



Executive Summary

General

1. Riding on its competitive edge as an international financial hub, Hong Kong needs to develop an innovation and technology strategy to ensure its sustainable development. According to the *World Economic Forum 2015-16 Global Competitiveness Report*, Hong Kong ranks a respectable No.7 in overall competitiveness, but fares significantly lower in the metrics of innovative capacity, and availability of scientists and engineers.
2. Hong Kong's total spending on R&D is 0.73% of GDP, lower than that of Singapore's 2.1%, Korea's 4.2%, China's 2.1% (including 4% for Shenzhen and 6% for Beijing) and the OECD average of just over 2%. Several studies point out the positive impact of R&D investment on long-term economic growth.

Human Resources

3. In Hong Kong, career prospects of science, technology, engineering, and mathematics (STEM) graduates are considered less attractive than professions such as business and finance, let alone medicine and law. This creates a vicious cycle of weak demand for and supply of scientists and engineers.
4. The Hong Kong SAR Government lags behind in R&D investment. Public spending on R&D amounts to 0.4% of GDP, half the average of about 0.8% for its Asian and OECD counterparts. Downstream, applied research in particular requires more attention.
5. Hong Kong's universities have made great strides in academic achievement over the past decade. However, there are insufficient incentives for academics to translate academic output into impact on the economy and society, in the form of product innovations and commercialisation. Under the current university systems, KPIs for academics place much higher emphasis on academic output than on impact. Moreover, more cross-disciplinary and/or cross-institutional collaborations are required to stimulate research excellence.
6. While more and more university research funding allocation is linked to the success of getting competitive research grant, the bulk of research funding is not awarded on competitive basis. Moreover, the majority of competitive research funding is dispersed among many smaller projects. These factors limit the quality and scale of research projects.

Business

7. Migration of Hong Kong's manufacturing industry to the Mainland has resulted in a small industrial sector in the SAR. In other economies, the industrial sector is an important driver of applied research. Moreover, the relatively small domestic market limits the development of technology-intensive services such as e-commerce. These are among the reasons for the low business R&D expenditure, at 0.3% GDP, compared to over 1% of other major economies.
8. There has been a surge in start-up activities in the past couple of years. However, the community remains small compared to other international cities. The ecosystem of early stage investments is yet to mature. Some success stories will help inject a sense of confidence into young people, and nurture social attitudes and support towards entrepreneurship.
9. The rise of China creates an insatiable demand for advanced technologies to solve its social and economic challenges. The emergence of Shenzhen as a technology hub opens up opportunities for Hong Kong's strong basic research fundamentals to leverage on. Advocating for a technology cluster with Shenzhen will fill the industrial and business demand for R&D.

Government

10. The Government, as faithful follower of laissez-faire and fiscal prudence doctrines, did not develop a holistic and long-term approach to innovation and technology.
11. In the context of the Mainland's ambitious 13th Five-Year Plan, which places a high priority on investing in innovation and technology development, the HKSAR Government's underperformance in public R&D investment is highlighted.
12. The Government does attempt to promote a smarter city. However, its efforts and impact lag behind those of other advanced countries and cities. Many studies point out that Hong Kong falls behind when it comes to open government data, a unified standard for geospatial data across government departments, and free public Wi-Fi service.



Key Recommendations

The HKSAR Government needs to develop a long-term strategy and to take a holistic approach in driving innovation and technology. Focus should be on fostering a healthy ecosystem and strengthen linkages between upstream, midstream and downstream knowledge creation and transfer.

- 1. Substantially increased investment in research capacity.** Talent is the key to a thriving innovation and technology ecosystem. To kick start a virtuous cycle of talent development and economic growth, the Government needs to take the initiative to substantially increase investments to strengthen Hong Kong's research capacity. Building up a critical mass of talents in competitive niches will enable Hong Kong to tap into R&D outsourcing opportunities by multinational corporations (MNCs) in Asia as well as from Mainland China. More importantly, it will become the springboard of start-ups entrepreneurs who can foster the development of new knowledge-based industries. We recommend the Government to establish a HK\$50 billion endowment fund on applied research, and to target public R&D to 1% of GDP to catch up with regional and international peers.
- 2. Reform KPIs of universities and research funding mechanisms.** To make universities more responsive to economic and societal needs, the University Grants Committee (UGC) needs to review the current performance evaluation system that places high emphasis on publications to also consider wider impact. In addition, to promote research excellence and to align Hong Kong with international best practice, all new research funding should be channelled to the Research Grants Council (RGC) to increase the relative weight of project-based, competitive-driven research to discretionary institutional funding. Finally, as public research funding takes centre stage in many countries' innovative and technology strategies, research councils are best to be given an independent status with strong linkages with the government, industries and other stakeholders.
- 3. Review regulatory environment to create space for innovation.** The Government should leverage on Hong Kong's advantages and infrastructure as an international financial hub and a cosmopolitan city to drive innovation and technology. To do so require a careful assessment of any policies that constrain the growth of firms. Regulatory bodies need to strike a balance between innovations,

competition and other regulatory roles. Simplified regulatory approaches could be considered for start-ups so long as certain principles are met. Threshold levels could be set when tighter compliance rules are required.

4. **Priming a sustainable start-up ecosystem and foster business dynamism.** The Government should focus on a market-based approach to support the development of venture capital and private incubator industries via co-investment schemes and other incentives, as well as promoting entrepreneurial activities inside universities and attracting non-local talents into Hong Kong, rather than seeking to pick winners. To encourage start-ups, business and MNCs to invest in R&D, Hong Kong needs to boost its R&D tax incentives or subsidies to make them competitive viz. regional peers.
5. **Collaboration with Mainland China.** Hong Kong's legal and infrastructural advantages as well as geographical proximity to Mainland China make it uniquely positioned to act as a "super-connector" between China and the world. An innovation and technology policy should include strategies to attract local and non-local researchers and start-ups to develop Hong Kong as an important node in the global supply chain of product designing-prototyping-testing-sampling-manufacturing-marketing as well as to drive collaboration between Hong Kong/s universities and research centres with companies in Shenzhen and Pearl River Delta.
6. **Strengthen the Basic Foundation of Smart City.** We agree with the Government's intention to examine its smart city initiatives including building Hong Kong as a well-connected Wi-Fi city and expanding open government data and its use. While expanding open government data in order to spur new research and development of new products, the Government should also review how to modify and expand Web API to provide more personalised and convenient updates of new information to citizens and users. The Government should introduce standards for government departments in the release of their data and statistics online. Since most Smart City applications are location-based, the establishment of a spatial data infrastructure (SDI) of Hong Kong lays an important foundation for further development of Smart City applications.