



Research Office
Legislative Council Secretariat



Fact Sheet

Innovation and Technology Development in Hong Kong

FS02/2022

1. Overview

- In Hong Kong, successive governments has attached great importance to the development of innovation and technology (I&T), with a view to pushing forward economic restructuring and more diversified development. In addition, **the 14th Five-Year Plan supports Hong Kong's development into an international I&T hub.** In his election manifesto, the Chief Executive also pledged to develop Hong Kong into an international I&T centre, and promote cross-disciplinary and cross-jurisdictional collaboration. More specifically, he identified **rationalising funding for research and development ("R&D"), keeping regulations abreast with the times, attracting top R&D talents and developing the Shenzhen-Hong Kong Loop ("the Loop") into the Shenzhen-Hong Kong Technology In-depth Cooperation Zone** as some areas that require attention.
- Gross Domestic Expenditure on R&D ("GERD") as a percentage of Gross Domestic Product ("GDP") in Hong Kong has been rising steadily from 0.46% in 2000 to 0.75% in 2010 and further to the latest figure of 0.99% in 2020 (in 2017, the previous-term government set a target to raise the ratio to 1.5% by the end of its term i.e. 2022). In addition, the number of R&D personnel increased from around 9 800 and 25 200 in 2000 and 2010 respectively to about 36 100 in 2020. Nevertheless, the figures still lagged noticeable behind Asian peers with more developed I&T sectors (See **Appendix** for details).
- Separately, the local startup ecosystem has become more vibrant in recent years. The number of startups supported by incubators and accelerators¹ and/or operating in co-working space rose remarkably from about 1 000 in 2014 to around 3 800 in 2021, when the amount of venture capital investment surged from around HK\$1.24 billion to about HK\$41.7 billion in the same period. Nevertheless,

¹ "Incubators" are organisations which help startups to overcome business challenges and achieve stable development by providing various assistance including mentoring and co-working spaces (examples include Cyberport Creative Micro Fund and Cyberport Incubation Programme); "accelerators" refer to programmes that aim at assisting startups to achieve rapid business growth, and they usually provide assistance such as funding support and workshops to help startups to connect with large enterprises and attract investments (such as SPRINTER jointly launched by the Hong Kong Science and Technology Parks Corporation, the Hongkong and Shanghai Banking Corporation and Hong Kong Business Angel Network, and SOW Asia which supports social enterprises exclusively).

as most startups focus on developing technology applications (e.g. Financial Technology, E-commerce, Supply Chain Management, Logistics Technology, Design and Data Analytics), they do not necessarily conduct significant amount of R&D activities.

- This *Fact Sheet* provides a brief summary of support policies for the I&T sector introduced in Hong Kong over the past year or so, the challenges encountered by the sector, and support and development initiatives rolled out in other places to tackle such issues.

2. I&T policy of the Government

- The Hong Kong Government spares no effort in promoting I&T development, through developing I&T infrastructure, promoting R&D, stepping up funding support schemes, supporting startups and innovative enterprises, and pooling talents. Recent initiatives on these fronts include:

2021 Policy Address	<ul style="list-style-type: none"> • Earmark an additional 250 hectares of land for I&T development, including 150 hectares for the San Tin Technopole. • Set up an “InnoLife Healthtech Hub” to focus on research work regarding biomedicine, chemistry, physics, engineering, big data, artificial intelligence, etc. • Grow the talent pool via different measures, such as continue to implement “Global STEM Professorship Scheme” to attract outstanding R&D talent from overseas to engage in teaching and R&D work in Hong Kong. • The Hong Kong Science and Technology Parks Corporation (“HKSTPC”) establishes the “GBA InnoAcademy” and the “GBA InnoExpress” in the Hong Kong Science Park Shenzhen branch to enhance training and exchange for I&T talent from both sides and to provide business development support services for I&T enterprises in Hong Kong and Mainland respectively. The two initiatives have been launched in July 2022 (see “Hong Kong-GBA I&T collaboration”). • The HKSTPC will also work with the local universities which have campuses in the Greater Bay Area (“GBA”) to establish incubator networks.
The 2022-2023 Budget	<ul style="list-style-type: none"> • Doubled total subsidy to HK\$440 million allocated to the 16 State Key Laboratories and six Hong Kong Branches of Chinese National Engineering Research Centres in Hong Kong to provide more support their R&D activities. • Doubled total subsidy to HK\$16 million for the “Technology Start-up Support Scheme for Universities.” • Set up a HK\$5 billion new investment fund “Strategic Tech Fund” to invest in technology enterprises and projects, and earmark HK\$10 billion to promote the development of life and health technology. • Establish the Digital Economy Development Committee and conduct a comprehensive e-government audit. The Committee held its inaugural meeting in July 2020, and committee members exchanged opinions on issues such as the digital economy, unleashing the potential of relevant industries, and strengthening education and manpower.
Initiatives rolled out since July 2022 under the current-term government	<ul style="list-style-type: none"> • Retitling of the Innovation and Technology Bureau as the Innovation, Technology and Industry Bureau in July 2022 to highlight re-industrialization as a standing policy function and work focus of the bureau. • Innovation and Technology Commission launched of the Innovation Hub@HK website (www.innovationhub.hk) in mid August 2022, as a showcase for the R&D outcomes of universities and research institutes in Hong Kong, a one-stop platform to connect universities, research institutes and the industry to facilitate the technology transfer and commercialisation of R&D outcomes, and assist the industry to enhance efficiency, thereby upgrading and transforming businesses and strengthening their competitiveness.

Hong Kong-GBA I&T collaboration

- Hong Kong's strength in basic research should provide considerable potential for synergistic growth in partnership with the Mainland cities in GBA which are strong in applied scientific research. Examples of recent collaborative projects in the region include:
 - **Hong Kong-Shenzhen Innovation and Technology Park ("HSITP")** — The HSITP is targeted to complete in phases from end-2024 onwards, serving as a key scientific research base as well as providing relevant higher education, cultural and creative, and other complementary facilities. The HSITP and areas around Lok Ma Chau/San Tin will be consolidated to form the San Tin Technopole, which, together with the Shenzhen Innovation and Technology Zone, will form the Shenzhen-Hong Kong Innovation and Technology Co-operation Zone of approximately 540 hectares;
 - **"Co-operation Arrangement on the Establishment of 'One Zone, Two Parks' in the Shenzhen-Hong Kong Innovation and Technology Co-operation Zone at the Lok Ma Chau Loop" ("Cooperation Arrangement")** — The governments of Hong Kong and Shenzhen signed the Cooperation Arrangement in September 2021 and launched a joint policy package to implement measures conducive to the flow of talent, scientific research resources and business development, etc.;
 - **"GBA InnoAcademy" and "GBA InnoExpress"** — In July 2022, the HKSTPC launched two programmes at the Shenzhen branch of the Hong Kong Science Park, namely (a) GBA InnoAcademy, as a resource centre, training hub and exchange platform for talents; and (b) GBA InnoExpress, to support startups and I&T enterprises to go global and attract foreign investment; and
 - **Guangdong-Hong Kong Technology Cooperation Funding Scheme ("TCFS")** — Under the TCFS, which is implemented by the Hong Kong Special Administrative Region Government, the Department of Science and Technology of Guangdong Province and the Science, Technology and Innovation Commission of Shenzhen Municipality, a total of 337 projects with a funding amount of HK\$970 million were supported by the Innovation and Technology Fund as of April 2022.

3. Challenges for I&T development in Hong Kong

- Given R&D can act as a key propeller of I&T development, the world-renowned R&D capacity (especially in basic research) of higher education sector in Hong Kong should prove to be vital. Five local universities were ranked among the top 100 in world university rankings in 2022, and GERD performed by the higher education sector as a percentage of GDP (at 0.53%) outperformed many Asian peers (such as Taiwan, Singapore and South Korea, with ratios ranging from 0.28% to 0.43%²).
- Regarding innovation and entrepreneurship, startups in Hong Kong attributed accessibility to international/regional markets and business opportunities in the Mainland, the simple tax system and low tax rate, and access to funding as their rationales for setting up in Hong Kong.³
- Notwithstanding the advantages mentioned above, development of I&T and promotion of applied research in Hong Kong are still subject challenges:
 - **University policies fail to encourage commercialization of discovery arising from academic research**——For instance, patents are usually owned by universities unless the inventor pays a high price to buy out the patent; as to revenue-sharing, researchers' share of revenue generated from university-led commercialization activities is limited to 25% to 50% if the institutions shouldered a significant portion of the costs; and staff is only allowed to engage in outside practices and activities for no more than one day per week.
 - **Need to strengthen nurturing and attracting talents**——I&T talents are vital to promoting I&T development. In 2020, Hong Kong had 4.9 R&D personnel per 1 000 population, lagging behind the corresponding figures of 19.6 and 8.6 in Shenzhen and South Korea respectively, and as compared with 8.1 in Singapore. Currently, prospects for local graduates from science and engineering programmes are not expected to be particularly promising, thereby discouraging elite students from pursuing relevant bachelor/postgraduate programmes. Meanwhile, the various talent admission schemes have yet to boost talent supply significantly.

² Japan has a ratio of 0.69%, which is higher than that in Hong Kong.

³ According to a survey conducted by InvestHK, key factors driving startups to set up in Hong Kong included accessibility to international or regional markets (73%), the simple tax system and low tax rate (67%), business opportunities in the Mainland (61%), and access to funding (59%).

- **University-industry collaboration, thus the effect on promoting commercialization of research results, remains limited**—— GERD performed by the business sector as a percentage of GDP was a mere 0.41%, markedly behind the figures in Singapore (1.15%), Japan, Taiwan, South Korea (ranging from 2.59% to 3.80%) and Shenzhen (5.09%). A survey indicated that only some 4 100 business establishments in Hong Kong (or around 1% of total) had undertaken in-house R&D activities in 2020, and just some 14% (around 600) of these business establishments had collaboration arrangements on R&D activities with other organizations.⁴
- **Need to foster closer R&D collaboration between Hong Kong and Mainland cities in GBA**—— Among the 600 business establishments having collaboration arrangements on R&D activities with other organizations in 2020, only 150 set up such arrangements with GBA-based institutions outside Hong Kong. A survey conducted by the University of Hong Kong also found that 90% of domestic-funded firms in the Mainland never hired I&T solutions developed in Hong Kong, citing reasons such as unaware of Hong Kong’s technology achievements, higher cost involved, and concerns over communications issues and ability to meet technological demands.
- **Need to strengthen linkage between I&T and technology application in the business sector and/or industrial development**—— The authorities have yet to establish a comprehensive policy on re-industrialization, and the relevant facilitation, promotion and support measures need to be more concrete and better coordinated.⁵ In addition, experiences from the places studied suggest that long-established manufacturers can gain from the adoption of smart technologies. Hong Kong may benefit from closely following such development.

4. Relevant experience of I&T development in the Mainland and overseas

- Both the Mainland and overseas places spare no efforts in driving I&T development for fostering sustainable economic growth and building up long-term competitiveness. A number of examples below can serve as reference for Hong Kong:

⁴ Other organizations include higher education institutions, public research institutes or affiliates of the establishments concerned.

⁵ In 2017, the Government established the Committee on Innovation, Technology and Re-industrialization (“the Committee”) that is responsible for putting forward appropriate development strategies and work proposals as well as enhancing cooperation and coordination among stakeholders. The Committee is chaired by the Financial Secretary, with members mainly drawn from the I&T and industrial sectors, as well as the Secretaries for Innovation, Technology and Industry Bureau, Commerce and Economic Development Bureau, Financial Services and the Treasury Bureau, and Education Bureau.

Singapore: Promoting cross-sectoral collaboration and supporting the manufacturing sector

- The Singaporean government has promulgated a series of 5-year national technology plan that sets out an array of measures to facilitate cross-sectoral collaboration, including: (a) establishing relevant institutions and infrastructure⁶; (b) forming designated platforms to **promote collaborative efforts at different R&D stages and enable sharing of knowledge, expertise and technology**; and (c) launching support programmes, such as providing funding for arranging secondment of research scientists and engineers from academia/research institutes to local enterprises for up to two years to enhance their competitiveness through helping them improve their production process or develop products.
- Moreover, Singapore in 2021 published its inaugural 10-year manufacturing sector roadmap, Manufacturing 2030, to focus on the development of advanced manufacturing and the provision of multiple support measures, such as:
 - “Industry 4.0 Human Capital Initiative Enabler Programme,” which **subsidizes companies to trial Industry 4.0 solutions in a low-cost and conducive environment** before implementation and scale-up; and
 - “A*STAR Future of Manufacturing Initiative,” which provides three additional platforms for facilitating access to (a) A*STAR’s advanced manufacturing equipment and facilities; (b) **a suite of plug-and-play technologies for easy adoption**; and (c) a virtual environment to experiment advanced manufacturing technologies.

Shenzhen: Encouraging commercialization of research results by the academia and attracting high-end talents

- Universities are required to allocate at least 50% of commercialized income to **reward relevant researchers**. They should also allow staff who takes sabbaticals to launch new businesses to keep their positions, and **consider their engagement in relevant outside practices when evaluating the performance of researchers**.
- The Shenzhen municipal government encourages universities to offer consultancy services to outside parties and **share facilities like laboratories, R&D centres and equipment with the industry**. Such facility sharing practices are included as part of the evaluation performance of universities.

⁶ For instance, Singapore established the Jurong Innovation District to link up enterprise, universities and/or research institution for greater clustering effect to facilitate a collaboration network along the advanced manufacturing value chain.

- In 2022, each individual would **receive at least RMB1.6 million (HK\$1.9 million)** under the high-level talent programme alongside housing and other benefits. Qualified talents could be further awarded with concessions for home purchases, rent-free housing and/or housing subsidies (for instance, those choosing to work in Nanshan are also eligible for a monthly housing subsidy of up to RMB5,000 (HK\$5,900) for three years).

Australia: Focusing on I&T talents for selected industries

- Australia's Global Talent Visa Program covers **10 target sectors**, including **Agriculture Technology, Health Industries, Defence, Advanced Manufacturing and Space, Digital Technology, and Financial Technology**. To be eligible for the visa, individuals must "prove they are internationally recognised with evidence of outstanding achievements" or be recent doctoral degree graduates, have the ability to attract a salary at or above AUD162,000 (HK\$830,000), and be able to **promote innovation and create jobs**. In 2021-2022, there are 15 000 places available under the program.

Japan: Creating technology talent at source

- The Japanese government puts much focus on school training and support to **prepare college/university students for I&T jobs**. The Ministry of Education, Culture, Sports, Science and Technology provides support for universities to launch the "University Science and Technology Innovation Creation Fellowship Programme," assisting doctoral students with living and research expenses, as well as **helping them secure career path after graduation** with a view to beefing up the potential talent pool.

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Gross Domestic Expenditure on R&D in selected places (2020)

	Gross Domestic Expenditure on R&D (“GERD”) as % of Gross Domestic Product (“GDP”)			
	Overall	Ratio of GERD performed by selected sectors to GDP (%)		
		Higher education	Business	Others
Hong Kong ⁽¹⁾	0.99	0.53	0.41	0.05
Singapore ⁽²⁾	1.89	0.31	1.15	0.43
Japan	3.59	0.69	2.59	0.32
Taiwan	3.63	0.28	2.99	0.35
South Korea	4.81	0.43	3.80	0.57
Shenzhen	5.46	0.11	5.09	0.26

Notes: (1) Preliminary figures; subject to change.

(2) Figures for 2019.

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Hong Kong

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Note : ^ Internet resources listed above were accessed in October 2022.