

## Innovation and Technology

**Promotion of Innovation and Technology:** Innovation and technology (I&T) are drivers for economic growth and the key to enhance competitiveness of our industries. In November 2015, the Innovation and Technology Bureau (ITB) was established to formulate holistic I&T policies, thereby fostering the development of I&T and related industries in Hong Kong, raising the competitiveness of Hong Kong and improving the quality of life of our citizens.

In her Policy Address in October 2017, the Chief Executive has set out eight major areas to step up Government's efforts to develop I&T, namely increasing resources for research and development (R&D), pooling technology talent, providing investment funding, providing technological research infrastructure, reviewing legislations and regulations, opening up government data, bettering procurement arrangements, and popularising science education. The Chief Executive also chairs personally a high-level steering committee to co-ordinate the Government's efforts to spearhead the I&T drive.

**The Innovation and Technology Commission (ITC)** under the ITB implements related policies and measures as well as provides excellent software and hardware support for key players to collaborate on research, development and innovation activities. The approach in promoting I&T development is underpinned by five core strategies: providing world-class technology infrastructure for enterprises, research institutions and universities; offering financial support to stakeholders in the industry, academia and research sector to develop and commercialise their R&D results; nurturing talent; strengthening science and technology collaboration with the Mainland and other economies, and fostering a vibrant culture of innovation. The ITC also works closely with other Government departments, the industrial and business sectors, tertiary institutions and industrial support organisations to promote applied R&D in different technology areas, as well as the upgrading of foundation industries.

**The Office of the Government Chief Information Officer (OGCIO)** under the ITB provides leadership for delivering information and communications technology (ICT) functions within the Government and enables the Government to take a proactive, leading role in championing ICT development in the

community. The OGCIO has five core missions: delivering effective, secure and citizen-oriented e-Government Services, meeting rising public expectations; nurturing and developing ICT talents in Hong Kong, enhancing competency and professionalism; developing a vibrant ICT industry, promoting high-tier data centres, cloud computing services, big data and cyber security awareness; developing Hong Kong into a world-class smart city; and promoting a digitally inclusive, knowledge-based society.

**Committee on Innovation, Technology and Re-industrialisation:** The Committee on Innovation, Technology and Re-industrialisation was established in April 2017 to advise the Government on matters relating to the promotion of I&T development and re-industrialisation in Hong Kong. The Committee is chaired by the Financial Secretary.

**Innovation and Technology Fund (ITF):** The Government set up the ITF in 1999 with an injection of \$5 billion to support projects that help industries develop innovative ideas and upgrade their technological level. Three injections amounting to a total of \$9 billion were made in the past years. An additional \$10 billion injection was approved by the Legislative Council in July 2018 to continue the operation of various funding schemes and implement new initiatives under the ITF.

There are 15 programmes under the ITF to cater for different needs: Innovation and Technology Support Programme; Guangdong-Hong Kong Technology Cooperation Funding Scheme (TCFS); Partnership Research Programme; Enterprise Support Scheme; R&D Cash Rebate Scheme; Midstream Research Programme for Universities; Public Sector Trial Scheme; Technology Voucher Programme; Researcher Programme; Postdoctoral Hub; Reindustrialisation and Technology Training Programme; Technology Start-up Support Scheme for Universities; Innovation and Technology Venture Fund; General Support Programme; and Patent Application Grant. As at the end of January 2019, 9 514 projects with a total ITF funding of \$15.5 billion were approved, of which 3 757 are R&D projects. Most of the funded R&D projects were related to information

technology (34 per cent); electrical and electronics (26 per cent); manufacturing technology (16 per cent); and biotechnology (8 per cent).

### **The Hong Kong Science and Technology Parks Corporation (HKSTPC):**

The HKSTPC was established in May 2001 to provide one-stop infrastructural and other support services to technology-based companies and activities. It offers a comprehensive range of services to cater for the needs of industry at various stages, ranging from supporting technology start-ups through incubation programmes, providing premises and services in the Hong Kong Science Park for applied R&D activities, to providing land and premises for production in the industrial estates.

The 22-hectare **Hong Kong Science Park** located in Pak Shek Kok is an important I&T infrastructure in Hong Kong. It provides a conducive environment to nurture world-class clusters, through making available suitable buildings for lease to technology-based enterprises to carry out R&D work. Its target sectors are biomedical technology, electronics, green technology, information and communications technology, and material and precision engineering.

The Science Park provides state-of-the-art laboratories and shared facilities which help reduce the capital investment of technology companies in product design and development, and enable rapid entry of new products into the market at lower cost. They include the IC Failure Analysis Laboratory, Reliability Laboratory, Robotics Catalysing Centre and Biomedical Technology Support Centre. The HKSTPC is developing two building blocks as Stage 1 of the Science Park Expansion Programme, which will be completed in 2019. In addition, an InnoCell is being developed adjacent to the Science Park to provide residential units with flexible design and ancillary facilities for leasing to principals of tenants and incubatees of the Science Park as well as their employees and visiting researchers from the Mainland and overseas. It is expected to be completed by end 2020.

The HKSTPC manages three **industrial estates (IE)**, located at Tai Po, Yuen Long and Tseung Kwan O, which provide 217 hectares of land in total. The Government and the HKSTPC have revised the IE policy to support re-industrialisation for promoting smart production and high value-added industries. In future, the HKSTPC would mainly build and manage specialised multi-storey industrial buildings for rental to multiple I&T-based industrial partners. The HKSTPC is also developing the Data Technology Hub and the Advanced Manufacturing Centre in the Tseung Kwan O IE for completion

in 2020 and 2022 respectively. The Government will also provide an additional allocation of \$2 billion to the HKSTPC to build manufacturing facilities in the industrial estates for the dedicated advanced manufacturing sector.

To reinforce the role of the Science Park as Hong Kong's flagship technology infrastructure, the Government has allocated \$10 billion to the HKSTPC. Of this, about \$3 billion will be used to construct research-related infrastructure and facilities, whereas the remaining \$7 billion will be used for enhancing support for its tenants and incubatees.

The Government is pressing ahead with the establishment of two research clusters – the “Health@InnoHK” on healthcare technologies and the “AIR@InnoHK” on artificial intelligence and robotics technologies – at the Science Park to attract the world's top universities, research institutes and technology enterprises in the relevant fields to conduct more collaborative research in Hong Kong. An allocation of \$10 billion has been set aside. Non-profit-making research laboratories set up in these two clusters will be provided with financial support. The target is for the research laboratories to be set up progressively in the clusters starting from the fourth quarter of 2019.

### **Hong Kong Cyberport Management Company Limited (Cyberport):**

The Cyberport brings together a cluster of high quality ICT and related enterprises. Through the provision of financial and a range of professional support, the Cyberport has implemented numerous public mission programmes and organised various events to nurture start-ups over the years. The Cyberport also provides advanced technology infrastructure, runs internship programmes for ICT students and incubation programmes for new start-ups, and facilitates synergy and partnership among members of the ICT industry.

In 2018, the Government allocated \$300 million to the Cyberport for strengthening the support to its tenants/incubatees and promoting the development of e-sports in Hong Kong.

\$5.5 billion has also been earmarked for the development of Cyberport 5 which is expected to be completed in 2024.

### **The Hong Kong Productivity Council (HKPC):**

The HKPC provides integrated support services to help Hong Kong's industrial and commercial enterprises achieve a more effective use of resources and increase the value added content of products and services, thereby enhancing productivity and competitiveness. Anchored on its core competence in manufacturing technologies, information technologies, environmental technologies, and management systems, the

HKPC has been helping Hong Kong's industrial and commercial enterprises in technology and process upgrading, promoting re-industrialisation and helping innovative industries move up the value ladder and tap new business opportunities.

**Five R&D centres:** In 2006, the ITC set up five R&D centres to drive and co-ordinate applied R&D in five focus areas, namely automotive parts and accessory systems; information and communications technologies; logistics and supply chain multi-tech; nanotechnology and advanced materials; and textiles and clothing. Since their establishment, the centres have been working closely with the industries in conducting industry-oriented R&D and promoting commercialisation of the R&D results. As at the end of January 2019, 1 286 projects from the R&D Centres were approved at a total project cost of about \$6.8 billion.

**Talent:** Human resources are essential to the promotion of I&T in Hong Kong. Towards this end, the ITC has introduced a Researcher Programme to fund organisations undertaking ITF-funded R&D projects, incubatees and I&T tenants of the HKSTPC and the Cyberport, and I&T start-ups selected for co-investment under the Innovation and Technology Venture Fund to recruit graduates as researchers to assist in the R&D projects, with an aim of encouraging them to pursue a career in I&T. As at the end of January 2019, a total of 3 815 researcher positions were approved

To nurture and bring together more technology talent, the Government has launched in August 2018 the Postdoctoral Hub, which provides funding support for the recruitment of postdoctoral talent for R&D work, and the Reindustrialisation and Technology Training Programme, which subsidises local enterprises on a 2:1 matching basis to train their staff in advanced technologies, especially those related to "Industry 4.0". The funding period of both Researcher Programme and Postdoctoral Hub has been extended from two years to three years with effect from 27 February 2019.

The Government also rolled out the Technology Talent Admission Scheme in June 2018 to provide a fast-track arrangement for the admission of overseas and Mainland technology talent to undertake R&D work in Hong Kong. The scheme is open to tenants and incubatees of the HKSTPC and the Cyberport that are engaged in the areas of biotechnology, artificial intelligence, cyber security, robotics, data analytics, financial technologies and material science.

The OGCIO implements an eight-year Enriched IT Programme in Secondary Schools from the 2015/16 school

year with an aim to nurture young IT talent to meet future development needs. Through collaboration among secondary schools, tertiary institutions, industry and the Government, eight partner secondary schools have established enriched IT classes to provide intensive IT training to students (from secondary two to secondary six) who are interested and talented in IT. The Programme also supports secondary schools to organise IT activities to foster a pro-IT atmosphere and stimulate interest in IT in the school community. To further help young people build a sound foundation in IT to prepare for pursuing IT-related tertiary education and eventually the I&T industry, \$500 million has been earmarked to implement the IT Innovation Lab in Secondary Schools initiative under the Enriched IT Programme. Financial support will be provided to all publicly funded secondary schools to set up an IT Innovation Lab to enhance IT facilities, and organise more IT-related extra-curricular activities outside traditional classroom learning.

#### **Innovation and technology co-operation with the Mainland:**

The Government strives to strengthen I&T co-operation with the Mainland. Hong Kong has world-class universities, tremendous strength in scientific research, international business environment, a robust rule of law and intellectual property rights protection system, and so forth. Meanwhile, the Mainland has a massive market, as well as the capability of research results commercialisation and advance manufacturing. There are 16 State Key Laboratories in Hong Kong and six Hong Kong Branches of Chinese National Engineering Research Centres.

The Central Government affirms the solid science and technology foundation and high quality technology talents of Hong Kong. President Xi Jinping made an important instruction which supports Hong Kong's development into an international I&T hub. The Government is also actively participating in the work of developing the Guangdong-Hong Kong-Macao Greater Bay Area into an international I&T hub. The Ministry of Science and Technology (MOST) and the Ministry of Finance has announced that universities and research institutions in Hong Kong can apply for science and technology funding of the Central Government and use the funding in Hong Kong. This policy allowing cross-boundary remittance of research funding will inject impetus into the city's research sector.

The MOST and the Government of the Hong Kong Special Administrative Region (HKSAR Government) signed the Arrangement on Enhancing I&T Cooperation between the Mainland and Hong Kong in September 2018. The Arrangement and its annex, Joint Action Plan on Mainland and

Hong Kong I&T Collaboration, will serve as an action guide and framework for the two parties to take forward the various I&T co-operation initiatives in the coming few years. Both sides will follow up relevant policies and matters through the Mainland/Hong Kong Science and Technology Co-operation Committee jointly established by the MOST and the HKSAR Government.

Guangdong and Hong Kong have launched the TCFS since 2004 to encourage collaboration between research institutions and industries of the two places. As at the end of January 2019, the ITF has funded 265 TCFS projects with a total amount of about \$860 million. Among the 265 projects, 103 were jointly funded by Guangdong/Shenzhen authorities and the HKSAR Government, involving ITF funding of about \$230 million.

The HKSAR Government and the Shenzhen Municipal People's Government are jointly developing the Lok Ma Chau Loop into Hong Kong-Shenzhen Innovation and Technology Park (the Park), setting up a key base for scientific research, as well as relevant higher education, cultural and creative and other complementary facilities in the Park. The Hong Kong-Shenzhen Innovation and Technology Park Limited (HSITPL), vested with the responsibilities of superstructure construction, operations, maintenance and management of the Park, commenced two studies related to the Master Planning and Business Model and Business Planning for the Park in 2018. In the same year, the HKSAR Government also commenced the works contract for land decontamination and advance works, and the consultancy on detailed design and site investigation of Main Works Package 1, aiming to deliver the first batch of land parcels by 2021 for the HSITPL to construct the first batch of buildings and relevant facilities.

The OGCIO takes active steps to facilitate exchange and collaboration between the ICT industries of Hong Kong and the Mainland. The OGCIO has been leading local ICT delegations to visit the Mainland to explore collaboration and business opportunities, taking advantage of Mainland's implementation of the strategic "Internet+" and "Belt and Road" initiatives. The OGCIO regularly takes part in major ICT exhibitions in the Mainland providing opportunities for local ICT companies, especially SMEs, to showcase their innovative products and services and to tap into the Mainland market.

The OGCIO collaborates closely with Guangdong Province with the establishment of the Hong Kong/Guangdong Expert Group on Co-operation in Informatisation. The OGCIO has put in place the mutual recognition scheme of electronic signature certificates between Hong Kong and Guangdong which helps

enhance security and reliability of cross-boundary e-commerce between the two places. The Hong Kong/Guangdong ICT Expert Committee has been set up to strengthen co-operation of the two places in promoting the development and adoption of cloud computing, big data, Internet of Things, smart city and other technologies. The Committee will also work on formulation of standards in the said technical areas that are applicable to both places. In 2016, Hong Kong joined the Cloud Computing Working Group of the National Information Technology Standardisation Committee to participate in formulation of the Cloud Service Purchase Guideline.

**Fostering an Innovation and Technology Culture:** The ITC organises an annual InnoTech Month which comprises InnoCarnival, roadshows, exhibitions, guided tours, workshops, talks and technology competitions etc. to arouse the interest of the general public in I&T. The ITC also supports I&T-related competitions such as the Hong Kong Student Science Project Competition and the Joint School Science Exhibition. The Innovation and Technology Scholarship recognises outstanding undergraduates who undertake science or other science-related degrees in local universities and encourages them to pursue I&T as a career.

The Internet Economy Summit is an annual signature event to provide a platform for the Mainland and international ICT visionaries and business leaders to share their insights on the development of Internet economy, and promote Hong Kong as a bridge connecting the Mainland and international markets.

The OGCIO has been collaborating with the local ICT industry in organising the Hong Kong ICT Awards since 2006 to recognise outstanding achievements and to showcase Hong Kong's ICT innovation and successes.

**Encouraging Local R&D Activities:** To encourage enterprises to invest more in local R&D and promote local R&D activities, the Government provides enterprises with enhanced tax deduction for their expenditure incurred in qualifying R&D activities. The deduction will be 300% for the first \$2 million spend on qualifying R&D and 200% for the remaining amount. There is no cap on the amount of enhanced tax deduction. The deduction is applicable to qualifying R&D expenditures incurred on or after April 1, 2018.

**Smart City Development:** the Government published the Smart City Blueprint for Hong Kong in December 2017, outlining the Government's vision and mission to build Hong

Kong into a world-class smart city. The Blueprint maps out development plans up to 2022 and beyond, covering six major areas, namely “Smart Mobility”, “Smart Living”, “Smart Environment”, “Smart People”, “Smart Government” and “Smart Economy” and providing a clear and concrete direction for the smart city development in Hong Kong. Three digital infrastructures in supporting Smart City Blueprint are under development.

- **eID:** The OGCIO will set up a one-stop online eID system to provide an eID for all Hong Kong residents free of charge on a voluntary basis, enabling them to use a single digital identity and authentication method to conduct government and commercial online transactions. This will foster the development of a new economic service model that emphasises direct interface with residents and consumers. The eID system is expected to commence operation by mid-2020.
- **Pilot Multi-functional Smart Lampposts Scheme:** The OGCIO will implement a pilot scheme of replacing some existing 400 lampposts with smart lampposts in four selected districts in the territory with higher pedestrian flow, including Central/Admiralty, Causeway Bay/Wan Chai, Tsim Sha Tsui and Kwun Tong/Kai Tak Development Area. Smart devices will be installed in the smart lampposts to provide convenient data services and collect various real-time city data, enhance city and traffic management, and complement the future infrastructure development for the fifth generation (5G) mobile communications services in Hong Kong. The first batch of lampposts will commence service in mid-2019.
- **Next Generation GovCloud and Big Data Analytics Platform:** The OGCIO will modernise the existing government cloud infrastructures and adopt a new application architecture. Through implementing this new platform, bureaux and departments can expedite the development and delivery of digital government services, including the big data analytics and artificial intelligence applications. The Next Generation GovCloud platform will go live in the third quarter of 2020.

**Wi-Fi Connected City:** To make it easier for the public and visitors to access free Wi-Fi services in Hong Kong, the OGCIO has been collaborating with the industry to promote public Wi-Fi services which are offered by the public and

private organisations completely free of charge or free for a certain period of time under the common Wi-Fi brand “Wi-Fi.HK” since 2014.

**Data Centres:** The OGCIO champions initiatives and measures to develop Hong Kong as a prime location for high-tier data centres in the region. The Data Centre Facilitation Unit established under the OGCIO provides information and one-stop support to assist enterprises interested in setting up data centres in Hong Kong, including conversion of existing industrial buildings and industrial lots for data centre use, and works with government departments on measures to facilitate the setting up of data centres taking into account their unique mode of operation.

**Cyber Security:** The OGCIO adopts a robust management framework and maintains a comprehensive set of information security policy and guidelines with regular audits to continuously enhance cyber security within the Government. Multi-layer safeguards are in place to protect the digital assets of the Government.

The OGCIO has established a dedicated governmental computer emergency response team (GovCERT.HK) to handle information security incidents in the Government in an effective and co-ordinated manner.

In collaboration with key partners, the OGCIO promotes awareness of cyber security in the community and provides practical advice to guard against cyber attacks through various channels and means, such as the Hong Kong Computer Emergency Response Team Coordination Centre, Cyber Security Information Portal ([www.cybersecurity.hk](http://www.cybersecurity.hk)), seminars, contests and school visits. To further enhance Hong Kong’s overall capability to deal with cyber threats, the OGCIO spearheads the Cybersec Infohub, i.e. a public-private-partnership programme, with funding support from TechConnect (Block Vote) under the ITB to promote cross-sector collaboration and sharing of cyber security information on trusted platforms.

**E-Government:** The GovHK portal ([www.gov.hk](http://www.gov.hk)), the one-stop portal of government information and e-services, was launched in 2007, followed by its account-based platform – MyGovHK in 2010, to provide single access to an array of personalised e-Government services. The GovHK portal adopts responsive web design to enhance user experience and meet the increasing demand of the public for mobile services.

The revamped Public Sector Information (PSI) portal (data.gov.hk) was launched in December 2017 to make government information released online and free of charge for public consumption available in digital format with new and enhanced functions such as visualisation of multiple datasets on a map, with a view to tapping creativity and wisdom of the community in developing innovative applications with PSI, thereby bringing about convenience to the citizens and business opportunities to the industry.

The OGCIO facilitates the implementation of mobile e-Government services through providing support to Government departments and developing mobile applications commonly used by them for public services.

A new policy on opening up government data was firmed up in September 2018, stating that government bureaux and departments (B/Ds) should endeavour to release their data for free public use. Over 80 government B/Ds have published their first annual open data plans by end of 2018.

**IT Strategy:** The OGCIO formulates government-wide IT strategy and advises government bureaux and departments in their formulation of departmental IT strategy addressing policy objectives. The OGCIO facilitates government bureaux and departments to plan and execute their IT-enabled change initiatives in a more agile, cost effective and co-ordinated manner by adopting cloud computing and other emerging technologies. These initiatives include:

- **Electronic Information Management:** In line with the government-wide electronic information management strategy that embraces content management, records management and knowledge management, the OGCIO is implementing common shared services such as electronic recordkeeping and collaborative workspace on cloud platform for adoption by government bureaux and departments.
- **Electronic Procurement:** The OGCIO is rolling out its cloud-enabled electronic procurement service to government bureaux and departments to enhance efficiency from the automated and integrated procurement processes. Suppliers also reap the benefits of shorter transaction turnaround time and greater business opportunities.
- **Government Human Resources Management Services (GovHRMS):** Providing common IT services to facilitate

human resources management activities of staff members as well as strategic manpower planning and human resources management decision making in Government. The OGCIO monitors the development and implementation of the GovHRMS.

- **Government Data Centre Service Arrangements:** The OGCIO is building a government data centre complex with a view to consolidating some of the existing government data centres, leading to better economy of scale, cost effectiveness as well as greener management in the overall government data centre operations.
- **Government Electronic Communications Infrastructure:** The OGCIO establishes and maintains an advanced and secure electronic communications infrastructure for effective and efficient communications and collaboration in government operations and delivery of public services.

**Digital Inclusion:** To facilitate access to online information and services by everyone including persons with disabilities, the OGCIO has been implementing a Web/Mobile App Accessibility Campaign since 2011 through a multi-pronged strategy ranging from Government leadership, fostering awareness, promulgating guidelines and tips, nurturing expertise and organising recognition scheme to encourage adoption of accessibility design. Since 2018, the Hong Kong Internet Registration Corporation Limited (HKIRC) has become the organiser of the Web Accessibility Recognition Scheme, while the OGCIO co-organises the scheme. The HKIRC is a non-profit making and non-statutory corporation to manage and administer the registration of Internet domain names under .hk and .香港 country-code top level domains.

The OGCIO has been conducting the ICT Outreach Programme for the Elderly since 2014 to help institutionalised and “hidden” elderly, and elderly receiving day care services and home care services experience how ICT can spice up their life and facilitate an active and healthy ageing. Since 2017, services have been further extended to cover elderly people with dementia. The Programme was regularised from 2018-19. An Enriched ICT Training Programme for the Elderly was also introduced in February 2019 for elderly persons with basic ICT knowledge to learn about the adoption of digital technology in their daily living and serve as trainers to help more elderly people acquire technology knowledge. In the second half of 2019, the OGCIO will establish a web-based

learning portal to help the elderly and people in need acquire digital skills in a fun manner, so that they can benefit from the advancement in digital technology in their daily living.