PRICEWATERHOUSECOOPERS

Scottish Enterprise

Kelvin Institute Evaluation

Final Report

April 2008

"The Kelvin Institute, a bridge between academia and industry, will assist universities to package their intellectual property into a technologically robust product thus attracting the attention of businesses. Through utilising existing networks the Kelvin Institute will be an evangelist for university/business interaction"

ERDF Grant Application, Part 3, 2005.

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1 Introduction

1.1 Study Rationale

PricewaterhouseCoopers LLP were commissioned by Scottish Enterprise, in September 2007, to undertake an evaluation of the economic and wider impacts of the Kelvin Institute ("the Institute") pilot initiative.

The idea for the Institute originated in 1999 when the (then) First Minister suggested that Scotland should consider developing new and innovative approaches to commercialisation through an 'E-Institute' focusing upon Scottish universities research excellence in computer science, information and knowledge management, communication and software systems.

This concept was formalised in the 'Scottish Executive Report on the Knowledge Economy Cross-Cutting Initiative' (February, 2001) which suggested an academically based: *"E-commerce institute or institutes maximising the benefits from access to top class research and expertise in Scotland and abroad, gathering it together and developing it further in order to be readily accessed by companies and individuals"*.

In response to this policy initiative the Universities of Glasgow and Strathclyde (in 2001) submitted a pilot project bid to the Scottish Executive to develop a business case for such an institution. Their initial project proposals referred to the development of an E-Institute of: *"international renown as Europe's leading research and commercialisation centre of technologies and processes that are the cornerstones of the knowledge economy"*.

In response to this bid the Scottish Executive made around £6 million available to Scottish Enterprise to:

- Assist the two Universities, where appropriate, to develop their business case to pilot the Institute; and,
- Support the implementation and operation of the Institute if the business case suggested project viability.

In November 2002 the Universities submitted proposals to Scottish Enterprise for funding support. Consideration of these proposals, by Scottish Enterprise, identified a series of issues that required resolution (not least in terms of state aid legislation, corporate structure and governance, monitoring and evaluation procedures and related performance measures).

Consequently - given the resources and time required to address these issues - approval for support of the Institute proposals, by Scottish Enterprise, was only secured by the Universities in late 2003. The

Institute was set up as a company limited by shares in December 2003 with the shareholding being distributed between the Universities of Glasgow and Strathclyde, Scottish Enterprise Glasgow and Scottish Enterprise National.

Once operational the Institute faced various challenges in endeavouring to fulfil its initial objectives and performance targets not least in terms of lack of demand for the IT products and solutions initially proposed, a greater focus by the Universities on research performance rather than commercialisation and various internal management issues.

In December 2004 after concerns (about delivery) from the KI Board and Scottish Enterprise Peer Group a review of the Institute (initiated and funded by Scottish Enterprise) was undertaken by Pierce Flynn (formerly CEO of Damovo). This review led to a change of in the Institute's business plan. The new plan involved a range of changes to the Institute's operation including broadening the activity of the Institute to act as a professional development and commercialisation resource for all Scottish universities, commissioning existing and new Institute staff to initiate projects (rather than solely initiating projects from seconded academics) and drawing on external advisors from the private sector to qualify project opportunities.

As a result of these changes the focus of the Institute was widened - both in terms of overall theme and institutional involvement – as reflected by the revised objectives of the Institute (as stated in the Institute's latest Operating Plan) namely to:

- Identify academic research within Scotland's university base with commercial potential and align to market opportunity;
- Establish relationships with SMEs that will enable them to develop and take to market products and technologies; and,
- Develop the technology beyond proof of principle and commercialise through sale, licence or spin out.

In meeting such objectives it is anticipated, by the Institute, that a: *"virtuous circle of activity"* will be created which will allow the Institute to: *"better identify and align academic research to commercial opportunity"*.

As indicated by the above over 2001 to 2007 Institute activities and stakeholder roles have significantly changed. In retrospect three distinct periods are apparent:

- **Initiation and development of the concept** (2001 to 2003); whereby the Universities sought to progress the Institute and secure Scottish Enterprise approval;

- **Initial operation** (2003 to 2004); whereby the perceived failure of the Institute to meet initial objectives and performance targets resulted in mitigating actions being taken (as advised by Scottish Enterprise and endorsed by the Institute Board); and,

- **Subsequent operation** (2005 to 2007); which as a result of these mitigating actions, led to a radical change in the direction and operation of the Institute.

1.2 Key Issues

Against this background, and to assist Scottish Enterprise in assessing how best to continue and develop linkages between know how (academia and technology) and product development (industry) to the benefit of the Scottish economy, the key issues we required to address in our work included:

- Identifying the direct (current and future) economic impacts of the Institute to assess whether the objectives for the Institute have been (or are likely to be) met in an effective and efficient manner and thus whether the advice and funding support provided by Scottish Enterprise (post 2003) has generated 'value for money';

- Analysing how impacts have been achieved, in terms of the processes and activities involved in implementing and managing the Institute, as well as examining the wider spill over effects and lessons learnt from the involvement of Scottish Enterprise, the Universities and other stakeholders in this initiative; and,

- Assessing, on the basis of both the above, the implications for the future of the Institute and, more broadly, Scottish Enterprise's role in supporting knowledge transfer and commercialisation.

1.3 Our Approach

In addressing these issues our approach has comprised:

- A detailed analysis of the documents, provided to us by Scottish Enterprise, in relation to the initiation, implementation, management and outputs of the Institute to date;

- A comprehensive interview programme across a cross section of the Institute's staff, management team, Board members, advisors, Scottish Enterprise staff, University representatives and other stakeholders, to test their views of the Institute and its impact (now and in the future);

- An economic impact evaluation – based on the above and the stated outcomes of Institute activities up to November 2007 – to identify the current and potential future effects of the Institute in terms of net income, employment and gross value added;

- The examination – using the Scottish Enterprise Business Environment Mapping framework – of the wider spill over effects and lessons learnt from the operation of the Institute; and,

- An analysis of the implications of our findings to inform Scottish Enterprise, and other key stakeholders, in assessing and selecting how best to generate future benefits from commercialisation of academic know how (through the Institute or successor bodies and programmes).

1.4 Outputs

The findings from these stages of work are summarised in the rest of this second draft report for discussion in terms of:

- **Context *(Section 2)***; indicating the background to the development of the Institute, market failures that the Institute aims to address and the profile of Institute activities, related funding and outcomes and consequently what, in our view, were the key evaluation issues in taking forward our work;

- **Sample Selection and Survey Programme *(Section 3)***; outlining the rationale for selecting representatives for interview and the process and frameworks we used to test direct and wider impacts and 'lessons learnt';

- **Direct Impacts *(Section 4)***; providing a quantitative analysis of the outputs identified from the activities of the Institute and the range of potential impacts that might arise in the future;

- **Wider or Spill Over Impacts *(Section 5)***; analysing, on a qualitative basis, the range of other effects – upon stakeholders – that have been generated by their involvement with the Institute in terms of benefits (over and above any direct outcomes) and lessons learnt (that might inform future initiatives); and,

- **Conclusions and Recommendations *(Section 6)***; suggesting – in the context of all of our findings – the implications of our work and, in particular, the options that might be considered by Scottish Enterprise in taking forward future initiatives in this field.

Finally, by the nature of our work programme, we have compiled a significant amount of data, information and related study material and thus 'evidence base' to support our overall findings and conclusions.

We have provided this evidence in the form of appendices to this report (and cited these appendices at relevant sections) in terms of:

- **Background Material Summaries *(Appendix A)***; in the form of matrices highlighting the key findings of our review of Institute documents provided to us by Scottish Enterprise;
- **Consultees *(Appendix B)***; listing the names and organisations of the representatives we interviewed during our work programme;
- **Interview Frameworks *(Appendix C)***; detailing the questions we asked consultees in relation to their understanding, involvement with and views of the Institute; and,
- **Economic Impacts *(Appendix D);*** outlining the background analysis to support our findings in relation to direct Institute impacts.

2 Context

2.1 Introduction

In this section we outline the initial rationale and objectives for the Institute, provide an overview of the main activities and outcomes to date and the implications – given these factors - upon our approach to evaluating potential impacts.

This analysis is, in part, based on our review of around 300 documents relating to the Institute that were provided to us at the start of this study by Scottish Enterprise. Our main review findings, in relation to this documentation, are detailed at Appendix A.

2.2 Initial Rationale for the Kelvin Institute

As indicated, in the introductory section of this report, the concept for the Institute originated in 1999 when Henry McLeish (the then First Minister) identified the opportunity to secure greater benefit to the Scottish economy from the research and expertise of Scottish University IT departments.

The rationale underpinning support for such a concept was the view held by the (then) Scottish Executive that, despite the presence of good quality universities and research institutes, Scottish firms had traditionally been unwilling or unable to exploit the presence of cutting edge research (in such fields as artificial intelligence, opto-electronics, e-commerce, language technology and biotechnology) into marketable products and industrial processes.

There were various reasons cited by the Scottish Executive for such unwillingness, which may be characterised in "market failure"[1] terms as:

- **Risk**; namely the perception by companies and related funders that Research and Development ("R&D") and innovation activities are inherently risky and require significant levels of investment over long periods of time which are not (or cannot be) matched by internal and external funding availability; and,
- **Imperfect Information**; i.e. the lack of sufficient linkages between companies and universities and research institutes to reduce the risks associated with such R&D by developing collaborative, interdisciplinary, innovative solutions to meet current and future market needs.

[1] Which may be defined as: "*imperfections in markets that prevent them from producing efficient outcomes"* in: "Assessing the Impacts of Spatial Interventions Regeneration, Renewal and Regional Development: The 3Rs guidance", ODPM, May 2004.

Given the increasing recognition of the value of intellectual knowledge and expertise resident in academic institutions that can be used to increase the levels of technology transfer (and hence regional and national economic regeneration and development) public sector bodies in the UK have been –since the late 1990s - seeking to develop new models of funding support for the development and commercialisation of research. The focus of these models has been to promote greater and stronger collaboration between academia and industry in order to address the perceived gap or market failures to maximise the benefits of knowledge transfer.

Consequently, as part of its priority to enhance the global competitiveness of local businesses and the Scottish economy as a whole, the Scottish Executive identified – again in late 1990s - the promotion of university-industry interaction as a major priority in its economic development policy.

The Institute, as reflected by the 'Scottish Executive Report on the Knowledge Economy Cross-Cutting Institute' (February 2001) was one of the first pilot projects identified as offering the potential to re-inforce such linkages. As a pilot the key focus was to determine the "lessons to be learnt" in addressing the (identified) market failures of risk and imperfect information through such an Institute model.

2.3 Institute Objectives

As indicated, in the previous section, the initiation and development of the Institute concept was taken forward by the Universities of Glasgow and Strathclyde. Between 2001 to 2003 work was undertaken by these Universities and several advisors to develop a business case for the Institute to secure funding support from Scottish Enterprise. As detailed in the revised business plan for the Institute (dated January, 2002) the activities of the Institute were to be composed of three facets, namely a:

- *"Strong R&D programme addressing ubiquitous computing and universal communication, knowledge management and information retrieval, contextual analysis, and e-business enabling factors (trust, security and privacy) all linked to commercial exploitation;*
- *Commercial programme highlighting the needs of industry, young and old, big and small, and including the commercialisation of intellectual property, entrepreneurial development and 'apprenticeship' programmes to meet and replenish the skills requirements of the knowledge economy; and,*
- *Dissemination programme, utilising both digital and traditional technologies to complement the other two activities and providing information and knowledge on current developments and future opportunities."*

On the basis of these objectives and revisions to the business plan - as well as the requirement by the

Universities to address a range of other issues - Scottish Enterprise provided the Institute, in late 2003, with conditional funding support of up to £6 million. The Institute – via the University of Strathclyde - could drawn down this support, subject to the approval of Scottish Enterprise, in carrying out the activities necessary to ensure: *"greater university – industry collaboration"* and the: *"commercialisation of R&D research"*.

The Institute was constituted in December 2003. The equity position of each party is illustrated in Table 2.1 below.

Table 2.1: Kelvin Institute Equity Stakes

KI Partners	% Equity
University of Strathclyde	46.8%
Scottish Enterprise (Glasgow and National)	25.1%
University of Glasgow	15.6%
Share Option Scheme	12.5%

As indicated Scottish Enterprise has a 25.1% share of the Institute which satisfies the public sector requirement to hold an influential position without being a controlling shareholder. The remaining shareholding was distributed between the two Universities (and a small amount was also set aside for a future Share Option Scheme). The Universities' relative shareholding was calculated based on their initial input to the Institute. The University of Strathclyde agreed to second the services of three senior members of academic staff whilst Glasgow University provided one secondee. As a result Strathclyde received three times the shareholding of Glasgow.

Once the Institute entered its initial operating phase it is our understanding that, over 2004, various factors or challenges were identified (by Scottish Enterprise and other stakeholders) to meeting the future performance targets associated with the Institute's initial objectives.

Our consultations with stakeholders suggest, for example, that these challenges included:

- A lack of demand for the 'pervasive computing applications' proposed, or being developed, by the Institute;
- Reduced engagement of certain University departments given the 'competing' pressures on them to secure main stream funding from research (rather than through the perceived 'marginal' funding available through the Institute's commercialisation activities);

- Minimal engagement with SMEs, or other Scottish companies, to explore their technological needs and the opportunities the Institute might provide to addressing these needs;
- A lack of clear focus and 'over-elaboration' in the proposed revenue generating activities of the Institute (to include, for example, consultancy services, training and conferences); and, perhaps unsurprisingly in the context of all the above,
- A perception that the Institute lacked direction or a coherent strategy and, by definition, clarity in its service offering and market position.

In recognition of these factors, in late 2004, the Board (of the Institute) with the support of Scottish Enterprise changed some of the personnel involved in managing and operating the Institute as well as the focus and reach of the Institute's (proposed) activities.

Consequently, by December 2004, a new business plan and strategy was approved by Scottish Enterprise which outlined a wider remit. The aim of the Institute became one of identifying and maximising the commercial potential of innovative research projects within the Institute and partner universities, licensing the best intellectual property into the commercial sector and, as a result, generating a number of potential benefits to Scotland and Scottish businesses, including (as reflected in the revised business case):

- *"The development of an entrepreneurial culture linking universities, independent commercialisation efforts, access to venture capital and the global market;*
- *New spin out companies creating high value added knowledge economy jobs to help Scotland retain its competitive advantage;*
- *Raising Scotland's profile as a country which encourages innovation and R&D and encourages its commercialisation – making Scotland more attractive to inward investment;*
- *Providing local companies with early access to new ICT technology giving them first mover advantage and increasing their competitive edge; and,*
- *Formation of new companies in Scotland and partnerships to exploit the technologies developed."*

As indicated previously – in the introductory section of this report – the objectives of the Institute are now defined in terms of:

- Identifying academic research within Scotland's university base with commercial potential and alignment to market opportunity;

- Establishing relationships with SMEs that will enable them to develop and take to market products and technologies; and,
- Developing the technology beyond proof of principle and commercialise through sale, licence or spin-out.

In terms of performance indicators – in meeting these objectives – the new operating plan also identifies a range of measures against which to judge Institute activities, namely:

- Demonstrating the success of the Kelvin commercialisation model by achieving commercial outcomes for projects either through new company spin-outs, technology sale or licensing;
- Generating a strong pipeline of high quality projects originating from Scottish universities, HEIs and SMEs approved for funding;
- Justifying and securing additional public funding to allow the Institute to fund more university based projects and continue to provide an economic development role;
- Strengthening key processes around the identification and commissioning of university projects and the conversion of technology into commercial activities and establishing an auditable trail to prove that the maximum impact is being achieved;
- Raising the profile and building brand awareness to facilitate sourcing of opportunities, exploitation of customer references and the Scottish Enterprise network and thereby promoting commercialisation with the Scottish technology community; and,
- Strengthening the Kelvin team, skill base and processes to improve execution and operational effectiveness.

We examine below the range of activities that have been undertaken by the Institute to meet such targets and fulfil its strategic objectives.

2.4 Overview of Institute Activities

Once operational, in 2004, work started on the project selection and support process with a core team being assembled within the Institute comprising:

- A Chief Executive Officer;
- A Project Director;
- A Commercialisation Director;
- An International Director;
- A Financial Controller;
- An Office Manager; and,
- An Administrator.

In addition, a project team was identified consisting of:

- A Principal Engineer;
- A Senior Engineer; and,
- Two Programmers.

The Institute also implemented a formal project selection process, in 2004, to allow the Institute Advisory Board to assess the viability of potential projects. It is our understanding that this process consisted of (and to some extent has evolved to include):

- **Lead Identification** – the majority of lead identification was initially expected to come out of meetings with departments and individuals within the two Universities, commercialisation offices, Scottish Enterprise and academic contacts (and, latterly, with other Scottish universities and national and international companies). Once identified leads were passed onto the project origination team within the Institute for qualification;
- **Qualified prospect** – a lead was qualified through an initial phone call or meeting in order to determine whether it met the criteria for an Institute project. The prospect would then go forward to the Advisory Board;
- **First level of diligence** – all qualified projects were reviewed by the Advisory Board to shortlist those which should go forward for further diligence. At this stage an initial budget was set for diligence and resources identified as well as responses to the key questions set out in the Institute project application form;

- **Fully worked up project plan** – the outputs from the first level of diligence were reviewed internally and a decision taken as to which projects should be taken forward to the full project planning stage. The decision was based on the available budget, internal capability and the ability to source external capability. The output from this phase was a project plan with milestones, deliverables, IP strategy and full costing (including initial outline terms with the originating University); and,

- **Project Start** – finally fully worked up project plans would go to the main board for project approval and an agreed start date.

Once selected projects were run in two distinct phases:

- **Phase One** focused on developing the technology to a stage where its value could be demonstrated to a potential customer. A detailed review of the project was conducted by the Institute at the end of this phase (typically at around 6 months) when the updated project plan and business plan for the project were reassessed. The outcome of this review was a decision to either progress the project to Phase Two or reallocate resources to other projects; and,

- **Phase Two**, during which the Institute expanded its efforts to identify and engage potential commercial project sponsors and key customers while the project team completed the implementation of the technology. At the end of the 12 months the Institute evaluated the project's commercial potential against three possible outcomes:

    - the project was not taken forward on the basis of insufficient market potential or other barriers to market entry;

    - the project's technology could be licensed to a third-party where, for example, the technology involved – typically software - might have one or more applications of relevance to (private sector) companies; or,

    - a new company would be formed to exploit the new technology (where a new company was formed the Institute anticipated providing support to identify a suitable management team, develop a business plan, attract public/private investment and utilise appropriate incubation facilities).

2.5 Project Outcomes

In terms of “the lessons learnt” or implications that might be drawn concerning the processes adopted above – in terms of project selection – it is our understanding that, since the origination of the Institute

by the two Universities in 2001, and subsequent formal inception, in December 2003, the Institute has supported a total of 16 projects.

Of these 16, five projects were funded, during the initial operating phase, under the previous management team and, therefore, predate the objectives currently set for the Institute. These five projects were:

- The International Centre for Leadership in Finance – paid consultancy;
- The Metropolitan Police Force (iOPS) - paid software development;
- The Edinburgh Festival Project - research and development project in computing technologies;
- The information Hub Project – set up to create tools to better manage information for knowledge workers; and,
- Incubator and Business Mentoring – "Purple Patch", a small wireless start-up company that shared the Institute's office space and business facilities (the Institute took 800 shares in Purple Patch as remuneration).

Since 2004 the Institute has provided funding and other forms of support to 11 projects. Of these, five are currently either 'on-hold' or, from the perspective of the Institute, have been completed. These five projects are:

- Schemata - software development (waiting for lead academic to complete patent filing);
- Prosthetics/Socket-Fit - research and technological development (project lead currently attempting to raise finance to complete project);
- Wireless Sensor Networks/Sensor/'Tram' - research and technological development (patent filed in May 2007);
- KICS - repackaged IP that was developed under the original iOPS project (i.e. Institute owned version of iOPS software, although there has been no further development of this software since end of iOPS project); and,
- KIMS - data visualization of marketing information (demonstration level prototype available).

Finally the Institute is engaged (as of November 2007) in supporting six 'live' projects with the expectation that some, if not all of these projects, will be taken forward to a commercialisation outcome. These projects are:

- MINOS/VECSEL Photonics - research and technological development. A licence agreement with Solus Technology is being negotiated (the IP is publicly available and is being advertised at present);
- Wind Turbine Controller - research and technological development. Further development of existing research has resulted in preparation of a new patent for filing;
- "Tell-A-Story" - research and technological development. Involves the creation of a software prototype to display to potential customers in the field of child psychology;
- Solar Project/Photovoltaic Cells - research and technological development. Background IP has been created by Glasgow University with the potential for further foreground IP to be developed by the Institute;
- Software Delivery System (SDS)/V2-SDS2 - research and technological development. Several commercial opportunities are being explored for SDS as a stand alone software application. SDS will also be used to distribute the "Tell-A-Story" application; and,
- Mobile Photo V2/MP2 - research and technological development of digital photo sharing software. An internal Institute project team have commenced on the commercialisation phase of this project by demonstrating their prototype to potential customers in China, the UK and the US.

It is also important to note that the Institute has identified a further eight potential projects (namely, Cimphony, DigePrint, EdiVision, Terahertz, Microbial Fuel Cells (MFC), Tapestry, VisPath, and Zeroed-In) which are currently being developed to initial business case stage.

In short, therefore, against the processes that have been latterly adopted by the Institute it is too early to evidence the final outcomes of the (eleven) projects concerned. It is apparent, however, that all these projects have the potential to realise some form of commercialisation outcome (with the majority of projects likely to generate licensing income and/or further funding support).

Moreover across all 16 current projects the Institute has, as outlined in Table 2.2 overleaf, recorded a series of key outputs including:

- Consulting revenues in the region of £210,000;

- Two start up companies (ie; Purple Patch and Jario, the latter of which has developed an intelligent trading system)[1];
- Three patents (and two anticipated patents);
- Around £250,000 private sector project support and leverage (through initial funding contributions by 'Picsel and ntl); and, as a result of the above,
- Around 20 new jobs.

Table 2.2: KI Institute Outputs (2007)	
Main Commercialisation Outcomes	
Key Indicators	**Actual to Date**
Consulting	ICLIF £58,000 Met Police £155,000 Total = £213,000
Patents	3 filed, 2 being prepared for filing
Spin Outs/Start Ups	2
Jobs created	20
Amount of private sector leverage	£250,000
Disclosures (NDA's)	50
Licenses – Commercial	Not as yet
ERDF and Other Related Outcomes	
Licenses – Evaluation	4
In Licenses – Universities	3
Promotional Events	2
Companies contacted	30
Companies visited / visiting	30
No. of commercialisation projects (current)	8
Sales derived from exports	£31,000
New jobs created for ethnic minorities	1
New jobs created for women	2

Source: SE KI Papers, ERDF KPI's, and updates by KI Management Team, 2007.

[1] Although it is our understanding that as of March 2008 another spin out – Aicon – has been formed as a result of the WIND project.

As also illustrated, in Table 2.2, for the purposes of ERDF and Scottish Enterprise monitoring processes the Institute has also identified a range of other outcomes including, for example, a level of 2 promotional events, 30 company visits and 3 license agreements with University partners.

2.6 Funding

Prior to its inception the work involved in developing the Institute led to expenditure of approximately £1.2 million (for the period of June 2000 through to December 2003). As illustrated, in Table 2.3 overleaf, the main expenditure items over the first two years of setting up the Institute (from 2000 to 2002) included salaries (79%), recruitment (10%), administration (3%) and legal fees (2%). In the following financial year (2002 to 2003) the Institute once again spent a significant proportion (61%) on salaries, 10% on consultants and 14% of total spend on accommodation and legal fees. These expenditure items were initially borne by the University of Strathclyde with Scottish Enterprise reimbursing the University once the Institute was constituted in December 2003.

Table 2.3: Financial Analysis (2000-2003)

Activity	June 2000 - Oct 2002	Percentage	Nov 2002 - Dec 2003	Percentage
Salaries	£319,612	79%	£490,023	61%
Travel	£6,000	1%	£53,208	7%
Legal	£7,285	2%	£56,900	7%
Administrative	£12,849	3%	£51,412	6%
Computer Equipment	£2,468	1%	£49,505	6%
Recruiting costs	£42,207	10%	N/A	0%
Relocation	£4,237	1%	£7,054	1%
Office accommodation	£10,003	2%	£6,500	1%
Consultants	N/A	0%	£82,365	10%
Total	**£404,661**	**` 100%**	**£796,967**	**100%**

Source: KI Board of Director's Meeting, May 2004, Slides 5 & 6.

In December 2003 the Scottish Enterprise Board accepted the recommendation of the Board Approvals Committee to endorse the E-Institute paper requesting £6M funding over three years (subject to a number of milestones which would need to be met to allow continual funding).

As stated within the Scottish Enterprise Glasgow, Business Growth, Executive Team Paper, January 2003, overall funding for the Institute was anticipated to be in the region of £7.8 million. It was agreed that the majority of funding for the Institute, as illustrated in Table 2.4 below, was to be provided by Scottish Enterprise (77%) with the remaining funding to be drawn down from the two Universities (15%) and private sector contributions (8%).

Table 2.4: Anticipated Funding Breakdown

	Year 1	Year 2	Year 3	Year 4	Total	
Glasgow University	67,500	71,000	74,500	74,500	**287,500**	**4%**
Strathclyde University	273,800	186,000	197,000	197,000	**853,800**	**11%**
Private Sector[1]	350,000	100,000	100,000	100,000	**650,000**	**8%**
Scottish Enterprise	1,800,000	2,300,000	1,900,000	0	**6,000,000**	**77%**
Total	**2,491,300**	**2,657,000**	**2,271,500**	**371,500**	**7,791,300**	**100%**

[1] Figures for the private sector included commitments by Picsel of £500,000 over 5 years to support the position of the Executive Director and by ntl at a level of £250,000 in year one of operation. It is our understanding that £100,000 and £150,000 respectively was eventually secured from these two sources.

In addition to the above the Institute successfully applied for ERDF funding in 2005. Total ERDF funding of £863,000 was granted to the Institute in January 2006 (and was due to be 'drawn down' over the next two years). On 11th August 2006 the Institute Board amended the original grant application from ERDF downwards, from £863,000 to £645,000, due to the perceived risk in the project not reaching its agreed eligible spend figure within the lifetime of the grant (ie from1st January 2006 until 31st December 2007). The Institute has since submitted a Notification of Change which extends the life of the projects to 31st March 2008 as a result of under spend of ERDF monies. This is also in line with the Institute Board plans to take projects through to this date.

The Institute total expenditure was around £4.7m between January 2004 to August 2007. A breakdown of expenditure by key activities is provided in Table 2.5 overleaf. The main expenditure over this period was salaries including research and administration staff (42%), external consultants (15%) and projects (11%).

Table 2.5: KI Expenditure 2004-2007						
Activity	**2004 (£)**	**2005 (£)**	**2006 (£)**	**2007 (£)**	**Total (£)**	**Percentage**
Project Expenses	16,651	11,191	288,064	217,929	533,835	11%
Consultancy	206,604	231,766	181,675	62,812	682,857	15%
Marketing	36,734	25,848	43,035	28,177	133,794	3%
Business Development	20,939	24,932	45,321	98,203	189,395	4%
Conferences	47,705	0	0	0	47,705	1%
Salaries	544,790	437,042	518,832	477,414	1,978,078	42%
Legal & Professional	82,415	43,809	61,331	71,901	259,456	6%
Rent Rates & Service Charge	20,340	47,446	82,318	82,039	232,143	5%
Administrative Expenses	250,774	54,455	76,368	33,075	414,672	9%
Depreciation[1]	12,375	50,355	76,371	44,521	183,622	4%
Taxation	10,449	4,317	2,109	0	16,875	0%
Total	**1,249,776**	**931,161**	**1,375,424**	**1,116,071**	**4,672,432**	**100%**

Source: Institute Audited Accounts 2004-2006 and Management Accounts, August 2007.

[1] It is our understanding, in discussions with the Institute management team, that this item represents expenditure on IT and other related equipment.

As of August 2007 £1.32m of the total £6.6million Scottish Enterprise funding remains available to the Institute together with ERDF funding claimable against future qualifying expenditure.

Finally, combining the information outlined in Table 2.2 and Table 2.5, suggests a total cost of implementing and operating the Institute, to August 2007, of around £5.9 million (i.e. £1.2 million over 2000 to 2003) (Table 2.2) and £4.7 million over 2004 to 2007 (Table 2.5)).

2.7 Evaluation Issues

In our view a number of evaluation issues fall out of the Institutes development, objectives and outcomes. First, and perhaps foremost, is the distinct steps (and changes in related objectives and activities) involved in the development, initial and subsequent operating phases of the Institute.

Given the innovative and consequently untested nature of the Institute concept (at least in 2001) it is perhaps not unsurprising that it took two years until the Institute could be constituted (particularly given the approval process set up by the Scottish Executive whereby Scottish Enterprise required to review the Universities proposals prior to any funding support).

Similarly given that most businesses evolve and adapt to changing market conditions it is again not unusual for the activities and direction of the Institute to alter – in particular the limited initial funding available dictated that such change should be initiated expediently in 2004.

Consequently, while a significant level of funding, resources and time were involved in setting up and implementing the Institute (over 2001 to 2004) it was not until 2005 that any significant focus was provided to developing or commercialising projects.

From an evaluation perspective we suggest that such 'distinct' steps imply that:

- Consideration should be given to what lessons might be drawn from the first two (development and initial) phases; and,
- While current project impacts may be (by definition) limited consideration should also be given to the likely future impacts of the subsequent operating phase.

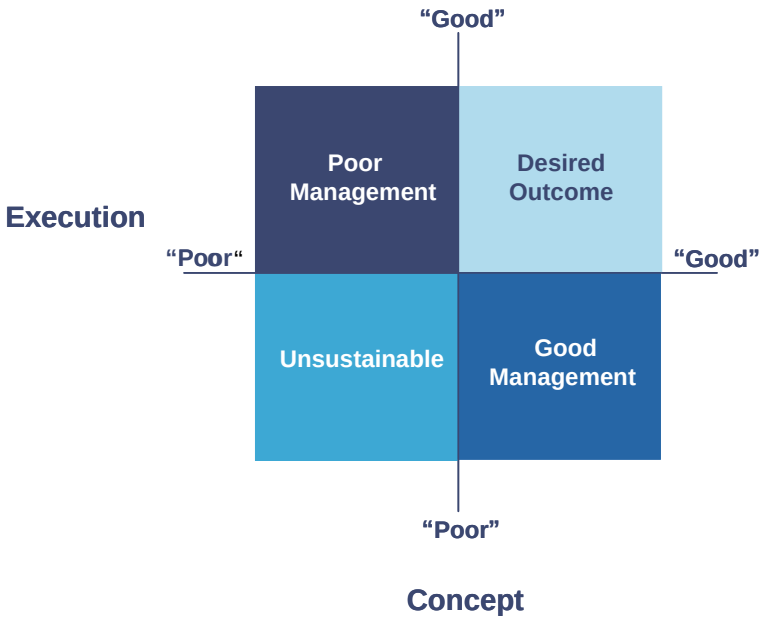
(a) Lessons Learnt

In examining the current activities and outcomes of the Institute – against the time and resources devoted to implementing and managing this initiative - it is important to assess, in our view, whether the:

- Structure and organisation of the Institute (ie; full time staff, independent company, physical location outwith the Universities and Board structure) has supported or impeded the development and impact of this initiative (ie in terms of meeting the Institute's original and revised objectives); and/or,
- Activities and processes adopted as well as the objectives themselves were appropriate or otherwise to addressing the identified market failures of the gap or mismatch between (industry) needs and (academic) know how.

In simple terms, therefore, we examined with stakeholders the relationship between the 'concept' of the Institute and the 'execution' of this concept to determine where – across the four outcomes illustrated in Figure 2.1 below – the Institute is perceived to have been positioned across the various phases of development (i.e. 'good concept, poor execution' and so forth).

Figure 2.1: Potential Concept and Execution Outcomes



Moreover such analysis provided a perspective (from a retrospective position) of the alternative approaches which might or should have been adopted (i.e. from a lessons learnt perspective if you were to do this again what would you do differently?).

(b) Current and Future Impacts

The process of evaluation is time bound – it involves assessing past activities to examine outcomes and impacts at a given point in time. It is apparent, particularly in the context of the currently recorded outcomes identified by the Institute (and detailed previously at Table 2.2) that such impacts are likely to be relatively insignificant.

It is also apparent that, over the last 12 to 18 months, there has been an increase in project activity (by Institute based staff) which has the potential to realise commercialisation outcomes in the near to short term.

In our view it is important to distinguish between these current and future outcomes and indicate 'what has' and 'what might be' the relationship between these outcomes and the Institute objectives and activities.

3 Sample Selection and Survey Programmes

3.1 Introduction

In this section we outline, in the context of our analysis of the Institute and evaluation issues, how we selected stakeholders and interview themes and topics.

3.2 Stakeholders

Two main groups of interviewees were selected, namely:

- **Stakeholders**; i.e. representatives of organisations involved in key aspects of the Institute's funding, operation, management and outcomes; and,
- **Projects**; covering the researchers, academics and consultants across a sample of projects receiving Institute funding and support.

Sample Selection: Stakeholders

In order to understand the rationale and objectives of the Institute and consequent performance stakeholders interviewed included representatives from various internal Scottish Enterprise teams that at the time of our interview programme were responsible for:

- Competitive Business;
- Growing Business;
- High Growth Support;
- Knowledge Management (Strategy);
- SE Industry Teams;
- SE Investment; and,
- Knowledge Transfer.

A selection of representatives were was also drawn from the Universities of Glasgow and Strathclyde including those directly involved in supporting the Institute (whether in terms of strategic and operational direction, research activity and commercialisation) as well as the respective Research and Commercialisation Offices.

Sample Selection: Projects

In relation to Institute projects we interviewed:

- All the current management team and staff to review their views on the current (and planned) portfolio of projects with which they are engaged; and,
- Various 'external' representatives that had either been involved in leading and developing Institute supported projects or advising such 'project owners' in initiating and taking forward their business plans.

Outcomes

As illustrated – at Table 3.1 below and detailed at Appendix B - our consultation exercise covered a total of 33 interviews – involving 14 project representatives (8 external and 6 internal) and 19 stakeholders.

In carrying out these interviews 27 of the total of 33 involved 'one to one' discussions and the remainder were conducted in the form of a group meeting.

Table 3.1: Consultation Interview Selection

Category	Interviews
Projects	14
Stakeholders	19
Total	33

The consultation exercise was conducted between October 2007 and the beginning of November 2007. All interviews were undertaken on a non-attributable basis.

3.3 Interview Framework

A framework of common themes and topics for discussion were devised for each set of interviewees. The detailed frameworks used for stakeholders and project representatives are attached at Appendix C.

In summary terms the interviews with **stakeholders**, including the Institute Management Team and Board and related SE personnel, focused on their views and comments on the strategic context and role of the Institute, the project identification and assessment process and how this operates

(particularly in addressing the Institute objectives) how commercialisation opportunities are assessed, the outcomes and results of the Institute and the impacts it has had (or will have) particularly in terms of commercialisation and bringing products to market and their sustainability, lessons learnt, opportunities for adding greater value, the potential future role and remit of the Institute and the role of other funding providers.

With **project representatives** we focussed on:

- **Background and rationale for involvement** – to determine their understanding of the objectives of Institute funding, their involvement and rationale behind their commitment, outcomes if Institute funding had not been forthcoming, the ability of the Institute to meet its original remit and the timeframe;

- **Experience of the Institute** – to review perceptions regarding the Institute's performance by ranking experience from very good to very poor in terms of the application and selection process, project management, marketing, relationship with industry, quality of advice and support, complementarity with other funding and benefits to date;

- **Specific Impacts** – in terms of the outputs secured or expected (including Intellectual Property, licensing revenue and other income, employment, and other outcomes) plans for the future, any requirements for further inputs from the Institute and any other effects; and,

- **Wider Benefits** – to identify the major lessons learnt from involvement with the Institute, particularly in relation to the commercialisation process, improvements to current arrangements, the development of new areas of research activity, the future role of the Institute, the securing of commercialisation benefits and making them sustainable and any requirements for further input from Scottish Enterprise or other organisations (including the private sector).

4 Impacts

4.1 Introduction

Our analysis of the impacts of the Institute is based on what is now known to have occurred as a result of Scottish Enterprise funding and what impacts might occur in the future.

In relation to 'known impacts' we have based our analysis upon two sources of evidence, namely the:

- Declared Institute outcomes as of November 2007(as defined previously at Table 2.2); and,
- Results of our consultations with project representatives from the Institute as well as University departments.

With regard to 'future impacts' we have drawn on our consultations with the latter representatives as well as external data sources in relation to commercialisation outcomes across UK and international universities and institutes.

The detailed analysis (and supporting assumptions and data) upon which our estimates of impacts are based is provided at Appendix D. The remainder of this section provides, therefore, a summary of our key findings.

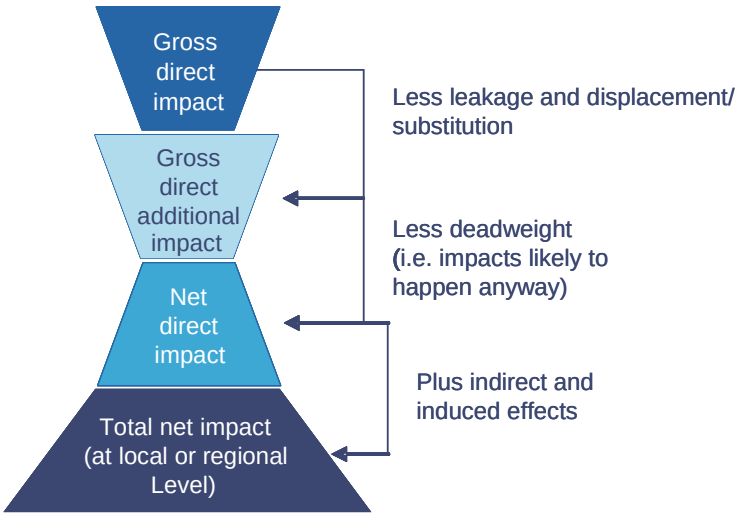
4.2 Impact Framework

The basis upon which we have measured impacts (across known and expected effects) consists of two components, namely the:

- Level of benefits that are likely to have been supported **directly,** within the Institute, partner Universities and other Scottish based organisations, as a result of Scottish Enterprise funding support; and,
- Range of impacts that are likely to be generated **indirectly** as a result of the 'initial injection' of the above funding.

In measuring these effects we have adopted Scottish Enterprise guidance in relation to net economic impacts. As illustrated, in Figure 4.1 overleaf, this guidance suggests that various effects require to be considered in deriving the net (as opposed to the gross) impacts of any given project or programme.

Figure 4.1: Net Economic Impact Framework



In the context of the Institute we have interpreted each of these effects as:

- **Leakage**; representing the loss of income (and related employment and gva) to the Scottish economy as a result of:
    - Initial Scottish Enterprise funding to the Institute being spent on materials, consumables and services supplied from non-Scottish sources; and,
    - Any future 'induced' funding support to Institute projects (again) being spent on non Scottish service or product providers.
- **Substitution/Displacement**[1]; representing activities that have not been taken forward as a result of the Institute's operation;
- **Deadweight**[2]; which endeavours to capture outcomes that may have occurred 'anyway' (even) had the Institute not been taken forward; and,
- **Indirect and Induced Effects**; in terms of the likely streams of income, employment and gva that, through appropriate multiplier analysis, are likely to have been (or will be) generated from the:

[1] Or alternatively: "the proportion of the intervention's outputs/outcomes accounted for by reduced outputs/outcomes elsewhere", "Assessing the Impacts of Spatial Interventions Regeneration, Renewal and Regional Development: The 3Rs guidance", ODPM, May 2004.

[2] Or: "the proportion of gross observed outputs/outcomes that occur under the reference case (in appraisal) or counterfactual (in evaluation)" (source as above in footnote one).

- Expenditure by the Institute on Scottish based providers; and,
- Potential income that may be generated by projects developed or supported by the Institute.

4.3 Current Impacts

As illustrated, in Table 4.1 below and detailed at Appendix D, we have estimated that the current impacts of the Institute to date are likely to have comprised around:

- £8.6 million of net income within the Scottish economy;
- 203 full time equivalent years of employment ("Fteye"); and,
- £5.79 million net gva.

Table 4.1: Combined Direct and Knock-On Net Impacts of the Kelvin Institute

Impacts	Direct	Indirect & Induced	Total
Income	£5.24 m	£3.42 m	£8.66 m
Fteye	121	82	203
GVA	£3.50 m	£2.29 m	£5.79 m

The key assumptions, on which these projections are based, are:

- **Direct Leakage;** effects are assumed to be around 50% for direct project related activities, 100% for computer equipment (at the Institute) and 0% for Institute staff and project support services (based on our consultations with stakeholders and Institute management);
- **Substitution/Displacement;** were likely to be minimal as those projects that might have received alternative funding support would probably have taken longer to deliver and be focussed on research rather than commercialisation outcomes;
- **Deadweight Effects;** were not apparent in respect of the Institute services, or related external support but, in the case of non institute based projects, around 50% would have probably been taken forward through alternative sources of funding support;

- **Indirect and Multiplier;** effects based on Scottish Executive data concerning type II multipliers and gva breakdowns; and,

- **Induced Effects;** in terms of the current projects. Outcomes were not apparent given that none of the existing project portfolio has yet to deliver any significant outputs (in terms of spin outs, licence income and so forth). This outcome is not altogether unexpected given the long term lead times to exploitation of the projects concerned.

4.4 Future Impacts

As detailed, in Section Two of this report, there are currently eleven projects that the Institute is (or has been) involved with that might, in the future, generate some form of commercialisation outcome.

Under a 'worst case' scenario it may be assumed that no such outcomes are realised. Under a 'best case' scenario; however, we have assumed that:

- All eleven projects do realise some form of commercialisation outcome; and,

- These outcomes are similar in output terms to other commercialisation projects in Scotland and the rest of the UK.

Consequently we suggest, as illustrated in Table 4.2 below, that the final impacts of the Institute are likely to fall between net income levels of around £8.66 million to £13.31 million, net fteyes of around 203 to 251 and gva levels of between £5.79 million to £7.89 million.

Table 4.2: Potential Future Impacts				
Worst Case Scenario				
Impacts	**Current Impacts**	**Future Spin-Outs**	**Future Licences**	**Total**
Income	£8.66 m	0	0	£8.66 m
Fteye	203	0	0	203
GVA	£5.79 m	0	0	£5.79 m
Best Case Scenario[1]				
Impacts	**Current Impacts**	**Future Spin-Outs**	**Future Licences**	**Total**
Income	£8.66 m	£4.0 m	£0.65 m	£13.31 m
Fteye	203	40	8	251
GVA	£5.79 m	£1.56 m	£0.54 m	£7.89 m

[1] The detailed assumptions underpinning this scenario as provided in Appendix D.

4.5 Conclusions

In drawing conclusions concerning the 'value for money' of any given public sector initiative it is necessary to compare the level of resources committed to the initiative with the net effect or impacts secured.

Adopting this approach for the Institute suggests, relative to the 'worst' and 'best' case scenarios considered above - that under the:

- Former, worst case scenario, the initial funding commitment of Scottish Enterprise of £6.6 million is likely to generate £8.66 million of net benefits (i.e. representing a ratio of 1:1.3); whereas,
- Latter, best case scenario, this commitment may generate up to £13.31 million of net benefits (i.e. representing a ratio of 1: 2.0).

Moreover, in the context of the 'distinct periods' of the Institutes initiation and operation, it may be concluded that the latter or last operating period (of 2005 to 2007) could, in isolation, generate a significantly higher cost to benefit ratio.

For example, if a comparison is drawn between the best case outcome (at Table 4.2) and the expenditure invested post 2004 (at Table 4.3 overleaf) then:

- In the former case the ratio of costs to benefits is 1:2; whereas,
- In isolation the ratio of post 2004 costs to post 2004 benefits is higher at a level of 1:2.7.

Table 4.3: Expenditure to Income Benefit Ratios		
Total Expenditure Income Ratios		
Total Expenditure	**Potential Income**	**Ratio**
£6.6 million[5]	£13.1 million[6]	1:2
Post 2004 Expenditure Income Ratios		
Total Expenditure	**Potential Income**	**Ratio**
£3.42[7]	£9.15[8]	1:27

This outcome suggests, therefore, that the most recent investment by Scottish Enterprise is potentially likely to generate the greatest return in impact terms.

In retrospect most of our consultees drew this conclusion – namely if the Institute were to be instituted today then the preferable operating and business model (i.e. that which would most likely generate real benefit) would be to adopt the current structure and management rather than that initially proposed.

In the context of the 'lessons learnt' evaluation issues highlighted previously (at Section Two) and, given the distinct nature of the three phases of the Institute's development, it may be tempting to conclude that if resources and support had been decided in the same manner pre 2004 then overall outcomes might have been or could be potentially 'better'.

While our analysis - at Table 4.3 – is also supportive of this view it is neither appropriate nor practical for the purposes of evaluation 'to ignore' the resources and expenditure devoted to the initiative in the initial operating period. In particular we suggest that there are a series of substantive conclusions that can (and should) be drawn about the overall investment by Scottish Enterprise, namely:

[5] Assumes that £6.6 million funds will be committed by May 2008.
[6] Best case total benefits as per Table 4.2.
[7] Total expenditure by the Institute from 2005 to August 2007.
[8] Assumes that the direct benefits over 2005 to 2007 are around £4.5 million (i.e. £3.42m divided by £6.6. million multiplied by total direct benefits of £8.66m) and future benefits will be £4.65 million (as per Table 4.2).

- Overall the project has demonstrated value for money with current net impacts likely to be around £8.66 million compared to the (likely) total public sector investment of £6.6 million; and,
- When considering future potential impacts at ‘best’ we suggest such impacts could rise to a level of £13.31 million for the same level of investment.

5 Wider or Spill Over Impacts

5.1 Introduction

In this section we review the wider non quantifiable benefits that are likely to have been generated by the Institute by reviewing the:

- **Analytical Framework** adopted by Scottish Enterprise to capture such benefits;
- **Effects** identified through our consultation programme in relation to this framework; and,
- **Conclusions** that may be drawn concerning the Institute in relation to the generation of such effects.

Analytical Framework

Over the last four years economists, within the public sector, have placed increasing importance upon assessing the wider impacts of projects and programmes. The drivers for this focus have been the:

- Recommendation, within the new HM Treasury 'Green Book', of reviewing and where possible quantifying the social and other effects of projects and programmes;
- Evidence, primarily from the appraisals of proposed major transport projects such as Cross Rail, that such effects may have a material impact on the selection of a preferred project option; and,
- Importance attached to 'cross cutting initiatives' and consequent recognition, within recent appraisal and evaluation processes, of the need to identify the interdependencies between different but related interventions and aggregate market conditions and impacts.

Against this background – and in order to complement the measurement of direct impacts – Scottish Enterprise has developed a "Business Environment Mapping" ('BEM') framework to assess the interaction between companies and organisations that have received Scottish Enterprise support and their *"external business environment"*.

As indicated in the BEM Scottish Enterprise paper: *"the environment in which businesses operate is a key driver of their ability to succeed"*. The paper proceeds, therefore, to provide a framework against which to classify this environment in terms of six key characteristics, namely:

- **Financial Capital;** in terms of the availability of appropriate funding support and the ease or otherwise of accessing such support;

- **Intellectual Capital;** covering the potential to access and leverage knowledge assets (both internally and externally);
- **Physical Capital**; in terms of access to appropriate equipment and facilities to allow development and growth (as well as the wider infrastructure networks to allow market accessibility and penetration);
- **Human Capital**; covering the availability of the: *"right skills at the right time"*;
- **Market Capital**; through networks across a given sector and the perceived value of this sector to existing and potential customers; and,
- **Social Capital**; that covers the internal and complementary support within a sector or groups of firms and organisations.

Adoption of these factors, in turn, provides the basis against which to assess whether they are prevalent in a certain sector (and if not, how they may be addressed through intervention) and to evaluate the influence of Scottish Enterprise on these factors once a project or programme has been initiated. It is in the latter context that we adopted this framework to identify the potential wider effects of the Institute.

Institute in relation to BEM

It was agreed with Scottish Enterprise representatives at the outset of our study programme that consideration should be given, in our consultations with project representatives and other stakeholders, to the influence of the Institute upon the factors identified across the BEM framework.

Given the nature of the Institute objectives it was also agreed that, for the purposes of our evaluation, these factors should be more specifically defined in order to examine the influence of the Institute (or otherwise) within the 'external environment', in which it operates. Consequently the issues which we agreed could (and should) be tested encompassed:

- **Financial Capital;** namely whether the Institute has effected the:
    - Perceptions (and ultimately) interest of private sector and other funders that, in the absence of the Institute, may not have considered supporting Scottish based commercialisation within the Higher Education and related research fields; and,
    - Ability of project teams to promote interest in and attract support for their projects which, again in the absence of the Institute, they may not have been in a position to take forward;

- **Physical Capital;** to examine the extent to which any of the equipment purchased by the Institute has attracted other users and benefits that would otherwise not have been (or taken longer to be) generated;
- **Human Capital;** to assess the influence of Institute on staff and project teams skills and capabilities;
- **Intellectual Capital**; namely whether the Institute has influenced project teams, universities and other stakeholders in regard to their strategic approach to and implementation of commercialisation and whether, in turn, the (brand) profile of the Institute provided a basis for attracting (or retaining) skills that might otherwise not have been available;
- **Market Capital**; in relation to wider stakeholders' perceptions of the Institute and the impact that this Institute may have had upon commercialisation activities 'pre' and 'post' Institute involvement; and,
- **Social Capital**; whether involvement in the Institute had led to any increased knowledge transfer and network opportunities or activities across projects and institutions and, if so, the potential benefits that had been obtained.

(a) Financial Capital

On the basis of our consultations – with both project representatives and wider stakeholders – we suggest there is currently little or no evidence to suggest that the Institute has changed the perceptions or interest of the private sector towards supporting Scottish based commercialisation projects.

We have drawn this conclusion on the basis that:

- There is little evidence, to date, of recurring private sector investment in either the Institute or related projects;
- The relatively low number of projects which have been developed (and consequent low level of 'deal flow'); and,
- The emphasis, by the Institute, of drawing down its own funds to support project development (rather than seek external private sources).

On the other hand we suggest that over the last year the Board and management team, through the use of external advisor support, have placed greater emphasis on the potential of Institute based projects, in meeting current and future market opportunities, to seek external funding (and, therefore, potentially raise awareness of Scottish commercialisation activities in relevant financial communities).

Our consultations with project teams and Institute staff indicate, for example, that such emphasis has led to the engagement with potential funders, which:

- Has led to changes in project development towards meeting identified funder needs; and,
- Ultimately has the potential to lead to financial support.

(b) Intellectual Capital

As outlined above we have interpreted this effect as capturing the influence (or otherwise) of the Institute upon the activities and actions of the two Universities in relation to commercialisation.

It is apparent, from our consultation, that the Institute has been perceived by the Universities as an 'independent initiative' that while potentially complimentary to mainstream commercialisation activities primarily focuses upon:

- Supporting projects within University departments that would otherwise not generate interest from the relevant commercialisation offices; and,
- Generating 'internal' projects supported Institute funding and resources (that might ultimately be developed by the University commercialisation offices).

In addition we would suggest that this perception of 'independence', and the resultant lack of engagement with University departments in identifying or developing projects, has proved a significant constraint to realising the initial vision for the Institute of drawing upon inter disciplinary resources to meet industry needs (and, therefore, to develop and enhance 'intellectual capital' across departments).

Perhaps unsurprisingly, and as recognised in the human capital section below, we suggest that significant effort (and related benefits) have been focused (and generated) on developing projects within the Institute.

(c) Physical Capital

Given the significant proportion of Institute resources devoted to staff and support services we suggest that – aside from the software related to Institute projects – there is little evidence (or relevance) to this type of effect being generated (In addition the project provides an example of where the opposite holds i.e. despite availability there has not been any take up for alternative uses).

(d) Human Capital

This effect relates to the impact of the Institute on staff and project teams. It is apparent, from our consultations, that one of the key benefits of the Institute resulting from the re-organisation and revised objectives identified in 2004 was the emphasis on focusing projects (and staff) upon market needs, the project characteristics required to meet such needs and, consequently, how best to respond to commercial opportunities.

In particular, in the case of both Institute staff and project team members from University departments engaged with the Institute, the internal and external advice provided has been beneficial and led to the development of a range of new skills and expertise, not least in relation to:

- Project management capabilities;
- Understanding and awareness of commercial market needs (in terms of business plans, product characteristics, market penetration etc); and,
- Targeting and engagement with potential (industrial) customers.

(e) Market Capital

In the context of ' market environments' it is important to consider the extent to which the Institute has influenced the network of support, advice and other activities 'pre' and 'post' Institute activities.

We suggest that there is little evidence to suggest such effects have – at least to date – been generated given the:

- Relatively low engagement with external companies; and,
- Lack of profile or engagement within the Universities.

The Institute has recently, however, begun to cultivate a relationship with SRI International, an independent, not for profit research institute conducting client-sponsored research and development for government agencies, commercial businesses, foundations, and other organizations. The Institute has been seeking advice and support from SRI with the first workshop session between KI project teams and SRI personnel being held in November 2007 (with an on-going intention to develop further potential collaborations).

(f) Social Capital

This final effect focuses upon the influence of the Institute in developing networks and knowledge transfer within and across the Universities and other stakeholder bodies.

Until recently we suggest that there is little or no evidence of this type of effect occurring either within the Institute or with other organisations. Subsequent to the organisational changes since 2005, however, the Institute in our view has:

- Encouraged interaction within its own project teams to develop and explore linkages across and between different 'products'; and,
- Targeted opportunities to support projects across and between particular fields within all Scottish Universities (in particular by focusing on some of the 'pooling' initiatives supported by the Scottish Funding Council).

Conclusion

It is our view that the Institute has not generated any significant 'spill over effects'. In short the linkages between the Institute and the external environment in which it operates have not been strong or well developed. On the other had recognition should, in our view, be given to the human capital, expertise and skills that have been developed by Institute staff, in addition to the recent association with SRI International.

In the next and final section of this second draft report we consider the implications and 'lessons learnt' from this conclusion and our overall evaluation of Institute activities.

6 Conclusions and Recommendations

6.1 Introduction

Our overall conclusions, based on our findings from the consultation programme and analysis of impacts, are that the:

- Institute has generated sufficient economic benefit to the Scottish economy in 'value for money' terms;
- Recognition of the issues faced in the initial operating period led to mitigating actions (identified by Scottish Enterprise and endorsed by the Institute Board) to ensure that such benefits could be potentially greater over the lifetime of the project; and,
- Types of activities currently piloted by the Institute provide a platform from which to consider taking forward new initiatives in the field of commercialisation.

In the rest of this section consideration is, therefore, given to the lessons that may be drawn from our evaluation in relation to future policy and programme development.

6.2 Potential Lessons Learnt

We suggest that in taking forward any future initiatives of this nature that initial consideration should be given not only to the nature of the market failure identified (ie the 'failure' to link industry to academia) but also the best means to respond to such failure in terms of addressing market needs.

In general terms this suggests to us three different types of approaches should be considered by Scottish Enterprise in developing any new initiatives in relation to commercialisation, namely:

- Pro-active engagement with industry sectors to identify needs (and opportunities) that could be addressed by university know-how;
- Pro-active engagement with University departments to identify needs (and opportunities) to roll out know-how to commercial parties; and,
- Pro-active engagement with both industrial sectors and university departments to develop joint and potentially new opportunities for commercialisation.

In considering any, or all of these options, we believe that an assessment should be made of various factors, not least the:

- Extent of the market (ie what are the characteristics of companies that might be prepared to invest in University know how in Scotland, what are the numbers of potential commercialisation projects within relevant University departments);
- Key needs of the market place (ie how best to engage industry sectors, what funding or other support will be required by Departments);
- Resources and skills required to address these needs (what are the levels of funding, organisational structures and skills base required); and,
- Performance and success indicators (that will demonstrate real change and benefit and can be used to monitor and manage on-going performance overtime).

Our consultation with stakeholders suggest that some or part of the issues that the Institute has faced in the development and initial phase of operation were linked to the lack of clarity in relation to each of these factors and that, as a consequence, the role of the Institute and its market position was never clearly defined or stable until 2004.

We suggest also that the corporate structure of the Institute might also have had an influence on performance and that in setting up any new initiative that is separate (if not independent of the university sector) that consideration will need to be given to:

- Ensuring there is sufficient incentive for universities and departments to engage with the organisation concerned (ie in terms of either funding or skills or both and related reward structures); and,
- Appropriate representation from the private sector in terms of the focus of operations, outcomes and if relevant, funding sources.

It is important to note, in our view, that the general environment in which universities now operate is significantly different than when the Institute was originally piloted. Given the current constraints on central funding as well as the demonstrable benefits from commercialisation (as evidenced by universities such as Cambridge and Edinburgh) Scottish universities are more aware of and engaged with developing a range of knowledge transfer activities. The overall “climate” for a new initiative is, therefore, likely to be favourable.

Similarly, one of the other key factors – as demonstrated most recently by the Institute – is access to appropriate industry expertise.

As reflected by our consultations, and the wider impacts identified, the use of specific sectoral experts in reviewing project opportunities and introducing the disciplines of business planning, project management and customer engagement have all proved to be beneficial in developing recent projects.

Finally, by implication we suggest that consideration, for any future initiative, might be given to formalising such relationships so that rather than 'contracting-in' expertise as and when required some form of partnership arrangement could be considered with private sector funding bodies and/or institutes of a similar nature with greater experience and expertise in a relevant sector or key market places.

Consequently we recommend, in developing options for any future initiative in this field that:

- There should be sufficient engagement, across industry sectors and university departments, to ensure:
  - Levels of potential projects that are attractive to and spread the risk of partnership involvement; and,
  - Attract relevant market expertise at an international level given the global nature of the key market opportunities that are likely to be addressed.
- Partnerships, give the above, should be actively sought in relation to funding and commercialisation from:
  - Organisations with funds of sufficient scale to support projects through to exploitation;
  - Institutes with a depth of experience and reach to ensure such exploitation can be realised; and,
  - Ideally a combination of the above.

PRICEWATERHOUSECOOPERS

Scottish Enterprise

Kelvin Institute Evaluation

Final Report

Appendix A – Background Material Summary

Appendix A – Background Material Summary

Kelvin Institute Material Review Matrix

Key Factor: Stated Objectives	
Description and Comment	**Sources**
Initially the Kelvin Institute was set up as an E-Institute with the following mission and objectives: "The E-Institute will become Europe's leading research and commercialisation centre of technologies and processes that are the cornerstones of the knowledge economy." To establish a world-class Institute to act as: • a source of new knowledge and research • a pipeline for trained graduates • a vehicle for delivery of advanced skills • a catalyst for economic development • a spur for new business • an engine for business Objectives: • Establish multidisciplinary teams of scientists, engineers and business analysts to work on the cutting-edge issues involved in the development of the 'new economy'; • Develop programmes to serve as the conduit for commercialisation of technology outputs and for skills upgrading; • Provide technology exemplars and information dissemination services that will act as vehicles for promoting and demonstrating the activities of the Institute. Three broad themes have been identified for the initial research phase: • E-Living: New Technology and Infrastructure for an E-Society • E-Business: New Strategies, Models and Management Techniques • E-Services: Mobile Communications, Computing and M-Commerce	The E-Institute Briefing Paper, 2001 p. 3
According to the initial business plan for the E-Institute it was set up with the following mission statement: *"The E-Institute will be international renown as Europe's leading research and commercialisation centre of technologies and processes that are the cornerstones of the knowledge economy."*	The E Institute Business Plan, Jan 2002, p.7

Revised Mission Statement (2003): "The E-Institute will become Europe's leading research and commercialisation centre of technologies and processes that are the cornerstones of the knowledge economy." It was agreed that the E-Institute would be established as a company limited by guarantee and that on instruction from SE the Institute will be **renamed**. To achieve this aim the Institute will focus on the following three areas: • A strong R&D programme – focusing on three areas: o Universal communication o Knowledge management and information retrieval and, o E business enabling factors such as security, privacy and trust; • A commercial programme – highlighting the needs of commercial enterprises and including the commercialisation of intellectual property, entrepreneurial development and apprenticeship programmes to meet the needs of the knowledge economy; and, • An information dissemination programme- providing information and knowledge on current developments and future opportunities. Based on the above, the main income streams of the Institute will be as follows: • Contacted Research • Consultancy • Corporate Sponsorship • IPR Licenses • Information Dissemination and • Equity Realisations	Scottish Enterprise Glasgow, Business Growth, Executive Team Paper, January 2003, P.1
Updated Mission Statement (2004): *"The Kelvin Institute will be internationally renowned as Europe's leading research and commercialisation centre of disruptive information and communication technologies and processes that are the cornerstones of Scotland's knowledge economy."* The Kelvin Institute's mission is as follows: To raise the competitiveness of Scottish Industry and realise full value from the university research base by improving the transmission of fundamental research and knowledge into new and existing businesses in the broad domain of information sciences and communication technologies.	KI Board of Director's Meeting, May 2004, Slide 3 SCOTTISH EXECUTIVE EUROPEAN REGIONAL DEVELOPMENT FUND GRANT APPLICATION FORM, 2006 p.6

To achieve this, the Kelvin Institute will use its own development team to further research that will typically be complete in an academic sense, however will require development expertise in order to achieve market readiness. The KI will work with university departments to:

- Evaluate academic projects either as they approach the end of research funding or after research funding has been exhausted
- Bring selected projects in-house
- Develop the core project to commercial quality standards
- Provide marketing and business development support for a management team where a spin-out is created

The Kelvin Institute's role is therefore to:

• Identify and develop existing research projects with commercial potential
• Provide a bridge between industry and academic research
• Showcase the best of Scottish ICT research

Updated mission (2007):

Kelvin's mission is to deliver economic development value to Scotland by identifying and developing commercial potential within Scotland's academic research base and SME community:

1. To identify academic research within Scotland's university base with commercial potential and align to market opportunity.
2. To establish relationships with SMEs that will enable them to develop and take to market products and technologies.
3. To develop the technology beyond proof of principle and commercialise through sale, licence or spin-out.
4. To create a virtuous circle of activity where our involvement with academia provides a constant stream of innovation and opportunity, and our commercialisation activities develop a market awareness that allows us to better identify and align academic research to commercial opportunity.

The Kelvin will realize its vision through the following key objectives:

1. To demonstrate the success of the Kelvin commercialization model by achieving commercial outcomes for current projects either through new company spin-out, technology sale or licensing.
2. To generate a strong pipeline of high-quality projects originating from Scottish Universities, HEIs and SMEs approved for funding.
3. To justify and secure additional public funding to allow the Kelvin to fund more University-based projects and continue to provide an economic development role.
4. To strengthen key processes around the identification and commissioning of university projects and the conversion of technology into commercial activities and establish an auditable trail to prove that the maximum impact is being

achieved.

5. To raise the profile and build brand awareness to facilitate sourcing of opportunities, exploit customer references and the Scottish Enterprise network and thereby promote commercialisation with the Scottish technology community.
6. To strengthen the Kelvin team, skill base and processes to improve execution and operational effectiveness.

Historical Overview – Synopsis of the period 20 September 2001 through 19 December 2003

The Kelvin Institute formerly known as the E-Institute was established as a company limited by shares on 19 December 2003. In the two years prior to its establishment it weathered numerous financial and strategic reviews. A brief summary is provided below:

October 2001

- A review by PricewaterhouseCoopers LLP of the original E-Institute business plan was conducted.
- The Graham Hills Building at Strathclyde University became the 'temporary' home for the Institute.

March 2002

- A revised business plan with a focus on research and commercialisation of technology that would have a disruptive market impact was submitted.

April 2002 through August 2002

- Scottish Enterprise conducted a review and analysis of the business model.
- The budget was revised to reflect capital requirements to £6.0 million over five years.

September 2002 through December 2002

- Another review by PricewaterhouseCoopers LLP was conducted.
- The research agenda was reworked with a concentration on ubiquitous computing.
- The first permanent employees of the Institute were hired.

January 2003 – June 2003

- The name Kelvin Institute was secured as the new name of the E-Institute. The name change was requested by the e-Business Group at Scottish Enterprise.
- An analysis of the Institute's activities vis-à-vis State Aid concerns was conducted and successfully resolved.

Kelvin Institute Executive Director's Report.
18 February 2004
WG Nisen, P. 1

July 2003 – December 2003

- First company was admitted to the business mentoring programme.
- Final corporate papers were drafted and negotiated.

Ownership Structure

The Kelvin Institute was constituted in December 2003. The equity position of each party was, and is, as follows:

SE Internal Correspondence, Dec 2005

University of Strathclyde 46.8%
Scottish Enterprise 25.1%
University of Glasgow 15.6%
Share Option Scheme 12.5%

As funder of the Institute SE has a 25.1% share of the KI which satisfies SE's requirement to hold a sizeable equity position without becoming the controlling shareholder.

The remainder shareholding has been distributed between the two universities with a small amount set aside for a future Share Option Scheme. The universities' relative shareholding was calculated based on their input to the Institute. The University of Strathclyde (Strathclyde) agreed to second the services of three senior members of academic staff, whilst Glasgow University (Glasgow) would provide one. As a result, Strathclyde received three times the shareholding of Glasgow.

Strategic/Policy Documents

SCOTTISH PROGRAMMES 2000-2006 WESTERN SCOTLAND OBJECTIVE 2 PROGRAMME EUROPEAN REGIONAL DEVELOPMENT FUND, GRANT APPLICATION, Part 3, 2005, p.11

The need for innovative technology transfer models that address key failures in the process has been well documented in recent years. Scottish Enterprise has been at the forefront of developing new technology transfer models in recent years, and the Kelvin Institute is designed to address key market failures identified in the recent Lambert Review of Business-University Collaboration (December 2003) and the refreshed Scottish Executive strategy 'A Smart, Successful Scotland' (2004).

A Smart, Successful Scotland identified the following as key issues:

- The lack of management skills was a barrier to growing businesses of scale. The Kelvin Institute will address this failure by providing management skills at a critical phase of the spin-out's growth and by assisting to put in place a management team capable of growing the company to a level of scale.
- Business Start Up levels are low compared to the rest of the UK and many of our international competitors. The Kelvin Institute will address this failure by providing a clear path from research through to new start company
- Resources need to be focused on where there is the greatest potential contribution to the economy. By focusing on

areas where the Universities have combined research expertise the Institute is focusing on a key sector where the West of Scotland has an under-utilised competitive advantage.

- Evidence suggests that Scottish innovation performance is poor compared with other EU countries. The Institute will grow and accelerate innovation.
- Universities should be helped to package the knowledge generated by their research and to bring it to the attention of business. The Kelvin Institute bridge between academia and industry, will assist universities to package their intellectual property into a technologically robust product thus attracting the attention of businesses. Through utilising existing networks the Kelvin Institute will be an evangelist for university/business interaction.
- This (packaging of knowledge generated by University research) requires close co-operation, market understanding and a desire to maximise the impact of high quality research on product and processes. The Kelvin Institute, through its cooperative relationship with the universities, can bring its market understanding of the communications technology sector to move university research through development to new products.

Consequently, there will be a focus on increasing commercialisation opportunities and increasing business awareness of what the research base has to offer. This is precisely one of the outcomes that a Smart, Successful Scotland highlighted was required.

Lambert Review of Business-University Collaboration

One of the key recommendations of this wide ranging review was to increase the availability of 'proof of concept' funding. This is a generic term for funding and should not be confused with the Proof of Concept Fund operated by SE. Proof of concept funding is used to establish whether a new technology is commercially viable or not. It is the first stage in transferring IP to the market, and is needed for both licensing and spinning out.

The Kelvin Institute provides a new stream of this type of funding, extending the range of academic research that can be taken towards commercialisation. The demand for the Proof of Concept Fund is evidenced by the 593 applications to date, the 120 projects funded and underway and the fact that there has been no drop-off in the number of applications in the 5 rounds to date. However such projects have only come about as a result of a research team keen to advance a research project. The Kelvin Institute's model opens up a wide body of research which is 'on the shelf' either because the academic has moved on to new challenges or lacks the motivation, skills or market knowledge to identify the commercial potential of a particular piece of research.

Booz Allen Hamilton Report (2006)

"As identified in the recent Booz Allen Hamilton report 'Smart Spenders: The Global Innovation 1000' (December 2006) on the relationship between R&D, innovation and competitiveness amongst the top 1000 companies in the world as rated by their R&D expenditure in 2004, some of the most popular measures that have been used as proxies for successful innovation are flawed as regards the correlations which they purport to illustrate. While measuring levels of innovation

From: Kelvin Institute (KI) – Project Acquisition and Appraisal in 2006, p.2

activity, many metrics are not indicative of improvements in competitiveness through innovation, which involves a more complex chemistry than for example simply looking at the number of patents applied for. Similarly as regards the performance of universities in the so called 'Third Stream' knowledge transfer arena, it is suspected that several of the current measures while indicative of increased activity are not synonymous with increased economic growth at the same level. As such there is a requirement for a more subjective, and intimate analysis of knowledge transfer and related innovation activity in Scotland to better understand the true nature of the challenges, attitudes, initiatives and activities on the ground. In this regard the ethos and work of the KI place it in a strong position to contribute to a better understanding of the distinctive challenges faced by the universities in relation to knowledge transfer. The KI, like other forms of support for innovation, such as the various national initiatives including Proof of Concept, SMART, SPUR, SCORE and SEEKIT, and alternatively access to venture capital, bank and angel funding, applies rigorous processes of due diligence to each prospective opportunity. However central to the KI model is the role and predicament of the academics, who are simultaneously in many cases striving to publish, teach and fulfil knowledge transfer opportunities."	

Key Factor: Stated or Anticipated Outputs/Impacts	
Description and Comment	**Sources**
Outputs: • Academic - the Institute will inform and influence the development of new undergraduate and postgraduate courses in the Universities to meet the needs of the new economy. New interdisciplinary programmes to be initiated to reflect the growing demand for trained graduates highly skilled in information technology in addition to the business and social implications and development opportunities associated with it. • Commercial – 4 main areas: o Continuing Professional Development (CPD) to improve the skills base. o Commercialisation of academic IP generated through the research projects. o The provision of consultancy services, and technology and business forecasts. o Information dissemination. ***Impacts:*** By facilitating a successful transition to a knowledge economy the E Institute will bring benefits in terms of economic growth and cultural outcomes. By bringing together staff from the Business School, Computer & Information Sciences, and Communications at Strathclyde, and from the Department of Computer Science at Glasgow University a unique environment will be created to provide innovative solutions to the challenges presented by the E-economy. Economic Impact Assessment The impact of the E Institute on the regional economy has been analysed by using the Scottish Labour Market Intelligence	The E-Institute Briefing Paper, 2001 E-Institute Economic

Model. The model has forecasted that secondary effects arising from the E-Institute's activities should inject around £14.9m into the Scottish economy by the fifth year of the Institute's existence, based on 2001 prices. The analysis further indicates that the E-Institute will lead to 190 jobs across Scotland.

It is important to note that one of the reasons the E-Institute exists is to make contributions to the knowledge base in Scotland. These contributions will lead to an increase in the intellectual capital; and these contributions will be rapidly disseminated through relevant programmes in the following areas: information dissemination, contracted research, consultancy, seminars and conferences.

Impact, 2001

TABLE 1

Knowledge Economy characteristics	E-Institute's activity
Value from creativity	Wider scope of R&D
Investment in innovation	Industry driven innovation
Information	Cornerstone of activity
Consumer oriented	Outgrowth from SME activity
Digitisation	Ubiquitous digital environment
Short product cycles	Technology exemplars to illustrate this issue
Globalisation	International linkages
Change and Innovation	Cornerstone of activity
Lifelong learning	Business mentoring
Co-operative networks	World-wide ties

4 *TABLE 2*

Economic parameters	Functional Activity	E-Institute's role
Enhanced labour quality	Education and Training Lifelong learning Improvements in health	An element of the E-Institute's work is a learning environment for all participants, especially under- graduates and graduate students
Capital deepening and widening	Plant and machinery Computers Telecoms and Roads	The E-Institute will contribute to novel developments in computing and telecoms
Technological progress	R&D Commercialisation of Research Innovation/Diffusion E-commerce Networks and Internet	Thrust of E-Institute on complete value-chain from R&D, innovation to IP commercialisation. E-business, Communications Network Technologies, and Internet tools will be extensively employed.

Refer to report for further potential qualitative impacts from the E-Institute.

Outputs

According to the 2002 Business Plan it was anticipated that within five years the E-Institute would be financially self-sufficient and will have contributed to the establishment of:

- 14 companies – one of which would be a direct spin out company from the E-Institute
- 69 employees with over 50% directly working on the application of core research programmes

The E Institute Business Plan, Jan 2002, p.7

To achieve this goal the E-Institute set out the following key financial and growth targets over five years:

	2002	2003	2004	2005	2006
Revenues (000's)	911	1990	3602	5306	9423
Profits (000's)	-1962	-3049	-2553	-1187	2348
Employees	39	50	70	72	73
Companies Mentored	0	1	5	10	14

In addition to these financial goals it is anticipated that the E-Institute will become a pre-eminent cross-disciplinary research centre in Europe attracting world calibre academic and business professionals and generating high levels of intellectual property.

The emphasis on incubating companies re-enforces the commercial focus of the E-Institute. The key to this initiative is the E-Institute's comprehensive incubation and mentoring programme. The rate of new company formation as well as the total number of companies that will pass through the incubator are shown below:

Categories	2002	2003	2004	2005	2006
No. of new companies	0	1	4	6	6
No. of companies lost	0	0	0	1	2
Companies in Mentoring Prog.	0	1	5	10	13
Companies Spun out of Mentoring prog.	0	0	0	0	1

Economic Impact (multiplier)

- The E Institute is expected to inject approximately £14.9m into the Scottish Economy by year five based on 2001 prices and
- Lead to 190 jobs across Scotland

In addition to the following qualitative impacts:

- Contributing to an enhanced quality of labour by providing a learning environment for all participants
- Leading to capital deepening and widening by contributing to novel developments in computing and telecoms
- Contributing to technological progress by supporting R&D, innovation to IP commercialisation, and E business type activities

E-Institute Key Performance Targets 2002-2004:

Year One Targets			
Quarter One	**Quarter Two**	**Quarter Three**	**Quarter Four**
1. Secure gap funding 2. Recruit top calibre staff 3. Finalise the research agenda 4. Establish the Management Committee; select chairman 5. Launch the E-Institute	1. Leverage and external links 2.Establish Advisory Board 3. Execute the research programme	1. Launch the outreach programme with the White paper Series 2. Launch the first demonstration project	1. Initiate the sponsorship programme 2. Launch the seminar series 3. Identify candidates for the incubator
Year Two Targets			
Quarter One	**Quarter Two**	**Quarter Three**	**Quarter Four**
1. Launch new business incubation and mentoring programme 2. Plan participation in first conference as an exhibitor 3. Occupy larger facilities to accommodate incubated companies 4. Substantially expand the contracted research programme	1. Expand the research programme 2. Hire marketing director	1. Accelerate the EU and international grant programme 2. Secure first license of the E-Institute's intellectual capital	

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Key Performance Targets 2002-2004, (2002) and E-Institute, Three Year Cash Need Analysis with Strategic Milestones, November 2002

Year Three Targets			
Quarter One	**Quarter Two**	**Quarter Three**	**Quarter Four**
1. Substantially increase commercial activity	1. Continue the expansion of the new business incubation and mentoring programme	2. Emphasise sponsorship programme	3. Initiate planning for new research programme

Year Two Objectives
1. Launch the Incubator/Business Mentoring programme 2. Expand research programmes 3. Grow business development and other commercial operations 4. Launch second demonstration project 5. Host first international conference – 200 attendees forecasted
Year Three Objectives
1. Expand funding programmes 2. Launch third demonstration programme 3. Grow existing programmes 4. Host second international conference – 350 attendees forecasted

Revised targets 2003-2005

Year 1

It is planned that the E-Institute will be in a position to start operations at the beginning of January 2003. The prime objective of the first year of operation is to ensure that the Institute is established as a viable entity with the appropriate staff, technical infrastructure, international connections and initial research programmes to enable it to start generating an external income stream towards the end of the year.

Over and above the income which is already committed from the universities, Picsel and ntl, the first year's income of £220,000 from contracted research, consultancy and grants, starts with £20,000 in August, rising to £50,000 in December 2003.

Scottish Enterprise, Competitive Business, Board for Information, December 2002, p.1&2

Specific targets through this year on a quarterly basis are:

Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Recruit senior management and research staff 2. Finalise the research agenda 3. Establish the Board of Directors 4. Launch the E-Institute 5. Finalise all legal documents	6. Leverage and extend external academic and commercial links with a special emphasis on international collaboration 7. Finalise the Advisory Board 8. Execute the research programme	9. Launch the information dissemination initiative with the White Paper Series 10. Launch the first demonstration project; Virtual Scotland	11. Initiate an expanded sponsorship programme 12. Secure overseas research relationships 13. Identify candidates for the incubator

Achieving these targets is predicted to require an overall expenditure of £2,648,100. This is offset with an income of £913,600 leaving a first year funding requirement from SE of £1,734,500.

Year 2

In the second year the Institute will concentrate on controlled growth with the expansion of the programmes through which it will establish its unique international brand. In this year an overall expenditure of £4,009,061 is predicted allowing the existing income streams to increase and additional income streams from information dissemination and IPR licences to be established.

Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Launch new business incubation and mentoring programme 2. Plan participation in first conference as an exhibitor 3. Occupy larger facilities to accommodate incubated companies	4. Substantially expand the contracted research programme 5. Expand the research programme 6. Hire marketing director	7. Accelerate the EU and international grant programme 8. Secure first licensee of the E-Institute's intellectual capital	9. Continue to expand the new business incubation and mentoring programme

Year 3

Year 3 will see the consolidation of much of the research work and a concentration on commercialisation leading to substantial increases in contracted research and consultancy income. It is this year which will establish the E-Institute as a long term viable entity. To achieve this an expenditure of £5,072,048 is planned, balanced by an income of £3,587,500 to leave a funding requirement of £1,484,548

Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Substantially increase commercial activity	2. Continue the expansion of the new business incubation and mentoring programme	3. Emphasise sponsorship programme	4. Initiate planning for new research programme

Scottish Enterprise Glasgow, Business Growth, Executive Team Paper, January 2003, P.2

Updated outputs (2003):

- Employment - the Institute is predicted to reach 25-30 staff by the end of the first year and approximately 70 staff at the end of the 5th year with overall benefit to Scotland of 180 jobs;
- Income - the Institute is expected to generate a total of £19.3m in Scottish output in its fifth year - £9.4m directly and a further £9.8m indirectly.

Anticipated Outputs from ERDF support:

Technical Assessment Report For European Structural Funds Application, 2005

The project will create **136 high value jobs** within the programme period. Based on a crude calculation **each job costs £37,187 of the eligible costs or £14,875 of ERDF contribution**. It is important to note that whilst this crude intervention rate appears relatively high the following must be considered:

1. All these jobs are high value, knowledge based and will contribute significantly to the knowledge based economy Scotland aspires to be.
2. The number of jobs has the potential to rise significantly beyond the programme period. Based on other successful spin outs in Scotland it will take just one major breakthrough to create hundreds of high value jobs. For example **Q-One Biotech** was founded on IP developed at Glasgow University and currently employs 200 people at the West of Scotland Science Park.
3. Projects of this nature are by their nature, high in cost but high in return.
4. The ERDF legacy has the potential to be high as the Kelvin Institute will be in a position to generate income from patents developed through the ERDF funding period and is expected to be wholly self sustaining in the medium term.

KI Operating Plan, Board Presentation, 2007

In addition **£3m** will be generated within the programme period in additional company sales. This demonstrates immediate return on the ERD investment of £1m with the potential to grow ten-fold beyond the programme period.
 	
2007 Key Operational Targets:
 	
➢ Income from current projects
  ➢ 250k
➢ Additional Income
  ➢ one ITI funded project
  ➢ one FP7 project
  ➢ one new contract R&D (not related to current projects)
➢ University Projects
  ➢ 20 project proposals taken beyond point of initial discussion
  ➢ 10 projects proposals taken to advisory board
  ➢ 6 projects passed by advisory board (to be started if sufficient funding is available)
  ➢ *At least* half of these by end-May 2007
  ➢ Pipeline development process embedded and understood by all university partners
➢ One spin-out company with second in sight by end of year
 	
In 2007/8 Kelvin will:
 	
• Develop a contact database for each key institution, SME and third party stakeholder
• Prepare and circulate to the above a quarterly newsletter
• Deliver, at least annually, a formal presentation to each Institution
• Participate in Scottish Technology events
	The Kelvin Institute, Operating Plan 2007 – 2008, p.9

Key Factor: Recorded Outputs/Impacts	
Description and Comment	**Sources**
Kelvin Institute employment highlights for 2004: Current Headcount: 9 full-time equivalents; 2 part-time equivalents Projected headcount: 28 full-time equivalents; 12 part-time equivalents Outputs and Results to date:	Kelvin Institute Executive Director's Report, 18 February 2004, WG Nisen, P. 2 SCOTTISH EXECUTIVE

1. the No. of commercialisation projects in HE, FE and research institutions: 12 2. Total No. of gross new jobs created: 68 3. No. Of spin outs created 3 4. No. of new exporters entering new markets 3 5. Increase in sales derived from exports £1.5m 6. No of patents issues/ IPR registrations by businesses 9 7. Level of private sector leverage £3m. In relation to Equal Opportunities, Social Inclusion and Sustainable Development the following results are expected: No. of gross new jobs created for members of ethnic minorities: 20 No. of gross new jobs created for women 16 No. of gross new jobs created in areas of most need: 50 No. of patents issues/ IPR registration by businesses in env. sector. 1 The ERDF sought will bring real added value to a vital Scottish project. It will enable at least 40% more commercialisation projects to be funded and increase the number of jobs generated by at least 40%. The ERDF sought is for one year only and may be extended following close liaison with the PME. **Operating Plan, 2006** Total KI employment at start of 2006 – 14 people (10 employed, 4 contractors)	EUROPEAN REGIONAL DEVELOPMENT FUND GRANT APPLICATION FORM, 2006 KI Operating Plan, 2006, p.2

Key Factor: Activities	
Description and Comment	**Sources**
The core team of the Institute is made up as follows: Chief Executive Officer Project Director* Commercialisation Director* International Director Financial Controller Office Manager* Administrator*	**SCOTTISH PROGRAMMES 2000-2006 WESTERN SCOTLAND OBJECTIVE 2 PROGRAMME EUROPEAN REGIONAL DEVELOPMENT FUND, GRANT APPLICATION, Part**

Each project consists of a team of four people as follows:

Principal Engineer
Senior Engineer
Programmers (x2)

Projects will be run in two distinct phases; Phase I will focus on developing the technology to a stage where its value can be demonstrated to a potential customer. Institute staff will continually assess the commercial prospects of the project and actively solicit commercial interest. A detailed review of the project will be conducted by the Institute at the end of this phase (typically at around 6 months) when the updated project plan and business plan for the project will be assessed. The outcome of this review will be a decision to either progress the project to Phase II or reallocate resources to other projects.

During Phase II, the Kelvin Institute will expand its efforts to identify and arrange for commercial project sponsors and alpha-site customers while the project team completes the implementation of the technology. At the end of the 12 months the Institute will diligently evaluate the project's commercial potential with three possible outcomes:

- the project will come to a natural end;
- the project's technology will be licensed to a third-party; or
- a new company will be formed to exploit the new technology.

Where a new company is formed the Institute will provide support to identify a suitable management team, develop a business plan, attract public/private investment and other incubation facilities.

Appendix 2 – Kelvin Institute Job Descriptions

Chief Executive Officer

The CEO will report to the Chairman to the Board of the Kelvin Institute Ltd. and will be responsible to the Board for the effective management of the company and compliance with company legislation. The CEO will have overall responsibility for the operations of the Institute and its growth and expansion, and will be charged with developing its strategy and maintaining its financial viability. The CEO will take overall responsibility, with the Directors, for implementing and regularly updating the company's strategy and business plan.

Responsibilities include –

- Provide overall leadership and vision in developing the strategic direction of the company and in developing the tactics and business plans necessary to realize value for all stakeholders.

3, 2005

SCOTTISH PROGRAMMES 2000-2006 WESTERN SCOTLAND OBJECTIVE 2 PROGRAMME EUROPEAN REGIONAL DEVELOPMENT FUND, GRANT APPLICATION, Part 3, 2005, p. 34-39

- Insure the culture and values promote ethical practices, integrity and a positive work climate to enable the company to attract, retain and motivate a diverse group of highly qualified and capable individuals.
- Keep the Board fully informed on all aspects of the company's operational and financial affairs, and on all matters of significant relevance to the company.
- Develop and maintain sound effective organizational structures and insuring capable management succession, progressive employee training and development programs.
- Effectively promote and advance the interests and objectives of the company locally, nationally and internationally
- Develop and maintain collaborative working relationships with partners, stakeholders and academic institutions.
- Negotiate at senior level with industry and government.
- Managing change and motivating a diversity of technical experts and commercial staff

Commercialisation Director

The Commercialisation Director will report directly to the CEO and handle activities leading to the commercialization of technology developed and invented as the result of Kelvin Institute projects. These activities include

- identification of transferable technologies within the academic research base of partner universities which could form the basis of Kelvin Institute projects;
- evaluating commercial potential of technologies; preparing a written description of technologies and their current stage of development and their competitive advantages and disadvantages when compared to other related technologies;
- evaluation of commercial potential and development of commercialization strategies of Kelvin Institute technologies;
- negotiation of licenses and IPR agreements with partner universities
- determining the status and extent of proprietary rights protection, and whether additional protection is necessary and justified;
- determining the nature and extent of the primary markets to which the technology applies, including size and structure;

This position will also develop strategies for the commercialization of technologies. For each technology deemed to have significant commercial potential, the commercialisation director will prepare profiles of companies addressing the relevant markets; inform relevant companies of the availability of a new technology and make them aware of its relative advantages and disadvantages; promote commercial use of new technologies that may lead to new business ventures.

Project Director

The Project Director will report directly to the CEO and will be responsible for successful project coordination and management. The Project Director has management responsibility for all Kelvin Institute projects. The Project Director is responsible for participating in projects from specifications and timeline development thru delivery and support to ensure

success. The Project Director will work with the Commercialisation Director to determine the additional development required to bring the technology to a stage of attractiveness for commercial firms.

Responsibilities include:

- Recruit and retain suitably qualified engineers for Kelvin Institute projects.
- Establish and execute staff training plans.
- Conduct employee performance reviews.
- Interact with commercial sponsors in the evaluation of technologies.
- Assist in strategic and operational planning, business process improvement and make overall project improvement recommendations.
- Establish and adhere to applicable best practices.
- Manage multiple projects and multiple streams of project work simultaneously.
- Establish and manage to project quality and success metrics as defined in conjunction with management team and commercial sponsors.
- Effectively communicate project status to management team and keep all stakeholders informed of project status and all related issues.
- Manage and control changes in project scope while communicating impact to management and team.
- Identify, communicate and manage risks that may interfere with project execution or success.
- Manage team workload, assist with the definition and prioritization of upcoming projects, define appropriate staffing, and develop and manage project.
- Proactively work to identify and resolve issues.
- Continuously monitor development process and proactively work to identify and resolve issues.
- Ensure appropriate project documentation is produced.
- Track and monitor resource time on projects and use historical data to estimate resource requirements for future projects

International Director

The International Director will report directly to the CEO and will be responsible for developing international relationships and an international profile for the Kelvin Institute. He will work closely with the Commercialisation Director to identify opportunities and markets for Kelvin Institute technologies with particular focus on the United States of America.

Responsibilities include:

- Provides vision, strategy and leadership for the International channel.
- Provide international marketing services.
- Represent the Kelvin Institute as a spokesman and assist in securing strategic relationships and other business

opportunities as appropriate.
- Recommend and develop new strategies, relationships and innovative ideas to grow the international channel
- Work closely with commercialization director to identify and develop international opportunities.
- Attract international commercial partners to support and participate in the research and commercialisation.
- Drive relationship with the Scottish Development International (SDI) to leverage the international exposure of the Kelvin Institute through SDI offices.

Financial Controller – Job Description

- Prepare annual revenue and capital budgets and other financial plans
- Prepare monthly accounts and management information in respect of all financial operations
- Monitor expenditure against budgets
- Prepare the Financial Statements and any other financial information which the Institute is required to submit to external authorities
- Ensure that the Institute maintains satisfactory financial systems
- Provide professional advice on all matters relating to financial policies and procedures
- Produce quarterly VAT returns
- Produce annual statutory accounts and file with Registrar of Companies
- Produce annual return and submit to the Registrar of Companies
- Liaise with the Scottish Executive
- Liaise with the University of Strathclyde
- Liaise with Glasgow University
- Attend the Kelvin Institute Board Meetings
- Attend the Audit Finance and HR Group meetings
- Attend the Advisory Board meetings

Principal Engineer

The Principal Engineer will report directly to the Project Director and will be act as the technical lead on a Kelvin Institute project.

Responsibilities include:

- Design of the technical roadmap for a Kelvin Institute project to take underlying research results to a stage of commercial attractiveness.
- Managing a leading the project development from design to actual implementation.
- Understanding end-to-end requirements.
- Writing architecture, functional specification and design documents.

- Work as a mentor and lead for a team of engineers and programmers.

Senior Engineer

The Senior Engineer will report directly to the Principal Engineer and will be responsible for the actual implementation of a Kelvin Institute project.

Responsibilities include:

- Requirements development.
- Design, implementation, debugging and troubleshooting computer software code.
- Validation, testing and generating documentation for software and related hardware designs.

Programmer

The Programmer will report directly to the Principal Engineer.

Responsibilities include:

- Develop, test and document computer software systems, in conjunction with hardware product development, for industrial or other applications.

Office Manager – Job Description

- Provision of office accommodation, maintaining a high standard working environment for all employees
- Producing documentation for new employees:
  - Offer letter
  - Employment agreements
  - Induction instructions
- Maintaining employees' personnel files
- Running and maintaining the Sage payroll system
  - Inputting employee information
  - P45 details
  - Running monthly payroll
  - Inputting expenses where applicable
  - Inputting deductions where applicable
  - Make BACS payments
- Producing information and liaising with the Inland revenue:

- P45's
- P35's
- P11d's
- P60's
- P14's
- Make payments for PAYE/NIC contributions

- Maintaining the company bank account
- Sales ledger - invoicing
- Purchase ledger - input invoices and making payments on due dates
- Produce journals for accounting purposes:
  - Expense claim forms
  - Payroll
  - Pension scheme
  - Insurances
  - Credit cards
- Producing and maintaining Health & Safety manual
- Provision of Scottish Widows Pension Scheme in conjunction with Pension Advisor, maintaining same and making contribution payments on due date
- Provision of Group Life Assurance Scheme & Group Health Insurance in conjunction with provider and maintaining same
- Obtain quotations for insurances and ensuring insurances are up to date
  - Employers' Liability Insurance
  - Commercial Property/Business Interruption
  - Electronic Data Processing Property
  - Public & Products Liability
  - Indemnity Insurance
- Setting up and maintaining filing systems
- Reception and telephone switchboard duties
- Organising the production of company stationery and other material
- Ensuring the smooth running of the office, including all services supplies and maintenance

Administrator – Job Description

- Provision of high level, confidential secretarial service to the Chief Executive using Microsoft Word, Excel and Powerpoint
- Arrange conferences and liaising at all levels with customers, captains of industry, members of parliament, University professors and the general public
- Invoicing – ensuring that all invoices have both a Purchase Order Number and a Payment Request Form and are

duly authorised before payment is made

- Dealing with expenses for all staff members for overseas trips and in the UK – ensuring correct conversions from foreign currency and that all receipts have been received
- Responsible for the collation and preparation of expenses relating to ongoing Projects for obtaining reimbursement
- Ordering stationery and all consumables to ensure the proficient running of the office
- Arranging events and co-ordinating from start to finish
- Arranging meetings and hot desking for senior staff
- Organising travel and accommodation both in the UK and worldwide
- Diary management for Chief Executive and senior staff
- Setting up and maintaining filing systems
- Reception duties
- Telephone switchboard duties
- Ensuring the smooth running of the office, including all services supplies and maintenance

Project Pipeline

In order to ensure a steady stream of projects coming into the Kelvin Institute, the following pipeline process will be adopted in order to ensure a minimum number of projects reaching each point. The five project stages are identified as being:

- Lead Identification:

  An unqualified lead coming from contact with University commercialisation offices, SE network and academic contact.

  The majority of lead identification is expected to come out of the scheduled plan of meetings with key departments and individuals within the university network. The leads will be passed on to the project origination executive for qualification.

  Minimum number of leads during any 3 month period: 10.

- Qualified Prospect:

  A lead has been qualified through an initial phone call or meeting as meeting the criteria for a Kelvin Institute project.

  The prospect as a brief which will go forward to an internal review board.

  Minimum number of qualified prospects during any 3 month period: 8

KI Project Pipeline, 2007

- First level of diligence

  All qualified prospects will be reviewed by a Kelvin Institute internal review panel on a fortnightly basis to select those which should go forward for further diligence. The review panel will consist of the CEO, the Director of Projects and the Project Origination Executive.

  At this stage an initial budget will be set for diligence and resources identified. The initial diligence will attempt to answer the key questions as set out in the Kelvin Institute project application form.

  Minimum number of briefs moving to 1st level of diligence in any 3 month period: 4

- Fully worked up project plan

  The output from the first level of diligence will again be reviewed internally and a decision will be taken as to which should be taken forward to the full project planning stage. The decision will be influenced by available budget, internal capability and the ability to source external capability.

  The output from this process will be a project plan with milestones, deliverables, IP strategy and full costing. This will also include initial outline terms with the originating University.

  Minimum number of projects being worked up during any 3 month period: 2

- Project Start

  Fully worked up project plans will go to the main board for project approval and agreed start date.

  Minimum number of project starting in any 3 month period: 1

Key Factor: Funding

Description and Comment	Sources

Total funding requirement identified within the 2002 business plan of £11.1m by year 5 as shown below:

		Year 1 £'000	Year 2 £'000	Year 3 £'000	Year 4 £'000	Year 5 £'000	Total £'000
Contracted Research Consultancy & Grants							
(exc. international consultancy)	Income	220	870	1,920	2,640	2,880	8,530
	Costs	(429)	(641)	(947)	(1,784)	(1,928)	(5,729)
	Profit	**(209)**	**229**	**973**	**856**	**952**	**2,801**
International consultancy	Income	0	60	300	720	840	1,920
	Costs	(462)	(969)	(827)	(831)	(831)	(3,920)
	Profit	**(462)**	**(909)**	**(527)**	**(111)**	**9**	**(2,000)**
Corporate Sponsorships	Income	350	600	725	975	1,006	3,656
	Costs	0	0	0	0	0	0
	Profit	**350**	**600**	**725**	**975**	**1,006**	**3,656**
IPR Licenses	Income	0	30	165	420	600	1,215
	Costs	(1,085)	(1,538)	(1,835)	(1,236)	(1,325)	(7,019)
	In-kind adj	245	251	258	258	258	1,270
	Profit	**(840)**	**(1,257)**	**(1,412)**	**(558)**	**(467)**	**(4,534)**
University contributions	Income	344	251	258	258	258	1,369
	Costs	(344)	(251)	(258)	(258)	(258)	(1,369)
	Profit	**0**	**0**	**0**	**0**	**0**	**0**
Information Dissemination	Income	0	173	220	280	318	991
	Costs	(107)	(183)	(220)	(232)	(242)	(984)
	Profit	**(107)**	**(10)**	**0**	**48**	**76**	**7**
Equity Holding Realisation	Income	0	0	0	0	3,500	3,500
	Costs	0	(482)	(755)	(1,122)	(1,207)	(3,566)
	Profit	**0**	**(482)**	**(755)**	**(1,122)**	**2,293**	**(66)**
Fixed overheads							
Salaries							
Business development		(120)	(126)	(132)	(169)	(177)	(724)
Marketing		0	(45)	(72)	(78)	(80)	(275)

The E Institute Business Plan, Jan 2002, in E-Institute Review. Oct 2002, p.9

Administration	(227)	(268)	(296)	(314)	(345)	(1,450)
Other						
Business development	(49)	(44)	(57)	(57)	(54)	(261)
Marketing	(155)	(255)	(376)	(376)	(423)	(1,585)
Administration	(138)	(583)	(306)	(319)	(344)	(1,690)
	(689)	**(1,321)**	**(1,239)**	**(1,313)**	**(1,423)**	**(5,985)**
Total revenue	914	1,984	3,588	5,293	9,402	21,181
Total costs	(2,871)	(5,134)	(5,823)	(6,518)	(6,956)	(27,302)
Loss	**(1,957)**	**(3,150)**	**(2,235)**	**(1,225)**	**2,446**	**(6,121)**
Year End Employee numbers (FTE)						
Consultants	4	7	18	25	28	
Researchers	27	30	34	27	25	
Administrative	9	14	17	20	21	
	40	**51**	**69**	**72**	**74**	
Year end cash position (including outstanding revenue payments)	**(2,277)**	**(5,621)**	**(8,288)**	**(9,868)**	**(7,712)**	
Maximum cash requirement					**(11,115)**	

Agreed overall funding for the E-Institute is as follows:

	Year 1	Year 2	Year 3	Year 4	**Total**
Glasgow University	67,500	71,000	74,500	74,500	**287,500**
Strathclyde University	273,800	186,000	197,000	197,000	**853,800**
Private Sector*	350,000	100,000	100,000	100,000	**650,000**
Scottish Enterprise	1,800,000	2,300,000	1,900,000	0	**6,000,000**
Total	**2,491,300**	**2,657,000**	**2,271,500**	**371,500**	**7,791,300**

*Figures for the private sector denote commitments by Picsel: £500,000 over 5 years to support the position of the Executive Director, and ntl: £250,000 in year 1.

Scottish Enterprise Glasgow, Business Growth, Executive Team Paper, January 2003, P.1

SE Board Approval to Fund E-Institute

The November SE Board accepted the recommendation of the Board Approvals Committee to approve the E-Institute paper requesting £6M funding over three years, subject to this note on the milestones which would need to be met to allow

continual funding.

YEAR 1

The prime objective of the first year of operation will be to ensure that the Institute is established as a viable entity with the appropriate management controls, staff, technical infrastructure, international linkages and initial research programmes to enable it to generate external income streams totalling some £220k from its overall funding, including £1.73M from SE in the year. Targets for the year by quarter are:

Qtr.1	o Establish the Board of Directors
	o Finalise all legal documents
	o Launch the E-Institute
	o Commence recruitment of the senior management and research staff
	o Finalise initial research agenda
Qtr.2	o Initiate the international collaboration programme
	o Establish the Advisory Board
	o Consolidate commercial links from existing contacts
Qtr.3	o Launch Virtual Scotland demonstration project
	o Launch the information dissemination programme with the first publication
Qtr.4	o Expand corporate sponsorship programme
	o Establish first international research programme
	o Identify potential candidates for the incubator / co-location programme

YEAR 2

With approval of year two's £2.0M SE funding, the Institute will concentrate on controlled growth in order to achieve an income for the year of £2.0M. This will be achieved through monthly income streams rising from £155,833 to £170,833 over the year. Current targets for this year by quarter are:

Qtr.1	o Exhibitor participation at major conference
	o Launch new business incubation and mentoring programme
Qtr.2	o Expand the academic research programme
	o Expand the commercial contracted research
	o Commence negotiation to move to larger premises
	o Recruit marketing director
Qtr.3	o Increase international collaboration programme
	o Secure first licensee of the Institute's IP
	o Relocate to larger premises (potentially City Science)
Qtr.4	o Expand the new business, incubation and mentoring programmes

5 Scottish Enterprise, Competitive Business, The E-Institute, Board for Information, Jan 2003, P. 1&2

YEAR 3
SE scheduled funding of £1.5M in year 3 will help consolidate much of the ongoing research work started in previous years and will allow the Institute to focus on the commercialisation of the results of this work which should lead to an overall income of some £3.6M. The targets for year 3 are:

Qtr.1	o	Increase commercial contract work
Qtr.2	o	Further expansion of the new business, incubation and mentoring programmes
Qtr.3	o	Review and expansion of commercial sponsorships
Qtr.4	o	Initiate planning for new research programmes

It is this year which must establish the long term viability of the Institute. Underperformance in income in any year to this point will be mitigated by a reduction in spend and growth and it is the trend in performance over the first three years that will establish the form of the Institute for long term stability and allow the release of the final £0.77M of funding.

ERDF Funding

Total ERDF funding of £862,000 granted to the KI which commenced in January 2006 and spread over the next two years.

On 11th August 2006 it was decided to amend the original grant application from ERDF downwards from £862,778 to £644,711 due to the perceived risk in the project not reaching its agreed eligible spend figure within the lifetime of the grant (1st January 2006 until 31st December 2007).

Funding 2007-2008

At the end of 2006, £1.766million of the total £6million Scottish Enterprise funding remains available to Kelvin, together with ERDF funding claimable against future qualifying expenditure. Based on a number of budget assumptions as per the revised Operating Plan at the Kelvin Board meeting on the 5th of September 2007, and expenditure continuing in 2008 at current levels, Kelvin would be sufficiently funded out of Scottish Enterprise and continued ERDF funding until end March 2008, given the Notification of Change extending ERDF funding to 31st March 2008.

Kelvin Institute Board Minutes Feb. 2006

Kelvin Institute File Note on ERDF Decision, Sept. 2007

The Kelvin Institute Ltd Operating Plan 2007 – 2008, Annex E, p.3

Key Factor: Activities	
Description and Comment	**Sources**

Projected income and costs for the E-Institute (2002):

	2003 £'000	2004 £'000	2005 £'000	2006 £'000	2007 £'000	Total £'000
Income						
Contracted Research	80	480	1,140	1,740	1,920	5,360
Consultancy	40	150	480	480	480	1,630
Grants	100	300	600	1,140	1,320	3,460
Corporate Sponsorship	350	600	725	975	1,006	3,656
IPR Licenses	-	30	165	420	600	1,215
Glasgow University Contributions	68	68	68	68	68	340
Strathclyde University Contributions	276	183	190	190	190	1,029
Information Dissemination	-	172	220	280	318	990
Equity Holding Realisation	-	-	-	-	3,500	3,500
Total	**914**	**1,983**	**3,588**	**5,293**	**9,402**	**21,180**
Expenditure						
Salaries & fees	1,582	2,319	2,942	3,658	3,763	14,264
Project specific research	276	500	681	291	474	2,222
General research facilities	42	19	24	17	17	119
International linkages	462	969	827	831	831	3,920
Business mentoring	-	375	532	890	968	2,765
Marketing	155	255	376	376	423	1,585
Business development	49	44	57	57	54	261
Information dissemination	68	70	79	79	82	378
General & administrative	237	583	306	319	344	1,789
Total	**2,871**	**5,134**	**5,824**	**6,518**	**6,956**	**27,303**
Profit / loss before tax	**(1,957)**	**(3,151)**	**(2,236)**	**(1,225)**	**2,446**	**(6,123)**

Estimated Costs:

E-Institute Review. Oct 2002, p.9

E-Institute, Three Year

Category	Year 1 (2003)	Year 2 (2004)	Year 3 (2005)
Personnel	£1.66m	£ not specified	N/A
Infrastructure	£320,000	N/A	N/A
Business devt. & marketing	£164,000	£ not specified	£ not specified
Research & Info. Dissemination	£92,000	£ not specified	£ not specified
International Collaboration	£151,000	N/A	N/A
Administration	222,000	N/A	N/A
Business Incubation & Mentoring	N/A	£ not specified	£ not specified
Total Cost	£2.61m	£4m	£5.1m
Total Revenue	£900,000	£1.9m	£3.6m
Total Cash Need	£1.7m	£2.1m	£1.5

Cash Need Analysis with Strategic Milestones, November 2002

Since its inception the Kelvin Institute has spent slightly under £800,000 for the period September 2001 through January 2004. The main expenditures have been salaries, equipment, legal and travel. To date these expenditures have been borne by the University of Strathclyde with partial cover being provided by Scottish Enterprise. The Institute received £1.0 million from Scottish Enterprise in January 2004 and this money has been deposited in the Bank of Scotland.

The highlights for 2004 are:

Projected turnover: £472,000
Projected Expenditures: £2,793,892
Current Headcount: 9 full-time equivalents; 2 part-time equivalents
Projected headcount: 28 full-time equivalents; 12 part-time equivalents

Kelvin Institute Executive Director's Report.
18 February 2004
WG Nisen, P. 2

Historical Financial Analysis - June 2000 through October 2002:

Total expenditure: £ 404,661

- Salaries: £ 319,612
- Legal: £7,285
- Computer Equipment: £2,468
- Travel: £6,000
- Administrative: £12,849
- Recruiting costs: £ 42,207
- Relocation: £4,237
- Accommodation: £10,003

KI Board of Director's Meeting, May 2004, Slide 5 & 6

November 2002 through December 2003:

Total expenditure: £796,967

- Salaries: £ 490,023
- Legal: £ 56,900
- Computer Equipment: £ 49,505
- Travel: £ 53,208
- Administrative: £ 51,412
- Consultants: £ 82,365
- Relocation: £ 7,054 (disputed)
- Accommodation: £ 6,500 (estimated)

Projected income and expenditure for the Kelvin Institute, from KI revised business plan August 2004:

	Revenue (£'000)					Expenditure (£'000)						Profit / Loss (£M)
	Seminars	Consulting Services	Contract Research	Misc*	Total	Service Delivery	Marketing	Sales	Self-funded research	G&A/ Misc**	Total	
2004	60	20	48	158	286	85	44	153	619	1087	1988	-1.7M
2005	302	150	317	588	1357	480	261	249	439	1118	2547	-1.2M
2006	360	480	1140	1370	3350	1260	204	451	64	1110	3089	0.3M

KI Revised Business Plan, August 2004

Key Factor: Monitoring and Evaluation	
Description and Comment	**Source**
"The KI has the evidence from working with academic colleagues to show that the suspicion that not all academics can or wish to become entrepreneurs, is well founded. Furthermore in the case of the traditional spin out company model for the commercialisation of IP, the possible loss in whole or in part of the academic to his/her institution and hence overall to the country's academic performance, is an additional opportunity cost, and detracts from the continuous need for new ideas and knowledge as part of the ongoing national innovation system. The second observation concerns the myth that a healthy flow of new ideas with innovation potential must almost inevitably lead to a significant boost to economic growth. While there is almost certainly a positive correlation between the volume and intensity of R&D activity and a concomitant improvement of competitive performance, whether at organisational, sectoral or national level, it is the additional activities that come after the initial stage of what the Booz Allen Hamilton report refers to as 'ideation' in the innovation value chain, that ultimately determine success or failure in economic terms. Again it is a common belief that many academics do not appreciate this complexity. However that is not the experience of the KI where academics are known to fully recognise that even after proof of concept, and laboratory prototyping there is a lengthy process of engineering to be undertaken before any prospect of a robust product can be demonstrated for use in a 'live' real world situation. In most cases the academic neither has the motivation nor the skill set to tackle this part of the process, but again the KI can play a valuable role in contributing to the judicious selection of projects and the product development stages of the innovation value chain. It is difficult for SME's to set aside resource from running the existing business to apply it to adapting the business through new innovations. In this regard not only the KI staff themselves, but the KI's wider network of experts particularly on the Advisory Board, can add considerable value to the commercialisation part of each project by providing true insights into how various markets work, and by opening up avenues of potential partnership."	From: Kelvin Institute (KI) – Project Acquisition and Appraisal in 2006, p.2 & 3
SE Internal Audit, Major Projects: Overall conclusion – in general major projects are being well managed. Kelvin Institute – an update on the project was taken to the SE Board in Feb 2005 and an implementation review is planned for early 2007. However given that the project has undergone significant changes the need for an implementation review prior to the changes was highlighted.	SE Internal Audit, Major Projects, Final Report, Aug 2006

Summary of findings from audit review: • All of the projects were underpinned by relevant economic research as appropriate. • Gate 1 and 2 reviews were carried out where required. Only minor matters of non-compliance were noted. • Good level of compliance with the guidance on economic appraisal sections of approval papers was noted. Indicating an improvement in their quality as a result of the Gateway process and peer reviews. • Issues of non-compliance was noted in relation to projects tendered and contracts issued • Implementation reviews were the weakest area – with no implementation review being undertaken to date and in only two cases was a review scheduled within the correct timescale. • Lack of supporting back-up evidence for one of the projects to secure EU funding. • Only two of the nine projects had claimed any performance benefits and input these to KMIS. This is for a variety of reasons including: o the benefits are yet to materialise as they accrue over a long time period; o it is not prudent to claim the benefits until an evaluation has taken place; or o staff are not always clear that 'local measures' should be input to KMIS. • It was generally found that the approval papers contained vague statements on plans for future evaluations and these are not linked to any Network approach to evaluations and learning. • Satisfactory project files were not maintained for all the projects reviewed. ***Original Objectives*** According to an initial evaluation, the objectives of the E-Institute are completely within SE's remit as outlined in "A Smart Successful Scotland" with strategic objectives aimed at: • The establishment of an internationally recognised centre concentrating on multi-disciplinary research and commercialisation to attract FDI and VC funding for 'market ready' companies in Scotland; • The establishment of high growth technology start-ups via the commercialisation of Scottish university research; • The generation of a significant number of high quality jobs. Predicted Outputs • The E-Institute is likely to generate £19.2m in Scottish output - £9.2m directly and a further £9.8m through multiplier effects • An estimated 180 jobs should be created, 66 within the Institute itself and 114 in other parts of the economy; • The employment generated will be significantly higher skilled and qualified than the Scottish average •	Kelvin Institute – Evaluation Work (Scottish Enterprise)

KI Key Performance Indicators:

	Actual to Date
Consulting	None to date, however, may be some in 2007/2008
Disclosures (NDA's)	50
Patents	1
Licenses - Commercial	Not as yet
Licenses - Evaluation	0
In Licenses – Universities	3
Spin Outs/Start Ups	2
Promotional Events	2
Revenues £ K	TBC
Companies contacted	20
Companies visited / visiting	20
No. of commercialisation projects (current)	8
No. of new jobs created	20
Amount of private sector leverage	£250,000
Sales derived from exports	£58,000
New jobs created for ethnic minorities	1
New jobs created for women	2

Outputs and impacts of KI ERDF application Feb 2005

Outputs	
No. of commercialisation projects in HE, FE & research institutes	15
Results	
Total No. of gross new jobs created	78 (60 on project work, 12 of which will transfer to successful spin outs which will create a further 18 additional jobs)
No. of gross new jobs created for members of ethnic minorities	25
No. of gross new jobs created for women	20 (to be confirmed)
No. of gross new jobs created in areas of most need	60
Increased investment in R&D by assisted businesses	Need to discuss with SEP, KI could be seen as the assisted business ??

No. of new businesses surviving 18 months	3
No. of new businesses surviving 3 years	3
No. of new businesses created	3
No. of new exporters' businesses entering new markets	3
Increase in sales derived from exports	£1.5m turnover per year
No. of new links between SMEs, HE, FE and research institutions	TBC
No. of spin outs from SMEs, HE, FE and research institutions	3
No. of patents issued/IPR registrations by businesses	10
No. of patents issued/IPR registrations by businesses in env. Sector	2
Private sector leverage	£3m

KI Project Review Matrix							
Project Name	**Institution**	**Cost**	**Funding Source**	**Outputs**	**Description**	**Other**	**Source**
E-Institute Funded Projects							
International Centre for Leadership in Finance	Kelvin Institute	£70,000	Kelvin Institute	Non-financial benefits: Entry project in Malaysia, access to major financial institutions and chief executives, establish ties with GSB	The Kelvin Institute will deliver a two phase programme, covering eight days for CEOs and an accompanying planning executive from the largest banks in Malaysia. Phase I, will consist of an introductory programme which will be delivered by members of the Kelvin Institute staff in conjunction with professors from the Strathclyde Graduate Business School. Phase II will continue the scenario planning process begun in Phase I. A greater emphasis will be placed on practical recommendations for successfully incorporating advanced technology into the Malaysian banking and financial system.		Kelvin Institute Executive Director's Report, 18 February 2004, WG Nisen,
Interactive Offender Profiling System (IOPS) Metropolitan	Kelvin Institute	£275,000	Kelvin Institute	Non-financial benefits: Reference project for security market; refine software development procedures	The Kelvin Institute in conjunction with the Department of Computer and Information Science at the University of Strathclyde and Professor David Canter of the University of Liverpool have submitted a proposal to the		Kelvin Institute Executive Director's Report, 18 February 2004, WG Nisen,

Police Force – Greater London					Metropolitan Police Force of Great London to develop an Interactive Offender Profiling System (IOPS). The main engineering challenges of setting up such a system revolve around: a) the collecting and managing of various forms of partially structured data; b) modelling inferences about the patterns of actions of offenders; and c) Integrating search and retrieval algorithms derived from recent investigative psychology findings to allow enhanced decision support. These challenges reflect a general set of problems of significant current interest to Computer Scientists. The project will therefore develop the science base for this general class of problems in this important real-world context.		
The Edinburgh Festival Project	Kelvin Institute	£0		Made possible research relationship with Intel and possible relationship with Microsoft Research; enhances our research credentials; provides a competitive advantage to the Edinburgh Festivals; provides a real world test for our ubiquitous computing research; possible spin-off companies based on IP	The Edinburgh Festival Project is a research and development project intended to explore and advance ubiquitous computing technologies in the setting of a large arts festival, with a view towards more generalised application in a wider range of context-aware systems and services. We propose to explore systems that take a broader notion of user context than location alone, by using aspects of context related to ticket purchase and event attendance within a festival, as well as location data via geo-referenced WiFi cells, RFID beacons and GPS. We would aim to gain experience of Intel's PlaceLab, but we would also offer in return usage data by substantial numbers of visitors to the Edinburgh International Arts Festival, and collaboration in the extension and application of PlaceLab to a context–aware system for the festival visitor.		Kelvin Institute Executive Director's Report, 18 February 2004, WG Nisen,
Information Hub Project	Kelvin Institute			Non-financial benefits: Cornerstone of ubiquitous	The initial product of InfoHub development will be a hosted service that will collect and share		Kelvin Institute Board of Directors

				computing research; forms basis for digital outreach programme; to be used by the Metropolitan Police project	research project information in the areas of ubiquitous computing, knowledge management and trust modelling		Meeting, November 2004
Incubator and Business Mentoring – Purple Patch	Kelvin Institute				The first company to come into the incubator was Purple Patch, a wireless data communication system integrator.		Minutes of Board Meeting, 2004
KI Funded Projects currently on-hold							
Schemata - SCM	Kelvin Institute			There are three unique algorithms for analysing the structure of data. A patent application covering the base algorithms was filed early July 2007.	Schemata allows users to apply context to documents that are not linked together, greatly improving the quality of search results. It does this by allowing users to categorise documents the way the want using a scheme that is appropriate to them.	Main customers would be large user base organisations that handle a significant volume of data. First targets would be web businesses such as Google, Yahoo! and Microsoft.	KI Project Brief, 2007
Prosthetics	Kelvin Institute			Research and technological development	A prototype scanner has been developed which will allow the biomechanical properties of the patient's residual limb to be determined (Phase I). The output from the scan is currently being enhanced using signal processing techniques to prepare it as input for the creation of finite element analysis (FEA) models which would be used for socket design (Phase II). The Kelvin will be in a position to demonstrate the technology following the successful completion of Phase II.		The Kelvin Institute, Operating Plan 2007 – 2008, P.17
Socket-Fit (next stage development of the Prosthetics project above)				A prototype scanner has been produced. Initial scans have produced data which has been digitally enhanced in preparation for image reconstruction through Finite Element Analysis. The results from these initial tests have been disappointing and are below the quality that would be	The goal of Socket-Fit is to develop a solution that once fully developed will provide prosthetists with the ability to create optimum fitting sockets more quickly and efficiently.	The project costs were stripped to a minimum **in December'06** and the project team have been asked to examine alternative project outcomes and alternative uses for the technology that has already been	The Kelvin Institute, Operating Plan 2007 – 2008, p.18

				required for subsequent processing.		developed.	
Wireless Sensor Networks – WSN/ AEA Technology Rail (Train)	Kelvin Institute and University of Strathclyde.			Patent filed 31st May 2007	To develop wireless sensor networks for the rail industry to allow preventative maintenance of railways systems. This is a collaborative project between The Kelvin Institute, The University of Strathclyde and **AEA Technology Rail**. **Scotrail** will provide access to rolling stock for testing purposes. The Kelvin Institute is developing a generic software platform that enhances off-the-shelf WSN hardware. Wireless sensor networks (WSN) are a collection of extremely small battery operated wireless sensors that extend the data gathering principle by being self-organising. This means that they form a network by themselves and use it to relay data back to a computer from other sensors that would normally be out of range.	Given no killer application, the strategy is to license to existing companies that write WSN software stacks. Examples include AirBee, Crossbow WSN, Ember, Freesacale, IWT ETC. The software will be licensed "sideways" to competitors. It will be sold as a plug-in that enhances the capabilities of their existing stack. This mitigates the problem of competition given that the plug-in will be patented.	KI Project Brief, 2007
KIMS (Kelvin Institute Marketing Suite)	Kelvin Institute			The Client application has been previously developed as a bonus output from previous projects, this is a very acceptable demonstrator, which exposes the core value in the analysis work, which has been developed. Some re-development is needed to re-package the technology into what would be the end product, this would take around 8 weeks of dedicated project time. Due to a lack of available development staff, further work is frozen until we can	KIMS is a marketing application that uses the same visualisation techniques as the Metropolitan Police application. It has already been presented to the American Marketing Association and other commercial opportunities are currently being explored.		The Kelvin Institute, Operating Plan 2007 – 2008, p.18 and 37

				recruit some experienced programmers.			
KI Funded Live Projects							
Mid Infrared Novel Optical Source – MINOS/ VECSEL Photonics	Kelvin Institute			There is no patent on the laser design as there is a lot of prior art. The intention is to file an application specific patent towards the end of the project, though the technology will be continuously evaluated throughout the course of the project for suitably patentable IP. A licence agreement with Solus Technology is currently being negotiated.	Mid-Infrared (MIR) light is well suited to a range of applications including process control, homeland security, gas sensing, spectroscopy and free space optics. MINOS will build a laser that can be operated at any region in the 2um to 3um wavelength range to produce a compact and high quality laser source.	Short-term approach will be to target early adopters who will pay a premium for access to such a laser source. For e.g. academic institutions or research laboratories.	KI Project Brief, 2007
Wind Turbine Controller - WTC	Kelvin Institute			Background IP/know-how has been licensed from Strathclyde University for a 1% royalty in sales and a 5% equity stake in any company formed. Further development has resulted in preparation of a new patent for filing.	The Wind project has developed algorithms for the active pitch regulation of wind turbines which have been optimized to reduce the fatigue loading on the wind turbine tower. These algorithms strongly influence not only the load placed upon the turbine structure but also its overall performance thereby reducing the overall cost of wind power generation.	The customer is a WTG manufacturer such as Vestas, GE Wind, Enercon etc Vestas would be the first target customer followed by Siemens.	KI Project Brief, 2007
Tell A Story	Kelvin Institute			TAS has not generated any identifiable patentable technology. However the product is unique as there are no other tools on the market that can computerise doll play which gives the Institute a first mover advantage.	Child psychologists currently use doll-play techniques to assess a child's representation of relationships. The Kelvin Institute is developing a software suite called Tell-A-Story (TAS) that computerises doll-play techniques.	TAS will be sold directly to child psychologists who use doll-play techniques, primarily in the UK and US. Training courses on the software will be administered and sold by the Kelvin Institute.	KI Project Brief, 2007

GAIM	Kelvin Institute			In just over three months since project kick-off (November 2006), outline terms have been agreed with a development partner, Cohort Studios Ltd. and an alternative application for Child Psychologists has been developed in prototype and terms agreed with Scottish Health Innovations Ltd (SHIL). Collaboration with Cohort Studios Ltd has been developed which will allow the Kelvin to prove the middleware technology in the market whilst retaining all of the IP in preparation for the sale of the middleware as a separate product. Cohort will pay Kelvin between 20 – 25% of all gross revenues (both development milestone payments and ongoing royalties) on a successful sale of the prototype.	In November 2006, the Kelvin started a new project, GAIM, which builds upon internally generated IP and expertise. GAIM is a project where the original idea was conceived and developed internally by Kelvin staff, leveraging existing expertise and market experience. The proposition is to develop a piece of AI middleware for the games industry, but to do so in a way that minimizes market risk by engaging with one or more development partners from the games industry at an early stage, and by exploiting alternative commercial outlets for the technology throughout the development progress.		The Kelvin Institute, Operating Plan 2007 – 2008, p.18
Solar Project	Kelvin Institute			Glasgow University has written a patent for key background IP which is due to be filed in the next few months. It is exclusively licensed to the Kelvin Institute. Foreground IP is to be developed by the Kelvin Institute and is anticipated to generate another patent.	The Solar project intends to offer an alternative to silicon and will look at exotic materials for the construction of solar cells. This will help to improve efficiencies and yield so that costs are reduced to the same as, or less than, silicon.	Customers for this product would be solar cell concentratOR companies e.g. BP Solar, Solfocus, Concentrix ETC.	KI Project Brief, 2007

Photovoltaic Cells (next stage development of the Solar project above)	Kelvin Institute			Initial project plans, technical milestones and budgets and IP strategy have been produced. Negotiations are underway with Glasgow University to secure a licence to the background IP. However the IP will be advertised publicly.	The University of Glasgow (UoG) is pioneering III-V (GaAs) technology and had developed processes that will underpin higher efficiencies, lower costs and improved yields for photovoltaic cells. Photovoltaic cells that are deployed in terrestrial applications are based on silicon based compounds, however, with the current shortage in silicon feedstock and improving efficiencies of GaAs-based cells, a market opportunity is emerging for solar modules, based on GaAs cells, which would be used in terrestrial concentrator systems.		The Kelvin Institute, Operating Plan 2007 – 2008, p.40
Software Delivery System (SDS)	Kelvin Institute			Several commercial opportunities are being explored for SDS as a stand alone software application. SDS will also be used to distribute the "Tell-A-Story" application being developed for SHIL.	SDS was internally developed as a solution to the problems the KELVIN development teams experienced when trying to deliver and manage software updates to The Metropolitan Police. SDS is an electronic distribution platform that remotely installs applications and also 'self heals' a damaged installation. In a customer environment this could be used to 'fix' an installed application such as Microsoft Word, where a virus has deleted key files; SDS would detect the damaged install and 'heal' the application by replacing missing components.		The Kelvin Institute, Operating Plan 2007 – 2008, p.18, 2007
Software Delivery System V2-SDS2 (next stage development of the SDS project above)	Kelvin Institute			The Kelvin Institute has not patented any IP. At present a number of patents exist in the same area in the US, Europe ad Japan. The implication of these patents to SDS needs to be assessed, particularly if US markets are to be targeted.	The SDS was developed by KI as a solution for downloading, updating and establishing access rights to software products internally. Building on successful internal trials the Kelvin Institute is now exploring commercial opportunities for SDS.	This product is aimed at specialist software vendors that produce high end products where the cost per license exceeds £500. Egs include; Autodesk, Avid, Cadence, National Instruments etc.	KI Project Brief, 2007
Mobile Photo V2 – MP2	Kelvin Institute			The Kelvin Institute has not patented any IP.	The Kelvin Institute is developing digital photo sharing software for next generation SmartPhones. The technology is called MP2.	MP2 targets Windows Mobile based SmartPhones, controlled by a number of key	KI Project Brief, 2007

						manufacturers i-Mate, HTC, HP, Toshiba, Samsung etc.	
KI Project at Evaluation Stage							
Microbial Fuel Cells - MFC	Kelvin Institute			Researchers have been assembled and an MFC device and associated IP has been secured	The MFC offers the unique capability to treat waste materials, using a wide variety of substrates, while generating small amounts of electricity, which can be offset against the running costs. Unlike other Fuel Cells, the MFC is completely self-powering and does not require to be replenished.	Potential customers include, Environmental Health and Protection Agencies, Operators of Bio-diesel Production Plants, Operators of alternative fuel cell technology and Operators of Sensor Networks.	KI Project Brief, 2007
Terahertz	Kelvin Institute/M2			M2 have developed a widely-tuneable Terahertz Laser	The laser can be employed in 40GHz to 4THz. It has the potential to be highly portable, and can scan areas from 15mm x 15mm and below, to 100um x 100um in vivo	There is potential for the Terahertz Laser to be used in medical device applications, such as treatment of breast cancer (an intra-operative probe) or label-free DNA Tagging.	KI Terahertz, Due Diligence Report, 2007
VisPath	Kelvin Institute			The VISPATH system provides a prototype toolkit (coded in C++) for defining a specific tracking problem, and engine for extracting the pose information from input images and then performing an analysis of the tracked pose.	The VISPATH software system is intended to address the development of applications that required the location and configuration of a human body to be extracted from a single image, or series of images, collected by any means (video or still camera) and digitized accordingly (to be compatible with computer processing).		Human Pose Estimation & Tracking Technology Evaluation Report Draft 1, 2007
Cimphony	Kelvin Institute			The Mercury CIM (Common Information Model) Power Systems Toolkit has been in development for over four years within the University of Strathclyde, providing a mechanism for creating,	The CIM was created as a standard means for the global electricity industry to communicate network infrastructure information.	The market for this toolkit is ultimately the utility companies globally who are moving towards adoption of the CIM standard.	

				storing, viewing, editing and converting power systems data in a CIM format. The toolkit runs as a web application on a host server and has been successfully tested in Windows, Linux and Apple OS X environments.			
Tapestry	Kelvin Institute			3 Professors at the University of Edinburgh: Music (Prof. Osborne), Physics (Prof. Campbell) and Psychology (Prof. Lee) are combining expertise to create a new electronic musical instrument	The main objective is to investigate how the performance and experience of music can have a therapeutic effect on those with physical and mental disabilities. Research work is currently being undertaken in 4 Scottish Local Authority schools for children with mental and physical handicaps.		KI Tapestry, Due Diligence Report, 2007

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Appendix B: Consultees

Appendix B - Consultees

Name	Institution
Bruce Ainsley	Solus-Technologies
Mel Anderson	University of Glasgow
George Boag	Targeting Innovation
Jim Bonar	Ovisor Technologies
Stephen Breslin	Kelvin Institute
Bill Bryan	Wind
Dan Collicot	Kelvin Institute
Sergio Dominguez	University of Strathclyde
Tariq Durrani	University of Strathclyde
Adrian Gillespie	Scottish Enterprise
Colin Grant	University of Strathclyde
Hugh Hall	Scottish Enterprise
Frederick Hallsworth	Scottish Enterprise
Andrew Hamnett	University of Strathclyde
Robert Higginson	Kelvin Institute
Alasdair Jack	Kelvin Institute
Professor Bill Leithead	University of Strathclyde
Hugh Lennie	Kelvin Institute
Simon Leslie	Kelvin Institute
Paul Lewis	Scottish Enterprise
David Lockwood	Thales
Huanhe Lui	Kelvin Institute
Alison MacFarlane	University of Strathclyde
Graeme Malcolm	M2lasers
Margaret McGarry	Scottish Enterprise
John Mertens	Kelvin Institute
Dr Helen Minnis,	University of Glasgow
Graham Paterson	University of Glasgow
Steven Spencer	Kelvin Institute
Dabney Standley	Kelvin Institute

Frank Tooley	Photonix
Ray Welland	University of Glasgow
David Wightman	Kelvin Institute

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Appendix C: Interview Frameworks

Appendix C – Interview Frameworks

Stakeholders / Key Partners

1. **Strategic context and role**

    a. What is your involvement to date with the Kelvin Institute ("the Institute") and what were the key factors influencing this involvement?

    b. What do you perceive to be the key objectives of the Institute at a strategic and operational level?

    a. What role does SE / your organisation play in supporting commercialisation activity outside of the Institute?

    b. Do the Institute activities complement and add value to other commercialisation activities undertaken at Strathclyde / Glasgow and elsewhere?

        i. If Yes please provide details

        ii. If No please identify why and the impacts

    c. Which other organisations do you see having a role in commercialisation activity and why?

        i. Do these organisations inter-act with SE and the Institute?

            1. If not why not?

            2. If yes please explain how (in terms of roles and wider impacts)

    d. Has the Institute displaced any activities previously undertaken by Scottish Enterprise or other bodies?

        i. If so how is this evidenced? and,

        ii. What have been the impacts?

    e. Describe how the Institute facilitates / enables the development and commercialisation of research activities. Please identify any issues you see with the selection and appraisal processes for securing support for these activities

f. If the Institute had not been implemented what impact do you think this would have had on commercialisation and exploitation opportunities in Scotland?

2. Outcomes and Results (Strategic Value)

a. What do you see as the key outcomes achieved by the Institute? Please provide examples.

b. What benefits do you believe the Institute has generated for you / your organisation and more widely? Please provide details.

c. Can you identify any negative outcomes or impacts for you / your organisation which can be attributed to the Institute? Please evidence this view.

d. Against what Key Performance Indicators (KPI) is and / or should the activities of the Institute be judged?

e. What do you consider a reasonable timeframe over which the results, benefits and outcomes of the Institute should be measured? Please identify any key implications for going forwards.

f. Is the Institute addressing the gap originally identified between research and market commercialisation?

   i. If so, please state why you believe this to be the case

   ii. If not, please state why you believe this and which gap it should be addressing instead

g. What impact do you think the Institute has had on the development of research with a strong potential for future commercialisation in Scotland?

h. What influence / impact do you believe the Institute has had on Scottish Universities, Institutions, and companies in relation to commercialisation of research?

i. Do you believe the Institute has facilitated greater / increased interaction and collaboration between Scottish Universities and industry?

   i. If yes, please identify how and give examples

   ii. If no, please detail why you believe this

j. What aspects of the realised or anticipated benefits from the Institute are sustainable and what is / will be required to secure this sustainability in the longer term? Please provide details.

k. Do you believe the Institute has influenced the development of a more entrepreneurial culture within the University and / or Scotland?

   i. If yes please provide examples

   ii. If no please identify your reasons

3. Outcomes and Results (Future Development)

a. What, in your view, are the strengths and weaknesses of the Institute in terms of delivery, role, and effectiveness?

b. Are there any improvements that you believe could be made to the current arrangements? Please detail the areas and why you believe this to be the case.

c. Are there any current areas of research activity that are not being addressed by the Institute where you believe potential commercialisation opportunities could exist? Please identify how you believe the Institute could address these opportunities

d. What do you see as the future role for the Institute, including whether or not you believe that it should continue. Please identify reasons for your view.

e. What in your opinion would be the position if the Institute ceased to operate?

f. Is there more that could be done to secure potential commercialisation benefits and, in particular, make them more sustainable? Please provide details.

4. Others

a. What lessons have you learnt from your involvement with / or knowledge of the Institute in relation to commercialisation and bringing products to market? Please provide details.

b. Do you see a wider role for the private sector in supporting initiatives of this type?

   i. If so, what and how could this be developed.

   ii. If no why?

Projects: Current and Completed

1. Background

a. What is your understanding of the objectives and rationale for the Institute?

i. For Strathclyde / Glasgow University?

ii. For Scotland?

b. What has been your involvement to date with the Institute?

Research	….	Consultancy	….	Commercialisation Support	….	Other	….

c. If you have participated or are you participating in Institute funded development activity please provide a description of the main areas of activity:

d. What was the primary rationale for the development activity?

Development of Research	….	Commercialisation	….	Both	….	Other	….

Please detail:

e. What were the principal reasons for seeking support from the Institute?

To develop research of potential future commercial interest?	….	To access new funding to prepare research outcomes for commercialisation?	….
To develop collaboration with other Universities to support future commercialisation of research?	….	To promote / secure greater engagement / collaboration with industry	….
To access commercialisation support?	….	To secure other public sector support?	….
To secure funding as part of other collaborative activity?	….	Other? Please specify.	….

f. What are / were you expectations of the Institute?

g. Where your expectations met?

i. If yes, please detail how?

ii. If not, please explain why?

h. What would the position have been for your activity if Institute funding had not been available?

1. Activity would not have gone ahead?	Yes	….	No	….
2. If no, would the activity have taken place in a different form:	Yes	….	No	….

Later (timeframe)	
Smaller scale (%)	
Lower quality (%)	
Different outcomes (please detail these)	

3. If no, were alternative sources of funds considered?	Yes	….	No	….
4. If yes to 3. were such funds secured?	Yes	….	No	….

5. If yes to 4. please identify source and scale of funding secured:	

6. If yes to 4. was commercialisation a requirement for securing the funding?	Yes	….	No	….

7. If yes to 4. please provide details of the results and outcomes of the activity:	

8. Would the results / outcomes identified at 7. have enabled a new submission for Institute funding to be made?	Yes	….	No	….
9. If yes to 8. has a submission been made?	Yes	….	No	….
10. If yes to 9. was this submission successful?	Yes	….	No	….

11. If yes to 10. please detail the current status of	

the project and its expected outcomes	

Please provide basis / rationale for above comments:

i. Is the Institute addressing the appropriate gap between research and market commercialisation?

   i. If so, please state why you believe this to be the case;

   ii. If not, please state why you believe this and which gap it should be addressing instead:

j. What do you consider a reasonable timeframe over which the results, benefits and outcomes of the Institute should be measured? Please identify any key implications for going forwards.

2. Experience of Institute

a. How would you rate your experience of the Institute in terms of the following elements? (5 = very good or strongly agree to 1 = very poor or completely disagree)

	1	2	3	4	5	N/A
Clarity and ease of use of the application and selection processes?						
Quality of project management of the Institute?						
Marketing and promotional material for the Institute?						
The strength of the relationship with Strathclyde / Glasgow?						
Access to industrial partners via the Institute?						
Level / extent of industrial collaboration?						
Quality of industrial collaboration?						
Provision of commercialisation advice and support?						
Quality of commercialisation advice and support?						

Access to wider dissemination and networking activities?						
Complementarity with other sources of funding?						
Do you believe that the development of the Institute has been beneficial to the reputation of Strathclyde / Glasgow?						
Overall, would you classify your overall impression as positive?						

Please provide appropriate evidence or examples to support or explain your views:

b. To what extent (if any) has your experience of / with the Institute changed your attitude or approach at an individual and organisational level? Please provide details. We are particularly interested in areas related to the commercialisation and exploitation of research.

c. Do you believe that the Institute represents a sustainable model for the development of research activity that could be commercialised? Please give reasons for your view.

3. Specific Impacts of the Institute

a. Please identify any significant impacts of the Institute in terms of:

i. The number of commercialisation development projects undertaken:

Yes …. No …. Too early to tell ….

If yes please provide details:

ii. The number of new commercialisation activities developed:

Yes …. No …. Too early to tell ….

If yes please provide details:

iii. An increased level of commercial focus to your wider research activity:

Yes …. No …. Too early to tell ….

If yes please provide details:

iv. Requirement for increased numbers of staff to support commercialisation activity:

Yes .... No .... Too early to tell ....

If yes please provide details:

v. Raising levels of staff competencies and skills:

Yes .... No .... Too early to tell ....

If yes please provide details:

vi. Increased levels of networking or knowledge dissemination:

Yes .... No .... Too early to tell ....

If yes please provide details:

vii. Increased levels of university industry linkages and cooperation:

Yes .... No .... Too early to tell ....

If yes please provide details:

b. Please identify any specific changes / benefits attributable to the Institute, in terms of:

i. The development of new IP:

Yes .... No .... Too early to tell ....

If yes please provide details of current or projected:

ii. Registration of IP (e.g. patents):

Yes .... No .... Too early to tell ....

If yes please provide details of current or projected:

iii. Licensing of IP (e.g. patents):

Yes	....	No	....	Too early to tell	....

If yes please provide details of current or projected:

iv. Creation of new spin-out companies:

Yes	....	No	....	Too early to tell	....

If yes please provide details of current or projected in terms of employment:

Full Time	……..
Part Time	……..
Other (e.g. Contract)	……..

v. Generation of income:

Yes	....	No	....	Too early to tell	....

If yes please provide details of level and timeframe for realisation:

c. Please provide details of any other changes / benefits attributable to the Institute. This could include academic benefits, reputational issues, cultural change, improvements in links with business, etc.

d. Going forwards, please detail any future activities or requirements (for example, further research activity or funding needs) related to the Institute funded activity:

e. Please identify (and provide appropriate details) if any of the expected / projected outcomes / impacts identified above are dependent upon or linked to the activities / requirements identified in the previous response:

4. Outcomes and Results (Future Development)

a. What, in your view, are the strengths and weaknesses of the Institute in terms of delivery, role, and effectiveness?

b. Are there any improvements that you believe could be made to the current arrangements? Please detail the areas and why you believe this to be the case.

c. Are there any current areas of research activity that are not being addressed by the Institute where you believe potential commercialisation opportunities could exist? Please identify what these areas are and how you believe the Institute could address these opportunities.

d. What do you see as the future role for the Institute, including whether or not you believe that it should continue. Please identify reasons for your view.

e. What in your opinion would be the position if the Institute ceased to operate?

f. Is there more that could be done to secure increased potential commercialisation benefits and, in particular, make them more sustainable? Please provide details.

5. Others

a. What lessons have you learnt from your involvement with / or knowledge of the Institute in relation to commercialisation and bringing products to market? Please provide details.

b. Do you see a wider role for the private sector in supporting initiatives of this type?

   i. If so, what and how could this be developed.

   ii. If no why?

Commercialised Ventures (e.g. Spin-outs)

1. Background

a. What is your understanding of the objectives and rationale for the Institute?

   i. For Strathclyde / Glasgow University?

   ii. For Scotland?

b. Please provide a description of main commercialisation development activity undertaken with Institute funding that led to the formation of your company:

c. What was the primary rationale for this commercialisation activity? Please detail:

d. What were the principal reasons for seeking support from the Institute?

To develop research of potential future commercial interest?	….	To access new funding to prepare research outcomes for commercialisation?	….
To develop collaboration with other Universities to support future commercialisation of research?	….	To promote / secure greater engagement / collaboration with industry	….
To access commercialisation support?	….	To secure other public sector support?	….
To secure funding as part of other collaborative activity?	….	Other? Please specify.	….

e. What were you expectations of the Institute? Please describe:

f. Where your expectations met?

   i. If yes, please detail how?

   ii. If not, please explain why?

g. Could the current success have been achieved without the contribution from the Institute (or an alternative funding programme)?

h. What would the position have been if Institute funding had not been available to fund the commercialisation activity?

1. Activity would not have gone ahead?	Yes	….	No	….
2. If no, would the activity have taken place in a different form:	Yes	….	No	….

Later (timeframe)	
Smaller scale (%)	
Lower quality (%)	
Different outcomes (please detail these)	

3. If no, were alternative sources of funds considered?	Yes	….	No	….
4. If yes to 3. were such funds secured?	Yes	….	No	….

5. If yes to 4. please identify source and scale of funding secured:	

6. If yes to 4. was commercialisation a requirement for securing the funding?	Yes	….	No	….

7. If yes to 4. please provide details of the results and outcomes of the commercialisation activity:	

Please provide basis / rationale for above comments:

i. Were your expectations of the commercialisation opportunities of the activity valid in terms of market rationale, demand, etc?

   i. What factors affected it and how?

   ii. Did the expected project outcome change overtime and if so why (e.g. licensing v spin out, personnel, external support and funding sources, etc.)?

j. How accurate were the proposed project milestones?

   i. What impacted on them and how did this affect the outcomes of the project

   ii. Was the business planning completed within schedule

   iii. When was a final decision reached on post Institute involvement?

k. How realistic were the timeframes and work programmes?

   i. What impacted on them and how – what were the implications and results

l. How accurate – in retrospect - were the technical descriptions of the project and expected results and were there any significant variations?

m. Apart from the application process and reviews how did the administration of the Institute impact on the development of the project?

n. Do you believe that the Institute is addressing the appropriate gap between research and market commercialisation?

   i. If so, please state why you believe this to be the case:

   ii. If not, please state why you believe this and which gap it should be addressing instead:

o. What do you consider a reasonable timeframe over which the results, benefits and outcomes of the Institute should be measured? Please identify any key implications for going forwards.

2. Experience of Institute

a. How would you rate your experience of the Institute in terms of the following elements? (5 = very good or strongly agree to 1 = very poor or completely disagree)

	1	2	3	4	5	N/A
Clarity and ease of use of the application and selection processes?						
Quality of project management of the Institute?						
Marketing and promotional material for the Institute?						

The strength of the relationship with Strathclyde / Glasgow?						
Access to industrial partners via the Institute?						
Level / extent of industrial collaboration?						
Quality of industrial collaboration?						
Provision of commercialisation advice and support?						
Quality of commercialisation advice and support?						
Access to wider dissemination and networking activities?						
Complementarity with other sources of funding?						
Do you believe that the development of the Institute has been beneficial to the reputation of Strathclyde / Glasgow?						
Have you received any support since spinning out?						
Overall, would you classify your overall impression as positive?						

Please provide appropriate evidence or examples to support or explain your views:

b. To what extent (if any) has your experience of / with the Institute changed your attitude or approach at an individual and organisational level? Please provide details. We are particularly interested in activity related to the commercialisation and exploitation of research.

c. Do you believe that the Institute represents a sustainable model for the development of research activity that could be commercialised? Please give reasons for your view.

3. Specific Impacts of the Institute

a. Please identify any significant impacts of the Institute in terms of:

i. Current or projected employment:

Full Time ……..

Part Time	……..
Other (e.g. Contract)	…….

ii. Generation of income:

Yes …. No …. Too early to tell ….

If yes please provide details of level and timeframe for realisation:

b. Please provide details of any other changes / benefits attributable to the Institute. This could include academic benefits, reputational issues, cultural change, improvements in links with business, etc.

c. Going forwards, please detail any future activities or requirements (for example, further research activity or funding needs) related to the Institute funded activity:

d. Please identify (and provide appropriate details) if any of the expected / projected outcomes / impacts identified above are dependent upon or linked to the activities / requirements identified in the previous response:

4. **Outcomes and Results (Future Development)**

a. What, in your view, are the strengths and weaknesses of the Institute in terms of delivery, role, and effectiveness?

b. Are there any improvements that you believe could be made to the current arrangements? Please detail the areas and why you believe this to be the case.

c. Are there any current areas of research activity that are not being addressed by the Institute where you believe potential commercialisation opportunities could exist? Please identify how you believe the Institute could address these opportunities

d. What do you see as the future role for the Institute, including whether or not you believe that it should continue. Please identify reasons for your view.

e. What in your opinion would be the position if the Institute ceased to operate?

f. Is there more that could be done to secure increased potential commercialisation benefits and, in particular, make them more sustainable? Please provide details.

g. What are your plans for the future and what additional outputs do you anticipate will be delivered as a result?

h. Is there a role for SE or other public sector agencies - if so what and why?

i. What involvement is there from the private sector?

5. **Others**

a. What lessons have you learnt from your involvement with / or knowledge of the Institute in relation to commercialisation and bringing products to market? Please provide details.

b. Do you see a wider role for the private sector in supporting initiatives of this type?

i. If so, what and how could this be developed.

ii. If no why?

c. How has Institute involvement helped your project – if at all – in terms of:

i. Project management

ii. IP and future research capabilities

iii. Commercialisation opportunities

iv. Effect upon and ability of you to engage with the private sector/other funding sources

v. Other effects (please evidence)

d. Have you received any other forms of Scottish Enterprise support and if so what has been their impact on your project in terms of using/engaging with:

i. SE Priority Industries Teams

ii. Proof of Principle Programme

iii. High Growth Companies Initiative

iv. Enterprise Fellowships

v. Other SE support

e. Were there any areas where you feel the University (Strathclyde or Glasgow) could have added additional value to improve the commercialisation process and facilitate successful conclusions to your project more quickly or effectively?

f. Has involvement with the Institute led to a greater appreciation of / access to business angels, venture capital activities / support by your team and / or organisation? If so how is this evidenced?

g. Has involvement with the Institute increased the level and quality of the company's activities and / or staff capabilities? If so how is this evidenced?

h. Has involvement with the Institute led to new collaborations with other Institutions or (private sector) organisations? If so please describe.

i. Is there any evidence of participation with the Institute attracting other staff / funding to the company post spin-out?

j. What new skills have you (and others where relevant) acquired and how have these been applied outside the original project?

k. What other Institutions/bodies (if any) have been interested in your project and what perceptions do you think they have of the Institute initiative?

l. Has involvement with the Institute led you to make contacts with other Institute project teams and if so what was the outcome?

m. What other benefits do you believe the Institute has generated for you, your organisation and more widely.

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Final Report

Appendix D: Economic Impacts

Appendix D – Economic Impacts

In this Appendix we detail the approach we have adopted to analysing the likely range of economic impacts which have (and could in the future) be generated by the Institute's activities.

We have outlined, therefore, the basis upon which we have identified and measured the:

- Effects of the Institute's current activities; and,
- Potential future impacts that might occur.

In assessing such effects we have drawn upon various guidance material provided by Scottish Enterprise to analyse impacts. In addition – given the limitation of the data available from the relatively few projects in our consultation sample – we have also drawn upon:

- Scottish Executive data concerning multiplier values and gva per employee over relevant industrial sector; and,
- Extant information concerning commercialisation activities and outcomes in other UK and international universities (as referenced throughout the rest of this Appendix).

Current Effects

As illustrated, in Table D1 below, it is apparent that over the period of 2002 to 2007 that:

- Total expenditure on the Institute was in the region of £5.8 million;
- Around £2.7 million of this expenditure related to Institute staff costs;
- A further £2.3 million represented (internal and external) support services to Institute projects;
- Approximately £0.5 million was related to direct project related expenditure; and,
- £0.2 million was spent on Institute (IT) equipment.

Table D1: Total Expenditure Kelvin Institute 2000 to 2007			
Item	2002-2003 £	2004 -2007 £	Total £
Staff	809,635	1,978,078	2,787,713
Support Services	340,0209	1,976,897	2,316,917
Projects	-	533,835	533,835
Equipment	51,973	183,622	235,595
Total	£1,201,628	£4,672,432	£5,874,060

In assessing the net (as opposed to gross) effects of these different streams of expenditure we have reviewed, as detailed below, the likelihood of 'direct leakage' and the potential substitution/ displacement effects of funding support (by Scottish Enterprise, ERDF and the Universities).

(a) Direct Leakage

In our view, based on our consultations with stakeholders and the Institute staff and management teams, it is apparent that most (if not all) resources – in terms of staff and support services – be categorised as "locally or Scottish based" (ie the Institute has not drawn upon or funded non Scottish sources of support or staff to undertake its operation).

In contrast expenditure on Institute equipment and project materials is likely to have been sourced from non Scottish sources given the high proportion of IT content involved to support Institute activities.

Consequently, as illustrated in Table D2 below we have assumed:

- No leakage (ie -0%) in relation to staff and support services expenditure;
- A potential level of 50% for direct project expenditure; and,
- A level of 100% for the Institutes IT equipment.

Table D2: Assumed Impact of Direct Leakage on Total Expenditure over 2000 to 2007			
Item	Total £'000	Assumed Leakage %	Total Less Leakage
Staff	2,788	0	2,788
Support Services	2,317	0	2,317
Projects	534	50	267
Equipment	235	100	0
Total	5,874	91.4	5,372

(b) Substitution/Displacement

As indicated, in Section Four of our main report, we have not identified any displacement effects as a direct result of Institute activities.

(c) Deadweight

In regard to deadweight across the 16 Institute projects we suggest – on the basis of our consultations and analysis - that:

- Five projects were primarily focussed on the Institute providing consultancy services to external bodies (which while generating income for the Institute we have assumed such services would – in the absence of the Institute – have been sourced from other bodies and should not, therefore, from the perspective of the support provided or the objectives of the intervention by Scottish Enterprise be ascribed as a commercialisation outcome or impact); and,

- Eleven projects were focussed on commercialisation outcomes of which, based on our sample, around 50% might have received alternative funding support, but not the type of support services or Institute staff inputs that were provided.

Consequently, as illustrated in Table D3 below, we have assumed that:

- No deadweight should be ascribed to institute staff and support services (i.e. in the absence of the Institute none of these activities are likely to have been undertaken by other bodies); and,

- Around 50% of direct project costs may be viewed in deadweight terms (i.e. alternative funding sources might have been available for half of the projects undertaken by the Institute).

Table D3: Assumed effect of Deadweight on Expenditure over 2000 to 2007			
Item	Total £'000	Deadweight %	Direct Expenditure £'000
Staff	2,788	0	2,788
Support Services	2,317	0	2,317
Projects	267	50	133.5
Total	5,372	0.95	5,105

(d) Employment

The income levels identified in Table D3 will, in turn, support a level of direct employment. We have drawn several assumptions in regard to the Institute activities, namely that:

- Over the lifetime of the Institute the average staff complement has averaged around 12 employees per annum;
- For support services, of the type used by the Institute, an annual revenue per employee of around £75,000 is appropriate in line with other labour intensive business services; and,
- For project expenditure a level of £25,000 revenue per employee is likely based on Scottish Enterprise Proof of Concept Programme estimates for similar types of commercialisation projects.

On the basis of these assumptions we estimate that the net expenditure associated with the Institute over 2002 to 2007 has potentially supported – as illustrated in Table D4 below – up to 120 additional full time equivalent years of employment ("fteye").

Table D4: Assumed Levels of Direct Full Time Equivalent Years of Employment over 2000 to 2007			
Item	Net Direct Expenditure	Assumed Income per employee per annum	Estimated full time year of employment
Staff	2,788	n/a	84
Support Services	2,317	£75,000	31
Projects	133.5	£25,000	5
Total	5,246		120

(e) GVA

Given the estimates relating to employment levels above we have also estimated likely gva impacts based on Scottish Executive data. As indicated in the introduction to this Appendix and outlined, in Table D5 below, we have selected labour categories from the Scottish Executive database that we believe best accord with the expenditure streams associated with the Institute, namely:

- 'Other Business Activities' in relation to Institute staff and support services; and,
- 'Research and Development' in relation to project activities.

Table D5: Assumed Levels of GVA associated with Net Direct Expenditure of Institute over 2000 to 2007

Item	Estimated Direct Expenditure	GVA per employee per annum	Total GVA £(m)
Staff	84	29,800[1]	2.5
Support Services	31	29,800	0.9
Projects	5	18,100[2]	0.1
Total	121	-	3.5

[1] SIC Division 74: 'Other Business Activities' gva per employee, Scottish Executive, Scottish Economic Statistics, 2004.

[2] SIC Division 73: 'Research and Development' gva per employee, Scottish Executive, Scottish Economic Statistics, 2004.

As illustrated, in Table D5, adoption of these categories implies that a total of £3.5 million gva has been generated as a result of the direct net expenditure in the Institute.

Indirect and Multiplier Effects

In assessing the indirect and multiplier effects of the net direct expenditure associated with the Institute we have applied various level II multiplier values from the Scottish Executive Output, Income and Multiplier Categories, namely:

- (Type II) market research multipliers for the staff and support service categories of expenditure and gva; and,
- Research and development multipliers for project expenditure.

As illustrated at Table D6 overleaf applying these multipliers to direct net additional and expenditure levels suggests that the wider or catalytic effects of the Institute could have been in the region of 83 full time equivalent years of employment and £2.29 million gva.

Table D6: Wider Catalytic Effects				
Employment				
Item	Staff	Support Services	Projects	Total
Net Employment (fteye)	84	31	5	120
Employment Multiplier	0.707[1]	0.707[1]	0.563[2]	-
Multiplier Impacts	59	21	3	83
GVA				
GVA	2.5	0.9	0.1	3.5
GVA Multiplier	0.647[3]	0.647[3]	0.878[4]	-
Multiplier Impacts	1.62	0.58	0.09	2.29

[1] Category III, Market Research, Type II employment multiplier, Scottish Executive.

[2] Category I08, Research and Development, Type II employment multiplier, Scottish Executive.

[3] Category III, Market Research, Type II gva Multiplier, Scottish Executive.

[4] Category 108, Research and Development, Type II gva multiplier, Scottish Executive

Finally, aggregating both the direct and indirect or wider catalytic impacts identified suggests, as illustrated in Table D7 overleaf, that the total net effects of the Institute are likely to have been:

- Around £8.6 million income generated within the Scottish economy;
- 203 additional full time equivalent years of employment; and,
- Around £5.8 million additional gva.

Table D7: Total Net Impacts			
Income £m			
Item	Direct (Income)	Indirect and Induced (Income) [1]	Total (Income)
Staff	2.788	1.80	4,588
Support Services	2.317	1.50	3,817
Projects	133.5	117	0.258
Total	5.246	3.424	8.663
Fteye			
Staff	84	59	143
Support Services	31	21	52
Projects	5	3	8
Total	121	82	203
gva (£m)			
Staff	2.5	1.62	4.12
Support Services	0.9	0.58	1.48
Projects	0.1	0.09	0.19
Total	3.5	2.29	5.79

[1] These effects are derived on the basis of the gva multipliers and adopted at Table D6.

Future Effects

In assessing the potential future impacts of the Institute we have assumed two 'future states of the world' to illustrate the potential range of impacts that would result from the Institutes current profile of activities, namely:

- **'Worst Case Scenario'**; whereby none of the eleven projects (with which the Institute has been involved) generates any form of commercialisation outcome; and,
- **'Best Case Scenario'**; where all eleven projects do generate a commercialisation outcome.

In the former, worse case, the future outcomes of the Institute will remain unchanged from those currently identified (of £8.86 million net income, 203 fteye and £5.79 million as identified in Table D7 above).

In the latter, best case, we have drawn on a range of sources to derive assumptions on the potential future impacts that might result, namely that the:

- Ratio of spin outs to licences from the eleven projects is likely to be 2 to 9 in line with UK university rates (of 2 to 3 spin outs per every 10 licences as evidenced in: 'The UK is good at science, poor at the exploitation of science', PMSU, 2006);
- Income likely to be generated by these two spin outs will be in the region of £1.0 million per annum (as evidenced by POCP data);
- Impact (ie causality) of the Institute in generating such income can be ascribed over the first two years of the spin-out;
- Likely employment levels of such spin outs is likely to be in the region of 10 employees per company over these first two years (as per levels of income per employee in capital intensive companies in the UK);
- Average net gva per spin out is likely to be around £0.390 million per annum (as per POCP data);
- Average licence income generated from the remaining projects is likely to be in the region of £36,000 per annum per project (as evidenced by: "University Spin-out Companies: Starting to Fill the Evidence Gap", Gatsby Charitable Foundation, 2005);
- Average income per employee associated with licence income – as per business services in Scotland – is in the region of £75,000 per annum.
- Impact that might be ascribed to the Institute from such licences is likely (at minimum) to be two years; and,
- Average gva per licence is likely to be around £29,800 per annum (as per Scottish Executive data).

Accordingly, as detailed in Table D8, by adopting the assumptions under the best case scenario the Institute might generate a further £4.65 million income, 48 fteyes and £2.1 million gva.

Table D8: Best Case Scenario

Impacts	Future Spin Outs	Future Licences	Total
Income	£4.0m[1]	£0.65m[2]	£4.65m
Fteye	40[3]	8[4]	48
Gva	£1.56m[5]	£0.54[6]	£2.1m

[1] i.e. £1.0 million income per project, 2 projects and for 2 years 'attribution' to Institute influence - £1.0 million x 2 x 2 = £4.0 million.

[2] ie £36,000 per annum, 9 projects and 2 years attribution - £36,000 x 9 x 2 = £648,000.

[3] ie 10 fteyes per annum per spin out, 2 projects, 2 years attribution – 10 x 2 x 2 = 40 fteye.

[4] ie average income per employee of £75,000 per licence - £650,000 ÷ £75,000 = 8 fteye.

[5] i.e. average gva per project is £0.390 million per annum, 2 projects, 2 years of attribution - £0.390 million x 2 x 2 = £1.56 million.

[6] i.e. average gva per licence is £29,800 per project, 9 projects and 2 years of attribution - £29,800 x 9 x2 = £536,400.