



Interim Evaluation of the Institute for System Level Integration (ISLI) – Final Report

Scottish Enterprise Edinburgh and Lothian

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Executive Summary

Introduction

As part of the ongoing monitoring and evaluation of the Institute for System Level Integration (ISLI), Scottish Enterprise Edinburgh and Lothian (SE E&L) commissioned DTZ to undertake an assessment of both the quality of the intervention to date in terms of the efficiency with which the funding has been deployed, and the effectiveness of the intervention in delivering outcomes and impacts (quantitative and qualitative). To assist SE E&L to be able to make well-informed decisions on the future of the intervention, this report draws upon the information gathered during the evaluation process and our previous knowledge of ISLI to present a series of recommendations on the value for money of the intervention and the scope for future implementation.

Background and Rationale

ISLI is a central part of SE's original vision to establish Scotland as a leading world centre for electronic product design and technology. It aims to fill the gap between industry and academia within micro and opto electronics technology by building capacity and fostering world-class activity resulting in the growth of companies and the industry. In support of SE strategy, ISLI has three specific objectives:

- Deliver high quality and industry relevant Postgraduate and Professional Education and Training;
- Deliver and support services to stimulate industry-based R&D and company innovation; and
- Undertake pre-competitive research through its University network.

The rationale for ISLI is based on addressing a number of barriers facing the microelectronics industry. These are identified in the 2005 SE Board Paper and include: the availability of highly skilled engineers; Investment in Research, Design and Development; the transfer of knowledge and new technologies from the academic base; and the adoption of new technologies in order to create and improve products.

ISLI has a strong fit with policy goals in terms of encouraging innovation and commercialisation in the technology arena and developing priority industries through the use of enabling technologies. There is evidence that ISLI is addressing failures in the market through the provision of teaching resulting in highly skilled design engineers going into industry and through the provision of direct support to industry to stimulate R&D and innovation.

ISLI Activity

The progress of ISLI in each area of activity against the objectives set out in the ISLI Business Plan and the funding agreement with SE is summarised below. ISLI has been successful in meeting, or exceeding, its performance targets in a number of areas including the level of CPD activity and the amount of research funding leveraged. The Design Team performance is not clear as the activity is reported in a different way to the targets.

ISLI has very clear and well-managed financial reporting systems. The clear presentation of financial information makes transparent analysis of ISLI's finances possible. ISLI has seen a period of income growth, this growth being achieved despite challenging conditions surrounding student numbers. During the period, the level of annual SE subsidy required has dropped slightly but ISLI has acknowledged that ongoing subsidy is required and justified given the market failures being addressed. The drop in subsidy has been achieved through control of costs as income has been driven up. There is good evidence that income will continue to be driven up while efficiencies are sought in staff and premises costs. This is likely to mean that should ISLI continue to be funded from public sources, the funding requirement will drop.

MSc Objectives: Output of at least 40 MSc graduates per annum, at least 10 of which to be from Scotland.

MSc Progress: Target numbers not met and proportion of domestic students just short.

EngD Objectives: To successfully negotiate seven new EngD contracts each year of which at least 50 per cent of contracts will be with SMEs including micro start ups.

EngD Progress: Both targets exceeded.

CPD Objectives: To achieve a minimum of 400 person days of training per annum presented to local engineers, of whom at least 65% will be from local SMEs.

CPD Progress: Target for number of person days exceeded, but focus on SMEs not met.

Design Objectives: To secure, per year, 3 to 5 industrial contracts, support at least 1 joint research / technology transfer project with universities, create 1 new start-up company from the ISLI Design Competition and assist 6-10 companies.

Design Progress: Difficult to assess progress, but appear to have met target for joint projects with universities and the number of companies supported.

Research Objectives: To publish research outputs in appropriate professional and trade journals, target is ~20 papers per year by ISLI linked researchers, to leverage over £5m of research funding and to proactively support ISLI financed academics in their efforts to increase their research capability by the attraction of high quality researchers.

Research Progress: All targets met, with the amount of research funding leveraged ahead of target.

Operational Review

ISLI seems to be operating in a steady state and there are no major changes recommended to its operations. In terms of activity, there appears to be considerable scope to increase the level of Design Team activity across all areas, but in particular to generate more commercial income. This should be addressed as a priority moving forward.

Other minor changes that have been identified include more co-ordinated marketing and promotion of ISLI to raise the profile amongst potential students and industry and the issue of putting in place cover for the Deputy Chief Executive post.

The current format of reporting to SE could be better aligned to the goals and targets for each area of activity to provide better clarity for all parties in ISLI's performance and to allow ISLI to more accurately demonstrate the contribution it is making in each area.

Economic Impact

Through an analysis of the outputs and outcomes of the various activities of ISLI it is possible to calculate the impact on the economy from April 2005 to the end of 2007. The impact is summarised below and the detailed impact assessment is shown in Section 5 along with details of the assumptions made at each stage. The net impact associated with the activities below is around £16m.

GVA associated with	Direct, Indirect and Induced GVA
Off-campus expenditure of non-Scottish MSc & EngD students (A.1 + B.1)	£372k
Savings to companies employing ISLI graduates (A.2)	£1.4m
Savings to companies from ISLI CPD (A.3)	£220k
Savings to companies sponsoring an EngD RE (B.2)	£834k
Revenue associated with EngD project activity (B.3)	£2.9m
Revenue associated with design team activity (B.4)	£3.2m
Leveraged research funding (C.1)	£1.8m
Turnover of ISLI (D.1)	£5.5m
Equivalent to a total net additional GVA of:	£16.2m

Progress Since Previous Evaluation

The 2004 evaluation found that ISLI was making a worthwhile contribution to the Scottish economy through its education and research programmes. However, it was felt that the organisation represented poor VFM and a series of cost savings were suggested. The economic impact of ISLI from April 2005 to December 2008 was presented above. There is strong evidence that ISLI has addressed the issues identified in the previous evaluation.

An assessment of the financial information has shown the level of annual SE subsidy required has dropped slightly. This drop in subsidy has been achieved through control of costs as income has been driven up. The evaluation has found good evidence that income will continue to be driven up while further efficiencies are sought in staff and premises costs. This is likely to mean that should ISLI continue to be funded from public sources, the funding requirement will drop. Therefore, it is our assessment that ISLI has represented good VFM over the last three years.

Options for the Future

There are a number of potential options for the future shape of ISLI and these are outlined below. However, it is important to recognise that given the timing of this interim evaluation there is an opportunity for ISLI and SE to work together over the remainder of the current agreement period to determine the best way forward for ISLI. The following options were presented in the 2005 SE Board Paper, where the conclusion was to continue funding to ISLI in its current form. If these options were to be applied at the next funding application round the options would look as follows:

- **Option 1: Wind-up ISLI**
In this option, the Institute would cease to exist as a single organisation and entity following completion of the current funding agreement.
- **Option 2: Separation of Activities**
In this option the ISLI would be broken up into a number of constituent parts with the MSc and EngD programmes continued to being run part as of one of the partner universities' postgraduate programmes.
- **Option 3: Relocation to University Campus**
In this option, the ISLI is maintained and developed in line with the Business Plan for the next 5-years.
- **Option 4: ISLI Remains on the Alba Campus**
This option is essentially the status quo. In the previous options' appraisal this was the preferred option for SE and ISLI.

In addition to these options, which are centred on the question of public funding, ISLI may wish to consider further options. These could include:

- **Option 5: Relocation to West Lothian College**
This option is similar to Option 3 above in that the operational model for ISLI is maintained and developed in its current form. ISLI would remain within Livingston but would relocate to the more central location of West Lothian College. The main difference to Option 3 is that ISLI could maintain its independence from the universities.
- **Option 6: Teaching Activity Goes to the Universities**
This is similar to Option 2 above, as in this option the ISLI would be broken up into a number of constituent parts with the MSc and EngD programmes continued to being run part as of one of the partner universities' postgraduate programmes. However, the industry-facing and research activities of the Design Team and the CPD activity would be maintained by ISLI and operated in a similar way to the present model.

Summary

There was a clear message emerging from the stakeholders of ISLI (in its widest sense to include industry) that ISLI is still a valuable asset and that the whole is still greater than the sum of its parts. This is reflected in the value placed on the collaboration between the partner universities and industry and the high regard in which graduates of the MSc and EngD programmes are held.

There is clearly significant work to be done in determining the future vision for ISLI and the implications this has on the resources required. As noted above, the timing of this interim evaluation means that there is an opportunity for ISLI and SE to work together over the remainder of the current agreement period to determine the best way forward for ISLI. The options outlined above can provide a framework for this discussion.

1. Introduction

1.1 Study Background

The Micro and Opto Electronics Industry in Scotland has the potential to capitalise on large and fast growing markets. Central to this is the ability of Scottish businesses to be competitive in international markets. In order to achieve this, these businesses need to have access to highly skilled design engineers and leading research. Scottish Enterprise (SE) aims to position Scotland as a leading world centre for electronic product design and technology.

As part of the ongoing monitoring and evaluation of the Institute for System Level Integration (ISLI), Scottish Enterprise Edinburgh and Lothian (SE E&L) commissioned DTZ to undertake an assessment of both the quality of the intervention to date in terms of the efficiency with which the funding has been deployed, and the effectiveness of the intervention in delivering outcomes and impacts (quantitative and qualitative). To assist SE E&L to be able to make well-informed decisions on the future of the intervention, this report draws upon the information gathered during the evaluation process and our previous knowledge of ISLI to present a series of recommendations on the value for money of the intervention and the scope for future implementation.

1.2 Study Objectives

The objectives of the study are as follows:

- To identify and assess the economic benefits derived from the provision of SE funding since the last funding agreement of April 2005, including a calculation of net additional GVA;
- To determine whether the ISLI is delivering the objectives, outputs and outcomes outlined in the SE Board Paper of March 2005; and
- To make initial recommendations on future SE funding of ISLI beyond the current agreement which ends in 2010, based on SE's strategic direction and the performance of ISLI.

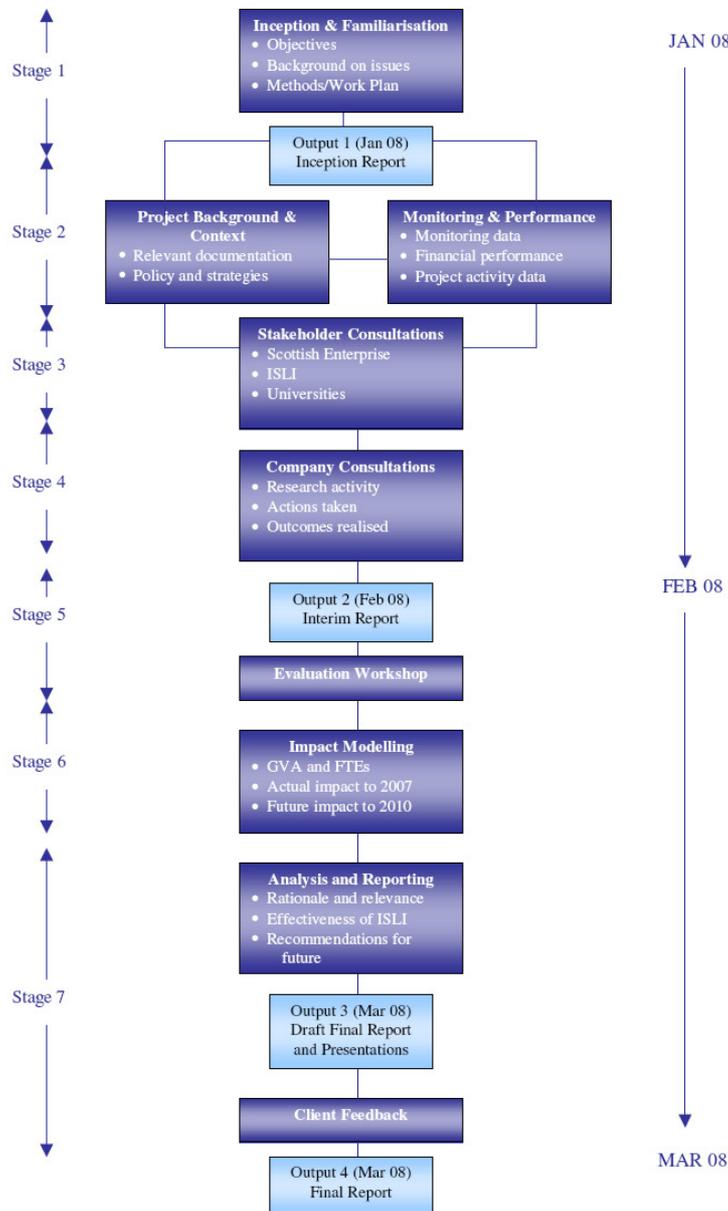
There are a number of key outputs that the evaluation should deliver including:

- A review of the performance of ISLI against the following:
 - o The objectives, outputs, outcomes and impacts identified in the SE Board approval of March 2005
 - o The recommendations identified in the DTZ evaluation of 2004
 - o The measures set out in the ISLI business plan submitted in 2004
 - Identification of the effectiveness of the universities' marketing and the degree they take real ownership of the Institute;
 - Conclusion on whether the business model of ISLI is effective in meeting its objectives;
 - Identification of the key challenges for ISLI in the current and predicted operating environment and recommend how these challenges should be addressed;
 - Review of the contribution of ISLI to the economy of Scotland, identifying and assessing quantifiable and non-quantifiable economic benefits derived from the provision of SE funding since April 2005, including a calculation of net additional GVA and conclude whether there is still a compelling case for ISLI's continued SE support; and
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- Initial recommendations on future SE funding of ISLI beyond the current funding agreement which ends in 2010, based on SE's strategic direction and the performance and reporting of the ISLI

The methodology employed to meet the study objectives and to deliver the outputs is outlined below in Figure 1.1.

Figure 1.1 Study Approach



1.3 Report Structure

The remainder of our report is structured as follows.

- Section Two explores the rationale for ISLI and revisits the case for continued support from SE through this mechanism;
 - Section Three profiles the activity of ISLI from April 2005 to the present day;
 - Section Four reviews the operational aspects of ISLI drawing upon evidence from the consultation programme;
 - Section Five assesses the economic impact of ISLI based on feedback from companies and consultations with stakeholders; and
 - Section Six draws upon the preceding sections to present our conclusions and recommendations.
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2. Rationale for Intervention

2.1 Introduction

ISLI is an academic collaborative venture between four Scottish Universities – Edinburgh, Glasgow, Heriot-Watt and Strathclyde – SLI Ltd and SE. SLI Ltd is a company limited by guarantee whose members are the four universities and SE. The company is responsible for the financial operation of ISLI. The operation ISLI is governed by a members’ agreement between the four universities, SE and SLI Ltd, and by service level agreements between the four universities and SLI Ltd. SE channels development funding to ISLI, and to the end of the current funding agreement in 2010 will have provided £13.1m.

This section explores the policy and strategic context within which ISLI sits and sets out the principal activities of the organisation and the market failures it aims to address. The section concludes with a discussion of the evidence on market failure gathered in the consultations.

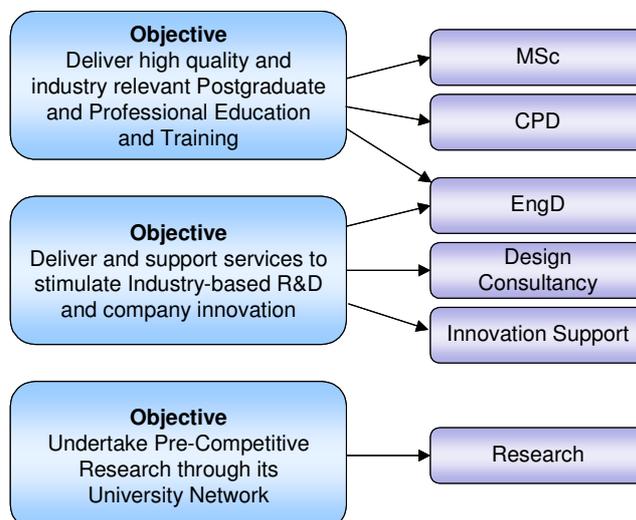
2.2 Principal Aims and Activities of ISLI

ISLI is a central part of SE’s original vision to establish Scotland as a leading world centre for electronic product design and technology. It aims to fill the gap between industry and academia within micro and opto electronics technology by building capacity and fostering world-class activity resulting in the growth of companies and the industry. In support of SE strategy, ISLI has three specific objectives:

- Deliver high quality and industry relevant Postgraduate and Professional Education and Training;
- Deliver and support services to stimulate industry-based R&D and company innovation; and
- Undertake pre-competitive research through its University network.

These objectives are addressed through the following main areas of activity:

Figure 2.1 Main areas of ISLI’s Activity



2.3 Policy and Strategy Context

ISLI was founded in 1998 at the Alba Centre as a cornerstone in SE's vision to establish Scotland as a leading world centre for electronic product design. The SE Board Approval of 2005 requires ISLI to support the work of the Enterprise Network through a focus on the following areas:

- Delivery of high quality and industry-relevant postgraduate and professional education and training;
- Delivery and support of services to stimulate industry-based R&D and company innovation; and
- Pre-competitive research through the university network.

A series of targets are set associated with each of these areas as shown in Table 2.1. ISLI's performance against these targets is assessed in the subsequent sections of the report.

Table 2.1 SE Targets for ISLI 2005-2010

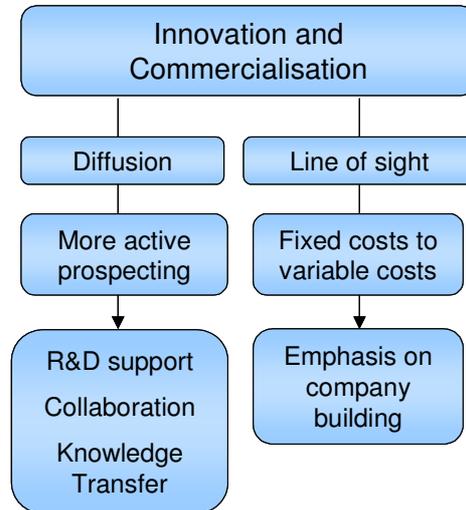
Objectives	Outputs	Impacts
Deliver high quality and industry relevant Postgraduate and Professional Education and Training	200 MSc graduates 2,000 person days of training	£8.5 to £12m investment in R&D leveraged
Deliver and support services to stimulate Industry-based R&D and company innovation	28 EngD graduates 20 industrial collaborations 5 technology transfer projects 45 companies assisted 5 start-ups supported	170 to 200 net jobs £32 to £38m net GVA
Undertake Pre-Competitive Research through its University Network	20 papers published p.a.	Over £5m research funding leveraged

Source: SE Board Paper on ISLI, March 2005

Given the change of Government in 2007 and the current restructuring of the Enterprise Network, new policy is just beginning to emerge. Two of the main policy areas to directly affect ISLI are outlined below:

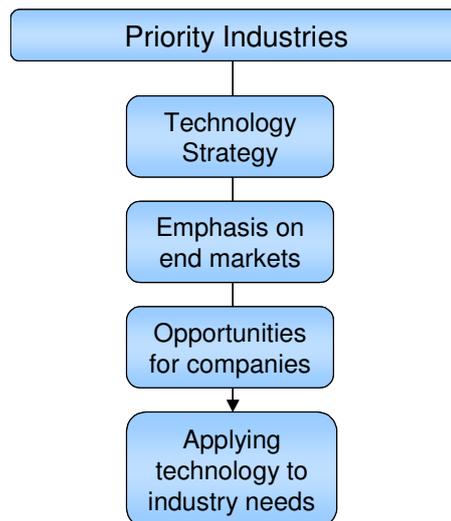
- **Innovation and Commercialisation Policy** – There is a renewed importance of Innovation in SE driven by the principles of a stronger focus on business and the deepening and widening of business innovation or diffusion – with a stronger focus on **outputs** and consolidation of innovation funding with a clearer **line of sight** to the market. There will be more emphasis on the scale of commercial opportunities and less on numbers. SE will have a role in the following processes that stimulate innovation: R&D support, collaboration and knowledge transfer. The emerging policy is illustrated in Figure 2.2.

Figure 2.2 Emerging SE Policy – Innovation and Commercialisation



- **Priority Industries** - A Technology Strategy will be developed, which will be focussed on what the industry needs rather than what SE will do i.e. it will be a demand led strategy. The focus of activity for SE should be upon identifying growing markets globally and where Scotland can compete within these markets to be genuinely world class. This involves a review of the opportunities for companies represented by enabling technologies. Technologies that can be applied across industries are important to this way of working.

Figure 2.3 Emerging SE Policy – Priority Industries



The implications of the emerging policy context for ILSI are that it will have an opportunity to demonstrate the contribution the organisation makes to stimulate innovation through R&D support, collaboration and knowledge transfer. ILSI will also be able to demonstrate that its activities are based on and responding to demand from industry in order to demonstrate the contribution it could make to the Technology Strategy. Finally, ILSI is starting to explore different areas of technology application e.g. sustainable energy or life sciences and the universities are recognising this as an opportunity also, and this activity should continue.

2.4 Market Failure Assessment

The rationale for ISLI is based on addressing a number of barriers facing the microelectronics industry. These are identified in the 2005 SE Board Paper and include:

- The availability of highly skilled engineers;
- Investment in Research, Design and Development;
- The transfer of knowledge and new technologies from the academic base; and
- The adoption of new technologies in order to create and improve products.

These barriers stem from a series of market failures and a key part of the monitoring and evaluation framework is the accurate measurement of the consequences of market failures, and the extent to which ISLI has addressed such failures. The market failures that have been identified are summarised below:

- **Information Failure** – there is an asymmetry of information between the supply and demand sides characterised by a lack of understanding on the part of companies of the benefits of employing highly skilled graduates and in adopting new technology and processes and a lack of knowledge of how to do this along with supply side failures in terms of a lack of suitable courses to train highly skilled design engineers.
- **Risk Aversion** – a sub-set of information failure is that companies are highly risk averse to investment in new technologies and due to a lack of understanding of the opportunities presented by commercialisation of IP.
- **Scale** – Scotland does not have the critical mass to operate effectively on its own with capability concentrated in a small number of SMEs and academic departments.
- **Externalities and Spillover** - due to the nature of the intervention, ISLI cannot capture all of the value, as the end beneficiaries of its activity are external to the organisation.

A fundamental part of the evaluation is a reconsideration of the rationale for public support. It is therefore important that this interim evaluation challenges the rationale and market failures underpinning the operation. This has been done by challenging the various stakeholders in ISLI to gather views on the extent to which there remains a valid rationale for ISLI.

The evidence from consultations with ISLI Board Members, staff, the partner universities, SE and industry indicate that there remains to be market failure issues and that ISLI is addressing these issues. Given the complexity of the subject area taught on the ISLI MSc, the delivery of this material is only viable through the collaboration of partner universities that make up the Institute. The collaboration allows the universities to pool their strengths in particular areas to provide a course that fits with industry demands.

Feedback from industry on the teaching activity indicates that companies see the EngD programme offered by ISLI as unique, and as having considerable industry benefits compared to standard PhD programmes. The companies tend to give students a portfolio of projects; therefore, unlike the conventional PhD there is less risk that the output at the end of the programme is no longer appropriate to the needs of the company.

Similarly, the feedback from industry on the commercial activity of ISLI highlighted that there are no other known services, similar to those of ISLI in terms of technical expertise and funding, available to companies. In addition to the financial benefits from ISLI services,



companies find the technical combination within the scale of the team and the single interface valuable. There is evidence that this support is leading to real benefits for the companies.

2.5 Summary of Rationale for Intervention

In summary, ISLI has a strong fit with policy goals in terms of encouraging innovation and commercialisation in the technology arena and developing priority industries through the use of enabling technologies. There is evidence that ISLI is addressing failures in the market through the provision of teaching resulting in highly skilled design engineers going into industry and through the provision of direct support to industry to stimulate R&D and innovation.

3. ISLI Activity Analysis

3.1 Introduction

This section presents the results of the analysis of the monitoring data on the activity of ISLI. The analysis focuses on monitoring data collected by ISLI from April 2005 to date. There are three main elements to this analysis:

- Teaching activity, including the MSc and EngD;
- Commercial activity of the Design Team; and
- Financial information related to the overall income and expenditure of ISLI and in each of the areas of activity.

This analysis provides useful background information for the evaluation and highlights the recent trends and current situation in terms of the main aspects of ISLI activity by year. The activity objectives for ISLI were set out in the ISLI Business Plan of 2004, and these objectives cover the period from April 2005 to March 2010. With the ISLI currently being three years into this funding agreement, its activity can be assessed on this partial basis.

3.2 Teaching Activity

3.2.1 MSc activity

Objective: Output of at least 40 MSc graduates per annum, at least 10 of which to be from Scotland.

Over a five-year period this objective translates to 200 graduates, and considering the targets to date one would expect 120 graduates to have graduated from ISLI. However, as Table 3.1 indicates the yearly MSc outputs have not reached this target.

Table 3.1 Number of MSc graduates per academic year

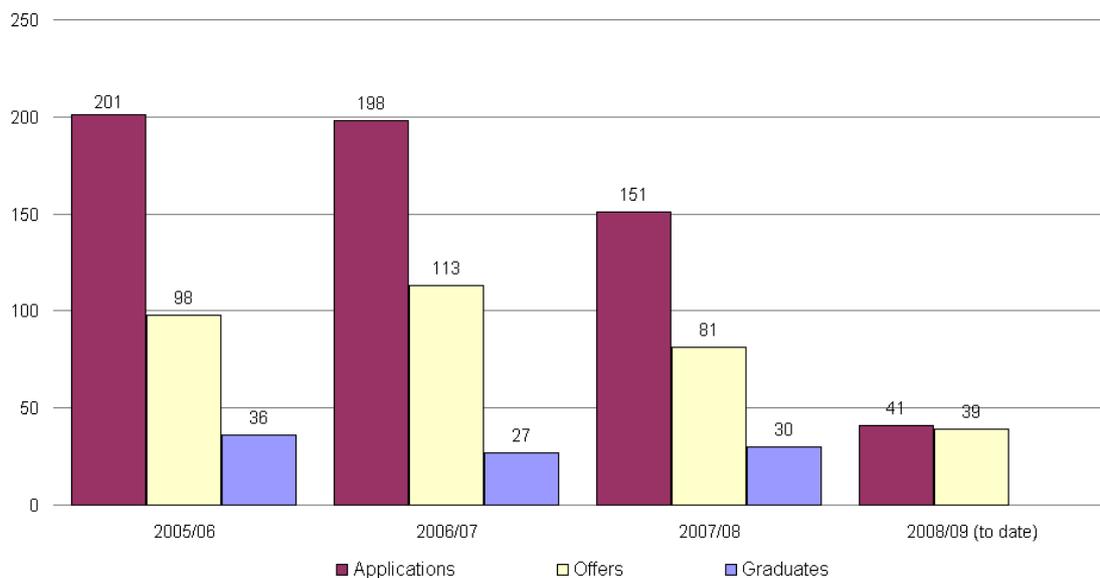
Academic year	Target	Actual
2005/06	40	36
2006/07	40	27
2007/08	40	30
Total	120	93

Source: ISLI

It has been recognised in the industry of engineering that MSc numbers are declining globally. A buoyant labour market is seen as one contributing factor to this decline, whereby engineering undergraduates take up employment directly after graduation declining postgraduate education. In addition to this there is increased competition from higher education institutions offering integrated Masters programmes (MEng), or less costly MSc programmes often with guaranteed residence permit upon the finalised programme – Australia and Canada have been identified by ISLI as the main competitors in this regard.

Figure 3.1 shows that there has recently been a decline in MSc applications for ISLI, and the number of offers went down by almost 30 per cent between 2006/07 and 2007/08. The numbers for year 2008/09 are as of the end February 2008, and therefore these levels are expected to increase.

Figure 3.1 Number of MSc Applications, Offers and Graduates per academic year, 2005 – to date



Source: ISLI

The MSc is an essential component of the ISLI EngD, and many MSc graduates go on to do an EngD at the institute. The course attracts many students from overseas and may be considered as an attraction and a magnet of skilled workers from outside Scotland. Figure 3.2 shows that the majority (56 per cent) of MSc students originate from overseas, and 22 per cent are from Scotland. Therefore the level of domestic students is just short of the target of 25 per cent, as set out in the Business Plan objective.

While the domestic students level is slightly lower than the stated target, ISLI appears to be a net importer of talent. As illustrated by Figure 3.3, a significant proportion of students take up employment in Scotland once graduated, and companies based in Scotland employed almost half of the MSc graduates of 2005-07. The MSc is designed to primarily meet the needs of local industries and the Institute has been successful in delivering local graduate retention.

Figure 3.2 MSc Student Origin 2005-2007

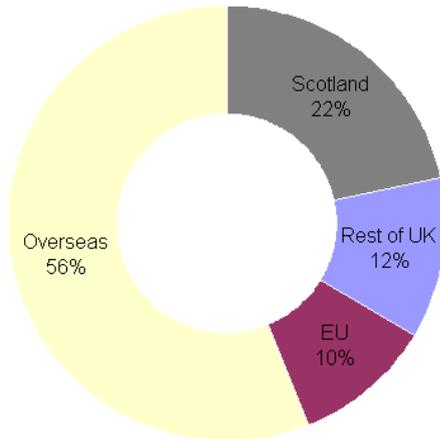
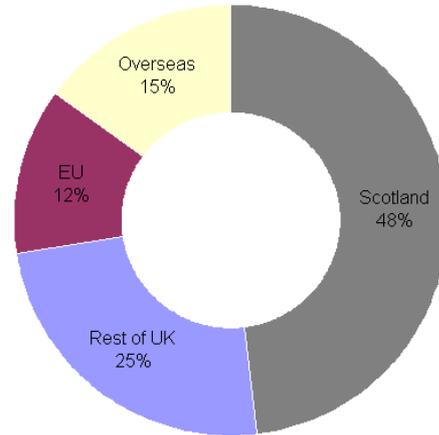


Figure 3.3 MSc Student Employment Destination 2005-2007



Source: ISLI

3.2.2 EngD Activity

Objectives: To successfully negotiate seven new EngD contracts each year of which at least 50 per cent of contracts will be with SMEs including micro start ups.

The EngD programme is focused on new product and process development and acts as a linkage between academia and industry, whereby it contributes to increasing company-based research and development. The number of EngD contracts awarded is on target by the end of year three of the Business Plan timeline. In year 2005/06 the awarded contracts were below the target of 7, but the following two years the levels have exceeded the target.

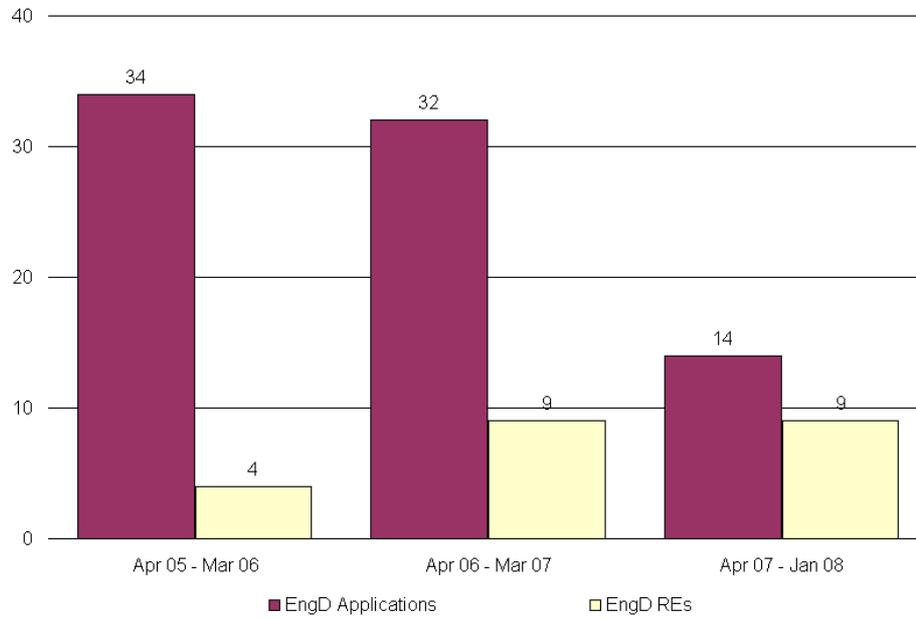
Table 3.2 Number of EngD contracts per academic year

Academic year	Target	Actual
2005/06	7	4
2006/07	7	9
2007/08	7	9
Total	21	22

Source: ISLI

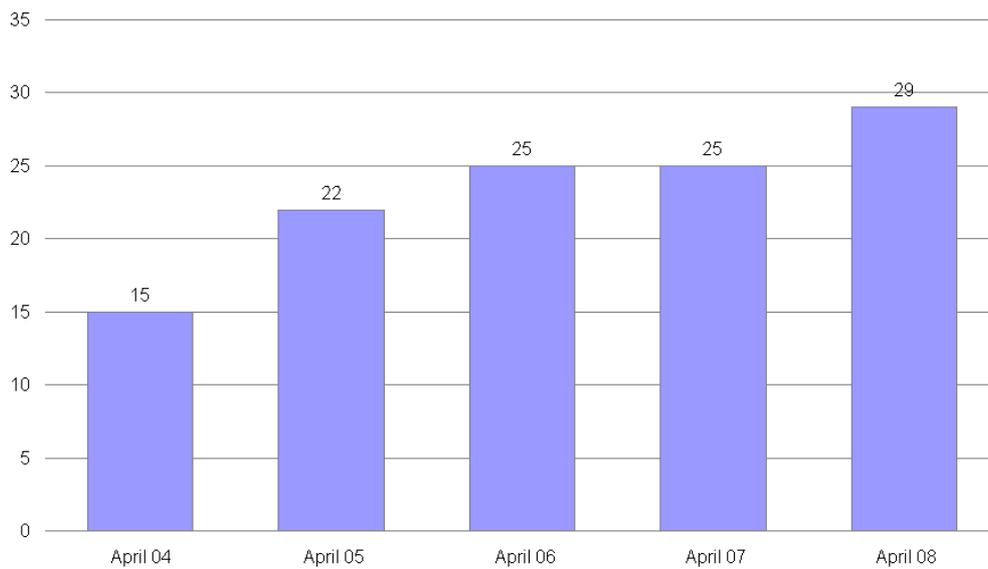
As Figure 3.4 illustrates the number of EngD applications have declined in the current academic year. However, with two months still remaining of academic year 2007/08 there is potential for the total number of EngD application to increase during this time. The total stock of EngD Research Engineers (REs) is illustrated in Figure 3.5 and shows that there has been a steady increase in the total level of active REs in the most recent year, underpinned by the above-target new contracts in years 2006/07 and 2007/08.

Figure 3.4 Number of EngD Applications and REs per academic year, April 2005 – to date



Source: ISLI

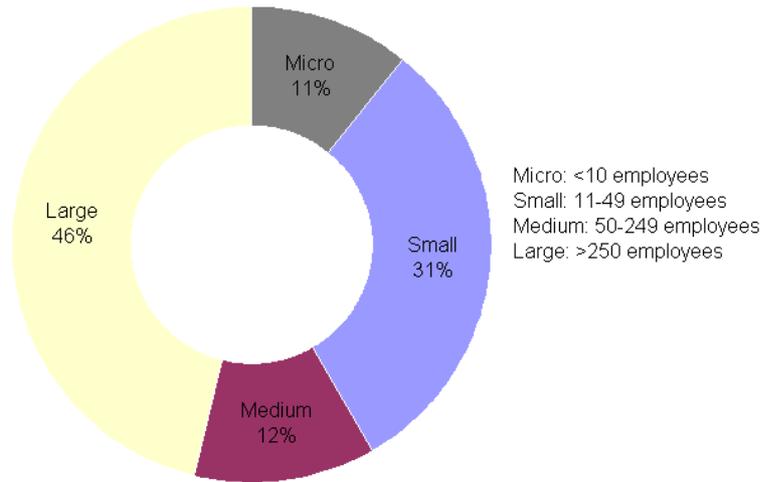
Figure 3.5 Total Active EngD REs by end of academic year, April 2004 – April 2008



Source: ISLI

The Business Plan objective on EngD activity states that at least 50 per cent of the contracts should be with SMEs and micro start-ups. Figure 3.6 shows more than half of the EngD contracts are with micro to medium sized companies, and within in these, small companies have the largest share of 31 per cent. Overall, large companies sponsor 46 per cent of the EngD contracts.

Figure 3.6 EngD sponsor companies by size



Source: ISLI

As illustrated in Figure 3.7, 75 per cent of the current EngD sponsor companies are located in Scotland, mainly in the central belt. Many companies see the EngD programme as a recruitment tool, and sponsors often make an employment offer at the end of the EngD programme. Figure 3.8 shows that 50 per cent of the EngD graduates have been employed in Scotland since finalising their programme. Overall, around two thirds of the graduate employment is with commercial companies, while some is in defence and academia.

Figure 3.7 EngD Sponsor Companies by Location

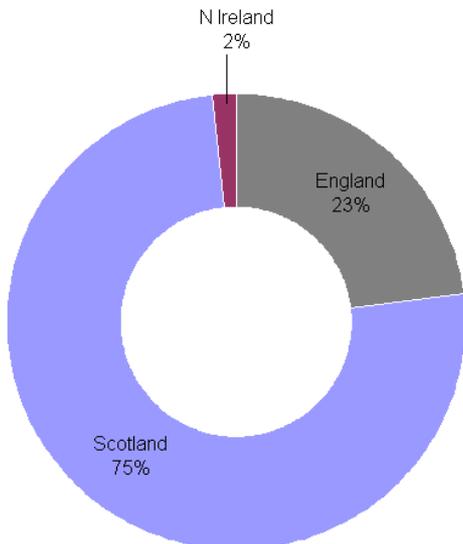
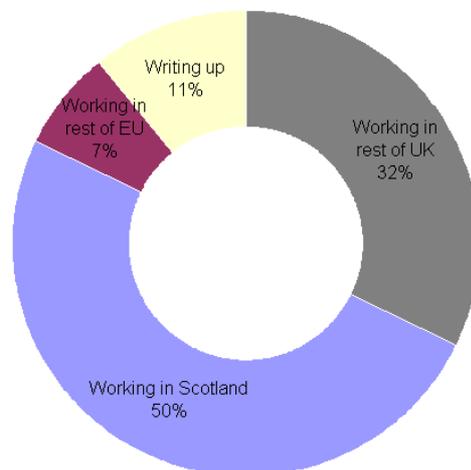


Figure 3.8 EngD Graduate Employment Status



Source: ISLI

3.3 Commercial Activity

3.3.1 Continuing Professional Development (CPD)

Objectives: To achieve a minimum of 400 person days of training per annum presented to local engineers, of whom at least 65% will be from local SMEs.

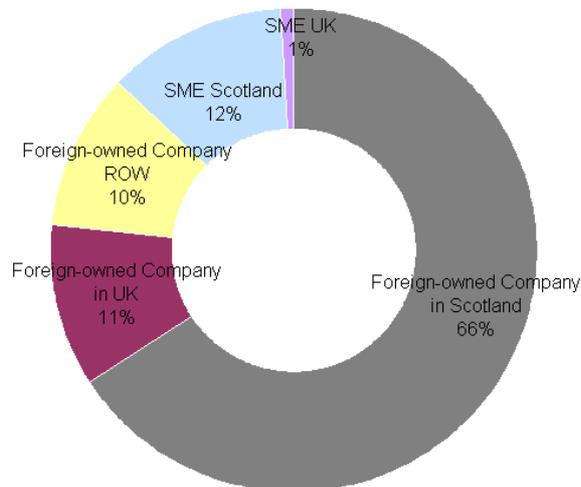
The target for CPD activity over the five-year period from April 2005 to 2010 equates to 2,000 person days of training to be delivered in total. As Table 3.3 shows, this target has been exceeded in the three years from 2005 to 2007 with 2,626 person days of training having been delivered to date. The increase in CPD activity is marked compared to the situation at the time of the previous evaluation by DTZ in 2004/05 and the greater contribution of CPD activity is reflected in the financial analysis later in this chapter.

Table 3.3 CPD Activity by year

Year	Delegates	Teaching days	Person days
2005 – 9 Courses	146	65	1,687
2006 – 12 Courses	292	33	521.5
2007 – 10 Courses	129	34.5	417.5
Total	567	132.5	2,626

Source: ISLI

Figure 3.9 Origins of CPD Delegates 2000-2007



Source: ISLI

The CPD activity whilst over-exceeding its activity target has not met its target to deliver 65% of this activity to locally based engineers in SMEs. Figure 3.9 shows that while 78% of the delegates were based in Scotland, only 13% of these were in SMEs as opposed to larger foreign-owned companies. If ISLI is to make this target by the end of the funding agreement it will require a substantial re-focussing of CPD activity towards SMEs. However, the value of delivering CPD to foreign-owned companies in Scotland should still be recognised, as they contribute greatly to Scotland’s economy and ISLI may well have a role in embedding and retaining these companies in Scotland by providing this service locally.

3.3.2 Design Team Activity

Objectives: To secure, per year, 3 to 5 industrial contracts, support at least 1 joint research / technology transfer project with universities, create 1 new start-up company from the ISLI Design Competition and assist 6-10 companies.

The Design Team within ISLI has a variety of roles, which are set out in the ISLI Business Plan under the headings of Design Consultancy and Innovation:

“To provide professional electronic system design consultancy services to industry, strengthen the Institute’s education and training activities and support technology transfer from the research base.”

“ISLI’s aim is to catalyse the creation of new technology based businesses through engagement with individuals and nascent early stage organisations. The Institute will assist in shaping ideas into technically and economically feasible product or systems proposals making use of its design team to provide technical advice and realize proof-of-principle demonstrators as appropriate.”

A general comment we would make on the Design Team activity is that there is scope for the monitoring to be better aligned to the objectives and targets in the ISLI Business Plan and SE Board Paper. The existing reporting of activity makes it difficult to align performance to targets. Table 3.4 shows the level of activity recorded in the monitoring to SE E&L. It should be noted that both EDSS and TTOM are funded separately by SE and will be the subject of their own programme evaluations. Therefore, whilst the activity of ISLI under these programmes is noted, this activity is not included in the assessment of impact in Section Five.

Table 3.4 Design Team Support to Companies

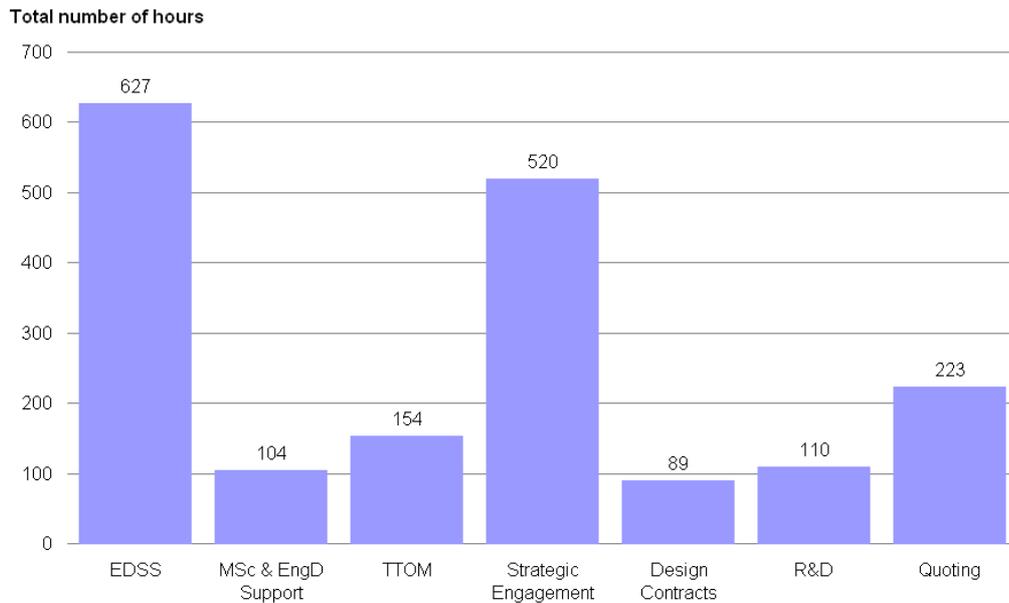
Period	Design contracts	Technology transfer (EDSS)	TTOM
April 2005 – March 2008	11	105	10
Total			125

Source: ISLI

In 2007, the Design Team has introduced a system of recording the usage of staff against the different activities. This is an extremely valuable management tool, and also offers an opportunity to demonstrate performance against targets if it were to be linked into the objectives and targets for the team as identified above. An analysis of the usage data from May 2007 to January 2008, as shown in Figure 3.10, reveals that the main areas of activity for the Design Team in terms of the number of hours spent were EDSS and strategic

engagement, which includes participation in the Analog Skills Initiative, UK Design Forum activity and work with the Intermediary Technology Institutes (ITIs).

Figure 3.10 Total Hours of Design Team Activity May 2007- January 2008



Source: ISLI

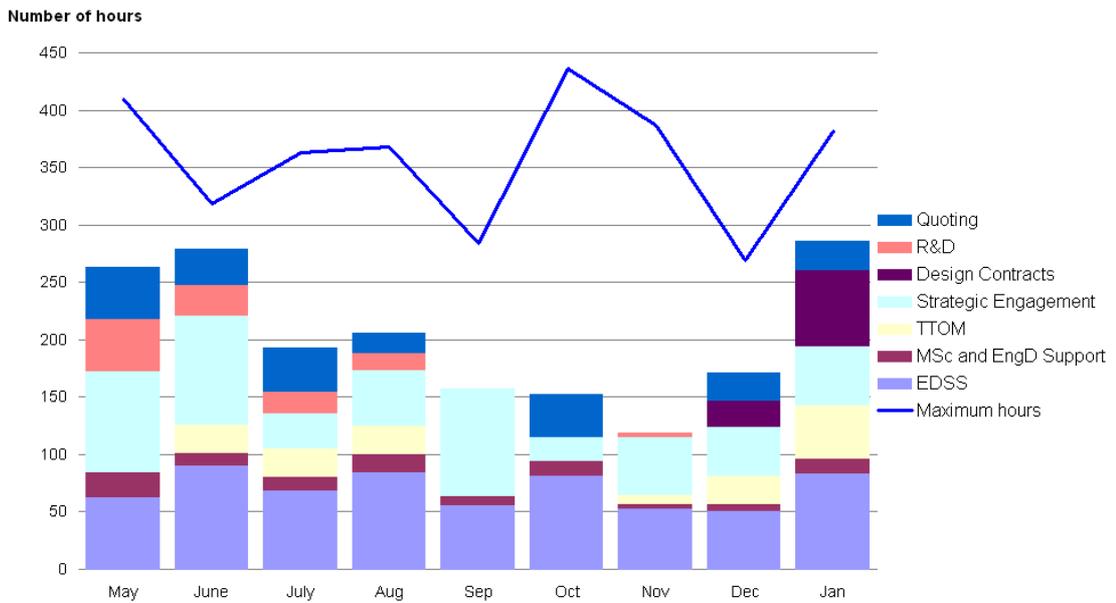
There appears to be a significant amount of spare capacity within the Design Team as indicated in Figure 3.11. The blue trend line shows the maximum hours available, which is arrived at by removing sick time and holidays from the absolute maximum working hours in each month and then using 70% of the residual time as the maximum available per month (due to down time from multiplexing between different tasks). The gap between the trend line and the activity bars, which show the actual utilisation of the team by activity, represents time which could be spent on commercial activity.

This is shown in a different way in Figure 3.12, which presents the utilisation rate of the Design Team in terms of the number of hours worked as a proportion of the maximum hours available. The peaks in activity were in June and January, with utilisation at 87% and 75% respectively. However, utilisation in October and November fell to 35% and 31% respectively.

This suggests that there is scope for the Design Team to significantly increase the income from design contracting and other fee-bearing activity. This would increase the multiplier of the team, or the income compared to total staff costs. The issue of increasing the multiplier of the team is picked up in the financial analysis later in this section.

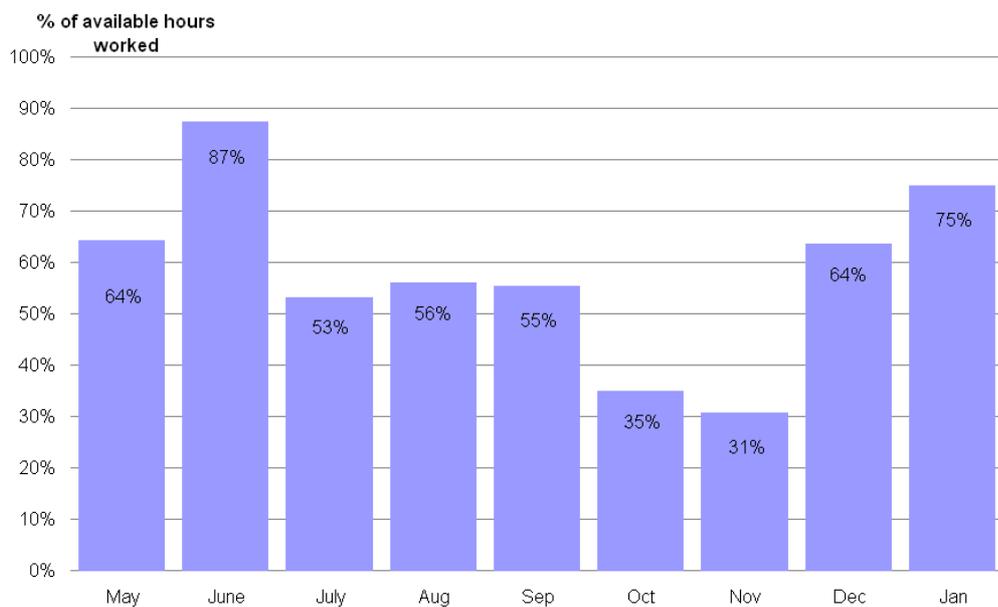
The Design Team has had a number of successes in terms of its activity leading to tangible outcomes for the companies assisted. This includes assistance provided to Oligon, a start-up company based in Livingston which resulted in the development of IP. This IP was a significant element in the purchase of Oligon by Wolfson Microelectronics in January 2007.

Figure 3.11 Actual Hours of Design Team Activity Compared to Available Hours May 2007- January 2008



Source: ISLI

Figure 3.12 % of Available Hours of Design Team Activity Allocated May 2007- January 2008



Source: ISLI

3.3.3 Pre-competitive Research Activity

Objectives: To publish research outputs in appropriate professional and trade journals, target is ~20 papers per year by ISLI linked researchers, to leverage over £5m of research funding and to proactively support ISLI financed academics in their efforts to increase their research capability by the attraction of high quality researchers.

The number of research papers produced relating to ISLI activities is recorded by ISLI and from April 2005 to November 2007, there have been 58 examples of published research. Clearly, this helps to raise the profile of ISLI's activity. Therefore, ISLI is well on track to meet its target in this area.

ISLI monitors the level of research funding leveraged from other funding bodies¹ in its monitoring report to SE E&L. The SE Board Paper sets a target of over £5m to be leveraged by the end of the current funding agreement in 2010. In its monitoring reports to SE, ISLI has reported leveraged funding of £3.7m to date. Some of this funding is included in the information gathered from the partner universities on leveraged research funding (see Tables 3.6 to 3.9) as ISLI is a direct partner in many of the research projects. In addition, the partner universities have identified a further £2m of funding that has been leveraged through their involvement in ISLI. This gives a total of around £5.7m, which more than meets the target for the current funding period.

Table 3.5 Leveraged Research Funding by year

Period	Cumulative	Actual
April 2005 – March 2006	£ 1,020,235	£ 1,020,235
April 2006 – March 2007	£ 2,410,119	£ 1,389,884
April 2007 – December 2007	£ 3,705,549	£ 1,295,430
Total		£ 3,705,549

Source: ISLI

The remaining objective for this area of activity is to proactively support ISLI financed academics in their efforts to increase their research capability by the attraction of high quality researchers. This directly supports ISLI teaching activity, but also drives the research agenda of the Institute and its partners. The evidence for this is largely qualitative (although it is recognised that the high quality of researchers is also indicated in the papers published and funding attracted), and feedback from the consultations indicates that this objective has been met. The partner universities highlighted that one thing that would be a great help in this respect is if ISLI were to be awarded the status of an HEI, as the role of an industrial partner is very restrictive in accessing funding. The partner universities have provided details of the research funding leveraged through their participation in ISLI. The following tables present the details of this activity, along with an assessment of the role of ISLI in securing these research streams. In addition, it was highlighted that ISLI has a role in providing informal facilitation of research interaction between staff at the member departments.

¹ This includes MSc Sponsorship, all EngD income, TTOM + Consultancy, PATENT, EDSS, ASI, SRDG, iDesign and other development/research funding.

Table 3.6 Heriot-Watt University Leveraged Research Funding

Research Activity	<p>Scottish Research Development Grant (SRDG) Scottish Consortium in Integrated Micro-Photonics Systems (SCIMPS) – Collaboration on integrated micro-photonics with ISLI, University of Glasgow, University of Strathclyde.</p> <p>IMEMS Design – Collaboration with ISLI, Strathclyde University and Semefab on Design of MEMS.</p> <p>Patent Network of Excellence (NoE) – Collaboration with ISLI and other 20 European partners of Design for Manufacturing of MEMS.</p> <p>EngD – 3 EngD students currently supervised by HWU staff.</p>
Funding	<p>SRDG (£1.2M) from the Scottish Funding Council</p> <p>IMEMS Design (£1M) from Scottish Enterprise²</p> <p>Patent NoE – total of £4.2M from the EEC. Not all of it is for ISLI or HWU</p> <p>EngD – EPSRC and companies associated to EngD</p>
Project start/end dates	<p>SRDG – (2005-2010)</p> <p>IMEMS Design (2007-2010)</p> <p>Patent NoE (2003-2008)</p> <p>EngD - continuing</p>
Partner organisations	See Research Activity above
Staff involved	<p>SRDG – 2 Research Associates</p> <p>IMEMS Design – 1 Research Associate</p> <p>Patent NoE – 2 equivalent full time Research Associates</p> <p>EngD – 3 students PhD level</p>
Outputs	<p>SRDG – At least 5 publications so far</p> <p>IMEMS Design – No publication as commercially sensitive</p> <p>Patent NoE – at least 7 publications so far. Additional funding obtained from company BCF Designs for industrial contracts.</p>
Role of ISLI in achievement of funding	<p>SRDG – Low</p> <p>IMEMS Design – High</p> <p>Patent NoE – Low</p> <p>EngD - High</p>
Likelihood of project going ahead in absence of ISLI?	<p>SRDG – High</p> <p>IMEMS Design – Low</p> <p>Patent NoE - High</p> <p>EngD - Low</p>
Sustainability of research in absence of ISLI funding	For SRDG and Patent NoE the research would be sustainable. For IMEMS Design, there would not have been any project. HWU has also other sources of funding. For EngD, HWU has other EngD streams of funding but not in the field of SoC

² It should be noted that this is a separate SE funded project with its own outcome and impact targets, but it has been included as the partner universities recognise the role of ISLI in attracting this funding.

Table 3.7 University of Strathclyde Leveraged Research Funding

<p>Research Activity</p>	<p>EngD Programmes with: Epson (Livingston) 2000-2004. Development of novel speech coding and recognition methods Clyde Broadcast (Glasgow) 2002-2003. Development of modular DSP units for radio broadcast industry Entegra Ltd (Maidenhead) 2002-2006. Development of Cordic arithmetic units for high speed linear algebraic DSP systems. Steepest Ascent (Glasgow) 2003-2007. Research and development of adaptive DSP systems for audio/bluetooth basestation implementation. Elixent (Bristol). Development of video compression implementations for Elixent logic fabric (Elixent were purchased by Panasonic in 2007). Funded Research Projects: Field Programmable Gate Array (FPGA) IP Core Protection: Software and hardware development for protecting FPGA IP cores SCIMPS - Scottish Consortium on Integrated Micro-Photonics Systems Integrated Micro and Nanosystems Design Centre</p>
<p>Funding</p>	<p>EngD - EPSRC and approx £10k per annum from each company FPGA IP – Funded by Algotronix Ltd SCIMPS - SFC under the SRDG scheme ~ £1.1m Design Centre - Scottish Enterprise ~ £1.2m</p>
<p>Project start/end dates</p>	<p>FPGA IP - 2006 - 2010 SCIMPS - 2006-2009 Design Centre - 2006 - 2009</p>
<p>Partner organisations</p>	<p>EngD - EPSRC and approx £10k per annum from each company FPGA IP – Funded by Algotronix Ltd SCIMPS - SFC under the SRDG scheme ~ £1.1m Design Centre - Scottish Enterprise ~ £1.2m</p>
<p>Staff involved</p>	<p>FPGA IP - 2006 - 2010 SCIMPS - 2006-2009 Design Centre - 2006 - 2009</p>
<p>Outputs</p>	<p>EngD - 2 Journal Papers, 3 conference Papers and 4/5 Engineers trained and retained in Scotland FPGA IP - Various conference presentations and publications SCIMPS - outputs are expected to be new research projects and research papers based upon the pump-priming research which is funded from the SFC grant Design Centre - Provision of an integrated design through to manufacture capability for MEMS systems within Scotland</p>

Role of ISLI in achievement of funding	EngD – High FPGA IP – High Design Centre - High
Likelihood of project going ahead in absence of ISLI?	EngD - Low FPGA IP – Medium Design Centre - Low
Sustainability of research in absence of ISLI funding	EngD - Not sustainable without EngD support FPGA IP – Medium Design Centre - Medium

Table 3.8 University of Edinburgh Leveraged Research Funding

Research Activity	<p>EngD Programmes with:</p> <p>Clyde Space Ltd (2007-11) - Power management for satellite and renewable energy technologies</p> <p>Mobile Healthcare Networks (2007-11) - Multi-radio architectures for robust mobile monitoring applications</p> <p>Thales Optronics (2006-10) - Asynchronous Processing in FPGA for EO sensors</p> <p>Spiral Gateway (2004-08) - EDA automation solutions for SoC applications</p> <p>Snell & Wilcox (2004-08) - A study into the abstraction and integration of hardware and software for accelerated product development in a broadcast environment</p> <p>Atmel (2003-07) - Investigation of issues of flexibility in SoC architectures</p> <p>MicroEmissive Displays Ltd (2002-06) - Investigation of IP blocks for application-specific microdisplays</p> <p>Funded Research Projects:</p> <p>ESPACENET: Evolvable Networks of Intelligent And Secure Integrated And Distributed Reconfigurable System-On-Chip Sensor Nodes For Aerospace Based Monitoring And Diagnostics</p> <p>ReSIP – Reconfigurable System-on-Chip based Networks of Integrated and distributed Sensor Platform Nodes for Environmental Diagnostic and Sensing</p> <p>SOCCAD: Automatic Generation of New Hybrid SoC Architectures for Low Power High Performance Applications</p> <p>Primitive Computation – A Paradigm for ULTRA Low Power High Performance Reconfigurable SoC</p>
Funding	<p>ESPACENET - EPSRC (£503,208)</p> <p>ReSIP – EPSRC (£235,683)</p> <p>SOCCAD - EPSRC (£260,512)</p> <p>Primitive Computation –EPSRC (£496,606)</p>
Project start/end dates	<p>ESPACENET (2005-08)</p> <p>ReSIP (2005-08)</p> <p>SOCCAD (2005-08)</p> <p>Primitive Computation (2004-07)</p>

Partner organisations	<p>ESPACE NET – University of Kent, University of Surrey, Institute for System Level Integration (ISLI), Surrey Satellite Technology Ltd (SSTL), NASA Jet Propulsion Laboratory (USA), Epson Scotland Design Centre, Spiral Gateway Ltd.</p> <p>ReSIP - University of Kent, Institute for System Level Integration (ISLI), EPSON Scotland Design Centre, Spiral Gateway Ltd., ClearSpeed Technology Ltd.</p> <p>SOCCAD - Institute for System Level Integration (ISLI), EPSON Scotland Design Centre, and Spiral Gateway Ltd.</p> <p>Primitive Computation - Institute for System Level Integration (ISLI), EPSON Scotland Design Centre, Wolfson Microelectronics</p>
Staff involved	<p>ESPACE NET – 1 PI, 4 Co-Is, 2 RAs, 1 PhD Studentship</p> <p>ReSIP - 1 PI, 2 Co-Is, 1 RA, 1 PhD Studentship</p> <p>SOCCAD - 1 PI, 2 Co-Is, 1 RA, 1 PhD Studentship</p> <p>Primitive Computation - 1 PI, 2 Co-Is, 3 RAs, 1 PhD Studentship</p>
Outputs	<p>ESPACE NET – 13 conference papers</p> <p>ReSIP – 4 conference papers</p> <p>SOCCAD – 9 conference papers</p> <p>Primitive Computation – 1 journal, 16 conference papers, 2 patent application</p> <p>EngD projects – 1 journal, 3 conference papers</p>
Role of ISLI in achievement of funding	<p>ESPACE NET – Medium</p> <p>ReSIP - high</p> <p>SOCCAD - High</p> <p>Primitive Computation – High</p>
Likelihood of project going ahead in absence of ISLI?	<p>ESPACE NET – High</p> <p>ReSIP - low</p> <p>SOCCAD - Low</p> <p>Primitive Computation - Low</p>
Sustainability of research in absence of ISLI funding	<p>The existence of ISLI as a consortium member has significantly contributed to the award and success of the following projects:</p> <p>ReSIP, SOCCAD, Primitive computation</p>

Table 3.9 University of Glasgow Leveraged Research Funding

Research Activity	<p>EngD Programmes with:</p> <p>Aliathon (Dunfermline) 2003-2007. Novel FPGA designs for high-speed communication algorithms.</p> <p>@UKplc (Reading) 2006-2010. Application of machine learning techniques to intrusion exploits associated with hosting environments.</p> <p>Xilinx (Edinburgh) 2005-2009. Novel tools and techniques for debugging high abstraction-level FPGA designs and on-chip monitoring of FPGAs</p> <p>CodePlay (Edinburgh) 2007-2011. Novel compilers for deploying parallelised C++ onto FPGAs.</p> <p>SLI Ltd (Livingston) 2004-2008. Novel architecture for supporting multiple wireless protocols on a single ASIC.</p> <p>SLI Ltd (Livingston) 2003-2007. Novel architecture for a reconfigurable Finite State Machine controller.</p> <p>Funded Research Projects:</p> <p>Design, Implementation and Adaptation of Sensor networks (DIAS): A multi-institution project funded through the EPSRC's WINES I call, to investigate engineering support for environmental sensor network design, deployment, and operation.</p>
Funding	<p>EngD - EPSRC and approx £10k per annum from each company</p> <p>DIAS - EPSRC - ~£250k for Glasgow and ~£250k for Strathclyde</p>
Project start/end dates	DIAS - 1 October 2005/30 September 2008
Partner organisations	DIAS - University of Glasgow, Strathclyde University, University of St Andrews, University of Manchester, Lancaster University
Staff involved	<p>EngD - 2 academic staff</p> <p>DIAS - 3 academic staff</p>
Outputs	<p>EngD - 1 conference Papers (research embargoed), 4 conference Papers and 1 Engineer trained and retained in Scotland</p> <p>DIAS - 3 conference papers (many more in progress), 3 research assistants trained and retained in Scotland and 2 PhD students</p>
Role of ISLI in achievement of funding	<p>EngD - High</p> <p>DIAS - Medium</p>
Likelihood of project going ahead in absence of ISLI?	<p>EngD - Low</p> <p>DIAS - Medium</p>
Sustainability of research in absence of ISLI funding	<p>EngD - Not sustainable without EngD support</p> <p>DIAS - Sustainable without ISLI – although facilitation of new collaborative projects will suffer without ISLI involvement.</p>

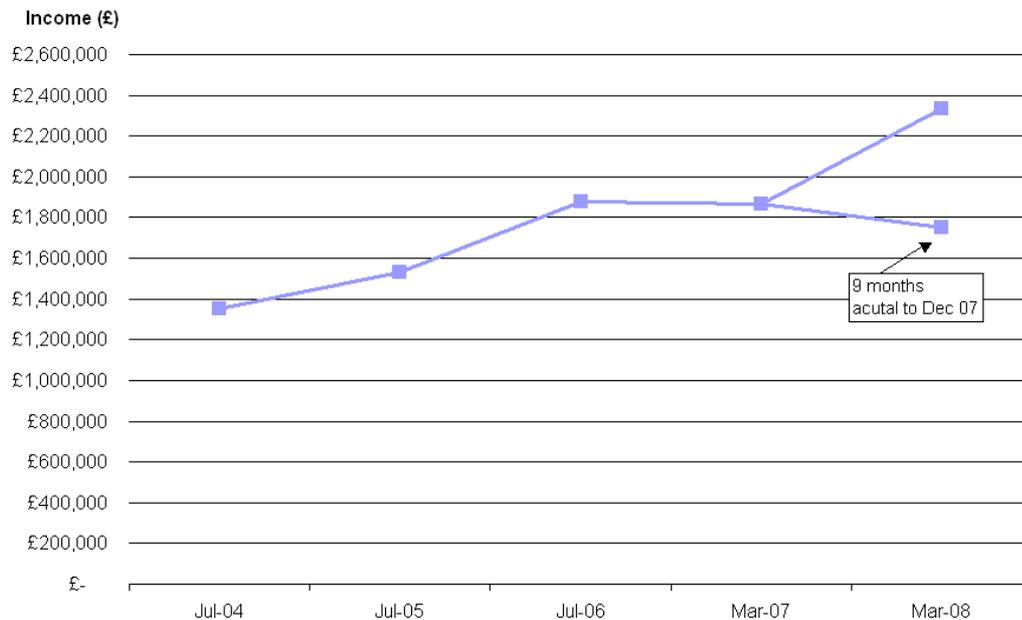
3.4 Financial Information

This section contains an overview and analysis of the key financial information relating to ISLI. Trends in income and expenditure are reviewed including the contribution of different income streams. The analysis covers the period from July 2004 to December 2007.

ISLI Ltd changed its financial year-end from July 31st to March 31st in 2007. For comparison purposes, figures to March 2007 have been grossed up to 12 months. For the latest financial year, figures are presented to December 2007 (9 months) and then extrapolated to estimate the 12-month figure to March 2008. Due to uncertainties in income for the last quarter, this figure cannot be estimated and so had been calculated on a pro rate basis so care should be taken in drawing any conclusions on the final year figure until the year end figure has been confirmed.

Figure 3.9 shows that ISLI's total income has grown considerably in the early part of the period before reaching a plateau in 2006 and 2007. The year to March 2008 is likely to see an increase on last financial year continuing an upward trend for the whole period.

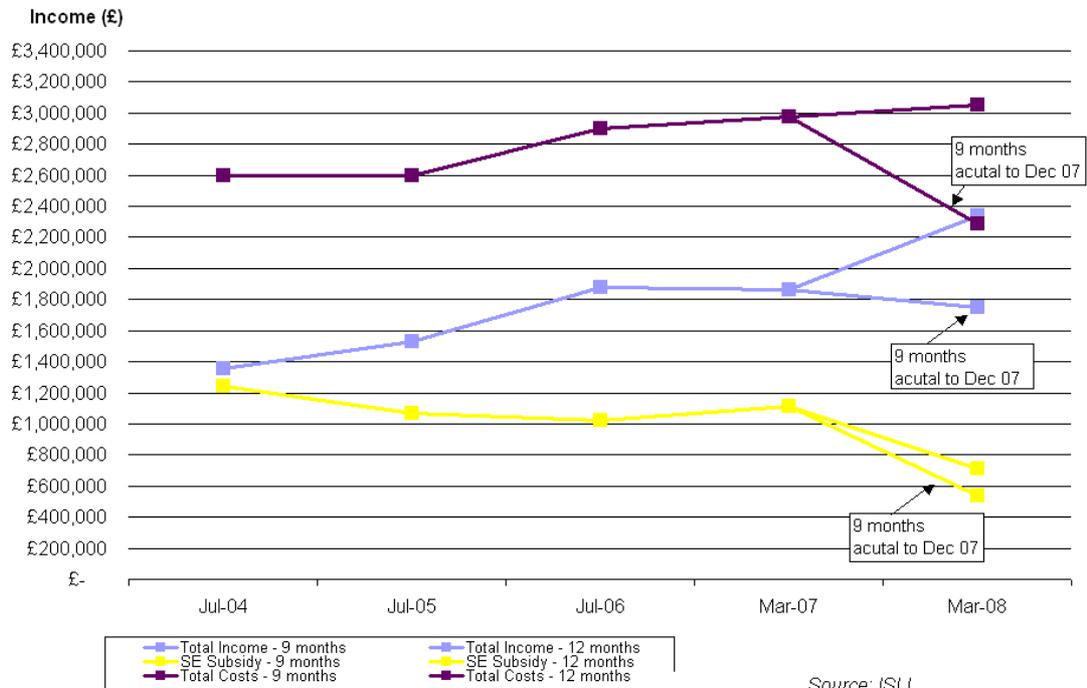
Figure 3.9 ISLI Total Income



Source: ISLI

Figure 3.10 considers total income, total costs and the level of SE subsidy paid to ISLI on an annual basis. It can be seen that as income has risen, so has the level of cost, however there has been some convergence. The SE subsidy required has remained relatively stable apart from a fall in the first year. The final draw down to March 2008 has not yet been confirmed.

Figure 3.10 Total Income, Total Costs and SE Subsidy



Source: ISLI

When total income is broken down into different streams (Figure 3.11) it can be seen that the rising trend is seen in the EngD program in particular, while the MSc program has only risen marginally. The reasons for this situation are discussed elsewhere. The level of CPD has grown significantly while Design Project income has fallen to March 2007, but is set to have recovered in the 2007/08 financial year. MEMS income, which first appeared in 2006, is making a significant contribution with the drop in March 2007 most likely attributable to timing of income.

Given that the latest figures are for only 9 months, the income streams highlight that the financial year ended March 2008 is likely to exceed the previous year continuing the upward trend. The individual income streams have not been extrapolate to 12 months to avoid inaccuracy. ISLI splits costs into direct costs attributable to income streams and overheads.

- **Direct Costs** – relate mainly to direct costs in delivering courses that are easy to allocate. ISLI subtracts direct costs from income to derive a gross profit figure for each income stream.
- **Overheads** – relate to ISLI staff, premises and other general running costs. They are not apportioned to income streams, though they were previously. ISLI has acknowledged that the subsidy required for its activities means that there is little point in trying to apportion overheads. Rather ISLI is attempting to grow income faster than its cost base.

Figure 3.12 shows the breakdown of overheads for ISLI for the 8 months to March 2007. It can be seen that staff form 70% of total costs followed by facilities at 19%. Staff have accounted for 65-72% across the period of review. Marketing and depreciation account for 3% of costs each. No other costs stand out.

Figure 3.11 Breakdown of ISLI Income by Activity Streams

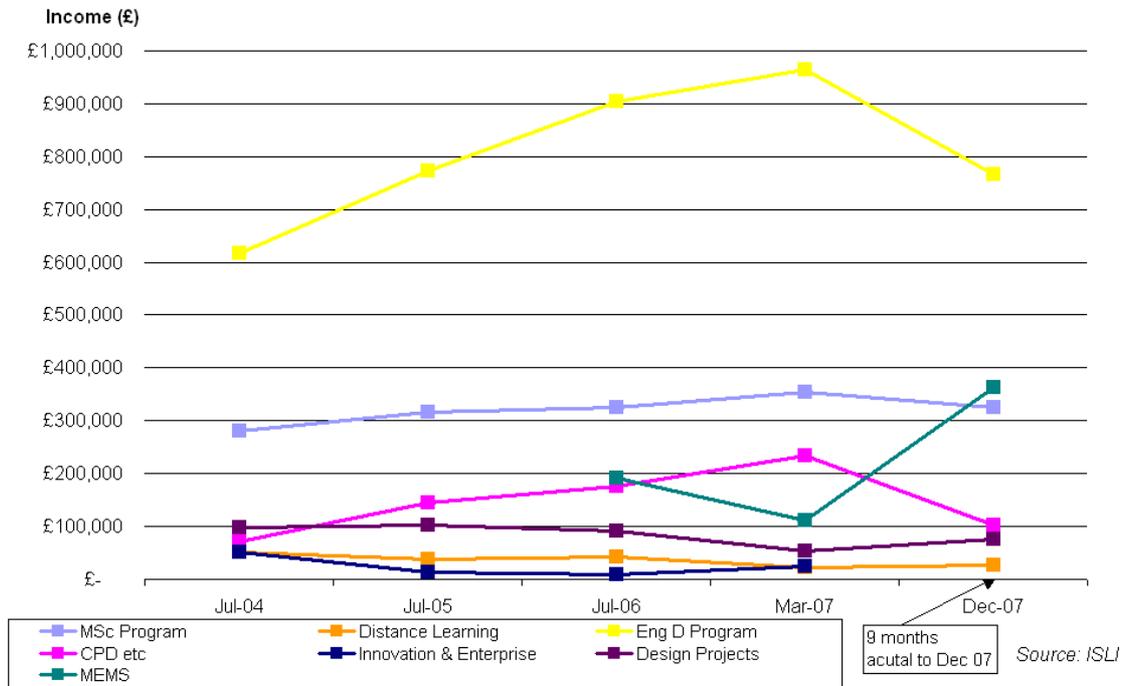
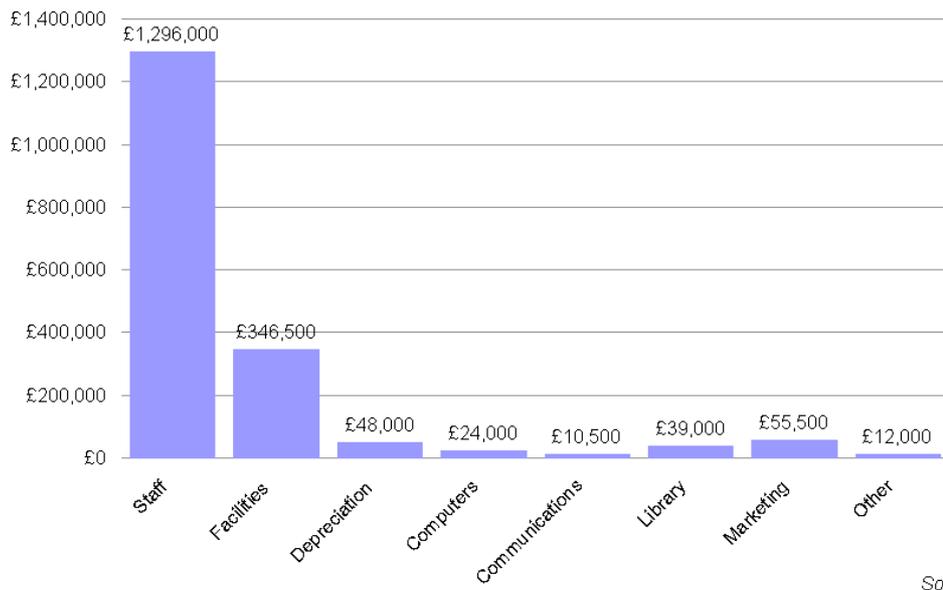


Figure 3.12 Breakdown of ISLI overheads to March 2007





ISLI's high staff costs, in common with most organisations, highlight the need to be efficient and effective in driving income through staff in order to minimise the need for SE subsidy. ISLI requires experienced staff to deliver its remit so it would be a false economy to hire cheaper engineers for example. There is some evidence of income now being driven up through MEMS and the Design Team, however, levels of leverage (measured as all staff costs versus consultancy income) are very low in comparison to commercial consultancies.

There is also evidence of increased efficiencies such as the proposal to use a University admissions system to reduce ISLI administration staff costs.

Facilities are a major cost at 19% and there has been ongoing debate for a number of years about the value for money of the current premises, particularly in light of the remote location. ISLI is approaching a lease break so will have an opportunity to consider alternatives. The benefit of being located independently from any of the universities must be set against the ongoing cost to the public purse of an independent location. This point is discussed later.

3.5 Summary of Activity Analysis

The progress of ISLI in each area of activity against the objectives set out in the ISLI Business Plan and the funding agreement with SE is summarised below. ISLI has been successful in meeting, or exceeding, its performance targets in a number of areas including the level of CPD activity and the amount of research funding leveraged. The Design Team performance is not clear as the activity is reported in a different way to the targets.

ISLI has very clear and well-managed financial reporting systems. The clear presentation of financial information makes transparent analysis of ISLI's finances possible.

ISLI has seen a period of income growth, this growth being achieved despite challenging conditions surrounding student numbers. ISLI has found other sources of income such as MEMS and CPD. Design projects and distance learning have not delivered increases in income and the design team, in particular, needs to provide more justification for its role, given the fall in income in 2007. It may be that design income rebounds in the latest financial year.

During the period, the level of annual SE subsidy required has dropped slightly but ISLI has acknowledged that ongoing subsidy is required and justified given the market failures being addressed. The drop in subsidy has been achieved through control of costs as income has been driven up. There is good evidence that income will continue to be driven up while efficiencies are sought in staff and premises costs. This is likely to mean that should ISLI continue to be funded from public sources, the funding requirement will drop.

MSc Objectives: Output of at least 40 MSc graduates per annum, at least 10 of which to be from Scotland.

MSc Progress: Target numbers not met and target for proportion of domestic students just short.

Target 1: x

Target 2: ✓

EngD Objectives: To successfully negotiate seven new EngD contracts each year of which at least 50 per cent of contracts will be with SMEs including micro start ups.

EngD Progress: Both targets exceeded.

Target 1: ✓

Target 2: ✓

CPD Objectives: To achieve a minimum of 400 person days of training per annum presented to local engineers, of whom at least 65% will be from local SMEs.

CPD Progress: Target for number of person days of training exceeded, but target focus on SMEs not met.

Target 1: ✓

Target 2: x

Design Objectives: To secure, per year, 3 to 5 industrial contracts, support at least 1 joint research / technology transfer project with universities, create 1 new start-up company from the ISLI Design Competition and assist 6-10 companies.

Design Progress: Difficult to assess progress as results reported in different manner, but appear to have met target for joint projects with universities and the number of companies supported.

Target 1: ?

Target 2: ✓

Target 3: ?

Target 4: ✓

Research Objectives: To publish research outputs in appropriate professional and trade journals, target is ~20 papers per year by ISLI linked researchers, to leverage over £5m of research funding and to proactively support ISLI financed academics in their efforts to increase their research capability by the attraction of high quality researchers.

Research Progress: All targets met, with the amount of research funding leveraged ahead of target.

Target 1: ✓

Target 2: ✓

Target 3: ✓

4. Operational Review

4.1 Introduction

This section of the report presents the results of the analysis of the consultation programme with ISLI staff and Board members, representatives from the partner universities, Scottish Enterprise and industry. The section starts with a review of the key issues that have emerged from the consultations, before considering a number of elements of ISLI including staffing and the location of the Institute. This analysis provides evidence to directly feed into the conclusions and recommendations.

4.2 Key Issues for ISLI

A number of themes emerged from the consultation programme with ISLI staff and stakeholders, including the partner universities, SE and industry. Some of the common themes are identified below along with an assessment of the implications for ISLI:

- **Recruitment of Students** – Firstly, there is a general issue in terms of the attractiveness of the subject area. ISLI is affected by the general trend in students not entering science and engineering disciplines. There has been a fall in MSc numbers in these areas in general. Secondly, there are some issues with recruiting students in terms of the effort that has been put into marketing the MSc to potential students. ISLI has brought in sales and marketing expertise to the core team to address this issue. There is recognition from ISLI that the organisation needs to up its presence in key markets, and sales and marketing effort is being targeted at India to raise 2008 numbers. ISLI should ensure that a structured plan is in place to give strategic direction to this effort moving forward linking in wherever possible to existing networks within the partner universities. There is also greater potential to use the ISLI alumni to promote the MSc more informally.

One limitation of the programme is that EngD funding is only available to UK residents and nationals – therefore overseas students cannot hold the grant. The partner universities have reported that in the current education climate it is very difficult to attract good PhD and EngD researchers from this UK-only pool. Therefore given that companies are investing in the research and not necessarily the individual, a significant step forward in ensuring that students are available to fill the places being offered and supported by industry would be to open the scheme up to support places for any well qualified student who applies, regardless of nationality. The universities feel that ISLI and future funders should consider pressure on the appropriate authorities to address this, lest the research in Scotland dry up because of lack of students being available.

- **Health of the Industry** – There is a general feeling that Scotland has a very healthy SME sector in electronics. Furthermore, initiatives like EDSS can help other companies outwith the sector to understand how electronics can help them develop – with the recognition that all key industries have electronics underpinning them. Feedback indicates that Scotland has a particular strength in analog design and there have been a number of spin-out companies in this area. This has implications for skills demand and this is discussed below.
 - **Relevance of Subject Coverage** – This applies to both the MSc and the CPD activity. In the case of the MSc, the development of a themed MSc is a practical step to address the
-

relevance of the subject taught. In order to keep pace with changing industry needs, and provide a programme that is attractive to a larger group of students, the MSc will evolve to offer a core range of subjects along with four different subject-specific themes in signal processing, hardware design, business and management, and embedded software design. This change will be introduced for the 2009/10 academic session. The CPD activity allows a quick response to industry needs as it does not have the same latency issues as the MSc in having to go through the university quality assurance procedures. The CPD portfolio of teaching material is being actively developed by ISLI.

More generally, ISLI is participating in the Analog Skills Initiative (ASI). The ASI has been launched in Scotland and is being delivered by ISLI and the University of Edinburgh. The ASI is an SE programme to promote and support analogue and mixed-signal design in Scotland. The initiative, which was launched in August 2005, is backed by SE and has been developed in consultation with industry. Over the next five years, the initiative will put in place a number of activities including raising the awareness of analog design as a career opportunity for undergraduates; developing course materials to help new graduates cope with the transition between leaving University and starting work; and creating a focus for professional development activities for analog design engineers. An industry advisory group has been put in place to keep the initiative relevant to industry needs. This is picked up in the industry consultations, and it was noted that currently there is an emerging trend of analogue design in Scotland, but with specialised engineers being a scarce resource, several companies believe ISLI has the opportunity to adapt to the current skill gap and boost analogue expertise in Scotland.

The feedback from industry on ISLI's area of focus is diverse. The initial focus of ISLI is considered by some of the consultees as no longer relevant to the market. Some question the generality of the institute and the limited focus, while others believe the Institute has moved with time and adapted to market and technological changes, while noting that perhaps it could be quicker to react.

It is recognised by the industry that Scotland needs to develop the engineering sector, and that ISLI could play an important role. There are few home-grown skilled engineers and the skilled labour is lost to companies elsewhere in the world. ISLI can assist in staff retention across the industry by offering courses and EngD programmes to current employees of companies within the industry. Furthermore, if ISLI can attract both domestic and foreign students to Scotland, develop entrepreneurial skills amongst engineers and support industry development and growth in Scotland, it is felt that it would make a real impact on the national engineering sector.

- **Image and Branding** – There is recognition within ISLI that the Institute is seen as singularly Scottish and there have been deliberate moves to counter this and align marketing activity to promote a consistent message. Given the nature of the organisation ISLI has found it difficult to pitch itself to the market, as each element's value proposition is different and intrinsically linked to the other. At the more micro level, the EDSS initiative has allowed the Design Team to get out into the marketplace talking to companies to promote the services and capabilities of ISLI. There is evidence of this leading to further engagement with companies.

The view from industry was that the visibility of ISLI within Scotland is generally good, but there is, on the other hand, limited knowledge beyond the local market. In order for ISLI to boost its presence, many companies claim that there needs to be increased funding,

especially if it is to become a UK and global player. According to some the critical mass needed is absent, there is limited equipment, the expertise is too thinly spread and ISLI lacks in focus.

- **Monitoring and Evaluation** – ISLI has a monitoring system in place for measuring its activities and outputs and there are good financial monitoring processes in place. In the case of the MSc and EngD, there is some monitoring of alumni but, as identified above, it is worth developing this more formally to help the marketing and image/branding of ISLI through word of mouth. The EDSS monitoring system is a good model and it would be valuable to extend this to all Design Team activity, ideally to allow monitoring across engagements to track multiple assistances to companies. This could help to demonstrate more clearly the reach of the Design Team. Whilst we are not suggesting a timesheet system, ISLI could benefit from a better way of capturing the value added by the team across all areas of ISLI activity and with all the stakeholders – industry, academia and students. The current format of reporting to SE could be better aligned to the goals and targets for each area of activity to provide better clarity for all parties in ISLI's performance and to allow ISLI to more accurately demonstrate the contribution it is making in each area.

4.3 Location

There are mixed views on location both across the different groups consulted and within the groups. However, there is a general consensus that there would be a danger in losing the collaborative, independent nature of ISLI if it were to be located on one of the partner university campuses. Within this there is recognition that everyone has moved on with the advent of research pooling so the concern is more about a practical issue of the likelihood of the Institute becoming absorbed into the location rather than any more political concerns about favouring any one location. ISLI has demonstrated a commitment to the local economy of West Lothian by inviting the Chief Executive of West Lothian Council onto its Board. This potentially offers a way to open dialogue on the infrastructure issues faced by ISLI in its current location. There is a break point in the current lease on the Alba Campus in 2009, and this offers an opportunity to resolve the location issue.

Some companies call the location of ISLI into question, although not in the context of business services but more in the context of student welfare and the future direction of ISLI. There is a feeling that the Institute is in an isolated location and lacks in public transport infrastructure. In practical terms it is suggested that it would be an improvement if it were situated near a railway station or similar key transportation locations. Some companies argue that its location hinders the Institute from being world class, and becoming a greater attraction for students, lecturers and guest lecturers nationally and internationally.

4.4 Staffing

The previous DTZ evaluation in 2004 raised a number of questions around staffing, principally on the lack of cohesiveness of the senior management team. The new Director of ISLI came into post in 2005, and since then there have been a series of changes implemented to personnel and the communication of the senior management team. The senior management team has been filled by internal promotions, so the team has a sound knowledge of ISLI. There are ongoing management training requirements and these are being addressed.

The post of Deputy Chief Executive has been created and filled by an existing member of the team, but this position has been affected by long-term illness. Whilst the Director and Chairman have taken on some of the responsibilities of this role, it has been identified that there is a need to provide more formal cover for this post. We would fully endorse this, as the post is key to developing the strategic direction for ISLI moving forward.

There is a performance management system in place and staff appraisals used to be annual, but a six-monthly appraisal system has been introduced. There appears to be a disjoint between the overall strategic plan for ISLI and the individual objectives for staff. It is important that there is a shared understanding amongst staff of the vision for ISLI and what the organisation is trying to achieve, and that this understanding feeds into day-to-day objectives. This could be considered further to try to develop the performance management system to be in synch with corporate planning activity.

4.5 University Contribution

Commitment from the universities to ISLI remains strong and all four partners value the collaboration that is made possible through ISLI on teaching and research. It is also recognised the ISLI helps the universities get closer to industry and to bridge the gap between industry and academia. The research activity that has been undertaken related to ISLI was described in Section Three.

The partnership of four universities is an attraction to companies and it is viewed as a wide range of expertise to draw upon. There are wide-ranging choices of courses, which can be tailored to fit the company profiles and business areas. However, a few considered ISLI to offer limited flexibility in courses. One company stated the usefulness of a future website or database listing the modules choices available to allow companies further flexibility and better strategic fit.

In terms of marketing of ISLI, while it is recognised that the ISLI MSc is competing with some of the universities' own MSc programmes for students, there is potential for ISLI to be more aligned to the universities marketing networks. This could perhaps be through greater use of the overseas representation of the universities.

4.6 Business model

The stakeholders and members of ISLI did not propose any changes to the current business model. It is felt to be appropriate to deliver the activities of the organisation and no alternative models were suggested. There is general agreement amongst companies consulted that ISLI, compared to universities, operates closer to industry. ISLI has a more practical focus, is nearer to SMEs needs and works in line with companies' timescales as opposed to their own.

It is viewed generally that ISLI provides a good fit with industry in relation to Intellectual Property (IP). The IP ownership arrangements facilitate the research process and minimises difficult negotiations between partners. Some have however expressed that there is still some protection and unclear ownership of IP and negotiations can be difficult and require compromises. It is considered by some that the support could be much more effective if ISLI was able to omit clauses of IP ownership in their contracts.



In summary, there appears to be no need to alter the current ISLI business model as long as the operational model remains. However, should the focus of ISLI change in the future the business model will have to be re-examined.

5. Economic Impact Assessment

5.1 Introduction

This section details the process adopted for calculating the direct economic impact of the activities of ISLI. In order to calculate the direct impact of the organisation, a series of assumptions have been made for each area of activity. The direct impact of ISLI is expressed as attributable increases in net additional GVA.

5.2 Activity impact - qualitative

5.2.1 Commercial activity

Some companies, especially SMEs, are often faced with considerable risks and technical challenges when they seek to integrate or improve their products or processes. ISLI provide consultancy services and feasibility studies to assist companies in tackling those tasks effectively.

In the short-term these services may displace the recruitment of additional employees, as confirmed by some consultations, but in other cases the research may not be undertaken, or done during a longer time span using existing staff. However, in the long-term some of the consultancy services have led to prototype development and increased market knowledge. ISLI activity has helped some companies to establish and build the business in the long-term, and in one case company acquisition.

One company nevertheless questioned the EDSS activity, and it was suggested that it could potentially displace activity, which would have otherwise been undertaken by commercial companies themselves. Instead of adding to final outcomes, concern was expressed that the cost is simply transferred from companies, whilst no additionality is evident.

On the other hand most consultees recognise that there are no other known services, similar to those of ISLI in terms of technical expertise and funding, available to them. In the absence of ISLI, companies would be turning to the market for advice, and those consultancy services would be far costlier.

In addition to the financial benefits from ISLI services, companies find the technical combination within the scale of the team valuable. There is considerable crossover between disciplines within the consultancy team, and companies value the single interface. Furthermore, continuity and familiarity are important features of ISLI services along with their confidentiality.

It is difficult to directly attribute quantifiable impacts to ISLI support services, however, companies are largely positive towards the outcomes. Benefits that arise following ISLI engagement include product development, broadening product and market knowledge, increased sales and revenue, recruitment opportunities, market visibility and boosted presence with clients.

5.2.2 Teaching activity

Companies that have engaged in EngD activity are generally pleased with the programme and would consider taking, or have taken, on EngD graduates. Many companies see few alternative or comparable programmes to the programme offered by ISLI, which have considerable industry benefits compared to standard PhD programmes. With the EngD companies find they can dictate projects, instead of the more 'hands-off' approach of PhDs.

Companies tend to give students a portfolio of projects, and this approach allows greater flexibility to respond to the dynamics of the real business environment, enabling the four-year partnership to focus on relevant areas. Unlike the conventional PhD there is less risk that the output at the end of the programme is less appropriate to the needs of the company. While ISLI offers a lucrative industry-focused alternative to a PhD programme, the MSc competes more directly with universities and is often seen as a less lucrative course compared to university MEng integrated programmes.

Some of the companies consulted maintain that they would have not undertaken the specific research in the absence of the sponsored REs. Others state that research would have been undertaken but during a longer time, leading to greater costs both in terms of time and staff costs.

The immediate benefits of taking on an EngD student are both financial and administrative. It is more cost efficient to engage a student on projects and this provides a strong financial incentive for most companies consulted. The administrative benefit of EngD students is their capacity to focus on product development and research without being sidetracked by daily business demands or queries. Beyond financial inputs from the companies there are also time inputs in terms of industrial supervision and work revision, and one company estimated the total time for a four year EngD programme at three months full-time work.

Furthermore, many companies view the EngD programme as an efficient and cost-effective recruitment tool, and this is a major reason of taking on EngD students. A few companies have employed MSc students in light of their MSc projects carried out as part of their programme. Others tend to turn to universities for graduate engineers, as these often run integrated MEng programmes, and some companies do not see the MSc as a key strength of ISLI. With EngD students being placed within companies for some time, companies have the opportunity to evaluate their learning and skills. One company considered the time inputs greater than expected, and found that considerable guidance was needed to keep the focus of projects right, as a natural conflict between academic and industry requirements also are evident in the ISLI EngD programme.

Qualitative impacts of EngD programmes tend to be product development, but also the identification of 'dead-ends' which in turn saves time and cost for individual companies. When products have been developed, which is a common outcome from EngD programmes, companies have been able to sell prototypes and begin producing on a greater scale. Some companies have found that their market presence has grown as a result of new product development. The benefits are greater in the long-run with developed prototypes, extended production and increased revenue, and can be core to the future. Some of these outcomes, according to companies, would not have happened without the EngD programme offered by ISLI.

The feedback from MSc student engagement is overall positive, and companies are impressed by students' knowledge and good work. The projects are always small and self-contained. One company was of the opinion that there was much emphasis on the project report, which often meant that the process and communication with the company was overlooked in the marking.

5.3 Activity impact - quantitative

Through an analysis of the outputs and outcomes of the various activities of ISLI it is possible to calculate the impact on the economy from April 2005 to the end of 2007. The impact is summarised in Table 5.1 and the detailed impact assessment is shown in Table 5.2 along with details of the assumptions made at each stage. The net impact associated with the activities in Table 5.1 is around £16m.

Table 5.1 Summary of Total Quantifiable Net Impacts

GVA associated with	Direct, Indirect and Induced GVA
Off-campus expenditure of non-Scottish MSc & EngD students (A.1 + B.1)	£372k
Savings to companies employing ISLI graduates (A.2)	£1.4m
Savings to companies from ISLI CPD (A.3)	£220k
Savings to companies sponsoring an EngD RE (B.2)	£834k
Revenue associated with EngD project activity (B.3)	£2.9m
Revenue associated with design team activity (B.4)	£3.2m
Leveraged research funding (C.1)	£1.8m
Turnover of ISLI (D.1)	£5.5m
Equivalent to a total net additional GVA of:	£16.2m



Table 5.2 – ISLI Economic Impact Assessment 2005/06 to 2007/08

Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
A.1 Postgraduate and professional education and training	<ul style="list-style-type: none"> 73 non-Scottish MSc graduates 	<ul style="list-style-type: none"> 73 Non-Scottish students attracted to Scotland 	<ul style="list-style-type: none"> £416,100 off-campus expenditure by non-Scottish MSc students (Off-campus spend per student source: Universities UK, University of Strathclyde, “The Economic Impact of UK Higher Education Institutions” May 2006) equivalent to a GVA of £212,211 (GVA to output ratio source: http://www.scotland.gov.uk/Resource/Doc/982/0051950.xls) 	<ul style="list-style-type: none"> £649,492 injected into Scottish economy from off-campus expenditure by non-Scottish MSc students equivalent to a GVA of £331,241 (Type II Multipliers Source: 2004 Input-Output Tables and Multipliers for Scotland http://www.scotland.gov.uk/Resource/Doc/133434/0054634.xls) 	<ul style="list-style-type: none"> GVA is calculated from expenditure using the Scottish average ratio of GVA to output (51%) The multiplier used is average of the Type II Output Multipliers for the following sectors - Bread, Biscuits, etc; Miscellaneous Foods; Spirits and Wines, etc; Tobacco; Wearing Apparel; Footwear; Soap and Toilet Preparations; Electrical Equipment; Hotels, Catering, Pubs, etc; Railways; Other Land Transport; Air Transport; Telecommunications; Banking; and Recreational Services (1.561)
A.2 Postgraduate and professional education and training	<ul style="list-style-type: none"> 93 MSc graduates 20 Scottish MSc graduates 	<ul style="list-style-type: none"> 45 MSc graduates remaining in Scotland 	<ul style="list-style-type: none"> £1,800,000 productivity savings made by Scottish companies recruiting ISLI graduates (rather than other graduates) because of their higher skill set equivalent to 	<ul style="list-style-type: none"> £2,725,845 injected into the Scottish economy from productivity savings made by Scottish companies recruiting ISLI graduates (rather than other 	<ul style="list-style-type: none"> Each graduate saves recruiting company £40,000 in the first year after recruitment (and £0 thereafter) Source: ISLI Business Plan, Nov 2004



Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
			<p>GVA of £918,000 (GVA to output ratio source: DTZ Piedad Consulting, "Micro and Opto Electronics Baseline Study" 2005)</p>	<p>graduates) because of their higher skill set equivalent to GVA of £1,390,181</p>	<ul style="list-style-type: none"> • GVA is calculated from savings made by companies using the electronic design sector ratio of GVA to output (51%) • Type II Multiplier used is the output multiplier associated with the Electronic Components sector (1.514)
<p>A.3 - Postgraduate and professional education and training</p>	<ul style="list-style-type: none"> • 567 individuals in Scotland receiving CPD training 		<ul style="list-style-type: none"> • £285,000 efficiency savings to Scottish companies from ISLI CPD 	<ul style="list-style-type: none"> • £431,592 injected into the Scottish economy from efficiency savings to Scottish companies from ISLI CPD (Type II Multipliers Source: 2004 Input-Output Tables and Multipliers for Scotland http://www.scotland.gov.uk/Resource/Doc/133434/0054634.xls), equivalent to GVA of £220,112 (GVA to output ratio source: DTZ Piedad Consulting, "Micro and Opto Electronics Baseline Study" 2005) 	<ul style="list-style-type: none"> • Type II Multiplier used is the output multiplier associated with the Electronic Components sector (1.514) • GVA is calculated from savings made by companies using the electronic design sector ratio of GVA to output (51%)



Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
B.1 - Industry-based R&D and support services	<ul style="list-style-type: none"> 13 non-Scottish students enrolled on the EngD 		<ul style="list-style-type: none"> £51,300 off-campus expenditure by non-Scottish MSc students (Off-campus spend per student source: Universities UK, University of Strathclyde, "The Economic Impact of UK Higher Education Institutions" May 2006) equivalent to a GVA of £26,163 (GVA to output ratio source: http://www.scotland.gov.uk/Resource/Doc/982/0051950.xls) 	<ul style="list-style-type: none"> £80,074 injected into the Scottish economy from off-campus expenditure by non-Scottish students equivalent to a GVA of £40,838 (Type II Multipliers Source: 2004 Input-Output Tables and Multipliers for Scotland http://www.scotland.gov.uk/Resource/Doc/133434/0054634.xls) 	<ul style="list-style-type: none"> Non-Scottish students are students in Scotland for year 1 GVA is calculated from expenditure using the Scottish average ratio of GVA to output (51%) The multiplier used is average of the Type II Output Multipliers for the following sectors - Bread, Biscuits, etc; Miscellaneous Foods; Spirits and Wines, etc; Tobacco; Wearing Apparel; Footwear; Soap and Toilet Preparations; Electrical Equipment; Hotels, Catering, Pubs, etc; Railways; Other Land Transport; Air Transport; Telecommunications; Banking; and Recreational Services (1.561)



Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
B.2 - Industry-based R&D and support services	<ul style="list-style-type: none"> 72 Research Engineers (REs) placed in industry 	<ul style="list-style-type: none"> 54 REs placed in Scottish companies 	<ul style="list-style-type: none"> £1,080,000 efficiency savings made by Scottish companies sponsoring EngD REs for 3 years because of their higher skill set equivalent to GVA of £530,800 (GVA to output ratio source: DTZ Pieda Consulting, "Micro and Opto Electronics Baseline Study" 2005) 	<ul style="list-style-type: none"> £1,635,507 injected into the Scottish economy from efficiency savings made by Scottish companies recruiting ISLI graduates (rather than other graduates) because of their higher skill set equivalent to GVA of £834,109 	<ul style="list-style-type: none"> Each RE saves sponsoring company £20,000 per year (as cost to company is £10k p.a. and assumed employee costs of a RE of £30k) GVA is calculated from savings made by companies using the electronic design sector ratio of GVA to output (51%) Type II Multiplier used is the output multiplier associated with the Electronic Components sector (1.514)
B.3 - Industry-based R&D and support services	<ul style="list-style-type: none"> 22 new projects started in industry from EngD REs 	<ul style="list-style-type: none"> 7 new products or processes launched 	<ul style="list-style-type: none"> 7 new products or processes worth £4,950,000 in sales between 2005/06 and 2009/10 (Source: SE estimates based on ISLI business plan) supporting an average of 10 direct FTE jobs per annum (gross) or creating £2,525,000 GVA (gross) 	<ul style="list-style-type: none"> £2,867,000 GVA (net of additionality) associated with new products or processes or supporting an average of 15 additional direct, indirect and induces FTE jobs per annum 	<ul style="list-style-type: none"> GVA is calculated from sales using the electronic design sector ratio of GVA to output (51%) 30% of projects result in new products or processes Products generate no income in year 1, £100k in year 2, £250k in year 3, and £500k thereafter for the next 3years Additionality is 75%



Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
B.4 - Industry-based R&D and support services	<ul style="list-style-type: none"> Design consultancy services provided to companies 	<ul style="list-style-type: none"> 11 projects leading to 7 new products or processes 	<ul style="list-style-type: none"> Enhancement of the Scottish electronics research base 7 new products or processes worth £5,450,000 in sales revenue between 2005/06 and 2009/10 generated by projects supported by design consultancy between 2005/06 and 2007/08 (Source: SE estimates based on ISLI business plan) supporting an average of 11 direct FTE jobs per annum or creating £2,780,000 in GVA (gross) 	<ul style="list-style-type: none"> £3,157,000 GVA (net of additionality) associated with new products or processes generated by projects supported by design consultancy between 2005/06 and 2008/09 or supporting an average of 17 additional direct, indirect and induced FTE jobs per annum 	<ul style="list-style-type: none"> GVA is calculated from sales using the electronic design sector ratio of GVA to output (51%) Projects supported by design consultancy are assumed to have a 60% success rate from project to successful product launch and that products are launched in the year following the project. It is also assumed that the product generates no revenue in year 1, £100k in year 2, £250 K in year 3, and £500 K thereafter for next 3 years. Additionality is 75%
C.1 - Pre-competitive Research	<ul style="list-style-type: none"> Research posts funded in partner universities 	<ul style="list-style-type: none"> Leverage of £3.7m research funding 	<ul style="list-style-type: none"> Equivalent to £1,074,609 in GVA 	<ul style="list-style-type: none"> A total injection of £1,812,627 in GVA 	<ul style="list-style-type: none"> GVA as a proportion of output calculated for the Education sector (29%) Type II Multiplier used is the output multiplier associated with the Education sector (1.687) Additionality is 100%



Objective	Outputs	Outcome	Direct Impact (gross)	Direct, indirect and induced impacts net of additionality and displacement*	Assumptions
D.1 - Other			<ul style="list-style-type: none">ISLI Turnover of £8,164,296 (Source: ISLI Board Papers) resulting in and an equivalent GVA of £3,265,719	<ul style="list-style-type: none">Additional direct, indirect and induced GVA of £5,508,541	<ul style="list-style-type: none">GVA as a proportion of output is the average of that for the education sector and the design sector (40%)Type II Multiplier used is the output multiplier associated with the Education sector (1.687) – no output or employment multipliers are available for the design sectorAdditionality is 100%

* displacement assumed to be 0% throughout

6. Conclusions and Recommendations

6.1 Introduction

This section concludes the interim evaluation of ISLI by reviewing the performance of the organisation from April 2005 to date. The key findings of the evaluation are presented and the economic impact of ISLI is assessed. The section concludes with a series of options for the future of ISLI in terms of funding and the operational model and details further actions required by ISLI and SE.

6.2 Performance Against Objectives

During the course of the evaluation, feedback from the consultation programme has revealed that the general feeling is that ISLI is still a valuable asset. The key benefits and strengths of ISLI identified include:

- Its success in bringing universities closer to industry;
- The credibility of the four universities is attractive to industry and students;
- It can address industry needs through CPD and education;
- It allows industry, particularly SMEs/start-ups access to design expertise;
- The teaching activity produces highly skilled graduates/research engineers;
- Its ability to bring commercial design expertise into academic research bids; and
- It encourages academic interaction between the partner universities.

The specific objectives of ISLI for each of the areas of activity were set out in Section Three of the report. The performance of ISLI against each of these objectives is summarised below.

MSc Objectives: Output of at least 40 MSc graduates per annum, at least 10 of which to be from Scotland.

MSc Progress: Target numbers not met and proportion of domestic students just short.

EngD Objectives: To successfully negotiate seven new EngD contracts each year of which at least 50 per cent of contracts will be with SMEs including micro start ups.

EngD Progress: Both targets exceeded.

CPD Objectives: To achieve a minimum of 400 person days of training per annum presented to local engineers, of whom at least 65% will be from local SMEs.

CPD Progress: Target for number of person days exceeded, but focus on SMEs not met.

Design Objectives: To secure, per year, 3 to 5 industrial contracts, support at least 1 joint research / technology transfer project with universities, create 1 new start-up company from the ISLI Design Competition and assist 6-10 companies.

Design Progress: Difficult to assess progress, but appear to have met target for joint projects with universities and the number of companies supported.

Research Objectives: To publish research outputs in appropriate professional and trade journals, target is ~20 papers per year by ISLI linked researchers, to leverage over £5m of research funding and to proactively support ISLI financed academics in their efforts to increase their research capability by the attraction of high quality researchers.

Research Progress: All targets met, with the amount of research funding leveraged ahead of target.

6.2.1 Operational Changes

ISLI seems to be operating in a steady state and there are no major changes recommended to its operations. In terms of activity, there appears to be considerable scope to increase the level of Design Team activity across all areas, but in particular to generate more commercial income. This should be addressed as a priority moving forward.

Other minor changes that have been identified include more co-ordinated marketing and promotion of ISLI to raise the profile amongst potential students and industry and the issue of putting in place cover for the Deputy Chief Executive post.

6.2.2 Monitoring and Evaluation

The current format of reporting to SE could be better aligned to the goals and targets for each area of activity to provide better clarity for all parties in ISLI's performance and to allow ISLI to more accurately demonstrate the contribution it is making in each area.

6.3 Economic Impact

The economic impact of ISLI was presented in Section Five of the report. Feedback from industry on the teaching activity indicates that companies see the EngD programme offered by ISLI as unique, and as having considerable industry benefits compared to standard PhD programmes. The companies tend to give students a portfolio of projects, and this approach allows greater flexibility to respond to the dynamics of the real business environment. Therefore, unlike the conventional PhD there is less risk that the output at the end of the programme is no longer appropriate to the needs of the company.

The immediate benefits of taking on an EngD student are both financial and administrative. It is more cost efficient to engage a student on projects and this provides a strong financial incentive for most companies consulted. In addition, the qualitative impacts of EngD programmes tend to be product development, but also the identification of 'dead-ends' which in turn saves time and cost for individual companies.

The feedback on the commercial activity highlighted that there are no other known services, similar to those of ISLI in terms of technical expertise and funding, available to companies. In addition to the financial benefits from ISLI services, companies find the technical combination within the scale of the team and the single interface valuable. Benefits that arise following ISLI engagement include product development, broadening product and market knowledge, increased sales and revenue, recruitment opportunities, market visibility and boosted presence with clients.

The economic impact of ISLI from April 2005 to December 2007 is detailed in Table 6.1. The total impact from expenditure by non-Scottish students and savings to companies from REs, graduates and CPD equates to £2.8m. New products and processes from EngD projects are estimated to have generated £2.9m with £3.2m from design consultancy projects. There is a further £1.8m associated with the leveraged research funding. The total GVA associated with the activities of ISLI is £16.2m.

Table 6.1 Summary of ISLI Impact April 2005 to December 2007

GVA associated with	Direct, Indirect and Induced GVA
Off-campus expenditure of non-Scottish MSc & EngD students (A.1 + B.1)	£372k
Savings to companies employing ISLI graduates (A.2)	£1.4m
Savings to companies from ISLI CPD (A.3)	£220k
Savings to companies sponsoring an EngD RE (B.2)	£834k
Revenue associated with EngD project activity (B.3)	£2.9m
Revenue associated with design team activity (B.4)	£3.2m
Leveraged research funding (C.1)	£1.8m
Turnover of ISLI (D.1)	£5.5m
Equivalent to a total net additional GVA of:	£16.2m

According to the ISLI Board Reports, the SE subsidy to ISLI from August 2005 to December 2007 has amounted to just under £2.7m. Therefore, for every £1 of SE money invested, £6 of net additional GVA is gained.

6.4 Progress Since Previous Evaluation

DTZ's 2004 evaluation of ISLI³ identified a number of issues and made a series of recommendations. It is a requirement of this Interim Evaluation to revisit the previous report in order to make an assessment as to the performance of ISLI against the recommendations and the progress that has been made to address any outstanding issues. The following points summarise the main issues investigated:

- **Profile of ISLI** – The report highlighted that ISLI had failed to convince much of the Scottish industry that it has a key role in its future and awareness of ISLI was found to be patchy. It is therefore important to assess whether or not the organisation has managed to raise its profile over the last three years.

Assessment of progress: Ongoing - Awareness of ISLI appears to have been raised within the Scottish industry and there has been deliberate efforts to promote ISLI beyond Scotland, and this should be continued in the form of a unified approach to marketing and promotion.

- **Education and Training Programme** – The evaluation found that take up of activities offered outside of the MSc and EngD programmes was low and recommended that ISLI concentrate on the two postgraduate programmes in the future. It is necessary to review the programme that is now on offer and the take-up of each element to consider performance since 2004.

Assessment of progress: - Significant Progress - There has been a marked increase in the take up of CPD courses since the previous evaluation and this is now a strong area of activity for ISLI and acts as a vehicle to address industry training requirements faster than is possible through the traditional teaching elements of activity.

³ Evaluation of SE Funding to ISLI- Final Report, DTZ Pieda Consulting (now DTZ) for Scottish Enterprise Edinburgh and Lothian, November 2004

- **Cost Savings and Operational Efficiencies** – One of the key recommendations was that ISLI could reduce the level of deficit funding required from SE thus improving its value-for-money (VFM). Potential savings were identified in the areas of facilities, University payments, cost of premises and staffing. The extent to which these savings have been implemented and/or the rationale for non-implementation has been reviewed.

Assessment of progress: Good Progress – ISLI has achieved cost savings in staffing and premises since the previous evaluation and it is likely that this will continue in the future as costs are now actively managed.

- **Management Structure** – One of the conclusions of the evaluation was that there appeared to be a no cohesive senior management team and it was felt that the introduction of a deputy chief executive role would help bridge the gap between the Director and the rest of the ISLI staff, but given the funding situation at the time a restructuring of the senior management team was suggested as a more appropriate route. The effectiveness of the senior management structure has been scrutinised to assess whether the concerns of the previous evaluation are still valid.

Assessment of progress: Good Progress – There has been a significant restructuring of the senior management team and there are now good management processes in place to review performance. There are some ongoing training issues related to the management team that are being addressed and the post of Deputy Chief Executive that is currently vacant due to long-term illness will be filled moving forward on a temporary basis.

- **ISLI Business Model** – The business model where SLI Ltd is a legal entity responsible for the financial operation of ISLI was not felt to be the best model and a joint venture between the four universities was suggested as a possible alternative. The interim evaluation will have to reconsider the ISLI business model to assess whether or not it is fit for purpose moving forward.

Assessment of progress: Fit for Purpose – The business model of ISLI is felt by all of the partners to be the most appropriate model to deliver the current activities.

In summary, the 2004 evaluation found that ISLI was making a worthwhile contribution to the Scottish economy through its education and research programmes. However, it was felt that the organisation represented poor VFM and a series of cost savings were suggested. The economic impact of ISLI from April 2005 to December 2008 was presented above. There is strong evidence that ISLI has addressed the issues identified in the previous evaluation.

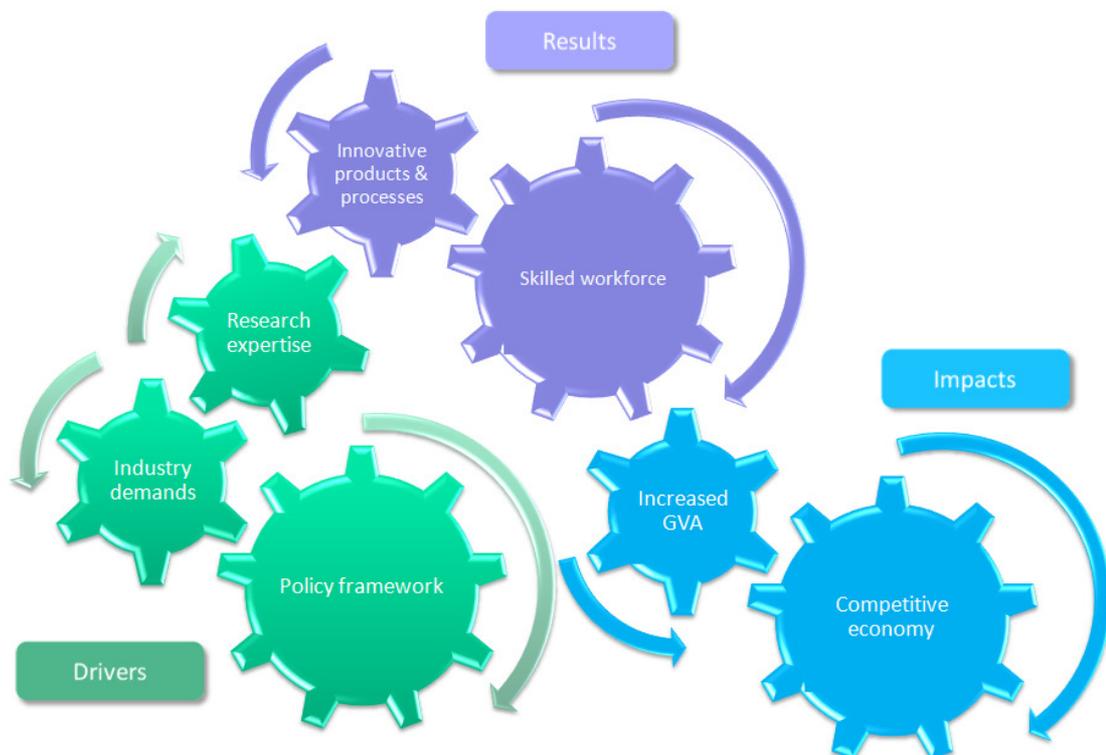
An assessment of the financial information has shown the level of annual SE subsidy required has dropped slightly. This drop in subsidy has been achieved through control of costs as income has been driven up. The evaluation has found good evidence that income will continue to be driven up while further efficiencies are sought in staff and premises costs. This is likely to mean that should ISLI continue to be funded from public sources, the funding requirement will drop. Therefore, it is our assessment that ISLI has represented good VFM over the last three years.

6.5 Options for the Future

One of the main aims of this interim evaluation is to make initial recommendations on future SE funding of ISLI beyond the current agreement which ends in 2010, based on SE's strategic direction and the performance of ISLI. It has been demonstrated throughout the report that ISLI is performing well in several areas, although MSc numbers are down on expected levels and Design Team activity could be increased. ISLI potentially has a strong fit with the emerging strategic direction of SE as described in Section Two. However, the question of whether or not there is a case for continued funding of ISLI from SE is dependent on the direction the ISLI chooses to take over the remainder of the current funding agreement and beyond.

Looking at the big picture, the end objective of ISLI is to stimulate a healthy economy by bringing together design and research expertise to provide the industry with skilled design engineers and expertise to help companies to be competitive in a global market. The following diagram was presented to SE E&L and ISLI at a workshop to stimulate discussion on the way forward for ISLI. It provides a useful framework for considering the different areas of emphasis of ISLI and the future vision for ISLI will have to be built on determining which of the area are of greatest importance.

Figure 6.1 Conceptual Model for ISLI



In order to efficiently and effectively achieve this top-level goal of stimulating a healthy economy, ISLI needs to have a clear, shared vision for where it is going. The vision has to be shared by the ISLI Board and senior management, the partner Universities, Industry and, Scottish Enterprise. Once a clear vision for ISLI has been established the Institute can then

determine what it needs to have in place to facilitate the drive towards this vision in terms of staffing, teaching products, infrastructure and funding.

In the case of funding, the bottom line is that SE has to establish whether or not there is still a case for public funding for ISLI and if there is should it be channelled through SE or another route. If there is to be a continued emphasis on the teaching elements of ISLI, this does not fit well with the emerging strategic direction where there will be a stronger focus on business and the deepening and widening of business innovation and consolidation of innovation funding. However, the services to industry have a very strong fit with policy on innovation and commercialisation and on developing enabling technologies to support priority industries. If ISLI were to become more aligned with these objectives, then this potentially strengthens the case for continued funding through the Enterprise Network. On the other hand, it seems likely that the nature of the teaching activity and the links of the MSc and EngD to industry will have a good fit with the policy of Skills Development Scotland so this could open up another potential funding avenue for ISLI, and ongoing discussions with the SFC should be continued.

There are a number of potential options for the future shape of ISLI and these are outlined below. However, it is important to recognise that given the timing of this interim evaluation there is an opportunity for ISLI and SE to work together over the remainder of the current agreement period to determine the best way forward for ISLI.

The following options were presented in the 2005 SE Board Paper, where the conclusion was to continue funding to ISLI in its current form. If these options were to be applied at the next funding application round the options would look as follows:

– **Option 1: Wind-up ISLI**

In this option, the Institute would cease to exist as a single organisation and entity following completion of the current funding agreement. All achievements and progress made by ISLI over the last 10-years would be lost although it is conceivable that one or more of the university partners could continue to operate the MSc and EngD programmes.

Assessment of option – This option has potential for significant reputational risk for SE in abandoning a flagship project. This option is not supported by the members of ISLI and is likely to result in any collaborative activity being damaged.

– **Option 2: Separation of Activities**

In this option the ISLI would be broken up into a number of constituent parts with the MSc and EngD programmes continued to being run part as of one of the partner universities' postgraduate programmes. The industry training and interface activities would be spun-out separately and driven to commercial viability. SE would enter into formal agreements with the universities to ensure all the activities continued.

Assessment of option – This option also has potential for reputational risk for SE and is not supported by the members of ISLI. It is also likely to result in any collaborative activity being damaged through the fragmentation of activity.

– **Option 3: Relocation to University Campus**

In this option, the ISLI is maintained and developed in line with the Business Plan for the next 5-years. The main difference is that it is located in its entirety at one of the universities' campus. The main advantage of this option is cost savings as the facilities and support costs could be substantially reduced.

Assessment of option – This option has far less potential for reputational risk for SE. It is not an option that is generally supported by the members of ISLI, as the independence of the location is felt to be critical. There is a major concern that the Institute would not be able to maintain its independence, as it would become gradually absorbed within the university at which it was located. The option is also dependent on space being available on one of the university campuses.

– **Option 4: ISLI Remains on the Alba Campus**

This option is essentially the status quo. In the previous options' appraisal this was the preferred option for SE and ISLI.

Assessment of option – This option has less potential for reputational risk for SE, but as strategic priorities are changing the case for continues core funding from SE to support the teaching activities is weakening. The members of ISLI support this option as they feel it maintains the collaborative activity developed to date and allows for future development.

In addition to these options, which are centred on the question of public funding, ISLI may wish to consider further options. These could include:

– **Option 5: Relocation to West Lothian College**

This option is similar to Option 3 above in that the operational model for ISLI is maintained and developed in its current form. ISLI would remain within Livingston but would relocate to the more central location of West Lothian College. The main difference to Option 3 is that ISLI could maintain its independence from the universities. The main advantage of this option are cost savings, as the facilities and support costs could be substantially reduced if ISLI were to move out of the high specification building at the Alba Campus and the more accessible location would benefit students and teaching staff.

Assessment of option – Both SE and ISLI could potentially support this option, as it would maintain the collaborative activity developed to date while addressing some of the fundamental infrastructure issues.

– **Option 6: Teaching Activity Goes to the Universities**

This is similar to Option 2 above, as in this option the ISLI would be broken up into a number of constituent parts with the MSc and EngD programmes continued to being run part as of one of the partner universities' postgraduate programmes. However, the industry-facing and research activities of the Design Team and the CPD activity would be maintained by ISLI and operated in a similar way to the present model. The difference to Option 2 is that in this option the industry activity would not be turned into a purely commercial venture and could still be aligned to support SE and Scottish Government policy.

Assessment of option – This option could allow SE to continue to support the industry-facing elements of ISLI without having to fund the teaching elements. In this option the teaching activity could still be branded as ISLI and linked to the industry activity, but ISLI would not have to bear the cost of running the programmes.



6.6 Summary

There was a clear message emerging from the stakeholders of ISLI (in its widest sense to include industry) that ISLI is still a valuable asset and that the whole is still greater than the sum of its parts. This is reflected in the value placed on the collaboration between the partner universities and industry and the high regard in which graduates of the MSc and EngD programmes are held.

There is clearly significant work to be done in determining the future vision for ISLI and the implications this has on the resources required. As noted above, the timing of this interim evaluation means that there is an opportunity for ISLI and SE to work together over the remainder of the current agreement period to determine the best way forward for ISLI. The options outlined above can provide a framework for this discussion.