

## Incubators, accelerators and S&T parks

### What are incubator schemes?

Technology incubator schemes provide workspaces for start-up firms to benefit from shared facilities and a range of business support services on preferential and flexible terms that would otherwise be unavailable through markets. Such support tends to be time-limited and is intended to support young firms during the most vulnerable stages of their development. Incubators are commonly found attached to research universities and PRIs, though they may also exist independently of such institutes while maintaining close ties. In this way, technology incubators constitute conduits for knowledge flows between public sector research groups and the commercial world of applications.

Technology incubators are targeted to provide the conditions for high-tech start-ups to grow and prosper. Accordingly, they can be important in supporting the generation and survival of spin-offs from research universities and PRIs. At the same time, they can foster other activities conducive to public sector research and that contribute to innovation, including technological development, R&D collaboration, advice and consultancy, and even inter-sectoral mobility through the employment of graduates and researchers by tenant firms.

### How do technology incubator schemes have an influence?

Technology incubators can help offset some of the constraints typically faced by research universities, researchers and high-tech SMEs when they seek to commercialise science and technology knowledge:

- In most OECD countries, research universities and PRIs have increasingly sought to commercialise their research results through the generation of spin-off firms. However, such institutes are mostly focused on performing research and teaching activities and have traditionally lacked a supporting environment for starting new firms. Technology incubator schemes are part of broader attempts by funding organisations to re-balance the activities of such institutes towards more commercialisation activity. They provide dedicated workspaces, including laboratories and workshops that would otherwise be difficult for start-up firms to access. They also act as a focal point for risk capital, funding organisations, and potential employees attracted to a critical mass of high-tech commercialisation activity.
- Researchers often lack the capabilities and networks to successfully start and run businesses. Technology incubators are helpful in that they provide a range of business services, including training, mentoring, finance advice, market research and technical consultancy. Many researchers involved in spin-off activity also wish to maintain their research positions in their institutes. As many technology incubators are institute-owned and/or operated, this is often possible.
- High-tech SMEs are often attracted to technology incubators on account of the latter's proximity to research universities and PRIs. This reflects incubators being well placed to provide scientific support through direct links between tenant firms and research groups. Technology incubators can also facilitate peer-based learning among tenant firms.

### What factors should be considered when implementing technology incubator schemes?

Several factors should be considered when implementing technology incubator schemes:

- Availability of public funding: while technology incubators earn income from their services, this may be insufficient to support all of the infrastructure and services they can usefully provide. Technology incubators may therefore be partly dependent on government funding for their long-term operation. The extent to which such commitment can be accommodated will depend on the public sector research funding regime that prevails.
- Wider business environment: the geographic location of technology incubators is particularly important. Proximity to markets and financing, but also an industrial ecology that sees agglomeration in clusters, can be highly beneficial to tenant firms. Success is much harder where these conditions are absent. Furthermore, IPR regimes need to be sufficiently robust to protect the largely intangible assets owned by tenant firms.
- Rules, ideas and incentives governing public research actors: technology incubators are likely to enjoy only minimal success where the rules governing the conduct of public researchers (many of whom are civil servants in several OECD countries) prevent them from engaging in commercial activities. Prevailing ideas around the roles of universities and PRIs can act as a further discouragement, as can the incentives shaping researchers' progression along traditional academic career paths.
- Availability of know-how and skills: setting up and managing technology incubators require certain types of skills that tend not to be widely available and that take time to learn. As much as possible, arrangements should be put in place for incubators to exchange good practices.

Technology incubator schemes have a degree of resonance with cluster initiatives and science and technology parks. They will also likely benefit from entrepreneurship training schemes and risk capital measures in support of spin-offs.

### **What are science and technology (S&T) parks?**

Science and technology parks are business support schemes offering infrastructure and various support services to high-tech SMEs. They tend to have formal and operational links with centres of research excellence, such as research universities or PRIs, which enable technology transfer, and are viewed as a means to create dynamic regional clusters of innovation. Although science and technology parks vary greatly in scope and size, they have become significant policy instruments for innovation policy in many OECD countries. Consequently, governments often support their creation and development through various financial and fiscal incentives.

Science and technology parks seek to encourage and support the start-up and incubation of innovative, technology-based businesses through the provision of collaborative links with public sector research. Specifically, they seek to influence firms' technological development by nurturing R&D collaboration and inter-sectoral mobility with public sector research organisations, and by providing access to their facilities and expertise. In doing so, they accelerate the transfer of research findings from public sector research to markets.

### **How do science and technology parks have an influence?**

Science and technology parks can help to overcome some of the constraints faced by high-tech SMEs when they seek to undertake R&D efforts to launch new innovations on the market:

- Fragmentation and weak or missing linkages are common problems in innovation systems. Science and technology parks can help overcome these problems by agglomerating high-tech SMEs, public sector research and other business support services. At the same time,

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they can contribute to the development of a critical mass of high-tech SMEs and the emergence of new high-tech regional clusters.

- It can be difficult for policy-making organisations and public research funding organisations to effectively target support to high-tech SMEs. Science and technology parks have the advantage of providing a focus for targeting such firms with a mix of policy instruments.

### **What factors should be considered when implementing science and technology parks?**

Several factors should be considered when implementing science and technology parks:

- Achieving critical mass in terms of research facilities and staff: successful science and technology parks often require the presence and involvement of large research universities and public research institutes supporting a critical mass of knowledge workers. Where this is weak or absent, science and technology parks might amount to little more than regular real estate ventures, a common fate of many schemes.
- Availability of public and private funding: the creation and development of science and technology parks require designated and sustained public funding and active private participation, combined with effective public policies to support firms that seek to convert ideas into successful commercial innovations.
- Wider business environment: IPR regimes need to be sufficiently robust to protect the largely intangible assets owned by tenant firms, while proximity to markets and financing can be highly beneficial to tenant firms.
- Leadership: leadership and strong commitment are necessary for the creation of science and technology parks. Also essential are effective leadership and professional management to facilitate networking among entrepreneurs, researchers, investors, and others within and around the science and technology park.

Science and technology parks have a degree of resonance with many other core policy instruments, including but not limited to: cluster initiatives, of which they may be a part; technology incubator schemes, from which firms can graduate to science and technology parks; support for large-scale R&D infrastructures and other centres of excellence, around which science and technology parks can be built; and university-industry linkage schemes and collaborative R&D programmes, which encourage interactions between public sector science and industry.

### **References**

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