Scottish Enterprise
BUSINESS PLAN 2012-15
Evidence Base

Scottish Enterprise

Supporting a globally competitive Scotland

CONTENTS

INTRODUCTION

Scottish Enterprise (SE) ensures that robust and timely evidence drive decisions and priorities on the delivery of economic policy. This involves ensuring there is robust and as up-to-date as possible evidence on:

- **the role an activity plays in driving economic growth and its contribution to the Government Economic Strategy (GES)**
- **Scotland's performance for the activity, for example compared to the UK or other EU and OECD economies**
- **market failures, features and challenges that prevent the market from operating efficiently itself (the rationale for intervention)**
- **the economic impacts and wider that can be achieved from the activities, over and above what would have happened without the activity (additionality)**

The evidence base draws on a range of sources including economic data analysis and benchmarking, research studies carried out by SE and other organisations, independent evaluations and economic impact appraisals. The outputs feed directly into policy development and to ensuring activities are delivered as efficiently as possible.

We are constantly updating and improving our evidence base and the methodologies we use, working with partners where appropriate. Our evaluations and research studies are publicly available through Evaluations Online. Where we have identified evidence gaps, this informs our Economic Research and Evaluation Plan.

This paper summarises the available evidence for the main areas of spend and activity outlined in the SE Business Plan. It should be noted that the 'activity categories' should not be considered in isolation and in many cases are interlinked. For example, for a company to fully exploit innovation support, it may need support to access funding and to enter new international markets. Frequently it is a portfolio of support that generates the biggest impact for businesses. Also, support for growth sectors involves both sector specific projects and 'cross sector' assistance.

GLOBALLY COMPETITIVE COMPANIES

COMPANY GROWTH

1. Why is company growth important?

Recent research has shown that economic growth tends to be driven by a small number of businesses. At the UK level, within the business base of firms with 10+ employees, it has been estimated that around half of all new jobs created between 2005 and 2008 were concentrated in 6% of 'high growth firms' (these are defined as firms with 10 or more employees that experience at least 20% employment growth year on year for three consecutive years)[1]. An update to this analysis, for the period 2007-10, showed that around 7% of businesses achieved high growth[2]. Other research shows that high growth firms tend to display higher than average levels of productivity[3].

Therefore increasing the enterprise performance of the business base and the number of companies that achieve significant or high growth can contribute to a number of Scottish Government Economic Strategy and National Performance Framework measures including increased productivity, employment and innovation.

2. Scotland's current performance

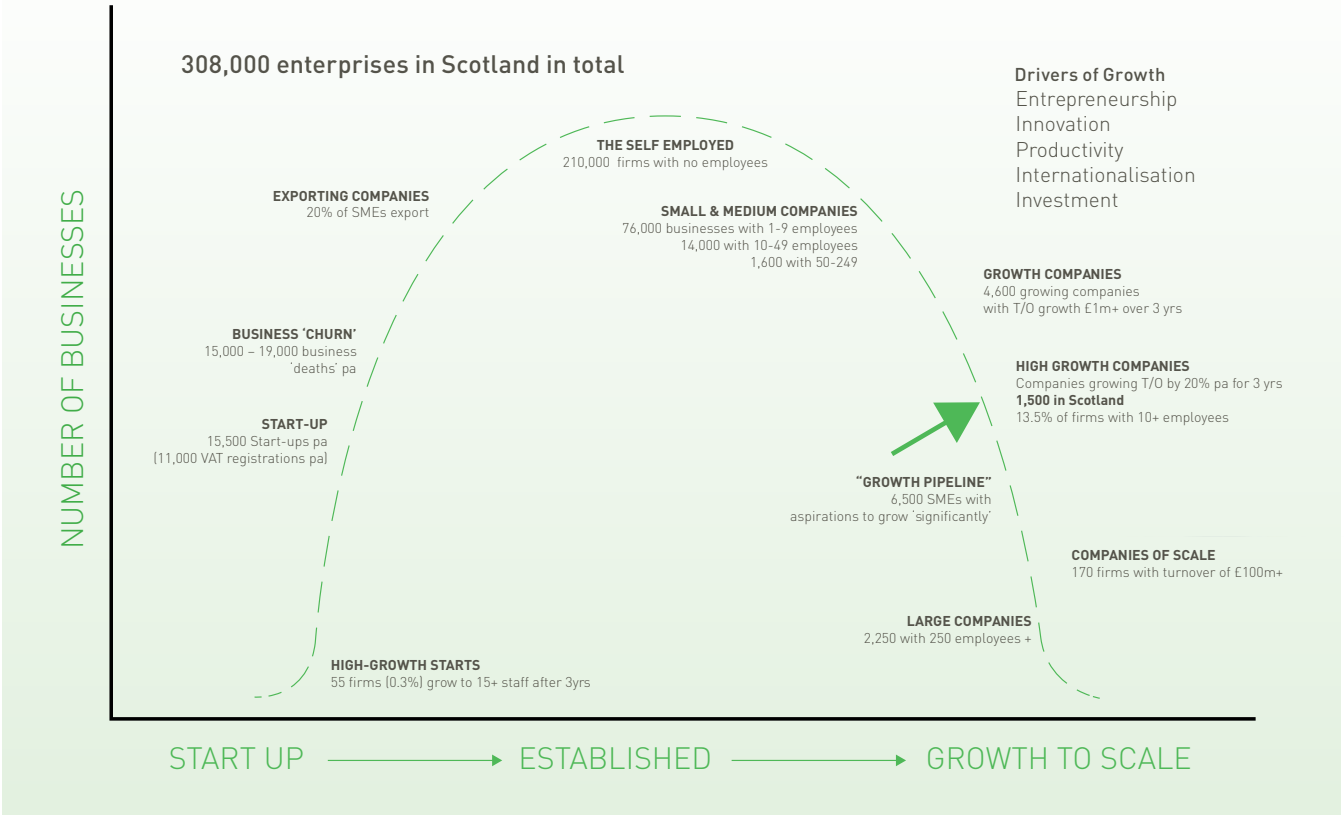
The majority of businesses in Scotland, as in the UK as a whole, are small and micro (98% have less than 50 employees). The Scottish business base has grown significantly over the last decade, driven by an increase in the number with no employees (i.e. self employed)[4]. Although self employed and micro businesses are an important generator of employment opportunities, they tend to be less productive than larger businesses, tend to invest less in innovation and tend to be less active in overseas markets[5 6 7]. Most self employed and micro businesses stay small[8].

The 'market' for company growth can be segmented for Scotland. This suggests that there are around 3,200 growth companies (with annual sales growth of £1m plus over three years), while there are few high growth firms (companies growing by 20% per annum for three or more years) and just a small number of companies of scale (firms with over £100m turnover) alongside a much wider base dominated by small businesses and the self employed.

Analysis shows that around 7% of Scotland's companies (with 10+ employees) achieve high growth in employment terms (similar to the UK rate) and 13.5% achieve high growth in turnover terms, slightly above the UK's rate. This equates to 800 and 1550 firms in Scotland on each measure. The proportion of Scottish companies that achieve high growth has tended to be above the UK's rate and the rate of other OECD countries in recent years[9]. Scotland's 1550 high growth firms employ 285,000 people, are relatively small, tend to be well established and are not generally in 'high technology' sectors.

1. http://www.nesta.org.uk/publications/reports/assets/features/the_vital_6_per_cent
2. http://www.nesta.org.uk/library/documents/Vital_Growth_v19.pdf
3. http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file49042.pdf
4. EkosGen (2011) Identifying the 'Gap' in Business Support: Data Analysis, Scottish Enterprise
5. Average turnover per employee rises with company size, http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/Corporate/Tables
6. http://www.bis.gov.uk/policies/science/science-innovation-analysis/cis
7. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/10-804-bis-economics-paper-05.pdf
8. http://www.bis.gov.uk/assets/biscore/enterprise/docs/j/11-1326-job-creation-and-destruction-uk-1998-2010
9. http://www.nesta.org.uk/library/documents/Measuring_Business_Growth_web.pdf

The 'Market' for Company Growth in Scotland



Source: Scottish Enterprise 2012 [10]

Although Scotland performs well in terms of its business base that achieves high growth, this is from a much smaller business base, in relative terms, than in the UK as a whole and many other countries. When compared on a 'per head of population' basis, Scotland had 29 businesses per 1,000 people in 2010, compared with 37 in the UK. While the stock of active businesses has increased there has been a persistent gap with the rest of the UK for a number of years. This is partly driven by Scotland's low business start-up rate compared to other countries and UK regions[11].

If Scotland had the same number of businesses per 1,000 people as the UK as a whole there would be 28%, or 193,000, more businesses. Within the 10+ employee sizeband, Scotland has 20% fewer businesses and if Scotland's business base matched the UK's and assuming the 13.5% high growth firm rate was maintained, Scotland could have an additional 300 high growth firms.

Given Scotland's small business base, there is a clear need to ensure the businesses we have are growing as fast as possible.

10. Data drawn from Scottish Government Corporate Statistics, BIS Business Demography Statistics and SE analysis.

11. http://www.strath.ac.uk/huntercentre/research/gem

3. Company growth challenges and market failures

There are a range of market failures and challenges that can prevent SMEs from realising their full growth potential[12]. These include:

Access to finance – potential lenders and investors can lack all the information needed to fully assess the risks and returns associated with providing funds to a business (information asymmetries market failure) and this can lead to risk aversion.

Investing in innovation - in a competitive environment, small businesses may encounter difficulties in securing sufficient internal return to make innovation worthwhile, in part because of the high transaction costs involved in defending property rights. Also, not all the benefits from innovation may be captured by the innovating company – knowledge spillovers can also benefit other rival companies. This can act as a disincentive to investing in innovation (externalities market failure). Finally, businesses may not appreciate the potential returns from successful innovation and this can be a further disincentive to investment (imperfect information).

Adopting business growth best practices – businesses may not be aware of business growth 'best practice' or of alternative growth models, or be aware of where to access or buy this type of information or where to access specialist support (imperfect information).

Internationalisation – businesses may overestimate the risks and/or underestimate the benefits of internationalisation, or lack the knowledge and skills to develop an internationalisation strategy (imperfect information).

The market failures and challenges above can lead to risk aversion among businesses and reduce the willingness to invest in company growth. Some of these have been exacerbated by the current economic slowdown.

The market failures and challenges highlighted above are explored in more detail in other relevant sections of this report.

4. Scottish Enterprise company growth support

Along with partners such as the Business Gateway, SE offers support to companies at all stages of company growth. The core of SE's services to businesses is delivered through account management, which is targeted at three main groups:

- **indigenous companies with clear growth potential**
- **major overseas-owned companies**
- **companies that are important to growth sectors or to the wider economy**

The objective of account management is to generate additional significant economic impact by raising the growth performance of supported companies, by generating and safeguarding jobs, and by improving efficiency and productivity. The account management process provides specialist input and support across key areas of business growth, including access to finance, innovation, internationalisation, business improvement and leadership development.

As well as companies that are account managed, SE also delivers support to companies beyond account management. This helps increase the number of companies seeking to achieve more significant growth. For example, SE provides funding for the Princes Scotland Youth Business Trust (PSYBT) who provide loans and advisory support to start ups by people in the 18-25 age category and support for social enterprises through Co-Operative Development Scotland.

5. Impacts of company growth support

An evaluation in 2009 of the Account Management approach found that the net GVA impact on the Scottish economy was estimated to be £610m between 2004/05 and 2006/07, representing a GVA return of up to £6 per £1 spend. The net employment impact was estimated to be 13,000 jobs between 2004/05 and 2006/07[13].

The evaluation highlighted that deadweight levels were relatively high with around two thirds of respondents reporting that interventions by SE had had limited impact, with turnover, profitability, employment and innovation expenditure being reported as being 'About the Same' as they would have been in the absence of any interventions. Conversely, a third of respondents

12. http://webarchive.nationalarchives.gov.uk/+/http:/www.berr.gov.uk/files/file39768.pdf and http://www.communities.gov.uk/documents/regeneration/pdf/1928819.pdf and http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file38301.pdf

13. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=325

felt that turnover, profit, employment and innovation expenditure would have been either 'a lot lower' or 'moderately lower' without SE support. The overall conclusion from the evaluation, though, was that Account Managed support represented good value for money despite the high deadweight.

Case study research with account managed companies found that large companies tend to look for SE to provide financial support for specific projects and generally do not seek or require strategic input. Small companies tend to look for both expertise and financial support and are more open to SE playing a strategic role in the company. The evidence suggests that the development of a strategic relationship with small companies is important in driving positive impacts[14].

An evaluation of PSYBT in 2007 found that £1 of SE expenditure generated £17 of net additional sales for supported businesses between 2004/05 to 2006/07 and that the programme represented very good value for money[15].

6. Company growth evidence and policy development

The Account Management evaluation and the case study research resulted in an action plan to improve the performance of the approach that would increase the impact generated. This included reviewing the composition of the portfolio (for example including more companies from key growth sectors and ensuring a focus on companies with growth potential) and managing the portfolio in a more dynamic way with companies coming in and out as necessary in order to maximise impact and reduce deadweight.

Indications are that this has reduced the level of deadweight, with around 70% of account managed companies stating that SE support has had a positive effect on their turnover performance (compared to around a third at the time of the evaluation).

7. Company growth data and evidence gaps

The last evaluation of the account management process covered the period 2004/05 to 2006/07. Following the introduction of revised approach to account management (as a result of the evaluation), evidence is required to quantify the recent impacts. An evaluation is planned for 2012/13.

INNOVATION

1. Why is Innovation important?

A range of research highlights the contribution of innovation to growth at both the company and economy wide level. For example, NESTA[16]research estimates that two-thirds of UK private sector productivity growth between 2000 and 2007 was a result of innovation and that innovative companies grow twice as fast, both in employment and sales, as firms that don't innovate[17 18]. OECD research suggests that around a quarter of labour productivity growth in a selection of member countries is due to investment in innovation through R&D, software, skills, organisational know-how and branding[19].

The UK Government's Plan for Growth highlights the role that innovation can play in its ambition to make the UK 'One of the best places in Europe to start, finance and grow a business'[20] and the European Union highlights the importance of innovation in its latest growth strategy and has set a target of 3% of the EU's GDP (public and private combined) to be invested in R&D and innovation by 2020[21]. The Scottish Government Economic Strategy highlights innovation's role as a key driver of Scotland's transition to a low carbon economy and The National Performance Network has a target for Scotland of at least halving the gap in total R&D spending compared to the EU average by 2011[22 23].

14. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=395

15. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=89

16. National Endowment for Science, Technology and the Arts

17. The Innovation Index: measuring the UK's investment in innovation and its investment (NESTA, 2009)

18. The Vital 6% (NESTA, 2009)

19. http://www.oecd.org/dataoecd/51/28/45326349.pdf

20. http://cdn.hm-treasury.gov.uk/2011budget_growth.pdf

21. Europe 2020 (EU, 2010)

22 .http://www.scotland.gov.uk/Publications/2011/09/13091128/0

23. http://www.scotland.gov.uk/About/scotPerforms/indicators

2. Scotland's current performance

Scotland's overall R&D performance, measured as R&D expenditure relative to GDP, lags that of the UK and a number of overseas economies. Total or gross expenditure on R&D in Scotland by businesses, higher education and government (GERD) was £1.9bn in 2010, equivalent to 1.6% of GDP, lower than the UK rate (1.8% of GDP) and the rate of the top quartile of OECD countries (2.4% of GDP in 2009). To reach the top OECD quartile rate, Scottish GERD would need to be £1.3bn higher per year.

Business enterprise R&D expenditure (BERD) was £622m or 0.52% of GDP in 2010, significantly below the UK rate (1.09%) and the top quartile of OECD economies (1.94% - 2009 figure). To reach the top OECD quartile, BERD would have to be £1.6bn a year higher[24].

R&D spend, though, can be a relatively narrow measure of innovation. A wider measure includes introducing new products/processes and buying in knowledge/technology. Using this definition, 17,000 SMEs (with 10 plus employees) were 'innovation active' in 2009, 55% of all Scottish SMEs in the sectors covered. This is a slightly lower rate lower than the UK as a whole (58%) and Scottish performance tends to be around mid table for EU economies[25]. To reach the top quartile of EU economies, 5000 more Scottish SMEs would need to be innovation active.

3. Innovation challenges and market failures

Investing in innovation can be hindered by a range of market failures and challenges. These include a lack of information on the costs and benefits of R&D and innovation (imperfect information market failure), difficulties in accessing finance for innovation as lenders may not understand the technical nature of the proposed innovation and/or its potential in the marketplace and route to market (asymmetric information market failure) and positive externalities, where other companies could benefit from the R&D delivered by one company, so creating a disincentive for that company to invest[26]. Individually or in combination, these are powerful factors that often lead to reduction in desire among SMEs to invest in innovation.

SE evaluation evidence confirms the barriers and failures above are relevant in the Scottish context. The evaluation of the R&D grant found that a quarter of companies specifically cited limited information on potential markets for new products and returns on investment as barriers to R&D. However, the single biggest barrier to R&D activity cited by Scottish companies was the cost of R&D[27]. As R&D can be risky and future returns often unknown, this further highlights effects of imperfect information (at the company level) and asymmetric information (at the lender level) on R&D investment decisions.

4. Scottish Enterprise Innovation support

SE's principal support to companies includes innovation advice and funding support through SMART and R&D grants. Both advice and grants help address risk aversion caused by imperfect information. Specific sector R&D support is available through projects such as WATERS[28](for wave and tidal energy R&D).

The Innovation Support Service provides advice to companies focusing on the commercial aspects of innovation projects to help ensure the likelihood of the returns from the projects are commensurate and that risks are mitigated, helping to address risk aversion.

Providing grant support can also help to reduce the perceived risk to companies of investing in R&D by reducing the effective cost to the company relative to future returns, reducing any 'investment hurdle rate' for a company. Grant support is often complemented by wider support to assist companies to fully exploit innovation activity, for example assistance to enter new export markets. Also, for some multinational companies, R&D activity can be mobile, and grant support can help attract investment to Scotland.

5. Impacts of Innovation support

In 2010/11 SE R&D Grant expenditure was £20.4m which levered an additional £51.4m from supported companies (in total around 13% of Scotland's BERD). The 2009 evaluation of the Large R&D Grant scheme concluded that: there continued to be a strong strategic case for continued support; that direct benefits are wide ranging; that the potential economic

24. http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/RD

25. http://www.bis.gov.uk/policies/science/science-innovation-analysis/cis SMEs are those with 10-249 employees

26. See for example http://www.pedz.uni-mannheim.de/daten/edz-h/gdb/06/innovation_market_failures_and_state_aid.pdf

27. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=348

28. Wave & Tidal Energy: Research, Development & Demonstration Support (WATERS)

29. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=348

impact could be substantial; and that value for money is excellent[29]. The evaluation found that without SE grant support, 60% of R&D projects would not have happened in Scotland and a further 30% would have been at a smaller scale or completed at a later date. In terms of economic impacts, £1 of grant support could deliver a cumulative increase of between £8-£11 net GVA over a ten year period. The evidence suggests that significant impact is delivered in later years, once the R&D activity is complete and exploited.

The 2010 evaluation of the small R&D and Innovation Support Grant produced similar findings: the strategic rationale is still valid; the grants attract significant leverage from supported companies; they deliver a wide range of company benefits; they have a positive impact on company R&D/innovation competency and provide clear value for money[30]. Of the companies surveyed, 40% stated that without the grant support the R&D/innovation would not have gone ahead in Scotland and 55% stated that it would have been delayed and/or of a smaller scale. The evaluation evidence shows that £1 of grant support could deliver a cumulative increase of £8-£12 net GVA over a ten year period.

An evaluation of SMART grants, covering the 1999 to 2008 period, found that a majority of grant recipients said that their R&D project had improved company growth and performance and that the grant had enhanced their capability to innovate in the future. Economic benefits were estimated to be around £10 net GVA for £1 SMART grant expenditure[31].

6. Innovation evidence and policy development

With the strength of the evaluation impact findings, recommendations focused on process improvement and optimisation of economic impact for programme beneficiaries, for example improvements to 'project application' processes to minimise administrative burdens. With regards to the large R&D Grant, the evidence contributed to: project prioritisation (particularly of a strong R&D pipeline of potential projects in 2010/11); consideration of the promotion of collaborative projects between businesses; and focused R&D calls, for example in wave and tidal energy.

7. Innovation data and evidence gaps

The recent evaluation evidence considered projects that were at relatively early stages of development and implementation, therefore impact assessments are largely based on company views of future turnover. Ongoing monitoring of the progress of the R&D and innovation projects and the success of commercial exploitation will provide a better understanding of actual economic benefits. A monitoring and progress review of R&D and wider innovation grants is planned for 2013/14. An update of the SMART programme is planned, following its move from the Scottish Government to SE.

Considering the wider innovation landscape and recognising current thinking at the European level in particular, an update to the NESTA Innovation Index in 2012/13 will benchmark the wider contributors to innovation at a Scottish level, allowing comparisons with the other regions of the UK. To allow more meaningful sector-based analysis, it is hoped this can be followed-up with a further exercise later in 2012/13.

30. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=451

31. http://www.scotland.gov.uk/Publications/2009/09/28103010/0

COMMERCIALISATION

1. Why is Commercialisation important?

Commercialisation is the 'conversion' of a science or technology-based idea into a product or service which delivers value to a particular market, with route to value often via new company formation and/or licensing of intellectual property into an existing company. The commercialisation process can drive economic growth creating or accessing new markets through the introduction of new products and services that in turn create jobs and GVA[32]. Research shows that high technology companies are more likely to achieve high growth than those in non-high technology sectors[33].

NESTA asserts that successful economies will be 'shaped by an ability to commercialise, and profit from, investment in new knowledge and services'[34]. Further, the Scottish Government Economic Strategy highlights that Scotland needs to make better use of its research asset base, including university research, highlighting the need to strengthen the translation of these research assets into commercial opportunities and economic growth through the creation of new products and services[35].

Scotland has competitive advantage in key areas of science and technology research. Published research undertaken in Scotland receives 1.8% of the world's citations against 0.1% of the population, and Scotland is ranked first amongst 27 comparator nations for research impact in relation to GDP[36]. Exploiting this competitive advantage through commercialisation can contribute to a number of the Scottish Government's National Performance Indicators such as new business formation, increasing R&D spending and improving knowledge exchange from university research[37].

2. Scotland's current performance

Although Scotland has areas of research excellence, performance is relatively poor in terms of numbers of active entrepreneurs and business start ups[38]. Scotland also has a low proportion of high technology businesses across its business base. This suggests that knowledge assets are not being fully exploited in Scotland[39].

The technical focus of commercialisation links closely with Scotland's R&D performance measures, which lag that of the UK and a number of overseas economies. As referenced in the Innovation section, combined gross expenditure levels on R&D by businesses, higher education and government (GERD) in Scotland was £1.9bn in 2009, or 1.67% of GDP. This is lower than the UK rate at 1.87% and well behind the top quartile of OECD countries at 2.78%; to reach this top quartile GERD would require a further £1.3bn expenditure per annum.

3. Commercialisation challenges and market failures

The journey from concept to market is uneven and often indirect, with many obstacles along the way, and, importantly, any number of entry and exit points. As far back as 1996, the Commercialisation Review[40] recorded barriers relating to risk, skills and access to finance, key themes that are drawn out in other literature and from SE's Commercialisation Longitudinal Study (2012)[41]. These highlight the number of challenges faced as commercialisation moves from idea/concept formation through to full commercialisation of a product or service.

The market failures and challenges are similar to those outlined in the Innovation section. Due to the technical nature of most commercialisation activity, market failures are caused by imperfect information, associated with a lack of information on the costs and benefits of technical and business development, and positive externalities, where it is recognised that competitors could benefit from the technical knowledge developed by a company[42]. Further, the risk associated with R&D activity, where the successful exploitation of research and future financial returns are either uncertain or undefined, can negatively affect technology investment decisions (this more as a market feature than an intrinsic market failure).

32. http://www.targetinginnovation.com/tlx/assets/documents/uploaded/general/COMMERCIALISATION%20PAPER.pdf

33. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=492

34. The Innovation Index: Measuring the UK's investment (NESTA, 2009)

35. http://www.scotland.gov.uk/Resource/Doc/357756/0120893.pdf

36. http://www.scotland.gov.uk/Publications/2011/09/15103949/6

37. http://www.scotland.gov.uk/About/scotPerforms

38. http://www.strath.ac.uk/huntercentre/research/gem/

39. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=492

40. The Royal Society of Edinburgh

41. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=479

42. See for example http://www.pedz.uni-mannheim.de/daten/edz-h/gdb/06/innovation_market_failures_and_state_aid.pdf

The Technology Strategy Board (TSB) highlights the barriers to commercialisation related to the difficulty in finding both finance and partners, and to the risks and uncertainties around investing in early-stage technologies (including timing and return on investment, particularly from new and emerging markets)[43].

As a result of these market failures, features and challenges, there can be strong barriers to companies, entrepreneurs and funders to invest in technological development and new companies. It can be difficult to build a business case around longer-term commercialisation opportunities, in turn affecting access to finance and ability to attract partners. This is particularly acute for small companies, who, although being major contributors to growth within the economy, can struggle to find funding of scale beyond early-stage project requirements to develop new/improved product(s) and bring them to market. In addition, from a human capital perspective, small companies commonly lack the experienced management skills required to match the exploitation potential of technology ideas, particularly within the areas of sales, marketing and general business development.

4. Scottish Enterprise Commercialisation support

The focus of SE's activity since 2008/9 has recognised the need for businesses to understand the market opportunities of their IP and knowledge at the earliest stage. This is achieved by helping companies: focus on end-customer needs throughout the technology development process; develop a clear understanding of the 'path to market' and key investment channels; and develop flexibility in both understanding and responding to changing market conditions. These factors are all driven by the need to build experienced management teams to commercialise IP and knowledge from the outset. This approach is ensuring greater success in helping create more companies of scale and supporting existing high growth technology companies within Scotland.

SE's commercialisation model comprises three distinct strands:

- **capacity building, including Informatics Ventures, Edinburgh BioQuarter and academic spin outs**
- **commercialisation development funding support, incorporating Proof of Concept and the development of Intermediary Technology Institute intellectual property**
- **early-stage technology company support, including the High Growth Start-Up Unit, Enterprise Fellowships and the Scottish Institute for Enterprise**

5. Impacts of Commercialisation support

A recent review of SE commercialisation support concludes that there continues to be a strong strategic case for continued commercialisation support and that potential impacts attributable to SE support represent a good value-for-money return. Wider benefits that cannot readily be monetised are also recognised, such as improved skills and expanded networks.

Although commercialisation support has delivered only moderate economic returns to date (2012), the review estimates that net additional attributable impacts (GVA return to spend) could be between 6 and 8 to 1 over a ten year timeframe. This would be in line with time elapsed to develop concepts through to establishing a business and gaining traction in the marketplace. Impacts are estimated to be higher for companies supported since 2008, reflecting the re-focused nature of SE's approach. The review also shows a faster projected company growth profile following the re-focus, suggesting a quicker 'economic return' on investment[44] .

6. Commercialisation evidence and policy development

Research completed in 2009 influenced a re-focus of the approach to commercialisation towards[45]:

- **building strong business management teams from the outset;**
- **understanding line of sight to market entry from the outset**

43. http://www.innovateuk.org/_assets/0511/technology_strategy_board_concept_to_commercialisation.pdf

44. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=479

45. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=349

- **taking a single coordinated approach to advisory and funding support**
- **selecting fewer projects to support and providing greater acceleration of the strongest propositions**
- **de-selecting underachieving projects, where appropriate, and focusing resources on the strongest propositions**
- **where possible, seeking to ensure new businesses are anchored in Scotland**

The findings in the 2012 review suggest the changes made to the programme are working and potentially delivering greater impact. The single coordinated approach to advisory and funding support is appreciated by companies and is contributing to their future success.

7. Commercialisation data and evidence gaps

Following the 2012 review, ongoing monitoring of the current cohort of businesses, specifically in terms of success in commercial exploitation, will provide a better understanding of actual economic benefits over time. It is expected that a follow-on longitudinal exercise will be undertaken in 2013/14 to re-assess programme progress.

The availability of data and evidence of Scotland's comparative commercialisation performance, benchmarked for example against the rest of the UK and other OECD countries, will be explored in 2012/13.

Two significant barriers to growth that the 2012 research highlights are:

- **increased difficulty in securing external investment, especially at the later stages of getting products ready for the market**
- **weaknesses in marketing capability within companies.**

SE is considering how this intelligence can be used to inform policy development.

INTERNATIONAL TRADE AND INVESTMENT

1. Why is international trade and investment important?

Scotland's International Trade and Investment Strategy 2011-2015 highlights the increasingly important role international trade and investment plays in accelerating Scotland's economic recovery[46]. As the world becomes more connected and trade more open, the international opportunities for Scottish businesses increase. At the same time increasing imports will lead to greater competition in domestic markets. Businesses that increase their competitiveness and diversify their customer base are likely to have greater long term security and sustained growth. The National Performance Framework has set a target for Scottish businesses to deliver a 50% increase in the value of international exports by 2017.

There is a wide range of evidence highlighting the contribution that trade and investment makes to economic growth[47 48 49]. Companies that trade internationally are generally more productive, have higher productivity growth and are more innovative than their peers. Entering international markets drives innovation and productivity as businesses are exposed to new technologies, management practices, ideas and opportunities.

Similarly, foreign investors can drive productivity growth as they tend to be more productive, engage in more R+D and invest more in staff development than indigenously owned companies[50]. Also, inward investors can have a positive impact on the productivity levels of domestic businesses through 'knowledge spillovers' which enable them to improve their products and processes. This can be as a result of staff moving between companies, through supply chain contacts (inward investors may share knowledge with suppliers to increase quality), through increased competition and by domestic companies imitating inward investor technology and work practices.

A key finding of the available evidence is that the benefits of inward investment depend crucially on the characteristics of the investment project. Those that are high quality, for example R&D intensive ones, provide skilled employment and are 'technology exploiting' and tend to result in the greatest direct and indirect benefits.

46. http://www.sdi.co.uk/resources/reports/international-trade-and-investment-strategy-2011-2015.aspx

47.http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=351

48. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/11-805-international-trade-investment-rationale-for-support.pdf

49. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=388

50. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/11-805-international-trade-investment-rationale-for-support.pdf

2. Scotland's current performance

Scotland's overseas exports have grown over the last few years. In 2010, exports to the rest of the world (not including the UK) reached £22.0bn, a rise of 18.7% (or an average of 4.4% per year) since 2006[51]. Between 2006 and 2009 Scotland's export growth was higher than the UK and most OECD countries, with Scotland in the top quartile of OECD countries (5th out of 31 countries)[52]. Following a dip in 2008 after the start of the recession, the volume of manufactured exports has risen 7% (2009-2011) against the backdrop of a weak global economy[53] . Research suggests that around 20% of SMEs in the UK are exporters, and the share for Scotland is likely to be very similar[54]. This, though, is lower than the EU average of around 25%.

Although the vast majority of enterprises are Scottish owned, non-Scottish owned enterprises (i.e. inward investors that are 'Rest of the UK' and 'Overseas' owned) account for over a third of Scottish employment and over a half of turnover. Inward investment therefore makes a significant contribution to Scotland's economy.

Scotland is ranked 2nd of the UK regions for attracting investment (only beaten by the South East which includes London) and continues to attract a high proportion of R&D projects, attracting more than any other region in the UK in 2010 (19% of total)[55]. Many inward investment projects come from companies that already have operations in Scotland and see the benefits of further investment. This is most likely because Scotland, due to past experience of investing here, is considered a 'lower risk' option than other potential locations. The US dominates as a source of overseas inward investment projects (i.e. excluding investment from the rest of the UK) accounting for 40% of the total, with 9% from France, 8% from Nordic countries, 6% from Germany and 5% from Japan.

3. International trade and investment challenges and market failures

There are a number of barriers to international trade. Generally companies overestimate the risks involved in exporting and entry into new markets and can face irreversible sunk costs involved in both entering and exiting new markets, such as in market research, setting up distribution, licensing or joint ventures agreements, and other arrangements where there requires investment of both time and money. This can be a particular issue for smaller companies that can often lack specialised resources (e.g. international marketing skills). Also, some companies become 'locked into' domestic markets and activities and do not consider exporting as an option.

The main market failure identified in the research relates to imperfect information. When entering new markets, companies need information about, for example, potential customers, regulations and quality standards for goods and services in the targeted markets. Searching for information is costly, and when firms only have a partial knowledge about markets, they underestimate the potential benefits of entering them[56]. It can be wasteful for individual firms to undertake high cost information gathering individually when the public sector can provide information as a 'public good'. Other barriers that have been identified include lack of internationalisation skills and knowledge and difficulty accessing social and business networks in overseas markets[57].

For inward investment, the main market failure is imperfect information. This can be related to information about a country's attributes as an investment location such as potential customers and suppliers, skills availability and the price and quality of accommodation, or the general business environment. Again, this provides a rationale for information provision[58].

Another challenge in attracting inward investment is the internationally mobile nature of many projects and competition from other locations, some of which can be lower cost. In these cases, financial incentives (such as Regional Selective Assistance (RSA) or R&D Grants) can help narrow the cost differential.

51. http://www.scotland.gov.uk/About/scotPerforms/indicator/exports

52. http://www.scottish-enterprise.com/about-us/How-we-work/Resources/Economic-Reports.aspx (Economic Performance Indicators)

53. http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Exports/IMEIntroduction

54. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/11-805-international-trade-investment-rationale-for-support.pdf and http://www.scotland.gov.uk/Publications/2008/05/22155951/6

55. http://www.ey.com/GL/en/Issues/Business-environment/2011-European-attractiveness-survey

56. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=351

57. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/11-805-international-trade-investment-rationale-for-support.pdf

58. http://www.bis.gov.uk/assets/biscore/economics-and-statistics/docs/i/11-805-international-trade-investment-rationale-for-support.pdf and http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=352

4. Scottish Enterprise/Scottish Development International (SDI) international trade and investment support

SDI is the international arm of SE, Highlands and Islands Enterprise (HIE) and the Scottish Government and provides services to support international trade and inward investment for the whole of Scotland[59].

Support for Scottish companies to internationalise addresses information barriers in particular. For example, the 'Export from Scotland' tool is an online resource providing guidance to Scottish companies on exporting or growing their international business[60]. 'Smart Exporter' is focused on upskilling the wider company base and encouraging more SMEs to become exporters for the first time by providing information on exporting opportunities and how to exploit them and by offering a package of activities through workshops, training events and a national helpline.

The 'Export Explorer' programme focuses on assisting companies with significant export growth potential through, for example, support to redesign a product to service an overseas market and market visits. Other support includes the SDI overseas network and the knowledge and expertise this offers on the ground, the provision of information on market opportunities (specialist market research), support for trade missions and learning journeys and international strategy development. Companies can also access a worldwide network of business professionals who have a strong Scottish connection (Globalscots[61]) and who can provide local market knowledge, advice and connections to help Scottish companies to break into international markets.

SDI's support to attract inward investment is based on promoting the competitive advantages that Scotland has to offer. Many inward investment successes come from companies which already have operations in Scotland and SDI works with these to promote and encourage further expansion. This may include the provision of specialist market information and supporting local and national supply chains. SDI can also provide access to financial incentives such as RSA, R&D Plus and Training Plus and facilitate access to training support through partner agencies.

59. http://www.sdi.co.uk/

60. http://www.sdi.co.uk/export-from-scotland.aspx

61. http://www.globalscot.com/

62. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=388

5. Impacts of international trade and investment support

An independent evaluation of the economic impact of SDI's trade and investment support was completed in June 2010[62]. This highlighted significant impact for both international trade and inward investment support. The analysis of international trade activities covered 2005/06 to mid 2009, and of supported companies surveyed:

- **over 40% achieved net additional sales in new overseas markets – with 80% expecting to do so in the future**
- **35% had adopted new ideas that had led to improved competitiveness**
- **80% stated that without SDI support, internationalisation would have taken longer, been at a smaller scale or would have been done less effectively**

In terms of economic impact, support had delivered net additional exports of almost £174m over the period (average of £58m per annum), net additional GVA of £75m and 1,100 net additional jobs. This represents a GVA to cost ratio of 7:1. If future expected sales are included, businesses estimated SDI support would generate a further £72m, increasing the GVA to cost ratio to 13:1.

The evaluation of SDI's inward investment activities covers the period 2001/02 to 2007/08 and the main findings include:

- **SDI-assisted inward investors had higher employment (than comparable inward investors that were not assisted) of around 10%**
- **SDI-assisted inward investors paid higher real wages (around 15%)**
- **56% reported employment/activity safeguarded as a result of SDI support**
- **53% had increased their investment at an existing site, 44% had increased training and 25% had increased R+D**
- **Half had grown since arriving in Scotland, while only 7% had contracted**

In terms of economic impact, inward investors created 18,000 net additional jobs (at a public sector cost of

per job £14,000) with an estimated GVA generated by employment over the period of £300m, or a GVA per £ cost of 11:1.

6. International trade and investment evidence and policy development

The evaluation evidence highlights the significant economic benefits to Scotland of trade and investment and this is fully reflected in the Trade and Investment Strategy which has a focus on increasing both the number of exporters and prioritising those with the biggest growth potential[63]. For example, an additional £2.5m was allocated to SE this year by the Scottish Government to target 100 new exporters with significant growth potential.

As recommended by the evaluation, much work has been undertaken with partners to raise their strategic understanding of international trade and investment, and trade and investment is now given greater priority by SE and HIE as well as by business organisations and partners.

In addition, the evaluation evidence highlighted that companies reporting the strongest impacts were those who had received strategic trade and investment support, and this now has a greater emphasis within wider company support.

7. International trade and investment data and evidence gaps

A robust evidence base already exists across trade and inward investment activities. Case studies with a small number of inward investors are currently underway to better understand the range of 'spillovers effects' from their activities in Scotland. The progress of the new Smart Exporter and Export Explorer projects will be assessed over the next two years and research to better understand the role of the Globalscot Network in assisting internationalisation is planned for 2012/13.

REGIONAL SELECTIVE ASSISTANCE (RSA)

1. Why is RSA important?

The GES highlights that differences in income, participation and growth across Scotland is a drag on overall economic performance and potential. By addressing the performance of poorer performing regions, this can boost the performance of Scotland as a whole[64]. RSA has been delivered as a regional policy tool in the UK since 1972 with the aim of addressing regional labour market inequalities. A requirement of RSA support is that investment is in areas of high unemployment (designated Assisted Areas) and that the projects create or safeguard jobs[65] The rationale for RSA is that disadvantaged areas within Scotland are best served by a 'state aid' that produces a wide range of effects at the firm level and, more importantly, at the broader regional and national level. RSA provides grant support to both indigenous and overseas companies that are seeking to invest in Scotland[66].

RSA provides SE with a very flexible source of funding that can be used to support indigenous companies and attract mobile investment. For many inward investment projects, companies are often considering a variety of off- or near-shore locations. Accordingly, a financial case has to be made within the company for an investment in Scotland against these other locations. Often the companies will have target Internal Rates of Return (IRR) that have to be met before investment is sanctioned. In these cases RSA support can make Scotland cost competitive with other locations. Often, but not always, the cost differential is driven by wage levels which may be higher in Scotland than other locations. In these instances RSA is important in filling the funding "gap", and taking the IRR either to, or near to, a level that the company's senior management sees as being acceptable.

RSA is also important in some instances for providing visible evidence that Scotland's public sector (in its widest sense) is willing to provide support to a company, with some companies looking for evidence of "civic support" in recognition of the benefits that they will bring to the Scottish economy through their investment. RSA is thus often very important, not in improving the efficiency of a company per se, but in securing net additional investment (and jobs) for Scotland that would otherwise go to a non-Scottish location.

63. http://www.sdi.co.uk/resources/reports/international-trade-and-investment-strategy-2011-2015.aspx

64. http://www.scotland.gov.uk/About/scotPerforms/purpose/cohesion

65. http://www.scottish-enterprise.com/fund-your-business/RSA.aspx

66. In England this is now known as Selective Finance for Investment and Selective Financial Assistance in Northern Ireland

RSA contributes to a number of GES targets including increasing employment and narrowing the gap in participation between Scotland's best and worst performing regions by 2017.

2. Scotland's current performance

One indicator of regional inequality is the employment rate across local authorities (LAs). The latest data show that the employment rate of the three best performing LAs was 81.4% in 2010 compared to 62.8% in the three worst performing LAs, a difference of 18.7%[67]. The gap between the best and the worst did reduce between 2004 and 2008, but rose by 5.2 percentage points between 2008 and 2009. This rise was caused by a fall in average employment rates in the three worst performing LAs, with the average rate in the best performing LAs broadly stable.

3. RSA challenges and market failures

Spatial economic inequity is the main economic challenge that RSA can help address and is the main rationale for intervention. The areas that are eligible for support are characterised by higher than average levels of unemployment and other forms of structural weakness. Inequality is not a market failure as such, but is a valid rationale for public policy [68].

Market failures that can contribute to regional inequality are linked mainly to imperfect and asymmetric information. This can lead to difficulties for companies in accessing private sector funding for projects, especially for companies considered 'high risk'. Companies may also not know of the sources of, and mechanisms to, access the necessary amounts of external finance.

By supporting investment in particular areas this may also result in 'positive externalities' such as the effects that arise from firms being located together. These include the benefits of collaboration and networking, technological spill-overs and information transfer. Without spatially focused support such as RSA, companies may not choose to locate or invest in particular locations and benefit from these externalities[69].

4. Scottish Enterprise RSA support

RSA is a discretionary grant, with the amount of aid dependent upon criteria such as the size of business, its location and a judgment as to the level of support needed for the project to proceed[70]. Generally the smaller the company the higher the level of support potentially available, as a percentage of total investment costs.

Over the period 2008/09 to 2010/11, RSA offers of almost £160m were made to total capital expenditure of the supported projects of £990m. RSA is therefore leveraging private sector investment of £830m, a 1 to 5 ratio. This supported 17,600 gross jobs. Over the three years, Scottish owned companies accounted for 58% of RSA accepted offers but just 27% of offers by value. This reflects the fact that the average offer to a Scottish company was around £0.25m: a quarter of the average offer made to a non-Scottish owned company. Scottish owned companies on average apply for smaller grants and create or safeguard fewer jobs per offer.

5. Impacts of RSA support

An evaluation of RSA, covering the period 2000-2004, outlines the main benefits or outcomes cited by RSA recipients. These include improvements to sales, improved efficiency of machinery, introduction of new or significantly improved products and increased productivity. The evaluation found high levels of additionality, with almost 30% of businesses stating that they would not have achieved similar business outcomes without RSA, and a further 30% stating they probably would have, but at a later date or at a smaller scale. Only 2% stated they would have achieved similar outcomes without RSA. The evaluation concluded that there was a significant degree of additionality associated with RSA grant support to both Scottish and inward investors and that RSA has achieved results in a cost effective way and with significant positive short-term returns to both the Scottish and UK economies[71].

The recent SDI evaluation provides more up-to-date evidence of the benefits of RSA. This considered the impacts of inward investment activity over a seven year period from 2001/02. The annual costs of SDI support over this period were estimated to be £35m, 86% of which was accounted for by RSA awards (RSA costs of £30.1m). Factoring down the total inward investment

67. http://www.scotland.gov.uk/Resource/Doc/933/0124154.xls
68. http://www.hm-treasury.gov.uk/d/green_book_complete.pdf
69. http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file45548.pdf
70. http://www.scottish-enterprise.com/fund-your-business/rsa.aspx
71. http://www.scotland.gov.uk/Resource/Doc/216893/0058124.pdf
72. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=388

impacts by 86% gives an annual figure for additional GVA of £258.3m, an annual ratio of cost to impact of 1:9[72]. If these impacts are modelled over a ten year period, the cost to impact ratio could rise to 1:17. These high benefit to cost returns are due to the competitively mobile nature of many inward investment projects and that deadweight and displacement are very low.

6. RSA data and evidence gaps

The last formal evaluation of RSA was published in 2008 and covered the 2000-2004 period. An update to this is planned for 2012/13, jointly with Invest Northern Ireland (to provide benchmarks with its similar Selective Financial Assistance scheme).

GLOBALLY COMPETITIVE BUSINESS ENVIRONMENT

BUSINESS INFRASTRUCTURE

1. Why is Business Infrastructure important?

Infrastructure is important to creating the globally competitive business environment which facilitates company and sector growth and attracts talent and inward investment. It 'provides a base for economic output and other forms of investment, and therefore is a driver of productivity'[73]. Good infrastructure facilitates growth, and growing economies need increased investment in infrastructure.

Investment by business in tangibles (e.g. plant & machinery and ICT) and intangibles (R&D, human capital, branding, process improvements etc) is a key driver of labour productivity as it generates more capacity and efficiency for the production of goods and services. Almost half of the UK's annual labour productivity increase (2.5% pa) between 2000 and 2004 was attributed to increases in the quantity of capital in use[74]. Other evidence suggests that around half of the UK's productivity gap with the US and two thirds of the gap with France is explained by lower capital per worker[75].

The scale and location of business investment is influenced by firm-specific factors, such as market opportunities, and business environment factors, such as the cost of doing business, the tax system and the availability of skilled labour. The availability and quality of infrastructure is another important influencer of business investment. There is evidence that failure to invest in the maintenance of infrastructure has a significant negative impact on economic growth while 'investment in infrastructure can play an important role in supporting and facilitating other economic activity[76].

Investment in infrastructure, such as industrial, office and R&D space, can be an important factor in attracting inward investment as well as helping existing businesses achieve high growth. Infrastructure investment can also drive 'agglomeration' benefits[77]. These are knowledge spillover, labour market pooling or input sharing economies which arise from the 'clustering' of competitors, workers, researchers and customers and raise the competitiveness of the location. SE focuses much of its infrastructure investment on key growth sector projects where these agglomeration benefits accrue, typically in cities, which underpins SE's support and contribution to the Cities agenda[78].

2. Scotland's current performance

The UK performs poorly on business investment relative to its major competitors[79]. In 2009 business investment relative to GDP was 8.8%, ranking the UK 18th out of 20 OECD countries. Seven of these countries had business investment levels at least 50% higher than the UK, including two, South Korea and Australia, which had levels double the UK rate. Business investment in Scotland is likely to be in line with that of the UK, and so below most OECD

73. http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/d/bud06_productivity_513.pdf
74. http://www.hm-treasury.gov.uk/d/pbr_csr07_macroeconomic333.pdf
75. http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/files/file42710.pdf
76. http://www.bis.gov.uk/analysis/economics/productivity-and-competitiveness
77. http://www.bis.gov.uk/analysis/economics/productivity-and-competitiveness
78. http://www.scotland.gov.uk/Resource/Doc/365367/0124252.pdf
79. OECD Economic Outlook Database 2010
80. Scottish business investment data is not available

economies[80].

Although the 2009 data represents a 19 year low for the UK, relatively low business investment in the UK is an established trend. In 2000, the business investment to GDP ratio was 12.2% ranking the UK 16th out of 20, and in 1991 it was 12.0%, ranking 13th.

To reach the top quartile of OECD countries, UK business investment would have had to have been £82.6bn or 67% higher in 2009 than the level estimated (£122.8bn)[81].

3. Business Infrastructure challenges and market failures

There is a rationale for the public sector to invest in business infrastructure based on a market failure resulting from imperfect information which can constrain private investment due to[82]:

- **limited information on the potential scale and timing of returns from investment and lack of awareness of investment opportunities, especially in emerging sectors**
- **perceptions that potential costs, benefits and timescales could be larger, smaller or longer respectively than might be realistic, for example due to fear of planning delays or complexity of public-private projects**
- **uncertainty around costs and returns, including asset disposal, from specialist business infrastructure including R&D/lab and incubator space.**

There is also a 'positive externality' market failure which can restrict private investment in infrastructure. This is where other businesses and society benefit as well as the investing business, and this can reduce the incentive to invest, resulting in the under provision of necessary infrastructure. Utility and transport infrastructure are examples of this.

Market failures can exist in the availability of suitable sites for smaller companies where private developers feel they cannot cover the sunk costs involved in development. Also, the private sector can also fail to provide a solution when land reclamation and remediation needs to take place before a site can be developed[83]. Further, site availability varies significantly by geography, with rural areas often poorly served. This provides an equity as well as market failure rationale for SE's infrastructure interventions in rural areas.

4. Scottish Enterprise Business Infrastructure support

SE's infrastructure investments are mainly focused on Scotland's growth sectors and are designed to address the market failures and challenges outlined above, and to lever in private sector investment. They cover a range of projects designed to improve the business environment and to demonstrate the opportunities for investment in Scotland. Examples include:

Infrastructure Project	Growth Sector
National Renewables Infrastructure Fund (NRIF)	Energy
BioQuarter	Life Sciences
International Technology and Renewable Energy Zone (ITREZ)	Energy
Dundee Waterfront (Seabraes Yard and V&A)	Creative Industries
Advanced Forming Research Centre (AFRC)	Enabling Technologies
Energy Park Fife and Energetica (NE Scotland)	Energy
Clyde Waterfront:	
– Scottish Hydro Arena, SECC	Tourism
– Creative Clyde	Creative Industries
– International Financial Services District (IFSD)	Financial and Business Services
Edinburgh International Conference Centre	Tourism
Aberdeen and West of Scotland Science Parks	Multi sector

Many of SE's major infrastructure projects are delivered in partnership with other public and private sector organisations. While SE plays a leading development and delivery role on most of these

81. http://www.oecd.org/document/0,3746,en_2649_201185_46462759_1_1_1_1,00.html
82. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=483
83. http://www.emda.org.uk/res/docs/RES_TechPaper2_InterventionFramework.pdf

projects, it plays a key supporting role on other ones critical to Scotland's economic development, notably transport, energy transmission and digital infrastructure projects.

5. Impacts of Business Infrastructure support

The projects highlighted above are major long-term projects which take years to develop and years more to return economic benefit. Some are in their infancy while others have been developing over the last ten or more years. They share the characteristic that much or all of their economic impact will accrue in the future, and so assessment of their impact is mainly based on appraisal rather than evaluation. Examples include:

- **Edinburgh BioQuarter aims to position Edinburgh and Scotland as one of the leading global locations worldwide for biomedical research. The project is expected to generate on-site investment of £250m, create net additional employment impact at the Scottish level of up to 6,800 jobs and net GVA impact of up to £1bn, an almost 8 to 1 GVA impact to spend return over a 25 year period**
- **ITREZ will be a global R&D hub where developers, suppliers, academics, researchers and support organisations will co-locate, driving research, collaboration, innovation and commercialisation in the offshore wind sector. ITREZ includes the R&D operations of major companies including SSE, Scottish Power Renewables and Gamesa as well as knowledge exchange and international marketing activities. It could create 700 high value jobs and £100m of net GVA over ten years**
- **Scottish Hydro Arena at the SECC in Glasgow could host 140 events per year, creating 2,500 jobs and net cumulative GVA of £185m over the 2014-33 period, representing a GVA return of almost £10 to every £1 of SE investment**
- **Energy Park Fife is a 140 acre brownfield development which is being developed as a strategic industrial location for manufacturing and assembly operations related to the offshore wind sector. It already hosts companies heavily engaged in the sector including BiFab, who manufacture sub sea 'jacket' structures for use in both the offshore wind sector and also the traditional oil and gas sector. Over the 2010-29 period, almost £130 million of net GVA could be created, generating over £20 GVA per £1 that SE may invest there.**

6. Business Infrastructure evidence and policy development

SE's approach to investment in infrastructure has evolved over time in line with its strategic objectives and its understanding of where it delivers most value. This has resulted in the current focus on infrastructure investment on unlocking the potential in Scotland's key growth sectors.

7. Business Infrastructure data and evidence gaps

As projects develop, monitoring and evaluation data will be used not just to establish infrastructure project outcomes and impacts, but to cross-reference to projections made at project appraisal stages to assess for over-optimism or pessimism. This will enable SE to better estimate the potential returns from proposed infrastructure projects and thus better prioritise its investments.

EQUITY FUNDING

1. Why is Equity Funding important?

Small and medium-sized enterprises (SMEs) potentially constitute the most dynamic firms in the economy. However, they often face economic and institutional barriers to growth including limited access to working capital, funds to invest in innovation and growth and to long-term credit. A lack of adequate finance is a significant obstacle to the development of both viable early stage and established businesses with growth potential (the importance of high growth companies to overall economic growth has already been highlighted). Research has found that the not attracting enough funding was a constraint on growth and development for many spin-out companies[84].

Although only a small proportion of companies seek equity finance (estimated to be 1-2% of SMEs) it is

84. http://clients.digipage.co.uk/?userpath=00000000/00007479/00025542/&page=6

an important source of funding for young, innovative companies that have the potential to achieve high growth. As a result of a number of market features and failures, there is an 'equity gap' where SMEs are seeking capital investment in amounts too large for business angels and too small for traditional private equity funds. A second equity gap emerges where some businesses that had previously received very early stage funding are not able to access further rounds. This has been exacerbated over the last decade or so as investors sought to minimise risk by supporting companies at a later stage in their development[85]. The consequences are that some businesses cannot achieve their full potential and generate additional economic benefits.

The GES highlights that gaps in access to capital are constraining Scottish businesses from reaching their full potential and that there is a need to build capacity in the investment community to remove barriers to investment[86].

2. Scotland's current performance

The SME Access to Finance research in 2010 provides evidence on credit conditions in Scotland[87]. For all tyes of finances, it concluded that overall lending to Scottish SMEs in 2010 was lower than in 2009 due to a combination of weak demand and constraints of supply. The demand for finance was lower than 2009 reflecting, among other things, an easing of working capital pressures and an increase in the proportion of firms revising growth objectives downwards. The research notes that there is a mixed picture on new supply of finance. Outright rejection rates for businesses have increased and supply for new lending appears constrained, yet there is some evidence of an overall improvement in the total amount of finance secured, probably through fewer but larger deals.

Considering risk capital in particular, between 2005 and 2008 the annual value of investments rose steadily reaching almost £120m (in 150 companies) by the end of the period. The number of investments declined between 2005 and 2008, but rose significantly in 2008. Also, the median value of deals generally rose over the 2005-08 period[88]. Research is currently underway to update the Risk Capital market report for the 2009-11 period.

85. http://www.bis.gov.uk/assets/biscore/enterprise/docs/b/11-1009-bis-equity-finance-qualitative-reviews-ukhtf-bridges

86. http://www.scotland.gov.uk/About/scotPerforms/purposes

87. Scottish Government, SME Access to Finance 2010

88. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/PQR/Risk-capital-market-in-scotland-2008.ashx Note the Risk Capital Market report is currently being updated to cover the 2009-2011 period

3. Equity Funding challenges and market failures

A lack of finance for all companies does not necessarily constitute the existence of funding market failures. Market failures exist where viable businesses (e.g. with a proven track record of sales and profits and with growth potential) or early stage businesses or investment opportunities experience difficulties in raising appropriate levels of equity and debt capital required for development[89].

Recent research has highlighted the structural problems, features and market failures that have combined to cause this funding/equity gap. On the supply side, causes include[90]:

- **the high cost of due diligence and transactions that tend to be fixed and so represent a larger proportion of an investment in early stage, smaller deals compared to larger ones. This acts as a disincentive to investors to invest in the smaller deals, even if these are with more developed businesses. Also, without due diligence and research information, it makes it more difficult for investors to distinguish good investment opportunities from bad ones**
- **the perception of risk – information on returns from early stage growth capital investment is generally limited as only a few growth funds exist with comparable data and this can make investors more 'risk averse'. In this context investors may maintain their existing portfolios rather than identify new investment opportunities**
- **past poor performance – historically, there have been low returns and yields on investments in high tech companies**
- **fund manager remuneration – later stage and buyout deals have provided better returns and personal remuneration for fund managers so that there is less incentive for them to invest in earlier stage deals**
- **limiting risk exposure – the private equity/venture capital industry has in recent years sought to limit its exposure to risk by focusing on buyout and secondary purchase investments, which tend to be larger and are perceived to be less risky**

89. Scottish Enterprise, Market Failure in the Scottish Risk Market, R T Harrison report, 2000s

90. The Provision of Growth Capital to UK Small and Medium Sized Enterprises (BIS, 2009), BIS equity finance programmes qualitative reviews of: a) UKHTF and b) the Bridges Fund (BIS, 2011)

On the demand side (amongst SMEs) the main market features and failures are:

- **lack of information – SMEs may not be sure of the best sources of finance for development or how to obtain it at acceptable costs**
- **lack of investment readiness – SMEs, even with a track record, may be unable to present themselves as investable opportunities, e.g. they may have poor business plans and models or inadequate management skills**
- **aversion to equity – a reluctance to dilute ownership further or share IP rights**

The factors above, and the fact that capital has gone into higher performing, less risky and more liquid capital funds and alternative assets (especially when markets are volatile and there is significant investment switching) have all led to a lower than optimal supply of funding to viable SMEs. Also, in the current period of credit and economic uncertainty, the causes and effects of the equity gap have become more prominent, now affecting mature businesses with positive track records.

Not all the causes of the funding/equity gap are market failures; some are simply features of the growth capital and equity funding market. However, they do result in viable growth potential SMEs facing difficulties in access funding and so provide a strategic rationale for public sector risk capital support.

4. Scottish Enterprise Equity Funding support

The Scottish Investment Bank (SIB) supports the development of Scotland's private sector SME funding market to ensure both early stage and established businesses with growth and export potential have adequate access to growth capital[91]. SIB offers a suite of investment funds:

- **the Scottish Seed Fund (SSF) provides company loans and equity investment from £20,000 to £250,000 to early stage companies that possess growth ambitions**
- **the Scottish Co-investment Fund (SCF) can invest between £50,000 to £1m in company finance deals up to £2m in partnership with private sector investors**
- **the Scottish Venture Fund (SVF) can invest £500,000 to £2m alongside private sector partners, in finance deals of between £2m and £10m**
- **the Scottish Loan Fund (SLF) provides mezzanine loans ranging from £250,000 to £5m to qualifying Scottish SMEs on a wholly commercial basis.**

The SSF, SCF and SVF are equity products which adopt an innovative co-investment and shared risk intervention model to encourage more private investors to invest in early stage Scottish companies with high growth potential. The SLF is a debt product which is aimed at established growth and export SMEs (with turnover above £1m). The SLF is managed by a third party fund manager, with an investment of £55m from the public sector and £39m from private sector institutional investors.

5. Impacts of Equity support

An ongoing independent evaluation of the SSF and SVF has demonstrated that SIB Funds are supporting business growth while contributing to future economic growth (GVA) and job creation[92]. The evaluation considered the benefits up to 2010 to 83 companies supported through SSF and 28 companies supported through SVF.

The evaluation highlighted high levels of investment additionality. For example, 55% of SSF private co-investors stated that they would not have invested in the companies without SIB (40% of SVF private co-investors) and 36% would only have made a smaller investment (33% of SVF private co-investors). No investors stated they would have made the same level of funding without SIB co-investment. The evaluation also concluded that the SIB funds had attracted a number of new and international private investors to the Scottish market.

The potential economic impacts of the SSF support delivered between 2006 and 2010 could be £110m net additional GVA by 2021 and the creation of 365 net additional jobs. The potential impacts of SVF support delivered between 2006 and 2010 could be £150m net additional GVA and the creation of 530 net additional jobs by 2021. A number of the companies supported by both funds are pre-revenue, and this reduces the cumulative GVA impacts. While these companies are pre-revenue, they are adding value to the economy in terms of high value jobs and investment in R&D activity.

91. http://www.scottish-enterprise.com/microsites/scottish-investment-bank.aspx

92. Publication date – Summer 2012 – findings to be incorporated with an update to the Equity Market report.

The evaluation concludes that both funds demonstrate value for money. A further key finding is that the investments were 'necessary but not sufficient' to bring about the impacts and that wider support provided by SE and partners, such as strategy development, internationalisation and innovation support, was a very important contributing factor to achieving these impacts. Thus, the provision of equity finance cannot be viewed as a product that operates and delivers impacts in isolation.

6. Equity Funding evidence and policy development

SIB pro-actively manages all investments to achieve meaningful commercial returns and to support growth. To maximise opportunities for growth, SIB has built strong relationships with companies invested in, account managers and specialist teams within SE. This is an ongoing area of focus to support companies to achieve their growth ambitions. SIB ensures that as many of the supported companies as possible are also account managed to ensure that, post investment, they can benefit from wider SE support. The evaluation evidence highlights the important role that wider support plays in assisting the growth of companies that have received SIB funding, and in particular internationalisation support.

The evaluation also highlights that one reason that funding opportunities are rejected by private investors is a lack of investor readiness. To help address this, SIB is working with Financial Readiness Specialists who work alongside SE Account Managers to ensure that companies are supported at the stage when they need to access external finance for the first time. Alongside this, SIB will continue to engage with wider SE teams to support a strong, quality pipeline of eligible deals.

7. Equity Funding data and evidence gaps

The evaluations highlighted that many of the companies are pre-revenue and early stage, and close ongoing monitoring of supported companies will allow an assessment of actual performance against that projected, and this will allow the evaluation findings to be regularly updated.

The SLF is in its early stages of operation, and a process review in 2012/13 will assess early performance. Research into micro-finance and the supply and demand for finance for life sciences companies is also planned for 2012/13.

GLOBALLY COMPETITIVE SECTORS

The Scottish Government Economic Strategy highlights that a number of sectors offer particular opportunities for growth by exploiting existing comparative advantages or capitalising on Scotland's unique natural assets[93]. These are sectors where Scotland has distinctive capabilities and businesses with the potential to be internationally successful. These growth sectors are:

- **Creative Industries**
- **Food & Drink**
- **Life Sciences**
- **Tourism**
- **Energy (including renewables)**
- **Financial & Business Services**
- **Universities**

As well as these, **Scotland's Technology and Advanced Engineering** sector underpins and forms an essential part of the supply chain for the growth sectors above. The growth sectors along with the technology and advanced engineering sector account for almost 40% of Scotland's GDP, over 30% of Scotland's employment and 60% of overseas exports.

In addition, SE works closely with a number of other sectors that make a sizeable contribution to Scotland's economy and where opportunities for growth exist. These include:

- **Textiles**
- **Aerospace, Defence & Marine**
- **Forest & Timber Technologies**
- **Construction**
- **Chemical Sciences**

93. http://www.scotland.gov.uk/Publications/2011/09/13091128/5

CREATIVE INDUSTRIES

1. Why is the Creative Industries sector important?

Within creative industries, SE's key focus is in the area of digital media. Digital Inspiration, the strategy for the sector, highlights that digital media and its underpinning technologies are increasingly pervasive[94]. In economic terms, the rapid development and adoption of new digital communications technologies is fuelling massive global demand for media and entertainment. The convergence of technologies with new distribution channels creates a significant opportunity for the development of new content, services and platforms in fast growing global markets. This convergence has greatly expanded the range of channels and devices through which consumers can now access content including digital television platforms, broadband internet, mobile phones, games consoles and handheld devices.

According to the latest PWC Global Entertainment and Media Outlook (2011-2015)[95], the industry was worth $1.48 trillion in 2011 and is forecast to grow to $1.85 trillion by 2015, with the strongest growth in internet advertising, video games and internet access. For Scotland, these growth markets offer massive potential. Scotland has world class companies in this sector and global centres of research excellence.

2. Recent sector performance

Creative industries GVA was £3bn in 2008, a rise of £1.3bn since 2003, and the sector employed 63,000. Sector overseas exports in 2010 reached £1.4bn, almost 7% of Scotland's total. Over 75% of creative industries turnover is provided by three sub sectors: computer games, software & electronic publishing; and architecture.

3. Creative Industries challenges and market failures

A particular challenge faced by the sector is access to investment and growth finance. The reasons for this include a lack of business 'investor readiness', particularly related to the business skills and entrepreneurial capacity of the management team, and not enough investors that are knowledgeable about the sector.

Digital media companies can also face barriers to creating and exploiting IP for commercial return. Low levels of innovation can be due to a lack of information on the costs and benefits of technical and business development, and 'positive externalities', where it is recognised that competitors could benefit from the technical knowledge developed by a company[96]. Combined, these suggest strong barriers to innovate and willingness to invest in technological development. Further, the risk element associated with R&D activity, where future returns are often undefined, can negatively affect technology investment decisions.

4. Scottish Enterprise Creative Industries support

SE supports creative industries companies through enterprise and company growth, innovation support, internationalisation and access to finance. Innovation and R&D support includes encouraging and supporting innovation in business models and content generation, encouraging new kinds of innovation particularly in generating revenue from new digital platforms, and developing connections between technology providers and content producers. The attraction of sector specialist investors who have a strong record of investment in digital media is key to addressing the challenge of access to investment and growth finance.

Sector specific support includes exploiting assets at Pacific Quay (as part of Creative Clyde) and the Seabraes Yard in Dundee, focusing on the digital media growth opportunities in Dundee. In addition, SE launched Interactive Scotland in March 2010 which provides a platform to address several of the areas for action in the industry strategy, through the establishment of a business advisory service.

94. http://www.digitalinspiration.org.uk/content/default.asp
95. http://www.pwc.com/gx/en/global-entertainment-media-outlook
96. http://www.pedz.uni-mannheim.de/daten/edz-h/gdb/06/innovation_

5. Impacts of Creative Industries support

An evaluation of Interactive Scotland is currently underway and initial findings are that a number of companies supported have already benefited through new business contacts, greater awareness of public support and improved business skills. Despite the early stage of the project, the evaluation estimates that the project could deliver a cumulative, net additional £9m of GVA to the Scottish economy by 2014, a return of 6 to 1 on SE investment.

6. Creative Industries evidence and policy development

SE and the Technology Strategy Board (TSB) are exploring establishing a 'Launchpad' investment initiative, to provide matched funding to small businesses, following a successful pilot in Shoreditch, London[97]. Research findings suggest strong potential demand for a Launchpad initiative in Scotland and initial discussions with the TSB have identified Creative Clyde as a first location, with the potential, depending on the outcome, to look at further activities in other cities such as Edinburgh and Dundee.

7. Creative Industries data and evidence gaps

Research is planned to assess whether SE's innovation products fit the needs of Scottish digital media companies and whether additional products, more tailored to the post-production process, are required.

Within the industry, freelance employment is a feature and this may raise difficulties/barriers in accessing some types of support. Research is required to investigate this, and its implications, in more detail.

FOOD & DRINK

1. Why is the Food & Drink sector important?

The Food and Drink sector, including food processing, agriculture, fishing and aquaculture, makes a significant contribution to the Scottish economy, accounting for £11.9bn turnover and £4.8bn GVA in 2009. The sector employs 113,000 people across the supply chain, including sectors such as packagers, labellers and bottlers. Scotland has:

- **world-class research including land use, animal health & genetics, brewing & distilling, life-sciences and nutrition & health**
- **a strong natural asset base – one of the top three salmon producers in the world, just under three quarters of the UK fish catch, approximately one quarter of the UK beef herd and almost half of soft fruit production**
- **an internationally successful whisky sector, accounting for around a quarter of UK exports, with a GVA growth of almost 100% since 2000**
- **a significant contribution to both urban and rural economies**

The sector also has strong links with the Tourism and Life Sciences growth sectors.

2. Recent sector performance

Since 2007, food and drink GVA has risen 11.3% compared to a decline of just over 2% for the economy as a whole, with both the food and drink subsectors growing strongly[98]. In 2010, food and drink manufacturing overseas exports reached £4bn, of which £3.3bn was drink exports (mostly whisky)[99]. Exports have risen by 50% since 2005, double the rate of all Scottish exports. The sector is Scotland's biggest exporter (around 20% of total Scottish exports) and its continued growth is key to achieving the Scottish Government's ambition to increase Scottish exports by 50% by 2017.

3. Food & Drink challenges and market failures

There a number of key challenges for the industry to overcome in order to fulfil its potential[100]. These include:

- **increasing productivity and exports, particularly in the food sector**
- **increasing the number of companies of scale**
- **overcoming route to market challenges, particularly for international opportunities**

97. http://www.innovate10.co.uk/launch-pad/about

98. http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/GDP2011Q3XLS

99. www.uktradeinfo.com

100. http://www.scotland.gov.uk/Publications/2009/10/23153824/0 http://www.scotlandfoodanddrink.org/media/10025/industry%20strategy%20resfresh.pdf Interim Evaluation of Scotland Food and Drink (Ekos, 2009)

- **increasing investment in skills and innovation**
- **accessing funding to build scale through expansion and collaboration**

Evidence suggests information market failures are a barrier for the sector (the sector is to a large extent fragmented which inhibits sharing of information and communication) and that some small businesses can face challenges engaging with larger ones as part of the supply chain (the sector is predominantly made up of small scale businesses that can have less ability to access opportunities within the market due to limited resources and an inability to effectively engage with larger businesses within the wider supply chain)[101].

For the health food and drink market, which has been identified as having significant growth opportunities, challenges include access to the right skills, limited access to market intelligence/foresighting and lack of investment.

4. Scottish Enterprise Food & Drink support

As well as support through account management, sector specific support includes:

- **core funding to Scotland Food and Drink, the industry body**
- **funding industry intelligence research**
- **Insights/Food Forum that aims to stimulate collaboration allowing companies to cooperate, share ideas and achieve sufficient scale to compete globally**
- **Food & Health Innovation Service to increase the level of business innovation**
- **Scottish Food & Drink Skills Academy**

5. Impacts of Food & Drink support

The evaluations of Scotland Food & Drink and of the UK Food and Drink Premium Market Development projects suggests that, despite good progress in addressing market failures and challenges, a number still exist, such as industry fragmentation, and there is a continued rationale for support[102] [103]. The evaluation of the Scottish Food and Drink Information Service found that it provided for its intended market well and satisfaction among food and drink companies was generally high. The Service has made good progress against all of its objectives in terms of the business benefits being delivered, except for productivity improvements. Total public sector expenditure on the Service over its lifespan (2003-2011) is estimated at £2.1m with total net additional cumulative GVA of around £6million[104].

6. Food & Drink evidence and policy development

SE's support to the sector has been fully driven by the priorities identified in the industry strategy 'Fresh Thinking'[105]. This strategy was developed with strong input from industry and sector organisations following a comprehensive economic research and consultation process. This strategy, and the research undertaken during its development, provides the core evidence base on which SE and strategic partners have developed their approach to supporting the sector.

Scotland Food and Drink has developed a corresponding action plan to deliver the strategy, identifying a range of strategic priorities for action including growing the processing and primary sub-sectors, sustainability, R&D spend/innovation, exports, productivity growth, and growing scale and collaboration. This has meant SE a move away from financing and delivering certain activities (e.g. Access to Markets) to leading in areas such as export support. SE is also focusing on R&D and innovation.

7. Food & Drink data and evidence gaps

There is currently work underway to develop monitoring and evaluation plans for all sector partners which will track the GVA impact of step-change projects. A full impact evaluation of Scotland Food and Drink is planned for 2013/14.

101. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=445&taxonomy=FAD

102. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=445

103. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=318

104. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=29&taxonomy=FAD

105. http://www.scotlandfoodanddrink.org/media/10025/industry%20strategy%20resfresh.pdf

LIFE & CHEMICAL SCIENCES

1. Why are the Life & Chemical Sciences sectors important?

The life sciences industry contributes £1.4bn GVA to the Scottish Economy. Scotland is home to the second largest life science cluster in the UK and one of the most sizable life science clusters in Europe, with significant academic and business strengths and internationally recognised capabilities in stem cells/ regenerative medicine, clinical/translational medicine, medical technologies (MedTech) and pharmaceutical services (Pharma Services). Scotland is notable for its expertise in drug discovery and bioinformatics. In addition, animal health, agriculture and environmental research in Scotland is recognised as world class; this will be influential in addressing future markets around sustainability and the low carbon environment[106].

Many of Scotland's industries including chemicals, life sciences, electronics and food and drink have chemical sciences at their core. These industries are dependent on innovative chemistry to create new products, technologies and new market opportunities. The Chemical Sciences industry contributes £2bn GVA to the Scottish economy. Significant global opportunities exist in the petrochemical, speciality and fine chemicals markets which ensure that the chemical sciences sector will continue to heavily contribute to the Scottish Government's ambitions in the areas of Low Carbon and increased export performance, as well as offering solutions to global societal challenges.

Industrial Biotechnology has the potential to contribute to a number of sectors including forestry and timber, life sciences, chemical sciences and energy, for example through bio-based (or bio-transformed) chemicals and fuels. Other emerging areas such as development of carbon utilisation technologies and also oil molecule efficiency technologies are being investigated.

2. Recent sector performance

There are over 640 life science organisations employing more than 32,500 people (2010 figures)[107]. There are around 140 medical technology companies that collectively generate around a third of life sciences sector turnover[108]. The life sciences sector has seen a 75% increase in turnover, currently £3bn annually, since 1998 and contributes £1.5bn to Scotland's GVA. Productivity is over £91,000 per employee, compared with the Scottish average of just under £60,000. Business expenditure on R&D (BERD) is £149m, almost 25% of Scotland's total[109], with total international exports in 2010 of £815m, 4% of Scotland's total[110].

There are around 210 chemicals companies in Scotland generating £9bn revenue, £2bn GVA and employing around 70,000 staff[111]. The sector is highly productive with GVA per employee of £161,000. BERD is £9.4m with total exports from the chemicals sector in 2010 of £3bn[112 113]. In addition, Scotland has the UK's number one academic chemistry department at the joint Chemistry Research School of Edinburgh and St. Andrews Universities (EaStChem).

3. Life & Chemical Sciences challenges and market failures

Scottish based life science companies face challenges in[114]:

- **accessing funds – especially for later stage growth and internationalisation and to reduce the reliance on local business angel funding**
- **accessing quality specialist staff – both recruitment of experienced senior management teams and appropriate experts at critical stages of company development**
- **stimulating business innovation**
- **health care product reimbursement in UK – accessing and understanding the NHS to achieve collaborative working in early stage product development**

106. http://www.scotland.gov.uk/Publications/2010/01/26105228/0
107. Based on Scottish Enterprise 'sourcebook' data
108. http://www.lifesciencesscotland.com/media/14388/lss-strategy-2011.pdf
109. http://www.scotland.gov.uk/Resource/Doc/933/0123568.xls
110. http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/KeySectors/Database
111. http://www.scotland.gov.uk/Resource/Doc/933/0120551.xls
112. http://www.scotland.gov.uk/Resource/Doc/933/0123568.xls
113. http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Exports/
114. http://www.scotland.gov.uk/Publications/2010/01/26105228/2 GCSIntroduction

For Chemical Sciences, the main challenges for the sector are to:

- **maintain global competitiveness and sustainability of the existing business base in the face of merger and acquisition activity**
- **address the lack of collaboration between academia and business**
- **address skills availability**
- **tackle the limited public knowledge, understanding and perception of the sector**

SE research and evaluation studies highlight the existence of information market failures[115] [116], particularly around the assessment and quantification of the outcomes and benefits of academic/industry collaborations and investments in research and innovation. The very nature of some life science research activities means that outcomes can be uncertain and highly risky. Stem cells and regenerative medicine is a particular example where innovation is frequently non-linear in nature (i.e. does not always follow the traditional commercialisation process). In addition, the end market, the level of demand, the cost of and the willingness to pay for new products can be uncertain[117].

4. Scottish Enterprise Life & Chemical Sciences support

A relatively small number of companies contribute a large portion of output for the sector and given the highly competitive global business environment, it is important that these companies are retained in Scotland. Therefore, the focus is to build (and retain) more resilient and ambitious companies and associated supply chains by enabling companies to translate innovation into new products and services, and evolve into stronger businesses, for example by encouraging mergers and acquisitions and boosting manufacturing capacity and international sales. Life Sciences sector support is focused on:

- **anchoring companies that can deliver significant economic benefit for Scotland**
- **building more resilient and ambitious companies and supply chains focused on value generation**
- **attracting inward investment and talent**
- **realising maximum impacts from transformational sector projects around key areas of strength and market opportunity**

SE support is focused on intellectual asset commercialisation, innovation support and entrepreneurship, R&D collaboration, access to capital, internationalisation and business growth.

A key feature of many of the interventions is a focus on addressing co-ordination and information failures. A number of projects focus on developing strategic collaboration between NHS, academia and industry to grow the sector. For example, Edinburgh BioQuarter is a life sciences real estate, research and commercialisation project that will establish Edinburgh and Scotland as one of the world's top centres for biomedical commercialisation. Health Science Scotland is a partnership between Scotland's four medical schools, associated Health Boards, Chief Scientist Office (CSO) and SE to enable translational medicine research collaborations with industry[118].

For Chemical Sciences, the focus is on:

- **industry engagement including launch and implementation of a refreshed sector strategy**
- **growth and retention of the sector in Scotland**
- **development of transformational projects such as the National Plan for Industrial Biotechnology, Grangemouth Manufacturing Centre and development of Centres of Excellence which lever Scottish academic capability aligned to industry strength to exploit global opportunity**

5. Impacts of Life & Chemical Sciences support

SE appraisal and evaluation evidence highlights that significant impacts of life sciences support are likely to emerge in the medium to longer term (i.e. 5-15 years) as a result of the time taken and risk associated with bringing a novel healthcare product to market. There are shorter-term impacts that can be realised en route, particularly by the support services and MedTech businesses. Examples of the impact of Life Sciences sector support include:

115. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=390

116. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=474

117. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=295

118. www.healthsciencescotland.com

- **the Stem Cell Translational Fund (SCTF) was set up to respond to evidence of access to funding challenges and the lack of a critical mass or supply of specialist life science investors in Scotland. Support has helped deliver outcomes such as new patents, licences and collaborations. Without the Fund's support, these projects would have remained at the basic research stage or been severely delayed[119].**
- **the evaluation of the Translational and Clinical Medicine range of interventions including TMRC/ TMRI[120], Generation Scotland, and NRSPCC[121] concluded that there has been substantial enhancement of collaboration between the academic sector, NHS and industry resulting in an increase in industry sponsored projects. Benefits for business are expected to emerge over the longer term[122].**
- **the Edinburgh BioQuarter is expected to generate on-site investment of £250m, create net additional employment impact at the Scottish level of up to 6,800 jobs and net GVA impact of up to £1bn, an almost 8 to 1 GVA impact to spend return over a 25 year period[123]. As well as economic impacts, a broad range of wider benefits could be achieved including development and protection of IP and culture change within the academic base (such as encouraging a more commercial focus, a stronger engagement by academia with industry and greater exposure to venture capital)**

Examples of the impact of Chemical Sciences sector support include:

- **a review of Chemical Sciences Scotland activity highlighted that SE investment had resulted in a private investment leverage of 8 to 1, more than 30 collaborations between industry and academia, growth of new businesses and that more than 30 businesses participated in SDI trade missions resulting in estimated increased orders of £5m[124]**
- **a review of the Earls Gate project at Grangemouth, a joint venture with CalaCHEM, shows that new chemicals companies locating on this site have created more than 400 jobs. Further investment is to be made in the Grangemouth facility to attract more business to the site**
- **the 'Grangemouth project' as a whole, which aims to develop further the land assets of existing chemical sciences businesses and to attract new manufacturing activities, could by 2025 create an additional 6,000 jobs and an additional £390m of GVA per annum if all milestones are achieved[125]**

6. Life & Chemical Sciences evidence and policy development

Evaluation and appraisal work has highlighted the importance of monitoring and tracking the outputs of R&D and commercialisation activities to help identify: appropriate routes to impact, that the projects are en route to achieving impact, and for those that are not, actions that are required.

7. Life & Chemical Sciences data and evidence gaps

Evidence gaps have been identified in relation to assessing the economic benefits of attracting international and industrial research income into Scotland. Foresighting activity is required to assess areas of opportunity in emerging BRIC (Brazil, Russia, India and China) markets and oil utilisation. In addition, an assessment of the demand for and supply of sector focused risk capital will be undertaken.

TOURISM

1. Why is the Tourism sector important?

The tourism sector contributes in the region of £4.4bn GVA to the Scottish economy and employs over 200,000 people in around 20,000 tourism-related businesses. Overall, the Scottish tourism sector accounts for 11% of total service sector GVA (for the UK as a whole, tourism accounts for 9% of service sector GVA). The sector includes hotels, restaurants, bars, camping sites, travel agencies, museums, sporting activities and other recreational activities.

Scotland's tourism sector has distinctive strengths, built on Scotland's natural and built environment and culture, which makes it a distinct destination in the international tourism market, and has globally

119. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=474

120. Translational Medicine Research Collaboration/ Initiative

121. NHS Research Scotland Permissions Coordinating Centre

122. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=390&taxonomy=LSC

123. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=390&taxonomy=LSC

124. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=485

125. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=486

competitive advantage with assets that cannot be relocated outwith Scotland and services that can only be delivered from here[126].

Tourism has a key role to play in relation to regional equity, being the mainstay of many rural economies across Scotland. There are also strong links to other sectors, for example food and drink (e.g. Experiencing Scotland, a project working to improve the quality and provenance of food within tourism facilities) and textiles.

The tourism sector has proved resilient, despite current economic challenges and significant international competition. The industry is playing a key role in supporting the economic recovery, especially in maintaining levels of employment and attracting over £3bn spend by tourists from the rest of the UK and overseas[127].

2. Recent sector performance

Prior to the recession, tourism output rose at the same rate as the economy as a whole, although between 2008 and 2011 output declined at a slightly faster rate[128]. There was also a slight decline in both visitor numbers and spend in 2010. Overall tourist trips to Scotland fell by 2% in 2010, when compared with 2009, with spend falling by 0.8%.

Within the UK since 2005, Scotland has attracted a disproportionate share of UK domestic visitor expenditure (13% compared to a population share of 8.4%). Scotland's share of spending by overseas visitors to the UK has been just over 8%[129].

The vast majority of the volume and value of Scotland's tourism is accounted for by the domestic markets - Scotland, England, Wales and Northern Ireland. In 2010, their total share was 84% of trips and 65% of visitor spend. However, 35% of Scotland's total visitor spend is delivered by the 16% of trips made by international visitors, highlighting the high value of many foreign visitors. Their trips are often longer than those of domestic visitors, involving more spend per trip[130].

3. Tourism challenges and market failures

Tourism is an SME dominated industry. Challenges exist around productivity, innovation, collaboration, skills, information on markets, competition (from other countries) and access to investment funding[131].

In 2008, productivity per employee was £20,200[132] compared to the Scottish average of £29,500 for the service sector as a whole. There are a number of possible reasons for such low productivity including the proportion of the workforce that are part-time, the seasonal nature of some activities, the occupational structure, low skill levels and low investment and innovation levels[133].

Recent research also highlights significant challenges related to the quality of management in some businesses and high staff turnover resulting in reluctance to invest in skills training. In areas outside the main cities there are challenges in relation to the supply of tourist accommodation, transport and IT connectivity.

Evidence suggests the main market failures are[134]:

- **information asymmetries – as an industry dominated by small firms, many do not have the resource or knowledge to be able to easily source the business advice/access the data that will help them to grow**
- **externalities – individual businesses do not tend to make investments on their own that will benefit other businesses, resulting in a need for collaboration and co-ordinated action**
- **public goods – tourism firms are heavily dependent on the quality of the physical environment and infrastructure and publicly provided facilities. Visitors are frequently attracted by what is available within a destination as much as by the services that can be provided by the companies in the area. All of the companies benefit from the provision of these facilities but if it is left to the companies alone they will not be best, if at all, provided**

4. Scottish Enterprise Tourism support

SE delivers its support through both its Company Growth work (including Account Management) and a range of specifically targeted project interventions

126. http://www.scotland.gov.uk/Publications/2009/12/21143709/1

do?ui=basic&action=show&id=474

127. http://www.visitscotland.org/pdf/Tourism%20in%20Scotland%202010.pdf

128. http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/KeySectors/Database

129. http://www.stforum.co.uk/wmslib/PDF_Docs2012/TLG_report_of_trends_and_markets_research_final_-_updated_15_February_2012.pdf

130. http://www.stforum.co.uk/wmslib/PDF_Docs2012/TLG_report_of_trends_and_markets_research_final_-_updated_15_February_2012.pdf

131. http://www.scotland.gov.uk/Publications/2009/12/21143709/1

132. http://www.scotland.gov.uk/Resource/Doc/933/0104706.xls

133. http://www.scotland.gov.uk/Publications/2009/12/21143709/1

134. "The Economic Case for the Visitor Economy"

to address the challenges and market failures highlighted above. These include:

- **industry leadership – to generate higher levels of industry ownership of, and commitment to, the development and delivery of the industry strategy**
- **innovation - to establish a culture of innovation in the industry based around effective use of market intelligence, business collaboration and investment in new products and services, for example through Tourism Innovation Scotland, the Innovation Toolkits and the Innovation Fund**
- **destination development - to realise the full tourism and economic value of the main tourism destinations in the SE area through a coordinated approach to investment in improving the quality of the visitor experience; delivered through a variety of capacity building, business development and infrastructure support across the six key destinations**
- **product development - to encourage investment to maximise the value of key Scottish tourism assets such as golf, the outdoor environment and business tourism**
- **company growth - including engagement with the wider tourism company base to develop strong leadership and management skills**

5. Impacts of Tourism support

Since 2008/09, just under £1.5m has been invested in the Tourism Innovation Programme. An evaluation in 2012 found that there remains a strong case for continuing with the programme and that net GVA impacts could be over £12m over the 2012-15 period, a cost to GVA ratio of 1:7[135].

The Tourism Destination review highlighted the continuing rationale for investing in Destinations noting the "destination approach is still at an early stage... ... and it's unrealistic to expect the market failures to have been addressed at this stage"[136].

A number of evaluations note the difficulty in identifying quantitative evidence of impact in terms of GVA, for example the evaluations of Tourism Management and Leadership Development and Tourism Product Development[137]. The evaluations do, however, emphasise that this does not mean that additional economic benefit has not been created; rather it was that the nature of the intervention made it very difficult for companies to identify and attribute hard figures[138].

6. Tourism evidence and policy development

Evidence has been used to develop interventions in a range of areas. This includes discontinuing support where market failures have been assessed to be no longer relevant (e.g. forest, ancestral and whisky tourism products) and moving into new areas such as sailing and business tourism. Innovation support is being developed in line with the findings of a 2012 evaluation which will be used to help shape the nature, targeting and resourcing of the future programme[139].

7. Tourism data and evidence gaps

A qualitative and quantitative evaluation of the approach to developing destinations that was introduced in 2008 is planned. Further future work will assess the scale of the potential tourism and business benefits for Scotland of the 2012 Olympics and 2014 Commonwealth Games and Ryder Cup.

ENERGY

1. Why is the Energy sector important?

Energy is important to the Scottish economy due to the continuing scale of oil and gas sector operations and the size of opportunity in the renewables, carbon capture & storage (CCS) and low carbon technologies (LCT) sectors in which Scotland enjoys a strong comparative advantage. Global energy demand is expected to increase by a third by 2035, with the share of non-hydro renewables in power generation growing from 3% to 15%[140], as concerns over climate change continue.

135. Evaluation of Tourism Innovation Programme, Publication date – Summer 2012

136. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=459&taxonomy=TOU

137. See http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=324&taxonomy=TOU and http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=354&taxonomy=TOU

138. SE is not alone with this challenge – tourism related evaluations by the English Regional Development Agencies were able not to report economic impact ratio figures

139. Evaluation of the Tourism Innovation Programme, Publication date – Summer 2012

140. http://www.iea.org/weo/

The oil and gas sector employs an estimated 23,500 people directly in Scotland with a GVA of £21.8bn[141]; 30% of jobs are in extraction activities and 70% in supporting services. The sector is internationally competitive and has the skills, knowledge and capabilities that are transferable to and can accelerate the development of the renewables and CCS sectors.

The Scottish Government Economic Strategy[142] highlights the significant opportunity for Scotland from renewable energy and low carbon. This is driven by its commitment that by 2020 renewables will account for the generation of 100% of domestic electricity demand and 30% share of all energy and by the Climate Change (Scotland) Act[143] which commits Scotland to reduce its carbon emissions by at least 80% from 1990 levels by 2050 and by at least 42% by 2020. Full-time equivalent employment in renewables in Scotland is already estimated at over 11,000[144].

Scotland is estimated to have the largest offshore renewable energy resources in the EU (25% of EU offshore wind; 25% of EU tidal; and 10% of EU wave power)[145]. It is estimated that the offshore wind sector in Scotland could be worth £1.3bn GVA in 2020 and £7.1bn GVA in total this decade, with an additional £6bn of GVA generated through wider supply chain and other indirect benefits[146] [147]. This could create 28,000 full-time equivalent jobs in the sector, supporting an additional 20,000 jobs in the wider Scottish economy. Marine energy could create up to 5,300 direct jobs and £4.0bn of GVA this decade.

Opportunities in CCS will grow rapidly as a result of EU directives[148]. The EU has stated the need for a number of demonstration CCS plants in Europe by 2020 and Doosan Babcock estimates a worldwide market for 80 CCS projects per year post 2020.

The Low Carbon Economic Strategy for Scotland[149] states that the low carbon environmental goods and services sector is forecast to grow 5.3% per year up to 2014 from £3 to £4.3 trillion, with the Scottish market growing from £8.5 to £12bn, 2007-15. It estimates that the LCT sector in Scotland could create 26,000 jobs by 2020 in CCS, carbon finance, sustainable transport & buildings, and energy management.

Including renewables and environmental management, the low carbon sector in Scotland could employ 130,000 people by 2020, or over 5% of the workforce. This will result from success in establishing Scotland as an international destination of choice for global investment in low carbon sectors and the development of the financial architecture for a global low carbon economy.

2. Recent sector performance

The value of Scottish oil and gas supply chain sales was estimated at £17.9bn in 2009, with exports to over 100 countries accounting for 45% or £7.2bn of this[150]. Capital investment in 2011 was estimated at £8.5bn and is expected to rise to £11.5bn in 2012 on the back of record oil prices; £10bn barrels of oil equivalent (boe) remain to be recovered[151]. The sector's GVA accounted for 21% of Scottish GVA in 2009[152], and it had by far the highest sectoral GVA per employee at over £925k. It is estimated that 198,000 jobs could be supported in total by the sector in Scotland[153].

There are an estimated 11,136 full time equivalent jobs supported in renewables in Scotland in 2012[154] (14% in development, 78% in the supply chain and 8% in academia/ support agencies). The multiplier effect on renewables projects is large, with almost six jobs supported in the supply chain for every job in development.

In CCS and LCT there is a strong Scottish cluster of companies with market leading technology and global operations and reputations. Most of the technologies required for the next generation of clean coal power stations exist at small scale, including carbon capture, but require demonstration on operational plant to prove their effectiveness and reliability.

3. Energy challenges and market failures

A significant challenge for offshore renewables is the very high development costs and technology risks

141. http://www.scotland.gov.uk/Resource/Doc/933/0123675.xls

142. http://www.scotland.gov.uk/Resource/Doc/357756/0120893.pdf

143. http://www.legislation.gov.uk/asp/2009/12/contents

144. http://www.scottishrenewables.com/publications/employment-renewable-energy-scotland/

145. http://www.scottish-enterprise.com/your-sector/energy/energy-background/energy-key-facts.aspx

146. http://www.scottish-enterprise.com/~/media/publications%20archive/News/Scottish-Offshore-Wind-CreatingAnIndustry.ashx

147. http://www.scotland.gov.uk/Publications/2011/08/04110353/0

148. Large Combustion Plants Directive, Industrial Emissions Directive and Emissions Trading Scheme 3

149. includes the renewables sector http://www.scotland.gov.uk/Resource/Doc/331364/0107855.pdf

150. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/MNO/Oil-and-gas-sector-report-0910.ashx; updated report due in 2012

151. http://www.oilandgasuk.co.uk/cmsfiles/modules/publications/pdfs/EC028.pdf

152. http://www.scotland.gov.uk/Resource/Doc/933/0123675.xls

153. http://www.oilandgasuk.co.uk/publications/viewpub.cfm?frmPubID=434

154. http://www.scottishrenewables.com/publications/employment-renewable-energy-scotland/

that inhibit investment, especially while the costs of exploiting other energy sources remain significantly lower and less risk. The Routemap describes seven inter-linked challenges:

- **investment in infrastructure – at ports where turbines can be manufactured and tested**
- **development of a globally competitive supply chain in Scotland in R&D, manufacturing, installation, operations and maintenance and services**
- **ongoing innovation of technologies and practices – driving down costs**
- **planning and consents – required for site development**
- **regulation of and access to the Grid – connecting power generated to customers**
- **development of the necessary and available skills base in Scotland**
- **access to investment for companies to exploit opportunities**

Similar challenges face the development of CCS and emerging LCTs. In the oil & gas sector the challenge is for Scottish-based companies to keep innovating to ensure that remaining UKCS oil & gas can be recovered economically and global markets can be exploited. Using oil & gas sector know-how is crucial to building competitive advantage in offshore renewables.

Relatively low investment globally to date in offshore renewables, CCS and LCTs is due to the much lower costs of production of non-renewable energy sources. Government intervention through regulation and subsidy is incentivising investment. Other intervention focuses on addressing a lack of information in the market relating to:

- **nature and scale of market opportunity, costs and future returns – affected by uncertainty around government policies, subsidies and regulation, as well as energy demand and prices**
- **technologies and their potential – to work in challenging offshore environments**
- **supply chain capabilities – of indigenous companies to support developers and manufacturers and to recognise and exploit opportunities in these sectors**
- **routes to commercialisation – how to develop and finance technologies and take them to market**
- **public sector and other support – available to facilitate the exploitation of opportunities**

This can result in lack of awareness, uncertainty, lack of confidence and risk aversion across developers and investors which limits investment. History shows – with North Sea oil and gas, for example – that government intervention is required to provide information and demonstrate the potential of new industries & technologies and facilitate investment in them.

There is also positive externality market failure restricting private investment in port and grid infrastructure and R&D. This is because other businesses and society benefit from these investments, reducing the willingness of an individual business to invest. This results in the under provision of necessary infrastructure and R&D and provides a rationale for public sector support.

There is a public good market failure rationale for public sector support to encourage the development of non-carbon emitting energy sources. Society wants an environment in which climate change is controlled by reducing carbon emissions. This will not happen if left to the market while emissions-producing energy remains much cheaper to produce.

4. Scottish Enterprise Energy support

To support the achievement of the Routemap, SE supports investment in R&D, demonstration and deployment in offshore wind to drive technology development and reduce project development costs by 30%.

Support to grow the energy and LCT sector is provided through initiatives such as:

- **National Renewables Infrastructure Fund (NRIF) which will lever private investment into key port demonstration and manufacturing infrastructure prioritised in the National Renewables Infrastructure Plan (NRIP)[155] to enable turbine manufacturing and testing in Scotland**
- **International Technology and Renewable Energy Zone (ITREZ)[156] in Glasgow where companies, academics and support providers will co-locate, driving research, collaboration, innovation and commercialisation**

155. http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/Renewables-support/energy-renewable-energy-reports.aspx

- **renewables R&D funding to support the prototyping of offshore wind turbines (POWERS[157])**
- **infrastructure and support for businesses at strategic sites**
- **supply chain development**
- **provision of market information and analysis**

These projects are in addition to the support which SE and SDI is providing to growing numbers of renewables companies to encourage inward investment, growth, internationalisation and innovation, including: account management, Scottish Investment Bank, R&D and SMART grants, Regional Selective Assistance and Scottish Manufacturing Advisory Service.

5. Impacts of Energy support

Because the offshore renewables, CCS and LCT sectors are so young, with so many major projects in their infancy, SE is reliant on appraisal estimates of benefits rather than evaluation evidence to describe the potential impact of its interventions. Such impact projections are challenged by the high levels of uncertainty which underpins them. It is very difficult, for example, for renewables companies supported by SE to accurately project their turnovers into the future, and thus for GVA and job impact estimations based on them to made with confidence.

6. Energy evidence and policy development

It will be some time before comprehensive evaluation evidence is available on the impact and wider value of SE's interventions. The current focus is on transparent project impact appraisal, good project monitoring and reviews which assess processes, outputs and potential outcomes and identify learning.

7. Energy data and evidence gaps

The renewables baseline study when published in 2012 will provide industry policy-makers with valuable data on the current value and composition of the sector. The plan is to update this annually and to benchmark progress against this.

FINANCIAL AND BUSINESS SERVICES

1. Why is the Financial & Business Services sector important?

Financial and Business Services (F&BS) accounts for 12% of the Scottish Economy (5% from Financial Services and 7% from Business Services)[158] and employs 360,000 people across the full range of skills from entry level to highly skilled (95,000 in financial services and 265,000 in business services). The sector has expertise, capabilities and businesses which are, and have the potential to be, internationally successful in areas of global demand in sectors such as asset management, insurance and pensions. Furthermore, financial services firms, particularly banks, are the main source of the capital and investment which is required for businesses to meet their growth ambitions.

F&BS contribute to a number of drivers of economic growth. Their productivity is 25% above the Scottish average and they account for 11% of overseas exports[159]. The Ernst and Young Item Club forecasts that the sector's growth will be around double that of Scotland as a whole[160].

Scotland is internationally recognised as the most important UK financial centre outside London and the South East[161], underlined in March 2012 when Edinburgh was chosen as the host city of the UK's Green Investment Bank, and is increasingly recognised globally as an internationally competitive destination and attractive place for F&BS in which to locate and expand. According to the Global Financial Centres Index, which ranks 75 key global cities, both Glasgow and Edinburgh are in the top 10 most competitive cities in Europe, with Edinburgh ranked 32nd and Glasgow 33rd in the world[162].

2. Recent sector performance

Like much of the Scottish economy, F&BS have been affected by the recession. Prior to the downturn, the

156. http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/research-and-development-support/itrez.aspx

157. http://www.scottish-enterprise.com/your-sector/energy/energy-how-we-can-help/energy-funding/powers.aspx

158. http://home.scottishenterprise.net/publications/5e9a9e91-d4b8-4749-829c-1149a7165ad0___scottish_keyfacts_-_january_2012.doc

159. http://www.scotland.gov.uk/Resource/0038/00385828.pdf

160. http://www.ey.com/UK/en/Issues/Business-environment/Financial-markets-and-economy/ITEM-Club-Scotland

161. http://www.scotland.gov.uk/Publications/2010/02/15090915/1

162. http://www.zyen.com/PDF/GFCI%2010.pdf

sector grew at a pace significantly faster than the Scottish economy as a whole, and since 2008 growth has broadly matched it. Overseas exports reached £2.1bn in 2010, an increase of over £800m since 2008.

3. Financial & Business Services challenges and market failures

The F&BS sector has a number of sub-sectors including; Banking; General Insurance; Asset Management & Asset Servicing; Life & Pensions; and Business Services. These sub-sectors face different challenges and opportunities.

Financial services operate within a high regulatory environment and this limits the potential for significant numbers of start-ups to enter the sector. There are also 'scale' barriers as the sector is dominated by a small number of large firms (in 2011 around 90% of employees were in business units employing at least 250 employees[163]), making it hard for new entrants. Both these contribute to 'market power' market failures.

Despite being dominated by large firms with sufficient resource to study markets and areas for location of assets, there are still information based market failures, particularly with respect to positioning Scotland as an area for inward investment.

4. Scottish Enterprise Financial & Business Services support

SE helps to deliver the aims of the industry strategy[164] by focusing on:

- **the attraction and retention of high value added inward investment and employment where SE and SDI can engage and influence at a strategic level to help capitalise on new opportunities**
- **the growth of key companies, for example through supporting access to new markets and leadership and management development**

On access to finance, SE collaborates with the main banks and lenders to improve the supply of investment finance to companies, for example by helping banks understand more about the growth potential of companies and sectors. This is alongside work with companies to improve their 'finance readiness' and to increase their awareness of bank lending criteria and requirements.

5. Impacts of Financial & Business Services support

There have been a number of recent successes in attracting F&BS inward investment projects. Over the 2008/09 to 2010/11 period, projects that could create 7,400 jobs were attracted to Scotland.

6. Financial & Business Services evidence and policy development

A refresh of the 2005 Financial Services Strategy is currently being considered to reflect the changing regulatory and economic landscape, such as the public ownership of major banks, new regulations (e.g. Basle III and Solvency II[165]), the Independent Commission on Banking[166] and the funding requirements for Scotland's low carbon sectors.

7. Financial & Business Services data and evidence gaps

There are a number of evidence and data gaps that are shaping future research. A review of innovation activity has shown that significant levels of product innovation already take place within the sector. Further research will help identify whether there is a case for direct support by SE to promote further innovation, and the nature of this support. Also, there is a need to understand the role of financial services in funding renewable and low carbon projects, and work is underway to understand the role of the sector in this area.

An overview of the global market for asset management and insurance will identify opportunities for Scotland's businesses, and research is planned to identify opportunities for the 're-shoring' of activities into Scotland (e.g. activities that have been offshored in the past). Finally, the financial services sector and certain sub-sectors of business services are facing an increase in the level of regulations which impact on them, and research is required to assess the impact of these.

163. http://www.scotland.gov.uk/Resource/Doc/933/0121729.xls

164. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/STUV/strategy-for-the-financial-services-industry-in-scotland.ashx

165. http://www.fsa.gov.uk/

166. http://bankingcommission.independent.gov.uk/

UNIVERSITIES

1. Why are Universities important?

Scotland's universities contribute to Scotland's economy by developing the graduate skills base, by attracting students and research income to Scotland, by maintaining Scotland's world leading position in research and through knowledge transfer and exchange with the business base. Scotland's universities are regularly ranked among the best in the world and are as strong as or stronger than key international competitors on measures such as the production of research publications, citations and knowledge transfer efficiency[167].

A number of studies outline the breadth and significance of universities' impact on the economy. The major ESRC (Economic and Social Research Council) research programme 'IMPACT' highlights their importance to regional competitiveness through activities such as knowledge exchange with businesses, the impacts of students, graduates and skills development, and the benefits of community engagement. Quantifying the economic impact of universities also requires consideration of the scale of their employment, purchasing power, property holdings and the talent, vibrancy and cultural benefits that their students and staff bring. Universities also play a key role in the governance of city or regional partnerships[168].

An OECD review highlights the role of universities as engines of growth through their contribution, alongside business and the public sector, to innovation systems and clusters (both of which are reflected in Scotland), by improving the balance between labour market supply and demand and through building the capacity for engagement between universities and other regional economic partners[169]. The European Commission similarly outlines the important role universities can play in regional economic growth and competitiveness[170].

2. Current performance

Scotland's universities are estimated to contribute £6.2bn GVA to Scotland's economy. The sector is estimated to support directly or indirectly almost 150,000 jobs in Scotland (direct employment is 35,000) and it attracts over £1bn of income to the Scottish economy through research contracts and overseas students[171]. Higher education expenditure on R&D reached £984m in 2009, equivalent to 0.86% of GDP. This is around double the rates of the European (0.46%) and OECD (0.43%) averages[172]. Scotland also has a strong track record on commercialisation, and particularly spin-outs from university research, which compares favourably to the rest of the UK and the USA[173].

3. Universities' challenges and market failures

Universities can face challenges in effectively commercialising research and in developing links with the business community around technology transfer. On the commercialisation of research, information market failures can make it hard, for example, to attract the necessary funding to take a product from the concept stage through to market. Academic staff may also lack the management and marketing skills to grow spin-out businesses, and the challenges in growing businesses of scale from spin-outs are highlighted in the commercialisation section of this paper (e.g. accessing growth funding).

There are also challenges around business/university links and engagement. University research expertise and knowledge can potentially be a significant asset to businesses. However, information failures among universities (e.g. how to approach and work with businesses, IP ownership uncertainties) and businesses (e.g. awareness of services and support universities can offer) can reduce the scope for effective business university collaboration.

167. http://www.scotland.gov.uk/Publications/2009/11/10153556/0

168. http://www.impact-hei.ac.uk/

169. http://www.oecd.org/dataoecd/51/27/39378517.pdf

170. http://ipts.jrc.ec.europa.eu/activities/research-and-innovation/documents/connecting_universities2011_en.pdf

171. http://www.universities-scotland.ac.uk/uploads/173.UniversitiesScotlandSummaryresponseGreenPaperfinal.pdf

172. http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/RD/GERDPubTables

173. http://www.universities-scotland.ac.uk/uploads/briefings/knowledgeexchangeF%26Fjw.pdf

4. Scottish Enterprise University support

Scotland has recently, through a partnership approach, developed a number of technology and research centres, increasing engagement between leading edge university research, the Scottish company base and inward investors, and has been active in the development of the Technology Strategy Board's Catapult Centres (formerly TICs – Technology Innovation Centres) for the UK. These include the International Technology and Renewable Energy Zone (ITREZ), in partnership with Strathclyde University and tapping into expertise in other universities through the Energy Technology Partnership; and the Edinburgh BioQuarter, in partnership with Edinburgh University, which also draws on research strengths in Glasgow, Dundee and Aberdeen through Health Science Scotland.

In other sectors, SE support assists universities to deliver specialist consultancy services. For example, the Food & Health Innovation Centre (where the lead university is Aberdeen and Interface provides the link to other institutions) helps companies exploit the growing market for healthy food and drink products.

The focus within Scotland's International Trade & Development Strategy on Scotland's education assets reflects the growing importance of universities to increasing both export earnings and inward investment.

For commercialisation, support includes development funding, for example Proof of Concept, and early-stage technology company support, for example Enterprise Fellowships. Funding is also provided to Regional Business Advisors for the most promising growth prospects among the Scottish Institute for Enterprise's work with students.

5. Impacts of Universities support

Findings from the review of SE commercialisation support provide strong evidence that a more business growth focused approach to commercialisation, including university spin outs, is positively influencing company development and helping to put in place more of the key characteristics for future growth and higher impacts. The review concludes that there continues to be a strong strategic case for continued commercialisation support and that potential impacts attributable to SE support represent a good value-for-money return. Wider benefits, for example those that cannot readily be monetised, are also recognised, such as improved skills and expanded networks[174].

The Edinburgh BioQuarter is expected to generate on-site investment of £250m, create net additional employment impact at the Scottish level of up to 6,800 jobs and net GVA impact of up to £1bn, an almost 8 to 1 GVA impact to spend return over a 25 year period[175]. ITREZ will be a global R&D hub where developers, suppliers, academics, researchers and support organisations will co-locate, driving research, collaboration, innovation and commercialisation in the offshore wind sector. ITREZ could create 700 high value jobs and £100m of net GVA over ten years.

6. Universities evidence and policy development

Drawing on evaluation and research evidence, SE is developing its role as a significant partner in the university sector's ambitions for Scotland. Current and evolving interaction is focused on utilising the universities' considerable research assets to help grow businesses through commercialisation and innovation, and to attract inward investment; to help universities grow their own overseas presence; to embed entrepreneurship across the sector; and to work in partnership to enhance leadership in Scotland. SE also works with the sector to develop its overall role in building regional competitiveness, including areas such as graduate skills flow.

7. Universities data and evidence gaps

While there is strong evidence on components of work with universities (e.g. commercialisation of research), there are evidence gaps in areas such as the impact of universities on business leadership and the impact of attracting additional research income from outside Scotland. Work is underway to quantify the baseline for the sector's impact in the areas where SE is most actively engaged.

174. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=349

175. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=349

TECHNOLOGY AND ADVANCED ENGINEERING

1. Why is Technology & Advanced Engineering important?

The Enabling Technology Strategy for Scotland, **Towards a Brighter Future**[176], states that one of the best ways to enable economic growth is to encourage a far wider adoption of new technology and the UK Government Office for Science outlines the strong opportunities for growth in the UK economy through the 2020s if businesses can harness scientific and industrial capabilities to take advantage of technology-enabled transformations in manufacturing, infrastructure and the internet[177].

Technology & Advanced Engineering (TAE) are cross-cutting technologies that include:

- **Advanced Materials**
- **Bioscience**
- **Electronics, Photonics and Electrical Systems**
- **High Value Manufacturing/Advanced Engineering**
- **Information and Communication Technologies**

These are activities that in turn support the development of many other sectors such as energy, life sciences and digital media. A company is classed as being in TAE if it has capability or is operating in one of the sectors.

There are a number of studies that suggest technology is a key driver of economic growth. For example, in the US the creation and adoption of new technology is estimated to have driven between one quarter and one half of national economic growth[178]. The Enabling Technology Strategy for Scotland highlights that a 1% increase in output driven by technology could result in 38,500 new jobs. In addition, there are 30 world ranked research departments involved in TAE related activities, highlighting Scotland's strong research asset base.

2. Recent sector performance

While TAE cannot be easily defined (there is no standard SIC code), SE has identified around 1,340 companies that make up the core of the TAE sector. These are companies that create technologies that can be applied in multiple sectors and market areas, have a commitment and track record in developing, owning and/or licensing IP, have a track record in successful patent development, have a strong commitment to innovation and R&D, and have experience or a willingness to work in collaboration with other business partners or science institutes.

These TAE companies employed over 84,000 people in 2009 and contributed £7.5bn GVA to the Scottish economy, a rise of over 7% from 2008. Productivity levels (£91,250 GVA per head) are significantly above the Scottish average[179].

3. Technology & Advanced Engineering challenges and market failures

Market failures exist for both the adoption/use of technology by Scottish companies and for the creation of technology. For adoption/use, information failures are related to knowledge of how new technology can drive company performance, what technologies are available and how best to implement new technologies. This can result in companies underestimating the benefits of technology and reducing investment.

Technology creation, information and externality market failures, as highlighted in the Innovation and Commercialisation sections, can reduce the incentives for businesses to invest in R&D. For example, a lack of information or uncertainties about the markets for new products, technology applications and the returns from R&D can increase their perceived riskiness, reducing investment and technology creation. Externalities, where other companies could benefit from new technologies, can also act as a disincentive to R&D.

There are also challenges around business/university links and engagement. University research expertise and knowledge can potentially be a significant asset to businesses. However, information failures among universities (e.g. how to approach and work with businesses, IP ownership uncertainties) and businesses (e.g. awareness of services and support universities can offer) can reduce the scope for effective business university collaboration.

176. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/DEF/enabling-technologies-strategy-towards-a-brighter-future.ashx

177. http://www.bis.gov.uk/assets/bispartners/foresight/docs/general-publications/10-1252-technology-and-innovation-futures.pdf

178. http://brie.berkeley.edu/publications/WP%2097.pdf

179. Based on SE and Scottish Government analysis of companies in the Enabling Technologies sourcebook linked with Scottish Annual Business Statistics data

4. Scottish Enterprise Technology & Advanced Engineering support

SE support to Enabling Technologies can be split into a number of areas including direct R&D grant support to businesses and building the capacity of the university sector to engage and work with businesses around technology development and exploitation. This includes major investment in the Advanced Forming Research Centre (AFRC) at Strathclyde University as well as ongoing support for Informatics (led from the 5 star rated Edinburgh University Informatics Department). The Scottish Technology Showcase project, which in 2011 attracted 1,500 attendees, allows companies to showcase products to potential customers.

5. Impacts of Technology & Advanced Engineering support

The Informatics Department at Edinburgh University has a global reputation for excellence and to help maximise its economic contribution to the economy SE and the Scottish Government invested £19m in the PROSPEKT program. This was to support expansion of the school and the development of new commercialisation activities focused on company creation, business adoption and exploitation of informatics technologies.

An interim review of PROSPEKT suggested that virtually all output targets had been achieved just a quarter of the way through the programme (such as engagement with companies and the attraction of research funding) and by the end of the programme 38 new companies had either been spun out or started up and over 500 existing companies had received support[180]. The review concluded that the programme was working well and suggested improvements around focusing on and tracking key business outcomes and working more closely with other sources of entrepreneurship support to maximise impact.

The Commercial Breakthrough Service (CBS) was set up to develop the sales and marketing abilities of staff employed in technology driven businesses. It linked companies with consultancies expert in the sales and marketing field to develop a company owned action plan around sales and provided support for the early implementation of that plan. The evaluation of the programme suggested that the sales performance of companies had improved as well as the sales competencies of staff[181]. It suggested that these improvements could lead to around £1.9m of net additional GVA as a result.

6. Technology & Advanced Engineering evidence and policy development

In order to build on the success of the PROSPEKT programme, a new project Informatics in Scotland is being taken forward. This takes the learning from the delivery of PROSPEKT into a new scaled up programme working with the Scottish Informatics and Computing Science Alliance (SICSA) or the Scottish informatics research pool to continue new firm formation and the provision of support to existing Scottish companies to improve their business performance. An appraisal suggests that the programme could deliver almost £80m of net additional GVA over a ten year period, a return of 1:6 on SE investment.

The recent evaluation of the Wellness and Health Innovation project is being used to shape Scottish engagement with the Delivering Assisted Living Lifestyles at Scale (DALLAS) Technology Strategy Board (TSB)initiative[182], while the CBS evaluation is shaping the ongoing development of sales and marketing support for technology based businesses.

7. Technology & Advanced Engineering data and evidence gaps

The current appraisal and evaluation evidence covers Enabling Technology projects that are at relatively early stages of development and implementation. The economic impact assessments are largely based on company views of future benefits rather than benefits actually achieved. Ongoing monitoring of the progress and any successes will provide a better understanding of actual economic benefits.

There is also scope to track and understand the impact of joint research calls with other public agencies (such as the TSB) in areas such as collaborative research and the development of key technologies, and the benefits of projects designed to encourage business-academic collaborations in key technology areas.

180. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=355

181. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=476

182. http://www.innovateuk.org/content/competition/dallas-delivering-assisted-living-lifestyles-at-sc.ashx

TEXTILES

1. Why is the Textiles sector important?

The Scottish Textiles industry is innovative and internationally competitive with a world class reputation for quality, service and product. Over 630 companies operate in Scotland, including leading names in luxury and performance textiles companies such as WL Gore and the Scottish Leather Group. Scottish textiles sell in over 150 countries in three of the most dynamic areas of the market: aesthetic textiles, designer fashion and performance fabrics. The textiles industry is a significant contributor to the rural economy of Scotland where around 30% of companies are located.

2. Current sector performance

In 2009 textiles sector GVA was £243m and employment was 11,000, 2.3% of all Scottish manufacturing employment. Exports were £295m in 2010, 2.2% of all Scottish manufactured exports[183]. Since the beginning of 2009 (Q1), textiles exports have generally risen each quarter, and were up 18% by the third quarter of 2011[184]. This growth highlights the continued strong international demand for Scottish textiles products.

3. Textiles challenges and market failures

The Textiles industry strategy highlights the challenges facing the sector[185]:

- **industry profile and visibility**
- **addressing the importance and cost of environmental sustainability, with particular attention to energy and raw materials usage**
- **availability and access to funding and investment**
- **growing strength of competition from low-cost manufacturing countries**
- **industry attractiveness and retention of key skills**
- **low levels of R&D spend and product innovation**

4. Scottish Enterprise Textiles support

The industry strategy identifies five themes that SE support contributes to:

1. **Maximising Markets – encouraging diversification, identifying and appraising opportunities in new and existing markets**
2. **Improving Customer Intimacy – improving the quality of relationships between buyers and manufacturers**
3. **Value Through Innovation – innovation in process, product and collaboration; knowledge exchange and advanced manufacturing capability**
4. **Improving Industry profile – creating a viable, sustainable brand for the industry which will enhance Scotland's reputation in key markets**
5. **Strategic Industry Development – strengthening the overall business environment through increased and improved industry intelligence & leadership**

There is evidence that the perception of Scottish textiles is varied among buyers, developers, media and customers. Communicating widely what Scotland can provide by way of product and service needs both focus and consistency.

5. Impact of Textiles support

An evaluation of textiles sector support covering the period 2006-09 report showed that activity (e.g. one-to-many events, intelligence gathering and dissemination) delivered strategic added value across a broad range of areas such as improved industry leadership and better industry synergy, engagement, coordination and alignment. The net impact of sector support for 2008 (only) was the creation of 123 net jobs and £6m net GVA[186].

The SE textiles team took a lead in developing senior level engagement with potential customers for textile products and hosted an extensive tour for Saks 5th Avenue who operate over 50 stores globally. This close customer activity allowed for enhanced opportunities,

183. http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Exports/GCS2010_tables

184. http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/IME2011Q3XLS

185. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/Sectors/Textiles/Textiles%20Scotland%20Strategy%202011%20to%202015.ashx

186. Publication date – Summer 2012

increased knowledge and relationship building which was well received by industry and secured sales for Scottish companies of around $2m in 2011. SE and SDI have continued this process to secure similar programmes with Brooks Brothers and Paul Smith.

6. Textiles evidence and policy development

Recent research carried out by SE into the global trends for textiles has identified the following areas as those where the industry could create maximum impact:

- **Performance Textiles & Processes – the global market is growing at four times the rate of conventional textiles**
- **Premium/Luxury Markets – opportunities to position and affirm Scottish textiles as a core supplier to the luxury products market, both in fashion and interiors, and capture a greater share of global premium markets**
- **Designer Fashion – With over 200 leading brands and marques buying product from Scotland, ensure communication with these customers and secure the interest of emerging brands**

7. Textiles evidence and data gaps

Research is planned on:

- **industry sustainability mapping (e.g. assessing the opportunities of low energy production and assessing the threats of not responding appropriately)**
- **emerging textiles technologies (mapping of new/ disruptive global technologies that apply to textiles)**
- **exploration of post-applied Nanotechnology & Microencapsulation to traditional textiles (for improved performance and properties)**
- **the rising importance of provenance to customers (e.g. quality assurance, ethical production, fair trade and local heritage)**
- **identifying competitor best practice (e.g. lessons can be learned from leading global textiles sectors such as Italy's 'Loro Piana', New Zealand's 'Merino' production and Sweden's Design collaborations').**
- **customer expectations of textiles brands (exploring the future needs and ambitions of customers)**

AEROSPACE, DEFENCE AND MARINE

1. Why is the Aerospace, Defence & Marine sector important?

The Aerospace, Defence & Marine (ADM) sector (which also includes Security & Resilience activities) forms an important part of Scotland's advanced manufacturing base and there are a range of global opportunities that Scotland's ADM company base can exploit. Scotland has a leading position within the UK in complex naval shipbuilding and the defence sector is technology-based and diverse, with the presence of leading companies. Scotland also has a significant and growing involvement in the Space industry, which is a UK government focus. A further industry growth area in which Scotland has a developing company and research involvement is in Security and Resilience, which is also viewed as an important area of diversification for defence companies. Growth of the global aviation industry will provide opportunities for Scotland's aerospace manufacturing, maintenance repair and overhaul (MRO) companies.

There are also significant research assets in Scotland in a range of companies and universities. University strengths include optoelectronics, systems engineering, information and signal processing, electronics systems, power systems, naval architecture & marine engineering and security technologies.

2. Recent sector performance

Overall there are around 850 companies involved in the sector in Scotland, together generating a combined turnover of £5.2bn and a GVA of £2.1bn. These companies employ around 40,000 people[187] and productivity for the sector is above the Scottish average (these figures identify both core companies and those involved in the wider AD&M supply chain).

187. http://home.scottishenterprise.net/publications/36474966-f235-4f91-b83d-828de8fc100b___adm_industry_study_-_summary_points_(2).ppt

3. Aerospace, Defence & Marine challenges and market failures

Challenges facing the sector include[188]:

- **Industry Growth – low number of Scottish-owned businesses and comparatively low levels of activity in aerospace compared to UK**
- **Research & Technology – weak links between university and company R&D; poor coordination of research funding streams; low availability of funding and low engagement of SME research procurement programmes; applicability of grant funding to non-MoD funded defence R&D**
- **Skills – low awareness/use of existing skills initiatives; poor perception of engineering and ADM as a career opportunity; poor visibility of long term engineering skills needed to enable academic planning; poor levels of leadership and management skills**
- **Supply Chain – poor levels of penetration**
- **Internationalisation – low levels of international activity in Scottish companies; need for company input to refine and develop Scotland's value add proposition for inward investment and international collaboration**

A number of these are a result of information market failures, where businesses may not be aware of the benefits, for example, of engagement with universities on R&D, may not be aware of skills training opportunities and may not be aware of exporting opportunities.

4. Scottish Enterprise Aerospace, Defence & Marine support

Support is focused on encouraging commercially-oriented R&D (e.g. through R&D grants), supply-chain development (e.g. through SMAS), internationalisation and company strategy development. At an industry level, SE is supporting the development of increased cohesion in the Scottish ADM cluster and the development of Scotland as a centre of excellence in marine design. The Advanced Forming Research Centre (AFRC) is also an important resource for ADM companies.

5. Impacts of Aerospace, Defence & Marine support

The prime focus of activities supporting the ADM sector is through company support to, for example, invest, internationalise and innovate, and through company development support; the impacts of these are highlighted in relevant sections.

6. Aerospace, Defence & Marine evidence and policy development

The research carried out for the ADM strategy highlighted the challenges faced, and this has driven the nature of support SE provides to help develop the sector. For example, research highlighted the need to increase the number of indigenous companies involved in the ADM sector and SE is developing supply chain development opportunities.

7. Aerospace, Defence & Marine data and evidence gaps

Official published sources cover only parts of the key sector (Shipbuilding and Aerospace) and further data analysis is required to identify all companies which are effectively part of the sector. There is also a need to develop better data on ADM R&D expenditure and on civil vs. defence activity.

188. http://www.scottish-enterprise.com/~/media/SE/Resources/Documents/ABC/Aerospace-defence-marine-strategy.ashx

189. http://www.scotland.gov.uk/Publications/2010/11/15085756/0

CONSTRUCTION & FOREST & TIMBER TECHNOLOGIES

1. Why is the low carbon built environment sector important?

The Construction and Forest & Timber Technologies sectors contribute significantly to the low carbon built environment. The Scottish Government's Low Carbon Economic Strategy[189] was introduced in 2010 and has the objective to 'moving towards a low carbon built environment – reducing carbon emission, through all phases of the building process, from design to construction, through operation and maintenance, within the new and existing building stock'. It states the Government's ambition for all new buildings in Scotland will be zero carbon by 2017, where practicable. It also acknowledges the market opportunity for retrofitting the existing building stock.

Construction

The Scottish Construction sector, one of Scotland's largest sectors and accounts for about 8% of GVA and is also important in providing the infrastructure that enables other sectors to grow. The sector has a significant role to play in the transition to a low-carbon built environment and a low-carbon economy due to the fact that around 40% of all carbon emissions are derived from the built environment.

Forest & Timber Technologies

Scotland's Forest & Timber Technologies sector incorporates the planning, planting, management and harvesting of forests, through to the value-added downstream activities of sawmilling, pulp and paper production, panel and board manufacturing and the development and production of higher value goods such as engineered timber products, contributing to sustainable construction. Forests cover 17% of Scotland's land area and are a rural community amenity asset and a significant raw material source. Forests can help mitigate climate change by storing the same amount of carbon in trees as is emitted through energy change. This means that timber is virtually carbon neutral and the sector plays a vitally important role in the low carbon economy in terms of the potential for carbon sequestration and the development of a low carbon built environment.

2. Current sector performance

Research by BRE 'Developing Scotland's Low Carbon Built Environment' (2010)[190] estimates that over 14,000 organisations are involved in LCBE activity in Scotland in four broad sub-sectors: 'building envelope' activities (materials and products which make up the internal and external elements of a building), technologies (products and services that contribute to the supply, management and use of water and energy within a building), professional services (planning, designing and specifying buildings) and R&D.

Forest & Timber Technologies contribute £1.6bn GVA annually and up to 38,500 jobs to the Scottish economy. Many of these jobs are in Scotland's rural communities. Over the past few years industry has invested over £0.5bn in new processing technology and innovation, and has seen consistent growth of around 4% annually[191].

Construction is one of Scotland's largest sectors, accounting for £6bn of Scotland's GVA (10% of total GVA) and employing around 130,000 people[192].

3. Low carbon built environment – challenges and market failures

The Scottish Government's Low Carbon Economic Strategy 2010 identifies two market opportunities within the built environment: reducing current energy and carbon emissions associated with new and existing buildings through energy efficient, low carbon design and specification and exploiting innovation in sustainable building technologies in both domestic and global markets.

BRE report identifies a number of market failures and challenges that can prevent businesses from fully exploiting opportunities:

190. http://www.evaluationsonline.org.uk/evaluations/Browse.do?ui=browse&action=show&id=383&taxonomy=CON

191. http://www.forestryscotland.com/forestry/strategy

192. http://www.scotland.gov.uk/Resource/Doc/933/0120548.xls

- **Lack of knowledge about low carbon products within supply chains and the benefits of low carbon buildings and products (information market failure)**
- **Lack of investment by support companies to develop low carbon products due, in part, to a lack of clarity on specific support mechanisms available (information market failure)**
- **Market immaturity and lack of demand means significant competition does not currently exist within the industry, contributing to high investment and upfront capital costs (monopoly power market failure).**
- **A lack of perceived demand for the development of low carbon products within SMEs, in part due to a lack of awareness of the potential benefits of being involved in product development and innovation, and the commercial spin offs that are possible (information market failure).**

For the construction industry, beyond the low-carbon aspects, challenges include the need to increase product and process innovation, expanding into international markets, and developing better leadership, collaboration and working practices between companies.

Challenges for the Forest & Timber Technologies sector include increasing innovation in new or improved added value timber products, developing new markets/ increasing penetration of existing markets, developing greater supply chain efficiencies and growing the skills and capacity of the workforce[193]. In the past the sector has been characterised by a culture of low levels of collaboration in product and process innovation, marketing and research due in part to information market failures (for example businesses being unaware of the benefits of innovation).

4. Scottish Enterprise low carbon built environment support

Forest & Timber Technologies

The Roots for Future Growth Strategy identifies four areas of focus for SE support, based on the contribution the sector can make to the Scottish and sustainable low carbon economy[194]. These include:

- **Intelligence, communications and benchmarking: e.g. collation and dissemination of market information and best practice**
- **Product and process innovation and technology: e.g. encouraging the development of, and penetration of, new valued added products into existing and new markets.**
- **Developing industry capability e.g. working with the Scottish Manufacturing Advisory Service and academic / research.**

SE has undertaken research to identify opportunities for the Forest & Timber Technologies sector and how SE can support its future growth. This baseline of current sector performance, identified and significant opportunities for growth and outlined a plan of action for Scottish Enterprise and partners to create significant and sustainable economic growth[195].

Construction

The new industry strategy will be completed by May 2012 following which an action plan will be developed among key partners. Opportunities that the strategy is likely to focus on include:

- **Structure: to achieve greater cohesion within this fragmented sector.**
- **Product Innovation: around the creation of a low-carbon built environment in building technologies and the development of new products and services**
- **Process innovation: construction opportunities exist to improve build quality and time, reduce waste and 'shrinkage' in the materials supply chain and other overheads.**
- **Supply chain including utilisation of smart materials: as both a consumer and an enabler of other sectors, opportunities exist to connect the supply chain to ensure Scottish investment proliferate as far as possible to other sectors such as Energy and Forest & Timber Industries.**
- **Procurement – scope exists to ensure a more streamlined and equitable process.**
- **Workforce - the sector needs to ensure current and future students and workforce are equipped with skills and knowledge required to work in the industry as regulations, materials, equipment, methods and markets evolve.**

193. http://www.forestryscotland.com/media/101263/rffg%20lower%20res%20web%20version%202.pdf

194. http://www.forestryscotland.com/forestry/strategy

195. To be published in Spring 2012

196. http://www.scottish-enterprise.com/your-sector/construction/~/media/SE/Resources/Documents/Sectors/Construction/scottish_construction_industry_plan_2007-2012.ashx

197. http://www.evaluationsonline.org.uk/evaluations/Search.do?ui=basic&action=show&id=468

5. Impacts of low carbon built environment support

The Scottish Construction Centre (SCC) was launched in 2007 in response to the 2003 'Achieving Construction Innovation and Excellence in Scotland' report[196] and the recommendations of the Modernising Construction Strategic Group. SCC's remit was to improve the performance of the Scottish construction industry through innovation and excellence. The Centre's main objectives were to assist the Scottish construction industry to improve its productivity and overall performance, raise awareness of best practice and availability of support services, unify support for industry through provision of a 'one door' enquiry and signposting service, analyse and disseminate information on industry performance, deliver the Construction Demonstration Project Model programme and establish Best Practice Clubs across Scotland. An evaluation of SCC in 2011 found that net additional GVA over a 10 year period, based on SE investment of £2.7m, may be £30m[197]. This would imply a GVA to SE investment return of around 11 to 1.

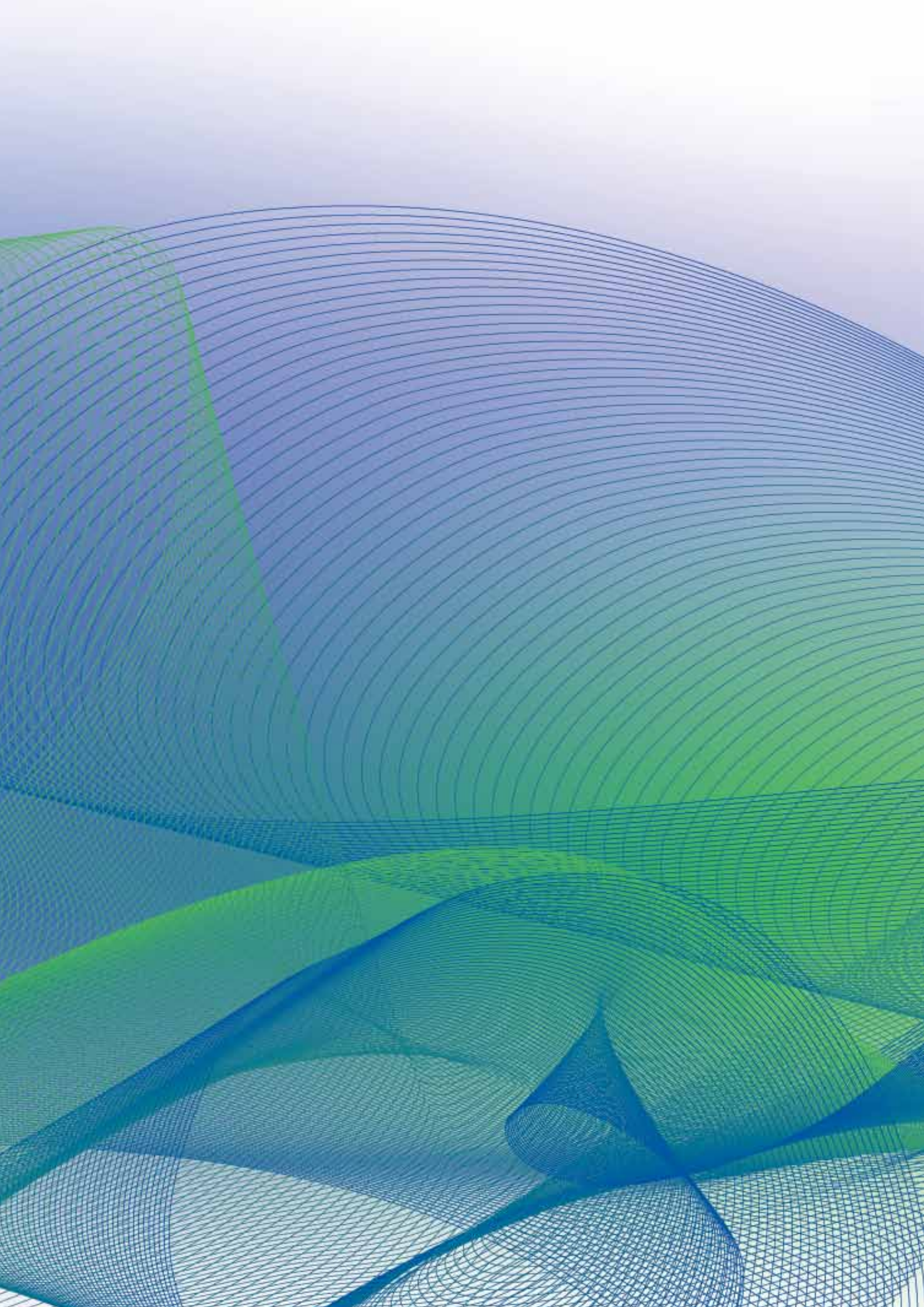
6. Evidence and policy development

Many of the recommendations from the Scottish Construction Centre evaluation were considered in developing a new model for a project that superseded the Centre project. This new project, 'Construction Scotland' involved the establishment of an industry owned, commercial not-for-profit vehicle Construction Scotland Ltd to help build a foundation for the industry to attract funding, operate independently and commercially and respond to industry needs.

As highlighted in the section above, a new industry strategy has a planned launch of Spring 2012 and research has highlighted a number of opportunities. SE is currently working with Construction Scotland to develop specific actions to deliver the strategy.

7. Data and evidence gaps

Research requirements include economic baselining, international benchmarking, updating data on the current and future forest stock, market forecasting and identifying new market opportunities (including internationalisation) for existing products.



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