the I&T industry. These include the Hong Kong Science Park ("HKSP") with a total gross floor area ("GFA") of 330 000 square metres ("sq. m"),[5]

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[4] The Commerce, Industry and Technology Bureau was also responsible for other policy areas, including Hong Kong's external commercial relations, inward investment promotion, and development of the industrial and trade sectors.

[5] The 22-hectare Hong Kong Science Park ("HKSP") was developed in three phases with a total gross floor area ("GFA") of 330 000 square metres ("sq. m"). Phase 1 (with a GFA of 120 000 sq. m), Phase 2 (with a GFA of 105 000 sq. m) and Phase 3 (with a GFA of 105 000 sq. m) were completed in 2004, 2011 and 2016 respectively.

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ASTRI modelled after the successful Industrial Technology Research Institute of Taiwan, and Cyberport[6] serving as a digital community for technology start-ups to nourish and thrive. The three industrial estates ("IEs"), located at Tai Po, Yuen Long and Tseung Kwan O, which are managed by the Hong Kong Science and Technology Parks Corporation ("HKSTPC"),[7] provide 217 hectares of land in total. In 2014, the HKSAR Government and HKSTPC had revised the IE policy[8] to accommodate I&T industries. HKSTPC would mainly build and manage specialised multi-storey industrial buildings for rental to multiple I&T industrial partners. As a continued effort to promote the development of the I&T industry, HKSTPC will also develop two pilot projects on the vacant sites in the Tseung Kwan O IE in the next few years (details in paragraph 2.2.7).

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6 Cyberport is an innovative digital community with over 900 digital tech companies. It is managed by Hong Kong Cyberport Management Company Limited, which is wholly owned by the Hong Kong Special Administrative Region ("HKSAR") Government.

7 Hong Kong Science and Technology Parks Corporation ("HKSTPC") is a statutory body established in 2001 with a public mission to facilitate the establishment and the nurturing of a world-class technology community dedicated to applied research and development ("R&D") in Hong Kong, and to strengthen Hong Kong's position as a regional technology hub by promoting innovation, technology development and commercialization of five technology clusters, namely electronics, information technology and telecommunications, precision engineering, biotechnology, and green technology. The HKSAR Government is the sole shareholder of HKSTPC which is governed by a Board of Directors appointed by the HKSAR Government. HKSTPC operates and manages HKSP, three Industrial Estates ("IEs") and the InnoCentre at Kowloon Tong.

8 In 2014, in conjunction with HKSTPC, the HKSAR Government reviewed the utilization and long-term development direction of HKSP and IEs ("the Review"). Pursuant to the recommendation of the Review that HKSTPC should use the land in the three IEs more efficiently to support science, innovation and technology ("I&T") based industries, the Government revised the IE policy to accommodate I&T industries.

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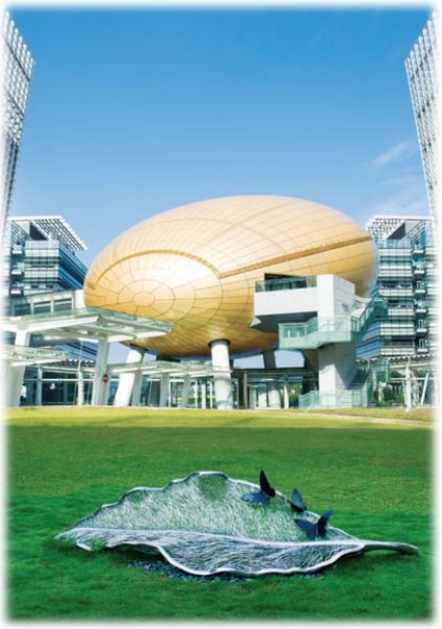
Hong Kong Science and Technology Parks Corporation operates and manages the Hong Kong Science Park, three Industrial Estates and the InnoCentre.
(Source: Hong Kong Science and Technology Parks Corporation)



(Source: Hong Kong Science Park)

Main buildings of Hong Kong Science Park and InnoCentre.

(Source: InnoCentre / Brand Hong Kong)

CHAPTER 2 — INNOVATION AND TECHNOLOGY INDUSTRY IN HONG KONG

(Source: Hong Kong Applied Science and Technology Research Institute)

Main buildings of ASTRI and Cyberport.

(Source: Hong Kong Cyberport Management Company Limited)

2.1.4 In addition to the above infrastructure, the HKSAR Government has also identified a site near Liantang/Heung Yuen Wai Boundary Control Point for the long-term development of IEs. The HKSAR Government will also develop a Hong Kong-Shenzhen Innovation and Technology Park ("the Park") at the Lok Ma Chau Loop (details in paragraph 2.2.9).

2.1.5 Compared to other economies, Hong Kong ranked fourth in infrastructure out of the 127 surveyed economies in the Global Innovation

Index 2017.[9] However, it achieved a much lower ranking in other areas, e.g. coming in 28th in "human capital and research" and 25th in both "knowledge and technology outputs"[10] and "creative outputs".[11] Likewise, Hong Kong ranked first in infrastructure for the seventh time in the Global Competitiveness Report 2016-2017.[12] However, it ranked relatively lower in "innovation capacity" (27th) and "availability of scientists and engineers" (43rd).

2.2 Development of innovation and technology industry in Hong Kong

2.2.1 The then CE Mr TUNG Chee-hwa established the Commission on Innovation and Technology in March 1998 to advise him on policy measures required to drive forward I&T development in Hong Kong. The Commission delivered its first report in September 1998, and Mr TUNG had based on the report's recommendations to set out an I&T blueprint for Hong Kong.

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9 The Global Innovation Index is compiled by the Cornell University, graduate school INSEAD and the World Intellectual Property Organization. The index is a composite indicator that ranks the worldwide economies in terms of their enabling environment to innovation and their innovation outputs.

10 This pillar covers all those variables that are traditionally thought to be the fruits of inventions and/or innovations such as patent applications, increase in labour productivity, as well as intellectual property receipts as a percentage of total trade.

11 This pillar includes three pillars: (a) intangible assets (e.g. statistics on trademark applications); (b) creative goods and services (e.g. audio-visual and related services exports); and (c) online creativity (e.g. average monthly edits to Wikipedia and video uploads on YouTube).

12 The Global Competitiveness Report is published by the World Economic Forum, which is an independent international organization comprising about 1 000 top corporations and global enterprises. The Report assesses the competitiveness landscape of the worldwide economies to provide an indication on the drivers of their productivity and prosperity.

2.2.2 The technology blueprint, as unveiled in the Policy Address delivered in October 1998, had ushered in a new period of growth for the I&T sector in the immediate years thereafter. Of particular importance were the HKSAR Government's I&T policy measures implemented in the following areas:

(a) setting up ITF in 1999 with a capital injection of HK$5 billion. Under ITF are various funding schemes to support projects that assist Hong Kong companies to upgrade their technological level and introduce innovative ideas to their businesses;

(b) founding the publicly-fund ASTRI in 2000 to perform high quality R&D for transferring to industry for commercialization, with a view to enhancing Hong Kong's competitiveness in technology-based industries through applied research;

(c) establishing HKSTPC in 2001 to enhance technological infrastructure. The Corporation offers a comprehensive range of services to cater for the needs of industry at various stages, ranging from incubation programmes to providing premises and services in its HKSP (details in footnote 5) for applied R&D activities; and

(d) opening Cyberport in 2003 to support its tenants' operations through the provision of state-of-the-art information technology infrastructure, thereby promoting information and communications technology ("ICT") in Hong Kong.

2.2.3 In a further effort to nurture the I&T industry, the HKSAR Government set up five Research and Development Centres in 2006 to drive and co-ordinate applied R&D in their respective focus areas and promote

commercialization.[13] As at May 2016, the five Research and Development Centres have conducted over 920 projects involving a funding amount of about HK$4.1 billion. In 2015, ITB was established with the responsibility of formulating and implementing holistic I&T policies, thereby fostering the development of I&T and related industries in Hong Kong.[14]

2.2.4 Amid the HKSAR Government's increased effort on promoting I&T, 1.4% or 3 885 of the business establishments had undertaken R&D activities in 2015, as evidenced by the survey conducted by the Census and Statistics Department. A total of HK$8 billion was spent by these establishments on in-house R&D activities in 2015, representing an increase of 38.6% over 2010. Nevertheless, the I&T industry is still a relatively small sector in Hong Kong, accounting for only 0.7% of Gross Domestic Product ("GDP") and 0.9% of total employment in 2015. In addition, Hong Kong's gross domestic expenditure on R&D ("GERD") as a ratio of GDP has remained virtually unchanged in recent years, and the GERD/GDP ratio in 2015, at 0.76%, lagged behind many other developed economies (**Figure 1**). As another indicator of strength of R&D activities, researcher intensity[15] in Hong Kong stood at 7.22 in 2015. The figure was among the lowest of developed economies.

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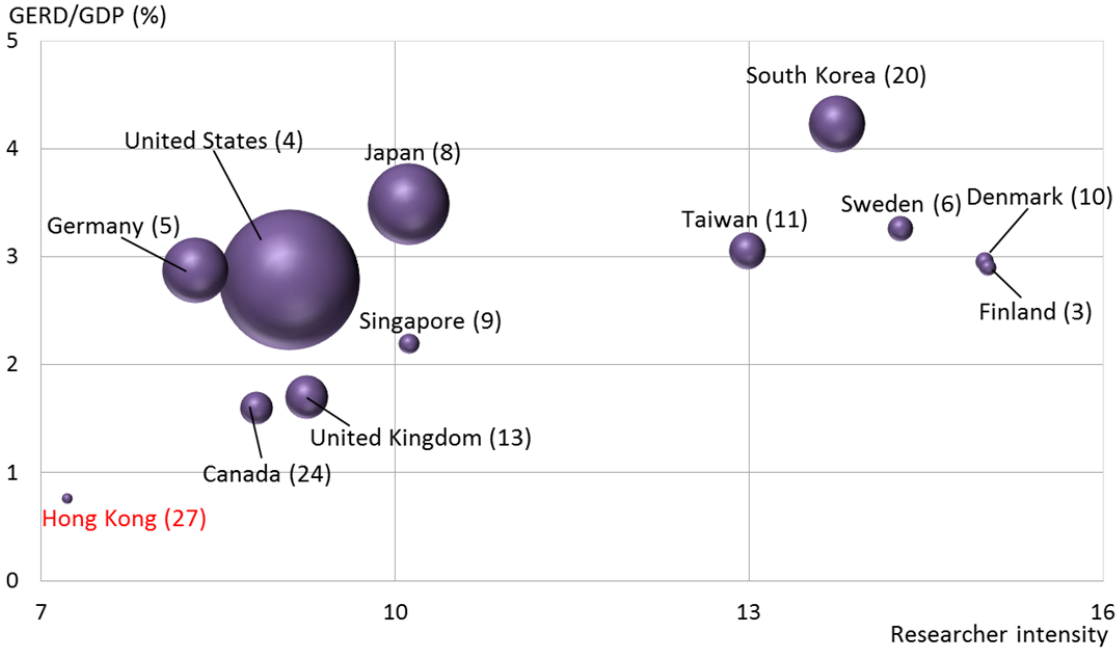
[13] The five focus areas are (a) automotive parts and accessory systems; (b) information and communications technologies; (c) logistics and supply chain management enabling technologies; (d) nanotechnology and advanced materials; and (e) textiles and clothing.

[14] The HKSAR Government provides a strategic environment for I&T development through five core strategies. They include (a) providing world-class technology infrastructure for enterprises, research institutions and universities; (b) offering financial support to stakeholders in the industry, academia and research sector to develop and commercialize their R&D results; (c) nurturing talent; (d) strengthening science and technology collaboration with the Mainland and other economies; and (e) fostering a vibrant culture of innovation.

[15] Research intensity refers to the number of full-time equivalent number of researchers per 1 000 labour force.

Figure 1 – R&D investment and researcher intensity of selected economies, 2015 or nearest year



Notes: (1) The figure in the parenthesis represents the ranking in the Global Innovation Index as published in the Global Competitiveness Report 2016-2017.

(2) Bubble size indicates GERD in 2015 or nearest year.

(Sources: Census and Statistics Department, Organisation for Economic Co-operation and Development and World Economic Forum)

Re-industrialization policy

2.2.5 The former CE Mr LEUNG Chun-ying introduced in his 2016 Policy Address the initiative of re-industrialization and considered that it would be a potential new area of economic growth for Hong Kong. To grasp the opportunities brought about by the fast development in ICT and Internet of Things ("IoT") technologies, the HKSAR Government would strive to attract high value-added industries that would be suitable to be based in Hong Kong so that traditional labour-intensive industry could

migrate to smart production. Given Hong Kong's traditional manufacturing knowhow and quality standards, Hong Kong had potential in moving towards high-end, highly-customized and high-growth technology areas such as robotics, medical and health-related industries, environmental solutions, as well as the new generation of consumer products embedded with the IoT technologies.

2.2.6 To promote re-industrialization, the HKSAR Government announced that apart from implementing the revised IE Policy (details in footnote 7), the Hong Kong Productivity Council ("HKPC") would also facilitate industrial upgrading and transformation, enabling enterprises to embrace re-industrialization and move towards high value-added production. On testing and certification, measures were also introduced in 2016 to exempt relevant waiver fees to facilitate the operation of laboratories in industrial buildings.[16]

2.2.7 In his Policy Address delivered in January 2017, Mr LEUNG Chun-ying reported the progress of re-industrialization. Apart from the development of the two pilot projects in Tseung Kwan O IE,[17] the HKSAR

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[16] The HKSAR Government announced on 25 January 2016 that to facilitate the operation of testing and calibration laboratories ("testing laboratories") in industrial buildings, the Government would exempt the waiver fee that would otherwise be chargeable for issuing waivers to allow the use of the entirety or part(s) of an industrial building under a general industrial land lease as testing laboratories. Applications under the new measure may be submitted to the Lands Department from 1 February 2016. They are subject to the payment of an administrative fee.

[17] The two pilot projects include: (a) a multi-storey Advanced Manufacturing Centre ("AMC") with a GFA of about 108 588 sq m on a 2.71 hectares site; and (b) a Data Technology Hub ("DT Hub") with GFA of about 27 015 sq m on a 0.54 hectare site. AMC will focus on selected high value-added manufacturing with extended activities including R&D, logistics support, prototyping and design, etc. DT Hub aims to accommodate uses ancillary or complementary to the data transfer operations and global telecommunications at the data centres and switching centres at Tseung Kwan O IE and Hong Kong.

Government also introduced the Technology Voucher Programme[18] in November 2016 to subsidize the use of technology by SMEs to improve productivity or facilitate upgrading and transformation.

2.2.8 The HKSAR Government had also commissioned HKPC to establish an Inno Space[19] to facilitate the sharing of practical technologies and skills to promote the translation of I&T ideas into industrial designs or products, and subsequently to nurture a start-up ecology and facilitate re-industrialization in Hong Kong.

2.2.9 The HKSAR Government had set aside a site of over 50 hectares near the Liantang/Heung Yuen Wai Boundary Control Point for use by the I&T sector (including the development of a science park and IEs) and other emerging or traditional industries. Furthermore, the HKSAR Government and the Shenzhen Municipal People's Government signed the Memorandum of Understanding on Jointly Developing the Lok Ma Chau Loop by Hong Kong and Shenzhen on 3 January 2017, agreeing to jointly develop the Lok Ma Chau Loop into the Park. The Park, which will be managed and operated by HKSTPC, is positioned to be a base for co-operation in scientific research involving top-tier enterprises, research institutions and higher education institutions, which can connect upstream and midstream research to downstream market, enhancing the collaboration among the industry, academic and research sectors to further promote

[18] The Technology Voucher Programme is to be implemented for an initial period of three years from November 2016 with HK$500 million from the Innovation and Technology Fund ("ITF"). It provides funding up to HK$200,000 for each eligible small and medium enterprise ("SME") on a 2:1 matching basis. Subject to the cumulative funding ceiling, up to three projects from an SME may be approved. Each project should normally be completed within 12 months.

[19] Located at Hong Kong Productivity Council's headquarters, Inno Space, spanning 8 000 square feet, has been in operation since October 2017. Inno Space comprises three zones, namely Inno Idea, Inno Prototype and Inno Network, and is equipped with a spectrum of advanced software and hardware facilities such as 3D printing machines, laser cutting tooling, computer-aided engineering software, motion capturing systems and virtual reality/augmented reality application development systems, etc.

commercialization and industrialization of R&D outcomes. To take forward the construction of the Park, the HKSAR Government plans to submit the relevant funding application to the Legislative Council for approval in early 2018 the earliest.

2.3 HKSAR Government's innovation and technology policy

2.3.1 The HKSAR Government has adopted an array of policy measures to facilitate the multi-faceted development of the I&T industry. The measures include establishing specific government authorities to promote the industry, setting up funding schemes to support industry-oriented R&D, nurturing technological entrepreneurship, and engaging private sector participation.

Specific government authorities

Innovation and Technology Bureau

2.3.2 Established in 2015, ITB aims to formulate and implement holistic I&T policy, through a higher level of leadership and better coordination across the I&T industry. ITB has set out its work priorities on areas including: (a) fostering R&D collaboration; (b) promoting investment on technology start-ups and the use of local technology products and services; (c) studying the Smart City initiative; (d) building Hong Kong into a connected Wi-Fi city; and (e) augmenting the pool of I&T talents.

2.3.3 ITB has two executive arms to assist the Bureau in implementing the I&T policy, namely ITC and the Office of the Government Chief Information Officer. The former implements policies and measures to promote I&T development, and the latter provides leadership for the development of ICT and oversees the implementation of the ICT policy within and outside the HKSAR Government.

Commerce and Economic Development Bureau

2.3.4 In addition, the Commerce and Economic Development Bureau ("CEDB") has entrusted its department, Invest Hong Kong ("InvestHK"), with the responsibility of providing free advice and services to overseas and Mainland I&T companies which plan to set up an office or expand their existing business in Hong Kong. InvestHK also implements a StartmeupHK initiative with an aim to attract global start-ups to set up business in Hong Kong. The initiative includes the operation of www.startmeup.hk as a one-stop portal to the start-up community in Hong Kong, which provides information on the latest start-up events and various resources including government incentive and incubation schemes, accelerators, angels and venture capitals.[20] The portal is also a platform for local and overseas start-ups to share their success stories.

Government's funding schemes to support industry-oriented research and development

2.3.5 In Hong Kong, ITC manages ITF, which was initially set up in 1999 with a funding of HK$5 billion.[21] As at April 2017, ITF had

[20] For start-ups, accelerators and incubators offer great ways to develop and grow their businesses. An incubator programme helps new companies to survive through the start-up phase. In general, an incubator is physically locating a start-up company in one central work space with many other start-up companies. Supports might include but not limited to financial incentives, management training, office space and contacts/networking. The start-up can stay in the work space as long as it has grown to the scale it needs to relocate to its own space. In contrast, the emphasis of an accelerator programme is to "accelerate" growth of an existing company through months-long mentorship and other support services. The graduation of the company from the programme might improve its chances of raising venture capital from a third party entity.

[21] Since 1999, the following injections to the Fund have been made: (a) HK$5 billion in February 2015; (b) HK$2 billion as endowment capital to generate investment income to finance projects under the Midstream Research Programme for Universities in June 2016; and (c) HK$2 billion for financing the Innovation and Technology Venture Fund in July 2016.

supported 6 229 projects involving a total funding of about HK$12.4 billion. Most of the funded R&D projects were related to information technology, electrical and electronics engineering technology, and manufacturing technology, which together accounted for 66% of the total approved funding since the inception of ITF.

2.3.6 Under ITF, two major funding schemes, namely the Innovation and Technology Support Programme ("ITSP") and the Enterprise Support Scheme ("ESS"), have been rolled out to support R&D activities. ITSP aims to support midstream/downstream R&D projects undertaken mainly by universities, the five Research and Development Centres, industry support organizations, professional bodies and trade and industry associations. ESS is designed to encourage the private sector to invest in R&D. Funding support of each approved project is up to HK$10 million and will be provided on a dollar-for-dollar matching basis. Project period should not be longer than two years.

2.3.7 There are other funding schemes under ITF to cater for different needs. For example, private companies which carry out or sponsor R&D activities may apply for cash rebate under the Research and Development Cash Rebate Scheme. Meanwhile, the Midstream Research Programme for Universities and the Technology Start-up Support Scheme for Universities support R&D activities in universities, whereas the Public Sector Trial Scheme promotes realization or application of the R&D results in the public sector.[22]

2.3.8 In addition to ITF, the Cyberport Creative Micro Fund has also been established to encourage innovation and creativity. A grant of HK$100,000 in cash will be awarded to the successful applicants in a 6-month project period for proof of concepts and developing prototype

[22] The Public Sector Trial Scheme provides funding support for production of prototypes/samples and conducting of trial schemes in the public sector to facilitate and promote the realization and commercialization of R&D results under ITF projects. The maximum ITF grant is HK$1 million for each application.

products. There is also the Innovation and Technology Fund for Better Living to develop I&T products and services that can improve people's daily life.[23]

Promoting technological entrepreneurship

2.3.9 Nurturing start-ups has been among the top agendas of the HKSAR Government's I&T policy, with HKSTPC and the government wholly-owned Hong Kong Cyberport Management Company Limited ("the Cyberport Management Company") administering their respective publicly-funded incubation programmes to foster technological entrepreneurship. In addition, ITC has launched the Technology Start-up Support Scheme for Universities under ITF to support technology start-ups in local universities.

Publicly-funded incubation programmes

2.3.10 HKSTPC operates Incu-App, Incu-Tech, and Incu-Bio as incubation programmes to groom start-ups with R&D activities in mobile application, electronics and engineering, and biotechnology respectively. The maximum incubation periods range from 18 months to 48 months. During the incubation period, incubatees are provided with office space at subsidized rent, the access to university resources and a financial aid of between HK$60,000 and HK$240,000.

2.3.11 To further support the development of its incubates and current Science Park tenants, HKSTPC runs the Leading Enterprises Acceleration Programme to nurture start-ups working on innovative technologies with high market potential into regional or global companies. The programme's participants are provided with financial support,[24] quality professional

[23] Under the Innovation and Technology Fund for Better Living, an approved project will receive a grant up to 90% of the total eligible costs of the project or HK$5 million, whichever is the less.

[24] The maximum assistance is HK$400,000 for the App-track programme, HK$680,000 for the Tech-track programme, and HK$950,000 for the Bio-track programme.

services, fundraising and business opportunities, mentorship and other support services.

2.3.12 Meanwhile, the Cyberport Management Company administers the Cyberport Incubation Programme to support the development of ICT industry in Hong Kong. Incubated companies are provided with rent-free working space and a financial support up to HK$330,000 over the 24-month incubation period. The Cyberport Management Company also operates the Cyberport Accelerator Support Programme to prepare Cyberport incubatees and alumni for international markets and investors. Each successful applicant are entitled to financial assistance up to HK$300,000.

Technology Start-up Support Scheme for Universities

2.3.13 In his 2016-2017 Budget, the Financial Secretary announced that the HKSAR Government would continue the Technology Start-up Support Scheme for Universities ("TSSSU")[25] to assist technology start-ups established by university teams[26] in commercializing their R&D results. An annual funding of up to HK$4 million is provided to each of the six local universities. Each funded technology start-up may receive up to HK$1.2 million each year for no more than three years.

Encouraging private investment in innovation and technology

2.3.14 The opportunity to access funding is crucial for most start-ups. Over the years, the HKSAR Government has launched various programmes to encourage private sector investment in I&T enterprises. These include

[25] In 2014, the HKSAR Government set up the Technology Start-up Support Scheme for Universities ("TSSSU") under ITF initially for three years from 2014-2015 with an annual funding of HK$4 million provided to each of the six local universities.

[26] The teams should be associated with the six local universities, namely The University of Hong Kong, The Chinese University of Hong Kong, City University of Hong Kong, The Hong Kong University of Science and Technology, Hong Kong Baptist University, and The Hong Kong Polytechnic University.

the Corporate Venture Fund, the Cyberport Macro Fund and the Innovation and Technology Venture Fund.

2.3.15 In 2015, HKSTPC launched the Corporate Venture Fund that co-invests in start-ups with private funds on a matching basis. The Corporation has earmarked HK$50 million for the Corporate Venture Fund, with the objectives of filling the funding gap encountered by local technology start-ups during their early investment stage, and encouraging more angel/venture capital investment in the local I&T industry. The Corporate Venture Fund targets start-ups that are located in HKSP or have participated in its incubation programmes.

2.3.16 In addition to the Corporate Venture Fund, two funding schemes have also been set out in the 2016 Policy Address to encourage private investment in the I&T sector. One is the setting up of a HK$200 million Cyberport Macro Fund by the Cyberport Management Company as an investment fund which targets to co-invest with other private and public investors in the Cyberport digital entrepreneurs. The other is the establishment of a HK$2 billion Innovation and Technology Venture Fund for co-investing with private venture capital funds on a matching basis.

2.4 Technology transfer and academia-industry collaboration

2.4.1 In Hong Kong, local universities conduct their scientific research and then pursue subsequent transfer to the industry and commercial sectors. The commercialization of academic research results is usually managed by a technology transfer office ("TTO") associated with its respective university. For example, TTO of The University of Hong Kong and its commercial arm, Versitech Limited, have been active in bringing the university's research results to the wider world.[27] TTO provides services and support to all

[27] These technology transfer offices are known as the Technology Transfer Centre in The Hong Kong University of Science and Technology, the Office of Research and Knowledge Transfer Services in The Chinese University of Hong Kong, the Innovation and Technology Development Office in The Hong Kong Polytechnic

academic staff on matters relating to technology transfer, whereas Versitech is responsible for contract negotiations.

2.4.2 To enhance the capabilities of TTOs of six local universities, the HKSAR Government provided an annual funding of up to HK$4 million for three years from 2013-2014 to 2015-2016. In 2016, the Panel supported the Administration's proposal to continue the funding support to TTOs of local universities for another three years up to 2018-2019.

2.4.3 Local universities also collaborate with private companies in conducting R&D, and academia-industry collaboration plays a vital role in promoting I&T development in Hong Kong. In this connection, the HKSAR Government has established the University-Industry Collaboration Programme ("UICP") under ITF to stimulate private-sector interest in R&D through leveraging the knowledge and resources of universities. The emphasis is on close collaboration between private companies and universities in Hong Kong.

2.4.4 UICP provides funding support to collaborative projects conducted by local companies in partnership with local universities.[28] The support is given as a grant, subject to cash contribution by the company amounting to no less than 50% of the project cost. In order to encourage private companies to undertake more R&D projects, all intellectual property rights arising from the project will be solely owned by the participating company.

University, the Knowledge Transfer Office in City University of Hong Kong, and the Knowledge Transfer Office in Hong Kong Baptist University.

[28] There are three schemes under University-Industry Collaboration Programme ("UICP"), namely the Teaching Company Scheme, the Matching Grant for Joint Research and the Industrial Research Chair Scheme. The Teaching Company Scheme aims to foster university-industry partnership by supporting local companies to take on graduate students from local universities to assist in proprietary R&D work. Meanwhile, the Matching Grant for Joint Research aims to foster university-industry collaboration in R&D projects. The Industrial Research Chair Scheme supports research efforts of universities and industry in technology fields that are not yet developed in Hong Kong but for which there would be good development potential.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

3.1 Overview

(Source: Operation World)

3.1.1 The Israeli I&T industry was born with the State of Israel. Since its establishment in 1948, Israel has been highly aware of living under constant threat of war by its neighbouring Arab countries. This reality had prompted the country to strive for achieving technological independence and supremacy, particularly in military capabilities, for national survival.

As early as in 1969, the Israeli Government established the Office of the Chief Scientist ("OCS") tasked with implementing government policy to support and encourage industrial R&D projects undertaken by private firms.

3.1.2 As a cradle of I&T with topnotch institutions of education and scientific research in the Middle East, Israel has, after almost five decades of development, firmly established itself as a global innovation hub and one of the world's most technologically advanced countries with a population highly technologically literate. The ongoing success of the Israeli I&T industry had led to the country being ranked second in terms of innovation among the 138 economies covered in the Global Competitiveness Report 2016-2017 (details in footnote 12). Israel also ranked 17th out of the 127 economies in the Global Innovation Index 2017, outperforming all other surveyed economies in the sub-indicators of ratio of researchers in the population and gross expenditure on R&D as a percentage of GDP (details in footnote 9).

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

(Source: Shutterstock)

3.2 Development of the innovation and technology industry in Israel

3.2.1 The development of the I&T industry in Israel originated in the military sector. In the early 1970s, application of military technology to develop products for civilian use led to the establishment of the first generation high-technology companies in Israel. In 1987, the Israeli Government decided to abort the costly project of developing Lavi, an Israeli-designed military jet. The decision had ushered in a breakthrough for Israel's I&T industry made possible by the release of hundreds of engineers with experience at the cutting edge of aerodynamic, avionics, computers and electronics into the commercial market.

3.2.2 The I&T industry in Israel had continued to develop in the 1990s and expanded rapidly in the 2000s, attributable to (a) the influx of science and engineering talents from the former Soviet Union; (b) the successful transfer of technology from academia to industry; (c) the move by multinational corporations to establish R&D centres in Israel to take advantage of the government's incentive measures; and (d) the investment activities of venture capital funds.

3.2.3 At present, there are over 5 400 high-technology companies operating in Israel's I&T industry, of which about 37% are start-ups, 56% small and medium companies, 1% large companies and 6% R&D centres of multinational corporations. These companies specialize in a diverse range of fields including telecommunications, semiconductors and components, software, cybersecurity, biotechnology and medical electronics. According to the Israeli Central Bureau of Statistics, there were 288 700 employees working in Israel's high-technology industry in 2015, accounting for about 9% of the total workforce.

3.2.4 In Israel, the national expenditure on civilian R&D totalled ILS 50 billion[29] (about HK$99 billion) in 2015, almost doubled the amount of ILS 26 billion (about HK$43.7 billion) in 2005. The expenditure also accounted for 4.3% of GDP in 2015, and this ratio was among the highest in member countries of the Organisation for Economic Co-operation and Development. Analyzed by operating sector, the business sector accounted for most of the national expenditure on civilian R&D, at a percentage share of 86% in 2015, followed by universities (11%), the public sector (2%) and private non-profit institutions (1%).

3.2.5 Regarding the economic contribution of the I&T industry, exports of high-technology industries (including computers, electronic and optical products, and spacecraft and related machinery) totalled US$22.5 billion (about HK$174.4 billion) in 2015, accounting for 50% of the total industrial exports (excluding diamonds). Exports of high-technology services such as computer software and R&D amounted to US$14.3 billion (about HK$110.9 billion), representing 42% of the total services sector exports.

Briefing on how Israel turned itself into a start-up nation

3.2.6 At the welcome lunch hosted by the Ministry of Foreign Affairs of the Israeli Government on 23 July 2017, Mr Hagai SHAGRIR, Head of Asia and Pacific Bureau of the Ministry of Foreign Affairs, shared with the

[29] ILS is the currency code for the Israeli new shekel (the currency unit of Israel).

delegation the success story of how Israel turned itself into a start-up nation. Mr SHAGRIR said that the lack of natural resources and raw materials, coupled with being surrounded by unfriendly neighbouring countries, had left Israel no alternative but to develop advanced technologies for sustaining the growth of the country. Over the years, Israel had successfully transformed itself from an agricultural-based economy into a more diversified and flexible knowledge-based economy, and that the Israeli Government had invested tremendously in R&D and I&T to facilitate the development of technology start-ups. With its highly qualified labour force, scientific institutes, and R&D centres, Israel had progressively focused on manufacturing products with high-added value, by developing products based on Israel's own scientific creativity and technological innovation.

3.2.7 Through the briefing by Mr Hagai SHAGRIR, the delegation noted that the Israeli Government saw education a precious legacy and had always played a major role in education development. Following the tradition of past generations, education had continued to be a fundamental value and was seen as the key to the future. The education system in Israel aimed to prepare children to become responsible members of a democratic and pluralistic society in which people from different ethnic, religious and cultural backgrounds coexisted. Jewish values and the principles of liberty and tolerance were part and parcel of the Israeli education system, which sought to impart a high level of knowledge, with an emphasis on scientific and technological skills essential for the country's continued development.

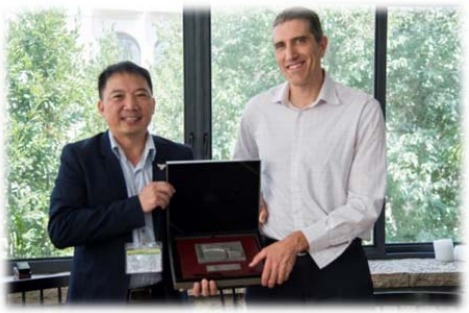
3.2.8 Besides formal education, Mr Hagai SHAGRIR highlighted the importance of military education and training for young people, and told the delegation that Israel was unique in that military service was compulsory for both males and females.[30] Israel was the only country in the world that maintained obligatory military service for women. Israel also had one of the highest recruitment rates in the world, with 80% of those who received summons serve. The delegation noted that what had typified the Israeli

[30] In Israel, military service is compulsory for young men (three years) and young women (two years).

army throughout its diverse history was its commitment to innovation and its continuous maximization of the resources at its disposal, both human and technological. The Israeli army had put great emphasis on the importance of improvisation and in order to defend Israel's territory, the army had developed and attuned cutting edge technology to meet its defense needs. It was also the reason why military service became one of the major sources of Israeli innovation. With all of the above factors combined, Mr SHAGRIR said that most young people in Israel had, since their very early age, grown with critical and independent thinking, a constant drive for improvement and perfection, the ability to question the conventional wisdom and challenge the hierarchy, and a sense of fearlessness in the face of risks and failure.

Mr Hagai SHAGRIR, Head of Asia and Pacific Bureau of the Ministry of Foreign Affairs, sharing the success story of Israel as a start-up nation at the welcome lunch hosted by the Ministry of Foreign Affairs.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL



Hon WU Chi-wai, Leader of the delegation, presenting a souvenir to Mr Hagai SHAGRIR.

(Standing from left) Dr Hon Junius HO Kwan-yiu, Ir Dr Hon LO Wai-kwok, Hon MA Fung-kwok, Hon Paul TSE Wai-chun, Prof YUE On-ching, Science Advisor of ITC, Dr Cecilia PANG Wai-bing, Biotechnology Director of ITC, Hon CHUNG Kwok-pan, Hon Charles Peter MOK, Hon Alvin YEUNG and Mr Zvika ZIV, Deputy Director of North-East Asia Department of the Ministry of Foreign Affairs; (Sitting from left) Mrs Ahuva SPIELER, Consul General of the State of Israel in Hong Kong Special Administrative Region and Macao Special Administrative Region (with effect from August 2017), Hon WU Chi-wai, Mr Hagai SHAGRIR, Mr Omer CASPI, Director of North-East Asia Department, Division for Asia and the Pacific of the Ministry of Foreign Affairs and Dr Hon Helena WONG Pik-wan.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

3.3 Israeli Government's innovation and technology policy

3.3.1 The Israeli Government has adopted a multi-pronged approach for the development of I&T industry in the country. This features, among other things, the establishment of specific government authorities to promote the I&T industry, incentive programmes offered to stimulate industrial R&D, engagement of private sector participation, support rendered to immigrant and returning resident scientists, and the policy of increasing exports to promote economic growth, expand investments in the industries, research and industrial development.

Israel Innovation Authority

3.3.2 As an independent and impartial public entity established in 2016 by the Israeli Government, the Israel Innovation Authority ("IIA") aims to nurture the development of I&T industry in Israel, and to create and strengthen the infrastructure and framework required to support the I&T industry. The inception of IIA was to replace OCS and its Israeli Industry Center for R&D,[31] which had been entrusted with overseeing all government-sponsored support of industrial R&D in Israel.

3.3.3 On 24 July 2017, the delegation took the opportunity to meet with Mr Avi LUVTON, Executive Director of International Cooperation Programs for the Asia Pacific Department of IIA, and to learn more about the work of IIA and its role to create economic prosperity through innovation. The delegation noted that the establishment of IIA stemmed from the Israeli Government's acknowledgement of the need to quickly and efficiently confront the rapidly changing needs and challenges facing the I&T industry. To increase efficiency and effectiveness, IIA had autonomy and flexibility to enable rapid response, which allowed it to introduce new and creative lending programmes, guarantees, funds and financial instruments.

[31] The Israeli Industry Center for R&D was the executive agency of OCS entrusted with, among other things, developing and promoting R&D funding schemes.

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Briefing session by Mr Avi LUVTON, Executive Director of International Cooperation Programs for the Asia Pacific Department of Israel Innovation Authority.

Hon WU Chi-wai, Leader of the delegation, presenting a souvenir to Mr Avi LUVTON.

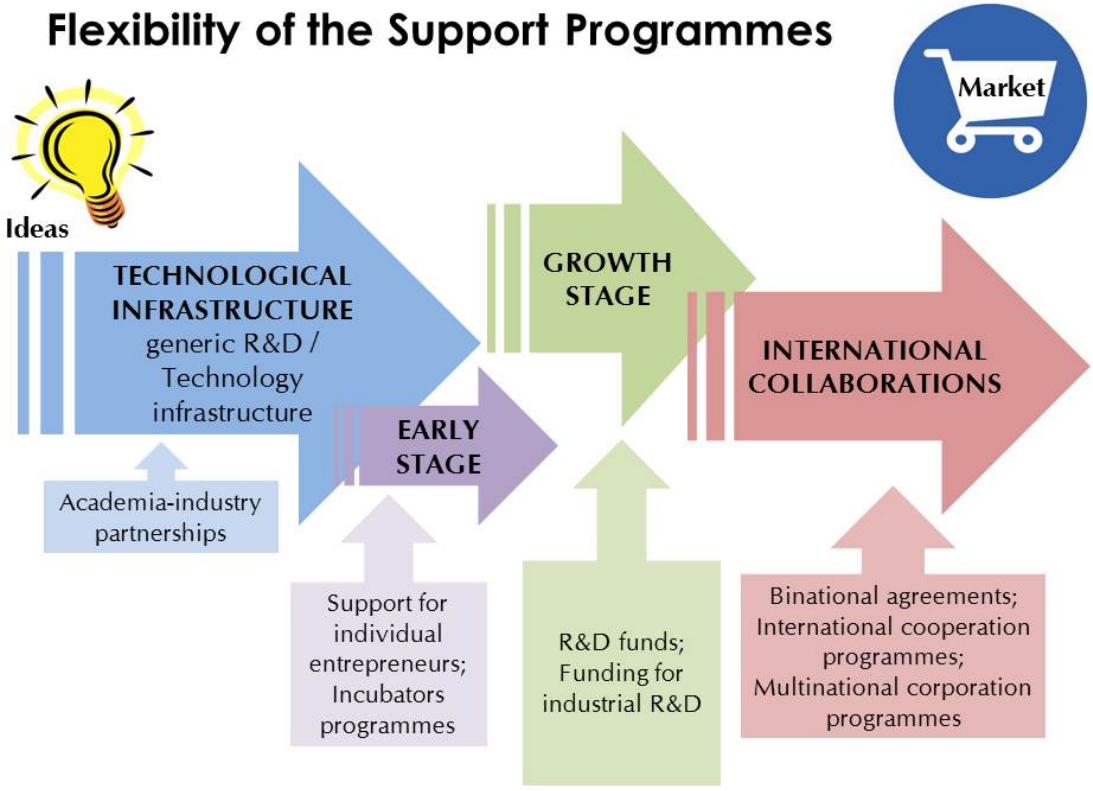
3.3.4 IIA has set up six innovation divisions, namely Startup Division, Growth Division, Technological Infrastructure Division, Advanced Manufacturing Division, International Collaboration Division and Societal Challenges Division. These divisions are responsible for managing support programmes that were tailored to the business needs of specific target groups of entrepreneurs and companies at various stages.

Incentive programmes offered to Israeli entrepreneurs and companies

3.3.5 As far as the support offered to entrepreneurs and companies is concerned, the delegation was advised that the Israeli Government had been promoting industrial R&D within the framework of the Law for the Encouragement of Industrial Research and Development ("the R&D Law") introduced in 1984. The stated goal of the legislation was to facilitate development of science-based, export-oriented industries capable of creating employment and improving the country's balance of payments. During the past few decades, OCS was empowered by the R&D Law to administer various incentive programmes to support R&D projects undertaken by companies ranging from novice companies with innovative concepts to start-up companies and established industrial R&D enterprises. OCS also promoted international cooperation in R&D by setting up bi-national funds to support joint R&D projects with foreign countries.

3.3.6 The delegation noted that IIA, which replaced OCS in 2016, had expanded the scope of the various incentive programmes and organized them under its six innovation divisions. Each division has its own specific focuses, managing a number of programmes to address the needs of and challenges faced by a specific target group of companies in the I&T industry. The Startup Division of IIA, for example, manages incentive programmes targeting at entrepreneurs with an innovative technological idea and start-up companies at early stage of development. The Growth Division of IIA, on the other hand, administers incentive programmes to promote technological innovation of mature and growth companies. There are also other incentive programmes implemented by IIA to promote academic-industry collaboration. The salient features of the incentive

programmes introduced by the Startup Division and Growth Division of IIA are summarized in **Appendices III and IV** respectively.



Israel Innovation Authority's support programmes addressing the needs of a specific target group of companies in the I&T industry.

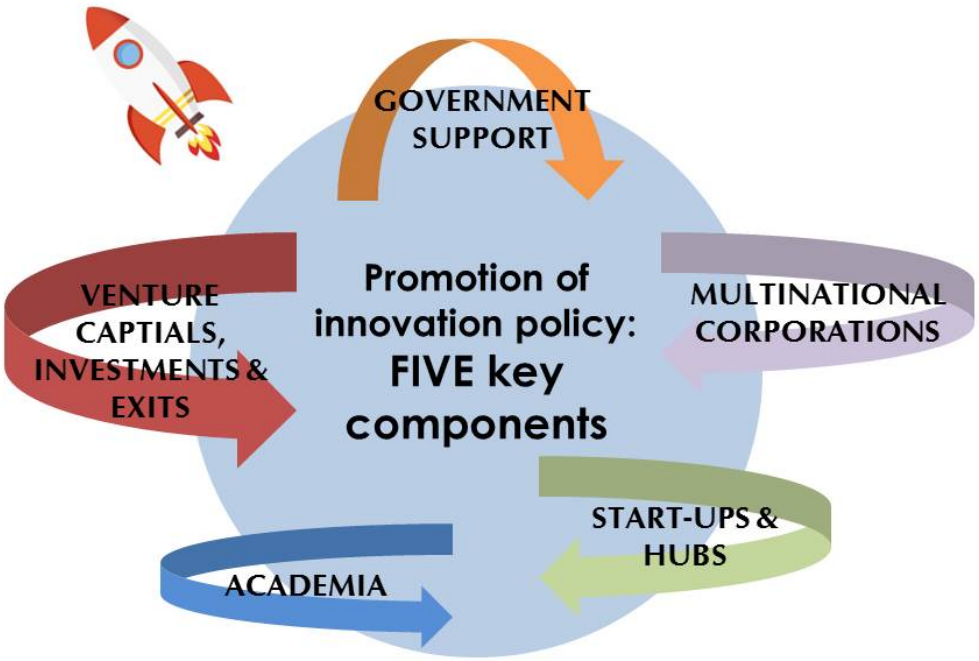
Assessment of funding applications

3.3.7 Mr Avi LUVTON said that IIA had engaged 180 technology specialists working full-time to assist interested entrepreneurs and companies in the applications of incentive programmes. Hence, the applications could normally be dealt with in a timely manner, and the applicants would be notified of the outcome of the application within a short

period of time. With much autonomy and flexibility, the success rate of application for the various incentive programmes exceeded 50%.

Promotion of Israel's innovation policy

3.3.8 In respect of the promotion of Israel's innovation policy, Mr Avi LUVTON advised the delegation that five key components, namely the government support, investment of multinational corporations, setting up of start-ups, cooperation of the academia and financing of venture capital funds, had formed to be a very strong driving force for promoting the innovation policy in Israel, thereby contributing to the benefit of the Israeli innovation ecosystem and Israeli economy as a whole.



The five key components as a strong driving force for promoting the innovation policy in Israel.

3.3.9 Mr Avi LUVTON pointed out that IIA had endeavoured to help companies and entrepreneurs enter into foreign markets, exporting R&D intensive high-technology products. Given that Israel had been renowned for its success in turning research results and new technologies into commercially viable products and services, the commercialization of R&D results became one of the reasons for the rapid increase of venture capital activities in Israel in recent years. With more than 300 multinational corporations actively operating in Israel, the number of merger and acquisition deals of Israeli high-technology companies increased, as evidenced by a total of 115 high-technology exits, reaching a total value of US$10 billion in 2016, a 12% more of the total value for high-technology exits in 2015. Mr LUVTON told the delegation that the most expensive acquisition deal ever in the history of the Israeli I&T industry was completed in March 2017 with Intel Corp. acquiring Mobileye NV[32] for about US$15 billion, paying the highest takeover premiums to play catch-up in the market for technology that helped cars drive themselves.

Hong Kong-Israel Research and Development Cooperation Programme

3.3.10 With the goal of promoting industrial R&D cooperation between Hong Kong and Israeli companies, the HKSAR Government and the Israeli Government signed a Memorandum of Understanding ("MOU") in February 2014. The MOU provides a framework for ITC and IIA to jointly encourage entities in Hong Kong and Israel to pursue industrial R&D collaborations and technology development.

[32] Mobileye was founded in 1999 by Amnon SHASHUA and Ziv AVIRAM and made its name with systems that alert drivers to pedestrians, unintended lane departures and speed limit violations. The technology, which can also trigger braking to prevent an accident, counts General Motors Co. among its customers. Recently, Mobileye has been pushing to sign up more carmakers for its advanced products, such as technology that collects data from vehicle fleets to build a real-time, crowd-sourced mapping service.

3.3.11 The two governments launched the Hong Kong-Israel Research and Development Cooperation Programme in December 2015 to provide Israeli and Hong Kong companies access to their respective governments for funding on collaborative R&D projects which aimed at the development of products or processes leading to commercialization in the global market, as well as assistance in locating R&D partners.

3.3.12 The delegation noted from Mr Avi LUVTON that since the launch of the Cooperation Programme, no successful match had been made between companies in Hong Kong and those in Israel. Mr LUVTON said that of all the Asian cities IIA had launched similar programmes with, including some cities in the Mainland, Hong Kong was the only one where no progress had been made so far.

3.3.13 The delegation noted that in response to media enquiries[33] on the progress of the Cooperation Programme, ITC stated that to foster collaboration opportunities between enterprises in Hong Kong and Israel, ITC and HKSTPC organized three "Israeli Business Matching" sessions over the past years. These sessions bought together 32 Israeli enterprises and 115 Hong Kong enterprises, assisting them to identify and select potential partners. Yet, ITC so far had not received any application submitted through the Cooperation Programme.

[33] See the HKSAR Government's press release dated 26 July 2017.

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Delegation members posing for a group photo at the main entrance of Israel Innovation Authority.

Other government authorities

3.3.14 The delegation also noted that in addition to IIA, there had been other Israeli Government authorities involved in formulating and/or implementing policies related to the I&T industry, including: (a) the Ministry of Science, Technology and Space which aimed to promote the development of science and technology in Israel and international scientific cooperation; (b) the Planning and Budgeting Committee of the Council for Higher Education which aimed to promote and allocate funding for scientific research in the academic sector; and (c) the Ministry of Finance which was involved in policy making and coordinating with other authorities on policies related to the I&T industry.

Engagement of private sector

3.3.15 The Israeli Government encourages local and foreign investment in industrial projects by offering a wide range of incentives and benefits provided under the Law for the Encouragement of Capital Investment. According to the latest information available,[34] government grants of up to 20% of the approved investment are available to companies establishing their plants in designated national priority regions in Israel.[35] Tax benefits are also offered to investors meeting specified criteria. For example, companies with an annual total income of at least US$375 million (about HK$2.9 billion) in Israel, a minimum capital investment of US$100 million (about HK$780 million) in a national priority region, and a combined balance sheet exceeding US$5 billion (about HK$39 billion) can enjoy a reduced corporate tax rate at 5% and a reduced dividend tax rate at 15%.[36] As a result of the government's incentives, many major multinational corporations have established their presence in Israel. For example, Apple, General Motors, Google, Microsoft, Cisco and Hewlett Packard have established R&D centres and acquired companies in Israel.

3.3.16 Israel's venture capital industry, which plays an important role in financing the booming high-technology sector, also benefits from the government's incentive measures. For example, foreign investors in eligible venture capital funds are entitled to receive tax exemption on the income generated from their investment in the Israeli I&T industry. In 2016, there were about 70 venture capital funds in Israel. During 2007-2016, a total of some US$9.13 billion (about HK$70.9 billion) had been raised by Israel's venture capital funds.

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[34] See Ministry of Economy and Industry (2016).

[35] National priority regions refer to Israel's peripheral areas or areas that the Israeli Government plan to develop.

[36] The standard corporate tax rate and the standard dividend tax rate in Israel are both 24%.

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Jerusalem Venture Partners

3.3.17 With a view to grasping a deeper understanding of the involvement of venture capital funds in the development of the I&T industry in Israel, the delegation took the opportunity to meet with Ms Fiona DARMON, Partner and Chief Operating Officer of Jerusalem Venture Partners ("JVP") on 23 July 2017.

Ms Fiona DARMON (middle) greeting the delegation at the entrance of the building of Jerusalem Venture Partners.

3.3.18 Founded in 1993, JVP is renowned for its hands-on approach in supporting and mentoring its companies, and welcomes global strategic and investment partners through all phases of the maturity cycle (including early stage, late stage, growth capital, and startup investments), with a view to creating disruptive technologies and solutions. As one of the leading venture capital fund corporations in Israel, JVP's investment strategy is spearheaded by a deep expertise in identifying opportunities from inception and growing them into global industry leaders. Through theme-driven

focus and strong network of strategic partners, JVP seeks to stay ahead of the latest market trends and address the most relevant market needs.

3.3.19 The delegation noted that JVP had created and invested in over 120 companies in Israel, the US and Europe. With over US$1.1 billion raised across eight funds, and a rich network of strategic and business partners spanning the world, JVP had led some of the largest and most noteworthy exits out of Israel.

3.3.20 Noting that start-ups and multinational corporations were part and parcel of each other, delegation members were keen to learn more about the role of multinational corporations in Israel's start-up ecosystem. In this connection, Ms Fiona DARMON informed the delegation that multinational corporations had a strong advantage in commercialization, manufacturing and marketing of new products worldwide. Start-ups and multinational corporations could both benefit from collaboration, by sharing the risk of R&D investment and relying on the facilities of multinational corporations for product development and market penetration. Since Israel was an entrepreneurial powerhouse and a hotbed for pioneering technologies, profitable business opportunities and high investment returns, many leading multinational corporations including Microsoft, Intel, IBM, Google, Apple and Facebook, etc. had for years ago turned to Israel to expand business portfolios and explore investment opportunities. As Ms DARMON put it, the start-ups needed these corporations because of their global insights and the opportunities they brought in, and multinational corporations had assisted the I&T ecosystem in Israel in developing products and solutions, and thus the contributions by multinational corporations were important.

3.3.21 The delegation was advised that quite a number of multinational corporations had opened up their own R&D or innovation centres in Israel, a majority after acquiring an Israeli start-up. Israel's highly skilled workforce, and especially graduates of the Israeli military's elite units, had garnered much international attention as multinational corporations had flocked to Israel to invest in or acquire Israeli start-ups and recruit local talent. Meanwhile, multinational corporations were the best platform for

Israeli engineers fresh out of school to hone their skills and knowledge, providing them insight on the workings of international business.

3.3.22 Speaking of engineering talent, Ms Fiona DARMON told the delegation that due to the mandatory military service, young people already received advanced technical training during their military service and acquired a high sense of responsibility and success orientation. The military training and education enabled young people to get technological skills and run large technological projects at a very young age, where they needed to improvise in order to get fast solutions. Once they had completed their military service, many of them were absorbed into the civilian marketplace, while others might use the newly acquired experience to launch their own start-up, which later became successful high-technology firms.

3.3.23 Similar to other technologically advanced countries, Israel has also been facing challenges including growing global competition and shortage of skilled manpower such as experienced engineers. In this regard, Ms Fiona DARMON said that the Israeli Government was aware of the shortage of skilled manpower, and had for years attempted to bring more members of the Israel's Arab community, some 20% of the national population, and ultra-Orthodox Jews into the labor force. In 2015, the Ministry of Economy and Industry of the Israeli Government launched a program over three years to integrate academics from the Arab, Druze, and Circassian communities into the high-technology industry. Apart from the above, the Israeli Government also reinforced the various vocational training programmes to provide more learning opportunities for Israelis.

3.3.24 During the discussion with Ms Fiona DARMON, the delegation also noted that another challenge faced by Israel was the insufficient experience in business management which had enticed many local start-ups to sell their potentially successful business pre-maturely to venture capital funds. This hindered the expansion of start-ups into large enterprises and led to a loss of added value to the Israeli economy.

3.3.25 When exchanging views on the development of the I&T industry in Hong Kong, Ms Fiona DARMON was of the view that as an international city, Hong Kong had already provided a favourable platform for high-technology start-ups in Hong Kong to explore business opportunities. Yet, Ms DARMON considered that the inventions or new products of some of the start-ups in Hong Kong were too academic in a sense that these inventions or new products did not come with commercial value. Moreover, the lack of investment of multinational corporations in R&D in Hong Kong and inadequate government measures to incentivize multinational corporations' investment might hinder the long-term development of the I&T industry in Hong Kong.

Ms Fiona DARMON highlighting the important role of venture capital fund corporations in the development of the innovation and technology industry in Israel and the challenges ahead.

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Delegation members exchanging name cards with Ms Fiona DARMON at the beginning of the meeting.

Hon WU Chi-wai, Leader of the delegation, presenting a souvenir to Ms Fiona DARMON to express the delegation's appreciation.

Viola Group

3.3.26 The delegation also took the opportunity to meet with the representatives of Viola Group, an Israeli leading technology-focused

private equity investment firm on 27 July 2017, and to learn more about the investment environment of the I&T industry in Israel.

3.3.27 Founded in 2000, Viola Group is a multi-strategy investment house with separate investment arms: Viola Ventures – a venture capital firm empowering early stage start-ups to become category leaders; Viola Growth – an Israeli-based technology growth capital fund, focusing on investing in global companies at expansion phase; Viola Credit – Israel's premier private credit fund offering multi credit products to growing companies; and Viola Partners – an exclusive investment fund tailored especially for private investors.

3.3.28 Ms Natalie REFUAH, Partner of Viola Growth said that Viola Group would partner with companies from inception to growth, and each partnership operated independently with a dedicated investment team, different investors and portfolio companies, but shared access to value-added services and professionals. As a private equity firm, Viola Group had been backed by leading global institutional investors from all over the world and provided long-term returns by identifying and pursuing attractive investment strategies in the vibrant Israeli technology market. They would invest in companies from several industries, including financial-technology, bio-technology, autonomous driving, IoT, aggregated reality and virtual reality, and cybersecurity. Another focus, artificial intelligence ("AI"), was being adopted across multiple fields simultaneously, as AI provided a way to code software and leverage an algorithm in order to generate insight from big data that previously was not possible.

3.3.29 During the briefing, Ms Natalie REFUAH reiterated the unique role of multinational corporations in the I&T ecosystem. In Israel, multinational corporations had been active beta sites and early adopters of innovative technology products, strategic equity investors, and acquirers of many Israeli start-ups, creating billions of dollars of revenue. Viewing Israel as a focal point for innovation, some multinational corporations had launched programs to work with start-ups in their areas of expertise, and a few of them had participated as limited partners in venture capital funds in order to get windows to new technologies.

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Ms Natalie REFUAH, Partner of Viola Growth (left) giving a briefing on the role of a private equity firm in the innovation and technology ecosystem.

Ms Natalie REFUAH and Mr Zvika ORRON, Partner of Viola Ventures (middle) receiving a souvenir from Hon WU Chi-wai, Leader of the delegation.

Ex Libris

3.3.30 As a start-up nation, Israel has a thriving ecosystem of over 4,000 start-ups as of 2016. The success is phenomenal. Over just a few decades, Israeli start-ups have developed groundbreaking technologies in areas such as computing, clean technology and life sciences, etc. Yet, as Israel does not have a large enough domestic market, most of the startups are focused on building solutions for foreign markets. In order to have a deeper understanding of the changes in the business environment of Israel for high-technology start-ups over the years, the delegation paid a visit to Ex Libris, a leading developer and provider of high-performance applications for libraries, information centers and researchers, and met with Mr Dvir HOFFMAN, Corporate Vice President of Resource Management Solutions on 26 July 2017.

3.3.31 Founded in 1986, Ex Libris is now a very successful high-technology company, offering the only comprehensive product suite for the discovery, management, and distribution of all materials – print, electronic, and digital. Dedicated to developing the market's most inventive and creative solutions, Mr Dvir HOFFMAN informed the delegation that Ex Libris led the way in defining and designing efficient, user-friendly products that served the needs of academic, research, and national libraries today, enabling them to transition into the future.

3.3.32 The delegation noted that Ex Libris catered to libraries of every type and size, from single-branch institutions to large consortia. The delegation was pleased to note that Ex Libris had set up a branch office in Hong Kong, and the customer base of Ex Libris included renowned tertiary institutions in Hong Kong such as The University of Hong Kong, the Chinese University of Hong Kong, and the Hong Kong University of Science and Technology, etc. Built on open architecture and with support for industry interoperability standards, Ex Libris products were flexible, customizable, easy to maintain and manage, and Unicode-compliant, with full multilingual capabilities. Implemented as stand-alone solutions or integrated with existing environments, Ex Libris products would help libraries streamline operations and increase user satisfaction and loyalty.

3.3.33 As regards the difficulties in the business development encountered by Ex Libris over the years, Mr Dvir HOFFMAN frankly told the delegation that there was no magic bullet for instant success. Ex Libris had met with numerous failure prior to the company's success in the leading role of library automation solutions today. Mr HOFFMAN further shared with the delegation that not only had the company stayed optimistic in the face of failure, but it also learnt from the failure, continued to invest tremendously in R&D and come up with even more innovative ideas for new products. He stressed that developing a can-do attitude in the work environment was one of the key factors to success. In addition to the company's determination and its own effort, Mr HOFFMAN said that the support services and assistance from the Israeli Government such as the launch of different funding schemes and tax concession measures were vital for the long-term development of start-ups in Israel. He also praised the creativity of the Israeli Government officials for the incentive programmes rolled out to facilitate the growth of the I&T industry.

Mr Yaniv COHEN, Corporate Vice President of Global Professional Services of Ex Libris (fifth from the left) and Mr Dvir HOFFMAN (sixth from the right) posing for a group photo with delegation members.

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Mr Dvir HOFFMAN receiving a souvenir from
Hon WU Chi-wai, Leader of the delegation.

Support rendered to immigrant and returning resident scientists

3.3.34 Israel is a large immigrant-absorbing country with many immigrants being science and engineering talents. Through the Center for Absorption in Science under the Ministry of Aliyah and Immigrant Absorption, the Israeli Government assists new immigrants with relevant qualifications and experience in finding employment in the academic and commercial sectors. The hiring employers receive subsidies for the cost of employing the immigrants in the initial period. In order to meet the demand for experienced scientists in the I&T industry, the Center for Absorption in Science also provides employment assistance to Israeli scientists who return to work in Israel from abroad.

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Policy of increasing exports to promote economic growth, expand investments in the industries and research and industrial development

Ministry of Economy and Industry

3.3.35 A thriving policy on exports of high-technology industries and services is vital for the sustainable development of the I&T industry in Israel. The Foreign Trade Administration ("FTA") of the Ministry of Economy and Industry is responsible for managing and directing the international trade policy of Israel. The delegation took the opportunity of visit to the Ministry of Economy and Industry on 26 July 2017 to obtain updated information on the role of FTA and its activities for the promotion of trade and export, attracting and encouraging foreign investments and creating strategic cooperation with foreign companies.

3.3.36 As briefed by Mr Ohad COHEN, Trade Commissioner of FTA, the delegation noted that the role of FTA was to manage and direct Israel's international trade policy, and to promote Israel's economy through a number of avenues: initiating and overseeing trade agreements, promoting Israel's exports, and fostering robust relations between Israel and foreign industries.

3.3.37 According to Mr Ohad COHEN, FTA has three main divisions, each of which is tasked with promoting the Israeli economy in distinct and significant ways. The Trade Policy and International Agreements Division facilitates Israel's free trade Agreements, maintains and develops inter-governmental trade relations and addresses regulatory barriers that affect the Israeli industry. The Export Promotion Division aims to ensure the continued advancement of Israel's exports. The International Projects and Financing Division offers different programs that support Israeli companies in their business operations abroad. Moreover, FTA operates as the headquarters of a total of 45 Economic and Trade Missions around the world. These missions act as the forefront of the Israeli Government's efforts to boost the Israeli industry in foreign markets, and are located in the main trade and commercial centers as well as in multilateral organizations, such as the World Trade Organization and the Organization for Economic Co-

operation and Development. In the past few years, Israel has increased its presence in the Far East and South America by opening additional missions in these regions.

3.3.38 In an effort to ensure that Israel's industries continue to be a leading competitive participant in today's global market, Mr Ohad COHEN informed the delegation that FTA had been tasked to carry out three major goals for the promotion of exports of Israeli industries and services. The first goal was to increase the total exports, reaching a targeted amount of US$1,000 billion (about HK$7,750 billion). To achieve this goal, FTA would focus on its assistance in expanding the export growth of Israeli industries and services in the European market and Asian market. The second goal was to facilitate the diversified development of Israeli industries, seizing investment opportunities for new high-technology industries in external markets. The third goal was to build a conducive business environment for exports to support the setting up of more new Israeli export companies and help them become more competitive and responsive to market demands with product diversification and innovation, which would in turn provide more employment opportunities for Israelis. Mr COHEN pointed out that the ultimate goal was to help Israel fully benefit from its exports.

Mr Ohad COHEN, Trade Commissioner of Foreign Trade Administration of the Ministry of Economy and Industry, briefing delegation members on the three major goals for the promotion of exports of Israeli industries and services.

3.3.39 In achieving the aforesaid goals, Mr Ohad COHEN advised the delegation that the 45 Economic and Trade Missions set up around the world aimed to provide assistance to Israeli export companies in terms of expanding market penetration opportunities, encourage investment and identify potential strategic business partners in the respective countries under their purview, with the head of each mission reporting directly to the Trade Commissioner of FTA. FTA had adopted the Export Request Management System ("ERMS")[37] to collect updated data of Israeli companies' exports and assess the performance of individual representative missions in terms of the volume of Israeli exports to the countries under their purview.[38] Mr COHEN said that the data collected was essentially important because when determining the cities/places for setting up new missions, the Israeli Government would make reference to the ERMS data and identify the most suitable cities/places with high potentials for business expansion and significant export volume for the benefit of Israeli export companies.

3.3.40 The delegation also noted that FTA had put in place a set of standardized key performance indicators ("KPIs") linked to each Economic and Trade Mission to evaluate and grade its work performance on a four-month basis. These indicators, among others, included the success rate of matching business opportunities in Israeli export companies with foreign companies and the respective export volume, etc.[39] Added to this, all

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[37] The Export Request Management System ("ERMS") is a referral system operated by the Foreign Trade Administration ("FTA") of the Ministry of Economy and Industry. ERMS aims to improve and optimize the services provided to Israeli export companies by the Economic and Trade Missions around the world.

[38] Through ERMS, FTA is also able to monitor the requests received and assess the quality and professionalism of the services provided to Israeli export companies, as well as the time the Economic and Trade Mission takes to generate a response to the request.

[39] Other key performance indicators set to evaluate the work performance of individual Economic and Trade Missions by FTA include: (a) the number of business to business activities/meetings organized and relevant details; (b) the number of requests from Israeli companies handled via ERMS and relevant details; (c) details of the information on related activities posted on websites; and (d) details of the enhancement work done for the missions to facilitate a more efficient and effective approach for providing assistance to Israeli companies.

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Economic and Trade Missions were requested by FTA to spare no effort in widely promoting the success story of Israeli export companies with a view to attracting and encouraging more foreign investment to Israel's economy.

3.3.41 In response to delegation members' enquiries on the hurdles faced by FTA in taking measures to achieve the aforesaid goals, Mr Ohad COHEN admitted that there were dissenting views within FTA and other units of the Ministry of Economy and Industry, casting doubt on the attainability of the goals set to be achieved. Mr COHEN said that he was not surprised of the dissenting views received and took the views very positively because the ultimate mission was to transform FTA from a cost centre into a profit centre. As Mr COHEN put it, "a small change makes a big difference.". The delegation was greatly impressed by the determination of the Israeli Government to create business opportunities and environment favourable to Israeli export companies.

Hon WU Chi-wai, Leader of the delegation, presenting a souvenir to Mr Ohad COHEN.

3.4 Technology transfer and academia-industry collaboration

Technology transfer company

3.4.1 In Israel, the higher education sector, particularly the eight research universities,[40] has been active in conducting scientific research and pursuing subsequent technology transfer to the industry and commercial sectors. The commercialization of academic research results of the research universities is usually managed by the university technology commercialization companies. These companies, known as TTCs in Israel, are established as subsidiaries associated with their respective universities. Renowned university TTCs in Israel include Yeda Research and Development Company Limited of the Weizmann Institute of Science[41] and Yissum Research Development Company ("Yissum") of the Hebrew University of Jerusalem.[42] Other renowned TTCs in Israel include Ramot of the Tel Aviv University, Technion Research and Development Foundation Limited of the Technion-Israel Institute of Technology, and Bar-Ilan Research and Development Company Limited of the Bar-Ilan University.

[40] The higher education sector in Israel comprises eight research universities, one open university, 30-plus academic and regional colleges and over 20 teacher training colleges. The eight research universities are (a) Technion–Israel Institute of Technology; (b) Hebrew University of Jerusalem; (c) Weizmann Institute of Science; (d) Bar-Ilan University; (e) Tel Aviv University; (f) University of Haifa; (g) Ben-Gurion University of the Negev; and (h) Ariel University.

[41] Yeda Research and Development Company Limited, founded in 1959, is the first technology transfer company ("TTC") founded in Israel and has emerged to be one of the highest earning university TTCs in the world.

[42] Since its establishment in 1964, Yissum Research Development Company has registered over 9 300 patents covering 2 600 inventions, and granted more than 880 technology licences.

3.4.2 The technology transfer process managed by the university TTCs generally involves the following stages: (a) an academic researcher reports to TTC of his or her university on any invention that is of commercial potential; (b) the TTC concerned assesses the potential of the invention; and (c) if the invention is of commercial value, the TCC concerned will apply for patent registration and devise a marketing strategy for the invention; and then identify potential commercial partner (or licensee) interested in the invention, negotiate licence agreement with the commercial partner, and follow-up on the agreement. A commercial partner granted with the patent licence will be given the permission to develop, use or sell the invention. The revenue generated from the payments of licence fee and/or royalty by the licensee is shared between the inventors and the research university.

3.4.3 According to a survey conducted by the Israeli Central Bureau of Statistics, university TTCs in Israel filed 372 new patent applications in 2015, accounting for 73% of the total applications filed by the technology commercialization companies surveyed.[43] The university TTCs also managed 752 active licence agreements in 2015, representing 68% of the total number of active licence agreements managed by the surveyed technology commercialization companies. The fields of these active licence agreements were mainly related with life sciences such as biotechnology (31% of the total number of active licence agreements managed by university TTCs) and medicines (14%); and the high-technology industry such as mathematics and computer science (13%), and physics and electro-optics (10%). In 2014, the total revenue of the university TTCs from the sale of intellectual property including royalties and licence fees amounted to ILS 1.66 billion (about HK$3.3 billion).

[43] The survey covered eight technology commercialization companies associated with the eight research universities, six with hospitals, and five with research institutions and academic colleges.

Government programmes for promoting academia-industry collaboration

3.4.4 While the academic sector has been taking the lead in technology transfer to the industry sector, the Israeli Government also plays the dual roles of (a) funding academic research of the higher education sector; and (b) laying down the legal framework for protecting intellectual property rights and promoting R&D.

3.4.5 The Israeli Government has also implemented a number of incentive programmes through IIA to promote academia-industry collaboration to produce advanced technologies and innovative products. The programmes include (a) the KAMIN Incentive Programme which encourages applied research in academia; (b) the NOFAR Incentive Programme which supports academic institutions in conducting applied research; (c) the MAGNETON Incentive Programme which promotes collaboration between academic research groups and Israeli companies in technology transfer; and (d) the MAGNET Consortiums programme which supports consortiums of industrial companies and research institutions that collaborate to develop innovative technologies. The details of these programmes are set out in **Appendix V**.

3.4.6 Noting the above background information on the technology transfer and academia-industry collaboration in Israel, the delegation was delighted to meet with the representatives of two renowned TTCs in Israel, namely Yissum of the Hebrew University of Jerusalem and Ramot of the Tel Aviv University ("Ramot"), on 25 and 27 July 2017 respectively. The purposes of the meetings were to receive briefings on the technology transfer process and the role of Yissum and Ramot in commercializing the research output of the respective universities, as well as the strategies adopted by the two TTCs in respect of commercialization and the building of long-term academia-industry research collaboration. During the meeting at the Tel Aviv University ("TAU") on 27 July 2017, the delegation also met with the Vice President of TAU and the representatives of TAU Ventures and Lahav Executive Education, and was given a brief introduction of the TAU's achievements in R&D and the effort to facilitate the promotion of academia-industry collaboration.

Yissum Research Development Company

3.4.7 Founded in 1964, Yissum aims to protect and commercialize the intellectual property ("IP") of the Hebrew University of Jerusalem ("HU"). HU's range of IP includes inventions and know-how in many fields, including nanotechnology, medicine and pharmaceuticals, agriculture and nutrition, water and environmental technologies, computer science and homeland security, etc. Working closely with researchers of HU, Yissum actively focuses on making these technologies commercially viable and desirable in the market.

3.4.8 Mr Matt ZAREK, Development Associate Director of Yissum, told the delegation that as of July 2017, Yissum had registered over 9 300 patents covering 2 600 inventions, licensed out 800 technologies and spun off 110 high-technology companies. Products that were commercialized by Yissum generated over US$2 billion (about HK$ 15.5 billion) in annual sales.

3.4.9 The delegation noted that Yissum had been using its extensive knowledge of industries and markets to seek appropriate businesses with partners, and adopting four commercialization strategies:

Licensing

3.4.10 Mr Matt ZAREK said that Yissum did not usually sell HU's IP to third parties. When Yissum decided to move forward with an innovation or technology of HU, it would apply for IP protection in the appropriate countries. The types of licenses included: (a) royalty-based license – to stipulate the payment of cash royalties on the licensee's sales, together with other types of lump sum or performance-based cash payments; (b) equity-based license – to give Yissum shares in the company (usually a joint venture in a new start-up) in lieu of a part (or all) of license fee; (c) research-based license – to combine a royalty- or equity-based license with a provision for the licensee to finance research carried out by the inventors at HU.

Establishing a company

3.4.11 When deciding whether to license a technology or establish a new company, the delegation noted that Yissum would take into consideration a number of factors, such as the maturity of the technology, the ability of the researcher to lead the efforts of the emerging company, the applications of the technology, and the ability to raise money.

Joint ventures

3.4.12 Mr Matt ZAREK further said that with its longstanding relationships with industrial and commercial enterprises, Yissum could use these relationships to form a joint venture that promoted HU technologies. A joint venture between Yissum and a business partner often took the form of a start-up. Yissum would transfer patents and know-how under license to the joint venture while the business partner would provide capital investment and management expertise. All the partners would acquire shares in the joint venture, as negotiated between them.

Collaborative research

3.4.13 The delegation was also advised that Yissum would facilitate collaborative research partnerships between business partners and HU researchers which might involve a single business partner or a multi-party consortium. Each research partnership would be tailored to the specific requirements of the inventor, the invention/technology, the partner, and HU. In a collaborative research partnership, all the partners would actively contribute to the research activity and the resulting IP would be generally shared.

3.4.14 Mr Matt ZAREK said that by adopting the aforesaid commercialization strategies, Yissum would be able to facilitate the conduct of scientific and applied research and the pursuit of subsequent technology transfer to the commercial sectors. HU had also introduced a number of incentive measures to encourage researchers at HU, mostly professors, to actively participate in the applied R&D work. Apart from granting cash royalties on the sales of invention to the professors concerned, the delegation

noted that the management board of HU would take into consideration the number of patents filed by individual professors when conducting their performance assessment.

Hon WU Chi-wai, Leader of the delegation, exchanging views with Mr Matt ZAREK on the key factors driving the success of technology transfer.

Mr Matt ZAREK introducing to the delegation the four commercialization strategies as adopted by Yissum for seeking businesses with partners.

Ramot

3.4.15 Ramot is a TTC at TAU. From the invention and patent protection stage to the licensing of commercial entities, Ramot initiates, assists and oversees the process of transferring new scientific and technological discoveries from TAU labs to the assembly line of commercial manufacturing. Ramot has been working closely with the industry and the venture capital sector owing to its ability to act as an effective and efficient interface, connecting cutting edge scientific innovation at TAU with the commercial marketplace. Ramot also offers creative solutions to its business partners while encouraging TAU's researchers to conduct more R&D in new technologies. Since 1999, more than 130 spin-off companies have had their start at Ramot.

Strategies of promoting technology transfer

3.4.16 As briefed by Mr Natan ELISHA, Director of Business Development of Ramot, the delegation noted that Ramot's status as a trusted proponent of all types of inventions played a vital role in engaging with both well-established corporations and game-changing start-ups. With the support of TAU, Ramot had adopted the various strategies to promote technology transfer, including (a) facilitating possible forms of collaboration; (b) sponsoring the conduct of research; (c) conducting joint research on a given technology; (d) encouraging broad collaboration that synergized several leading technologies with partner's capabilities; and (e) leveraging Ramot's Momentum Fund[44] for joint projects.

3.4.17 Mr Natan ELISHA also briefed the delegation that TAU had provided support for R&D projects through its Industrial Research Services Platform, assisting innovations in a wide range of services, such as providing

[44] The Momentum Fund invests in promising breakthrough technologies in a wide range of fields, including pharmaceuticals, healthcare, high-tech and the physical sciences. Tata Group is the lead investor of the Momentum Fund. Researchers of the Tel Aviv University involved in funded projects will receive assistance from both the Momentum Fund and Ramot in forging connections with industry, as well as guidance in all aspects involved in transforming projects into products.

cutting-edge facilities and equipment and comprehensive research methodologies.

3.4.18 In addition to the briefing on the work of Ramot, Professor Raanan REIN, Vice President of TAU, gave the delegation an overview of the various TAU's achievements in the areas of R&D and I&T, the support services and incentive measures rendered to university researchers, and its role to develop and reinforce areas of entrepreneurship and cooperation with the industries both locally and internationally.

3.4.19 The delegation noted that TAU had established cooperative endeavors with international partners in research and teaching, and in recent years had established cross-institutional cooperation with Asian countries such as India and China. This was reflected in the growth in the number of students and post-doctoral researchers from abroad engaged in studies and research activities at TAU. It had always been the focus of TAU to strengthen the entrepreneurship and cooperation with the industries both in Israel and abroad.

3.4.20 Professor Raanan REIN told the delegation that the academic achievements of researchers at TAU had been acknowledged by the many prestigious prizes that they had won, leading TAU to being considered one of the world's top universities according to annual rankings. Playing an active role in the industry and venture capital sector, TAU had the best alumni entrepreneurial record outside of the United States ("US"), and that half of all entrepreneurs in Israel came from TAU. As a matter of fact, TAU, the only non-US university, ranked 9th[45] in the world's top 50 universities whose alumni had managed to secure venture capital backing for their companies and enterprises.

[45] The ranking was published by PitchBook Universities Report 2016-17, which graded universities according to the number of graduates who founded venture capital-backed start-ups from January 2006 to mid-August 2016.

TOP 50 UNDERGRADUATE

(January 2006 to August 2016)

Rank	University	Entrepreneur count	Company count	Capital raised ($M)
1	Stanford University	1,006	850	$18,146
2	University of California (UC), Berkeley	997	881	$14,239
3	Massachusetts Institute of Technology (MIT)	813	695	$12,874
4	Harvard University	762	673	$17,204
5	University of Pennsylvania	724	648	$9,475
6	Cornell University	635	585	$10,777
7	University of Michigan	607	546	$7,767
8	University of Texas	561	511	$4,763
9	Tel Aviv University	515	429	$5,101
10	University of Illinois	451	415	$5,462

DATA: PITCHBOOK

In addition, TAU had been among the world's top 100 innovation universities, and TAU graduates also ranked 8th in the world for founding billion-dollar "unicorn" start-ups. TAU is an Israeli institution for generating start-ups and entrepreneurs and for fueling Israel's renowned knowledge economy.

3.4.21 Professor Raanan REIN emphasized that one of TAU's top priorities was to pioneer cross-disciplinary research combined with extensive industry ties. TAU had established several centers dedicated to bringing researchers from different fields together and encouraging them to share their knowledge in R&D and develop into new technologies to benefit society. The TAU Research Authority aimed to provide aid and support for researchers beginning with the initial planning stages of a study. As a

central administrative unit charged with managing all matters related to research, the Research Authority acted as the face of TAU for research foundations, government authorities and research partners in Israel as well as abroad. Professor REIN said that as an incentive to encourage TAU professors and students to set up research teams to conduct R&D in new technological fields, the professors and students concerned would be entitled to a larger proportion of the revenue generated from the payments of licence fee and/or royalty by a commercial partner after successful commercialization of their research results.

3.4.22 To provide all-round support to encourage innovation, TAU had for the first time launched its own venture capital fund, i.e. TAU Ventures. According to Mr Nimrod COHEN, Managing Partner of TAU Ventures, the idea behind this ambitious initiative was to combine all entrepreneurial activity on campus into a one-stop shop for generating commercially viable products and services. The US$10 million TAU Ventures would be a buzzing one-stop shop for students to get business development advice, brainstorm with mentors and partners, work on prototypes in specially-designed labs, receive training from StarTAU,[46] one of the largest community entrepreneurial non-profit organizations in the world, and enjoy business services from Ramot. Investing in early stage, cutting-edge technology based in Israel, TAU Ventures would mainly focus on early stage IP and ideas from TAU students, alumni and the wider I&T ecosystem. The delegation noted that the operation of TAU Ventures was entirely

[46] StarTAU is a non-profit organization, founded in 2009 by a group of then-students, who felt there's a gap in the academy's ability to support early-stage entrepreneurs inside the campus. In a very short time StarTAU grew to be the largest and most active entrepreneurship center in Israel, with a community of more than 15 000 local followers and thousands more throughout the world. StarTAU's mission is to provide entrepreneurs and students of entrepreneurship with the practical and professional guidance they need to start a successful business venture.

commercial driven, and had already attracted investment from top venture capital funds from the Silicon Valley.

Delegation members taking a photo with a sculpture of a Trojan Horse, which was made out of thousands of computer and cell phone components that were once working just fine, but later became infected with various viruses and malware. Nicknamed the "Cyber Horse," the sculpture was on display on the sprawling campus of the Tel Aviv University.

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Mr Nimrod COHEN, Managing Partner of the Tel Aviv University Ventures, receiving the delegation's souvenir on behalf of the Tel Aviv University.

(Second from the top left) Professor Raanan REIN, Vice President of the Tel Aviv University, introducing to the delegation the support services and incentive measures rendered by the University to researchers.

3.5 Tel Aviv – the Smart City

3.5.1 A smart city is a designation given to a city that incorporates ICT to enhance the quality and performance of urban services such as energy, transportation and utilities in order to reduce resource consumption, wastage and overall costs. The ultimate aim of a smart city is to enhance the quality of living for its citizens through smart technology.[47] The process in which a smart city is developed includes the use of IoT, analytics, automation and blockchain technology to improve the efficiency and effectiveness of transport, lighting, energy and citizen-facing services.

(Source: Siemens AG)

3.5.2 On 24 July 2017, the delegation was accompanied by Mr Eli LIPSHITZ, Cadet of Bureau for Diplomatic Training of the Ministry of Foreign Affairs, to walk along the boardwalk of Tel Aviv for a more direct understanding of how Tel Aviv could persistently act to create a favourable environment that would facilitate the collaborations between residents, business establishments and Tel Aviv's Municipality, while using cutting-edge technologies to enable learning, creativity and sharing to achieve social and economic prosperity.

[47] See Techopedia (2017).

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Delegation members taking a walk along the boardwalk of Tel Aviv and receiving a briefing by Mr Eli LIPSHITZ, Cadet of Bureau for Diplomatic Training of the Ministry of Foreign Affairs (first from the right), on Tel Aviv's Smart City project.

Municipality's effort

3.5.3 The delegation noted that Tel Aviv considered engagement a key value in implementing smart city's principles. The Municipality of Tel Aviv actively involved residents in the urban experience and urban development, and at the same time emphasized engagement in decision making processes and wisdom of the crowd as a means for smart municipal management in the new age.

3.5.4 Mr Eli LIPSHITZ told the delegation that in 2014, Tel Aviv was awarded the title Best Smart City in the World at Barcelona's Smart City Expo World Congress, trumping over some 200 other cities bidding for the title. Tel Aviv won the award based on its flagship civic engagement

project called DigiTel,[48] a personalized web and mobile communication platform providing residents with individually tailored, location-specific, life situation-based information and services. Since then, Tel Aviv had developed smart city vision that focused on the residents: improving their quality of life by listening to the residents' needs.

Wi-Fi

3.5.5 Tel Aviv has the widest wireless Internet distribution in the public domain of any Israeli city. The service is provided free of charge to all users (i.e. residents, visitors and tourists). Over 80 Wi-Fi zones have already been deployed throughout the city: at the beach, on the boulevards and streets, in the city squares and public gardens. The delegation noted that the use of the wireless network was simple and easy, and it would not be necessary to sign up in advance or provide any personal information.

Open data

3.5.6 In promoting the accessibility and transparency of the information provided to the general public, Tel Aviv's Municipality allows direct access to municipal databases that are not of a confidential nature. The environment enables the public and app developers to make use of information in municipal databases that deal with community affairs, culture, public health, budgets, statistical data and security.

Bike paths and bike-sharing systems

3.5.7 The Municipality of Tel Aviv is committed to increasing the use of bikes in the city. The delegation was advised that in recent years, the Municipality had allocated a lot of land for bike paths, and the areas

[48] DigiTel aims to facilitate a direct and holistic connection between the city and its residents, from alerting residents to neighborhood road works to sending targeted reminders for school registration and offering discounts which facilitate access to the many cultural events taking place in the city. Different departments of the Municipality are to feed data into the DigiTel platform in order to update residents on services and information relevant to them.

designated for bike riding continued to grow steadily. More than 100 kilometers of bike paths had been paved in Tel Aviv for use by residents and tourists. The popularity of bike-sharing systems in Tel Aviv had continued to grow. Tel-O-Fun, a bike-sharing rental project, had included about 150 stations throughout the city. More than 3 million rentals of 1 500 bikes had been recorded.

Delegation members being briefed on the popularity of bike-sharing systems in Tel Aviv.

3.6 Seawater desalination in Israel

3.6.1 In order to learn the operation of the desalination plant and the technology adopted in the desalination process, the delegation took the opportunity to pay a visit to Sorek Desalination Plant and meet with Mr Ronen WOLFMAN, Chief Financial Officer of Hutchison Water, on 24 July 2017 to obtain first-hand information on the development of large-scale desalination plants in Israel.

Water supply management in Israel

3.6.2 In Israel, the Ministry of National Infrastructure, Energy and Water Resources has established the Water Authority for regulation and management of water resources, including seawater desalination, developing new water resources, preserving natural water resources, and monitoring water quality. Mekorot, a government-owned water company, is responsible for operation of a water supply network known as the National Water Carrier across the country.

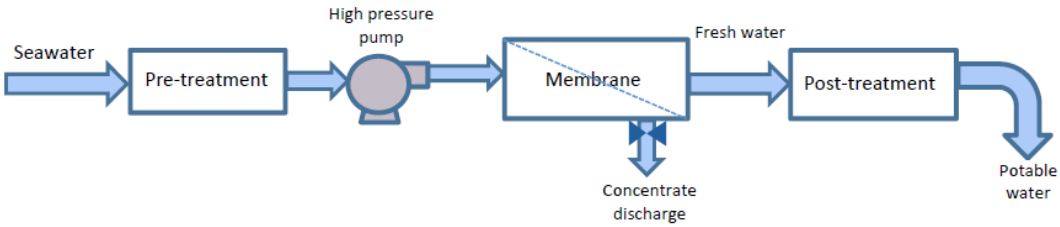
3.6.3 Total water usage in Israel amounted to about 1 990 million cubic metres ("cu m") in 2014, of which 56% was for agricultural use, 38% for domestic use and 6% for industrial use. Total water consumption is expected to increase by 31% to over 2 600 million cu m by 2020 and further by 35% to 3 500 million cu m by 2050. However, the availability of natural water resources is expected to drop by 15% by 2050 amid climate change. In face of water scarcity, the Israeli Government launched a nationwide seawater desalination master plan in 1997, building desalination plants to produce potable water primarily for domestic consumption. Currently, there are five desalination plants providing about 600 million cu m of desalinated water each year, equivalent to about 30% of daily water consumption in 2014. It is expected that the supply of desalinated seawater would increase by a total of 25% to 750 million cu m by 2020, accounting for a third of total water demand.

Reverse osmosis desalination technology in Israel

3.6.4 All seawater desalination plants in Israel adopt the technology of reverse osmosis ("RO") in the desalination process. RO technology is now the most common form of seawater desalination in the world, accounting for 65% of the total in 2014. RO is also the technology applied to the Tseung Kwan O Desalination Plant under planning.[49]

3.6.5 RO is a desalination process with the use of semi-permeable membranes which allow the passage of water molecules but not the dissolved salts. In the process, seawater is pre-treated to remove suspended solids. Sufficient pressure is then applied with the use of high pressure pumps to force water passing through the semi-permeable membranes, leaving the dissolved salts behind. Desalinated water then undergoes post-treatment, such as pH adjustment and disinfection, to make it suitable for drinking (**Figure 2**).

Figure 2 – Basic process of reverse osmosis



(Source: Banat, F. (2007))

[49] The Tseung Kwan O Desalination Plant is scheduled for completion in 2020-2021 with an annual capacity to provide 50 million cu m of fresh water or 5% of the total fresh water supply, expandable to 100 million cu m or 10% in the future. The estimated cost of water at 2013-2014 price level was HK$12.6 per cu m, with breakdown of HK$4.6 capital cost of the plant, HK$3.6 energy cost and HK$4.4 treatment, distribution and customer service costs.

3.6.6 Higher water recovery rate and lower energy requirement of RO technology make it a preferred technology compared to other options.[50] On the other hand, RO membranes are typically made of cellulose acetate or other composite polymers susceptible to fouling, resulting in lower quality of desalinated water. Moreover, it is rather costly to replace membranes on the one hand, and pre-treat seawater to mitigate fouling on the other. Both of them will add to the cost of fresh water production.

Sorek Desalination Plant

3.6.7 The Sorek Desalination Plant is located in the Tel Aviv District, a coastal city in the central-west Israel. As briefed by Mr Ronen WOLFMAN, the Sorek Plant was built at a cost of US$400 million (about HK$ 3.1 billion).[51] Commissioned in 2013, the Sorek Plant became the largest seawater desalination facility in Israel, with an annual capacity of 150 million cu m to provide 20% of total domestic water consumption. The Sorek Plant had its own independent power plant to generate energy for operation. The power plant ran on natural gas with less carbon dioxide emission, and its fuel cost was about 7% cheaper than that of a coal-driven power system. Excessive energy produced was sold to the national power grid. Furthermore, the Sorek Plant was designed with energy recovery devices throughout the desalination process to achieve energy efficiency. In 2015, the Sorek plant charged US$0.52 (about HK$4.0) per cu m of desalinated water.

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[50] Another commonly used technology is multi-stage flash evaporation of thermal desalination. Seawater is heated and evaporated, and then pure water is obtained by condensing the vapour. This method is energy-intensive and has lower water recovery rate, yet it is relatively simple to operate and produce high-purity water. This method is mostly used in those places in Middle East where solar energy is available and energy costs are of less concern. The water recovery rate of RO is about 50% and that of multi-stage flash evaporation is about 30%.

[51] The Sorek Desalination Plant is owned by IDE Technologies Ltd (51% of total shares) and Hutchison Water International Holdings Pte Ltd (a subsidiary of Hong Kong-listed Hutchison Whampoa Limited) (49% of the total shares).

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The delegation visiting the Sorek Desalination Plant on 24 July 2017.

3.6.8 The delegation noted that in addition to the Sorek Desalination Plant, there were four other seawater desalination plants in Israel: Ashkelon, Palmachim, Hadera, and Ashdod, all located along the Mediterranean coast to facilitate the transfer of seawater to the desalination plants. At the end of contract period of 25 years, the plants would be transferred to the Israeli Government. Mr Ronen WOLFMAN said that the Water Authority agreed to purchase an annual volume of desalinated water from all the desalination plants, and the purchase price was made up of a fixed component and a variable component varying with factors such as energy and operation costs. In terms of production capacity, the Ashkelon, Hadera, Sorek and Ashdod plants were the largest in Israel, each with an annual capacity of over 100 million cu m.

(Right) Mr Ronen WOLFMAN advising the delegation that the Sorek Desalination Plant is providing 20% of total domestic water consumption.

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Mr Ronen WOLFMAN touring the delegation around all the main parts of the Sorek Desalination Plant.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

3.7 Knesset - Israeli Parliament

3.7.1 On 25 July 2017, the delegation met with Mr Eitan CABEL, Chairman of the Economic Affairs Committee of Knesset, and other Committee members to exchange views on issues of common interest concerning the polices and measures introduced by the governments of the two places to develop and support the sustainable development of the various industries and the experience in the application of renewable energy. The delegation also took the opportunity to visit the Knesset building and its meeting facilities.

3.7.2 During the meeting, the delegation noted that similar to Hong Kong, Israel had been formulating polices and measures to address the pressing problems on waste management and environmental protection.

3.7.3 Waste management is a major challenge worldwide. Mr Eitan CABEL told the delegation that in Israel, the problem was aggravated by several trends which were unique to the country: (a) having a high rate of population growth, which was higher than other developed countries; (b) rising standards of living and consumption patterns; (c) accelerating building and industrial activity; and (d) being one of the highest population densities in the developed world. In a country with meager land resources on one hand and increasing quantities of waste on the other, a comprehensive policy framework for solid waste management was imperative. The delegation noted that to address the problem, the Israeli Government had formulated a policy on integrated waste management, aiming to reduce waste at source, reuse, recycling, energy recovery and landfilling. The goal was to reduce the total quantity of waste that the country generated, particularly the quantity of waste which reached landfills, and to increase waste recovery and recycling.

3.7.4 In respect of the energy policy in Israel, Mr Eitan CABEL said that as one of the signatories to the Paris Agreement,[52] the Israeli Government

[52] To address climate change, countries adopted the Paris Agreement at the 21st Conference of the Parties in Paris on 12 December 2015. The Agreement entered

had been striving to fulfill the international commitments to reduce greenhouse gas emissions and increase energy efficiency by rising production from renewable sources. In doing so, the Israeli Government had set goals for a change in the fuel mix for the generation of electricity, reducing the use of coal and increasing the use of natural gas. Measures had been rolled out to promote electricity generation from renewable energies, including the programmes implemented by the Ministry of the Economy and Industry. The Ministry of the Economy and Industry, by means of IIA, operated various tools to support Israeli industries, including the renewable industry in conducting R&D (by ways of technological incubators and funds for financing related projects). There were also specific tools for encouraging the development of the clean technology industry in the R&D stages, such as the grants for students for R&D and the establishment of pioneer installations.

3.7.5 The delegation also noted the policy direction for the Israeli Government to promote the development of industries. As for the promotion of the I&T industry, the Israeli Government had endeavoured to provide a conducive environment for the sustainable growth of I&T businesses by constantly reviewing the local laws to ensure that they could adapt to technological advancement. Meanwhile, the Israeli Government had adopted measures to strengthen the development of traditional industry, by encouraging improvement of manufacturing processes through investment in R&D in new products and advanced technologies.

3.7.6 During the meeting, the delegation also had a discussion session with Dr Shirley AVRAMI, Director of the Research and Information Center of Knesset, to learn more about the research services rendered to Knesset members to facilitate their discussion on the various issues with government officials at meetings.

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into force less than a year later. In the agreement, all countries agreed to work to limit global temperature rise to well below 2 degrees Celsius, and given the grave risks, to strive for 1.5 degrees Celsius.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

Meeting with Members of the Economic Affairs Committee of Knesset.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

Visiting the Plenary Chamber of the Knesset.

The delegation joining a guided tour to the Knesset, understanding the Knesset's roles and responsibilities, and the works of art displayed throughout the building.

CHAPTER 3 — INNOVATION AND TECHNOLOGY INDUSTRY IN ISRAEL

3.8 Courtesy visit to the Ministry of Foreign Affairs

3.8.1 On 26 July 2017, the delegation paid a courtesy visit to the Ministry of Foreign Affairs and met with Mr Shahar SHELEF, Director of Political-Economic Research and Analysis of the Center for Policy Research to receive a briefing on the work of the Center for Policy Research and the foreign policy of the Israeli Government in the Middle East, through which the delegation had gained a deeper understanding of the political situation in the region.

The delegation paying a courtesy visit to the Ministry of Foreign Affairs and Hon WU Chi-wai, Leader of the delegation presenting a souvenir to Mr Shahar SHELEF.

CHAPTER 4 — OBSERVATIONS AND CONCLUSIONS

4.1 Observations

4.1.1 Through the exchange of views at the meetings with the receiving organizations and individuals, the delegation firmly recognizes the significance of sustainable development of I&T ecosystem as an impetus for enhancing a country/city's competitiveness and fostering its long-term diversification of economic development. Seeing the importance of the government's role in the process of promoting the sustainable development of I&T ecosystem, the delegation is pleased to note that CE has announced in her Policy Address that the HKSAR Government will establish a high-level, inter-departmental "Steering Committee on Innovation and Technology", which will be chaired by herself, to examine and steer measures under the eight areas of I&T development[53] as well as smart city projects, with a view to driving the I&T development in Hong Kong in a highly effective manner. The delegation has made the following observations.

Administration and management of government's research and development funding programmes

4.1.2 The government's support, especially in R&D funding programmes, is an essential accelerator for the growth of start-ups in the I&T industry. At the meeting with the representatives of IIA, the delegation was greatly impressed by the steadfastness of the Israeli Government to provide all-round support to nurture the development of the I&T industry in Israel. The delegation notes that not only has IIA introduced a series of funding programmes tailored to the business needs of specific target groups of entrepreneurs and start-ups at various stages, but it also has much autonomy and flexibility, hence allowing the six innovation

[53] As announced in the 2017 Policy Address in October 2017, the HKSAR Government will step up its efforts to develop I&T in eight major areas, including: (a) increasing resources for R&D; (b) pooling together technology talent; (c) providing investment funding; (d) providing technological research infrastructure; (e) reviewing existing legislations and regulations; (f) opening up government data; (g) HKSAR Government to lead changes to procurement arrangements; and (h) strengthening popular science education.

divisions under IIA to rapidly respond to the challenges faced by the I&T industry and provide necessary assistance in an efficient and effective manner. According to IIA, the funding programmes have received overwhelming responses from start-ups and entrepreneurs. The success rate of applications for the various funding programmes administered and managed respectively by the six innovation divisions under IIA stands as high as 50%. The delegation is also impressed by the IIA's arrangement where 180 technology specialists are appointed working full-time to provide quick response and assist interested entrepreneurs and companies in the applications of funding programmes. This seamless and businesslike arrangement largely shortens the time required for vetting applications, enabling the applicants to be notified of the outcome of their applications within a short period of time.

4.1.3 As for Hong Kong, ITC, which has similar roles as IIA, has also been administering and managing the various programmes under ITF to finance projects that contribute to I&T upgrading and development of manufacturing and services industries in Hong Kong. But in terms of the success rate of applications[54] and the vetting and approval procedure, the delegation considers that ITC's performance stands in sharp contrast to IIA's.

4.1.4 The delegation is in general dissatisfied with the rigid and lengthy procedure currently adopted for vetting and approving applications of the various funding programmes under ITF. Some delegation members have the impression that the processing of applications remains at low pace and can be speeded up by a large extent. The delegation notes that members of the vetting panels for the programmes are mostly experienced prominent persons in various domains of the I&T sector such as academia and industry, etc. Since they are appointed to serve the panels on a voluntary basis, the meetings of the vetting panels could not be scheduled as frequent as possible to deal with the applications in a timely and efficient manner. In addition,

[54] As of May 2017, Innovation Technology Commission had processed 261 applications of the Enterprise Support Scheme under ITF. Among the 261 applications, 32 were approved, 88 were withdrawn by the applicants and 141 were not recommended for funding support. The success rate is 12.3%. During the financial years from 2014-2015 to 2016-2017, a total of 505 applications of TSSSU were received, of which 169 were approved. The success rate is 33%.

unlike IIA which has much autonomy and flexibility, ITC tends to be rigid and stringent in the vetting process given the Audit Commission's oversight of the prudent use of public funds under ITF. This may be the main reason for a lower success rate of funding applications. Some other delegation members consider that the lack of efficient follow-up by ITC on the unsuccessful applications may also be an important reason for a lower success rate of funding applications.

4.1.5 The delegation strongly suggests that to quickly respond to the rapid changing needs of enterprises and start-ups in the I&T industry, ITC should make reference to the experience of IIA and consider pushing ahead with the work of breaking barriers and restraints by reviewing the vetting and approving mechanism. In addition to the setting up of vetting panels where members are serving on a voluntary basis, ITC should consider appointment of professionals working full-time to comprehensively coordinate the assessment work of funding applications, facilitate a more efficient vetting process of applications by the vetting panels, provide precise and thorough explanation of the reasons for rejection, and render all possible assistance to the funding applicants for resubmission of applications.

Hong Kong-Israel Research and Development Cooperation Programme

4.1.6 During the briefing by Mr Avi LUVTON of IIA, the delegation was surprised to note that since the launch of the Cooperation Programme in December 2015, no successful match had been made between companies in Hong Kong and those in Israel, and that of all the Asian cities IIA had launched similar programmes with, including some cities in the Mainland, Hong Kong was the only one where no progress had been made so far (details in paragraphs 3.3.10 to 3.3.13).

4.1.7 Notwithstanding that ITC has explained in its response to media enquiries on the progress of the Cooperation Programme that it had co-organized three "Israeli Business Matching" sessions with HKSTPC, where ITC assisted quite a number of Israeli enterprises and Hong Kong enterprises to identify and select potential partners, the delegation raises grave concern about the inadequate follow-up on the Cooperation Programme. In

particular, after the three matching sessions held in Hong Kong, no dedicated team of staff is assigned to follow up on the liaison work between enterprises in Hong Kong and those in Israel. The delegation urges ITC to proactively promote the Cooperation Programme among Hong Kong enterprises to facilitate possible collaborative R&D projects with I&T enterprises in Israel.

Support to research and development teams of local universities in establishing technology start-ups

4.1.8 The delegation finds that the briefings by the representatives of Yissum of HU and Ramot of TAU have provided very useful reference for ITB to step up its efforts to provide all possible assistance for the R&D teams in local universities for establishing technology start-ups to commercialize their results.

4.1.9 In Israel, most of the technology entrepreneurs are originated from universities. Israeli universities are all along keen to encourage professors to set up technology start-ups on campus to commercialize academic research results. The delegation notes that one of Yissum's missions is to strike a balance between the promotion of academic basic research and entrepreneurship within HU. As university professors (most likely for the reason of promotion) tend to focus on conducting academic basic research rather than applied research, HU provides a conducive environment with incentive measures for professors to set up technology start-ups. Examples of these incentive measures include granting of cash royalties to the professors on the sales of invention, the management board of HU taking into account the number of patents filed by individual professors when conducting their performance assessment, as well as providing freedom and openness required for technology R&D. Yissum also offers an array of support services to professors, including proactively assisting professors in the filing of patent applications for IP protection of their R&D results, and helping them make well use of their results for commercialization.

4.1.10 In TAU, in order to encourage professors to start their technology businesses, the research teams, when compared with other parties of the collaborative R&D projects, will be given a larger proportion of the profits

generated from the commercialization of R&D results. The delegation notes that in Israel, university professors are seldom required to spend too much time on academic research in pursuit of better university rankings, but instead they are encouraged to focus on the conduct of R&D work for products and inventions which are of commercial value.

4.1.11 On the contrary, in Hong Kong's situation, under the current funding mechanism of the Research Grants Council ("RGC"), local universities tend to lean towards the development of academic research, and university professors are not keen on setting up technology start-ups and conducting applied research for commercialization of R&D results. Some delegation members observe that there is a distinct difference in the technology transfer and R&D activities between the universities in Israel and those in Hong Kong. Whilst most of the founders of start-ups in HU are professors, who are mostly well-known academics focusing on innovative high-technology R&D, a large number of founders of start-ups in Hong Kong's universities are university students and postgraduates focusing on mobile applications R&D. As such, the R&D projects conducted by professors of Israeli universities are likely of higher technological potential. In this connection, the delegation urges ITB to conduct studies on the relevant policy measures, including a review on the funding mechanism of RGC, so as to step up efforts to encourage and support university professors to pursue innovative high-technology R&D and set up technology start-ups for commercialization of results. The delegation also suggests that an appropriate profit-sharing mechanism be introduced to provide extra incentives for university professors and university students/postgraduates to pursue entrepreneurial technology activities in universities.

4.1.12 The delegation notes that apart from the incentive measures tailored to encourage university professors to start technology businesses on campus, TAU also encourages university students and postgraduates to set up I&T start-ups and carry out R&D projects. Noting that many university students and postgraduates are offered I&T-related jobs by multinational corporations a good few months before graduation, TAU has strengthened its R&D cooperation with the industry to encourage university students and postgraduates to stay in TAU and work full-time to conduct R&D activities. As such, Ramot strives to identify and finance R&D projects with highest

technology potential in TAU, and to facilitate collaboration opportunities with technology corporations in the private sector.

4.1.13 As pointed out by the representative of Ramot, government support is important for R&D projects at the early stage. The delegation notes that the Israeli Government has rolled out a funding scheme to support entrepreneurs with innovative technological concepts at the initial stage of R&D to establish start-ups and help them reach a significant fundable milestone. The highlight of the scheme is that the reimbursement of funds by the start-ups concerned will only be required if the funded project is ultimately rewarded with revenue and profits. No reimbursement of funds is required if the funded project turns out unsuccessful. The Israeli Government believes that the subsidies granted for unsuccessful R&D projects will never be in vain, given the number of jobs created during the process and reduction of risks borne by start-ups, which in turn facilitate a win-win situation for all stakeholders in the I&T industry. The Israeli Government's policy thinking of embracing uncertainty and failure is highly praised by the delegation.

4.1.14 The delegation in general considers that the policy directions in the nurturing of private investment in the I&T industry adopted by the governments of the two places are broadly similar. Yet, given its unique competitive edge, TAU is able to establish the very first university-operated venture capital fund, i.e. TAU Ventures. The US$10 million (about HK$78 million) TAU Ventures aims to focus on investing in IP at the early stage, innovative ideas from TAU students and postgraduates, alumni and the wider Tel Aviv ecosystem. According to the representatives of TAU Ventures, it has already attracted foreign investment from top venture capital funds from the Silicon Valley. In Hong Kong, the HKSAR Government has also rolled out funding schemes to support investment in the development of technology start-ups. These funding schemes include TSSSU under ITF which provides annual funding of up to HK$24 million to six local universities initially for three years to encourage their students and professors to start technology businesses and commercialize their R&D results (details in paragraph 2.3.13), as well as HKSTPC's HK$50 million Corporate Venture Fund and Cyberport's HK$200 million Cyberport Macro Fund which encourage private investment in technology start-ups (details in

paragraphs 2.3.14 to 2.3.16). The delegation appreciates the HKSAR Government's effort to introduce funding schemes aiming to enhance the atmosphere for I&T development in Hong Kong. The delegation further suggests that the HKSAR Government should input more resources to shore up the funding size of the schemes, and consider making progressively bolder attempts in financing R&D projects of local technology start-ups to create new impetus for I&T development.

Investment of multinational corporations in the I&T industry

4.1.15 In the I&T ecosystem, the role in which multinational corporations play in terms of investment in technology start-ups is inevitably vital. Owing to the lack of local markets, Israel is keen to have the financial support of multinational corporations for exploring the external markets. The delegation notes that in Israel, instead of investing in their own R&D activities for economic achievement, multinational corporations tend to employ a more cost-effective way to reach maximum economic achievement by acquiring technology start-ups with high potential and remarkable R&D results. Most of the multinational corporations, after acquisition of technology start-ups, choose to stay in Israel and continue to invest in setting up their own R&D centres for further development. The important role of multinational corporations in Israeli I&T industry is evidenced by the success of Israeli start-ups in terms of both the total number of start-ups established and its market values.

4.1.16 The delegation shares the view of Ms Fiona DARMON of JVP that the investment of multinational corporations in Hong Kong's I&T industry is inadequate and thus the HKSAR Government should consider introducing more incentive measures to encourage multinational corporations to cultivate and invest in R&D projects of technology start-ups in Hong Kong. Noting that some top-tier global R&D institutes, such as the Massachusetts Institute of Technology and the Karolinska Institutet from Sweden, have established their presence in Hong Kong, the delegation suggests that the HKSAR Government should adopt a market-based approach to support the long-term development of venture capital and private incubator industries in Hong Kong. On this, whilst the delegation is pleased to note that the HKSAR Government will provide enhanced tax deduction for expenditure incurred

by enterprises on R&D,[55] the HKSAR Government should also consider possible ways to attract more private investment in the I&T industry by multinational corporations and encourage the corporations to seize investment opportunities in Hong Kong and set up regional R&D centres, so as to promote long-term R&D investment activities and nurturing R&D talents, thereby strengthening the sustainable development of the I&T ecosystem in Hong Kong.

Economic and Trade Missions under the Foreign Trade Administration of the Ministry of Economy and Industry

4.1.17 The briefing by Mr Ohad COHEN, Trade Commissioner of FTA on the roles of the 45 Economic and Trade Missions under FTA to act as the forefront of the Israeli Government's efforts to boost the Israeli industry in foreign markets has provided food for thought for the delegation to exchange views with the HKSAR Government on the work of the overseas Hong Kong Economic and Trade Offices ("ETOs").

4.1.18 The delegation is greatly impressed by the proactive role of FTA in promoting Israel's exports and fostering robust relations between Israel and foreign industries. To increase and diversify exports and promote foreign investments, FTA has set up a total of 45 overseas Economic and Trade Missions to provide assistance to Israeli companies in expanding market penetration opportunities and identifying potential business partners in the overseas countries. The delegation notes that FTA has adopted a stringent approach to set strict standards in assessing the work performance of individual Economic and Trade Missions. As a referral system, ERMS aims to improve and optimize the services provided to Israeli companies by the overseas Economic and Trade Missions. Through ERMS, FTA is able to monitor the requests from Israeli companies received by each Economic and Trade Mission and to assess the quality and professionalism of the services provided to Israeli companies, as well as the time the Economic and

[55] In her 2017 Policy Address delivered in October 2017, the Chief Executive announced that ITB will introduce enhanced tax deduction for local R&D expenditure incurred. The first HK$2million of qualified R&D expenditure will be eligible for a 300% tax deduction, and a 200% tax deduction will be provided for the remaining balance.

Trade Mission takes to generate a response to the request. The delegation notes that FTA will make use of the ERMS data to evaluate the work performance of individual Economic and Trade Missions and conduct satisfaction surveys twice a year with Israeli companies which have submitted requests for assistance via ERMS to evaluate whether the services provided to them are satisfactory. Furthermore, the Head of each Economic and Trade Mission is required to submit a KPI assessment report to FTA every four months for examination and review. FTA will follow up with individual Economic and Trade Missions for improvement measures as and when necessary. Under such a stringent standard of assessment tools, the delegation observes that FTA is in full knowledge of the strengths and weaknesses of each of the Economic and Trade Missions and is able to keep up with the quality of services provided by the Missions to Israeli companies.

4.1.19 The delegation strongly recommends that the HKSAR Government make reference to the experience of FTA in the assessment of the work performance of overseas ETOs. It is highly advisable for CEDB to draw reference from the Israeli ERMS and KPI assessments concerned and formulate a set of standardized KPIs for overseas ETOs responsible for trade and investment promotion, with a view to enhancing the work effectiveness of overseas ETOs. Noting that the overseas offices of InvestHK and Hong Kong Trade Development Council and overseas ETOs operate independently of each other yet are tasked with similar responsibility in trade and investment promotion, the delegation further suggests that CEDB should review the division of work among the various offices, so that their work and functions could be better coordinated to enhance cost-effectiveness of the relevant promotion efforts and achieve synergy in the promotion of Hong Kong's economic development.

Smart city

4.1.20 The development of smart city is a process of embedding technology into the fabric of the city. It is an ongoing project which can tremendously improve the quality of life in the city and the city's competitiveness through the use of smart initiatives. The delegation understands that from a broader perspective, smart city involves the use of

ICT infrastructure and I&T-related solutions to address the issues of economy, environment, people's way of living, governance and mobility. Yet, different cities would have their own goals set for the development of smart city tailored to their own circumstances and policy priorities. The process in which the smart city is being built is unique to Tel Aviv. Its main motivation, as seen by the city's own definition of smart city and consistent with the challenges the city faces, is to improve resident engagement and strengthen trust between residents and the municipal government. In doing so, Tel Aviv has embarked on a strategy that combines building specific smart services which are based on a connected set of information sources and systems and leveraging the city's high-technology ecosystem to facilitate the construction of others.

4.1.21 The delegation is supportive of the HKSAR Government's commitment to formulate a smart city blueprint for Hong Kong[56] and agrees that it is essential for Hong Kong to press ahead smart city development in full steam. It is also encouraging to note that the HKSAR Government will invest HK$700 million to push ahead three key infrastructure projects for smart city development, namely providing an electronic identity for all Hong Kong residents, launching a pilot Multi-functional Smart Lampposts scheme and reforming the development technology of e-Government systems and building a big data analytics platform.

4.1.22 For Hong Kong's smart city development, the delegation considers that the experience of Tel Aviv is noteworthy in that the main driver for becoming a smart city in Tel Aviv is to create a more open, transparent and trusting relationship between the government and its citizens. The delegation suggests that the HKSAR Government should put in efforts to widely promote the adoption of big data analytics and enhance relevant

[56] To incorporate the experience and wisdom of different cities in smart city development, the HKSAR Government commissioned a consultant to assist in the formulation of the overall development framework of the Hong Kong Smart City Blueprint. The consultant submitted its study report on smart city blueprint in mid-2017. A two-month public consultation was conducted in August 2017. The HKSAR Government announced "the Smart City Blueprint for Hong Kong" (https://www.smartcity.gov.hk/doc/HongKongSmartCityBlueprint(EN).pdf) on 15 December 2017.

expertise and capability in the area. As regards open data, the delegation is of the view that the HKSAR Government should try to identify and open up more public and private data sets conducive to urban innovation such as the areas of transport, finance and economy, etc. To facilitate development of innovative solutions and promote smart city development, government departments and private organizations should be encouraged to release data for free reuse by the public, but without compromising the protection of personal privacy.

4.2 Summary of suggestions

4.2.1 The delegation's suggestions are summarized below.

In respect of the HKSAR Government's research and development funding programmes (details in paragraphs 4.1.2 to 4.1.5), the Administration should –

(a) make reference to the experience of IIA and review the vetting and approving mechanism with a view to quickly responding to the rapid changing needs of enterprises and start-ups in the I&T industry; and

(b) consider appointment of professionals working full-time to coordinate the assessment work of funding applications, facilitate a more efficient vetting process of applications by the vetting panels, provide precise and thorough explanation of the reasons for rejection, and render all possible assistance to the funding applicants for resubmission of applications.

In respect of the Hong Kong-Israel Research and Development Cooperation Programme (details in paragraphs 4.1.6 and 4.1.7), the Administration should –

(c) assign dedicated team of staff to follow up on the liaison work between enterprises in Hong Kong and those in Israel; and

(d) proactively promote the Cooperation Programme among Hong Kong enterprises to facilitate possible collaborative R&D projects with I&T enterprises in Israel.

In respect of the support to research and development teams of local universities in establishing technology start-ups (details in paragraphs in 4.1.8 to 4.1.14), the Administration should –

(e) conduct studies on the relevant policy measures, including a review on the funding mechanism of RGC, so as to step up efforts to encourage and support university professors to pursue innovative high-technology R&D and set up technology start-ups for commercialization of results;

(f) introduce an appropriate profit-sharing mechanism to provide extra incentives for university professors and university students/postgraduates to pursue entrepreneurial technology activities in universities; and

(g) input more resources to shore up the funding size of the schemes and consider making progressively bolder attempts in financing R&D projects of local technology start-ups to create new impetus for I&T development.

In respect of investment of multinational corporations in the I&T industry (details in paragraphs 4.1.15 and 4.1.16), the Administration should –

(h) adopt a market-based approach to support the long-term development of venture capital and private incubator industries in Hong Kong; and

(i) consider possible ways to attract more private investment in the I&T industry by multinational corporations and encourage the corporations to seize investment opportunities in Hong Kong and set up regional R&D centres, so as to

promote long-term R&D investment activities and nurturing R&D talents.

In respect of the work effectiveness of the overseas Hong Kong Economic and Trade Offices (details in paragraphs 4.1.17 to 4.1.19), the Administration should –

(j) draw reference from the Israeli ERMS and KPI assessments concerned and formulate a set of standardized KPIs for overseas ETOs responsible for trade and investment promotion, with a view to enhancing the work effectiveness of overseas ETOs; and

(k) review the division of work among the overseas offices of InvestHK and Hong Kong Trade Development Council and overseas ETOs, so that their work and functions could be better coordinated to enhance cost-effectiveness of the relevant promotion efforts and achieve synergy in the promotion of Hong Kong's economic development.

In respect of Hong Kong's smart city development (details in paragraphs 4.1.20 to 4.1.22), the Administration should –

(l) put in efforts to widely promote the adoption of big data analytics and enhance relevant expertise and capability in the area;

(m) try to identify and open up more public and private data sets conducive to urban innovation such as areas of transport, finance and economy, etc.; and

(n) encourage government departments and private organizations to release data for free reuse by the public, but without compromising the protection of personal privacy.

4.3 Conclusions

4.3.1 The delegation considers the duty visit to Israel very enlightening and fruitful. Delegation members have the opportunity to exchange views with Members of the Israeli Parliament and representatives of Israeli Government authorities on the policies to nurture the development of I&T, and the measures of the Israeli Government to create and strengthen the infrastructure and supplement the resources required to support the I&T industry. Through the discussions with the representatives of TTCs of HU and TAU, delegation members have obtained very useful information on the experience in creating business connections among scientists, researchers and technological companies, and the ways to transfer new technologies from laboratory to marketplace more efficiently. The meetings with the representatives of venture capital fund corporations have provided delegation members with information on its role as a capital raising centre in propelling the development of Israeli technology start-ups.

4.3.2 The delegation is most impressed by Israel's determination to make the best use of all of the possibilities that lay before the country and to explore and conceive new opportunities to succeed in maintaining its role as the "Start-up Nation". In the discussion of policy areas relating to natural resources, energy and I&T, the delegation learns that Israeli Government officials, Members of the Israeli Parliament, and representatives of venture fund corporations, high-technology companies and TTCs hold the unanimous view that I&T is the only best way for the overall development of the country, and the spirit of risk-taking and fearlessness in the face of failure is the key to Israel's success.

4.3.3 Although the experience of Israel in the development of the I&T industry may not be directly applicable to Hong Kong given the distinct differences in socio-economic situations between the two places, the delegation believes that the information and observations gained during the duty visit shed light on and provide valuable reference for the long-term development of I&T in Hong Kong.

ACKNOWLEDGEMENTS

The delegation would like to sincerely thank all the distinguished individuals, including Members of the Israeli Parliament, officials of Israeli Government authorities involved in the formulation, implementation and monitoring of policies on I&T, as well as representatives of TTCs affiliated with leading universities, high-technology companies, venture capital and private equity fund corporations, and the desalination plant for receiving the delegation during the visit and briefing the delegation on the subjects of policies and initiatives relevant to the promotion of industrial R&D and facilitation of the growth of I&T industry. The delegation finds the meetings and briefings very useful.

The delegation would also like to express its deepest gratitude to the Consulate General of Israel and the Ministry of Foreign Affairs of the Israeli Government for the kind support in organizing the duty visit to Israel and the warmest hospitality the delegation received during its stay in Israel.

The delegation specially thanks InvestHK for lining up the meeting between the delegation and Ex Libris, during which the delegation was given a briefing on the company's mission and the Israeli Government's support measures to assist the growth of high-technology companies in Israel.

ACRONYMS AND ABBREVIATIONS

AI	Artificial intelligence
AMC	Advanced Manufacturing Centre
ASTRI	Hong Kong Applied Science and Technology Research Institute
CE	Chief Executive
CEDB	Commerce and Economic Development Bureau
Consul General of Israel	Consul General of the State of Israel in Hong Kong Special Administrative Region and Macao Special Administrative Region
cu m	Cubic metres
DT Hub	Data Technology Hub
ERMS	Export Request Management System
ESS	Enterprise Support Scheme
ETOs	Overseas Hong Kong Economic and Trade Offices
FTA	Foreign Trade Administration
GDP	Gross Domestic Product
GERD	Gross domestic expenditure on R&D
GFA	Gross floor area
HC	House Committee
HKPC	Hong Kong Productivity Council

ACRONYMS AND ABBREVIATIONS

HKSAR	Hong Kong Special Administrative Region
HKSP	Hong Kong Science Park
HKSTPC	Hong Kong Science and Technology Parks Corporation
HU	Hebrew University of Jerusalem
I&T	Innovation and technology
ICT	Information and communications technology
IEs	Industrial estates
IIA	Israel Innovation Authority
InvestHK	Invest Hong Kong
IoT	Internet of Things
IP	Intellectual property
ITB	Innovation and Technology Bureau
ITC	Innovation and Technology Commission
ITF	Innovation and Technology Fund
ITSP	Innovation and Technology Support Programme
JVP	Jerusalem Venture Partners
KPIs	Key performance indicators
MOU	Memorandum of Understanding

ACRONYMS AND ABBREVIATIONS

OCS	Office of the Chief Scientist
R&D	Research and development
Ramot	Ramot of the Tel Aviv University
RGC	Research Grants Council
RO	Reverse osmosis
SME	Small and medium enterprise
sq. m	Square metre
TAU	Tel Aviv University
testing laboratories	Testing and calibration laboratories
the Cyberport Management Company	Hong Kong Cyberport Management Company Limited
The Panel	The Panel on Commerce and Industry
the Park	Hong Kong-Shenzhen Innovation and Technology Park
the R&D Law	The Law for the Encouragement of Industrial Research and Development
the Review	Review on the utilisation and long-term development direction of Hong Kong Science Park and Industrial Estates
TSSSU	Technology Start-up Support Scheme for Universities

ACRONYMS AND ABBREVIATIONS

TTCs	Technology transfer companies
TTO	Technology transfer office
UICP	University-Industry Collaboration Programme
US	The United States
Yissum	Yissum Research Development Company

EXPENDITURE OF THE VISIT

The expenditure of the duty visit is as follows:

Item Note (1)	**Expenditure chargeable to participating Members' Overseas Duty Visit Accounts (nine Members joined the duty visit) (HK$)**	**Expenditure chargeable to the Secretariat's expenditure account (three Secretariat staff members joined the duty visit) (HK$)**
1. Air passage	139,030 Note (2)	31,995 Note (3)
2. Hotel accommodation (5 nights)	87,750 (1,950 per person per night)	29,250 (1,950 per person per night)
3. Meals and sundry allowance	55,300 Note (4)	18,384 Note (5)
4. Miscellaneous (travel insurance, souvenirs, telecommunications expenses, etc.)	1,375 Note (6)	7,704 Note (7)
Sub-total	283,455	87,333
TOTAL	**370,788**	

Note:

(1) As in-town transportation for the visit was provided by the Ministry of Foreign Affairs of the Israeli Government, the said item was not included in this expenditure report.

(2) The breakdown of air fare for the nine Members is as follows:
   (a) Economy class (one Member): $7,375 x 1 = $7,375
   (b) Economy seat PLUS class (five Members): $10,665 x 5 = $53,325
   (c) Business class (three Members): ($24,445 x 1) + ($26,942.50 x 2) = $78,330

(3) The air fare for the three staff members travelled on economy seat PLUS class: $10,665 x 3 = $31,995

(4) This included a subsistence allowance of $54,783 for nine Members from 23 to 26 July 2017 ($6,087 per Member), and an actual out-of-pocket expenses of $517 for the departure day on 27 July 2017.
(5) This included a subsistence allowance of $18,261 for the three staff members from 23 to 26 July 2017 ($6,087 per staff member), and an actual out-of-pocket expenses of $123 for the departure day on 27 July 2017.
(6) This included travel insurance expenses of $1,375 for five Members. The other four Members arranged travel insurance by themselves.
(7) The breakdown of this item is as follows:
    (a) Travel insurance expenses for three staff members: $825 ($275 per staff member)
    (b) Souvenir expenses: $3,370
    (c) Telecommunications expenses: $2,902
    (d) Miscellaneous expenses: $607

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Appendix I

Visit programme

23 July 2017 (Sunday)	Arrival at Tel Aviv, Israel [Note (1)]
	Meeting with the representatives of the Jerusalem Venture Partners
24 July 2017 (Monday)	Meeting with the representatives of the Israel Innovation Authority
	Smart City tour in Tel Aviv
	Visit to and meeting with the representatives of the Sorek Desalination Plant
25 July 2017 (Tuesday)	Visit to and meeting with Members of the Economic Affairs Committee of Knesset (Israeli Parliament)
	Meeting with Dr Shirley AVRAMI, Director of the Research and Information Center of Knesset
	Meeting with the representatives of Yissum Research Development Company of the Hebrew University of Jerusalem

26 July 2017 (Wednesday)	Meeting with the officials of the Ministry of Foreign Affairs
	Meeting with the officials of the Ministry of Economy and Industry
	Meeting with the representatives of Ex Libris, a leading provider of library automation solutions
27 July 2017 (Thursday)	Visit to and meeting with the representatives of the Tel Aviv University and its technology transfer company – Ramot
	Meeting with the representatives of Viola Group, a leading technology-focused private equity investment firm
	Depart for Hong Kong Note (2)

Note:
(1) The delegation departed for Israel on the evening of 22 July 2017 (Saturday).
(2) The delegation arrived in Hong Kong in the afternoon of 28 July 2017 (Friday).

Appendix II

List of organizations and representatives met by the delegation

23 July 2017 (Sunday)
The Ministry of Foreign Affairs Mr Hagai SHAGRIR, Head, Asia and Pacific Bureau Mr Omer CASPI, Director, North-East Asia Department, Division for Asia and the Pacific Mrs Ahuva SPIELER, Consul General of the State of Israel in Hong Kong Special Administrative Region and Macao Special Administrative Region (with effect from August 2017)
Jerusalem Venture Partners Ms Fiona M DARMON, Partner and Chief Operating Officer
24 July 2017 (Monday)
Israel Innovation Authority Mr Avi LUVTON, Senior Director, International Collaborations Division
Sorek Desalination Plant Mr Ronen WOLFMAN, Chief Financial Officer, Hutchison Water

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25 July 2017 (Tuesday)
Economic Affairs Committee of Knesset (Israeli Parliament) Chairman Mr Eitan CABEL Members Mr Abd AI Hakeem Haj Yahya — Mr Dov KHENIN Ms Yael COHEN PARAN — Ms Shuli MOALEM-REFAELI Mr Esawi FREJ — Mr Roy FOLKMAN Mr Ayelet NAHMIAS-VERBIN
Israel Ministry of Economy and Industry Ms Ziva EGER, Chief Executive, Foreign Investments & Industrial Cooperation
Research and Information Center of Knesset Dr Shirley AVRAMI, Director
Yissum Research Development Company – technology transfer company of the Hebrew University of Jerusalem Mr Matt ZAREK, Development Associate Director, Yissum

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26 July 2017 (Wednesday)
The Ministry of Foreign Affairs Mr Shahar SHELEF, Director of Political-Economic Research & Analysis, Center for Policy Research
The Ministry of Economy and Industry Mr Ohad COHEN, Trade Commissioner, Foreign Trade Administration
Ex Libris – a leading provider of high technology library automation solutions Mr Dvir HOFFMAN, Corporate Vice President, Resource Management Solutions
27 July 2017 (Thursday)
The Tel Aviv University and its technology transfer company – Ramot Professor Raanan REIN, Vice President, Tel Aviv University Ms Orly FROMER, Advisor to the President and Director of Academic Relations and Business Development in Asia Mr Natan ELISHA, Director of Business Development, Life Sciences and Agro-Tech, Ramot Mr Nimrod COHEN, Managing Partner, Tel Aviv University Ventures Mr Alon EPSTEIN, Head of Development, Lahav Executive Education
Viola Group – a leading technology-focused private equity investment firm Ms Natalie REFUAH, Partner, Viola Growth Mr Zvika ORRON, Partner, Viola Ventures Ms Orly SETTON, Investor Relations, Viola Group

Appendix III

Major incentive programmes implemented by Startup Division of the Israel Innovation Authority

Programmes	Objectives	Targets	Grants and/or support offered
Tnufa Incentive Programme	• Supporting entrepreneurs in formulating and validating an innovative technological concept and reaching the R&D stage.	• Private entrepreneurs. • New Israeli startup companies.	• The grant provided is up to 85% of the approved budget, with a maximum grant of ILS 200,000 (HK$442,000) for a period of up to two years.
Incubators Incentive Programme	• Supporting entrepreneurs with innovative technological concepts at the initial stage of R&D to establish startup companies and helping them reach a significant fundable milestone.	• Private entrepreneurs. • New Israeli startup companies.	• The grant provided is 85% of the approved budget, with a budget limit of ILS 3.5 million (HK$7.7 million) for a period of up to two years. • Incubators Note (1) provide supplementary investment financing of 15% of the approved budget. They also provide other assistance including (a) physical space and infrastructure; (b) technological and business guidance; (c) legal advice; and (d) access to partners, additional investors and potential customers.
Young Entrepreneurship Incentive Programme	• Educating youth on knowledge and skills related to business entrepreneurship.	• Students in middle and high schools.	• Students experience the entrepreneurial process by establishing a company and developing a real business venture. They are also mentored and assisted by businessmen from various fields in developing their projects.

Note: (1) The incubator offers a supportive framework for the establishment of a company and development of a concept into a commercial product. Today there are 18 technological incubators and one designated biotechnological incubator in Israel, which are privately owned by seasoned and experienced groups such as venture capital funds, multinational corporations, as well as private investors and others. They are intended to invest in new startup companies and provide them with administrative, technological and business support. The incubators are selected by the Israeli Government through competitive processes for a license period of eight years and are spread across Israel.

(Source: Israel Innovation Authority (2017))

Appendix IV

Major incentive programmes implemented by Growth Division of the Israel Innovation Authority

Programmes	Objectives	Targets	Grants and/or support offered
R&D Fund	• Encouraging industrial R&D related to the development of new products or upgrade of existing technology.	• Businesses operating in Israel at all stages of R&D.	• A grant of 20% to 50% of the approved R&D expenditures is provided. • Companies operating in development zones (periphery areas) are eligible for additional support of 10%.
Generic R&D Arrangement for Large Companies	• Encouraging and supporting large companies to invest in the development of technological knowledge that can be implemented in a series of products over a long time frame.	• Large Israeli companies with revenues of more than US$100 million (HK$780 million) and total R&D expenditures over US$20 million (HK$156 million), or Israeli companies that employ at least 200 employees directly in R&D.	• The grant provided is up to 50% of the approved R&D expenditures for long-term R&D plans or an R&D project executed in cooperation with another Israeli company.

(Source: Israel Innovation Authority (2017))

Appendix V

Major incentive programmes implemented by the Israel Innovation Authority to promote academia-industry collaboration

Programmes	Objectives	Targets	Grants and/or support offered
KAMIN Incentive Programme	• Encouraging applied research in academia that can attract the investment interests of business entities.	• To assist research groups from Israeli universities, colleges and other research institutions that seek to conduct applied research, and the results of which must be applicable to industries in Israel and potentially have high added value for the economy.	• A grant of 85% to 90% of the approved budget, up to a maximum amount of ILS 400,000 (HK$884,000) for a period of one or two years is provided.
NOFAR Incentive Programme	• Bridging the development gap between academic knowledge and industry needs in the fields of biotechnology and nanotechnology by providing support and guidance to the academic institutions.	• To assist academic research groups that carry out applied research, and the results of which are not mature enough to be supported by the industry.	• The grant provided is up to 90% of the approved budget with a budget limit of ILS 550,000 (HK$1.2 million) for a period of 12 months. • The supporting industry partner participates in providing professional guidance, setting research goals and funding 10% of the project cost.
MAGNETON Incentive Programme	• Encouraging technology transfer from academia to industry for developing breakthrough products.	• To assist the partnership of (a) Israeli industrial companies seeking to incorporate new technologies developed in the academia for product development; and (b) academic research groups from Israeli research institutes and think tanks approved by the Israel Innovation Authority.	• The grant provided is up to 66% of the approved budget, up to a total of ILS 3.4 million (HK$7.5 million) for a period of 24 months. The rest of the approved budget is funded by the partner company.
MAGNET Consortiums programme	• Supporting the development of generic technologies in fields which Israeli industry has a competitive advantage.	• To assist the partnership of (a) Israeli manufacturing companies developing innovative technologies and competitive products; and (b) Israeli academic research groups seeking to promote applied research as part of a consortium.	• The grant provided is up to 66% of the approved budget for an industrial company and 100% of the approved budget for a research institution (80% as a grant and 20% from the industrial companies in the consortium). • The operating period is three to five years.

(Source: Israel Innovation Authority (2017))

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