



2022 Policy Address Submission

Policy Research Centre for Innovation and Technology
The Hong Kong Polytechnic University

The Hong Kong Polytechnic University Policy Research Centre for Innovation and Technology (PReCIT)

Recommendations on 2022 Policy Address

The Year 2022 is a special and milestone year for Hong Kong. Firstly, it marked the historic moment of the 25th anniversary of the establishment of the Hong Kong Special Administrative Region (HKSAR). Secondly, it witnessed the inauguration of the sixth-term HKSAR Government led by the Chief Executive, Mr John LEE Ka-chiu, on the 1st of July 2022.

The Chief Executive will deliver his first Policy Address on the 19th of October 2022, three months after the inauguration. In his opening remarks given at the Global Innovation and Technology Summit (大灣區國際科創峰會) on the 11th of August 2022, he mentioned that the National 14th Five-Year Plan had set out in its prologue to deliver our country into an innovative nation with a strong focus on science and technology. He also expressed clear support for Hong Kong to develop into an international innovation and technology (I&T) hub. Furthermore, he reiterated that Hong Kong should seize the opportunities to foster its I&T development and attract global talents to our city. Finally, he indicated that he would express his views and recommendations, as well as relevant measures on the I&T development of Hong Kong, in the Policy Address.

It is clear that the I&T development of Hong Kong will be one of the key foci in the upcoming Policy Address, in which the Chief Executive will deliver to the public clear directions and policies on the I&T development formulated by his team. Policy Research Centre for Innovation and Technology (PReCIT) of The Hong Kong Polytechnic University (PolyU), a university-level research centre aspiring to be a leading research centre in Hong Kong and the region with an influential voice in the field of innovation and technology, development strategy, and related policies, would like to make the following suggestions and sincerely hopes that the Chief Executive would consider including our suggestions in the Policy Address.

1. Strengthening Hong Kong Status as an International Innovation and Technology Hub to Foster the Development of Carbon-neutral City

1.1 Considering Hong Kong's Strength in Financial Services

Hong Kong should make more efforts to welcome institutional investors and corporate participants from overseas to develop Hong Kong into a global carbon trading centre, thereby strengthening Hong Kong's position as an international financial centre. According to a report released by the International Institute of Green Finance, Central

University of Finance and Economics, in August 2022, there is a huge demand for global transformation funds. It is estimated that about 1.6 to 3.8 trillion USD of the annual global infrastructure investment of about 6.9 trillion USD was spent on energy transformation investment. In China, according to the Governor of the People's Bank of China, Mr YI Gang, the demand for carbon emission reduction funds in our country's carbon peak stage is about 2.2 trillion RMB per year, and the demand for funds in 2030-2060 is about 3.9 trillion RMB per year. The estimations from other institutions also indicate that our country's capital needs to achieve the dual carbon goals are at the trillion level.

The huge demand for transformation funds presents opportunities for an international financial centre like Hong Kong. Hong Kong can attract international capital investment and promote the development and market-oriented application of green and low/negative carbon technologies. Hong Kong can also empower the green and low-carbon transformation of other regions. By providing financial support for the transformation, Hong Kong can effectively consolidate its status as an international financial centre. More importantly, doing so can set Hong Kong on its way to a leading carbon trading centre in China.

1.2 Strengthening the Construction of the Financial Standardization System for Transformation and Improving Related Supporting Measures

In order to attract more international capital into the low-carbon transition field, Hong Kong should focus on transforming the financial standardization system and infrastructure construction, financial instrument innovation and risk management, and information transparency. At present, the definition of transition finance has not yet been unified internationally. The non-uniform standards hinder the flow of capital. This is a great opportunity for Hong Kong to step into its role as an international financial centre and a bridge at home and abroad by continuously promoting transition finance and unified standards.

At the same time, transformational financial tools are an important starting point for promoting the development of green and low-carbon projects and are also the main means to meet various financing needs of the market. Innovative transformational financial tools can provide more financial support for green and low-carbon projects and entities, thereby promoting economic and social development. Therefore, Hong Kong should carry out more financial innovations under the premise of effective risk management, and promote the development of transformational financial instruments,

such as transformational and sustainability-linked bonds. In addition, given that information transparency can reduce the identification cost of investors and help promote capital flow, Hong Kong should focus on building an environmental information disclosure policy system and disclosure requirements.

1.3 Strengthening the Linkage with the Mainland to Promote Low-carbon Transformation

Hong Kong is inseparable from the support of the Mainland in its low-carbon transformation. Besides, Mainland has a huge market for developing renewable energy, so strengthening the cooperation with the Mainland is imperative, particularly regarding the development of large-scale and efficient zero- or low-carbon energy.

At the same time, Hong Kong is an essential window for enterprises in China to raise funds and invest abroad. As such, Hong Kong plays a critical role as a connection platform for promoting the transformation of Mainland financial standards to the international financial system. Based on this, Hong Kong should strengthen international and domestic transformation financial cooperation and exchanges, such as by strengthening ESG report disclosure requirements for listed companies, carbon emission data acquisition and database construction, corporate net zero emission guidelines, etc.

In addition, Hong Kong attaches great importance to the role of the carbon market in transforming the financial sector. Currently, there is still a need for more cooperation and exchanges in the regional development of the carbon market. Therefore, the Government should further clarify the development orientation of the Hong Kong and the Mainland carbon markets.

The Greater Bay Area (GBA) is facing some constraints in financial capital flows, and there are still significant differences in the legal, fiscal and taxation systems in Guangdong, Hong Kong and Macao. The advanced attributes of some green financial products and services make inter-regional cooperation ever more complex. To respond to this, the Government should work with other GBA governments to develop a systematic green financial cooperation plan, including a green financial exchange mechanism and unified standards for cooperation for the free flow of green financial resources and factors.

The Government should also pay attention to the global responses to the current energy crisis in Europe. The current geographical tension has resulted in an energy crisis in Europe, and many European countries have revised their commitment to carbon neutrality. For example, Belgium has extended its deadline for the exit of nuclear power, and the Netherlands has removed a cap on energy generated by coal-fired power plants. More recently, Copenhagen, the capital city of Denmark, has given up the goal of becoming a carbon-neutral city by 2025. While it is difficult to predict whether Hong Kong will face similar challenges in the future, the Government should remain alert to all these developments so that our carbon neutrality goal will not be hindered and the carbon neutrality-related market can maintain its high level of resilience.

1.4 Strengthening the Development of Renewable and New Energy

The Government should devote more resources to scaling up renewable energy as the potential has not yet been utilized effectively. To generate electricity, Hong Kong is currently relying on the import of nuclear energy and the burning of natural gas and coal. Although natural gas (methane) is much cleaner than coal in terms of sulfur and nitrogen emissions, it is not the ultimate solution to carbon neutrality as it also releases large amounts of carbon dioxide. Given the limited land in Hong Kong, if we do not plan to import more power (e.g., nuclear) from the Mainland, we need to have more offshore wind and solar farms. To this end, Hong Kong needs to be more proactive in using green hydrogen to replace natural gas and actively explore the possibility of a hydrogen infrastructure.

1.5 Developing a Real-time Carbon Tracking and Monitoring System

The electricity consumption in buildings is the main cause of carbon emissions. Apart from the energy saving and conservation technologies that should be further developed and equipped with, it is also important to let the big energy consumers know how much carbon they are consuming in a real-time manner during a different time of the day (i.e. a real-time carbon tracking and monitoring system). This information can help consumers reduce their carbon emissions effectively. A carbon emission auction market-driven mechanism is also desired and required to be designed to drive and encourage energy consumers to reduce their carbon usage.

1.6 Ensuring Green Electric Vehicles (EVs)

The zero-carbon emission transport is very important to achieve a carbon-neutral future and improve the air quality in dense metropolitan cities like Hong Kong. The Government should ensure that most EVs use the electricity from the generation with low carbon intensity. Otherwise, using EVs will cause more carbon emissions in other places. We should also develop a new scheme of control agreement (SCA) to encourage the power utilities to invest in more EV charging facilities. Apart from these, some incentive schemes can also be designed to facilitate the interactions between the EVs and the power grid (e.g. V2G) to improve the flexibility and resilience of the power grid. This will allow more renewables to be penetrated into the power grid to achieve the carbon neutrality target.

2. Seizing the Global Opportunities to Foster the I&T Development in Hong Kong

2.1 Attracting Talents to Consolidate the Foundation of Scientific and Technological Research and Development

High academic-level scientific research talents with rich experience in basic research and quality control have always been the biggest advantage of Hong Kong. However, in the face of the challenge of brain drain, how should Hong Kong attract and nurture more scientific research elites from near to far?

In nurturing local talents, providing more experiential learning opportunities should be the first priority as it can inspire an interest in scientific research among the younger generation. It is also necessary to strengthen the promotion to the public and improve the social status of the scientific research community so as to attract more high-quality young talents to join the industry and expand the foundation of the scientific community. The Government should look into developing university-based research programmes jointly hosted by universities in Hong Kong and the Belt and Road countries and providing scholarships for students studying the programmes. The Government can further supplement this strategy by providing subsidies for local I&T enterprises to recruit students after graduation. Besides retaining talent, such subsidies will also allow room for an increase in the salary package of the I&T professionals.

The Government should also produce measures that ensure the quality of living for top talents to remain competitive at a global standard. Past experiences have shown that having an interest in I&T is not enough to commit to it because high-calibre talents usually want a high-quality living, including a competitive income and promising prospects. This is particularly crucial given the sky-high accommodation cost in Hong Kong. Launching an I&T talent support scheme is crucial. To attract local talents to study I&T-related subjects, the Government should strive to strengthen or reform the ecosystem, making Hong Kong a livable city, abundant with quality job opportunities.

Furthermore, it will be worth the while for the government to encourage tech giants from the Mainland and overseas to build research laboratories in Hong Kong or move their headquarters to Hong Kong. This initiative would help create a favourable business environment for technology companies and start-ups while providing new employment opportunities for local and overseas talents. To further maximize this strategy, the Government can organize conferences, seminars, meetings and summits to promote Hong Kong enterprises in our I&T sector. This strategy can effectively attract enterprises worldwide to start their businesses in Hong Kong.

Driving scientific research from academia to practice is also key to talent retention and long-term development. This can be achieved with a close and systematic collaboration between the local universities and the Government; Specifically, while Hong Kong universities can focus on researching and developing innovative technologies and seeking technological breakthroughs in the upper and middle reaches, the Government should promote collaboration between universities and the five government-funded Research & Development (R&D) institutions to conduct mid-stream and downstream development and practice. At the same time, the Government should devise measures that can motivate the industry to pick up the commercialization part. Promoting this close cooperation and win-win model can facilitate the transformation of scientific research results into production in the industry and make innovative technologies applicable and in line with societal needs.

2.2 Expanding Scientific Research into a Complete Industrial Chain from Land to Product Adoption

Being able to practice the results of scientific research (i.e., commercialization) is an important part of I&T development. Turning the results of scientific research into a product with commercial potential requires a platform for technology R&D transformation. One of the biggest limitations of I&T in Hong Kong is the lack of land.

There is actually a great demand for I&T products locally; however, the fast-paced economic environment in Hong Kong, coupled with the reluctance of some local companies to participate in the field-testing stage, causes a lack of testing venues and opportunities for technology projects. Among them, the re-industrialization strategy involving the application of heavy machinery is the most affected, hindering the development of advanced manufacturing based on new technologies and smart production. The existing "Public Sector Trial Scheme" of the Innovation and Technology Commission assists in realizing and commercializing R&D results and promotes the application of technology. It is hoped that the Government will also embrace the spirit of daring to try and create an open environment to assist the development of I&T in Hong Kong. Indeed, many I&T products developed by our start-ups still have a long way to be able to be adopted in government projects due to the current tendering and listed supplier system which has to be revamped completely.

The Government should also draw up policies that respond to the increasing importance of the alliance with the Mainland in the I&T sectors. The Mainland has a huge market and actively provides space and supportive policies for talents and enterprises. In contrast, Hong Kong has high-level scientific research talents with rich experience in basic research and quality control. It is evident that the two should complement each other and jointly enhance the entire I&T industry chain. The development of San Tin Technopole, including the Hong Kong-Shenzhen Innovation and Technology Park, happens to be a treasure land for talents to promote the economy. The Northern Metropolis can serve as our turning point through the integration with Shenzhen. With the Mainland's heavy investment in I&T, ample digital workforce in the Greater Bay Area (GBA), and Shenzhen's strength in the digital economy (contributing more than 30% of the city's GDP last year), we are in a position to perfect the industrial chain and regularize the implementation of scientific research. The integration can also unleash the potential of GBA, while Hong Kong's financial and professional services can have a much bigger room for development.

The Government should formulate supporting policies to promote the flow of talent, funds, goods, information and other elements. Technology companies that settle in the park can take this opportunity to enter the Mainland market, and industrial cooperation with Shenzhen can provide Hong Kong researchers with opportunities for applied scientific research and R&D commercialization to share the strong R&D resources in the Mainland. In addition, Hong Kong's higher education institutions and research institutions can also receive direct financial support from the central government through co-funded programmes from the Mainland and Hong Kong and strengthen technical research cooperation with different Mainland provinces and cities.

2.3 Developing a University Town in the Northern Metropolis

The Northern Metropolis Development Strategy will bring enormous changes to residents along the bordering area with Shenzhen, as well as shifts in business models for the next 10 to 15 years. Therefore, collaboration among the Government, business, academia, and professionals in planning and land usage deliberation is critical for the long-term synergy between Hong Kong and Shenzhen and their integration into the GBA's development.

The PReCIT thinks that the Northern Metropolis may need a university; more precisely, a university town. First, this is to serve the growing population within and around the Northern Metropolis. Second, a university town in the Northern Metropolis can allow local, Mainland and overseas students to participate in the actual industry operation in one stop. Third, it can help foster effective communication between universities' research teams and the industry within the region. To this end, the Northern Metropolis will help with channelling and pooling technology R&D outcomes as well as professionals and expedite technology commercialization.

2.4 Taking Advantage of Global Opportunities – Carbon Neutrality

Whether I&T can become the fifth economic pillar of Hong Kong, or how to break through the encirclement between regions, depends on whether we can adapt to the development of the times and seize the opportunity when Hong Kong has favourable advantages. Among these advantages, the research field that focuses on the global desire - carbon neutrality, is one of the fields with rich scientific research experience in Hong Kong. Zero-carbon energy, building energy efficiency, new energy transportation, and production process management are keys to carbon neutrality. The Chief Secretary for Administration, Mr Eric CHAN Kwok-ki, said that Hong Kong should cooperate with the GBA to achieve carbon neutrality and join hands to build a green I&T ecosystem. The Government will devote about \$240 billion to facilitate carbon neutrality. This, in turn, will promote a green economy and create more I&T job opportunities.

In the past, many Hong Kong facility management companies entered the Mainland market. They have rich experience in building management and intelligent systems development. In addition, Hong Kong institutions have carried out a number of research projects on building energy efficiency in recent years and conducted a number of feasibility and preliminary tests with various governmental departments. In the next

step, the whole toolkit of green building management should be rolled out to the whole country and the world by combining the experience. In terms of production process management, Hong Kong is promoting re-industrialization. By promoting R&D, testing innovative carbon reduction technologies, and streamlining the processes, Hong Kong is expected to reduce carbon emissions in the manufacturing process effectively and develop high-value-added industrial chains locally and nationally.

The "Hong Kong's Climate Action Plan 2050," announced in October 2021, put forward the vision of "Zero Carbon Emission, Livable City and Sustainable Development." The new medium-term goal is to reduce the total carbon emission by half by 2035 based on 2005. However, it is difficult to achieve this goal with today's technology alone. Instead, the Government should pay more attention to the development of green technology, introduce more extensive funding, and adjust policies that enable green technology to be tested in the field at an early stage. Green technology can be used as one of the key I&T industries that Hong Kong has prominent strength in developing. In addition, the Government should conduct studies to understand the views of the general public on carbon neutrality as well as I&T to set the stage for more effective policies.

The Government should develop Hong Kong into a global knowledge centre of carbon neutrality by providing more research funding to local universities for the R&D activities related to carbon neutrality technologies and innovations. Hong Kong has multiple world-class research universities, but R&D expenditure as a share of the Gross Domestic Product (GDP) for Hong Kong has been relatively lower than that of other regions. For example, in the year 2020, R&D expenditure as a share of GDP for Hong Kong was only 1%, while the ratios for the whole of China, Korea, and Singapore are 2.4%, 4.8% and 1.9%, respectively.

2.5 Promoting Policy Research on I&T in the Context of the Belt and Road Initiative

The Belt and Road Initiative provides abundant and unlimited opportunities for Hong Kong's I&T development. However, policy research on I&T in the context of the Belt and Road Initiative in Hong Kong is still at the start-up stage. The Government should promote and foster more research studies in this field by providing funding for academics and researchers. Apart from Policy Research Funding Schemes (i.e. Public Policy Research Funding Scheme & Strategic Public Policy Research Funding Scheme), the Government should consider establishing new grants and funding specifically for research studies on policy initiatives on I&T development with respect

to Belt and Road Initiative. This funding scheme can motivate more academics and researchers to conduct high-quality research studies related to the field.

2.6 Promoting Academic and Research Collaborations with the Belt and Road Countries

The HKSAR Government should act as a bridge between local organizations and those in the Belt and Road Countries to promote academic and research collaborations. The Government should encourage universities to organize I&T student exchange programmes and innovative programmes in service learning in the Belt and Road Countries so that university students can have more opportunities to explore those countries. In addition, the Government can work together with universities to arrange attachment programmes for academics to further stimulate collaboration amongst academics on I&T research. To develop Hong Kong's young talent into future leaders in the I&T sector, the Government can regularly organize summits for students, academics, researchers, and business leaders from Hong Kong and the Belt and Road Countries to join together and exchange insights and views on critical issues, such as innovative leadership.

"A New Era – Stability. Prosperity. Opportunity" is the theme of HKSAR's 25th anniversary celebrations. On the road to a new era, Hong Kong, our city, will face a mountain of new challenges; but at the same time, abundant opportunities are waiting for us to explore. To seize those opportunities and take our city to the next level in both economic and I&T areas, having a series of comprehensive, holistic and practical policies is indispensable. The Government needs to formulate timely and effective policies and measures to enhance and promote global networks and collaborations. Equally important is for the government to provide sufficient resources to nurture and attract local and global talents. The PReCIT hopes that the Government would consider our recommendations in the policy-making process in the hope of making Hong Kong a better city together.

Contributors to the Recommendations on Policy Address 2022

- **Professor Christopher CHAO**
Vice President (Research and Innovation), Director of Policy Research Centre for Innovation and Technology and Chair Professor of Thermal and Environmental Engineering, The Hong Kong Polytechnic University
- **Professor Eric CHUI**
Head and Professor of Department of Applied Social Sciences and Co-Director of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University
- **Professor Daniel SHEK**
Associate Vice President (Undergraduate Programme), Dean of Undergraduate Studies, Core Member of Policy Research Centre for Innovation and Technology and Chair Professor of Applied Social Sciences, The Hong Kong Polytechnic University
- **Professor Haitian LU**
Director of Mainland Development Office, Core Member of Policy Research Centre for Innovation and Technology and Hong Kong Sustaintech Foundation Professor in Accounting and Finance, The Hong Kong Polytechnic University
- **Dr Siqi BU**
Associate Head and Associate Professor of Department of Electrical Engineering and Core Member of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University
- **Dr Xueyong ZHAN**
Associate Professor of Department of Management and Marketing and Core Member of Policy Research Centre for Innovation and Technology, The Hong Kong Polytechnic University