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For discussion on
18 March 2014

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 and seeks Members' views on the proposed measures.

BACKGROUND

2. The 2014-15 Budget attaches importance to, among others, the development and nurturing of innovation and technology. The Government aims to provide an enabling environment and proper financial support for universities, research and development (R&D) organisations and industry to conduct applied research and commercialise their innovations. We aim to accelerate technology transfer of upstream R&D results to translate more innovations into commercialised midstream and downstream R&D products or services. In this regard, a number of initiatives were announced in the 2014-15 Budget Speech to enhance the application and commercialisation of R&D results.

NEW INITIATIVES AND IMPROVEMENT MEASURES IN 2014-15

3. We will implement the following new initiatives and improvement measures –

(A) setting up an Enterprise Support Scheme (ESS) to replace the Small Entrepreneur Research Assistance Programme (SERAP) to encourage more private sector investment in R&D;

(B) extending the scope of funding of the Innovation and Technology Fund (ITF) to provide stronger support to downstream R&D and commercialisation activities; and

(C) providing funding support to the six universities designated as local public research institutions[1] to encourage their teams to start technology businesses and commercialise their R&D results.

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

(A) Setting up an Enterprise Support Scheme (ESS) to replace SERAP to encourage more private sector investment in R&D

Current Situation

4. At present, over 80% of ITF-supported R&D projects, via the Innovation and Technology Support Programme (ITSP) and University-Industry Collaboration Programme (UICP), are conducted by designated local public research institutions[2]. For companies that wish to seek ITF support for their in-house R&D activities, the only available source of funding is the Small Entrepreneur Research Assistance Programme (SERAP). However, SERAP may be viewed as less favourable than ITSP and UICP in the following aspects –

(a) ***Size of company*** – SERAP is restricted to small and medium enterprises (SMEs) which have less than 100 employees and are not subsidiary companies significantly owned or controlled by

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[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] In addition to the six designated universities in Footnote 1 above, the designated local public research institutions also include R&D Centres set up under ITF (i.e. Automotive Parts and Accessory Systems R&D Centre (APAS), Hong Kong R&D Centre for Information and Communications Technologies under the Hong Kong Applied Science and Technology Research Institute (ASTRI), Hong Kong Research Institute of Textiles and Apparel (HKRITA), Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies (LSCM) and Nano and Advanced Materials Institute (NAMI)); Hong Kong Productivity Council (HKPC); Vocational Training Council; and Hong Kong Institute of Biotechnology.

publicly listed companies. Larger companies in general cannot benefit from the funding support to conduct in-house R&D;

(b) ***Funding ceiling*** – while funding support by ITF on R&D projects conducted in collaboration with designated institutions may reach $30 million per project, the funding ceiling of SERAP is only $6 million per project; and

(c) ***Repayment requirement*** – while there is no repayment requirement for projects funded by ITSP and UICP, SERAP recipients are required to repay the funding from ITF when the project generates revenue or receives third-party investment. There have been comments that this repayment requirement would in a way become a disincentive for SERAP recipients to pursue success.

Proposed New Scheme

5. To address the limitations of SERAP, we propose to replace it with a new and much improved Enterprise Support Scheme (ESS) with the following arrangements –

(a) ***Size of company*** – companies registered in Hong Kong regardless of size will be eligible to apply. In implementing the Scheme, we will ensure that there are clear assessment criteria and sufficient checks and balance to ensure an open and objective selection process, including the necessary tests on technical merit, benefit to the community, proportionality and reasonableness; and the vetting panels for ESS would comprise experienced prominent persons in various domains of the I&T sector such as academia, industry, venture capital, etc. to ensure a fair and balanced assessment of the applications;

(b) ***Amount*** – funding up to $10 million for each approved project will be provided on a generally matching basis. Contribution from the applicant company should, unless in very exceptional circumstances, not be less than 50% of the total project cost. Both cash and in-kind contribution will be accepted;

(c) ***Assessment of applications*** – the applicant company would be assessed under a marking scheme to be devised, making reference to the current marking criteria of ITSP and SERAP. Since creating employment opportunities and nurturing local talent are our top priority, we would put special emphasis on the applicant's employment plan for talents;

(d) ***Fund recoupment requirement*** – in contrast with SERAP, we propose that there will be no requirement for fund recoupment of the approved grant. This will provide greater encouragement to companies to invest in R&D; and

(e) ***Intellectual property (IP) arrangements and profit sharing angle*** – the applicant company will own the IP of the project (unless otherwise agreed among parties concerned). As for the 'profit-sharing' requirement, we will also allow greater flexibility as justified in the prevailing circumstances.

Interface to Incubation Programme

6. Apart from providing financial support, the new Scheme will provide a suitable interface for the recipient company to join the Incubation Programmes currently operated by the Hong Kong Science and Technology Parks Corporation (HKSTPC) if it satisfies the prevailing admission criteria.

Next Step

7. Subject to Members' support of the proposed general approach, we will finalise the implementation details and consult the Panel and Finance Committee in due course. The new Scheme will then replace SERAP. In the interim, SERAP will continue (i.e. before the launching of the new Scheme).

8. As regards the existing cases of SERAP, they will continue to be dealt with under their existing rules. In accordance with the recommendations in Director of Audit's Report No. 61, we will review the outstanding SERAP cases by adopting a balanced approach to adequately protect the interests of the Government on the one hand while acting

appropriately and sympathetically to the companies concerned on the other. We will assess if there are reasonable explanations or cases of hardship and devise an appropriate way forward, e.g. demanding repayment, setting the timeframe for repayment, consulting the Department of Justice about the feasibility of instigating legal action and, in cases where recovery action is not warranted, seeking approval for write-off in accordance with prevailing Government procedures.

(B) Extending the scope of funding of ITF to provide stronger support to downstream R&D and commercialisation activities

Current Situation

9. In the past few years, the Government has put forward various measures to provide a more conducive ecological environment to facilitate the realisation and commercialisation of R&D results. In particular, we have extended the scope of ITF funding to cover production of tools, prototypes or samples and conducting of trial schemes in the public sector; adopted a 'cluster project approach' to enhance synergy and impact; and refined the assessment framework to give greater emphasis on realisation and commercialisation in addition to engineering and technical considerations.

10. Despite the above, the current scope of ITF is still too restrictive and has not reached downstream far enough to facilitate realisation and commercialisation of R&D results. Some views expressed include –

(a) ***Mismatch with industry needs*** – there have been suggestions that support from ITF is inadequate for the industrialists to leverage on their unique strength of integration of existing technologies to devise innovative applications; and

(b) ***Insufficient focus on downstream R&D*** – most projects funded by ITF, in particular projects under ITSP and UICP, do not go beyond the stages of concept proofing and laboratory validation. The conversion of R&D results into commercial products would still require much more work such as –

(i) ***Development engineering/system integration*** – at present, further development from working prototypes into multiple samples for commercial trial is generally not supported by ITF, nor projects involving mainly integration of technologies from various sources to create products that satisfy the needs of the market;

(ii) ***Larger scale process optimisation*** – scaling up the production process to enable commercialisation would require larger scale optimisation processes that are not supported under the current ITF funding rules;

(iii) ***Compliance testing and clinical trials*** – at present, testing and trials to enable compliance with industrial standards and regulatory requirements are supported by ITF, but only on a relatively limited scale;

(iv) ***Licensing of third-party IP*** – use of third-party IP could in many cases be essential to R&D as this would enable the necessary system integration for the eventual application of the R&D outputs. Currently, ITF only covers the expenses of licensing third-party IP to a limited extent; and

(v) ***Industrial design*** – at present, ITF does not support design development to improve user experience after the functional requirements of a product have been met. There were suggestions that such designs are often critical to the realisation and commercialisation of the R&D results.

Proposed Improvements

11. To address these inadequacies, we propose to expand the existing funding scope of ITF to cover more downstream activities, including –

(a) ***Development engineering/system integration*** – engineering activities that help turn prototypes into more production-ready forms and the processes of bringing together several sub-technologies into a single system that can operate in a holistic manner;

(b) ***Large scale process optimisation*** – industrial processes of improving efficiency and capacity of translating R&D results into marketable products, as well as scaling up the production capacity of a laboratory prototype;

(c) ***Compliance testing and clinical trials*** – researches and experiments to fulfil certain special regulatory or technical requirements;

(d) ***Licensing of third-party IP*** – acquisition or licensing of a reasonable portion of third-party IP to support downstream commercialisation; and

(e) ***Industrial design*** – optimisation of functions, value and appearance of products and systems for the mutual benefit of both users and manufacturers.

12. Some typical examples of these activities are set out at the **Annex**. Given that each technology area has its own unique characteristics, technical requirements and commercial challenges (e.g. the vast differences between biotechnology and information and communication technology), the above is not an exhaustive list of the industrial activities that will be covered by the widened funding scope.

13. The existing ITF assessment framework[3] would generally continue to be applicable after this revision of funding scope. In future, we are prepared to accept that the cost for downstream commercialisation activities may constitute a larger proportion of the total project cost. In that regard, we will take into account the following considerations when deciding whether and to what extent a project proposal with substantive amount of downstream activities would satisfy the requisite assessment criteria –

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[3] For example, applications under ITSP are vetted according to an assessment framework consisting of seven components (with different weightings) –
(i) I&T component (20%);
(ii) technical capability (20%);
(iii) financial considerations (16%);
(iv) existence of a holistic plan to realisation/commercialisation (16%);
(v) relevance with Government policies or in overall interest of the community (12%);
(vi) intellectual property (IP) rights and benefit-sharing (8%); and
(vii) management capability (8%).

(a) ***Reasonableness*** – downstream activities should be justified based on their individual merits, including their I&T content (e.g. involving innovative use of technology) and/or potential impact to the community. Nonetheless, mass production activities would generally not be supported;

(b) ***Proportionality*** – we expect that future ITF projects can comprise a balanced mix of mid-stream and downstream R&D activities; and

(c) ***Relevance*** – the new supported activities should be relevant to the industry or its potential market and/or bring upon positive impact to the community and supported by detailed plans for realisation and commercialisation.

Subject to Members' support, we will update the relevant funding guidelines and inform the relevant stakeholders of the details in time for the coming round of ITSP applications to commence in mid-2014.

14. We have conducted a consultation exercise on the above proposal in August and September of 2013 to solicit views from the relevant stakeholders, including representatives from the universities, R&D Centres, industry associations and chambers of commerce. An overwhelming majority of them supported the proposal and considered it conducive to closing the gap between the academic and research sectors and the industry, as well as promoting the commercialisation of R&D results. We have also consulted the Working Group on Manufacturing Industries, Innovative Technology and Cultural and Creative Industries of the Economic Development Commission on the proposal, and received support from Working Group Members.

Expected Benefits

15. The expected benefits of the two proposals set out in paragraphs 4 to 14 above are as follows –

(a) ***More private sector investment in R&D*** – stronger incentives will be provided for companies, regardless of size, to conduct in-house R&D activities. That would in turn encourage more private sector R&D expenditure in Hong Kong. On the one hand, it will lower the threshold for R&D and technology start-ups or SMEs to further their applied R&D efforts for translating the technology to marketable products or services. On the other hand, multinational corporations (MNCs) or large companies will be more willing to leverage on the ESS support and undertake R&D projects in Hong Kong;

(b) ***Encourage technology commercialisation*** – it will spawn more commercialisation activities which will in turn drive the level of R&D investment, particularly in the private sector. This will help engender a critical mass of talents, companies, capital and IP, etc. to build up a bigger I&T sector in the long run;

(c) ***Create more employment opportunities*** – the increase in private sector R&D will also translate into more jobs. Apart from jobs offered by local companies, the opportunities offered by local offices of MNCs and Mainland companies will be attractive to our young science and engineering graduates; and

(d) ***Local industry upgrading*** – companies will be encouraged to make use of indigenous as well as foreign innovative technologies to strengthen their product/service portfolios, thus improving the overall innovation capacity and competitiveness of the local industry by helping them to move up the value chain.

(C) Providing funding support to the six universities designated as local public research institutions to encourage their teams to start technology businesses and commercialise their R&D results

Importance of Technology Start-ups

16. Start-ups are business ventures in their earliest stage of development. Technology start-ups bring inspiration, innovation, ideas,

talents and technology applications for the advancement of our economy. These will translate into economic gains –

(a) Start-ups are drivers of job creation. They also create job opportunities when they outsource various activities to local service providers;

(b) MNCs like to invest in start-ups to tap into their innovations and talents. MNCs often choose to locate their headquarters and co-locate their R&D functions in cities anchored with clusters of innovative start-ups; and

(c) With the rapid evolution of the internet, cloud computing and social media platforms, the start-up costs have been driven down. Start-up businesses can now scale much faster and access new global markets.

Current Position

17. The key stakeholders within the start-up ecosystem in Hong Kong include investors (ranging from family members of the start-up entrepreneurs, angel investors, venture capitalist firms), co-working space providers, university entrepreneur centres, public and private incubators (which provide start-ups with a more structured form of support, such as provision of infrastructure/working space and networking platforms, dissemination of information and market intelligence, promotion and attraction of overseas investments, development of promotion and market channels), etc. These stakeholders operate in a highly interactive environment whereby each participant, while operating separately, can be linked to one another.

18. While Hong Kong possesses some requisite components and facilitation measures for the technology start-up ecosystem to flourish, there are comments that entrepreneurial financing is not readily available to local start-ups, and our talents are not sufficiently motivated to pursue a career in I&T. Whilst our universities are the cradle of talents, they have yet to become a spawning ground for university start-ups as in the case of the United States. This may be attributable to a number of reasons, such as –

(a) the rather high threshold for starting a new business venture, in terms of financial requirement and personal determination;

(b) technology start-ups are often perceived as risky given the initially negative cash flows and high failure rates;

(c) most Hong Kong students prefer a job with steady income or a career with an established company; and

(d) in Hong Kong, there are not many successful cases acting as 'role models' or strong motivators for people to invest in start-ups.

Proposed New Scheme

19. To encourage students and professors from the designated universities to start technology businesses and commercialise their R&D results, we propose setting up a new Technopreneurship Grant Scheme (TGS) through ITF, initially for three years from 2014-15, to provide an annual funding of up to $24 million to the six designated universities. Details are as follows –

(a) ***Amount and duration*** – an annual funding of up to $4 million will be provided to each of the six designated universities to support the setting up of technology start-ups by its teams (which can comprise students, professors, alumni, etc.) with the following arrangements –

(i) no limit on the number of start-ups set up under each university subject to the annual funding ceiling of $4 million for each university; and

(ii) each start-up will be funded for not more than three years with an annual funding capped at $1.2 million.

(b) ***Eligibility*** – technology start-ups formed by teams of the universities, as recommended by the respective universities, will be eligible for the grant application. The applicant must be a company, regardless of size, registered under the Companies Ordinance (Cap. 622). The company shall appoint a

person-in-charge who should be engaged in the company's business on a full-time basis. He should also be the person responsible for –

(i) overseeing operations of the company generally; and

(ii) liaising with the university concerned and the Innovation and Technology Commission (ITC) on matters relating to the company.

The team can have any mix of members of the university and may comprise –

(i) graduates/postgraduates;

(ii) professor(s) to serve as consultant, providing technical expertise and direction of the R&D work; and

(iii) business savvy university alumni, giving business and management advice, etc.

(c) ***Scope*** – the funds can be used for the following areas for achieving the purposes set out above –

(i) essential items for setting up and operating the start-ups (e.g. furniture and equipment, legal and accounting services, etc.);

(ii) project expenditure (e.g. manpower, equipment, other direct costs, etc.); and

(iii) promotion of the start-ups and marketing of their project deliverables.

Any expenditure item or part thereof which is already funded by the Government, a Government subvented body/institution or the university will however not be covered, i.e. no double payment for an expenditure item.

(d) ***Application procedures*** – the process will in general be as follows –

(i) the university will select from its own projects which have sound technological content and good commercialisation potentials for further development under TGS. It will

also encourage its staff and students to set up registered companies to undertake the selected projects; and

(ii) project proposals prepared by the start-ups and recommended by the respective universities will be assessed by ITC (e.g. to see if the eligibility requirements are met, the budget is reasonable, etc.).

(e) ***Reimbursement procedures*** – procedures for the annual reimbursement should largely follow the existing funding arrangements applicable to the Technology Transfer Offices/Centres of the designated universities, i.e. –

(i) payment will be made on an annual reimbursement basis, i.e. after the close of the Government financial year. ITC will issue a call circular to the universities requesting them to submit a certified statement of claim (up to the $4 million ceiling for each university) 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.); and

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

(f) ***Review*** – each start-up will be required to provide an annual report on the progress of its project and its business performance to the respective university. The universities will forward to ITC the annual reports of the start-ups, together with the universities' observations (e.g. outcome of projects, performance of the start-ups, etc.). This will facilitate our review in 2016-17 to consider the way forward. That said, improvements can be made as and when required in the light of actual experience.

We will work closely with the universities to finalise the detailed arrangements.

Interface with HKSTPC

20. TGS will include an interface which allows the project teams to join the Incubation Programmes operated by HKSTPC, if they satisfy the prevailing admission criteria.

Expected Benefits

21. The new TGS will –

(a) bring R&D results from campus to real world, by encouraging more entrepreneurial activities in the universities and facilitating more commercial development of university IP;

(b) lower threshold, and provide incentive to encourage young outstanding science, technology and engineering graduates to stay in the I&T sector; and

(c) encourage more technology start-ups which will add fresh impetus to the innovation ecosystem. Even though survival rate of start-up ventures is not high generally, participating students would be able to benefit from their entrepreneurial experience which will be beneficial in their future pursuit of career in the I&T world. Academic staff would also be able to build up their expertise on advising technology companies on their research direction and technology development.

ADVICE SOUGHT

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

Commerce and Economic Development Bureau
Innovation and Technology Commission
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Annex

Typical Examples of Downstream Research and Development Activities that will be Supported by the Innovation and Technology Fund

(a) ***Development engineering/system integration***

- integrating an automotive infotainment system from embedded hardware, firmware, programming and development into commercially available vehicles.
- creation of a software programme that integrates RFID, wireless communication and encryption technologies to provide secure transmission of workman's attendance records from worksite to an external system.

(b) ***Large scale process optimisation***

- production optimisation processes to facilitate mass production of bacteria-killing new coating materials for air purification, which will enable application of the new coating material to a larger surface area and lowering the cost of production.

(c) ***Compliance testing and clinical trials***

- conduct of compliance test for a new airbag system in automobile to ensure that it complies with the relevant industry safety requirements.
- clinical trials for new biotechnology products (including drug candidate) at a more substantial scale.

(d) ***Licensing of third-party intellectual property (IP)***

- purchasing or licensing third-party IP for the design of a complex system-on-chip integrated circuit to be integrated in a Smartphone provided that (i) the acquired/licensed part only constitute a reasonable portion of the entire project; and (ii) the applicant is able to prove that it is more cost-effective to acquire them externally than conducting the design in-house.

(e) ***Industrial design***

- user interface design for a wearable electronic device with intelligent display and sensing functions.