Intermediary Technology Institutes (ITI), Scotland, United Kingdom[1]

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Description of the approach[2]

Intermediary Technology Institutes (ITIs) were created in Scotland in 2002 with the aim of building on the strengths of the Scottish economy. A particular emphasis is on Scottish universities, research institutes, as well as on existing and nascent SME in the fields of digital media, life sciences and energy sectors. ITIs fulfil a co-ordinating task that helps to identify, commission, and/or acquire and diffuse pre-competitive research. Government funding has been committed for a period of ten years (Scottish Enterprise committed a GBP 450 million investment in the ITIs over the next 10 years). This reflects, besides other reasons, the long period that it takes for R&D discoveries, for example in the field of life sciences, to achieve market realisation.

The approach of ITI seeks to anticipate market developments through pre-competitive re-search, by identifying future global markets, rather than simply reviewing a proposal and award-ing requested funding in turn of waiting for results. The role of ITIs is to provide from the earliest possible moment on hands-on support in innovation processes. ITIs undertake market fore-sight exercises, focused technology development, and manage intellectual assets to maximise the commercial and economic return to Scotland. ITIs are open to all companies and research inst-tutes willing to participate in their programmes.

A total of three ITIs have been established in Glasgow, Dundee and Aberdeen, each employing a team of between 15 and 20 experts with long standing experience in early stage re-search, technology development, intellectual asset management, technology marketing, deal-making, and company formation and development. The three ITIs work together with the central office in Glasgow (ITI Operations) that provides co-ordinated services in human resource management, finance, corporate and legal affairs, and knowledge management under the objective of ensuring a co-operative, efficient work environment, simplifying procedures and cutting transaction costs.

The three ITIs have each an individual emphasis on life sciences, energy and communications technology and digital media: "ITI Techmedia", "ITI Life Sciences", and "ITI Energy". The process of knowledge generation and exploitation as it is managed by the ITIs incorporates the following phases:

1. Foresighting – this includes activities related to: business and market environment scan; market intelligence; identification of intellectual capital potentials;
2. Programme development – this includes activities related to: scoping, diligence, conceptual design, phasing of ideas;
3. Programme management – this includes activities related to: research agenda, intellectual capital accumulated and protected; and,
4. Value release – this includes activities related to: decision making on value release strategies – new firm formation, licensing, complete divestment according to pre-set criteria.

The ITIs seek to address the market failure which exists in taking 'good' ideas forward to commercial application, what is called the innovation's 'valley of death'. The ITIs provide re-sources, competences and expertise that SMEs often lack. ITIs help to reduce risks during the innovation

[1] Source: Discussion Paper " Entrepreneurship Environment and Policies: Exploiting the Science and Technology Base in the Region of Halle", in: *OECD LEED Local Entrepreneurship Series*, January 2007.

[2] Information material for this case study originates from web research and discussions between the author and Ewen Peters, Ewen Peters Associates, Scotland.

process by providing information and expert support from the earliest point possible. Nevertheless, an ITI is not a 'bricks and mortar' research laboratory, a substitute for company-driven research, or a replacement for fundamental research.

The operational outcomes for the period 2004/05 included: 13 Market Intelligence and Foresighting Reports published; 11 R&D Programmes commissioned (against a target of 9); 21 Programme participants (against a target of 11), with more than 50% Scottish-based; over GBP 70 million funds committed; 230 members, with more than 50% Scottish-based – 87 companies joined in 2004/5 (against a target of 65); and 95% of expert staff recruited has previous careers in industry.

A range of programmes are being developed and implemented by the ITIs. In the following a selection of 'early' winners are briefly described.[3].

- Cardio Bio-Markers Programme. "ITI Life Sciences" committed GBP 30 million over 3 years to help develop next-generation biomarkers. This has attracted a US-based company, Inverness Medical Innovations, which plans to invest GBP 37.5 million over 3 years to develop diagnostic test kits – and GBP 30 million in manufacturing, with the creation of 500 new jobs anticipated.
- Lithium-ion Battery Technology. "ITI Energy" committed GBP 4 million to a collaborative programme involving Scottish SMEs (Mpower, Axeon) and St Andrews University. Lithium rechargeable battery market is projected to be worth GBP 7 billion by 2015.
- Sensors and networks technology. "ITI Techmedia" committed GBP 4.75 million to a condition-based monitoring programme that will create sensors and networks platforms which allows for condition-based monitoring and predictive interventions, with potential applications in a wide range of industries and sectors.

An interim evaluation of the work of ITIs has shown that indigenous SME participation and created learning benefits, in terms of intellectual audit management, intellectual property protection and accessing specialised complementary assets meets the expectations. The average costs for a 3-year R&D programmes exceed with the amount of GBP 3-5 million, the initially planned budget of GBP 1-3 million. Nevertheless, the expectation of achieving a self funding rate of 40% after 10 years of operation, seem to be feasible. The ITIs are managing currently 10-15 R&D programmes per year, this is less than expected (20 programmes per year). They are completing 3-5 commercialisation deals per annum. Early success has recently been endorsed by the Scottish Parliament and the the Committee for Enterprise and Culture – has called for a doubling of ITI funding and extension of the model to other priority clusters

Why the approach is relevant to East Germany

Scotland realised that it needs to specialise and rationalise its expenditures into precomeptitive research in order to achieve higher levels of international comeptitiveness. Scotland also realised that its economic growth and success rests with the ability of local firms to access international markets. The situation of East Germany and its position within Germany and Europe can not be routinely compared with the situation of Scotland within the UK and Europe, however, there are similarities and analogies that make the experience of Scottish ITIs relevant for East Germany. These include high ambitions of metropolitan areas and a belief of private firms and public organisations in these areas together with the joint understanding that the future of economic success lies in knowledge generation and its commercial exploitation.

[3] For further general information, see www.itiscotland.com and, in particular on current pro-grammes, see http://www.itiscotland.com/defaultpage131abcde0.aspx?pageID=772

Reasons for the success of the approach

One of the main reasons for success of ITIs' work is related to their close relationships with both public and private stakeholders. The ITIs are members of Connect Scotland, Library House, the Scottish Council for Development and Industry (SCDI), the Scottish Chambers of Commerce in Glasgow, Dundee and Aberdeen, the Scottish North-American Business Council and CBI Scotland. The ITIs together maintain a network of relationships with 200 companies, both SMEs and multinationals, representing both the Scottish and the international business community and leading companies for technology development in the very sectors. Venture capitalists are also represented. On-line application for membership is possible. A membership to the ITIs offers the opportunity to participate in regular members-only meetings that offer early insights into identified business opportunities and access to a global network of experts and world class technology development. Members are offered the exclusive opportunity to participate in R&D programmes. Membership requires full association with the organisation and participation in funding of its activities. Membership typically costs GBP 400, plus VAT, and runs from April 1st to March 31st annually.

Through programme participation, Members can spread the risk associated with innovation and investment. Programme participants can benefit from a prior evaluation of the viability of the programme, based on solid market foresighting. ITI assumes the direct costs of a programme for participants although joint funding arrangements are also possible. ITI offers access to newly-generated intellectual property through active involvement in the programme. Participating companies have an early view of its output and the right of first refusal to new opportunities arising from the R&D. This way firms and organisations in Scotland are offered access to leading-edge technology platforms with concrete support to benefit or contribute to a wide range of technologies. All initiatives to date have successfully combined Scottish and global expertise. In particular, SMEs are offered access to ideas that would normally be out of their reach.

The obstacles that were faced and considerations for adoption of this type of approach in East Germany

When Scotland moved into the new economy it struggled to retain its competitiveness in an international environment. In 2000, the productivity gap for Scotland was estimated at minus 30%-40% behind the US; for Germany the gap amounted to minus 20%-30%). Entrepreneurial vitality, measure by new firm formation level, was in Scotland only 75% of the UK rate.

There were only few innovative high-growth technology start-ups in Scotland: 50 hi-tech start-ups per million persons compared to Massachusetts, US with 180 hi-tech start-ups per million persons. In many cases these high-tech start-ups in Scotland have been acquired by multinationals with-out leaving behind benefits for Scotland and the respective localities.

The level of business expenditures on R&D in Scotland were with approximately 0.6% of GDP only half of the EU aver-age with 1.24% of GDP. Scottish firms performed below average in terms of their share in UK patents, and offered only limited career opportunities for science/technology graduates. In general business clusters in Scotland lacked critical mass, relevant R&D intensity and missed strong local linkages. Overall, the absorption capacity for EU/UK government support for R&D was also unsatisfactory.

The here discussed Intermediary Technology Institutes (ITIs) form one of the key components of Scottish Enterprise’s approach to strengthening innovation and R&D in Scotland. The aim is (i) to create and expand the number of high growth, high value technology companies, (ii) to attract and expand foreign direct investment that is linked to knowledge and retained skills, and (iii) to nurture strong technical, entrepreneurial and flexible skills to create a fertile environment for growth.

The ITIs were an ambitious next step that followed the previous strategies, initiatives and economic development tools.

The important prerequisite for success was a long term commitment of the political leaders expressed in a ten year budget for these efforts.

Contact details and website for further information

Scottish Enterprise: www.scottishenterprise.com

Intermediary Technology Institute Scotland (ITI): www.itiscotland.com/

ITI Life Sciences: www.itilifesciences.com/

ITI Energy: www.itienergy.com/

ITI Techmedia: www.ititechmedia.com/