For discussion
on 16 April 2013

Legislative Council Panel on Commerce and Industry

New Initiatives on Promotion of Innovation and Technology

PURPOSE

This paper briefs Members on Government's latest initiatives on the promotion of innovation and technology (I&T) in Hong Kong.

OUR COMMITMENT

2. The Government attaches great importance to the development of I&T in Hong Kong. The Chief Executive has stressed in his 2013 Policy Address that the Government will focus on the development of the highly competitive sectors of the I&T industries in the light of Hong Kong's strengths. We will continue to provide software and hardware support; foster cooperation amongst the Government, industry, academia and research sectors; forge closer collaboration with the Mainland; and inject additional resources when necessary.

3. In the past three years, we have implemented various measures to facilitate the development of the I&T sector. Please refer to **Annex A** for the details.

NEW INITIATIVES IN 2013-14

4. To further support the development of the I&T sector, we will implement a number of new initiatives in 2013-14, namely –

(a) to provide funding to universities being designated as local public research institutions to enhance their capabilities of technology transfer (a measure announced in the 2013-14 Budget). A funding up to a ceiling of $4 million each year, initially for three years, will be provided to each university starting from 2013-14;

(b) to provide additional funding to Partner State Key Laboratories (PSKLs) to further recognise their achievements, strengthen their research and development (R&D) capabilities and promote joint effort with their Mainland counterparts. We will enhance the funding support by increasing the existing ceiling of $2 million each year to $5 million each year for each PSKL from 2013-14 until 2015-16; and

(c) to provide funding to Hong Kong Branch(es) of Chinese National Engineering Research Centre(s) (CNERC(s)) to enhance their R&D capabilities and collaboration with the Mainland. A funding up to a ceiling of $5 million each year, initially for three years, will be provided to each Hong Kong Branch of CNERC starting from 2013-14.

Details of the above new initiatives are set out in the ensuing paragraphs.

(A) To provide funding to universities being designated as local public research institutions to enhance their technology transfer capabilities

Universities as a pillar of I&T

5. Technology transfer refers to the process of transferring technology/knowledge from academia to society. This process will enable technological developments be accessible to a wider range of users who can then further develop the technology/knowledge into new products, processes, applications, services, etc. Technology transfer is a two-way process. Not only would the community enjoy realisable benefit from the knowledge/technology transferred from universities, but academics and researchers would also benefit by having closer ties with the community.

6. Our universities are an important pillar of our I&T industry, they are the spawning ground for both I&T talents and inventions. Hong Kong has a world-class tertiary education system and our universities are consistently ranked among the best in Asia. There are now six

universities[1] being designated as local public research institutions by the Innovation and Technology Commission (ITC), which engage in R&D and technology transfer activities.

Latest developments

7. The R&D Cash Rebate Scheme was launched in April 2010 to reinforce the research culture among private companies and to encourage them to establish strong partnership with designated local public research institutions, including universities. Under the Scheme, a private company will receive cash rebate on its investment in two types of applied R&D projects – projects under the Innovation and Technology Fund (ITF) and partnership projects[2]. To enhance the effectiveness of the Scheme, we have increased the cash rebate level from 10% to 30% effective from 1 February 2012. There was a significant improvement in the response to the Scheme in 2012-13, in particular, the number of cash rebate applications from partnership projects increased from 23 in 2011-12 to 36 in the first nine months of 2012-13 (57%), showing that more companies are motivated to seek partnership with local universities and research institutions in carrying out R&D. We sincerely hope that such projects will not stop with the completion of research reports or the issue of publications, but that with our proposed funding to encourage technology transfer, they will be adopted for use in real life thus bringing wider benefits to our community.

8. Knowledge transfer has also been included in the mission statement of the University Grants Committee (UGC)[3]. In this connection, the UGC has been providing a recurrent funding of $50 million each year (distributed among the UGC-funded institutions) since 2009/10 in order to build up their capacities and broaden their efforts in knowledge transfer. All institutions are also setting aside some of their

---

[1] These universities are City University of Hong Kong, Hong Kong Baptist University, The Chinese University of Hong Kong, The Hong Kong Polytechnic University, The Hong Kong University of Science and Technology and The University of Hong Kong.

[2] Partnership project refers to applied R&D projects funded entirely by the private companies and conducted in partnership with designated local public research institutions.

[3] One of UGC's missions is to enhance the student experience and advance the international competitiveness in teaching, research and knowledge transfer by institutions in accordance with their agreed roles.

own funds to facilitate knowledge transfer activities. Through dedicated Knowledge Transfer Offices or Technology Transfer Offices/Centres (which are hereafter collectively referred to as TTOs), the six universities have enhanced their work in promoting knowledge (including technology) transfer in partnership with the industry and other stakeholders.

9. While the UGC's recurrent funding mentioned above has enabled the universities to embrace knowledge transfer with a fresh impetus, the funding is allocated across all academic faculties, including education and humanities. We note that technology transfer is manpower intensive and requires skills that may be different from knowledge transfer for other non-I&T related faculties. For instance,

(a) in terms of internal capacity building, technology transfer would best be performed with sufficient technical know-how and knowledge about the commercialisation process in the team; and

(b) in terms of external liaison, technology transfer involves very diverse activities such as patent applications, seeking seed and matching funds, incubating spin-off companies, etc. These require dedicated funding and specialised knowledge, e.g. in patent management, legal and financial negotiations with angel investors and venture capitalists, etc.

10. In view of the above, as announced in the 2013-14 Budget Speech, we will provide funding to the six universities to enhance their technology transfer capabilities. Specifically, the funding aims to enhance their following areas of work –

(a) technology transfer and realisation of R&D results;

(b) building up the necessary professional support services such as contract negotiations, protection of intellectual property (IP), financial management and promotional and relevant marketing activities, etc.; and

(c) facilitating liaison and collaboration with the research community and industry locally, in the Mainland and overseas.

Proposed funding arrangements

11. We propose to provide funding support for the TTOs through the ITF, which largely follows the existing funding arrangements applicable to PSKLs. The relevant arrangements, outlined below, aims to provide suitable flexibility for the universities to determine their priorities of technology transfer activities –

(a) ***Amount*** – funding up to a ceiling of $4 million each year, initially for three years, will be provided to each of the six universities starting from 2013-14. In other words, during the three-year period, each institution will receive a maximum of $12 million (i.e. $4 million per year x 3 years);

(b) ***Objectives*** – the main objectives of our funding scheme are to encourage technology transfer activities, further promote applied research, and narrow the gap between the laboratory and the industry for R&D projects (especially ITF projects). While the funding support will be provided through the ITF, we propose to allow the universities flexibility to make use of the funds to support technology transfer activities arising from non-ITF projects as long as they meet the objectives mentioned above;

(c) ***Scope*** – the funds can be used for the following areas (normally to be carried out by their TTOs) for achieving the purposes set out in paragraph 10 above –

(i) professional services for technology transfer (including hiring of in-house staff and/or external professional services, e.g. legal, business development, etc.);

(ii) promotion of technology transfer (e.g. organising and/or participating in technology transfer activities);

(iii) IP support (e.g. patent search, IP evaluation); and

(iv) staff training on technology transfer related matters (e.g. entrepreneurship).

Recurrent expenses, such as rental, overheads like electricity charges, office equipment and other consumable items, will however not be covered;

(d) ***Procedures*** – the procedures largely follows the existing funding arrangements applicable to PSKLs, i.e. –

(i) payment will be made on an annual reimbursement basis, i.e. after the close of the financial year. ITC will issue a call circular to these universities requesting them to submit a certified statement of claim (up to the $4 million ceiling) for expenses incurred in the previous financial year. Payment will be made to the universities after verification (e.g. expenses are within approved scope, they are reasonable/proportional, etc.). We will work closely with the TTOs of the universities to finalise the reimbursement arrangements;

(ii) at present, there is a general requirement that applications under the ITF should normally secure industry contribution of at least 10% of the total approved project costs to demonstrate industry support. Given the nature of this proposal, such a requirement will not apply; and

(iii) the above arrangements will apply to all universities being designated as local public research institutions. If other local universities or tertiary institutions are designated by ITC, they will also be able to benefit from this initiative; and

(e) ***Review*** – the universities will need to submit annual reports on the impact and outcome of our funding support. This will facilitate our review in around 2015 to consider the way forward, e.g. whether we should in future allocate funding based on the outcome/achievements of technology transfer activities of universities.

(B) To provide additional funding to PSKLs to further recognise their achievements, strengthen their R&D capabilities and promote joint effort with their Mainland counterparts

Our existing support to PSKLs

12. A PSKL is a laboratory in Hong Kong recognised by the Ministry of Science and Technology (MOST) as an R&D partner of a corresponding Mainland's State Key Laboratory (SKLs) for its research excellence in a particular technology area. As at March 2013, there were around 260 SKLs established in the Mainland. At present, we have 12 PSKLs in Hong Kong specialising in various technology areas, including agrobiotechnology, chemistry, information and communication technology, life science, and precision engineering, etc. These PSKLs have gone through a vigorous admission process to demonstrate that they are in possession of high quality research capabilities. A list of the 12 PSKLs is at **Annex B**.

13. At the meeting of the Legislative Council Panel on Commerce and Industry (the Panel) on 18 January 2011, Members supported the Government's proposal (vide the LC Paper No. CB(1)1050/10-11(05)) to provide each of the PSKLs in Hong Kong with funding support up to $10 million in five years starting from 2011-12. The funding has provided additional resources to enable them to map out a longer term development plan, strengthen their research capability as well as build up the necessary infrastructure support such as equipment and relevant facilities. Members also suggested that the Administration should in future consider increasing the level of funding in recognition of the achievements of PSKLs.

Latest developments and achievements

14. Our PSKLs have reported ongoing R&D achievements, application of R&D results, and national and international awards received since the introduction of the funding arrangement in 2011-12. Some examples include –

(a) ***R&D achievements*** – The PSKL of Emerging Infectious Diseases (The University of Hong Kong)'s work has greatly facilitated the rapid identification and recognition of a 2012 novel corona virus which emerged in Saudi Arabia. The PSKL of Ultraprecision Machining Technology (The Hong Kong

Polytechnic University) has published over 260 papers in the field of ultra-precision machining, with more than 1 560 citations under Science Citation Index;

(b) ***Application of R&D results*** – The PSKL of Synthetic Chemistry (The University of Hong Kong) has filed various patents, including materials for practical organic light-emitting diode with device lifetimes over 100 000 hours. These materials have also been submitted to the PSKL's industrial partners for evaluation. The PSKL of Chirosciences (The Hong Kong Polytechnic University) has licensed a number of catalysts developed for chiral synthesis to industries in Hong Kong, the Mainland and overseas; and

(c) ***National and international awards*** – The PSKL of Millimeter Waves (City University of Hong Kong**)** and the PSKL of Molecular Neuroscience (The Hong Kong University of Science and Technology) have won the 2011 State Science and Technology Awards organised by the State Council upon nominations by the HKSAR Government. The PSKL of Oncology in South China (The Chinese University of Hong Kong) has received the Ernesto Illy Trieste Science Prize for Contributing to Human Health in Developing Countries in 2012.

Extended collaboration with the Mainland

15. The PSKLs have also been in active collaboration with their Mainland counterparts and industrial partners on various science and technology fronts, including –

(a) ***Participation in national research projects*** – Starting from 2010, universities and research institutes in Hong Kong, through their Mainland subsidiaries, may apply for the 'State Basic Research Programme of China' (also known as '973' Programme, which supports important projects taking into account the national technology development direction, national economy, as well as social development and other crucial aspects of the country). In 2011, the PSKL of Brain and Cognitive Sciences (The University of Hong Kong) became the first successful Hong Kong applicant for the '973' Programme. In 2012, two more PSKLs have obtained funding from the '973' Programme, namely the PSKL of Molecular Neuroscience (The Hong Kong

University of Science and Technology) and the PSKL of Synthetic Chemistry (The University of Hong Kong);

(b) ***Participation in National Science and Technology Programmes Expert Database*** – Directors of nine PSKLs have been selected for inclusion into the prestigious National Science and Technology Programmes Expert Database in February 2012. They would be invited by MOST to contribute to the Mainland's science and technology development under the National 12th Five-Year Plan by participating in policy formulation and project assessment for national science and technology programmes; and

(c) ***Participation in Mainland research platform building*** – The PSKL of Agrobiotechnology (The Chinese University of Hong Kong) established a Shenzhen Base at their university's Shenzhen Research Institute in 2011 and set up a 'Peacock Innovation Team on Agriculture' receiving a total of RMB 35 million from the Shenzhen authorities. The PSKL in Marine Pollution (City University of Hong Kong) has also established the Shenzhen Marine Research and Technology consortium for promoting innovative R&D of marine science in the Mainland.

Enhancing funding support

16. PSKLs are prestigious research infrastructure in Hong Kong. We are encouraged by their continued outstanding work and R&D achievements. We propose to enhance the existing funding support to the PSKLs to recognise their achievements, enable closer liaison with their Mainland counterparts and consolidate their position as centres of excellence in their chosen fields.

17. We will enhance the funding support for PSKLs by increasing the existing ceiling of $2 million each year to $5 million each year for each PSKL from 2013-14 until 2015-16. In other words, for a five year period, a PSKL can receive a maximum of $19 million (i.e. $2 million each year x 2 years for 2011-12 to 2012-13, plus $5 million each year x 3 years for 2013-14 to 2015-16). Other established funding arrangements will remain unchanged. The funding to a laboratory will cease if it is no longer recognised as a PSKL. As reported to the Panel in January 2011, the arrangement will be reviewed in around 2014.

18. We are also pleased to report that a new round of applications for admission as PSKLs was completed in December 2012. We are awaiting the final decision from MOST on Hong Kong's nominations. The enhanced funding will be available to new laboratories in Hong Kong if they are admitted by MOST as PSKLs.

(C) To provide funding to Hong Kong Branch(es) of CNERC(s) to enhance their R&D capabilities and collaboration with the Mainland

CNERCs in the Mainland

19. CNERCs are under the auspices of MOST and serve as a major initiative in driving basic as well as applied technological R&D in the Mainland. Research centres approved by MOST as CNERCs have strong R&D capabilities and enjoy leading positions in their chosen areas of expertise both in the Mainland and internationally. As at March 2013, there were around 290 CNERCs in the Mainland. (Note: while both CNERCs and SKLs are China's major innovation bases, they serve different purposes. CNERCs focuses on providing engineering research and consultancy support to the industries, including enhancing the core competency on transformation of technology achievements for productivity, promoting a higher level of maturity, compatibility and engineering standards in technology results, and provide technological innovation support for national socio-economic development. SKLs, on the other hand, focus on carrying out innovative research taking into account the national I&T priorities.)

Admission

20. MOST is the approving authority for admission as CNERC. The vetting process is very rigorous as outlined below –

(a) candidate research centres have to prepare their applications in accordance with the CNERC establishment plan or other relevant guiding documents promulgated by MOST. The applications are then scrutinised by the respective provincial/municipal science and technology authorities and only the best applications are submitted to MOST;

(b) MOST will conduct a comprehensive assessment of the applications before drawing up an initial shortlist; and

(c) MOST will then invite peer experts to conduct further comprehensive assessments. Candidate research centres which have successfully passed all relevant assessments will formally be approved as CNERCs.

21. The CNERCs in the Mainland cover various technology areas, namely agriculture, electronics and information and communications technology, manufacturing, material, energy saving and new energy, transportation, biology and medicines, environment protection, etc.

Monitoring and reassessment

22. CNERCs are subject to regular monitoring and are required to submit annual reports after admission as set out by MOST. MOST will also commission professional technology assessments on the CNERCs. The proficiencies of each CNERCs will be rated under four categories, namely 'outstanding', 'meritorious', 'average' and 'inferior'. Those that are rated as 'inferior' will be served a warning or de-listed as CNERCs.

Hong Kong Branch of CNERC

23. During his visit to Hong Kong in August 2011, Vice Premier Li Keqiang (as he then was) announced, amongst others, the initiative of establishing Hong Kong branches of CNERCs. The purpose is to continually expand new forms of cooperation in science and technology between the two places.

24. In August 2011, at the sixth meeting of the Mainland-Hong Kong Science and Technology Cooperation Committee[4], MOST and ITC agreed to explore the establishment of a CNERC branch in Hong Kong. In March 2012, it was agreed amongst MOST, ITC and relevant parties that the Hong Kong Applied Science and Technology Research Institute (ASTRI) could partner with the Southeast University in Nanjing to apply for the establishment of a Hong Kong Branch of the National Application-Specific Integrated Circuit (ASIC) System Engineering

[4] The Mainland-Hong Kong Science and Technology Cooperation Committee is an annual meeting between Mainland and Hong Kong, and is co-chaired by a Vice Minister of MOST and the Secretary for Commerce and Economic Development.

Research Centre[5] on a pilot basis. The Hong Kong branch will aim to leverage on the respective strengths of ASTRI and the Southeast University to jointly develop world-class integrated circuits and application systems to enhance the competitiveness of the integrated circuit industry in the Mainland and Hong Kong. ASTRI, as its hosting organisation, signed a cooperation agreement with the National ASIC System Engineering Research Centre for enhanced technological cooperation, and submitted its application to host the Hong Kong Branch of CNERC to ITC for onward transmission to MOST. Having examined the proposed establishment of the Hong Kong Branch, MOST agreed to establish the Branch in Hong Kong in June 2012.

Funding support for the Hong Kong Branch of CNERC

25. As in the case of providing funding support to PSKLs, we propose to, through the ITF, also provide funding support to the Hong Kong Branches of CNERC given their outstanding status. We will start with the first pilot case of the Hong Kong Branch of the National ASIC System Engineering Research Centre. The ceiling will be $5 million each year, initially for three years, starting from 2013-14. In other words, during the three-year period, the Branch will receive a maximum of $15 million (i.e. $5 million per year x 3 years). If more research centres in Hong Kong are awarded the status of Hong Kong Branches of CNERCs in future, they will be offered similar treatment. Such funding will cease if the Hong Kong Branch is no longer recognised by MOST.

26. The funds will be provided under the ITF on a reimbursement basis following in general the same funding arrangement and cover the same scope as with the PSKLs. We intend to conduct a review of these arrangements in around 2015.

27. It should be noted that apart from this new initiative, Hong Kong Branches of CNERC, similar to PSKLs, can also apply for funding through existing channels such as the ITF. Furthermore, they are also eligible to join force with their Mainland counterparts for applying research funding in Mainland, such as the '973' Programme.

---

[5] The establishment of CNERCs in the Mainland is supported by their hosting organisations. The National ASIC System Engineering Research Centre is supported by the Southeast University.

ADVICE SOUGHT

28. Members are invited to comment and support Government's latest initiatives on the promotion of I&T in Hong Kong.

Innovation and Technology Commission
April 2013

Annex A

Measures Introduced to Promote the Development of Innovation and Technology in the Past Three Years

Year	Measures Introduced
2010	(a) Launching a $200 million R&D Cash Rebate Scheme to provide a cash rebate equivalent to 10% of the qualified R&D investments to encourage the private sector investing in R&D with the support of the Innovation and Technology Fund (ITF). (b) Comprehensive Review of the ITF to promote commercialisation and realisation of R&D outcomes, including expanding its scope to cover production of prototypes/samples/tools, conducting of trials in the publicly funded organisations.
2011	(c) Reinforcing the importance of the Steering Committee on Innovation and Technology with the Financial Secretary take up the chairmanship. (d) Review of the role and performance of the five R&D centres and promoting collaboration among academia, R&D institutions, business community and the Government. (e) Starting the construction of the $4.9 billion Science Park Phase 3, which is estimated for completion in stages between 2014 to 2016. (f) Review of the use of industrial estates and promote their revitalisation to support the development of high technology industries, in conjunction with the Hong Kong Science and Technology Parks Corporation. (g) Providing an annual sum up to $2 million to each of the 12 Partner State Key Laboratories (PSKLs) in Hong Kong to support their operation and enhance their research capability.
2012	(h) Exploring the feasibility of expanding the Yuen Long Industrial Estate by about 16 hectares. (i) Enhancing the Small Enterprise Research Assistance Programme to encourage technology companies to carry R&D through increasing the funding ceiling for each project from $4 million to $6 million; extending the programme to cover companies with venture capital investment; and expanding the funding scope to facilitate commercialisation. (j) Increasing the rebate rate of the R&D Cash Rebate Scheme (mentioned in (a) above) from 10% to 30% of the companies' investment. (k) Increasing the allowance for the ITF Internship Programme by nearly 20% to encourage recruitment of local talents. (l) Enhancing technological collaboration with the Mainland through – − Encouraging more local R&D institutions and research personnel to take part in national science and technology programmes and promoting joint R&D with their Mainland counterparts by making use of the ITF (up to 50% of the approved funding could be spent outside Hong Kong); − nomination of Hong Kong experts for the National Science and Technology Programmes Expert Database; and − starting a new round of application exercise for PSKL. (m) Extending the Public Sector Trial Scheme from projects undertaken by the R&D centres to all completed ITF projects to facilitate the realisation and commercialisation of R&D results.

Annex B

The 12 Partner State Key Laboratories (PSKLs) in Hong Kong

Host University in Hong Kong	Partner SKL in Hong Kong	Mainland SKL Partner	Year of Approval by MOST
The University of Hong Kong	Partner SKL of Emerging Infectious Diseases	Chinese Centre for Disease Control and Prevention - SKL for Infectious Diseases Prevention and Control (in Beijing)	2005
The University of Hong Kong	Partner SKL of Brain and Cognitive Sciences	Institute of Biophysics, Chinese Academy of Sciences – SKL of Brain and Cognitive Sciences (in Beijing)	2005
The Chinese University of Hong Kong	Partner SKL of Oncology in South China	Sun Yat-Sen University Cancer Center – SKL in Oncology in South China (in Guangzhou)	2006
The Chinese University of Hong Kong	Partner SKL of Agrobiotechnology	China Agricultural University – SKL of Agrobiotechnology (in Beijing)	2008
City University of Hong Kong	Partner SKL of Millimeter Waves	Southeast University – SKL of Millimeter Waves (in Nanjing)	2008
The Chinese University of Hong Kong	Partner SKL of Phytochemistry and Plant Resources in West China	Kunming Institute of Botany, Chinese Academy of Sciences – SKL of Phytochemistry and Plant Resources (in Kunming)	2009
The Hong Kong University of Science and Technology	Partner SKL of Molecular Neuroscience	Institute of Neuroscience, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences – SKL of Neuroscience (in Shanghai)	2009

Host University in Hong Kong	Partner SKL in Hong Kong	Mainland SKL Partner	Year of Approval by MOST
City University of Hong Kong	Partner SKL of Marine Pollution	Xiamen University – SKL of Marine Environmental Science (in Xiamen)	2009
The Hong Kong Polytechnic University	Partner SKL of Ultraprecision Machining Technology	Tsinghua University and Tianjin University – SKL of Precision Measurement Technology and Instruments (in Beijing)	2009
The Hong Kong Polytechnic University	Partner SKL of Chirosciences	Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences – SKL of Bio-organic and Natural Products Chemistry (in Shanghai)	2010
The University of Hong Kong	Partner SKL on Synthetic Chemistry	Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences – SKL of Organometallic Chemistry (in Shanghai)	2010
The University of Hong Kong	Partner SKL for Liver Research	Shanghai Cancer Institute – SKL of Oncogenes and Related Genes (in Shanghai)	2010