Evaluation of the Heriot-Watt Converge Project

Final Report
5th September 2012
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1 EXECUTIVE SUMMARY

In 2009 Heriot-Watt University launched the Converge project, a £6.5 million initiative, supported by the European Development Fund (ERDF), which was designed to develop knowledge transfer capacity at the university. This report evaluates the impact of the Converge project.

1.1 Key Findings

The key findings of this evaluation are:

• since 2007/8 the effectiveness of funding applications supported by the business development team has increased from 16 pence per £1 to 30 pence per £1, despite a more challenging funding environment;

• since 2007/8 income from licencing has more than doubled and is expected to continue to grow substantially over the next few years;

• businesses assisted by the Converge project expect to increase their turnover £14.1 million and attribute £5.1 million of this increase directly to the business development team;

• these businesses expect to create an additional 146 jobs over the next three years, of which 37 can be directly attributed to the business development team;

• if the activity supported by the Converge project is sustained then the project is expected to contribute an additional £36.6 million GVA per year to the Scottish economy and support 321 new jobs by 2014;

• each £1 invested in the Converge project has generated £1.12 income for Heriot-Watt University; and

• the Converge project has enabled Heriot-Watt University to develop a distinctive new approach to industry engagement that can be considered a model of best practice within the Scottish university sector.

1.2 Background and Activities

The Converge project was initiated because Heriot-Watt University did not have adequate resources to effectively respond to enquires from industry or pursue knowledge exchange opportunities. In part this was due to a significant increase in the number of academic research positions at the University in previous years, many of which were filled by staff with little experience of industrial engagement.

The funding was used to hire 12 new staff who undertake four main types of activity:

• Entrepreneurship – a dedicated Enterprise Development Manager was appointed to help post-graduate researchers, research associates and academic staff develop knowledge transfer skills. This has been achieved through a series of events, workshops and lectures;

• Enterprise – a dedicated Enterprise Creation Manager was appointed to support university spin-outs. This Manager is also responsible for the Converge Challenge, a business plan competition open to all Scottish
Universities that provides cash prizes to help successful entrants to launch their business;

- business development – a team of Business Development Executives has been appointed to help identify and facilitate collaborative research and knowledge exchange opportunities; and

- marketing – a new marketing team is responsible for organising industry events and undertaking structured and targeted marketing.

1.3 Outputs and Achievements

The Converge project has seven targets relating to the number of enterprises supported and turnover and employment. Five of these targets have now been exceeded. The targets that have not yet been fully achieved relate to the development of products or services. This should however be interpreted as an underestimate of the time required to develop new products and services rather than a failure of the project.

- Since the Converge project was launched there has been a significant increase in the commercialisation outputs of the University. In particular:
  - the value of research funding secured by the University has increased by 10% since 2007/8, despite a more competitive funding environment;
  - the university has become more effective in securing funding, securing 30 pence for every £1 applied for in 2010/11 compared to 16 pence in 2007/8;
  - the number of licence agreements held by the University has increased from 8 to 24 since 2007/8 and income has more than doubled; and
  - three new spin-outs were created in 2009/10 despite very harsh trading conditions.

1.4 Business and Academic Feedback

Feedback was gathered from businesses involved in the project through telephone and electronic surveys. In total 46 responses were received from businesses, which represents 19% of all businesses supported by the project. A total of 11 academics also contributed to the study through a mixture of telephone and electronic surveys and face-to-face interviews.

In general feedback from businesses was very positive, with 95% of respondents stating that they would like to work with Heriot-Watt University again in the future. Three quarters of respondents were also unable to think of any way in which the support they received could have been improved.

In total 16% of businesses reported that their involvement with Heriot-Watt University had already had a positive impact on turnover but 51% expected a future impact on turnover. Around two thirds of businesses that expected a future increase in turnover were able to quantify the increase and estimated that it would amount to £14.1 million. These businesses attributed £5.1 million of this impact directly to the business development staff at the University. Importantly, these impacts are likely to be underestimated since they are based on responses from 19% of businesses that were assisted by the project.
One of the key issues highlighted by academics was the need for effective succession planning within the university to ensure that relationships with industry were not restricted to one or two key individuals. Another key issue was the need for greater recognition of the amount of time required to develop relationships with industry.

### 1.5 A Distinctive Approach

Evidence gathered from both businesses, academics and those involved in delivering the Converge project during the course of this evaluation suggests that Heriot-Watt University has been able to develop a distinctive new approach to industry engagement over the past three years. The approach is based on developing long-term relationships and providing customised support designed specifically to address the needs of individual industrial partners. It differs from the approach adopted by many other UK universities in being less target-driven and more adaptive to individual company needs and for these reasons has been particularly well received by industry. This approach has enabled the team to engage several industrial partners in long-term programmes of engagement and strategic alliances with the University that are expected to generate very significant, long-term returns for both partners.

The strength of the approach developed by Heriot-Watt University is difficult to define because it is based in numerous complementary factors. These factors include the expertise of the business development team and the contacts they have cultivated within industry and academic departments, their role as a single point of contact for industrial partners, the profile of the University within industry and the focus on ensuring that businesses are satisfied with the service they receive. Taken together these factors represent an important asset for the University and because this asset has taken a long time to develop, it could not be easily replicated or replaced.

### 1.6 Outcomes

The main outcomes of the Converge project has been a significant increase in the amount of knowledge exchange activity undertaken by Heriot-Watt University. If this activity can be sustained, then by 2014 the University should be generating an additional £36.6 million GVA each year for the Scottish economy and supporting a further 321 jobs. If this activity is not be sustained then it is likely that the University will not revert to its previous position but actually lose market share to competitor institutions that have continued to invest in their capacity to support knowledge exchange.

If current levels of activity are sustained then by 2014, each £1 invested in the Converge project will have generated £5.63 for the Scottish economy. This is comparable to other similar knowledge exchange initiatives undertaken by other UK universities and represents good value for money.

The Converge project is estimated to have generated £7.3 million income for Heriot-Watt University over the past three years. The total cost of the project was £6.5 million so each £1 invested in the project has generated £1.12 income for the University. This ratio is expected to improve over the coming years as the full impacts of the project are realised.
1.7 Conclusions and Recommendations

The overarching conclusion of this study is that the Converge is a successful project that has been well received by industry and will generate significant benefits for the Scottish economy over the next few years. The project has also resulted in the development of a distinctive new approach to industry engagement that can be considered a model of best practice within the Scottish University sector.

The main recommendation of this report is therefore that the activity supported by the Converge project be continued and if possible developed. Options for developing the project could include:

• developing a package of activity designed to enable businesses to engage more with students and graduates. This might include helping schools that do not currently offer student placements to develop suitable opportunities; and

• exploring how the University may be able to deliver more Continuous Professional Development (CPD) for existing industrial partners.
2 INTRODUCTION

This report presents the results of an evaluation by BiGGAR Economics of the work that Heriot-Watt University does with industry.

2.1 Background

Heriot-Watt University has a long tradition of working with industry but in recent years has been able to significantly expand this activity as a result of the Converge project, a £6.5 million initiative, jointly funded by the European Regional Development Fund (ERDF), the Engineering and Physical Sciences Research Council (EPSRC) and the University. The Converge project has enabled the University to employ additional business development, marketing, legal and administrative staff who have:

• supported projects that encourage greater engagement with industry;
• offered help to businesses find innovative solutions to problems;
• developed new technologies and new companies;
• shared knowledge and expertise; and
• facilitated a Scotland wide business plan competition (The Converge Challenge).

This report assesses the economic impact and outcomes of the additional activity and examines its long-term sustainability.

2.2 Approach and Report Structure

The starting point for this study was to review the strategic context for this project to assess how the project might contribute to the strategic objectives of the University, the Scottish Funding Council (SFC), the Scottish Government and the EU. This is summarised in section 3. The next step was to revisit the original objectives and rational for the project, in order to test whether and to what extent these remain relevant. This is described in section 4.

Section 5 of this report describes how the funding was used and what activities were delivered while section 6 describes what the outputs of this activity have been. This analysis is based on monitoring information collated by the University and consultations with key members of staff involved in delivering the project.

The next stage of this study was to assess the impact that of these activities. This was achieved using on-line and telephone surveys of the businesses and academics supported. Feedback from the academic surveys is presented in section 8 and feedback from businesses is described in section 7.

The wider, non-quantifiable outputs of the project are described in section 8 and the long-term outcomes of the project are presented in section 10. The conclusions and recommendations of this evaluation are presented in section 11.
3 STRATEGIC CONTEXT

This section describes the strategic context within which the Converge Project operates.

3.1 Europe 2020 Strategy

Europe 2020 is the EU's growth strategy for the coming decade. It is a strategy for smart, sustainable and inclusive growth. Smart growth focuses on developing an economy based on knowledge and innovation; sustainable growth seeks to promote a more resource efficient, greener and more competitive economy and inclusive growth will foster a high-employment economy delivering social and territorial cohesion. The Converge project encourages smart growth by fostering of innovations and research collaboration.

3.1.1 European Regional Development Fund

The European Regional Development Fund (ERDF) exists to promote regional development within EU member states. The Lowlands & uplands Scotland ERDF Programme 2007-13 focuses on a number of priorities and the Converge project fits particularly with Priority 1 – Research and Innovation. There are four target areas within this priority:

- a strong research base;
- links between that research base to an enterprise community;
- the industrial community has the capacity to take full advantage of its links with the research base; and
- willingness and demand among enterprises for research and innovation.

To address these areas, the Programme is focusing on support for individual enterprises and research centres and support for research collaboration. The Converge project encompasses both of these activities.

3.2 Scottish Government Economic Strategy

The Scottish Government Economic Strategy was updated and published in 2011. The overarching objective of the updated strategy is to deliver sustainable economic growth. There are five strategic priorities set out in this document. Of particular relevance to this study is the first of these priorities, to maintain and invest in a Supportive Business Environment. In order to achieve this priority, the Scottish Government has committed its self to pursuing a number of key actions, including:

- strengthening levels of innovation and commercialisation, including improving the links between our universities and private sector companies; and
- using the Scottish Investment Bank to support early stage innovative technology based businesses, and growth and exporting companies;

The Converge project contributes particularly to the first of these two actions because the central aim of the Project is to increase knowledge exchange between Heriot-Watt University and industry.
The Scottish Government economic strategy also identifies seven priority sectors that offer particular growth potential. These are:

- creative industries;
- energy;
- financial and business services;
- food and drink;
- life sciences;
- tourism; and
- universities.

Academics at Heriot-Watt University undertake research that is relevant to all of these sectors so by supporting the transfer of this knowledge into industry, the Converge project is directly supporting the Government’s objectives.

### 3.3 Scottish Funding Council

The Scottish Further and Higher Education Funding Council (SFC) is the national, strategic body that is responsible for funding teaching and learning provision, research and other activities in Scotland’s colleges and higher education institutions. The activity of the SFC is guided by its Corporate Plan, which covers the period 2009-2012. The Plan identifies five strategic themes and seven key outcomes. The outcomes are:

- employability and skills;
- access, inclusion and progression;
- knowledge exchange;
- specialism and diversity;
- collaboration;
- world-class research; and
- effective colleges and universities.

While the Converge project contributes in some way to achieving most of these outcomes, it is of particular relevance to the third outcome, knowledge exchange. To achieve this outcome, the SFC intends to work with its delivery partners to:

- create an effective, demand-driven exchange of knowledge and expertise with business and public and third sector organisations, which enhances competitiveness and promotes economic growth;
- support the formation of new knowledge-based businesses;
- provide easy access for small and medium-sized enterprises (SMEs) to the facilities and services of colleges and universities; and
- provide continued investment in Scotland to exploit knowledge, develop solutions, and demonstrate applications.
The Converge project directly supports all of these objectives.

3.3.1 Scottish Funding Council Outcome Agreement

In 2012/13 Heriot-Watt University will receive £35.4 million of funding from the SFC, including £11.2 million for research and knowledge exchange. From 2012, one of the conditions of this grant is that the University records progress across various areas of activity including articulation from colleges, widening access, further collaboration with business and industry and institutional efficiency. The University is in the process of finalising its outcome agreement with the SFC for the 2012/13; however, knowledge exchange will be a very high priority. The type of activity supported by the Converge project is key to achieving these outcomes.

3.4 Heriot-Watt University Strategy

Published in 2008, Focus on the Future is Heriot Watt University’s strategy for 2008 to 2015. This will be replaced in late 2012 by a new strategic plan, which was developed through Spring/summer 2012. Both note that the central purpose of the university at its foundation in 1821 was to solve real world problems through scientific thinking and highlight the continuing relevance of this objective today. The new strategic plan aims to build on this heritage by providing solutions to industrial challenges and relevant education to students. This will be achieved in part by harnessing the expertise of interdisciplinary teams to tackle particular strategic themes and transfer academic knowledge into industry. The current strategic themes include:

- energy;
- the environment and climate change;
- the life-physical sciences interface;
- risk and modelling; and
- infrastructure and transport.

The strategy also notes Heriot-Watt University’s strong tradition of collaborating with industry and highlights several examples of established partnerships with Scottish businesses. Increasing the number of external collaborations and joint ventures with industry is central to the University’s plans to increase the level of knowledge transfer with industry over the next ten years. The activity supported by the Converge project is likely to play a key role in achieving this.
4 NEED AND RATIONALE

This section describes the background to the Converge project and explains the rationale behind the project.

4.1 Need

The need for the Converge project is rooted in the need to increase Scotland’s productivity (as measured by GDP per hour worked) relative to its key trading partners. At present the gap between Scotland and the top performing countries in the OECD is around 14.5%¹ and the Scottish Government has set a target of closing this gap by 2017. Evidence from a range of international sources suggests that there are a range of drivers that influence productivity performance, including:

• investment in Infrastructure;
• resource efficiency;
• skilled, educated and adaptable workforce;
• innovation, commercialisation and research and development (R&D);
• enterprise;
• effective and efficient public services; and
• a competitive business environment.

Closing Scotland’s productivity gap will require action to support each of these areas but the need to support innovation, commercialisation and R&D is particularly relevant to this project.

4.2 Rationale

Gross expenditure on R&D includes that of businesses, government and higher education. Although Scotland performs relatively well in terms of publicly supported R&D (e.g. higher education spend), its performance in terms of privately funded R&D (i.e. Business Enterprise Research and Development) is relatively weak. In order for R&D expenditure to deliver productivity improvements for the Scottish economy it is therefore essential that the outputs from R&D activity funded by the public sector are effectively transferred into industry. This means that there is a strong rationale for initiatives to support knowledge exchange between industry and academia.

The rationale for supporting knowledge exchange between industry and Heriot-Watt University in particular is grounded in the relevance of much of the research undertaken at the University to Scotland’s priority industries. In particular, Heriot-Watt University has a strong track record of research and commercialisation within the energy sector (including oil & gas and renewable energy). Although this research presents significant opportunities for effective knowledge exchange, prior to the Converge project, the University did not have adequate resources to effectively pursue these opportunities.

¹ Scottish Government website, Scotland Performs, productivity target.
Prior to the Converge project, Heriot-Watt University received around 40 requests for assistance from businesses each month however the University only had 2 full time equivalent (FTE) business development staff to respond to these enquiries. This meant that opportunities to collaborate with businesses were often not realised due to an inability to respond to enquiries.

In addition, due to a significant number of junior research appointments made in the 1990s, many of the University’s research staff had little experience of industry engagement. Although the research undertaken by these staff might have been highly relevant to industry, opportunities were often not realised due to a lack of business development support.

The Converge project was designed to enable the University to realise these opportunities by enabling the Working with industry team to grow into a larger resource and offer wider businesses engagement services.

### 4.3 Continuing Need and Rationale

Figures from the Scottish Government show that the productivity gap between Scotland and its most productive competitors in the OECD narrowed slightly between 2009 and 2010. Despite this, the gap remains at 14.5% and as such the need for initiatives to support collaboration between industry and academia remains strong.

An economic impact study of Heriot-Watt University undertaken in 2010 highlighted the continuing relevance of research undertaken at the University to Scotland’s priority sectors and the contribution that this makes to increasing the competitiveness of these sectors. This suggests that the rationale for supporting knowledge exchange between industry and Heriot-Watt University remains strong.
5 INPUTS AND ACTIVITIES

This section describes the activities delivered as part of the working with industry project, the resources used to deliver them and the outputs that have been recorded to date.

5.1 Project Activities

The working with industry project involved four main types of activity:

- entrepreneurship;
- enterprise;
- business development; and
- marketing

5.1.1 Entrepreneurship

One of the staff appointments funded by the working with industry project is an Enterprise Development Manager who is responsible for helping postgraduate researchers, research associates and academic staff to develop knowledge transfer skills. These skills are necessary to increase collaborative and interdisciplinary research and knowledge exchange activities across the University and with industry. The type of activity undertaken to support entrepreneurship have included:

- a PhD Student Workshop Programme;
- staff Workshop programmes;
- Enterprising Research;
- research staff symposia;
- academic staff update sessions;
- Research Futures Open Lecture Series;
- Heriot-Watt “Exchange Events”;
- Enterprising Research Summer School; and

In addition to these activities, the Enterprise Development Manager has also been involved with setting up and directing the Scottish Crucible, a programme set up for the “research leaders of the future”. It is supported by the Scottish Funding Council, NESTA, the Royal Society of Edinburgh, the Scottish Government, the Scottish Parliament, and the Scottish University.

Heriot-Watt Crucible is Scotland’s first University based Crucible programme. This has now completed its third year and the third Crucible included 30 participants from across all academic schools Heriot-Watt University, the Moredun Research Institute and SELEX Galileo a multinational company that is also a strategic partner to the University. This aims to develop the research leaders of
the futures and create interdisciplinary links across the University by bringing people together from different disciplines and to work in a new way together.

Participants are nominated by their Heads of Schools and Directors and explore collaboration through visits to destinations such as to the British Council (to discuss internationalisation), the Scottish Parliament (to discuss policy) and Dynamic Earth (to discuss public engagement).

To encourage researchers who have completed Heriot-Watt Crucible to pilot some of the potential interdisciplinary research collaborations the Heriot-Watt Crucible Interdisciplinary Project Fund was established this year with funding from EPSRC.

5.1.2 Enterprise

The working with industry project has also enabled the University to appoint a dedicated Enterprise Creation Manager, who is responsible for supporting spinouts from Heriot-Watt University. At present 8-10 spin-outs receive close support where, for example, the Enterprise Creation Manager acts in the capacity of an observer on the board representing the University or as company secretary.

In the past, spin-outs were supported to the point of incorporation – i.e. they were supported until the point at which they became independent entities. The additional resources provided by the working with industry project means that the University is now able to support spin-outs for two years after they are incorporated, which reduces the risk of company failure.

One of the key risks for new spin-outs is running out of money due to not being able to secure investment as funders are reluctant to fund pre-revenue companies. This risk has increased due to the current economic climate. One of the roles of the Enterprise Creation Manager is to help spin-outs identify and apply for funding, which helps them overcome this initial phase of development.

Another important strand of enterprise activity is the Converge Challenge. This was launched as a business plan competition in 2010 and originally targeted six research pools. The project has since been extended and is now open to all staff, postgraduate and final year undergraduate students at any Scottish University and Research Institute. In 2012, 50 applications were received from 13 Scottish Universities and one research institute of which:

- 25% applicants are undergraduate students;
- 42% postgraduate students;
- 19% research staff;
- 15% academic staff; and
- 28% of applicants were female.

Out of these 48 applications approximately 30 are selected to go through training, which covers topics such as sales strategy, building a team and commercial awareness. Then they are invited to write a business plan resulting in 20-25 business plans submitted. Ten are shortlisted and worked with then a further six are selected with three winning prizes:

- first prize - £25,000 cash and £20,000 business mentorship support;
• second prize - £7,000 cash and £7,000 business mentorship support;
• third prize - £4,000 cash and £6,000 business mentorship support;

Running alongside this are business start up seminars which can be attended in person or live online. Over the 3 competitions 1,400 attendances have been recorded at these seminars. These help people who have never thought of setting up a business.

5.1.3 Business Development

The working with industry project has also enabled Business Development Executives (BDE) to be embedded in Heriot-Watt University’s Schools. Each of the BDEs is responsible for a particular area but one is also concerned with the cross cutting area of Energy. The role of the BDE’s is to identify collaborative research and knowledge transfer opportunities and project manage implementation and interactions with Scottish SMEs. This involves a variety of activities from identifying and supporting funding opportunities to being the main point of contact for academics and industry wishing to be involved in collaborative work. Businesses can engage with Heriot-Watt through collaborations, joint industry partnerships, knowledge transfer partnerships, licensing, consultancy and continuing professional developments.

This strand of activity has also involved company led design projects. These projects are proposed by companies and the work is undertaken by students over a 12 week period in teams of four with an academic supervisor. In 2011, 95 students took part in 19 Engineering Design Projects at 15 companies. This benefits companies by having potential employees learn about them, having a way of evaluating potential employees and gaining additional research input. For students it enables them to develop their skills and gain experience in the industry, which helps to improve their employability.

Strategic alliances have been developed as a model for long-term industry engagement. A strategic alliance is a long-term agreement by a company to invest regular amounts of company funds into a jointly agreed programme, covering a variety of activities. Heriot-Watt University currently has strategic alliances with:
• Renishaw;
• Cairn Energy;
• BAE Surface Ships;
• Selex Galileo;
• Baker-Hughes; and
• Rolls Royce.

5.1.4 Marketing

The working with industry project has also involved a significant increase in marketing activity. This has helped to increase academic and industry engagement through a series of events. Having a dedicated team means that marketing can be approached in a more structured and professional manner, which helps to increase the impact of the other three activities. For example without a dedicated marketing team the Converge Challenge would have
struggled to obtain its nation wide reach and would probably not have received as many applications from all across Scotland.

An example of how marketing contributes to increasing academic and industry engagement are Industry Days. These are a way of bringing industry together with academia. In designing these events, the team considered the type of expertise that companies in Scotland currently struggle to access and identified two significant areas:

• accessible academic thinking that is relevant to the company; and

• access to the thinking of large companies in their sector.

The two most recent events have attracted around 200 companies and provided an opportunity to demonstrate how Heriot-Watt University can help link SMEs with multi-national partners and their markets.

Events are also delivered in partnership with industry sectors for example an event was delivered in collaboration with East Coast Renewables and the Scottish Enterprise Renewables group and another was delivered with SCDI and partner companies on the topic of waste management.

This activity also ensures Business Development Executives can attend targeted events in a way that increases the visibility of Heriot-Watt University for example attending a conference in a trade show relating to a research strength of Heriot-Watt University with market specific literature. This type of focused marketing generates new opportunities as it enables Heriot-Watt University to be presented to companies who work in areas relevant to the University who may not have been aware of the University or the research it undertakes. It also helps to maintain the profile of the University with key industry stakeholders such as Scottish Enterprise and the Scottish Government.

5.2 Project Resources

When the initial ERDF funding application for the Converge project was submitted, the total cost of the project was expected to amount to just over £6.5 million. It was agreed that £2.9 million of this cost would be met by the ERDF and the remaining 3.6 million would be secured through match funding from Heriot-Watt University and the Engineering and Physical Research Council (EPSRC). To date, £3.3 million has been spent to date, of which £1.5 million has been claimed from the ERDF.

5.2.1 Project Costs

The largest component of expenditure to date has been staff salaries, which have accounted for £2.6 million, or 79% of total project expenditure. The remaining £0.7 million of expenditure has been spent on other project activity such as marketing (circa. £177,000) and consultancy fees (circa. £162,000). A breakdown of this expenditure is provided in Table 5-1.
Table 5-1: Eligible Costs

<table>
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<tr>
<th>Eligible Costs</th>
<th>Current Approved Cost (£)</th>
<th>Total Already Claimed</th>
<th>Cumulative Expenditure (£)</th>
<th>Expenditure this Progress report (£m)</th>
<th>Total Expenditure to date (£m)</th>
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<td>Consultancy</td>
<td>284,183</td>
<td>110,534</td>
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<td>51,920</td>
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<td>Evaluation</td>
<td>10,000</td>
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<td>0</td>
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<td>Staff Travel</td>
<td>254,530</td>
<td>16,263</td>
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<td>Marketing</td>
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<td>208</td>
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<td>Depreciation</td>
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<td>118,025</td>
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<td>Grant Schemes</td>
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<td>Other</td>
<td>631,485</td>
<td>88,605</td>
<td>209</td>
<td>75,106</td>
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<td><strong>Total</strong></td>
<td><strong>2,050,490</strong></td>
<td><strong>485,402</strong></td>
<td><strong>417</strong></td>
<td><strong>183,476</strong></td>
<td><strong>668,878</strong></td>
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The Project has received a total of £3.8 million of funding from Heriot-Watt University and the Engineering and Physical Sciences Research Council (EPSRC). The majority of this funding, £3.1 million, has come from the EPSRC. A break-down of the match-funding received is provided in Table 5-2.

Table 5-2: Public Match Funding

<table>
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<th>Source</th>
<th>Current Approved Profile (£)</th>
<th>Total in previous Progress Reports (£)</th>
<th>Total in this Progress Report (£)</th>
<th>Total for all Progress Reports (£)</th>
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<tr>
<td>HWU (SMI)</td>
<td>616,957</td>
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<tr>
<td>EPSRC (Quantum Light)</td>
<td>393,920</td>
<td>393,920</td>
<td>40,692</td>
<td>434,612</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,577,185</strong></td>
<td><strong>3,577,185</strong></td>
<td><strong>249,102</strong></td>
<td><strong>3,826,287</strong></td>
</tr>
</tbody>
</table>

5.2.2 Staff

The funding provided through the Converge project has enabled the existing Research and Enterprise team to expand significantly. Before the project started, the team consisted of 16 individuals, three of whom were administrative staff. The team now consists of 33 individuals, four of whom are administrative staff. Of the 17 new posts created, 12 have been funded through the Converge project with others coming from ERDF investment in Research Pools in which Heriot-Watt is a partner. The majority of these positions have been created in either marketing and development or business development. Figure 5-1 illustrates the structure of the RES team and how this has been developed as a result of the ERDF funding received.
Figure 5-1 - Research and Enterprise Services Operational Structure

Key:
- Black = ERDF Funded (Fixed Term) including staff in other units
- Dotted line = input into activity management
- Green = Research Pool Funded (Fixed Term)
- Blue = School Funded (Mixed Contracts)
- No color = University Funded
- All staff Edinburgh based. 60 staff based in Schools

PROFESSOR ALAN MILLER
Deputy Principal (Research & Knowledge Transfer)

GILLIAN MCFADEZIEAN
Director of Research & Enterprise

Research & Enterprise Operational Structure

Dr RUTH McLEAN
Entrepreneurship Development Manager (RES)

Dr IAN BROTHERSTON
Business Development Manager

ROBERT GOODFELLOW
Technology Transfer Manager

DI OLGA KOLOVA
Enterprise Creation Manager

Dr ANTONY WEIR
Head of Research & Legal Services

BETH JOHNSON
Office Manager

DEREK BROWN
Legal Services Manager

JULIE MITCHELL
RES Administrator & PA to Director of RES

SARAH BROWN
RES Secretary

ALLISON KERR
PA to DP Research & Knowledge Transfer

CLARE CAMERON
Project Administrator

Dr PAUL THOMPSON
Information & Planning

LINSEY DICKSON
Research Funding & Liaison Manager

JADE ROSS & LINNEA
RAVENTOS job share IP Advisor

Dr EVA DAY
EU Research Manager

COSTANZA DI FANT
Enterprise Fellow

SAM GANNON
Research Support Officer

February 2012

Dr ANDREW LIKEN
Business Development Executive - Energy

MATTHEW WASLEY
Business Development Manager (SUPA)

PAT CASSIDY, DONALD
BOOTH & ANNE-MARIE
SCS & ETP Posts

NATASHA MADEIRA
Business Development Executive - SBE

ANDREW MITCHELL
Account Manager, ECC

Dr SAGA ANNE QURESHI
Business Development Executive - SML

Dr IAIN MCEWAN
Business Development Executive - EPS

THERESA SHUTTER
Technology Translator

GRANT SELLAR
Business Development Executive MACS & SLS

Dr DRUE DIXON
Business Development Manager (DPC)

PETER ANGLO
Investment Director

MARTIN MURDOCH
Manager, PIP

CLARE CAMERON
Project Administrator

Dr PETER DAVIES
Business Development Manager (EPC)

KERRY MACDONALD
Head of Commercialisation

SARAH HARRISON
Business Development Executive (EPC)

Kim Mobley
Business Development Executive (EPC)

SAM GANNON
Research Support Officer

DEREK BROWN
Legal Services Manager

JULIE MITCHELL
RES Administrator & PA to Director of RES

SARAH BROWN
RES Secretary

ALLISON KERR
PA to DP Research & Knowledge Transfer

CLARE CAMERON
Project Administrator

Evaluton of Heriot-Watt Converge Project
6 QUANTITATIVE OUTPUTS

This section describes the quantitative outputs of the Converge project.

6.1 ERDF Outputs

The seven targets that were initially set for the Converge project were:

- 150 enterprises supported;
- 50 research networks and collaborations supported;
- 10 renewable energy research projects supported;
- 30 new products and services developed by supported enterprises and research centres;
- 30 new products and services developed by supported research networks;
- £1.5 million increase in turnover by supported enterprises; and
- 30 gross jobs created.

The date for achieving these targets was June 2012 but by March 2012 the project had already exceeded five of the targets (the project has since been extended to March 2013). The initial target for the number of enterprises supported was 150 and by March 2012 the project had supported 240 enterprises, exceeding the target by 60%. The project had also helped supported enterprises to increase their turnover by almost £2.0 million, 30% ahead of target.

The targets that were not fully achieved in this time frame related to the number of products or services that were developed by the supporting networks and enterprises. This should however be interpreted as an underestimate of the time required to develop new products and services rather than a failure of the project.

The time-lag between academic research and commercial product or service is often considerable. This means that some of the enterprises and networks supported by the Converge project are likely develop products and services in the future as a result of the support provided and that the targets may yet be achieved. The results of the business survey reported in section 7 tend to support this, with a number of companies reporting that while they expected to develop a product or process in the future as a result of the support they had received. Progress against targets to March 2012 is presented in Table 6-1.
### Table 6-1: Working with Industry Targets and Progress

<table>
<thead>
<tr>
<th>Progress vs. Targets</th>
<th>Target to June 2012</th>
<th>Total Achieved to March 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Enterprises Supported</td>
<td>150</td>
<td>240</td>
</tr>
<tr>
<td>Number of Networks Supported</td>
<td>50</td>
<td>69</td>
</tr>
<tr>
<td>Number of Renewable Energy Projects Supported</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Number of New Products/Services Developed by Supported Enterprises</td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>Number of New Products/Services Developed by Supported Networks</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Increase in turnover in Supported Enterprises</td>
<td>£1,500,000</td>
<td>£1,954,848</td>
</tr>
<tr>
<td>Number of Gross Jobs Created</td>
<td>30</td>
<td>36</td>
</tr>
</tbody>
</table>

### 6.2 Other Outputs

A range of other outputs have been recorded for the working with industry project:

- In 2011 95 students took part in 19 Engineering Design Projects at 15 companies:
- 17 new businesses\(^2\) have been created by the Converge Challenge of which eight are from Heriot-Watt University and nine are from other Universities over two years;
- 50 company founders have been trained so far in the Converge Challenge over two years, 14 of whom are female;
- The Converge Challenge has attracted 130 business ideas over three years;
- The Converge Challenge seminar and webinar series has attracted 1,400 unique users;
- Heriot-Watt Crucible Inter-disciplinary Project Fund has funded 12 projects.

### 6.3 Workload Statistics

The outputs of the Converge project can also be measured using workload statistics collated by the Research and Enterprise Services (RES) team. These show that there has been a steady growth in the number of enquiries logged by RES staff over the past four years, increasing from around 40 in 2007/8 to more than 600 in 2010/11. This increase is a result of the team’s increased capacity to respond to enquiries, funded through the working with industry project.

The number of enterprises supported also increased from 60 in 2007/8 to 200 in 2009/10 before falling again to 120 in 2010/11. It should be noted however that this fall was not because of a fall in activity but because the team took a strategic decision to be more selective about which enterprises to support in order to focus

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\(^2\) This includes both start-ups and spin-outs, not all of which were incorporated at the time of writing.
support where it is most likely to generate positive outcomes. These statistics are summarised in Table 6-1.

Table 6-2: Company Liaison

<table>
<thead>
<tr>
<th>Source</th>
<th>2007/08</th>
<th>2008/09</th>
<th>2009/10</th>
<th>2010/11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of projects secured</td>
<td>7</td>
<td>~ 10</td>
<td>~70</td>
<td>~120</td>
</tr>
<tr>
<td>Number of Enterprises Supported</td>
<td>~60</td>
<td>~ 41</td>
<td>~200</td>
<td>~121</td>
</tr>
<tr>
<td>Number of enquiries logged</td>
<td>~40</td>
<td>~188</td>
<td>239</td>
<td>600+</td>
</tr>
</tbody>
</table>

Source: Heriot Watt University

Perhaps most importantly the workload statistics also show that the RES team have become more effective at generating results. The number of projects secured by the RES team has increased from 7 in 2007/08 to around 120 in 2010/11 and the team have also increased their effectiveness at targeting funding proposals.

Since 2007/08, the value of the research funding proposals that have been supported by the Research and Enterprise Services staff has decreased from £131.2 million in 2007/08 to £79 million in 2010/11. This fall reflects the overall reduction in availability of research funding over the time period rather than a reduction in activity. Despite this, the value of funding secured by the University has increased slightly from £21.8 million in 2007/08 to £24.0 million in 2010/11, indicating that the team has become more effective in helping to secure research funding, despite increased competition. This is illustrated in Figure 6-1.

Figure 6-1: Value of Proposals/Awards
As the team have become more effective at securing research funding, the ratio between funding applied for and funding secured has fallen. On average during 2007/8 the University received 16 pence for every £1 research funding it applied for. By 2010/11, this had increased to 30 pence. This means that the average amount of funding secured per day by the team has increased. One effect of this has been to enable members of the team to spend more time on other knowledge exchange activities.

For example, since the Working with Industry funding was received, an existing member of the RES team has been able to focus exclusively on negotiating licence agreements. As a result, the number of licences drafted has increased from 10 to 30 since 2007 while the number of completed licence agreements has increased from 8 to 24. As a result, the annual income received by the University from licences has more than doubled since 2007/08 (the spike recorded in 2008/9 was due to the recovery of outstanding royalties amounting to £27,500).

Income from licences is expected to continue to increase in the future. The University is currently on target to sign at least 30 licence agreements in 2011/12 and expects that by 2015/16 it will be agreeing 35 new licences a year. This would lead to an expected cumulative annual income of around £0.4 million by 2015/16. This is summarised in Table 6-3. Significantly, a high proportion of new licence agreements reached with Heriot-Watt University have been with Scottish based SMEs. Of the 24 agreements reached in 2011/12, 16 were with Scottish based businesses.

Table 6-3: Licences

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number drafted</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>27</td>
<td>~30</td>
</tr>
<tr>
<td>Signed licence agreements</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Annual Income to date (total)</td>
<td>£19,772</td>
<td>£40,541*</td>
<td>£21,282</td>
<td>£18,232</td>
<td>£43,000</td>
</tr>
</tbody>
</table>

Source: Heriot Watt University *includes recovery of outstanding royalties amounting to £27,500.

Another important activity undertaken by the RES team is providing support for start-up and spin-out projects. Table 6-4 illustrates that the number of spin-ouits from the University has been steady at one per year, apart from the year 2009/10 when three spin out companies were created. It also illustrates that the team has supported three start-ups between 2007/08 and 2010/11, two of which were supported in the year 2010/11.

These figures tell the full story about the team’s activity in this area however because they do not account for economic conditions since 2007/8. Since the financial crash of 2008 small businesses have found it particularly difficult to secure finance. Coupled with general lack of demand in the economy, this has created a particularly hostile environment for young businesses.

Despite this, so far in 2011/12 the University has succeeded in creating three spin-out companies: Bryoactives Ltd; Acculuidics; and Hydrason). All of these companies have emerged from the Converge Challenge, (see section 5.1.2). Without the Converge project it is likely that the University would not have created any spin-outs during 2011/12.
Harsh trading conditions mean that it is also more difficult for start-up and spin-out companies to survive than it once was. Without the support provided through the Converge project, it is estimated that two companies would not have reached incorporation stage as they required help with forming a proposition. The Converge Challenge provided a boost for one of these companies to achieve this. It is estimated another two companies would have failed due to the lack of ability to secure funding and the lack of ability to get the right team in place. Company creation statistics are provided in Table 6-4.

<table>
<thead>
<tr>
<th>Source</th>
<th>2007/08</th>
<th>2008/09</th>
<th>2009/10</th>
<th>2010/11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of spin-outs created</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Number of start-ups supported</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Number of live projects (incl. PoC)</td>
<td>7</td>
<td>8</td>
<td>11</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Heriot Watt University
7 BUSINESS FEEDBACK

This section presents feedback from businesses about their engagement with the Working with Industry team and the outcomes of this engagement.

7.1 Business Survey

In order to gather company feedback about Heriot-Watt University’s work with industry, telephone interviews were undertaken with 30 of the businesses supported. These interviews were supplemented with an on-line survey that was distributed to other businesses that had received support. In total responses were received from 46 businesses, which represents 19% of all businesses supported by the project. The responses from these businesses are presented below.

7.1.1 Business Profile

Responses to the surveys suggest that the Converge project has supported a wide range of businesses, from single-traders to multi-national companies, in a variety of different sectors. Of the 46 responses received to the surveys, around one third were sole traders and micro enterprises, another third were SMEs and the final third were large companies with more than 250 employees. This is illustrated in Figure 7-1.

Figure 7-1 - Respondents by company size

<table>
<thead>
<tr>
<th>Company Size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business - sole trader</td>
<td>4%</td>
</tr>
<tr>
<td>Micro enterprise (&lt; 10 employees)</td>
<td>7%</td>
</tr>
<tr>
<td>SME (10-250 employees)</td>
<td>33%</td>
</tr>
<tr>
<td>Large company (250+ employees)</td>
<td>33%</td>
</tr>
<tr>
<td>Other</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

Responses were received from businesses in a variety of different sectors. The largest number of responses (24%) was from engineering businesses (mechanical, electrical, civil, computing) engaged in product design and advanced manufacturing. A further 15% of responses were from businesses in the renewable energy sector. Other important categories included aerospace and defence (11%), oil and gas (11%) and food and drink (9%). A break-down of the responses received by sector is provided in Table 7-1.
Table 7-1 - Break-down of responses by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Responses</th>
<th>% of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering/advanced manufacturing</td>
<td>11</td>
<td>24%</td>
</tr>
<tr>
<td>Renewable Energy/low carbon</td>
<td>7</td>
<td>15%</td>
</tr>
<tr>
<td>Aerospace/defence</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>Food and Drink</td>
<td>4</td>
<td>9%</td>
</tr>
<tr>
<td>Biotechnology and related technology</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>Packaging</td>
<td>3</td>
<td>7%</td>
</tr>
<tr>
<td>Utilities</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Textiles</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

7.1.2 Reasons for Engagement

To investigate businesses reasons for engaging with Heriot-Watt University, respondents were asked about how and why they first made contact with the Working with industry team and about their relationship with the University before this.

The single biggest source of referrals to the Business Engagement team (20% of the total) came from Interface, an initiative to connect businesses with Scotland’s higher education and research institutes. A further 15% of respondents had a long-standing relationship with Heriot-Watt University, 13% said that they had been approached by a member of the Working with industry team and 13% knew about the services available because they were graduates of the University. A summary of the routes through which businesses first made contact with the Working with industry team is provided in Table 7-2.
Table 7-2 – First contact with Working with industry team

<table>
<thead>
<tr>
<th>Method of Initial Contact</th>
<th>Responses</th>
<th>% of Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Referral by Interface</td>
<td>9</td>
<td>20%</td>
</tr>
<tr>
<td>Existing relationship</td>
<td>7</td>
<td>15%</td>
</tr>
<tr>
<td>Direct approach from Working with industry team</td>
<td>6</td>
<td>13%</td>
</tr>
<tr>
<td>Heriot-Watt University graduate</td>
<td>6</td>
<td>13%</td>
</tr>
<tr>
<td>Referral from another organisation</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>Referral by Heriot-Watt employee</td>
<td>5</td>
<td>11%</td>
</tr>
<tr>
<td>Event held by Heriot-Watt University</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Other event or conference</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Other marketing by Heriot-Watt University</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Heriot-Watt University spinout/start up</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Referral by Scottish Enterprise</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td></td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

The main reasons that respondents gave for contacting Heriot-Watt University were for help developing a product (24%) or concept (14%) or because the business required access to facilities or equipment at Heriot-Watt (10%). Other important reasons included help to develop a new process (9%), seeking assistance with funding applications (7%) or because the business was looking for a partner in a collaborative research project (7%). A summary of the main reasons mentioned by respondents is provided in Table 7-3.
Table 7-3 – Reason for approaching Working with industry team

<table>
<thead>
<tr>
<th>Reason</th>
<th>Responses</th>
<th>% Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help to develop a product</td>
<td>17</td>
<td>24%</td>
</tr>
<tr>
<td>Help to develop an idea/concept</td>
<td>10</td>
<td>14%</td>
</tr>
<tr>
<td>Required facilities/equipment</td>
<td>7</td>
<td>10%</td>
</tr>
<tr>
<td>Help to develop a process</td>
<td>6</td>
<td>9%</td>
</tr>
<tr>
<td>Help with funding application</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>Looking for collaborative research partner</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>Networking opportunities</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Proof of concept</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>Wanted to get in touch with an academic</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>Licensing opportunity</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Continuing professional development</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Technology analysis/benchmarking</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>Business case development</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Market analysis</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Advice on sources of funding</td>
<td>1</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

7.1.3 Prior Relationship with Academia

Respondents to the surveys were also asked about their previous relationship with Heriot-Watt and other universities. Almost half of the respondents did not have a relationship with Heriot-Watt University before the Converge project started and just over a third had a close existing relationship. Interestingly, almost two thirds of respondents also had a close relationship with one or more other university in the UK. These respondents were invited to comment on how their experience of working with Heriot-Watt University compared to their experiences working with other institutions. The general consensus amongst these respondents was that Heriot-Watt was one of the easier universities to work with and was somewhat more commercially responsive than some other institutions.
7.1.4 Satisfaction with Working with industry team

Respondents to the surveys were also asked about their experiences of working with the working with industry team and how important they felt it was for the University to provide this kind of support.

Overall respondents were very happy with the extent to which the working with industry team had understood the needs of their company. Only one respondent out of a total of 39 that replied to this question said that they thought the team had not understood the needs of his company well. A similar pattern emerged when businesses were asked how useful they found the support provided by the working with industry team, with only one respondent stating that they did not find the support useful. It should however be noted that the dissatisfaction expressed by this respondent related to the input of students to a project and supervision provided by academics, rather than the working with Industry team.

Overall, 95% of respondents stated that they would like to work with Heriot-Watt University again in the future, should a suitable opportunity arise. These respondents also all felt that it was important for the University to provide these kinds of services (76% felt it was very important).

Three quarters of respondents could not think of any way that the support they had received, either from the working with industry team or academics, could have been improved. Of the improvements that were suggested, more than half related to project time-scales and in particular the need to ensure that academics involved in a project fulfilled client expectations with regard to dead-lines. One respondent also said that they felt the only way the service could be improved is if the working with Industry team had more time available to spend with companies. Other comments related to communication (e.g. the need for Business Development staff to maintain communication with clients throughout a project) and establishing clear procedures (e.g. for dealing with potential conflicts between companies with licensing interests in related areas).

As a result of their working with Heriot-Watt University, the perceptions of the majority of respondents about working with Heriot-Watt had improved, either a lot (28%) or a little (28%). Respondents perceptions about working with universities in general had also improved slightly, with10% reporting that they felt much more positive about the benefits of working with universities than they were before working with Heriot-Watt and 20% saying that they felt a little more positive.
7.1.5 Financial Contribution

Businesses were asked about financial contributions they had made toward the collaborative projects they were involved with. Around two thirds of the businesses that responded said that they had contributed to the project, either in cash or in-kind or both. Taken together, the contributions made by these businesses amounted to £1.2 million.

7.1.6 Wider Benefits

Businesses were also asked to think about whether their engagement with Heriot-Watt University had generated any wider, non-financial impacts. Most companies were able to identify at least one type of wider impact and several were able to identify a number of benefits. These benefits include:

• 6 businesses expected to be able to develop and grow their business as a result of the support they received. For one company this was because Heriot-Watt had helped them to demonstrate a product to a potential investor and overcome an important funding gate while two other businesses said that the support would help them to enter new markets. One business also felt that they now had “credibility by association” because their clients gave their proposals greater weight as a result of the business having worked with Heriot-Watt University;

• 5 businesses expected their interaction with Heriot-Watt to have wider benefits for their sector. These benefits ranged from helping to safe-guard jobs in the ship-building industry, to promoting the development of Scotland’s sports sector;

• 4 businesses identified potential community or social benefits. These ranged from helping to ensure the continuity of power supply to the outer isles to helping to reduce the salt content in food;

• 4 businesses said that the support they had received was likely to generate positive environmental impacts. For two companies, this was as the result of making better use of fossil fuels, one company expected to be able to help consumers to reduce food wastage and another expected to be able to help customers to reduce product packaging;

• 3 businesses reported that the support they had received had (or was going to) help them to improve their products;

• 3 businesses felt that they had been able to make new professional contacts, including academics and other businesses, as a result of engaging with the university;

• 3 businesses they had been able or expected to realise productivity or efficiency improvements.

• 2 businesses identified benefits to students such as giving them real experience of working in their chosen field. For some respondents, the desire to “give something back” was an important motivation for working with the University;

• 2 businesses mentioned staff recruitment as a benefit of the project and the value of using student placements as a type of extended interview; and
7.2 Quantitative Impact

7.2.1 Current Impact

Businesses were asked if there was any current impact on turnover and employment from their current work with Heriot-Watt University. This showed that 16% of respondents recorded an impact on turnover and 9% recorded an impact on employment (Figure 7-3). Most (83%) of the respondents that said there was an impact on turnover quantified the impact as did three quarters of the respondents that said there was an impact on employment (Figure 7-4). This found that there is a current impact on turnover due to working with the university of £937,000 and 10 jobs of which £275,600 and 2.6 jobs are directly attributable to the business development team.

Figure 7-3 – Current Impact from working with Heriot-Watt University

Table 7-4 – Quantifying Current Impact

<table>
<thead>
<tr>
<th>Reason</th>
<th>Turnover (£)</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of working with Heriot-Watt University</td>
<td>937,000</td>
<td>10</td>
</tr>
<tr>
<td>Directly attributable to business development team</td>
<td>275,000</td>
<td>2.6</td>
</tr>
</tbody>
</table>

7.2.2 Future Impact

Businesses were asked whether they expected an increase in turnover and employment in the future due to their involvement with the Working with Industry team. More than half expected an increase in turnover and 44% expected an increase in employment.
However the quantification of what this could be proved to be difficult for respondents. Two companies said that this information was commercially sensitive. Qualitative descriptions of impact included:

- “potentially huge”
- “new in role so difficult to comment”
- “impossible to say as the ultimate aim to produce more oil, so potential gains are enormous, from the breakthroughs on research, hard to define, potential is extremely large”

The last comment reflected the difficulty several companies had quantifying the impact of their work with Heriot-Watt University as it was at the level of fundamental research.

Around two thirds (64%) of respondents who expected an impact on future turnover did try to quantify what this impact on turnover could be as did 53% of the respondents who expected an impact on future employment. These individuals expected turnover to increase by a total of £14.1 million and employment by 146 jobs of which £5.1 million and 37 jobs could be directly attributed to the support received from the business development team.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Turnover (£)</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of working with Heriot-Watt University</td>
<td>14,144,500</td>
<td>146</td>
</tr>
<tr>
<td>Directly attributable to business development team</td>
<td>5,146,150</td>
<td>37.3</td>
</tr>
</tbody>
</table>

It is important to note that these impacts are based on a sample of 46 businesses, which represents 19% of all businesses supported by the project and are therefore likely to be an underestimate.

### 7.3 Qualitative Feedback

During the telephone survey respondents were also encouraged to provide qualitative feedback about their experiences of working with the Working with industry team. The key points that emerged during these discussions are discussed below.
7.3.1 Comparisons with Other Universities

Several of the businesses that responded to the surveys had experience of working with other universities and commercial research facilities in the UK and elsewhere in Europe. On the whole these businesses felt that working with Heriot-Watt University compared favourably with working with other Universities in a number of respects.

Perhaps most importantly, several respondents felt that the working with industry team seem to genuinely try to provide a package of support that businesses would find useful. A couple of respondents contrasted this with the approach taken by some universities in which business development staff appear to be very target driven and overly focused on achieving tangible outputs such as a licence agreement or consultancy appointment. One respondent described the latter approach as “greedy” and something that could put businesses off working with universities.

A couple of respondents also felt that the team had a more realistic view of the value of intellectual property owned by Heriot-Watt University than was often the case within university commercialisation teams. These respondents felt that this was because the team understand that establishing rights to intellectual property is only the start of the product development process and that developing a marketable product requires significant additional investment by the company.

Some respondents felt that Heriot-Watt was more commercially focused than other institutions (“they talk our language”); however, this view was not universal. Two respondents from the renewable energy sector that also had experience of working with Strathclyde University perceived Heriot-Watt University to be more focused on academic research and Strathclyde to be slightly closer to industry.

7.3.2 Business Development Expertise

One view that did appear to be universal was that the individual skills and personality of the business development staff are extremely important. The characteristics that appeared to be important to respondents were a detailed knowledge about the University’s capabilities, commercial sensitivity and the ability to relate well to clients. These respondents also acknowledged that these skills take time to develop and recognised the investment made by the University in training the current team.

On the whole the feedback provided about the team was very positive. Several respondents referred to the members of the team by name and were clearly in regular contact with one another. One respondent commented about how valuable it was that the Business Development Executives are all degree educated but also have industry experience, which means they are able to relate well to businesses. Other respondents commented favourably on the “light-touch” nature of the support they had received, which struck the right balance between being helpful and being irritating.

7.3.3 Approach to Working with Industry

The approach taken by the team was particularly valued by respondents because it had a long-term focus. This is particularly important for businesses that are trying to tackle challenges at the forefront of academic knowledge. For example one of the businesses that has been assisted by Heriot-Watt University is BAE Maritime Services. This company is engaged in cutting edge research, which
means that it can take a considerable length of time to define the nature of a challenge before even starting to identify a solution.

Addressing these kinds of challenges generally takes a significant length of time, sometimes as much as 10 years. This means that a successful relationship with academia must be a long-term partnership. Based on feedback from businesses like BAE Maritime Services, building such partnerships is something that Heriot-Watt University appear to be good at.

Another strength of the Converge project was the pro-active nature of the team’s approach to identifying opportunities. Scottish and Southern Electricity for example reported that they had contributed almost £200,000 to a joint project, which had been initiated in response to a direct result of an approach from the team. If this approach had not been made, it is likely that this funding would have been awarded to another university.

Despite these successes the survey suggests that there is still some room for improvement. A small number of companies for example indicated that they would be receptive to undertaking further projects with Heriot-Watt University but stressed that this would depend on the University making a proactive approach to demonstrate its capabilities and practical experience.

7.3.4 Role of Working with industry team

Interestingly, three or four respondents initially stated that they had not received any support from the Converge project or business development staff. On further investigation it was found that this was not the case and that actually most of these businesses had very good relationships with an individual within the team but were just unaware of their position within the structure of the University. These businesses felt that they had interacted with Heriot-Watt University as an entity rather than with a particular department and felt that this single point of contact was extremely important.

One respondent explicitly commented on the value of this, stating that the academics and business development staff he had met with “presented a united front” and were both “promoting the Heriot-Watt brand” rather than a particular department. This respondent, who had experience of working with other Scottish universities, felt that although this was something that universities often struggled to get right it was extremely important.

Something else that the working with industry team appear to be good at is helping businesses to “join the dots” between industrial challenges, academic expertise and commercial opportunities. This was generally achieved by a member of the team convening a meeting with an existing client to explore potential opportunities and then determining whether the University might have the academic expertise to help realise these opportunities.

Renishaw for example, which has a long-term relationship with the University, reported that the team had helped to raise awareness about the company and its activities amongst academics and make people aware of the wide range of activity it is involved in. As a result, Renishaw has since increased the amount of joint projects it participates in with the University. Another example is MWH Global, which also has a long-term relationship with Heriot-Watt University but has previously mainly worked with one department. As a result of recent assistance provided by the working with industry team, the business has been
able to make new contacts within other departments and is now anticipating doing more work with the University in the future.

The team also provides support to university spin-outs. For example, one of the team currently acts as an advisor on the board of Hydrafact, a small spin-out in the oil and gas sector. Feedback provided by Hydrafact suggest that the support received from the team has been extremely valuable in helping the company to secure funding that has enabled it to develop two new products. Without the support provided by the team, responses from Hydrafact suggest that it would have taken the company three or four times as long to secure this funding. In the current economic climate, it is not unreasonable to expect that this would have had a serious detrimental impact on the company and perhaps even compromised its survival.
8 ACADEMIC FEEDBACK

This section presents feedback from academics about their engagement with the Working with Industry team and the outcomes of this engagement.

8.1 Previous Experience of Working with Industry

In order to get a perspective from academics about the value of the services supported by the Converge project, telephone interviews were undertaken with five selected academics from Heriot-Watt University and a further two academics replied to the survey on-line. In addition, feedback from four other academics was obtained during face-to-face interviews that were undertaken as part of a parallel study, investigating the economic impact of the University.

8.2 Prior Experience of Working With Industry

Six of the seven academics who responded to the survey had a close relationship with industry before receiving assistance from the working with industry team and all seven said that they had previously been involved in a joint project with industry. Two had experience of contract research, three had undertaken consultancy projects for businesses, three had undertaken (or were hoping to undertake) joint research with industry, one had been involved with design, developing and prototyping, one had been involved with a licencing opportunity and one had been involved in market research.

Despite this it is interesting to note that only two of the academics believed that they would have been able to achieve the same results from their engagement with industry without the support provided by the team. It is also interesting to note that, academics first became involved with the team in a number of different ways, three of the six academics that responded to this question had been approached directly by a member of the team. This provides evidence that the team takes a proactive approach to identifying opportunities, which was also one of the observations from the business feedback described in section 7.3.3.

8.3 Assistance from Working with Industry Team

The academics who responded to the survey had been assisted in a variety of ways. The most common type of assistance provided (mentioned by four academics) was help to identify companies to work with, help communicating with industry and help putting together a funding application. The types of assistance provided are summarised in Table 8-1.
Table 8-1 - Assistance provided by the Working with Industry team

<table>
<thead>
<tr>
<th>Assistance from Working with Industry team</th>
<th>Response total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identified companies for me to work with</td>
<td>4</td>
</tr>
<tr>
<td>Helped me communicate with industry</td>
<td>4</td>
</tr>
<tr>
<td>Helped with putting together a funding application</td>
<td>4</td>
</tr>
<tr>
<td>Freed up time by taking on the responsibility of business development</td>
<td>3</td>
</tr>
<tr>
<td>Identified contact within company for me to work with</td>
<td>3</td>
</tr>
<tr>
<td>Helped with putting together a project</td>
<td>2</td>
</tr>
<tr>
<td>Helped with project management</td>
<td>1</td>
</tr>
<tr>
<td>Identified other staff in Heriot-Watt for me to work with</td>
<td>1</td>
</tr>
<tr>
<td>Helped my students to work with companies</td>
<td>1</td>
</tr>
<tr>
<td>Suggested areas of application/future direction for my research</td>
<td>1</td>
</tr>
<tr>
<td>Helped me manage expectations of industry</td>
<td>1</td>
</tr>
<tr>
<td>Helped me understand the needs of industry</td>
<td>1</td>
</tr>
<tr>
<td>Took responsibility for negotiations with industry</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

8.4 Benefits of Working With Industry

The main benefit that academics gained from working with industry was access to new sources of funding. One view expressed was that this is because funding bodies tend to look more favourably on proposals that can demonstrate support from industry. Other benefits identified by academics were giving students an opportunity to gain experience of working with industry and being able to see skills and expertise applied in a commercial context.

All of the benefits identified by academics related either to tangible outputs such as funding and equipment or to learning related outputs such as building understanding of industry needs. None of the academics identified increasing their focus on commercialisation or developing intellectual property assets as a benefit.

This is interesting since it suggests that generating traditional commercialisation outputs (spin-outs, licences, patents) is less likely to motivate academic staff to engage with industry. Instead, academic staff are more likely to be motivated by the indirect outputs from engaging with industry (increased research funding, opportunity to develop knowledge, improved equipment/facilities). In order for the University to increase commercialisation outputs, it is therefore important to ensure that academic staff understand how working with industry can help to deliver the kind of benefits they care most about. Helping academics to make this link is part of the role played by the working with industry team.

A summary of the benefits academics identified from working with industry is provided in Table 8-2.
Table 8-2 – Benefits of working with industry

<table>
<thead>
<tr>
<th>Benefits from Working with Industry team</th>
<th>Response total</th>
</tr>
</thead>
<tbody>
<tr>
<td>New sources of funding</td>
<td>4</td>
</tr>
<tr>
<td>Enabling students to work with industry</td>
<td>3</td>
</tr>
<tr>
<td>Opportunity to apply skills/knowledge in a commercial context</td>
<td>3</td>
</tr>
<tr>
<td>Gain market/commercial knowledge to enhance teaching</td>
<td>2</td>
</tr>
<tr>
<td>Develop academic links with particular company</td>
<td>2</td>
</tr>
<tr>
<td>Gain knowledge about industry to pass on to students</td>
<td>2</td>
</tr>
<tr>
<td>Increase awareness of commercial applications of research</td>
<td>2</td>
</tr>
<tr>
<td>Stimulate ideas for future collaborations with industry</td>
<td>2</td>
</tr>
<tr>
<td>Improved understanding of industry needs</td>
<td>1</td>
</tr>
<tr>
<td>Increase likelihood of success of future funding bids</td>
<td>1</td>
</tr>
<tr>
<td>Gain knowledge about industry to pass on to colleagues</td>
<td>1</td>
</tr>
<tr>
<td>Improved equipment/facilities</td>
<td>1</td>
</tr>
<tr>
<td>Gain market/commercial knowledge to inform future research</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Analysis of survey responses

8.5 Impact of the Working with Industry Team

Two of the academics who responded to the survey reported that their perceptions about the benefits of working with industry had improved as a result of the assistance they had received. Three academics said that they thought they would now be working with industry less if they had not received support from the team. Although these numbers are low, it should be noted that all of these academics had existing relationships with industry before engaging with the working with industry team. This suggests that the services provided by the team are regarded as valuable even by experienced academics with a track record of working with industry.

All of the academics who responded to the survey believed that some degree of knowledge exchange had been achieved as a result of the project they had been involved in. Two of the academics also felt that they had learned something as a result of working with industry.

8.6 Future Activity

All of the academics who responded to the survey expressed a desire to continue to work with industry in the future. In general, academics experiences of working with industry have been positive and the working with industry team has played a role in this. In general all the academics consulted also thought that it was important for the University to support to academics to work with industry and believed that the failure to do this would have a negative impact on the University’s reputation and cause it to become too inward looking.

When asked whether there was any way in which the services provided by the team could be improved, academics had a number of positive suggestions. These mainly related to increased support for completing funding applications,
particularly for EU funding which has less familiar application processes than
domestic funding sources.

Another area in which academics believed the team could provide further support
is in pulling together consortia for large funding bids, which include both academic
and industrial partners and pursuing match funding from organisations like
Scottish Enterprise. On this, one academic suggested that the team may be able
to learn from Strathclyde University, which has had some success in this area.
This view correlates with feedback received from some businesses (see section
7.3.1)

8.7 Qualitative Feedback

In addition to the feedback gathered from the telephone and internet surveys,
feedback was also obtained during face-to-face interviews with key academics.

8.7.1 Succession Planning

One of the key issues to emerge from these discussions was that in the past,
relationships with industry have developed organically between particular
academics and individuals within a company. For example, some relationships
exist because a graduate has maintained contact with teaching staff after
securing a position within a company and others have developed because
individuals have moved from academia to industry (or vice versa) and maintained
contact with previous colleagues. Although these personal connections tend to
result in strong linkages between industry and academia, they can also be very
difficult to maintain when one of the individuals moves on or retires. This is a real
challenge for Schools seeking to maintain links with industry.

Feedback from senior academics suggests that the key to addressing this
challenge is to support less experienced academics to develop contacts with
industry and experience of knowledge exchange activity. As this is something
that the team is actively trying to address (see section 7.3.4), this feedback
provides some evidence of the continued need for the Converge project.

8.7.2 Culture Change

Another important issue raised by academics is that working with industry is often
not regarded as a priority by academic staff, particularly when faced with
competing demands from teaching and research commitments. Developing
relationships with industry takes time, not only to engage with potential partners
but also to plan potential engagements (i.e. identifying which companies to target
and working out how research might be relevant). As there is often a
considerable time-lag between initiating a relationship and starting to see results
from the relationship, time invested in such relationships is unfortunately often
regarded as “unproductive”.

As described in section 5.1.3, one of the roles of the Business Development
Executives is to support academics to develop relationships with industry by
helping to identify potential partners and initiating contact. Undertaking this kind
of “legwork” is something that was welcomed by academics but the fact that the
issue of “unproductive time” was raised at all provides some evidence of the
continued need for the project. This is reinforced by the reluctance of so many
academic staff to contribute to this evaluation, which suggests that working with
industry is still not generally regarded as a high priority.
9 APPROACH

This chapter draws together the inputs, activities, outputs and feedback from academics and companies to show how all of these activities and outputs result in a different way of working with industry. It also describes how this way of working better meets industry needs than current methods of engagement and creates more opportunities for projects and collaboration that will ultimately have greater economic impact on the Scottish economy than there otherwise would have been.

9.1 Asset

Chapter 5 discusses the activities that the working with industry team undertake but as the previous chapter shows the value added by the team goes beyond the outputs from these activities. The team have also become an important store of knowledge and an asset in their own right. The type of knowledge embodied by the working with industry team includes:

• knowledge of all activities across Heriot–Watt University – this benefits both companies and academics as the University as a whole can be promoted to companies and academics;

• knowledge of sector – this enables the working with industry team to advise on business development for the schools/university as they can identify where the company or sector needs are moving towards and spot opportunities that may not have been previously noted;

• knowledge of industry – the working with industry team’s knowledge of the industry means they can identify which companies would provide a valuable relationship in terms of monetary, reputational and strategic value and also identify who in the company would be the most appropriate contact;

• understanding and relationships with individual companies – for a company having a relationship with somebody who understands and knows your company’s needs means that you have a more efficient relationship with the university and are more likely to discuss opportunities with them rather than approach another university or even not mention the opportunities at all as don’t think the company will respond; and

• profile within the sector – as the working with industry team attend sector specific events potential customers are more aware of who Heriot-Watt University are and what they offer. This makes it more likely to approach the University when they want to discuss collaboration. For example one of the respondents to the company survey received several proposals from Interface and chose Heriot-Watt University’s proposal as they recognised the staff involved.

Having this store of knowledge means that the team are able to identify how academics might be able to assist industry and broker relationships between the two. Feedback from the businesses assisted by the team shows that this role is regarded as particularly valuable by industry (see section 7.3.4). It is also important to note that the value of this staff asset has increased over time as staff have accumulated knowledge and developed relationships within the university.
9.2 Service

As the previous chapter shows the key to the effectiveness of the working with industry team is that they provide a proactive service (see section 7.3.3). They are able to do this because the store of knowledge they possess means that they can provide a service to the company as a whole instead of just reacting to enquiries on a project basis. Being proactive means that if the team are unable to assist a company, they will use their knowledge either to signpost the company to somebody who can help or by exploring the company's needs in further depth in order to find other ways of working with them. Feedback from businesses suggests that this approach is valued by industry.

This result of this approach is that the University is able to develop holistic relationships with businesses that are not constrained to individual schools and departments. This can be contrasted with the approach prior to the working with industry project, where relationships were often much narrower i.e. between a division within a company and a particular department or a staff member. This means that relationships are built that are broad and also long lasting as they don't depend on personal relationships i.e. if the academic or staff member moved on there would be a danger that the relationship was lost. They are also longer lasting as relationships do not end with a particular project. For example two strategic alliances considered their relationship with Heriot-Watt University in terms of the University providing a research service. One company described the University as "providing a balanced R&D portfolio". The other considered the strategic alliance as a way of "having a resource on tap" and that the University played "a longer term research role" for their company.

The working with industry team has also helped to improve the quality of these relationships. This has been achieved by increasing face to face and telephone contact and reducing reliance on electronic communication.

This is shown by the way the working industry team undertake discussions with companies. These discussions involve the team exploring the businesses needs and then suggesting ways in which these needs can be addressed, either in terms of activities provided (such as company led student projects) or in terms of expertise the company may not have realised the university had. This broadening of the relationship enables much more opportunities for collaboration to arise.

The working with industry team also provides a similar service for academics by helping them to understand the relevance of their research to industry, identifying funding opportunities and the potential benefits of collaboration.

A distinctive aspect of the working with industry team's approach is their focus on making sure clients are satisfied with the service they received and relationships are maintained. This this is achieved in a variety of ways including:

• managing generation of work – ensuring the amount of work brought in is within the capacity of the University to deliver;

• resource management – managing academic resources in order to make sure that agreed outputs are delivered;

• managing expectations – ensuring that all parties understand each other; and

• project management – ensuring deadlines are met and regular communication with client is maintained.
This is summarised in Figure 9-1, which illustrates the various ways in which businesses can engage with Heriot-Watt and how the success of the engagement depends on guiding a company seamlessly through these activities by providing a comprehensive service.

**Figure 9-1 – Successful Company Engagement**

### 9.3 Added Value

The existence of this asset and the provision of this service means that Heriot-Watt University can not only maintain relationships but also get much greater value from these relationships. This benefits both the University and the company. The team add value to the University’s relationships with industry in a number of different ways. One of the most important is by helping companies to embark on a “ladder of engagement” with the University.

This means that after initiating an initial collaboration with a business, the team maintain communication with the client and continue to explore the businesses evolving needs with the aim of identifying further collaborative opportunities. This has been possible because the working with industry team have provided a single point of contact for companies and academics, which means that they are able to progress relationships from small projects to larger projects.
In summer 2010 an academic at Heriot-Watt University attended an event organised through the Crucible project (see section 5.1.1). This event encouraged the academic to explore an idea she had been considering that involved using ultrasound to help improve the quality of baked goods. With assistance from the working with industry team, contact was then initiated with MacPhie’s of Glenbervie, a large commercial bakery chain. MacPhie’s was interested in the idea and agreed to host a student for the summer to work on a small project to explore the idea.

Following a successful student project, the team then applied for funding from the EDTC Technology Gateway to undertake a feasibility study in autumn 2010. The feasibility study demonstrated that the new process had potential commercial value and so MacPhies decided to undertake a commercial trial in its factory kitchen during the spring and summer of 2011. The results of this trial were encouraging and suggested that ultrasound could be used to improve the quality and nutritional value of bakery products, as well as making their production more energy efficient.

The Working With Industry team then helped the project team to compile an application to the Technology Strategy Board (TSB). This involved pulling together a consortium of four companies, including two bakeries, a supplier of bakery equipment (ovens) and an electronics manufacturer, with expertise in ultrasound. This application was successful and in October 2011, the consortium was awarded £500,000 funding.

Although the project has not yet been completed, feedback from some of the companies involved suggests that the long-term impacts on the food and drink industry could be very large because the new process is likely to be relevant to bakeries across the UK.

Source: Baking with Sound, background story, Heriot-Watt University.

This process adds value to the academic base by increasing the inter-disciplinary nature of contacts and projects and accelerating the process of developing working relationships across the University. Value is also added to the working with industry team, who develop new knowledge, relationships and interdisciplinary contacts. This approach also helps to create a more collaborative mindset within Heriot-Watt University both in terms of working across disciplines and working with industry. This in turn creates further relationships and opportunities for the future. For example a student who works on a project for a company will learn more about the company. They could:

• graduate and work for the company and as an alumni of Heriot-Watt will continue the company’s relationship with them;

• graduate and work for another company but due to the project are more knowable about the sector and could make a business to business contact; and

• become an academic but due to the past experience of working with the company will seek to collaborate with the company on research projects.

Value is also added to the academic base by broadening the scope of their thinking. This is done by introducing academics to the latest developments in their sector, to ideas and queries from industry and to colleagues within Heriot-Watt University who are working on a similar problem from a different perspective. As discussed elsewhere in this report, one of the services that the working with industry team have provided, that has been particularly welcomed by academics is help to identify opportunities to work with industry and manage collaborative projects.
The increased size of the working with industry team has also led to economies of scale within Research and Enterprise Services. These have been achieved through greater specialisation, such as having dedicated staff focused on licensing or marketing.

The Converge Challenge adds value to the network of knowledge exchange and commercialisation offices in Scottish Universities by not replicating what they do. Heriot-Watt University works closely with universities with dedicated knowledge exchange and commercialisation offices and emerging spinouts from the Converge Challenge are signposted to their University’s offices. For those without such offices, they can access the support provided by Heriot-Watt University.

Added value also occurs from the fact that Heriot-Watt University is able to take advantage of new developments such as:

- fully realising opportunities such as Interface;
- keeping up with the trend towards funding for collaborative projects by supplying the industry partners needed to put projects together; and
- providing a competitive edge for funding applications by providing the necessary project management structure.

This is particularly important given that is becoming more difficult to secure funding and other Universities are now also engaging with industry in a more targeted way.

They also add value to students and courses by making them more entrepreneurial (e.g. seminars from the Converge Challenge have been used as part of a course for some students). Value is also added to Scotland as a whole as the Converge Challenge has introduced the idea of entrepreneurship to those who might never have considered setting up a business and by providing a path for those who do have ideas to turn them into companies.

Value is also added to students and courses by making them more relevant to industry by broadening the industry advisory course committees and encouraging more industry input into courses. For example one company that has a strategic alliance with the University discussed how they made the University’s course more modern.

Value is added to Heriot-Watt University’s reputation. The working with industry team has maintained and enhanced Heriot-Watt University’s reputation as a place where entrepreneurial and enterprising activities carried out and as a good partner for industry. The work of the team enables Heriot-Watt University to market itself as a good potential partner for industry.

Value is also added to Heriot-Watt University’s profile by as the working with industry team ensures the University is more visible to industry and policy makers.

### 9.4 Summary

Figure 9-3 illustrates how relationships between Heriot-Watt University and industry functioned prior to the Converge project. Relationships were generally narrower than they are today and tended to exist between individual academics and contacts within industry. In addition there was less collaboration between academics and less commercialisation activity and development of students.
Relationships were on a more personal level with the academic rather than with the University as a whole.

Figure 9-3 – Working with industry before Converge project

The Working with Industry team have changed this by providing a single point of contact for industry to engage with the University as a whole. Figure 9-4 summarises how the Converge project has created a more effective model of engagement by enabling an asset of knowledge, relationship and contacts to be created, a high quality and proactive service to industry to be developed and a variety of entrepreneurial and enterprising activities to be undertaken.
This model of engagement has increased Heriot-Watt’s capacity and ability to meet industry needs by:

- Improving student employability;
- encouraging students and academic staff to become more entrepreneurial;
- engaging more academics in collaborative research (both across disciplines and with industry);
- helping to make research more accessible and relevant to industry;
- developing broader and longer-term relationships with industry;
- providing a professional service to industry; and
- increasing the team’s knowledge of industries and sectors.

This new approach has led to a step change in activity and has enabled the working with industry approach has organically developed in order to best meet business needs and as the assets (the team) have developed. Therefore the Converge funding has provided a foundation for best practice with working with industry to develop. These create the building blocks for greater economic impact as summarised in the diagram through increasing the level of innovation, relevant research, funding and workforce skills in the Scottish economy.
9.4.1 Obliquity

This chapter has shown that working with industry is a complex system because:

- there is not one best way to work with a company - no "one size fits all" model of engagement;
- the outcomes of working with industry are highly dependent on the interactions between the individuals involved; and
- the environment in which businesses operate and business development support is delivered is competitive and changing.

In this situation the idea of obliquity is relevant. This is an idea outlined by the economist Professor John Kay, which states that goals are more likely to be achieved when pursued indirectly. In his book on the subject\(^3\), Professor Kay provides examples that the most profitable companies are not the most profit oriented as their main goal could be to provide the best service possible or to benefit people. "Aiming thus at something else, they found profit by the way"\(^4\).

"What this means in business terms is that the guys who were most spectacularly successful in business were the guys who cared about creating great businesses and that's people such as Simon Marks, Sam Walton and Bill Gates. These people cared about the activity. The financial side of the activity was secondary. That's not to say the financial side didn't interest them at all, and they certainly made bucketloads of money, but in a basic sense that's not what they were about."\(^5\)

The approach of the working with industry team is an example of this concept. By focusing on providing businesses with what they need, other targets such as income to the University are more likely to be met. As the feedback from companies shows, Universities that focus directly on targets are less likely to meet them because companies are less likely to work with them.

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\(^3\) Kay, John (2010), Obliquity – Why Our Goals Best Achieved Indirectly.
\(^4\) Kay, John (17\(^{th}\) January 2004), Obliquity, Financial Times.
\(^5\) Reece, D (28th March 2010), Professor John Kay on why the direct approach doesn't pay, The Telegraph.
10 OUTCOMES

This section describes the outcomes of the Converge project.

10.1 Increase in Knowledge Exchange Activity

The main outcome from the working with industry project has been a significant increase in the amount of knowledge exchange activity undertaken by Heriot-Watt University (illustrated by the workload statistics presented in section 6.3). This increase is due to an increase in the number of staff employed by of the Research and Enterprise Services (see section 5.2.2).

It has been noted elsewhere in this report that the knowledge and expertise of the working with industry team have taken time to develop. Evidence from interviews with businesses and senior members of the team suggest that it can take up to three years to fully train a Business Development Executive. Given that the project started in 2009 and the latest workload statistics relate to 2010/11, it is therefore reasonable to expect that outputs for 2011/12 will be even higher as the team reaches full efficiency.

After this, it likely that activity will continue to increase because the team will start to realise outputs from long-term projects that have been established over the past couple of years but which have not yet come to fruition. As the team will be operating at full capacity by this point however, it is likely that activity will increase at a slower rate than it has over the past couple of years. This is illustrated by the uppermost line in Figure 10-2.

If the working with industry project had not occurred it is likely that instead of increasing, the amount of knowledge exchange activity undertaken by Heriot-Watt University would have declined. This is because existing relationships between would have died off as academics and their contacts within industry retired or moved to other jobs. Although new academic staff would still have been recruited to fill these gaps, many of the new staff do not have as much experience of working with industry or as many contacts within industry. This effect is illustrated by the second line in Figure 10-2.

10.2 Increase in Economic Outcomes

Feedback from some of the businesses that have been supported by the Converge project (see section 7.2) suggests that the team have already helped businesses to generate almost £1.0 million of additional turnover and support 10 additional jobs. Due to the time-lags associated with knowledge exchange activity, the impact of much of the activity undertaken has yet to be realised. This means that the future impact of the project is expected to be considerably larger.

Feedback suggests that in three years time, the Converge project will have been responsible for helping businesses to generate £5.1 million additional turnover and to support 37 new jobs. As several businesses that expect turnover and employment to increase were unable to quantify the scale of these increases, this impact is believed to be an under estimate.

In addition to this, several businesses also expected that the assistance they had received from Heriot-Watt University would have wider impacts on the productivity and/or efficiency of their company or on the sector as a whole (see section 7.1.5). This means that the total impact of the working with industry project is likely to be
much greater than the increase in turnover recorded by the individual businesses assisted. An example of how this might occur is provided in Figure 10-1.

Figure 10-1 - Sector development case study

One of the businesses assisted by the Converge project is Scottish and Southern Electricity. This company is involved in a project to design sensors that could anticipate failure in sub-sea cables used to supply power to Scottish Islands and to transport power from off-shore wind farms back to the mainland. Academics at Heriot-Watt University are currently helping Scottish and Southern to develop a small prototype device and if this device proves successful, the company will consider developing a larger prototype to test in the open ocean. Should the project progress to this stage then it is expected that around 20 jobs would be created to manufacture, install and monitor the device.

This impact is relatively small; however, if Scottish and Southern develop a successful device, it is likely that other utility companies will follow suit so there will be a further impact from the manufacture, installation and monitoring of these additional devices. By reducing the risk of costly cable failure, these devices could also help to reduce the risks associated with off-shore renewable projects and make it easier for developers to secure investment for projects and support the development of the off-shore marine renewables sector.

By 2020 it is expected that the off-shore wind sector will employ 6,700 people in Scotland and the marine renewables sector will employ a further 1,486. Although it is impossible to quantify the contribution that the Converge project might make to achieving this, the long-term impact of even a tiny contribution is potentially huge.

Source: Telephone interview with Scottish & Southern Electricity

The economic impacts generated by the Converge project are illustrated in the third line of Figure 10-2. This shows how the current impact of the project is relatively small but is likely to grow in the coming years.

If the working with industry project had not occurred it is likely that instead of increasing, the economic impacts of knowledge exchange activity undertaken by Heriot-Watt University would have declined. As explained above, this is partly because existing relationships between would have died off as academics and their contacts within industry retired or moved to other jobs and fewer new projects would have been initiated.

Another reason for this effect is that during the course of the Converge project, business development activity at other universities has increased. This has occurred partly in response to a much more challenging funding climate, which has encouraged universities across the UK to focus more on generating income through commercialisation and collaborative research with industry. One consequence of this is that all universities must now work harder to maintain previous levels of commercial activity.

This increased competition from other universities means that the level of business development activity undertaken at Heriot-Watt University prior to the Converge project would probably now no longer be sufficient to maintain previous levels of commercialisation outputs. This means that if the Converge project had not happened, the impact of Heriot-Watt University’s business development activity would probably have declined – i.e. Heriot-Watt University’s market share would have fallen. This effect is illustrated by the bottom line in Figure 10-2.

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6 Centre for Economics and Business Research Ltd (June 2012), the Macroeconomic Benefits of Investment in Off-shore Wind.
The important point to note about the preceding discussion is that the full impact of the Converge project is not the increase in activity and economic impact that has been and will be supported but the difference between this and what would have happened if the project had not occurred. This is represented as the difference between the two lines in both sections of Figure 10-2.

10.3 Value for Money

An economic impact study published in 2012\(^8\) considered the impact of knowledge exchange and commercialisation activity supported by Heriot-Watt University. This report found that each year this activity generates £56.5 million GVA for the Scottish economy and supports 605 jobs.

This impact was generated by activities such as collaborative research, consultancy, training, student-placements, start-ups, spin-outs and licencing. As a result of the activity undertaken by the Working with Industry team, the University expects to be able to significantly increase all of these activities over the next two years. Targets recently submitted to the Scottish Funding Council as part of the Universities Outcome Agreement for 2012 provide an indication of the scale of increase the University expects to be able to achieve. These targets are replicated in Table 10.1.

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\(^8\) BiGGAR Economics (2012), Economic Impact of Heriot-Watt University.
Table 10.1 – Heriot-Watt University Knowledge Transfer Targets

<table>
<thead>
<tr>
<th>Output Measure</th>
<th>Target (by 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative research income</td>
<td>+20%</td>
</tr>
<tr>
<td>Income from CPD</td>
<td>+10%</td>
</tr>
<tr>
<td>Income from Consultancy</td>
<td>+7%</td>
</tr>
<tr>
<td>Income from licensing</td>
<td>180</td>
</tr>
<tr>
<td>Student placements</td>
<td>+20%</td>
</tr>
<tr>
<td>Start-up companies supported</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: HWU submission to SFC, Outcome Agreement 2012.

If the University succeeds in achieving these targets then by 2014 knowledge transfer and commercialisation activity undertaken by Heriot-Watt University will contribute £93.1 million GVA per year to the Scottish economy and support 926 jobs. This represents an increase of £36.6 million GVA and 321 jobs in 2 years. As this increase will be possible because of the additional activity supported by the Converge funding, it is reasonable to attribute all of this increase to the Converge project.

The total cost of the Converge project is expected to amount to £6.5 million. This implies that by 2014 each £1 invested in the project will have generated £5.63 GVA for the Scottish economy. This is comparable to recent knowledge transfer projects operated by other UK universities and research institutes. For example, an evaluation of the Changing Age for Business project at the Newcastle University last year found that each £1 invested generated £5.85 GVA for the regional economy. Similarly, an evaluation of the Genecom Orphans project in 2010 found that each £1 invested in the project generated £4.07 GVA for the Scottish economy. This suggests that the Converge project is delivering reasonable value for money.

10.4 Sustainability

The 46 businesses that responded to the survey described in section 7, reported that they had contributed £1.2 million of funding toward projects supported by the team. Further analysis of these projects using project-monitoring information collated by the Converge team suggests that these projects generated a total of £1.3 million income for the University over the course of the Converge project.

This income includes £200,000 per year from five of the six strategic alliances. This equates to an average of £40,000 per strategic alliance, or a total of £720,000 over the course of the project.

The other 41 companies that responded to the survey generated £1.1 million income for the University over the course of the project. This equates to an average more than £27,000 per company assisted. In total the Converge project assisted 234 businesses (excluding strategic alliance partners). This implies that the total income generated for the University from all the other businesses assisted by the project amounted to around £6.4 million over the course of the project.

In addition to this, the Converge Challenge also generates around £50,000 of support from the private sector each year. Multiplying this by the three years of the project and adding it to the other income received suggests that the Converge
The project will have generated almost £7.3 million of income for the University since it was established.

The total cost of the Converge project was £6.5 million so the project has generated a surplus of almost £0.8 million. The ratio of surplus income to project costs is therefore 0.12. That is every £1 invested in the project to date has generated £1.12 income for the University. Put another way, the income generated by the project to date is 12% higher than the cost of running the project.

As discussed above, it is expected that the impacts of the Converge project will continue to increase over the next few years. This will improve the income/cost ratio and help the project to achieve long-term sustainability for the University as a whole.
11 CONCLUSIONS AND RECOMMENDATIONS

This section presents the conclusions and recommendations of this evaluation.

11.1 Conclusions

This study has found evidence for the continuing need and rational for the Converge project. It has also found evidence that the project has exceeded most of its original targets and those that have not yet been achieved are likely to be realised over the next couple of years as the results of supported research start to emerge. Feedback from businesses supported by the project has generally been very positive. Virtually all of the businesses assisted (95%) said that it was important for the University to provide these kinds of services that they would like to work with the University again in the future.

Survey results suggest that the full impact of the project is likely to take some time to realise. In total 14% of the businesses that contributed to the evaluation reported that turnover had already increased as a result of the assistance they had received but 49% expected turnover to increase in the future. Not all of the businesses that expected turnover to increase were able to quantify this impact but those who could expected a combined increase in turnover of £14.1 million and 146 jobs of which £5.1 million and 37 jobs can be directly attributed to the Working with Industry team.

By 2014, the University expects to be able to achieve a significant uplift in several key measures of knowledge transfer activity as a result of the Converge project. This will contribute an additional £36.6 million GVA to the Scottish economy and support 321 jobs. This implies that each £1 invested in the project will have generated £5.63 GVA for the Scottish economy. This represents good value for money and is comparable to similar knowledge transfer projects elsewhere in the UK.

It is estimated that the Converge project has also succeeded in generating £7.3 million additional income for the University. This implies that every £1 invested in the project to date has generated £1.12 income for the University or, put another way, that the income generated by the project to date is 12% higher than the cost of running the project. It is expected that the impacts of the Converge project will continue to increase over the next few years, which will improve the income/cost ratio and help the project to achieve long-term sustainability for the University as a whole.

Perhaps most importantly, this study has also found evidence that the Converge project has succeeded in evolving a distinctive new approach to industry engagement that is discernibly different to that adopted by many other UK universities. The approach is based on developing long-term relationships and providing customised support designed specifically to address the needs of individual industrial partners. It differs from the approach adopted by many other universities in being less target-driven and more adaptive to individual company needs and for these reasons has been particularly well received by industry. This approach has enabled the team to engage several industrial partners in long-term programmes of engagement and strategic alliances with the University that are expected to generate very significant, long-term returns for both partners.

This approach has been well received by industry and compared favourably to the more short-term, target-driven approach taken by some other universities.
Consultation with the team also suggests that the approach has also attracted notice from other Universities in Scotland and elsewhere in Europe, which are now keen to emulate Heriot-Watt University’s success.

For these reasons, this report concludes that the Converge project has been highly successful. Not only has it achieved its original objectives and delivered tangible economic results for the businesses it has assisted, it has also evolved a new way of engaging with industry that could become a model of best practice across the Scottish University sector. This model of engagement will help to ensure that research undertaken at Heriot-Watt University continues to be relevant to the needs of industry and that the University continues to attract funding and support from industrial partners. In turn this will help the University to continue to attract the best students and staff, achieve its strategic objectives and maintain its international competitiveness.

11.2 Recommendations

The overarching recommendation of this evaluation is that the activity supported by the Converge project should be continued. In particular, it is recommended that the team continue to focus on pro-active activity designed to develop long-term relationships with industry rather than short-term results.

Another recommendation is that the team continue to try to engage academics with less experience of working with industry by demonstrating the value of industrial collaboration. Although many academics at Heriot-Watt University are very actively engaged with industry, feedback from academics gathered for this evaluation suggests that many still do not regard this as a top priority. Although this activity will not generate tangible results in the short-term, achieving this kind of culture change amongst academic staff will be key to achieving long-term strategic objectives of the University. One option for achieving this might be to consider implementing some kind of mentoring programme to enable mid-career academics to learn about engaging with industry from senior academics.

Subject to the availability of resources it is also recommended that the team considers how it might develop and formalise its existing programme of support. This might include:

• developing a package of activity designed to enable businesses to engage more with students and graduates. This might include helping schools that do not currently offer student placements to develop suitable opportunities; and

• exploring how the University may be able to deliver more Continuous Professional Development (CPD) for existing industrial partners.