EUROPEAN AND EXTERNAL RELATIONS COMMITTEE

AGENDA

3rd Meeting, 2013 (Session 4)

Thursday 7 February 2013

The Committee will meet at 9:00 am in Committee Room 6.

1. **Business in private:** The Committee will decide whether to take items 6 and 7 in private.

2. **Foreign language learning in primary schools:** The Committee will take evidence from:
   
   Lloyd Anderson, Director, British Council Scotland;
   
   Luca Tomasi, Policy Officer, Directorate-General for Education and Culture, European Commission;
   
   Angeliki Petriris, Language Officer, Directorate-General for Translation, European Commission Representation UK; and
   
   Frances Christensen, General Manager, Confucius Institute for Scotland.

3. **Foreign language learning in primary schools:** The Convener and Clare Adamson will report to the Committee on their recent visit to St Elizabeth Primary School, Hamilton.

4. **Brussels Bulletin:** The Committee will consider the latest issue of the Brussels Bulletin.

5. **Horizon 2020:** The Committee will consider an update from the Scottish Government.

6. **Scottish Government's Country Plan for China and International Framework:** The Committee will consider an approach to the launch of its inquiry.
7. **EU Commission Work Programme**: The Committee will consider a draft report of the proposed EU engagement of the Scottish Parliament's committees.

Ian Duncan  
Clerk to the European and External Relations Committee  
Room T3.40  
Scottish Parliament  
Edinburgh  
Tel: 0131 348 5191  
Email: ian.duncan@scottish.parliament.uk
The papers for this meeting are as follows—

**Agenda Item 2**
PRIVATE PAPER EU/S4/13/3/1(P)
Written evidence EU/S4/13/3/2

**Agenda item 4**
Brussels Bulletin EU/S4/13/3/3

**Agenda Item 5**
Paper by the clerk EU/S4/13/3/4

**Agenda item 6**
PRIVATE PAPER EU/S4/13/3/5(P)

**Agenda item 7**
PRIVATE PAPER EU/S4/13/3/6(P)
European and External Relations Committee

3rd Meeting, 2013 (Session 4), Thursday 7 February 2013

Foreign language learning in primary schools inquiry – written evidence

The Committee has received written evidence on its inquiry into the teaching of foreign languages in primary schools from the following organisation, in support of their oral evidence at this meeting:

- British Council Scotland
Written evidence from British Council Scotland

1. **About British Council Scotland**

Established in 1946 in Edinburgh, British Council Scotland’s purpose was, from the outset, to promote the best of Scottish culture and learning to the rest of the world – bringing foreign academics, students, policy-makers and artists to Scotland and taking counterparts abroad.

Ever since, British Council Scotland has enabled thousands of young people from Scotland to study and work abroad, helped schools and higher education institutions create partnerships in other countries, and supported professional development through international experience.

In addition, British Council Scotland has brought the brightest students from other countries to work, study and teach in Scotland, broadening the cultural horizons of our young people.

In a globalised marketplace, we believe that Scotland must be an outward-looking nation. Building relationships and trust between the people of Scotland and other countries helps remove barriers to overseas trade and business and so boosts Scotland’s economic prosperity.

Today, British Council Scotland is highly valued for its global reach. Through a network of offices in 110 countries, we can pull together overseas knowledge, experience, and perspectives, catalyse relationships and comment on issues affecting Scotland’s profile and standing in the world. Our overseas offices are also an invaluable source of support and assistance to visiting cultural and educational delegates from Scotland.

2. **Importance of Language in Primary School**

British Council Scotland believes the Committee is correct to highlight the importance of foreign languages in primary schools. Early teaching of foreign languages not only enables children to acquire linguistic skills that they will use later in their life, but also has important indirect benefits. These include\(^1\):

- Enhanced mental flexibility
- Enhanced problem-solving ability (including organisational skills)
- Expanded metalinguistic ability (intercultural skills)
- Enhanced learning capacity
- Enhanced interpersonal ability (team-working/communication and presentation skills/perception of the perspective of others)

\(^1\) Modern Languages Excellence Report, Scottish CILT, 2011
• Reduced age-related mental diminishment (dementia, Alzheimer’s)

**Conclusion 1:** The teaching of foreign languages from an early age is essential, both for the direct knowledge it gives children and for the ability that language has to provide cultural education and lift horizons and ambitions

3. **Language Rich Europe**

In November 2012, ‘Language Rich Europe’, a major consortium project led by the British Council and funded by the European Commission, provided a baseline report on the provision of modern language teaching across Europe was published. The report, entitled ‘Trends in Policies and Practices for Multilingualism in Europe’, examined how different European countries approached the teaching and use of regional, minority and foreign languages and included a chapter on Scotland.

The report highlights that Scotland was an early adopter of primary foreign languages (1992). By 2005, practically all Scottish primary schools taught a foreign language. Today, all young people have an entitlement to learn at least one foreign language from the later stage of primary school, but it is not compulsory. In addition, in most cases, Foreign Language teaching is limited to the final two years of primary school – 10 to 12 year olds - and has a small time allocation, There have also been recent concerns relating to teacher training and local authority support (due to funding reductions).

The report concluded by saying that “Although the issue of foreign language learning appears now to be creeping up the political agenda, there is clearly a need to continue to make a strong case for the social, cultural, intellectual and economic benefits to Scotland, as well as to invest in high quality training for teachers.”

**Conclusion 2:** Scotland has led the way in the teaching of foreign languages in the past and it is essential that funding and training is improved if this is to be maintained

4. **Economic Impact of Language**

An ability to do business with people in their own language is a crucial skill which demonstrates an enthusiasm towards other countries’ cultures that can help create goodwill and smooth negotiations.

However, further investigation in the Language Rich Europe report found that Scottish employers tend to circumvent rather than address language skill needs by

---

3 Modern Languages Excellence Report, Scottish CILT, 2011
exporting only to Anglophone countries or those where they can easily find English speakers. This approach is severely limiting Scotland’s economic potential when one considers that only 6% of the world’s population speak English as a first language and 75% of the world’s population don’t speak any English. 

One attitude might be that because an increasing amount of business is conducted online and the predominant language of the internet is English, speaking a foreign language is less important. However, while English was previously the dominant language of the internet, this is no longer the case. In 2000, English represented 51% of language usage on the internet but by 2009 this was down to 29% due to the steady growth in other European languages and in Chinese.

**Conclusion 3: It is critical to Scotland’s economic success in the future that businesses realise the importance of language being taught from an early age. The “English is enough” attitude must be challenged if Scotland is to prosper in the future.**

5. **Scottish Government Initiatives**

The Language Rich Europe report also commented on three areas of Scottish Government policy: the “1+2” approach, Gaelic Medium Education and the Scottish Baccalaureate in Languages.

i) **“1+2” Approach**

British Council Scotland welcomes the objectives of the “1+2” approach and the strong commitment from the Scottish Government to the principle that multilingualism is a good thing that can, in part, be delivered through the school system. We await with interest their plans for implementing this approach to language learning.

ii) **Gaelic Teaching**

The learning of Gaelic has been treated fundamentally differently in Scotland from that of foreign languages, with the setting up, from 1986 onwards, of Gaelic medium units in primary schools throughout Scotland, complemented by Gaelic-medium pre-school provision in many areas.

The most recent HM Inspectorate of Education (HMIE) report found that 2,312 children were being educated in the Gaelic medium. Most of these children do not have Gaelic as first language, while Gaelic is also offered as a second language in a number of primary schools. This focused approach, making Gaelic an early

55 Modern Languages Excellence Report, Scottish CILT, 2011
6 Modern Languages Excellence Report, Scottish CILT, 2011
requirement for many schools, has clearly had a strong impact in preserving and promoting the language; something the Scottish Government is clearly keen on continuing given the announcement on 4 January 2013 of an additional £4m of funding.  

*iii) Scottish Baccalaureate in Languages*

Although unable to examine this in detail, the Language Rich Europe report found that the Scottish Baccalaureate in Languages is an “interesting and promising initiative” aimed at bridging the gap between school and university and providing skills for learning, life and work.

**Conclusion 4: The approach taken to Gaelic-medium education has shown that with focus and investment, language can be taught effectively from an early age and there are early signs that the approach being taken in the “1+2” initiative will be successful as well**

6. **Programmes to solve the problems**

As well as being engaged in policy work through projects such as Language Rich Europe, British Council Scotland also delivers programmes that seek to have a practical impact on solving the issues identified. Two such programmes, Connecting Classrooms and Foreign Language Assistants are described below, along with testimony from those who have taken part about the benefits. We will continue these programmes in Scotland in the future and are, in fact, looking to grow the number of Scottish schools involved in both.

*i) Connecting Classrooms*

Connecting Classrooms is a flagship British Council programme for international work in schools. It is a three year programme (2012-2015), undertaken in partnership with Department for International Development (DFID). It builds on many years of experience with Global School Partnerships and Connecting Classrooms to be a more costs effective offer for schools, operating in over 50 countries.

We believe it is vital to engage with pupils in primary and secondary schools so that children and young people start to learn about the world around them through personal contacts with counterparts in other countries.

The Connecting Classrooms offer includes:

- A partner-finding service through Schools Online
- International School Award

---

7 [http://www.scotland.gov.uk/News/Releases/2013/01/gaelic-funding4113](http://www.scotland.gov.uk/News/Releases/2013/01/gaelic-funding4113)
- Grant funding partnerships
- Access to professional development, both online and face to face

In 2010-11, we worked with 351 schools, 19 higher education institutions (HEIs) and 22 further education institutions across Scotland.

Appendix 1 shows a case study, from Mearns High School, describing their Connecting Classrooms project undertaken with a cluster of six local primary schools, and what can be achieved.

ii) **Foreign Language Assistants**

Foreign Language Assistants (FLAs) – be they native speakers of French, German, Spanish, Italian or Mandarin Chinese – bring a cultural dimension to language learning that energises students and helps them attain greater fluency in their chosen foreign language.

Bringing FLAs to Scotland is a reciprocal arrangement that allows the British Council to send English Language Assistants (ELAs) from Scottish universities to schools in other countries.

British Council Scotland manages the FLA programme with a grant from the Scottish Government. In 2012-2013, 70 FLAs will work in Scottish schools – an increase of 20% on the previous year. Meanwhile, a total of 365 Scottish ELAs are teaching in other countries this academic year.

iii) **Comenius Assistants**

Comenius, part of the European Commission’s Lifelong Learning Programme, brings together schools, colleges and local education authorities across Europe and enables pupils and staff to travel and experience life within schools in different countries through the four different strands, School Partnerships, Regional Partnerships, In-service training and Assistants.

Since 2009, Comenius partnerships have created links between Scotland and 25 different European countries ranging, from Norway and Turkey to Portugal and Lithuania.

In 2010–11, a total of 72 Scottish schools and further education institutions took part in Comenius. Scotland welcomed six Comenius assistants, while 52 assistants from Scotland travelled to other European countries. 144 participants from Scotland also received funding for in-service training.
Conclusions

- The teaching of foreign languages from an early age is essential, both for the direct knowledge it gives children and for the ability language has to raise inter-cultural awareness and lift horizons and ambitions.

- Scotland has led the way in the teaching of foreign languages in the past and it is essential that funding and training is improved if this is to be maintained.

- It is critical to Scotland’s economic success in the future that businesses realise the importance of languages being taught from an early age. The “English is enough” attitude must be challenged if Scotland is to prosper in the future.

- The approach taken to Gaelic-medium education has shown that with focus and investment, language can be taught effectively from an early age. There are early signs that the approach being taken in the “1+2” initiative will be successful as well.

British Council Scotland would be pleased to provide more detail by way or oral evidence to the Committee.
Appendix 1 – Case Studies

Connecting Classrooms – Mearns and Surrounding Primary Schools

Over the past three years, Mearns Castle High School, along with their six Cluster Primary Schools - Mearns Primary, Hazeldene Nursery, Eaglesham Primary, Kirkhill Primary and Calderwood Lodge Primary - have been involved in the British Council’s Connecting Classrooms project. The broad aims of the project have been to forge links with partner schools from different countries, introducing aspects of the reciprocal culture into the existing curricula of the schools as well as developing an understanding of the different educational systems across the globe. Mearns Castle High School found all this to be stimulating, but also realised the huge potential in further strengthening links within their own cluster of primary schools.

In 2009, Mearns Castle and its feeder primaries were awarded £6,000 funding over three years as part of the Connecting Classrooms initiative; to create a link between the Scottish schools and seven counterpart schools in Delhi, India. One of the head teachers from the Indian schools came over for an initial visit and while he was over we held a ‘Scottish Highland Commonwealth Games’ where we invited all of the pupils from the primary schools to come to our school and collaborate in putting on a ‘Commonwealth Games’ to celebrate the Games being held in India and coming to Scotland the next time.

Following this, seven of our members of staff went over to India for 8 days to find out more about the partner schools and they got a really good feel for the culture of India and Delhi in particular. One of the key things we did was to produce an Indian-Scottish recipe book. We got the pupils in the Indian schools to write down their favourite recipes and combined these with recipes put forward by our own pupils. We had this designed, published and sold over 500 copies as part of our fundraising efforts.

It was through such initiatives that the Connecting Classroom teachers really began to collaborate as a team. The Mearns Castle Cluster was already a positive and energetic group of schools, but the Connecting Classrooms projects brought about a new dynamic and ethos to the team. When we hosted the eight Head Teachers from Delhi, the conversations between all parties was based upon a willingness to find out about each other’s cultures and educational systems. As a cluster, we began to further discuss collaborative ideas and further ways to keep the partnerships alive when the British Council funding ends. Indeed, the next event we are hosting as a cluster is an Indian themed sports day.

As the official three years of funding comes to an end, it is clear that we would like to continue to work with our partner schools in India and are currently investigation possible grants to support this. But as a cluster, focusing on international partnerships, the possibilities are endless in terms of what can be achieved. Links between all the schools in our cluster have undoubtedly been further strengthened by the project, with both teachers and pupils developing not only an greater understanding of Indian culture, but also raising awareness of the great work that goes on within each of our schools.
Case Study – Foreign Language Assistance

Zeng Miqun taught Mandarin Chinese at Our Lady's High School, Cumbernauld, North Lanarkshire. She and her students built a ‘Great Wall’ showcasing Chinese culture and pupils’ work.

The Chinese ‘Great Wall’ project enhanced pupils language skills and raised their awareness of Chinese culture. The display of pupils’ work helped them build their confidence and creativity in learning."
“"The Chinese class is great fun. We learnt a lot - not just language but also about the culture. I liked trying some tai chi." - S6 pupil
Comenius Case Study – Pentland Primary School, Edinburgh

Hosting their first Comenius Assistant prepared Pentland Primary School pupils in Edinburgh, Scotland for true international citizenship, not only through their proficiency at mastering another language but also in their confidence and international outlook.

Guillem Montero from Majorca, Spain spent six months as a Comenius Assistant at the school introducing Spanish language and culture and raising awareness of European issues. He was also instrumental in supporting the first year of their Multilateral Comenius School Partnership. He brought a ‘real life’ dimension to the multilateral Comenius project for pupils, parents and teachers and added authenticity in communication between Pentland and its partner school in Spain.

Guillem was involved in all school activities and took the lead role in the Mother Tongue Month activity within the school. He also coached Year 6 pupils entering the City of Edinburgh Euroquiz in February 2010. His work highlighted the global dimension in active citizenship and cultural awareness.

Rebecca Annand, Principle Teacher at Pentland Primary School said: “Through class lessons the pupils gained invaluable insight into life in Majorca and Spain. They were able to share their Spanish holiday experiences with Guillem, and he made it easy for pupils to identify the similarities and differences between life in Scotland and life in Spain. He engaged and motivated pupils to learn through using everyday experiences that they could relate to school life, holidays, hobbies, Christmas and Easter, for instance. His use of technology like YouTube really brought learning to life for the pupils. He also set up an after school class for teachers and pupils to improve their conversational skills in Spanish.”

With their Comenius Assistant’s support, staff and pupils developed their knowledge and understanding of the diversity of European cultures and languages, and the value of this diversity. It gave pupils an opportunity to build upon their basic life skills, enhance their personal development and their European citizenship. In return, the school provided Guillem with a realistic picture of Scottish education and an opportunity to become involved in language teaching, environmental issues and global citizenship. He relished the opportunity to accompany students on school outings as it gave him a better understanding of UK education outside the classroom.

Guillem described his assistantship as being a “great opportunity to get to know the local people and culture thanks to the school community. It gave me the opportunity to reflect and understand the differences between my country and theirs.”

Plans to continue the international dimension at Pentland Primary School are already in hand as the school has been awarded another Comenius Assistant this year. Marko Neumann from Germany hopes to build on the work which Guillem developed within the school but from a German perspective. The school is also beginning their second year of their Comenius School Partnership.
Introduction


Purpose of the Brussels Bulletin

2. The Brussels Bulletin is produced by the Parliament’s European Officer and is based on the key themes identified by the previous Committee as a result of its consultation on the Commission’s Legislative and Work Programme for 2011. These themes will be re-visited upon publication of the Commission Work Programme.

3. The current themes agreed by the previous Committee at its meeting on 14 December 2010 were—

   - Europe 2020
   - Cohesion policy
   - The Justice (Stockholm) Programme
   - Energy and climate change
   - Agriculture and fisheries
   - Multi-Annual Financial Framework

4. The European Officer provides early intelligence on expected developments, actions of the key players and detail of debate on these key themes, primarily through the Brussels Bulletin. This is circulated to relevant parliamentary committees and is published on the Parliament’s website. More detailed briefing can also be commissioned by a committee on any specific issue.

Recommendation

5. The Committee is invited to consider the latest issue of the Brussels Bulletin and to agree to forward it to relevant committees for their consideration.

Committee Clerk
February 2013
Common Fisheries Policy (CAP)
The Irish Fisheries Minister outlined the Council priorities for the next six months before the Fisheries Committee of the European Parliament (22 January 2013). Key amongst them will be seeking resolution of the mackerel issue (see below).

Mackerel debacle
The Scottish Government has called for the appointment of an international mediator to help resolve the on-going stalemate over mackerel fishing in the North east Atlantic (28 January 2013).

Further the Icelandic Government has declared a unilateral mackerel quota for its vessels.

Common Agricultural Policy
The Parliament's Agriculture and Rural Development Committee (AGRI) voted on Common Agricultural Policy (CAP) reform on 23 - 24 January 2013. MEPs had tabled over 7,000 amendments to the Commission's original proposals.

Sustainable transport
COMMON FISHERIES POLICY

Current status
Negotiations continue on the future of the Common Fisheries Policy (CFP). The Irish Presidency hopes to secure agreement by June 2013.

What’s happening?
The Irish Fisheries Minister Simon Coveney (Ireland currently hold the rotating Presidency of the Council) outlined his priorities for the next six months before the Fisheries Committee of the European Parliament (22 January 2013).

(The address followed significant disagreement between Parliament and Council over the December 2012 fisheries negotiations. Although the Parliament has co-decision over a greater number of aspects of fisheries management the Council continue to try to exclude them from exercising these new powers, using (as the EP argues) legal distinctions. In this instance the Council decided to split the draft Regulation on the multiannual management plan for cod into two separate texts, only one of which would be subject to co-decision with the EP).

Coveney expressed his confidence that a political agreement between Council and Parliament could be secured on all three proposals on CFP reform:

**Basic regulation.** Coveney stated that the Council has already agreed a General Approach and that the Parliament plenary vote will take place on 6 February 2013. The Council hopes to complete its position on outstanding issues during its 25 - 26 February 2013 meeting. The Presidency aims to commence trilogues in March 2013 with a view to reaching agreement at second reading in June 2013. Details of the timetable can be accessed [here](#).

**Common organisation of markets (CMO) regulation.** The Council has agreed a General Approach and the Parliament has adopted its first reading position (12 September 2012). Coveney informed MEPs that the Presidency hoped to have a negotiating mandate from Council by the end of the January 2013, with a view to commencing trilogues in February 2013. Details of the timetable can be accessed [here](#).

**European Maritime and Fisheries Fund regulation.** The Council agreed to a partial General Approach in October 2012. The Parliament plenary vote is expected in March or April 2013. Coveney hoped the Council General Approach could be finalised in April 2013, following which a negotiating mandate would be developed. Trilogues may begin in May with the aim of final agreement by the end of June 2013. Details of the timetable can be accessed [here](#).

MACKEREL DEBACLE

Current status
The Scottish Government has called for the appointment of an international mediator to help resolve the on-going stalemate over mackerel fishing in the North East Atlantic (28 January 2013).

What’s happening?
To appreciate the scale of the impact on the fishery, Iceland caught 2,000 tonnes in 2011, and 146,000 tonnes in 2012. Iceland justified this increase by claiming that there was an explosion in mackerel stocks in its waters as the fish began migrating further northwards as a result of warming seas.
The EU, Norway, Iceland and the Faroe Islands - the coastal states - jointly manage the northeast Atlantic mackerel fishery.

In an attempt to move the issue forward, the Scottish Cabinet Secretary for Rural Affairs Richard Lochhead MSP called for the appointment of a mediator ahead of the EU Fisheries Council.

The Cabinet Secretary stated, ‘The Scottish Government has been at the forefront in calling for sanctions against both the Faroe Islands and Iceland in response to their irresponsible setting of unilateral quotas, which between them amount to almost half the scientifically recommended total. [...] I would therefore be willing to support new approaches if that will help deliver a resolution to this long-stagnant dispute’.

He continued, ‘I want sanctions in place that help Iceland and the Faroe Islands realise they can’t get away with overfishing international stocks – stocks that are only healthy due to other countries’ responsible measures.

International fisheries negotiations can’t work on the basis that some countries manage a stock only for others to take advantage. But beyond that we need all players involved in this fishery - not only the EU and Norway but also the other countries with an interest, including Iceland and the Faroe Islands - to agree a management plan that will safeguard this stock.

To get to this point I believe we now need to appoint a neutral chair to move us forward. The appointment of an international mediator could help broker an agreement to end this dispute in an objective and neutral fashion’.

Although Member States have agreed in principle to adopt sanctions against Iceland and the Faroes, there appears to be no timetable for implementation. This delay has been widely attributed to the Commission, which is of the view that such an action would run afoul of World Trade Organisation (WTO) rules. It is also attributed to certain member states that fear the impact upon domestic processing, of any ban on Icelandic fisheries products.

Several other factors are at play in the situation, not least the upcoming Icelandic general election (27 April 2013), the Norwegian election scheduled for September 2013 and the recent loss of Marine Conservation Society accreditation (see Bulletin 80).

A more immediately intractable problem to an early resolution of the issue remains the full allocation of the 2013 Total Allowable Catch (TAC) of mackerel agreed at the recent EU-Norway bilateral negotiations. Such a complete allocation leaves little scope for in-year re-allocation.

In a development widely regarded as a pre-emptive negotiating move, Iceland has unilaterally lowered its mackerel quota (by an amount similar to the cuts accepted by the EU and Norway). Iceland’s industry Minister, Steingrimur Sigfusson, said that fishermen would fish 15% less mackerel this year than in 2012, taking the catch to 123,182 tonnes, to help assure sustainability of the stock. He stated, ‘We are willing to further reduce our catch if other coastal states agree to do so as well. I hope the coastal states will return to the negotiating table with us to discuss concrete proposals.’

Commenting on the move, a spokesperson for EU Commissioner for Maritime Affairs and Fisheries Commissioner, Maria Damanaki stated: ‘The Commission regrets Iceland’s announcement of a unilateral
fishing quota for mackerel. We regret that Iceland has decided its own quota unilaterally and not in consultation with its partners, for yet another year. The Commission remains committed to finding a multilateral solution with all coastal partners and appeals to Iceland to return to the negotiating table with an offer that is sustainable and constructive'.

Resolution of the situation is unlikely before the end of 2013, with any new catch allocations unlikely to be brought in until 2014 at the earliest.

COMMON AGRICULTURAL POLICY
Current status

What’s happening?
The AGRI Committee voted on the package of four proposals on Common Agricultural Policy (CAP) reform: direct payments, rural development, the Single Common Market Organisation (CMO), and a horizontal regulation for financing, managing and monitoring the CAP. MEPs had tabled over 7,000 amendments to the Commission's original proposals.

Direct payments. The Committee’s report was approved 31 to 12 with 1 abstention. The report endorsed the Commission proposals in relation to the capping of direct payments. However, it proposed excluding co-operatives and other groups of farmers who distribute payments received to their members, and ensuring that capped money remains in the region where it was capped and is used for rural development programmes.

The Committee agreed to place a €300,000 ceiling on payments to any single farm and to cut subsidies by 70% to farms receiving between €250,000 and €300,000. Subsidies would fall by 40% for farms receiving between €200,000 and €250,000, and by 20% for those getting €150,000 and €200,000.

The report also called for more flexibility in greening of Pillar I. The report determined that farms with under 10 hectares of arable land should be exempt and the rules should be relaxed for holdings of 10-30 hectares. According to the Parliament, the exemptions will apply to 82% of EU farmers. The Commission had recommended that only organic farmers should be exempt from greening schemes.

The Committee backed the Commission’s proposal to require that 30% of direct payments be linked to farmers’ environmental performance - such as diversifying crops, leaving up to 7% of land uncultivated to promote biodiversity, and creating permanent pastures.

The Committee also backed an amendment to allow national governments to transfer savings from the first pillar to rural development projects.

Under pressure from farmers in the newer EU countries, MEPs agreed that no country’s farmers should get less than 65% of the EU average payment (a significant boost some countries like Latvia, where farmers now get 33% of the EU average). Under the Commission's proposed system, member states with direct payments below 90% of the EU-27 average would close one-third of the gap as of 2014, with disbursements gradually rising to 90% of the EU average by 2020.
The Committee recommended that farmers under age 40 get a 25% bonus on the direct payment in the first five years they farm. But they capped the payment at 50 hectares, replacing the Commission’s plan for a limit based on the average farm size in each member state. It also called for additional payments to small farmers of up to €1,500, €500 more than the Commission recommended.

**Rural Development.** The report was approved 34 to 10. The report approved a proposal to allow for double funding for farmers who engage in pro-environmental practices, and also supported the Commission's proposal under which risk management tools would be funded from the budget for rural development programmes rather than the direct payments budget.

**Single CMO.** The report was approved by 26 to 14 with 4 abstentions. The report proposed to strengthen the original tools for managing production in the farm sector, including prolonging sugar quotas until 2020. The changes would give greater scope to policy makers and private actors to react to increasing market volatility.

Producer organisations in all sectors would also gain added bargaining power in negotiations on the food supply chain, and the report proposes providing such organisations with wider derogations from competition rules.

**Horizontal regulation.** The report was approved by 35 to 5, with 2 abstentions. The Committee’s report approved several measures designed to reduce bureaucracy for farmers and ensure proportionality in the penalties for breaching rules. Rather than imposing sanctions immediately, the report proposed that member states set up an early warning system to deal with cases in which non-compliance does not constitute a direct risk to public or animal health.

The Committee also rejected a Commission proposal to make public the names and municipalities of those in receipt of direct payments or money from rural development programmes.

Commenting upon the vote, George Lyon MEP, the shadow rapporteur on the direct payments report, stated, ‘Today’s vote is a big step forward towards a more sustainable farming model that can respond to the big challenges of climate change and biodiversity loss by reducing energy, water, nutrient use and GHG Emissions while still making a contribution to food security. We are finally moving away from income support without any strings attached. Instead we have begun the move towards a much more targeted funding approach to reward farmers for the public goods they deliver.’

The four reports will be voted on in Plenary 12 - 13 March 2013 before formal negotiations with the Council commence. However, it should be noted that the Parliament has said such a vote is contingent on agreement on the MAFF at the European Council 7 - 8 February 2013.

**SUSTAINABLE TRANSPORT**

**Current status**

**What’s happening?**
The Commission package includes:
- A Communication on a European alternative fuels strategy which looks to steer the development of transport technologies with an EU-level
framework. This identifies the main technologies as liquefied petroleum gas (LPG), natural gas and biomethane, electricity, biofuels and hydrogen. A planned framework of action would include legal measures on infrastructure; addressing public acceptance; guidelines on national financial incentives; and a coordinated R&D programme through the Strategic Transport Technology Plan, with EU support from Horizon 2020 funds.

- A draft Directive on infrastructure and standardisation to support national research, development and deployment efforts. This proposes a minimum number of recharging points for electric vehicles (EVs) by the end of 2020 in each Member State, 10% of which must be publicly accessible. The target for the UK would be 122,000 charging points (as against 703 currently in existence in 2011).

Additionally, the 14 countries (including the UK) with a hydrogen network are required to ensure a sufficient number of refuelling stations at a distance of no more than 300km by the end of 2020.

Minimum LNG and CNG fuelling points are also required for ports and motorways included in the Core Network of the Trans-European Transport Network (TEN-T). LNG refuelling points are to be built in all maritime and inland waterway ports; and at 400km intervals along motorways on the Core Network. This covers 139 European ports, including Edinburgh and Glasgow. Targets should be met by 2020 for maritime ports and motorways and 2025 for waterways. Publicly accessible CNG refuelling points should be available at distances of 150km by 2020.

EU Governments must also draw up national action plans detailing regulatory measures, incentives and support programmes.

The Commission is keen to stress that no public finances should be necessary to fund the prescribed level of infrastructure development “if the Member States use the wide range of measures available to mobilise private investment cost-efficiency.”

Available EU support includes the TEN-T programme, cohesion and structural funds. The costs will be distributed between Member States, dependent on the number of kilometres; the number of maritime/inland ports included on the TEN-T Core Network; and number of EV charging points to be installed (itself calculated taking into account the car stock and share of urban population).

The package of measures will now be examined by the Council and Parliament with final approval possible by the end of 2013. EU Energy Ministers are scheduled to hold a first debate on the dossier at their 10 June 2013 Council.

OTHER NEWS
Financial Transaction Tax (FTT). Discussion has begun amongst the 11 member states (Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain) who agreed to adopt the tax as to what to do with the money raised (estimated at €37bn per year).

The Commission now has to submit a proposal on how to allocate the money, with overseas development assistance and heavily indebted Eurozone countries expected to receive funds.
France, which is one of the biggest promoters of the tax, has indicated its openness to allocate up to 10% of this new income to overseas development.

**EU Emission Trading Scheme (EU-ETS).** Prices in the EU Emissions Trading System (EU-ETS) dropped to €2.81 a metric tonne (a 40% fall) after the Parliament's energy (ITRE) committee opposed a scheme known as ‘backloading’ - or supporting prices by extracting allowances from the market and re-injecting them later (24 January 2013). The Commission warned that the price could drop further and that the scheme could become irrelevant unless parties agreed on a rescue plan.

The €110bn scheme is key to the EU’s efforts to encourage utilities and industry to ‘go green’ but carbon prices are far too low to provide that incentive. Analysts say carbon prices need to be at least €20 to make utilities switch to lower carbon energy generation.

The scheme is now in its third trading phase and is legislated to run until at least 2020, which means it cannot be dismantled even if prices fell to zero.

Thursday’s vote is part of a long EU process. Although not binding, it is the latest sign of the difficulty the EU is having in reaching agreement on how to intervene in the carbon market.

So far, coal-intensive Poland is opposed, Britain wants a more ambitious plan and Germany, the EU’s most influential member, is undecided.

**Energy: UK infraction.** The Commission has referred the UK to the European Court of Justice (ECJ) for not implementing certain provisions of EU electricity and gas market rules by the March 2011 deadline (24 January 2013). The referral is the last step in legal action initiated in September 2011 with the issue of a formal letter to the UK giving notice of its infringement.

The non-implementation refers to Northern Ireland, where translation of the laws into national law is not expected to be complete until late spring 2013. The Commission requests the ECJ to impose a daily penalty payment of €148,177.92 on the UK for each of the partially transposed gas and electricity Directives.

**Energy reports.** The Commission’s Joint Research Centre has published the first edition of what is to become an annual status report on the technology, economic and market aspects of wind energy in Europe and the world. The report covers technology and market status as well as economic impacts.

The Commission has issued a report on Trans-European Energy Networks (TEN-E) spending, which shows the projects that have received funds from the programme between 1995 and 2011. These include the SSE North Connect interconnector plan with Norway.

**EU Energy Week.** The Sustainable Energy Week conference will take place in Brussels between 25 and 27 June 2013. Further details can be accessed here.

**Maritime Spatial Planning.** The Commission has confirmed that it will publish a draft directive establishing a framework for maritime planning and coastal management on 12 March 2013. The Directive would ensure that Member States provide a stable, reliable and future-oriented integrated planning framework to optimise the use of marine space to benefit economic
development and the marine environment and that in doing so they apply a common approach in order to facilitate cross-border maritime spatial planning.

**Industrial Policy.** The Committee of the Regions has launched a consultation on the EU 2020 Strategy’s flagship initiative ‘An industrial policy for the globalisation era’. The deadline for responses is 1 March 2013. The results of the consultation will be discussed at an event in Brussels on 10 April 2013.

**Gender balance.** The Commission has published figures which show that the share of women on boards in publicly listed companies has risen to 15.8% (up from 13.7% in January 2012). The figures represent the highest year-on-year increase recorded, with 24 countries experiencing an increase. However 25% of the EU’s largest companies still have no female representation at board level.

In November 2012 the Commission proposed legislation to set a minimum objective of 40% of non-executive board members to be women in listed companies by 2020, or 2018 for listed public undertakings. National Employment and Social Affairs Ministers are expected to hold a second discussion on the proposal on 20 June 2013.

**Plan Bee.** The Commission intends to propose a two-year EU ban on the use of three neonicotinoid pesticides on crops which are known to attract bees (31 January 2013). The pesticides are believed to be harmful to bees and may have contributed to bee decline across Europe. A spokesman for the Commission stated, ‘We are requesting that member states suspend for two years the use of these [neonicitonoid] pesticides on seeds, granular atom sprays and for crops that attract bees – sunflower, maize, rape and cotton.’

A vote on the two-year ban is now planned at an EU expert committee later this month (7 February 2013). The Commission hopes to have a proposal ready by March 2013, with swift enactment thereafter, possibly by 1 July 2013.

**Latvia and the Euro.** Latvia, which intends to adopt the euro in 2014, has passed a fiscal discipline law and supporting guidance (31 January 2013), the steps required to satisfy the EU that it is on track to join the Eurozone. Prime Minister Valdis Dombrovskis stated that he will ask the Commission and the European Central Bank for euro-readiness assessment reports in early March 2013. Based on the two convergence reports, EU leaders will make a final decision this summer on Latvia’s eurozone membership. Latvia would become the 18th Eurozone member.
## UPCOMING EVENTS & MEETINGS

<table>
<thead>
<tr>
<th>February 2013</th>
<th>March 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 – 7 European Parliament Plenary Session</td>
<td>1 Roundtable Discussion of EU Ministers with responsibility for Homelessness</td>
</tr>
<tr>
<td>7 - 8 European Council</td>
<td>4 Eurogroup</td>
</tr>
<tr>
<td>11 Eurogroup</td>
<td>5 ECOFIN (Finance) Council</td>
</tr>
<tr>
<td>12 ECOFIN (Finance) Council</td>
<td></td>
</tr>
<tr>
<td>15 – 16 Employment, Youth, Culture and Sports Council</td>
<td>7 – 8 Justice &amp; Home Affairs Council</td>
</tr>
<tr>
<td>18 - 19 Education Conference: Integration, Innovation and Improvement - The Professional Identity of Teacher Educators</td>
<td></td>
</tr>
<tr>
<td>18 – 19 Competitiveness Council</td>
<td>11 – 14 European Parliament Plenary Session</td>
</tr>
<tr>
<td>22 – 23 Transport, Telecommunications and Energy Council</td>
<td>11 Transport Council</td>
</tr>
<tr>
<td>25 – 26 Agriculture &amp; Fisheries Council</td>
<td>14 – 15 European Council</td>
</tr>
<tr>
<td>28 – 1 Employment, Social Policy, Health &amp; Consumer Affairs Council</td>
<td>18 – 19 Agriculture &amp; Fisheries Council</td>
</tr>
<tr>
<td>28 – 1 Committee of the Regions Bureau</td>
<td>20 – 21 Informal meeting of European Affairs Ministers</td>
</tr>
<tr>
<td>21 Environment Council</td>
<td></td>
</tr>
<tr>
<td>26 – 27 Energy Service Directive - Concerted action plenary meeting</td>
<td></td>
</tr>
<tr>
<td>27 – 28 European Parliament Mini Plenary, Brussels</td>
<td></td>
</tr>
<tr>
<td>27 – 28 Eu Forest Director’s conference</td>
<td></td>
</tr>
</tbody>
</table>
CONTACT DETAILS

Dr Ian Duncan

Rond Point Schuman 6
B – 1040
BRUXELLES
Belgique

or

The Scottish Parliament
EDINBURGH
EH99 1SP
UK

Tel: 0044 131 348 5226
Mobile: 0044 7785 306767
Email: ian.duncan@scottish.parliament.uk
Background and introduction

1. The European and External Relations Committee reported on the EU's Horizon 2020 Programme for Research and Innovation in June 2012. In responding to the report the Cabinet Secretary of Finance, Employment and Sustainable Economic Growth committed to updating the Committee every six months on progress with regards the development of the Horizon 2020 programme and on the work of the Scottish Research and Technological Development Steering Group.

2. The first of these updates, which is annexed to this note, covers:
   - the Framework Programme 7 (FP7);
   - the EU Research and Technological Development Steering Group;
   - Engagement with UK and Europe; and
   - Smart Specialisation Developments.

3. The update cites the increased number of Scottish organisations benefiting from the funding commitment, the rise in participation with FP7, and the fact that Scotland has exceeded the European Commission target for the FP7 Cooperation Programme, as evidence of the positive progress made. The update includes a full breakdown of the figures for FP7 and a letter regarding the promotional activities for the programme.

4. The update outlines the membership additions to the Steering Group, namely the Office of the Chief Scientific Advisor and the European Regional Development Fund and the Head of Enterprise Europe Network Scotland), which it hopes will provide further access to the EU market, partnership opportunities for businesses and a greater insight into EU legislation and policies.

5. The update notes that the Steering Group has continued to engage with the UK Government and the Northern Irish and the Welsh Assemblies, including attending various promotional events and briefing presentations.

6. The update concludes that the Steering Group is working closely with the European Commission to agree an approach to the Commission’s Smart Specialisation Strategy and includes further information on the Scottish dimension.

Recommendation

7. The Committee is invited to consider and note the first update from the Scottish Government.

Committee Clerk
February 2013
In my letter to you of 27 August 2012 I agreed to provide a regular update the members of the European and External Relations Committee on our interactions with UK Government bodies and EU Institutions as the work to establish the future EU Research and Innovation Framework programme, Horizon 2020, progresses. I understand that the Committee is scheduled to meet on 24 January 2013 and so trust that the Committee will find the following information both informative and helpful.

Framework Programme 7

I wrote to you on 31 October 2012 with details of support and promotional activities underway which were intended to optimise participation in the final calls of Framework Programme 7. A copy of that letter is in Annex A.

I am happy to report that the latest information received on participation in FP7 shows that the funding commitment for Scottish organisations has increased to \( \text{\texteuro437 million} \) – which represents 9.9% of total UK funding – along with a rise in the total number of participations to 1116. Work is underway to carry out a more detailed analysis of Scottish participation and I will forward a copy of the evaluation report to the Committee once it is finalised. In the meantime some information on participation that the Committee may find helpful is contained in Annex B. These latest results are both welcomed and encouraging, and I am hopeful that Scottish organisations will enjoy further success in the remaining calls of the programme.

EU Research and Technological Development Steering Group

The Scottish Government has continued to facilitate the work of the EU Research and Technological Development Steering Group and its engagement with stakeholders to promote the Scottish position during the development of the Horizon 2020 programme.

As the legislation process of Horizon 2020 is nearly at an end the Steering Group has reviewed its remit and membership to ensure that it is able to develop and deliver an implementation plan that will ensure a coherent, thematic approach to engaging with stakeholders both at national and European level. Membership of the Steering Group has been expanded to include representation from the Office of the Chief Scientific Advisor and the European Regional Development Fund.

In addition, the Head of Enterprise Europe Network Scotland has joined the Steering Group. Enterprise Europe Network is the biggest innovation and business network in Europe covering some 600 organisations across 40 countries. The inclusion of EEN in the Steering Group will provide additional expertise as well as access to information and advice on EU market opportunities, legislation and policies and on the range of the assistance available to businesses seeking commercial and technology partnerships across Europe.

Engaging with UK and Europe

Scottish Government members of the Steering Group have maintained regular engagement with UK Government officials on Horizon 2020. In addition to continuing to participate in the
Annex

UK Cross Government Horizon 2020 Steering Group and Framework Programme Network meetings, there have been regular opportunities to influence and shape the UK negotiating position as work towards obtaining a partial-general approach progressed. Additionally, Scottish views on an organisational review of the National Contact Point support structure were submitted, with a final report and recommendations expected to be published by BIS in the next few weeks.

Steering Group representatives attended a presentation on Knowledge Innovation Centres, hosted by BIS in London on 3 October 2012 and are continuing to liaise with BIS on possible UK participation in the next round of KICs, with Scottish Government officials due to attend a key stakeholders meeting to be arranged for February.

In addition to maintaining positive and regular lines of communication with officials in BIS, Steering Group members have had a number of meetings with officials from Invest Northern Ireland and the Welsh Assembly Government and discussed their preparations for Horizon 2020 and considered possible engagement opportunities with Republic of Ireland officials during the current Presidency period. The work of the Steering Group was also highlighted at Scotland Europa’s Annual General Meeting on 7 September 2012.

Scotland House in Brussels hosted a meeting of the Steering Group on 7 November, which was also attended by Scott Hudson, the First Secretary for Research and Innovation from the UK Permanent Representation to the EU. This meeting helped to reinforce the existing positive lines of communication between SG EU Office officials and UKREP. In addition a panel comprising senior officials from the League of European Universities; the European University Association; Digital Europe; and EURIKA met with the Steering Group This was followed by a networking opportunity with officials from a range of EU institutes and regional offices including Navarra, ERRIN and Catalonia.

Smart Specialisation Developments

Members of the Steering Group have worked closely with the European Commission of months in considering a Scottish approach to the Commission’s Smart Specialisation strategy. As you will be aware, the future Cohesion Policy will contain a conditionality for regions to demonstrate that their EU funding investment decisions, in relation to innovation, are based on a smart specialisation ‘framework’—i.e. that there is a strong, demonstrable regional commitment on how EU funds can support the translation of innovation-related activity into jobs and growth. In practice, this will require all regions to generate a Smart Specialisation strategy or to demonstrate how smart specialisation principles align with a region’s existing innovation policy framework.

Scotland was asked by the Commission to work directly with it as it developed its Smart Specialisation framework. Alasdair Reid, Director at the Technopolis Group was appointed by the Commission to carry out a Scottish smart specialisation review; that review has recently concluded and a copy of the Executive Summary is at Annex C. I have asked my officials to ensure that Scotland now registers on the Smart Specialisation Platform - which will provide new networking opportunities with other regions - and to further consider the recommendations made in the report. I will provide the Committee with information on how this activity is progressing, along with a further update on the work of the Steering Group to address the Committee’s recommendations in my next update.
Annex

In conclusion, I am grateful for the continuing interest of the Committee in our efforts to encourage and support Scottish engagement in the Horizon 2020 programme.

JOHN SWINNEY
Cabinet Secretary of Finance, Employment and Sustainable Economic Growth
COPY OF LETTER OF 31 OCTOBER 2012 ON FRAMEWORK PROGRAMME 7

Thank you for your letter of 27 September advising me of the latest call from the European Commission for Framework Programme (FP7) project proposals and to request information of how the Scottish Government (and its agencies) will ensure Scottish participation in the programme.

These latest FP7 calls present a final opportunity for eligible Scottish organisations to participate in projects. Over the lifetime of the FP7 programme, our enterprise agencies have worked in collaboration with Enterprise Europe Network Scotland (EEN) and Scotland Europa (SEu) to deliver over 60 awareness raising events in Scotland as well as one-to-one meetings. At each event the focus was on informing, supporting and increasing the number of high quality project submissions from Scotland.

A promotion plan was developed and implemented and the main details of this plan are set out below.

Public contact points
For several years Scottish Enterprise (SE) has hosted a dedicated EU funding page on its website that complements the information on both the EEN and SEu sites. For each of these sites there is a common email enquiry address, fp7@scotent.co.uk. The EEN and SEu teams meet weekly to compare all enquiries received and use this information to develop promotional plans and events.

Final Call Promotion
In July 2012 a landing page was developed on the EEN site to coincide with the final FP7 call announcement. This page (http://www.enterprise-europe-scotland.com/FP7FinalCalls) sets out the opportunities available to Scottish businesses to engage in FP7; hosts a selection of current FP7 news; sets out FP7 call deadlines and case studies; and provides links to other FP7 support and news pages on the EEN site as well as CORDIS and the EU Research Portal.

Awareness raising events
In 2012 SE hosted or co-hosted several FP7 awareness raising events. Keynote speakers at each event included the UK FP7 National Contact Point as well as representatives of Scottish organisations that had successfully participated in FP7 projects. Post-event surgeries were held where attendees could further discuss their project ideas.

Events during 2012 have included:

- 9 February – FP7 platform at Scottish Thistle life science event.
- 11 April – FP7 Health theme awareness event.
- 25 April – FP7 MastE~rclass- basic information on how to apply.
- 1 May – FP7 Transport Awareness Raising event
- 17 May – FP7 Environment and KBBE Awareness Raising events
- 18 May – FP7 NMP Awareness Raising event
- 25 May – Marie Curie Edinburgh event
- 12 June – Scottish Technology Showcase
Annex

14 June – FP7 Opportunities event.
19 June – Invitation to Innovate Event in Aberdeen
28 June – Water Funding Event in Dundee.
10 September - Water Funding Event in Dundee.
18 September - FP7 Masterclass
6 September – Scotland Europa AGM

Tailored Support
In addition to the events above there have been over of 50 one-to-one meetings with clients ranging from those with interest but little awareness of FP7 to experienced applicants looking for consortium partners or pre-submission review of their project.

Wider promotion
The SEu Brussels office continues to liaise with the Commission and support its members in meetings with EU officials and through connecting Scotland with 106 regions via the ERRIN network. This is a particularly valued network as Horizon 2020 evolves.

Electronic media
SEu and EEN subscribers received tailored advice throughout the year through regular monthly e-zines. This advice includes FP7 call details and consortium opportunities. The next e-zine, due on 12 October will include a Scottish FP7 case study.

Social media and other channels
FP7 is also being promoted and discussed through the use of multiple social media streams including Twitter, blogs, podcasts and LinkedIn Groups. Messages are designed to direct readers to the landing site mentioned above and its associated resources as well as sharing FP7 related news stories and events.

A new "FP7 Final Calls" podcast (The Last Chance Saloon for FP7) was recorded and has had in excess of 100 listeners. It joins the previous FP7 podcast (All About FP7 Funding for R&D) on iTunes as well as other websites. The "Final Calls" podcast was also publicised on the Audiobook network, the audio version of Twitter.

Scottish organisations have two potential roles in an FP7 project; as either coordinator (or lead) or as a partner. Scottish networks circulate partner requests on a daily basis to subscribers and members as well as being publicised in LinkedIn groups. One example was "7 FP7 Health projects looking for partners", and "5 FP7 projects looking for academic partners".

Publications
A one page article on FP7 was published in Holyrood Magazine on 9 July 2012. This edition of Holyrood Magazine had an additional circulation of around 10,000 as was used in the Festival of Politics Handbook in August. The Scotland Europa Insight Europe publication - also sent to stakeholders across Scotland - has also featured FP7 opportunities.

As the final Call deadlines approaches, project applications should be at an advanced stage and that should trigger increased activity on the part of the Scottish organisations to assist in matching eligible Scottish partners with consortia that are seeking partners from across the European Union.
Annex

I hope that this provides you with a flavour of the work being carried out by our key Scottish organisations to vigorously promote FP7 and provide support for those companies who are seeking to successfully participate in it.

JOHN SWINNEY
Cabinet Secretary of Finance, Employment and Sustainable Economic Growth
Scotland’s FP7 Key Facts  
29 October 2012 – awarded in total from FP7 across Europe €29,432,733,139

### The Basics
Captures the absolute figures for FP7 money in Scotland over the programme life time.

### Variables
Total FP7 money to Scotland €437,148,996

Previous award reports:
- **Quarter**
  - **31 October 2011**: €304,255,997
  - **28 February 2012**: €351,212,761
  - **29 June 2012**: €374,514,134
  - **29th October**: €437,148,996

Success rates (% conversion from application to award) 22.31%\(^9\)

Total FP7 money compared to previous FP programmes:
- FP5 €194,293,036
- FP6 €189,116,179

### Relative Performance
Captures the breakdown by origin of recipients and participations

### Variables
Total participations 1116

Number of participations
- Higher or Secondary Education: 778
  - Money awarded: €361,603,176
- Research Organisations\(^{10}\): 98
  - Money awarded: €27,271,661
- Private Commercial\(^{11}\): 181
  - Money awarded: €39,496,162
- Public Agencies: 27
  - Money awarded: €3,371,127
- Others (associations): 32
  - Money awarded: €5,406,867

222\(^{12}\) are SMEs which is 19.9 % of the total participations; of which 153 are Private Commercial organisations, 13.7% of the total of participations

Status of award (lead, partner)
- 314 Coordinators (lead) and 802 Partners

A breakdown of awards by FP7 theme will be available in the full evaluation report.

---

\(^9\) Success rate as per report produced by EC and provided by BIS June 2012  
\(^{10}\) Research Organisations participants vary so this figure includes both large organisations and SMEs  
\(^{11}\) Private Commercial participants vary so this figure includes both large organisations and SMEs  
\(^{12}\) This total of SMEs includes both Research Organisations and Private Commercial participants
Annex

Variables

Total FP7 money other UK regions (UK, England, Ireland, Wales & Scotland)

<table>
<thead>
<tr>
<th>Region</th>
<th>Amount (€)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>3,812,763,533</td>
<td>86.6%</td>
</tr>
<tr>
<td>N Ireland</td>
<td>53,426,735</td>
<td>1.7%</td>
</tr>
<tr>
<td>Wales</td>
<td>97,805,340</td>
<td>2.7%</td>
</tr>
<tr>
<td>Scotland</td>
<td>437,148,996</td>
<td>9.6%</td>
</tr>
</tbody>
</table>

222\textsuperscript{13} SMEs have secured €51,949,429 from the current FP7 Programme. This equates to 11.88% of the funding secured by Scottish organisations.

The EC has set a specific target for the Cooperation Programme within FP7 of 15% of the funding to be allocated to SMEs. This target has been exceeded as Scottish SMEs have secured 16% of funds under this programme.

\textsuperscript{13} This total of SMEs includes both Research Organisations and Private Commercial participants.
Annex C

A smart, sustainable nation? A review of research and innovation policy in Scotland

Alasdair Reid, Director, Technopolis - 6 August 2012

1. Scottish research and innovation policy: strategic priorities 14
   1.1 The Government Economic Strategy 14
   1.2 Science and innovation frameworks 16
   1.3 Structural Fund interventions for research and innovation 18
   1.4 Scotland’s ‘framework’ for smart specialisation 19
   1.5 Conclusions on strategic priorities 20

2. Summary appraisal of Scottish research and innovation performance and potential 22
   2.1 Research and innovation inputs (expenditure and people) 22
   2.2 Scientific and technological output and specialisation 25
   2.3 Business innovation performance and trends 28

3. The Scottish innovation policy and governance system: an appraisal 30
   3.1 Appropriateness of the policy mix: sectoral targeting and novel practices 30
      3.1.1 Sectoral strategies and sector specific support measures 30
      3.1.2 Stimulating business R&D and innovation investments 32
      3.1.3 Boosting innovation in a traditional sector - Scottish Food and Drink 33
      3.1.4 An emerging global leader? The Scottish marine energy sector 35
      3.1.5 Innovation everywhere? Innovation policy in rural Scotland 37
      3.1.6 Cross-clustering, entrepreneurship and demand side policies 40
   3.2 Grant and equity finance for innovation and commercialisation 46
   3.3 The governance system and stakeholder involvement 51

4. Conclusions and recommendations 53
   4.1 Summary conclusions 53
   4.2 Recommendations 55

Appendix A Guidance for expert assessment from DG REGIO 56
Appendix B Statistics on Scottish scientific and innovation potential 58
Appendix C Studies, policy documents and programmes on research and innovation 60
Appendix D Scottish innovation policy governance system 62
Appendix E Scottish participation in FP7 - a social network analysis (Scottish Participants only) 63

Table of figures and boxes

Figure 1 Scottish Government Economic Strategy (2011) ................................................. 14
Figure 2: Measures identified in the 2011 Economic Strategy to support innovation and commercialisation 15
Figure 3: Science for Scotland - priority actions ................................................................. 16
Figure 4: Scotland’s economic and innovation performance relative to other EU27 region 22
Figure 5: R&D expenditure per capita (in euro) by sector performance (2009) ........ 23
Figure 6: researchers per sector 2009, Scotland compared to Finland and Norway .. 23
Figure 7: Income from research grants and contracts by Scottish HE institution 2009/10 (£ thousands) 23
Figure 8 Scottish scientific output by scientific field (2000-2011)......................... 26
Figure 9 Scotland - Relative citation impact compared to the world average ........ 27
Figure 10: High-tech patenting trends by UK region ........................................... 28
Figure 11 : Business infrastructure projects per growth sector ................................. 31
Figure 12: distribution of R&D and innovation grant awards by sector 2009-12........ 32
Figure 13 Main policy measures addressing smart specialisation topics................... 40
Figure 14 Scotland’s Cluster Portfolio ..................................................................... 41
Figure 15 : The market for company growth in Scotland (SE, 2012) ......................... 41
Figure 16: forecast High-Growth Firms account managed by Scottish Enterprise (2010-13) by sector 44
Figure 17 Scottish Performance in FP7 ................................................................. 49
Figure 18 : growth in scientific publications (2000-2011) ....................................... 58
Figure 19 Scotland versus England – relative citation impact 2003-07 ................. 58
Figure 20: Scotland versus Finland, relative citation impact 2003-7 ...................... 59

Box 1: key challenges for science in Scotland (2008) 16
Box 2: rural innovation challenges – extract from a blog of the RIBS project 38
Box 3: Evidence on high-growth and technology based firms in Scotland 42
Box 4: Enterprise Areas policy 44
Box 5: A96 corridor digital health cluster – entrepreneurial discovery in rural areas 45
Box 6 : Scottish Investment Bank equity and loan instruments 47
Introduction

Innovation has been placed increasingly in the heart of much policy discourse in recent decades as a means to ensure sustained and increasingly sustainable (in the environmental sense of the term) economic development. The European Union (EU) has set ambitious goals for growth and jobs, first in the ‘Lisbon Strategy’ and more recently in the Europe 2020 strategy, that depend in part on more focused and ‘smart’ investment into research and innovation.

The European Commission defined national/regional research and innovation strategies for smart specialisation (RIS3) as “integrated, place-based economic transformation agendas that do five important things”:

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures;
- They build on each country/region’s strengths, competitive advantages and potential for excellence;
- They support technological as well as practice-based innovation and aim to stimulate private sector investment;
- They get stakeholders fully involved and encourage innovation and experimentation;
- They are evidence-based and include sound monitoring and evaluation systems.

Scotland is one of the four countries that together form the United Kingdom (UK). Since 1999 and the reconvening of the Scottish Parliament, Scotland has a high degree of political autonomy, as yet not matched by a similar degree of fiscal autonomy. Successive Scottish governments have developed distinctive policies in response to the specific economic, social and environmental challenges facing the country.

Scotland has one of the oldest traditions in public education (Europe’s first obligatory public education system from 1496 and the establishment of a first university as early as 1413) and in scientific excellence (the Scottish Enlightenment in the 18th century placing Scottish scientists at the forefront of philosophical, economic, medical and engineering sciences amongst other). It was also at the forefront of the industrial revolution with economic development driven by international trade, finance and the emergence of heavy industry from the 18th century onwards. In the second half of the 20th century, Scotland suffered significant deindustrialisation as mining, steel-making, shipbuilding and other heavy industries declined.

However, the national economy has been reconfigured since the 1980s driven in part by the oil and gas industry but also by the emergence or development of specialist engineering firms, the life science, food and drink, tourism and creative industries, sectors. Moreover, despite the recent global financial crisis and the adverse effects for some of the main Scottish financial institutions, the financial sector remains a major employer and internationally competitive in specific niche.

This historical perspective is important since it underlines that Scotland has already gone through several phases of economic development and structural adjustment in the last century alone. Hence, a challenge facing Scottish policy-makers and stakeholders is to continue to foster such adjustments in order to keep pace with a shifting technological frontier and globalisation trends.

In this context, this paper reviews the Scottish strategic policy framework for research and innovation policy as a pilot contribution to the application of the new RIS3 approach to designing and implementing EU Cohesion Policy support through the Structural Funds in the upcoming 2014-20 programming period. The report applies the set of questions suggested by the European Commission services (see Appendix A) structuring them according to the five criteria for a RIS3 mentioned above.

The report is structured as follows:

- A first section summarises the current policy framework in Scotland and explores the focus in terms of challenges and needs for knowledge-based development (criteria 1).
- A second section reviews the main strengths, weaknesses, opportunities and threats facing the Scottish innovation system. The section examines the extent to which the current Scottish research and innovation strategy build on strengths, competitive advantages and potential for excellence.
- Section 3 considers the range of support measures in place, or planned, and the extent to which they provide both support to technological as well as practice-based innovation and their effectiveness in...
stimulating private sector investment?. As well as the governance system and the degree of stakeholder involvement and the extent to which policy innovation and experimentation is encouraged.

- Section 4 presents the overall conclusions and recommendations to assist the Scottish authorities in the further development of their research and innovation policies in the context of the smart specialisation agenda.

Acknowledgements and disclaimer

The author has benefited greatly from in-depth discussions with and comments on a first draft from: Alison Hunter of Scotland Europa, Alison Munro - Senior Manager, Strategy Development, Strategy and Economics, Scottish Enterprise, Rob Clark - Head of Policy, Regional Development Directorate Highlands & Islands Enterprise

In addition, a number of interviews were carried out in June and July 2012 with senior officials from:

- Scottish Enterprise (SE): David Smith, Director of Innovation & Enterprise Services; Richie Malloch, Food & Drink Team; and Andy McDonald, Director of Renewables & Clean Technologies
- Highlands and Islands Enterprise: Calum Davidson, Director - Energy and Low Carbon; Morven Cameron, Head of Academic Development; Donna Chisholm, Head of Business Innovation and Growth Sectors.

Thanks are due to all interviewees who discussed openly and candidly the challenges and opportunities concerning their area or sector. The report also draws on interviews carried out in January 2011, by the author, for the Regional Innovation Monitor project of DG Enterprise. As per normal social science standards, comments are not attributed to individual respondents.

The author was given excellent access to a range of internal working papers and notes of the enterprise agencies, which has greatly contributed to the understanding of emerging policy orientations.

The usual disclaimer applies and any misinterpretations or factual errors are entirely the responsibility of the author.
1. Scottish research and innovation policy: strategic priorities

Since 2007, the Scottish research and innovation policy objectives have been relatively stable and are set out in the Scottish Government’s (initially a minority government re-elected in 2011 with an overall majority in the Scottish Parliament) programme for government (ref.) and Economic Strategy (2007, renewed in 2011). The monitoring of progress towards the purpose and strategic objectives of the Scottish Government is done through the National Performance Framework (NPF), a 10 year plan that is accompanied by a set of national outcomes, indicators and targets.

Two separate policy documents on science policy and innovation policy have been drafted since 2007 and can be considered as important framework policy documents. In addition, a number of sector specific policy documents have been issued since 2007 as the Scottish Government, and its agencies, has sought to (re)focus and refine science, higher education and economic development (innovation) policies.

Moreover, the various quasi-governmental agencies (Scottish Enterprise, Highlands & Islands Enterprise, Scottish Funding Council) that operate in support of scientific research, innovation and business development also issue their own (multi)-annual ‘business plans’ or policy notes. These documents explain how the agencies aim to contribute to the Government’s programme and to the national outcomes.

1.1 The Government Economic Strategy

The purpose and the strategic objectives of the Scottish Government’s economic strategy (see Figure 1) have remained broadly the same since 2007. The major change introduced in 2011 was to add a priority on transition to a low carbon economy.

Figure 1 Scottish Government Economic Strategy (2011)

<table>
<thead>
<tr>
<th>Purpose &amp; strategic priorities</th>
<th>Specific initiatives (selected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The purpose of the Scottish Government is to make Scotland a more successful country, with opportunities for all to flourish, through increasing sustainable economic growth</td>
<td></td>
</tr>
<tr>
<td>Supportive business environment</td>
<td></td>
</tr>
<tr>
<td>Transition to a low carbon economy (new 2011)</td>
<td></td>
</tr>
<tr>
<td>Learning, skills and well-being</td>
<td></td>
</tr>
<tr>
<td>Infrastructure development and place</td>
<td></td>
</tr>
<tr>
<td>Effective government</td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td></td>
</tr>
<tr>
<td>- Strengthening levels of innovation and commercialisation including improving the links between our universities and private sector companies</td>
<td></td>
</tr>
<tr>
<td>- Using the Scottish Investment Bank to support early stage innovative technology based businesses and growth and exporting companies</td>
<td></td>
</tr>
<tr>
<td>- £70 million National Renewables Infrastructure Fund to leverage private sector investment</td>
<td></td>
</tr>
<tr>
<td>- A commitment to investment in higher education so that Scotland remains an international centre of excellence for learning and creative thinking.</td>
<td></td>
</tr>
<tr>
<td>- Setting out plans for next generation digital fund to accelerate the delivery of superfast broadband across Scotland</td>
<td></td>
</tr>
<tr>
<td>- Increasing the public sector’s direct contribution to the economy through smart use of public procurement in order to promote jobs and growth encourage innovation.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Scottish Government (2011)

The SG has placed a strong emphasis, since 2007, on investing in a ‘supportive business environment’, which can be justified by the relatively weaker performance, on average, of the business sector in Scotland (as measured by indicators such as GDP growth and productivity). The SGES underlines that these efforts are focused on: growth companies, growth markets and growth sectors. The SGES does not precisely define what is meant by growth companies, however, growth sectors are defined as: sectors offering particular opportunities for growth – in all or part of that sector – due to existing comparative advantages or through the potential to capitalise on Scotland’s unique natural assets. These are sectors where Scotland typically has distinctive capabilities and businesses with the potential to be internationally successful. The growth sectors identified in the strategy are:

- Creative Industries (including digital)
- Energy (including renewables)
- Financial and Business Services
- Food and Drink (including agriculture and fisheries)
- Life Sciences
- Sustainable Tourism
- Universities

These sectors are similar to those of the 2007 strategy with the changes being an emphasis on sustainable tourism and the addition of the Universities sector. The latter is somewhat the ‘odd-man-out’ since it is not a business sector per se even if the strategic and economic importance of higher education as a ‘tradable service’ is evident. The strategy foresees the renewal or the development and roll-out of specific ‘industry strategies’ for each sector.

A further underlying thread of the strategy is an emphasis on export companies. This is consistent with the evidence that the export intensity of the Scottish economy is lower than the UK average.

In terms of innovation, the 2011 strategy extends the traditionally strong emphasis given in Scottish policy to research commercialisation (‘Innovation and Commercialisation, page 47). At the same time, the strategy notes that innovation is often ‘incremental change’ and that “innovation in its widest sense must be recognised and encouraged across the entire business base”.

**Figure 2: Measures identified in the 2011 Economic Strategy to support innovation and commercialisation**

- Launch a Scotland-wide Interface service to provide a central point of access for business to the knowledge and expertise within Scottish universities and research institutes;
- Streamline the commercialisation and innovation support delivered by Scottish Enterprise and Highlands and Islands Enterprise;
- Introduce a new approach to help improve Scotland’s leadership and management skills to promote innovation and drive company growth;
- Develop a culture of innovation across the Scottish economy, including the public sector. For example, we will examine different approaches to further incentivise research within the NHS, building on the work of NHS Research that complements our research intensive universities so that Scotland becomes an even more attractive location for investment by international pharmaceutical companies;
- Build on the success of the research pools – which are focussed on the sharing of research resources and infrastructure across our universities to improve research capacity and capability – and supporting them to collaborate more effectively with Scottish businesses, particularly SMEs; and in competing for European funding and influencing research calls to maximise the return on Scotland’s capabilities; and
- Continue to engage with the European Commission to ensure the design of Europe’s future research and innovation funding programme, Horizon 2020, complements Scotland’s research and innovation strengths.

Additional opportunities for driving business development through innovation and technology elsewhere in the strategy include through the focus on ‘economic opportunities from low carbon (page 53 of the SGES 2011 and see also the 2010 Low Carbon Economic Strategy); and through innovative public procurement.

The low carbon strategy is strongly entrenched in the Scottish Government’s internationally recognised ambitious targets for “transformational change” including the equivalent to 100% of Scotland’s demand for electricity to be met by renewables by 2020. Moreover, the transition to a low-carbon economy is seen as a multi-department, multi-agency effort, multi-instrument (e.g. via legislation, funding, public procurement, encouraging demand for low carbon goods and services, etc.). This is exemplified by initiatives such as the Environmental Clean Technologies (ECT) Strategic Partnership that will deliver coordinated support for businesses and academia within the emerging ECT sector.

Public procurement as a means to stimulate demand for new innovative products and services is clearly identified in the SGES in several places (e.g. in support of innovation more generally and the low carbon sector). The strategy specifically commits to ‘using public procurement to encourage innovation in both the public and private sectors – allowing bidders to come up with new ideas wherever possible’ (pg.87). However, the details on how this will be made operational are not discussed further.
1.2 Science and innovation frameworks

Given the Government’s stated purpose adopted in 2007, two policy documents, Innovation for Scotland (2009) and A Science Strategy for Scotland (2008), further developed the specific rationale and priorities for research and innovation policy.

The 2008 Science for Scotland ‘strategic framework’, based on background research and a consultation, identifies a number of key challenges. Importantly, the strategy clearly states that there is a need for a partnership-based approach to meet them.

Box 1: key challenges for science in Scotland (2008)

- Maintaining our global pre-eminence in science teaching and research and continuing to attract science-related inward investment;
- Encouraging more young people to study science subjects and build careers in science, technology and engineering in Scotland; developing a science workforce which is aligned and responsive to the future needs of the science base and the economy as a whole;
- Increasing business research and product development capacity, and business demand for and utilisation of the science base in ways which support economic growth, including deriving more from intellectual property and growing companies of scale;
- Ensuring that the science base responds effectively to business demand, producing research and knowledge that is of economic value and supports sustainable economic growth;
- Taking advantage of the opportunities provided by the challenges of climate change and sustainable energy to build on our excellent research base to develop new industries, technologies and products;
- Improving the international marketing of Scotland’s science and seeking broader and deeper international collaborations with existing and new partners.

Source: Science for Scotland 2008

Science for Scotland sets out proposed actions in five priority areas as summarised in Figure 3. While the strategic framework is comprehensive many of the actions are worded in a relatively vague way that makes tracking achievement difficult.

Figure 3: Science for Scotland - priority actions

<table>
<thead>
<tr>
<th>Priorities</th>
<th>Key actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing individuals</td>
<td>• 3-year Do something creative. Do Science marketing campaign</td>
</tr>
<tr>
<td></td>
<td>• The path is SET - new science careers guidance programme</td>
</tr>
<tr>
<td></td>
<td>• Introduction of a new science baccalaureate</td>
</tr>
<tr>
<td></td>
<td>• Improving match between science course and provision involving concerted action with SFC, SEMTA, etc.</td>
</tr>
<tr>
<td></td>
<td>• Targeted and sustained growth in postgraduate number (e.g. increasing number of RSE research fellowships)</td>
</tr>
<tr>
<td>Scientific Research:</td>
<td>• continue to support science infrastructure which underpins existing and emerging world-class research in order to sustain and enhance international standing and competitiveness</td>
</tr>
<tr>
<td></td>
<td>• Provide an integrated agenda linking strategic research through to science application in government-funded rural, environmental and marine scientific work</td>
</tr>
<tr>
<td></td>
<td>• Promote growth in medical and related research</td>
</tr>
<tr>
<td></td>
<td>• Build on the success of research pooling to promote interdisciplinarity by promoting collaborative and inter-disciplinary working across pools and also with business to improve knowledge exchange</td>
</tr>
<tr>
<td></td>
<td>• Enhance links with the UK Government, Research Councils and with the EU (Horizon 2020, ERA)</td>
</tr>
</tbody>
</table>
### Priorities

**Economic and Business Demand:**
- Increasing investment in knowledge exchange over time in order to support industry-led strategic projects – helping key business sectors to articulate their research needs and better utilise science
- Optimise the economic contribution of intellectual property from publicly funded research – incl. a proposal from Universities Scotland to create a single forum for all available IP from Scottish universities (2009)
- Encourage research collaborations between business and academia that focus on growing businesses – assist businesses to share knowledge, costs, risks and benefits of R&D
- Use industry expertise to identify emerging market opportunities where Scotland has both the research capacity and commercial potential to exploit scientific advances
- Promote investment in Scotland’s R&D base
- Influence creation of most appropriate fiscal and taxation regime to stimulate innovation

**International:**
- Build on international profile and wider benefits of Saltire Prize
- Develop international lifelong learning strategy further
- Strengthen Scotland’s international reputation for science (using Global Scots, travelling scientists, international partnerships, etc.)
- Promote increased scientific interchange with the EU and make full use of EU opportunities for collaborative working.

**Connections in Scotland and in Government:**
- Increase activity including themed conferences and smaller events to improve connectivity within Scotland
- Initiate a cross-cutting review of Scottish Government science and research expenditure.
- Improve collaboration and identification of strategic opportunities for key science industry sectors to lead global markets.

Interestingly, Science for Scotland acknowledge the need to improve the absorptive capacity of firms. It noted that “The Innovation Framework and the new delivery focus of Scottish Enterprise and Highlands and Islands Enterprise will present a new approach to boosting innovation performance in Scotland – moving beyond science and technology to impact on areas such as services, business model innovation and procurement. This will address the key issue of how – over time – to work with businesses in Scotland to help them increase their absorptive capacity (a firm’s ability to value, assimilate and apply knowledge) for science based innovation.”

As well as stating what Government will do, the document identifies actions required by a range of agencies and stakeholders. However, it does not include an explicit multi-annual budgetary framework for the implementation of science policy. Nevertheless, one of the actions was to initiate a cross-cutting review of Scottish Government science and research expenditure to inform the “next spending round”. It has not been possible to ascertain in discussions with stakeholders whether this review took place, however, a mapping of public support for research and innovation has been conducted in 2012 (see section 3.2)

The introduction to Innovation for Scotland argues that it shares, with the Skills for Scotland and Science for Scotland strategies, a commitment to a demand-led, outcome-focussed approach. According to the Innovation for Scotland strategy, the Government’s approach to innovation is based upon four underlying principles:

- a clear focus from public sector agencies on working with business to stimulate greater demand for innovative ways of working and aligning support to meet that demand;
• a support for innovation beyond the commercialisation of science and technology alone to also include the innovation of new services, new sources of innovative ideas from customers and suppliers, the transfer of innovative ideas from one industry to another – all delivering better value and quality of service to customers;

• a systems-based approach that recognises how the public sector, private sector, academia and the third sector, need to be aligned with each other and work together in partnership to achieve greater wealth creation and sustainable economic growth;

• a focus on the outcomes of innovation and how it contributes to increased, sustainable economic growth.

However, contrary to the claim that it ‘focuses on outcomes’, Innovation for Scotland is a relatively confused document to read, mixing commentary on specific issues with a description of on-going initiatives and proposals for streamlining the management of public support across the various agencies. It sets neither targets nor objectives to be achieved, nor does it fix specific timescales in which actions are to be taken. At most, it attempts to affirm a specific rationale for intervention that can be summed up as: the need to extend innovation activity beyond science and stimulate a demand pull from business, open- and user-led innovation so as to increase levels of innovation throughout the system. Indeed, the final chapter, on monitoring and evaluation, underlines the need to look beyond aggregate measures of R&D spending to measure innovation activity.

Like the Science for Scotland strategy, the Innovation for Scotland document does not include a multi-annual budgetary framework for the implementation of the policy. The absence of a clear publicly communicated funding framework for science and innovation can be considered a weakness of the Scottish policy scene.

The introduction to Innovation for Scotland underlines that the two enterprise agencies (Scottish Enterprise and Highlands & Islands Enterprise) had published a specific document that “details of how the enterprise agencies have been helping Scottish businesses to innovate. Again the document, clearly underlines that innovation is not only science based and that there is a need for “an open approach”. In order to understand the specific role and priorities of the enterprise agencies, it is more relevant to consider their multi-annual business plans (see details in section 3).

1.3 Structural Fund interventions for research and innovation

A fourth type of policy document which provides a framework for intervention in favour of science and innovation are the Structural Fund operational programmes, even if the overall importance of Structural Funds investment with respect to Scottish public sector budgets has declined over time. The ERDF operational programmes for the Lowland & Uplands (LUPS) and for the Highlands & Islands both have a priority aiming at supporting innovation, the former Priority 1: Research and innovation and the latter Priority 1: Enhancing business competitiveness, commercialisation and innovation. In the Lowlands & Uplands programme priority 1 received nearly a quarter of the funding (ERDF funding of €92.1m), “reflecting the importance of research and development” within the OP and the role of Scottish Enterprise as a SDB in delivering some of the priority’s objectives.

The 2010 annual implementation report noted that there had been strong interest in this priority and nearly 82% of the available budget had been allocated to 54 projects. As a consequence, it was forecast that some indicators would be fully achieved as early as 2010.

In the Highlands and Islands, priority 1 also received the joint highest level of support, (ERDF funding of €47.5m) “reflecting the importance of enterprise development in the region, the need to support entrepreneurship and the effort to raise innovation levels”. A further…. was allocated to Priority 2: Enhancing Key Drivers of Sustainable Growth with the aim ‘to enhance the sustainable value of the key drivers of the regional economy, specifically the UHI, the wider research capacity of the region and the use of the region’s natural, historical and cultural assets’. In particular, the OP stated that “Transforming the UHI and its network

---

12 e.g. consolidating the management of all knowledge transfer measures under the Scottish Funding Council or transferring the responsibility for the Intellectual Assets Centre and Innovators Counselling and Advisory Service Scotland to the enterprise agencies.

15 Of this allocation are included the two SDB bids submitted by Scottish Enterprise which were awarded a grant of nearly £20 million.

16 The OP mentioned specifically the role of the European Marine Energy Centre in Orkney and the Sustainable Research Development Centre in Forres (Moray) for the renewable energy sector.
into a major research and training resource for the region’s key sectors will be one of the key legacies of this Programme”\(^\text{17}\). By the end of 2010, both priority 1 and priority 2 were fully committed\(^\text{18}\) and this led the Programme Monitoring Committee to recommend a transfer from the under-committed Priority 3 into Priority 1.

Both programmes identify the need for support in increasing business expenditure on R&D and innovation activity, including non-technological, including through making available qualified personnel. Equally, both place an emphasis on improving research-industry links (in the Highlands & Islands the absence of a university at the programme outset was considered a weakness) and commercialisation of the research base. In line with the 2011 SGES, there was a reprioritising of innovation funding in the European Structural Funds Programme towards the low carbon economy to support the development of innovative low carbon technologies “where Scotland has the greatest competitive advantage.”

1.4 Scotland’s ‘framework’ for smart specialisation

Given the existing policy framework described above, the Scottish authorities working co-ordinated by Scotland Europe produced, in January 2012, a first outline response to the Commission’s smart specialisation agenda\(^\text{19}\). The paper provides a summary overview of Scotland’s approach to regional innovation (see also section 3) and outlines the core elements of Scotland’s innovation system – its infrastructure, key players, the rationale and direction. The document argues that Scotland’s innovation governance system is robust and that policy design and implementation is based on an established process of Scotland-wide engagement of key ‘partners’ (see further discussion in section 3.3).

Given the existing policy framework set out in the previous sections, the paper begins by stating that “it is not our intention to radically change our existing RIS. Rather, we seek to extend the reach and potential of our existing economic activity, building on a base of core, regional assets”. After reviewing briefly the economic and innovation context in Scotland (see also section 2), the paper sets out Scotland’s “framework” for smart specialisation. This section essentially confirms that the foundation of a future S3 strategy will be the SGES adopting a rationale of ‘what works locally’ by building on ‘Scotland’s core assets’. The assets mentioned are “its geography, its global dominance in serving international markets through specific products and services (ranging from whisky to niche tourism) and its reputation for outstanding quality in areas such as science and technology”. There is a clear intention to build on the seven key growth sectors of the SGES but in doing so to focus on specific high-potential firms or scientific teams, one interviewee described this as a process of ‘drilling-down into niche’ to identify, or to identify intersections between the key sectors (e.g. by considering the points where the application of key enabling technologies leads to new economic opportunities).

Considering the Scottish innovation system, the ‘framework’ underlines the importance of ‘specialist centres’ (three are specifically mentioned: Edinburgh Bioquarter, the International Technology and Renewable Energy Zone and the Power Networks Demonstration Centre) and ‘cluster groups’. Concerning the latter, it is argued that ‘there is a clear, historical evolution in how Scotland has aligned its sector-driven approach to economic development with its cluster development infrastructure. The connectivity between these components is a fundamental driver of identifying new and emerging specialisms to drive future economic growth’.

Interviewees underlined that the renewed interest in ‘cluster analysis’ was essentially aimed at trying to better understand emerging ‘niche’ in sub-sectors and the potential for cross-sector activity (e.g. linked to key

\(^{17}\) The OP noted that developing the capacity of the region’s teaching and research underpins not just the ERDF Programme for Europe produced, but the ESF Programme as well. Developing a strong university and college cluster of learning that can support not just skills development in the area but the research excellences that will reinforce the competitiveness of key Highlands & Islands industries will be a critical legacy of the Programme (such as life and environmental sciences and nuclear decommissioning). Support will be available for key investments in improving the research and learning capacity of the UHI and its network, including the ICT/communications links that facilitate remote learning and research centres (especially for the more peripheral and fragile areas of the region and non-traditional groups of learners).

\(^{18}\) It should be noted that this was partly due to the large allocations to strategic delivery bodies (SDBs): up to 70% of the total allocation of Priority 1 – Enhancing Business Competitiveness, Commercialisation and Innovation, was allocated to HIE, a total of €33.268 million; and up to 50% of the total allocation of Priority 2 – Enhancing Key Drivers for Sustainable Growth, was allocated to UHI Millennium Institute, a total of €20.716 million.

\(^{19}\) Scotland’s Approach to Smart Specialisation: Describing the Journey and ‘Distance Travelled’, January 2012. Produced by Scotland Europa in partnership with Scottish Enterprise and Highlands and Islands Enterprise, and in collaboration with the Scottish Government.
enabling technologies). A strategic review was undertaken in the first half 2012 (see more details in section 3.1.6). This work is expected to deliver three outputs of relevance for smart specialisation: reinforce current sector strengths; identify new and/or emerging sector strengths in Scotland; and establish Scotland’s unique complementary regional strengths, which occur where two or more sector strengths combine or overlap.

The paper also points to a number of new ideas under development that may be used to ‘revitalise’ Scotland’s innovation policy including innovation challenges (prizes), a market-focused innovation service, even greater integration of academic and industrial research, revitalising an evaluation approach and, as mentioned, refreshing the cluster portfolio. The paper concludes with a number of ‘good practice’ examples of interest to other EU regions and underlines that the Scottish authorities are keen to learn from relevant cases from other countries and regions.

As part of the exercise of consultation with the Scottish authorities, a number of comments were submitted on this paper notably the following main points:

- While accepting that the paper is a summing up of existing evidence and strategic plans, it makes a number of ‘claims’ or ‘assumptions’ that would require further evidence or referencing to be substantiated. For example, the paper refers to a dynamic innovation system even although it acknowledges a number of weaknesses in performance. There is a need to outline at least the basis (indicators, etc.) on which the Scottish innovation system is judged to be dynamic. Similarly, the paper underlines the strength of a partnership-based approach but there is no discussion of whether the forms and intensity of partnerships vary across sectors, etc. or whether there is room within a well-established ‘social networks’ for new and emerging firms, technology providers, innovators, etc.

- The paper considers some elements of the current policy framework and underlines how policy has evolved over time, e.g. in terms of research commercialisation, in the light of evaluation and review evidence. However, the extent to which other policy measures are contributing (or not) to reducing relative performance gaps (notably in terms of the noted weaknesses in business R&D intensity and turnover from innovation or productivity) is not subject to a critical review.

- Three specialist centres are mentioned, however, the reader is left wondering why these ones and not others since the paper does not sufficiently explain the extent to which Scotland’s research or business communities have a competitive advantage in these fields.

- In short, the paper fails to clearly identify why, from a comparative perspective, Scottish innovation performance is rather weak and does not examine critically enough where the current policy mix may not be resolving certain underlying bottlenecks in the innovation system. These points are explored in the following sections.

1.5 Conclusions on strategic priorities

Broadly speaking, the SGES (and subsidiary science and innovation policy framework) can be considered as a high quality and comprehensive strategic framework for economic development. The strategy sets clear priorities with defined quantified and qualitative targets. Moreover, given the re-election of the Government in 2011, the strategy will be pursued over a medium term period (up to a decade) offering a stronger possibility that such targets can be achieved. The main policy shift in the last few years has been towards a full integration of the low carbon strategy and a strong focus on renewable energy opportunities, based on a mix of natural resources, technological capacity and business know-how.

The Scottish Government’s strategy is based on a well-established key sectors approach that is derived from an initial identification of clusters dating back to the early 1990s (subsequent to an initial study by Porter’s Monitor Group) and initial funding for clusters in fields such as life science, electronics, tourism, etc. This policy has evolved over the last 15-20 years with a shift to an industry level strategy. The current focus of attention is now on identifying cross-sectoral opportunities and ‘emerging clusters’ that may be either technology based or market/demand driven.

The Scottish Government’s strategy also places a strong emphasis on internationalisation both of the main economic sectors, in terms of exports and integration of Scottish firms in international value chains, and of the public research and university sectors (e.g. using initiatives such as the research pools to raise the profile of Scottish research even higher). Internationalisation is a key element in the growth company focus pursued by the SGES and by the enterprise agencies.

The question remains whether the strategy correctly identifies the barriers and drivers to higher levels of economic prosperity, sustainable development and equity. The next section reviews the evidence on the main
bottlenecks in the Scottish innovation system in order to enable an assessment of the appropriateness of the current strategy and the future outline plans for adjusting the strategy, in the context of smart specialisation.
Summary appraisal of Scottish research and innovation performance and potential

This section reviews the main strengths, weaknesses, opportunities and threats facing the Scottish innovation system. The section examines the extent to which the current Scottish research and innovation strategy builds on strengths, competitive advantages and potential for excellence.

In terms of economic performance, the SGES (2011) argues that Scotland in the period since 2007 has broadly outperformed the other countries of the UK. Some analysts challenge the interpretation of specific data/indicators by the SG, however, whether the outcome is that Scotland is slightly above or slightly below the overall UK trend on specific indicators would appear to be a moot point. A more important issue would seem to be how Scotland, through pursuing a tailored economic strategy, can break away from the broadly under-performing UK economic ‘model’ (e.g. low business R&D, low relative productivity, weak industrial structure etc.) and align its economic development model with the performance of the smaller more dynamic (and more equitable) northern European countries.

Figure 4: Scotland’s economic and innovation performance relative to other EU27 region

As can be seen from Figure 4, Scotland’s innovation performance can be summed up as a form of dichotomy with a relatively strong higher education and public research performance, but business innovation and entrepreneurial activity lagging behind other small northern European countries.

2.1 Research and innovation inputs (expenditure and people)

Given Scotland’s remarkably strong higher education R&D performance, it could be assumed, and indeed this is an explicit policy assumption over the last decade, that economic growth and business development can be boosted by exploiting knowledge generated in the higher education sector.

Figure 5 shows that per capita Scotland as a whole spends slightly less per year on R&D as the UK (although the North-East of Scotland outperforms all comparators). However, the balance between R&D performed in the higher education sector and the business sectors is significantly different from the UK, the Nordic comparators and EU27 averages.
The skew of the Scottish innovation system towards the higher education sector is even more flagrant if the research workforce is considered. Figure 6 shows a comparison of the number of researchers in Scotland compared to two similarly sized (in population terms) Nordic countries. Finland in quantitative terms is ahead of both Scotland and Norway but Scotland’s higher education sector researcher workforce dwarfs both of the other countries; while in contrast the business researchers numbers paint a sorry picture for Scotland.

In overall terms, Scottish universities source research and contract research income in a similar way to universities in the other countries of the UK. Data from the Higher Education Statistics Agency (HESA) suggests that in 2009/10 academic year, Scottish HEIs received 13.8% of the total UK research and contract income, Scottish HEI’s generating a slightly larger share of income from UK research councils (38.9% versus 36.5%) and from the private sector (7.9% versus 6.4%) and a significantly slightly lower share from UK central government funds (16.7% versus 17.9%). While Scottish HEI appear to be performing above the UK average in terms of attracting private sector research money, the total share of private funding remains marginal compared to other funding sources. This needs to be kept in mind, when considered what factors are incentivising academic researchers to adopt a more or less applied focus to their work.

Moreover, the performance of the 19 Scottish Higher Education Institutes in attracting research grants and contracts is highly skewed. Only two universities, Edinburgh and Glasgow account for 52% of total income in 2009/10 and adding Aberdeen and Dundee universities results in four universities accounting for almost three-quarters of all research income. The same four universities generated 64% of UK private sector funding acquired by Scottish HEIs in the same year (the Scottish Agricultural College accounting for a further 10%). Given the findings on the level of research funding required to generate a spin-off in research intensive universities (see above), this suggests that at best a knowledge transfer route focused on spin-offs is viable in only a very few Scottish universities.
There are also marked differences in the sources of funds between Scottish HEIs:

- Four HEIs were markedly more dependent on UK Research Council funding in 2009/10: Edinburgh College of Art (54.7% of total income), Heriot-Watt University (53.8%), St Andrews University (58.5%) and Strathclyde University (54.1%).

- Three universities (Abertay Dundee, Dundee and Glasgow) had a significantly higher share income from UK Charity funding (between 30-38%);

- Five HEIs receive a significantly larger share of revenue from the private sector than the Scottish average: University of Abertay Dundee (15.6%), Glasgow Caledonian University (15.4%), Glasgow School of Art (24.3%), Heriot-Watt University (15.5%) and the Scottish Agricultural College (59.5%).

The funding patterns suggest that the Scottish HEIs are highly varied in their scientific versus applied research profiles (a hypothesis being that HEIs dependent on research council funding are orientated towards basic research while those with a higher share of charitable or private sector funding are more applied). In addition, a number of HEIs are largely dependent on Scottish, UK or EU public funds suggesting they are essentially supported by the public sector and may not be otherwise competitive.

The findings suggest that the knowledge transfer policy needs to be tailored to the different patterns of research activity and types of research conducted. There may be furthermore, a rationale to clearly distinguish in Scottish higher education research policy between funding aimed at reinforcing the international ‘competitiveness’ of a few selected research intensive universities and ‘applied R&D and teaching HEIs’ (potentially operating closer to the indigenous SME base needs).

The research pooling policy, that seeks to create virtual Scotland-wide research faculties (since merging universities as has occurred in Finland with the Aalto University appears to be off the political agenda), is a de facto recognition of the relative strengths and weaknesses of the Scottish HEIs in research activity and doctoral studies.

An analysis of Scottish participations to the EU’s Framework Programmes for Research (FP6, full period, and FP7, data to 2010) tends to confirm the dominant position of Edinburgh University as a central player (45% of all pairs of Scottish participants ‘pass’ through the University) ‘sustaining’ a network of R&D co-operation within Scotland. Considering all FP6 projects with Scottish participants, only four Scottish HEIs are ‘hubs’ (Edinburgh, Glasgow, Aberdeen, St. Andrews) within the full network. In terms of internationalisation of the Scottish research base through FP participation, relatively few countries are in the top hubs with which the Scottish participants co-operate through the FP projects (notably France, Netherlands, Italy and the Nordic countries). Closer examination of thematic fields within FP6, helps to differentiate roles of Scottish participants, with for instance, the University of Glasgow being the key player in aerospace research networks involving Scottish participants; while the Universities of Edinburgh and Glasgow are important nodes in life
science co-operation but interestingly both are less ‘central’ in the life science FP6 network than the Swedish Karolinska Institutet for Scottish participants.

Further analysis of research co-operation patterns and intensity in specific priority sectors and technology fields would be potentially valuable to assist in tailoring support policies to strengthen international networks.

The existing international research networks in specific fields could be potentially used to further boost the business sector co-operation linkages.

2.2 Scientific and technological output and specialisation

Scientific output\(^{20}\) is only one measure of the knowledge base of a country. Scientific output can be highly cited and hence have high scientific ‘impact’ but be, at least directly, of very low societal or economic relevance and hence have very little impact outside of the scientific community. Nevertheless, scientific output is one source of knowledge that can support or sustain economic development. In terms of relative scientific output, Scotland punches above its weight producing 11.70 % of all UK publications and 2.61 % all EU publications with only 10.3% of the UK’s R&D personnel and 1.7% of the EU27’s in 2009. Moreover, in terms of internationalisation of the research system, Scottish researchers appear to be broadly more likely than the UK average to produce scientific papers collaboratively with other European or non-European affiliated authors\(^{21}\). Scottish publications record a positive growth rate (see Figure 18), however the growth is slowing down since 2008 and this is more pronounced in Scotland than the UK total (including Scotland) or the EU27. The reasons for this trend are not evident.

In terms of Scottish scientific specialisation, Figure 8 breaks down total scientific output by field. From 2000-2011, 83% of Scottish publications were concentrated in only five scientific fields. Indeed, the two life science fields (medicine and biomedicine, genetics and molecular biology) dominate Scottish scientific output.

\(^{20}\) A bibliometric analysis suggests that researchers affiliated to Scottish institutions produced 158,018 publications between 2000 and 2011, of which 91.50% are journal articles and 6.27% conference proceedings.

\(^{21}\) Scottish researchers co-authored 13.49% of publications with researchers affiliated to a US university, 7.23% with German 5.47% French 5.29% Canadian and 4.76% Australian affiliation. In contrast, for the UK as a whole 11.2% of publications are co-authored with a US affiliation, 5.64% German and 4.23% French.
Scientific impact is generally measured by two criteria: publication rates in high-impact journals and citation rates. Scotland, due to scale, is not among the top 20 countries in the world in terms of total publications in any field, but does perform well in terms of relative citation impact (in a number of fields and notably in space-science (91%), materials (86%), pharmacology & toxicology (84%) and physics (68%).

Source: SCOPUS, calculations authors
The citation impact of Scotland compared to the UK and Finland provides two contrasting examples in terms of scientific profiles (see 0). Scotland matches the English performance in a number of fields and has clear lead in space science and to a lesser extent clinical medicine. England outperforms Scotland notably in geosciences, neurosciences and behaviour and plant and animal sciences (the latter perhaps reflecting the applied nature of agricultural research in Scotland).

Over the period 2003-2007, Scotland and Finland spent roughly the same (around €1.05bn) per annum on R&D in the higher education sector. Yet, in terms of impact Scotland outperformed Finland in most fields, apart from geosciences, education and social sciences where Finland has a lead and ecology/environment and clinical medicine where performance is similar.

However, scientific impact is not a sufficient measure of scientific specialisation nor does it say anything about technological specialisation or more importantly economic impact. The question remains whether these areas of top performance contribute to the priorities of the Scottish Government’s economic strategy. Indeed, for scientific results to have an economic or societal impact they need to be developed into exploitable technologies or, perhaps more importantly, foster the skills base via education and other forms of knowledge transfer.

Patent statistics are often used as a proxy for innovation output. Bearing in mind that the propensity to patent varies a lot per sector it is relevant to focus on the high-tech sector. Comparing trends in high-tech patents in Scotland and the UK regions, Figure 10 suggests that there is deterioration in high tech patenting activity across all regions over the period 2000-2008. Scotland performs similarly to the UK average with an observable stagnation in patenting rates despite the very high impact factors of publications and the Scottish Government’s efforts to invest in research commercialisation.
Even looking at disaggregated data on the patents per high-tech sector, neither the UK nor Scotland record noticeable growth in any of the high-tech fields. Moreover, the trends for Scotland appear to be more volatile than the overall UK trends. From the available EUROSTAT data, it is impossible to disaggregate further to investigate the drivers behind the observed patterns.

To summarise, Scottish scientific output is well above average and outperforms similarly sized northern European countries with similar levels of investment. The Scottish scientific output is heavily skewed towards life sciences but scientific specialisation (in relative terms) is more varied and includes fields like space sciences.

Technological (patenting) performance is much less impressive and follows a similar declining trend to the UK as a whole.

However, there is a need to avoid drawing a direct parallel between scientific output and specialisation and technological output and specialisation. The latter is largely driven by business R&D and hence Scotland’s weaker technological performance is attributable to the lower rates of business innovation rather than a problem per se in “commercialising research”.

2.3 Business innovation performance and trends

As noted above, business expenditure on R&D in Scotland is significantly below the UK average, which in turn is well below the EU27 average. As BERD is important not only in terms of product and process innovation but also in terms of the capacity of firms to absorb technologies developed elsewhere, this fact is clearly a major cause for concern.

Various studies and commentaries point to the structure of the Scottish economy and ownership patterns (e.g. a large share of US owned firms in BERD performing companies) and argue that BERD may be underestimated (the OECD acknowledges that industrial structure is one explanatory variable behind differing BERD trends and calculates for member countries adjusted BERD rates) and that innovation in Scotland may be higher than estimated by statistics due to a higher focus on technological absorption and non-technological innovation.

22 See: http://www.oecd-ilibrary.org/sites/sti_scoreboard-2011-en/06/08/index.html;jsessionid=848899nnkjumg.delta?contentType=itemId=/content/chapter/sti_scoreboard-2011-62-en&containerItemId=/content/serial/20725345&accessItemIds=/content/book/sti_scoreboard-2011-en&mimeType=text/html
However, using data made available by the Scottish Government Coad & Reid (2012, forthcoming) analysed the BERD trends for Scotland from 2001-2010 and found that:

- Over the period, there is almost no perceptible growth in absolute or relative BERD rates, suggesting that the current policy mix is at best maintaining BERD intensity in Scotland at ‘historical levels’.

- Although manufacturing is important in absolute terms, the trend line is flat since 2001 and no noticeable growth is observed in any sub-division of the manufacturing sector (machinery; transport equipment and aerospace; electrical machinery; mechanical engineering; chemicals).

- The fastest growth in R&D expenditure is recorded in the ‘other’ sectors group, notably driven by the extractive industries (oil and gas sector presumably as is further suggested by the intensity of BERD in North-East Scotland).

- Since 2006, the share of high-tech sectors in total BERD has actually declined, with a noticeable decline in hi-tech manufacturing BERD not fully compensated by a slight increase in BERD by high tech knowledge intensive services

- Scotland, like the whole of the UK, belongs neither to the group of high average annual GDP growth/low BERD (Norway and Ireland) nor the group of high-intensity BERD investors/lower growth (Denmark and Finland).

In summary, the data suggests that the sectors driving (or rather maintaining) BERD intensity in Scotland are not the ‘usual suspects’ (hi-tech manufacturing) but rather sectors classified generally as low-to-medium tech. Similarly, when looking at contribution to GVA growth or employment, there is no robust evidence that higher tech sectors or even knowledge intensive services in Scotland are making a strongly positive contribution over the last decade.

These findings tend to challenge the ‘policy consensus’ that boosting research commercialisation (notably via the spin-off route) and ‘growing’ high-tech sectors (e.g. life sciences) in Scotland will be a key driver of structural adjustment. Knowledge transfer and increasing the number of R&D performing firms capable of absorbing technology and knowledge across the various sectors of the economy may be a more productive route to higher innovation performance.

This conclusion that the spin-off route for knowledge transfer may have been over emphasised in Scottish innovation policy is further strengthened by other recent research. In particular, three findings tend to strengthen the view that innovation, return on investment and growth jobs are not being driven (directly) by the above average Scottish investment in HEI R&D:

- Firstly, using data from the Community Innovation Survey, Turnbull and Richmond (2011) observe that (p68): "Scotland's business innovation performance lags the UK as a whole for most innovation indicators", and that the lagging performance of Scottish firms is primarily due to SMEs – large firms seem to be relatively successful in terms of the innovation indicators investigated.

- Secondly, Harrison and Leitch (2010, page 1246) observe that Scotland has an IP income above average, a relatively strong performance in IP income generation, but a low performance in revenue from university spin-off sales.

- Thirdly, Mason and Brown (2010) challenge a number of preconceptions about High-growth firms. First, they are not exclusively found in High-tech sectors, but instead they seem to be relatively scarce in high-tech sectors. This highlights that high-tech firms may have difficulties growing or may simply lack growth ambitions or growth prospects. Second, HGFs are not small firms – Mason and Brown observe that medium and large-sized firms dominated the Scottish HGF population. Third, HGFs are not young firms since few are less than five years old (although most are younger than 25).

In short, policy measures that seek to enhance innovation skills and capacity for innovation co-operation activity in “larger-small” firms and medium-sized Scottish firms (irrespective of whether they are in ‘high-tech’ sectors or not) in order to increase the number of medium-to-large internationally competitive firms may be more likely to increase overall business R&D and innovation intensity.
3. The Scottish innovation policy and governance system: an appraisal

This chapter considers the questions posed by the Commission in terms of the focus of the sectoral, technological or supply-demand side focus of the innovation policy measures, the governance process and stakeholder involvement in strategy development (see Appendix A, questions 4-7).

3.1 Appropriateness of the policy mix: sectoral targeting and novel practices

The Scottish research and innovation policy mix is relatively well developed and provides both general support services and funding to all enterprises as well as funding for technology and sector-specific initiatives. Support is generally delivered through one of the two enterprise agencies or the SFC although other government agencies such as Creative Scotland, Visit Scotland and Skills Scotland are also active in supporting specific actions in their sector or field. Innovation support services in Scotland are delivered both directly by the two enterprise agencies and through various networks or services (often run by a contractor after a competitive tender).

This section assesses the range of innovation measures in place, or planned, and the extent to which they are sector specific and provide support to both technological and ‘practice-based’ innovation and stimulate demand for innovation. It also reviews the measures stimulating private sector investment in R&D and innovation and the extent to which financial engineering is used to support business innovation.

Finally, three specific cases, two sectoral and one ‘place-based’, are used to explore the development of ‘smart specialisation’ in Scottish research and innovation policy:

- The Food and Drink sector is one of the most important ‘traditional’ manufacturing sectors in Scotland. It is a complex sector driven by a mix of premium (whisky, salmon, etc.) and traditional products (meats, soft fruits, etc.) and characterised by a range of firms in terms of size and ownership with a number of subsidiaries of large ‘global’ firms, medium-sized national firms and a majority of smaller ‘family-run’ firms. Innovation intensity as measured by standard indicators is low but the sector has adopted a holistic strategy where innovation is about much more than formal R&D.

- As noted earlier, Scotland has placed a strong policy focus on developing renewable energy technologies and businesses. Within this field, the marine energy is the one in which Scotland has both a natural ‘competitive advantage’ (with a large share of the EU27 wave and tidal energy capacity in Scottish waters) and a global technological lead. The challenge for the sector is to turn this potential into a market lead through the testing and deployment of advanced technologies in Scottish waters and the consolidation of the existing ‘start-ups’ into larger Scottish based global leaders. The development of the sector also has significant development implications for the peripheral and fragile communities of the Highlands & Islands region.

- Thirdly, in terms of ‘place-based’ policies, the specific client management processes and types of innovation support delivered to firms in rural Scotland illustrate the need for a multi-faceted innovation policy. Highlands & Islands Enterprise has developed a specific approach to innovation support and to attracting and retaining skilled people into the region, including research teams linked to traditional and emerging clusters. Similarly, in the South of Scotland, Scottish Enterprise has experimented with novel approaches to supporting business innovation in rural areas.

3.1.1 Sectoral strategies and sector specific support measures

As has been underlined above, the Scottish Government’s economic strategy is predicated on policy focusing development of a seven growth sectors. While this strategic focus has been reaffirmed and reinforced since 2007, it is in many respects the logical extension of work begun in the 1990s to identify and support a number of clusters. Scotland was an early front-runner in applying the ‘cluster concept’ championed by Michael Porter leading to the launch of four pilot cluster initiatives by SE in 199923. However, from the 2004 onwards, the

---

23 In 1993, a study by Michael Porter’s Monitor Group identified 13 ‘key industries’ central to Scotland’s global competitive advantage. Subsequently, biotechnology (together with Food & Drink, Oil & Gas, and Semi-Conductors) comprised one of the pilot clusters launched by SE in 1997. This led to an extensive industry consultation and research and mapping phase undertaken over an 18 month period, and culminated in the development of a cluster strategy and funding support for implementation from SE. For instance, Biotechnology: A Framework for Action, a cluster strategy for Scotland, was formally approved by the Scottish Enterprise Board in May 1999. The Board supported investment of up to £38 million for the period 1999-2004 to deliver the Strategy.
cluster policy was abandoned and replaced by the growth sector concept, which was considered to better suit the needs of the broader Scottish economy.

Interviewees stressed that the sectoral approach in Scottish innovation policy has evolved over time and in different ways across sectors. One example is the life science sector where policy has shifted from a ‘broader brush’ approach to ‘drilling down’ into niche by increasing the understanding of ‘technical’ (scientific) capabilities and business capacities/opportunities. Interviewees underlined that there is no necessary linkage between these two aspects, e.g. scientific capabilities may be subject of commercialisation efforts rather than be directly applicable in a promising existing life science company. This dual approach is outlined in the Scottish Life Sciences Strategy 2011 where a distinction is made between strengths in the company base in two sectors of the human healthcare industry and strengths in the research base in stem cells and regenerative medicine and translational and clinical medicine skills. While there are clearly areas of overlap and transfer to the existing company base, the strategy underlines that the research excellence fields “are now ripe for translation into new business opportunities and as targets for inward investment”.

While there is by now a strategic commitment to supporting specific sectors this has not been necessarily mirrored by the earmarking of significant direct financial support to R&D and innovation in the form of specific sectoral or technology programmes. However, at the same time, funding has been channelled to ‘flagship’ business infrastructure projects which are linked to one or more of the growth sectors. The figure below lists the projects identified as the main business infrastructure projects in the 2012-15 Scottish Enterprise Business Plan. Additional business infrastructure project in the HIE area include: the UHI campus in Inverness, the developments around the European Marine Energy Centre (the world’s first wave and tidal energy test centre in Orkney), a new £6m Moray Life Sciences Centre in Elgin, the construction of European Marine Science Park in Argyll, etc.

Figure 11 : Business infrastructure projects per growth sector

<table>
<thead>
<tr>
<th>Infrastructure Project</th>
<th>Growth Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Renewables Infrastructure Fund (NRIF)</td>
<td>Energy</td>
</tr>
<tr>
<td>BioQuarter</td>
<td>Life Sciences</td>
</tr>
<tr>
<td>International Technology and Renewable Energy Zone (ITREZ)</td>
<td>Energy</td>
</tr>
<tr>
<td>Dundee Waterfront (Seabraes Yard and V&amp;A)</td>
<td>Creative Industries</td>
</tr>
<tr>
<td>Advanced Forming Research Centre (AFRC)</td>
<td>Enabling Technologies</td>
</tr>
<tr>
<td>Energy Park Fife and Energetica (NE Scotland)</td>
<td>Energy</td>
</tr>
<tr>
<td>Clyde Waterfront:</td>
<td></td>
</tr>
<tr>
<td>• Scottish Hydro Arena, SECC</td>
<td>• Tourism</td>
</tr>
<tr>
<td>Creative Clyde</td>
<td>• Creative Industries</td>
</tr>
<tr>
<td>International Financial Services District (IFSD)</td>
<td>• Financial and Business Services</td>
</tr>
</tbody>
</table>

For a useful summary of the cluster development process see Alison Munro, presentation to the TCI Conference in Ottawa [http://tcinetwork.org/media/asset_publics/resources/000/000/496/original/AMunro-scotent.pdf](http://tcinetwork.org/media/asset_publics/resources/000/000/496/original/AMunro-scotent.pdf). Formative evaluations of the clusters were carried out by Ecotec in 2005 and are available at [http://www.evaluationsonline.org.uk](http://www.evaluationsonline.org.uk).  

24 Two sectors of the human healthcare industry are considered to comprise the strongest springboard for growth in Scotland:

Medical technology, covering diagnostics and medical devices, comprises more than 150 companies, ranging from global multinationals to university start-ups.

Pharma services, encompassing more than 60 companies offering contract research in manufacture, pre-clinical, clinical and biosafety testing, and many more businesses providing allied professional services (such as intellectual property, legal and regulatory advice).
The Scottish Government directly or via SE have also supported capacity building notably through the industry leadership groups and funding and support for the development of governance structures and sectoral strategies. This has led to the creation out of ‘industry leadership groups’ of stand-alone organisations such as Food & Drink Scotland.

At the same time, targeted direct funding to businesses or consortia of firms from a specific sector for innovation and product development is something that has been relatively absent in the last decade in the Scottish policy mix. However, there are a number of recent shifts in the targeting and type of financial support provided and/or the process for delivering support that are worth underlining.

- A first attempt, in the food and drink sector, to structure services and funding cross-agency within a multi-annual road map (see section 3.1.3).
- The ILG have been asked to carry out an analysis of their sectoral innovation systems during 2012 in order to identify gaps and opportunities that are not yet being addressed by current policy measures.
- A perceptible shift to more targeted funding initiatives for sectoral innovation and technology development notably in the renewable energy and low carbon fields through the WATERS and POWER measures (see section 3.1.4).
- Finally, the Scottish Funding Council (SFC) have launched in 2012 a call for innovation centres which are designed to be demand led through bids from industry partnerships. The SFC, working with Scottish Enterprise (SE) and Highlands and Islands Enterprise (HIE), is making up to £10 million available in the first instance to support the development of the new Innovation Centres. The Innovation Centres should become sustainable communities of university academics and researchers, businesses, entrepreneurs and others that will drive innovation in and across Scotland’s key economic sectors. Funding for the Centres will be allocated through a competition process involving SFC, HIE and SE.

The innovation centres may be seen as a first response to a weakness of the Scottish policy framework, namely the lack of support measures for consortia of smaller firms to co-operate on innovation and product development within a medium-term road-map (e.g. the competence centre model applied with success in countries like Austria, Estonia and Sweden). As will be seen in the next section, direct grant funding for R&D and innovation is delivered on a single company basis and is heavily focused on a few, but not all, growth sectors.

### 3.1.2 Stimulating business R&D and innovation investments

The need to increase the intensity of private R&D&I investments is clearly recognised in Scottish innovation policy and specifically identified in the Scotland Europa paper on smart specialisation. The main forms of public financial support for business R&D expenditure are the SMART and R&D Grant instruments. These measures are generic (non-sectoral) and provide support to a single company to undertake commercially relevant R&D.

![Figure 12: distribution of R&D and innovation grant awards by sector 2009-12](image)

Source: Scottish Enterprise, data received by email July 2012. According to data received from Scottish Enterprise, supported companies (in £m) received an additional £51m from SE R&D Grant expenditure in 2010/11 which levered an additional £124m from other sources.

![](image)

* Source: Scottish Enterprise (2012)
the distribution by grant awarded is focused on three sectors in the last three years: creative industries (37% of total awards 2009-12), energy (25%) and life sciences (22%). The other three sectors, and notably the important food and drink sector account for only 8% in total of all awards (the same proportion as the other sectors).

A number of comments can be made concerning the sectoral focus of R&D funding support. Firstly, interviewees pointed out that the distribution by volume of funds would be significantly different since a few large R&D awards (to large multinational firms) account for a majority of total R&D and innovation funding. The sectoral focus would presumably shift towards the energy (e.g. a number of wave and tidal development projects are listed), life science (a large R&D grant was given for an R&D facility for one of the largest multinational pharmaceutical firms) and chemicals sectors (the latter accounting for three out of five large R&D grants to ‘other sectors’).

Secondly, a review of the project titles suggests that grant support for creative industries is essentially for ‘ICT’ projects covering fields such as: wireless systems, optoelectronics, artificial intelligence, robotics and various software or web based applications. Indeed, the overall dominance of ICT projects is in line with what is seen in other countries R&D grant funding systems.

It would be instructive, given the emphasis on cross-sectoral linkages, to understand the extent to which these ‘creative industries’ (ICT) projects are supporting developments in other sectors (e.g. the use of AI or robotics in marine energy or deepwater oil and gas energy exploration or the application of ICT in production processes in say the food and drink sector).

This said, the importance of R&D and innovation grant funding in supporting sector growth strategies need to be considered in a more holistic perspective. Whilst R&D and innovation funding can be critical to assist leading (growth) firms to stay at the forefront of ‘technological development’, other forms of support may be not only complementary to R&D and innovation grants but also critical for the success of business strategies in specific sectors (e.g. regulatory framework in energy) or places (e.g. firms in rural areas).

In terms of effectiveness of the current measures, interviewees expressed concern that while evaluations of specific programmes (e.g. the R&D grant or Smart Scotland measures) generally find that there have been positive effects on innovation activity or sales (gross value added), and that the public support is ensuring additionality (at a minimum, in terms of speeding up the innovation process), that there is not an overall perceptible improvement the broader indicators of innovation performance across the economy. Indeed, SE in a recent background report note that “to reach the top quartile of EU economies (for rates of innovation active firms), 5000 more Scottish SMEs would need to be innovation active”.

A range of interviewees from both the business support and research side of the innovation system underlined that the persistent business innovation deficit raised the question of a ‘missing link’ in Scottish innovation policy. While, as noted above, part of the explanation may be sought in the structure of the Scottish economy and while there may be a degree of ‘hidden innovation’ in certain sectors, SE’s own estimate of the need for 5000 more innovation active SMEs, suggests that providing R&D and innovation grants to around 100 enterprises a year is at best scratching the surface. Moreover, despite the evaluation findings of positive additionality, there must be a suspicion that firms being awarded R&D grants are at least in part ‘the visible tip’ of the iceberg (i.e. are the firms that are capable and would probably be engaged in R&D whatever the support available). The case of the food and drink sector discussed below underlines that the barriers to being innovation active are indeed partly financial but above all perhaps about access to the specialised know-how and skills (including specialised innovation advisory services but also in-company personnel).

### 3.1.3 Boosting innovation in a traditional sector - Scottish Food and Drink

Scottish Food and Drink is one of the most important manufacturing sectors in the country and has recorded in recent year excellent rates of growth, notably in exports, achieving the 10 year target the industry set itself in 2007 – to grow total exports by 38 per cent – six years early.\(^{26}\) Paradoxically, in the face of such strong growth, interviewees acknowledged that business R&D in the food and drink sector is ‘bumping along at low levels’ if indicators based on official statistics (like R&D/GVA) are used. Innovation survey results suggest that the level of innovation activity is higher than when measured by formal R&D but still below what is needed. In this context, the relatively low ‘penetration rate’ of the food and drink sector in the R&D and innovation grants system is surprising given the strategic importance placed on the sector by the Scottish Government and the

\(^{26}\) See: [http://www.scotland.gov.uk/News/Releases/2012/03/foodanddrinkexports270312](http://www.scotland.gov.uk/News/Releases/2012/03/foodanddrinkexports270312)
enterprise agencies in Scotland. Indeed, taking into account that around 10% of the SE account managed firms, roughly 250 companies, are from the food and drink sector, would suggest that the sector is punching below its weight in terms of innovation activity. However, rather than focus on overall aggregate trends, SE tries to track the companies that are potentially interested in food and drink R&D and work to encourage them to become more active. According to interviewees, out of the 250 SE account managed companies, a small share (50+) are able to do in-house R&D, but a larger group has an appetite for new product development and will consider to contract out for R&D services. A main barrier to investment in R&D is that a majority of food and drink companies have under £10m in turnover and rather low profit margins. Hence, the main focus of innovation in the sector tends to be on process innovation, although SE is making efforts to increase interest in design innovation.

The SE food & drink team works closely with Scotland Food & Drink (SDF, http://www.scotlandfoodanddrink.org/), which is a membership based not for profit organisation created in 2007 funding roughly 50/50 from public and private sources. A CEO and executive team report to the SFD board, drawn from a mixture of industry and public sector bodies, with a role is to approve and guide the strategy of the organisation. An Executive Group, comprising leaders from across the industry is the key delivery vehicle for SFD. Interviewees noted that it took about three years for SFD to get going as it took time for a consensus to build with the trade associations. However, according to interviewees, the various stakeholders are now much more aligned behind the strategy with a key success factor being that SFD created a role for itself by focusing on boosting exports of the sector (assisted by the recent inspirational target set by the Scottish Government to raise Scottish exports by 2017).

The strategy was followed up by an action plan that is supported by the various agencies. The action plan is broken down into work streams and each agency takes responsibility for one stream to avoid duplication of effort: for instance, SE is leading on innovation with a notable focus on healthier products. The work on innovation has two strands: 1) what do we have already that can be marketed better – e.g. Omega 3 in salmon 2) working to structure the fragmented supply side and link it better to the business needs.

Two main initiatives have been taken to support the structuring of the supply side. Firstly, Interface Scotland has been tasked with a specific mission to support food and drink innovation acting as a single entry point for firms to 17 HEIs (http://www.interface-online.org.uk/4423). A second initiative is the Food & Health Innovation Service (http://www.foodhealthinnovation.com/) that has been contracted out to a private RTO, Campden BRI (http://www.campden.co.uk/) which counts about 200 of the 250 SE account managed companies amongst its membership.

Interviewees considered that the new SFC innovation centres measure offers an opportunity for a next step in developing strategic research partnerships. Four applications have been submitted by food and drink sector, all industry led. This was considered to be evidence of a positive trend of industry engaging more with the research sector and with each other in innovation processes.

However, interviewees underlined that there remain gaps to be tackled in the sectoral innovation system. In particular, while there is plenty of top-level expertise at the primary end of the food sector value chain, there is not the same level of expertise in food manufacturing and processing stages. One interview cited as an example, the James Hutton Institute (http://www.hutton.ac.uk/) which is very strong but paradoxically this means a lot of their attention is on international work and not on ‘in Scotland’ activities. Hence, there is a need to increase the facilities/expertise around demonstration and testing of products and food concepts. As an example, interviewees noted that work is being done on making better use of natural assets such as oats and berries but that the main barriers arise at the stage of integrating such resources into existing products or

---

27 Scotland is the largest producer of farmed Atlantic salmon in the EU and the third largest globally, behind Norway and Chile


29 Leatherhead (http://www.leatherheadfood.com), another RTO, was also invited to bid to run the service.

30 http://www.hutton.ac.uk/
manufacturing processes (e.g. keeping consistency of a bread with berries). Similarly, there is very little being done on functional foods due to the lack of expertise and so there may be an opportunity for developing a collaborative programme. The interview evidence points to future support continuing to support market trend anticipation, tackle gaps in expertise, foster collaborative innovation and create testing facilities.

3.1.4 An emerging global leader? The Scottish marine energy sector

Energy has been a key element of the Scottish innovation framework since at least 2000. Whilst historically oil and gas is the mainstay of the energy sector (and accounts for a large slice of the Scottish economy), the renewables sector is expanding rapidly, in commercial terms, this has been first through technologies ‘developed elsewhere’, notably on-shore wind farms. The current focus of commercial, and to some extent technological development in Scotland is offshore wind. Interviewees underlined that offshore wind is driven by scale and that the key players are ‘non indigenous’, in ownership terms, including two key ‘utilities’ (Scottish & Southern and Scottish Power Renewables) which play a key role since they have a broad reach into the supply chain. Hence, the offshore wind industry leadership group is dominated by industry, heavily skewed to larger firms, with a focus on optimising the commercial potential in Scotland. Interviewees underlined that the strategy process is that priorities are defined by industry, the public sector then responds with its position, a consensus is then sought on which leads on to an action plan. Given the sector, the plan needs to cover more than funding and needs to consider legislative proposals (e.g. by Marine Scotland), etc. The strategy and action plan is open to almost continuous review given the fast moving nature of the sector. This implies that various ‘reference points’ are checked and reviewed by working groups, etc. on a periodic basis.

Interviewees noted that the approach being championed in Scotland borrows lessons from what the Danes achieved with on-shore wind, where they were able to impose on the market that you had to have your testing done in Denmark to be taken seriously. The key elements include of the Scottish model include strong government-business-academic co-operation (structured at the different levels from the First Minister down), an attractive regime for investors, subsidies for testing and deploying technologies. The strategy is to seek to foster multiple opportunities for industry and academic expertise to be combined in the development and testing of technologies. In the field of offshore wind, the aim is to establish Scotland as the base for testing new offshore wind technologies whether they are invented in Scotland or not. For instance, an interviewee noted that, Glasgow and Strathclyde universities are working on blade technologies pooling expertise with several multinationals, including from related sectors (e.g. aerospace for the blades). A key aim of the R&D being conducted is to reduce cost of renewable energy production to make it competitive and, interviewees noted that this helps to focus efforts.

However, while offshore wind has significant commercial potential (Scotland accounts for 25% of European wind energy potential), interviewees stressed that the field in which Scotland has a real opportunity to dominate globally from both a technological and business perspective is marine (wave and tidal) energy. Scotland is currently a world leader in wave and tidal (marine) energy technology due to the accumulated expertise, the range of test facilities and the scale of capacity in Scotland (25% of tidal stream and 10% of EU27 wave energy potential). A philosophy of ‘innovation by testing’ is thus strongly embedded in the policy approach to marine energy. An interviewee noted that a parallel in other industries could be how the Nordic (e.g. Sweden) countries have captured the market for testing and development in cold climate automotive technologies.

The interviewee noted that key elements supporting the development of marine energy (aside from the concentration in Scottish waters of a natural resource potential) include:

31 See: http://www.offshorewindscotland.org.uk
32 http://www.scotland.gov.uk/About/People/Directorates/marinescotland
33 The FM, himself, co-chairs with the Principal of the University of Strathclyde the Energy Advisory Board which meets once a quarter. Under this high level board, are five sub-groups including the Renewables Industry Leadership Group, co-chaired by the Minister for Energy, Enterprise and Tourism and a representative of Scottish Renewables (the industry group, http://www.scottishrenewables.com/).
34 The Marine Energy Road Map included a supply chain survey that estimate that up to £1.3 billion of expenditure could be generated in Scotland and as many as 2,600 marine energy jobs created by the installation of 1GW of wave and tidal capacity by 2020.
35 http://www.economist.com/node/21526931
• ambitious target setting by the Government (Scotland has set a target of 100% of electricity demand from renewables by 2020 and is already at 28%, compared to the UK’s 6.9%) allied to the incentive of prizes to foster innovation: the Saltire Prize in the field of wave and tidal.

• A policy and regulatory environment that is creating the market opportunity (allied to the significant resources in wave, wind and tidal energy in Scotland). Notably, the Scottish Government has set and maintained significantly more generous renewable obligations certificates (ROCs) for wave and tidal than the UK Government for the rest of the British Isles.

• The investment in the required infrastructure and grants to allow development testing and subsequent deployment of tidal and wave devices and subsequently arrays. This is allied to significant support for device development in Scotland but also enables Scotland to attract and co-operate with international developers of devices who use the Scottish testing sites. Interviewees

• Finally, early investment in developing a strong pool of expertise in Scotland, and indeed, in Orkney, one of the islands to the north of the mainland. HIE supported the EMEC from 2001 onwards, while Heriot-Watt University established a campus on Orkney over 20 years ago and has been running a Master course on marine energy (about 20 students per year). This has created a nucleus of people in Orkney, so that today, while there are only about 1000 experts globally working on wave and tide innovation, about 250-300 of them are on Orkney. The academic input has had significant impact in terms of building expertise in new fields, e.g. environmental impact assessment for deepwater engineering, etc.

Interviewees noted that is possible to trace a form of innovation value chain of marine energy and engineering expertise: Edinburgh University has the world’s most advanced marine tank for modelling stage, EMEC has nursery sites, zones for full deployment are being readied, etc. They also underlined that much of what is being done is outside of traditional innovation process and involves a lot of learning by doing. Equally, as EMEC often tests technologies developed in other countries, this gives the centre a pivotal role in terms of building up global level expertise in Scotland. Finally, interviewees stressed that the EMEC project has been very successful in attracting large corporation to undertake testing but also in developing a niche cluster of small spin-off firms in Orkney.

Finally, in policy terms, there has been an attempt to be more innovative in the types of support provided through the WATERS and POWERS measures launched to support early-stage prototyping and testing; and, hence, embed further technology development in Scotland. A key plank of the new approach is to launch ‘calls for opportunities’ and announce the available funding. Previously, the available funding for a call was not explicit so this has been a change of mentality within SE. Similarly, the fact that up to £70m was set aside for the investment in ports that serve the offshore wind sector was a clear signal to the business sector of the public sector commitment.

**From technological potential to Scottish champions?**

The model for future development is to mimic the way the Oil and Gas sector is effectively serviced out of three cities: Aberdeen, Houston, Stavanger, so that even if production expands elsewhere, Scotland would capture a good share of specialist service companies supporting a global industry. In this context, there is a need to develop companies covering the installation, deployment and maintenance expertise, so as to have a first mover advantage.

---

36 [http://www.sdi.co.uk/sectors/saltire-prize.aspx](http://www.sdi.co.uk/sectors/saltire-prize.aspx)

37 In June 2012, the industry-led Marine Energy Group (MEG) published a Marine Energy Action Plan that outlines progress made since the launch of the 2009 Marine Energy Road Map and makes recommendations to help improve access to finance, grid development, infrastructure and supply chain.


39 Scottish Enterprise have established a £70m National Renewables Infrastructure Fund to support private sector investors in the development of manufacturing locations. The fund aims to stimulate an offshore wind supply chain to help realise the opportunity for off-shore wind in Scotland.
However, interviewees noted that, aside from offshore wind, the renewables sector, including the emerging marine energy sector, is rather fragmented and composed of smaller firms. There is a concern that the big multinationals (e.g. ABB, Alstom) are starting to move into the marine energy sector and are buying up development teams. Hence, there is a risk that something similar to what has happened in life science sector (with spin-offs being bought out in trade sales) will happen again.

Interviewees suggested that one problem for growing and scaling up firms in the marine energy sector is that fund-raising has been fairly ad hoc. Firms have raised remarkable amounts but in small pieces or combined with grant funding. Hence, there is a need for investment funding of sufficient scale that could allow them to retain corporate expertise as well as technological expertise. If this process could be managed it would allow Scotland to create specialised suppliers to the major multinationals rather than be bought out by them. As one interviewee remarked “can you encourage collaboration between smaller Scottish companies so as to retain a degree of ownership and freedom in the domestic sector”? There is a concern that many of the firms are trying to be entire device manufacturers whereas in reality they are specialised in specific elements. Hence, if they could be encouraged to pool expertise, there is a potential to create a real champion.

A second challenge for the marine energy sector is to take a step up from testing to setting up a fully operational array. The investment required outstrips what is available in Scotland or even the UK, so there is a real argument for European added value in intervention in favour of the sector. Interviews noted that there is a real potential for Scotland to shape European thinking in this field. The European Commission should see the sector as a European opportunity, since while Scotland is in the lead but there is capacity in Portugal, Ireland, Spain, etc. The investments being made should be seen as a way to build up a sectoral innovation system on a European scale.

A third challenge is, as interviewees argued, that there is also a need to make sure that the technology provides a boost to the rural economy and society and is not just located there. Once the industry moves into full-scale deployment there is a need to be able to build large scale installations. This implies having the skills base ready. Scotland has the standard project management skills (e.g. from previous oil rig work) and a range of potential sites for fabrication and engineering. For instance, a former oil-rig construction yard at Nigg on the Cromarty Firth in the Highlands was bought in 2011 redevelopment by the Global Energy Group. This will create up to 3000 jobs, HIE has worked with other agencies (SFC and SDS) to support on-site training that puts people through the equivalent of three years in college in 12 weeks. There should be a similar focus on capturing, what one interviewee called, the intellectual legacy by embedding post-grads and doctoral students at production, fabrication and testing sites in rural areas on a longer-term basis.

### 3.1.5 Innovation everywhere? Innovation policy in rural Scotland

Interest in Scotland to the issue of tailoring policy to ‘place-based’ factors influencing economic development (and to some extent related academic or public research activities) is clearly present in policy circles. The need for a specific approach to innovation in rural areas was recognised already in a 2006 report (funded as part of the ERDF Regional Innovation Actions Programme) on The Scottish Innovation System – Actors, Roles and Actions11. This study concluded that there was a functioning innovation system in Scotland, but that it excluded areas both in the Highlands and Islands and in the South of Scotland. Partly as a result, a number of actions were taken to link rural and peripheral areas to the knowledge available in Scottish HEIs including the Hi-Links Project (a knowledge exchange project for the UHI which wrapped up in May 201142) in the HIE area and SE launched the South of Scotland Innovation System project (see below).

However, some six years on from the Scottish Innovation System study, a number of interviewees still argued that there is a more or less explicit “urbanisation of innovation policy” due to the focus on ‘high-tech’ growth companies and certain major initiatives in the ‘central belt’ (the area of Scotland lying between Glasgow and Edinburgh). Nevertheless, there is a clear recognition that there is not a one-size-fits-all approach from a geographic perspective to supporting research and innovation. Firstly, interviewees from HIE underlined that their approach to supporting both business innovation and the university sector was designed to take account of the specific development obstacles and opportunities that exist in the relatively more sparsely populated North-West of Scotland. Secondly, interviewees from SE noted that there was an on-going analysis of

---


42 [The final report of the Hi-Link projects is available at www.hilinks.uhi.ac.uk/files/hilinks-final-report-FINAL.pdf](http://www.hilinks.uhi.ac.uk/files/hilinks-final-report-FINAL.pdf)

Subsequently to Hi-Links, Interface Scotland has developed into a national service with a dedicated team covering the HIE area.
Scotland's economic geography' that will inform the work of their account managers and the future strategy of the agency in delivering support across the SE area.

In the Highlands & Islands region, the HIE client base is formed by about 500 account managed businesses and 80 social enterprises. The HIE business support services and funding is divided by geographical area rather than by type of support, hence R&D support is allocated to firms as part of a package of support rather than as a distinct measure. Individual firms are supported to reach growth targets on a 3-5 year horizon and an annual review adopts a holistic approach reviewing financial and non-financial indicators. In additional to the work of the locally based account managers, a small team within HIE provide horizontal support and complementary projects via the innovation and skills programme (which has a total annual budget of about £1m, of which about 35% is ERDF co-financing).

The specificity of innovation policy in the H&I region is illustrated by the focus on ‘people and skills’: both attracting and retaining skilled graduates in the region and supporting the know-how and skills of both managers and personnel of regional firms. Interviewees stressed that population and ‘expanding horizons’ were key issues in the H&I. In budgetary terms, the single largest innovation policy measure (in 2011) was the graduate placement scheme43, which is a cornerstone of the regional innovation policy. The graduates bring in ‘time and expertise’ for a maximum placement of 12 months with the objective being to fill 350 vacancies over three years.

Secondly, an ‘inward looking’ attitude and a ‘lack of ambition’ of rural firms (with many at best looking to ‘export’ to central Scotland or the other UK countries) is a second issue that HIE addresses through a number of specific actions. In order to tackle this ‘internal capability’ weakness, HIE is investing a lot of effort in entrepreneurial development through projects running with MIT and the UK Institute of Directors. These small-scale initiatives take regional entrepreneurs to Boston for ‘inspirational’ learning and bring leading business people from elsewhere in the UK to act as mentors for regional firms. Another example of actions designed to encourage greater ambition are HIE funded trade networks. These networks operate for three years and are run by facilitators who help firms to share knowledge about markets and technologies (e.g. more than 300 businesses in the creative industries sector have been assisted by trade networks funded by HIE). Interviewees also underlined that the Enterprise Europe Network in Scotland has proven to be a quite effective instrument of support for the internationalisation of firms.

The on-going strategic importance of ERDF co-financing of innovation related initiatives in the H&I region was underlined by interviewees. This extends beyond the mainstream operational programmes to Territorial Co-operation programmes which are used to learn from and exchange with other northern and Nordic regions. One example is the €1.1m RIBS project44 funded by the Northern Periphery programme. Based on a needs analysis of 120 SMEs and the business support community in the target regions, RIBS will develop Business Growth Programmes products in four main areas: SME Growth, SME Internationalisation, Entrepreneurship, and Rural Clustering. RIBS will facilitate rural cluster development through adopting an explicitly cross-sectoral approach.

Box 2: rural innovation challenges – extract from a blog of the RIBS project

In a blog for the RIBS project, John Mackenzie, Development Manager Innovation and Knowledge Transfer, Highlands and Islands Enterprise asked himself “are we (rural areas) so different to the urban densely populated areas in terms of the support and infrastructure required to develop a innovative and entrepreneurial ecosystem ?

So I thought about my experiences in terms of working in innovation support in the highlands and the challenges faced by the companies I am trying to support. Some of the obvious ones such as distance from customers, access to networks, lack of R & D investment, transport costs, poor IT infrastructure and difficulty recruiting. As well as these challenges one of the main obstacles mentioned in the highlands is access to academia with the University of the Highlands and Islands still in the capacity building phase.

These challenges do exist but they can also exist in an urban capacity albeit to a lesser extent so are we trying to differentiate rural innovation and the

43 Other funding sources are also available to regional businesses including SMART Scotland (via SE) and the UK wide Knowledge Transfer Partnerships (KTPs), which HIE co-finances.
challenges surrounding that for the sake of being different? In my experience of rural innovation and looking at the feedback from RIBS colleagues I don’t think we are. I think the type of support rural companies look for compared to urban companies differs in terms of the levels of confidence and belief that they can actually achieve success beyond their immediate vicinity. In most cases the bulk of the support given to them is about teaching them to have the confidence in themselves, their company and in some cases their staff”.

Source: [http://www.ruralinnovation.eu/](http://www.ruralinnovation.eu/)

Although SE does not explicitly target support to specific areas, it has developed a number of initiatives in favour of rural areas (e.g. the Rural Leadership and Planning to Succeed programmes). Moreover, the SE account managers are regionally based and work with innovation, sectoral or technology specialists who often found at regional level (e.g. the Food & Drink Sector team is based in Aberdeen). SE did experiment with support for a specific rural area, as noted above, through an ERDF co-financed project, the South of Scotland Innovation System Initiative (SoSISI) that ran from 2008 to 2011. The initiative aimed to increase the level of innovative activity within the South of Scotland (covering Dumfries & Galloway and the Scottish Borders), and facilitate the interaction for new and growing businesses with the broader Scottish innovation system. Only a couple of further education colleges and teaching only campuses of Scottish HEI are located in the South of Scotland area. Interviewees stressed that this meant there were limited local drivers for business-academia co-operation.

Similarly to the approach in the HIE, the interviewees underlined that there was no a priori focus on companies from growth sectors, rather the aim was to develop a culture of innovation and co-operation in firms with ambition to grow. Interviewees stressed that a lot of the time the main issue is ambition with companies focused on serving local markets. This meant that the business projects supported were not necessarily technology focused, for instance academics and their students were used to support market research. Equally, there was an emphasis on collaborative projects involving 2-3 companies in the food, tourism or creative industries sectors. For instance, in the food sector, food forums/clinics were run to support companies focused on serving local markets. This meant that the business projects supported were not necessarily technology focused, for instance academics and their students were used to support market research.

The experience from both the Highlands and Islands and the south of Scotland illustrates that supporting the innovation process in a company located in rural, peripheral and more sparsely populated areas requires a tailored (and in all likelihood more time and hence cost intensive) support that places a greater emphasis on accessing knowledge (on market possibilities, on technologies and on possible partners) but on raising management capabilities and hence levels of ambition. Interviewees in both regions argued that they are “doing the right thing” in applying an intervention logic with a strong focus on socio-economic cohesion and by doing more over a broader base irrespective of whether it just growth firms.

The project funded two main actions. The first ‘Knowledge Links for Business (KLINKS) funded a team composed of a dedicated advisor from Interface Scotland for the South of Scotland area plus a team from Targeting Innovation. The aim was to identify businesses with a capacity to interact with academia and encourage academics to come down to the south of Scotland and meet with groups of companies to explore co-operation possibilities. The second action Stimulating and Supporting Human Networking through a sub-project entitled Linking Entrepreneurs was contracted to Fusion, This project built on experience in the H&I area and aimed to link up entrepreneurs scattered across a relatively sparsely populated area in the South of Scotland through organising a series of bespoke events and support activities.

45 SE does have five regional advisory boards that provide input to strategy and alignment of service delivery to regional needs: [http://www.scottish-enterprise.com/about-us/our-leadership/regional-industry-advisory-boards.aspx](http://www.scottish-enterprise.com/about-us/our-leadership/regional-industry-advisory-boards.aspx)

46 Based on a January 2011 interview with Colin Meager & Moira Forsyth of Scottish Enterprise, managers of the South of Scotland Innovation System project and EKOS (2010): Strategic review of South of Scotland Innovation System (available at [http://www.evaluationsonline.org.uk](http://www.evaluationsonline.org.uk)).
On the other, reinforcing the capacity to boost innovation in a broader range of firms (given the need discussed above to raise the overall number of innovative active firms) through bespoke support at regional and local levels for 'firms with ambition' whatever their sector and wherever they may be located.

Equally, the perception that certain sectoral or industry leadership groups remain only relevant to firms in the urban areas of Scotland will need to countered and a more inclusive consultative or mobilisation process developed. A competitive call for funding of localised clusters or innovation networks across Scotland’s rural areas may be one possible option. This might require additional resources from Scottish and/or EU funding programmes. In general, the level of funding for innovation support in rural areas can be considered deficient since it does not allow the agencies to pursue potential emerging business opportunities (e.g. HIE noted that they did not have the resources to pursue the full potential of the natural health products sector).

### 3.1.6 Cross-clustering, entrepreneurship and demand side policies

In the Commission’s S3 assessment framework, a particular emphasis is placed on three more novel types of policies that can encourage and support innovation and business development. As summarised in Figure 12 the current Scottish innovation policy addresses each of these topics to differing degrees.

#### Figure 13 Main policy measures addressing smart specialisation topics

<table>
<thead>
<tr>
<th>Main policy measures</th>
<th>Cross-clustering and the identification of innovation opportunities at the interface between different disciplines/industries/clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Emerging policy discussion but no specific measures</td>
</tr>
<tr>
<td></td>
<td><strong>Entrepreneurship and the innovation capabilities of SMEs for instance by facilitating the diffusion and adaption of technologies, incl. key enabling technologies</strong></td>
</tr>
<tr>
<td></td>
<td>Scottish Seed Fund and other equity financing instruments of the Scottish Investment Bank</td>
</tr>
<tr>
<td></td>
<td>High growth start-up unit (SE)</td>
</tr>
<tr>
<td></td>
<td>Various innovation advisory services: Interface Scotland, Food &amp; Drink innovation service</td>
</tr>
<tr>
<td></td>
<td>Proof of concept and enterprise fellowships for research spin-offs</td>
</tr>
<tr>
<td></td>
<td>Business and research infrastructure projects in fields like biotech, informatics and energy</td>
</tr>
<tr>
<td></td>
<td><strong>The improvement of demand-side conditions and especially public procurement as a driver for innovation</strong></td>
</tr>
<tr>
<td></td>
<td>NHS Research Scotland Innovation Fund</td>
</tr>
<tr>
<td></td>
<td>Sectoral and national procurement Centres of Expertise</td>
</tr>
<tr>
<td></td>
<td>A range of measures in field of renewable energy: Saltire Prize, POWERS, WATERS2, National Renewables Infrastructure Fund, etc.</td>
</tr>
</tbody>
</table>

Interviewees from both SE and HIE recognised the importance of encouraging **cross-sectoral (clustering) co-operation and supporting the diffusion of enabling technologies across sectors**. A significant effort has been made in Scotland already to identify and examine such opportunities, both by the agencies and industry groups. SE is currently engaged in a review, requested by their board, designed to map Scotland’s cluster portfolio, identify emerging opportunities and then examine the competitive position of each of the main sectors. A first discussion paper, presented to the board in June 2012, has already outlined Scotland’s ‘cluster portfolio’ (Figure 14) and this work has confirmed the relative dominance of just four industries in the Scottish economy: energy (where the key companies are in Oil & Gas, Utilities and Chemicals), Financial Services (where the Banks still create significant wealth); Food & Drink – where growth is being driven by traditional whisky brands and new food producers; Engineering – where services, consulting and fabrication excellence upgrades global supply chains in many key sectors.

---


49 These four industries account for 40% of Scotland’s GVA and £15.3bn of exports (70% of total Scottish exports). The productivity levels in these industries are at least 50% higher than the Scottish average
A second key element of the SE analysis has been to underline the high degree of interconnection between the main industries and areas of significant complementarities, the most significant being centred around the energy sector. A third key finding is that the companies that drive Scotland’s economic performance are within ‘enduring’ industries with a long history of adapting to changes in economic and market conditions. Such findings provide an important nuance to the long-standing focus on a sector like life sciences and, given the conclusion on ‘enduring industries’ of ‘high-tech start-ups’, in general (see also evidence below on high-growth firms).

The paper goes on to identify a number of emerging new clusters or new configurations of existing clusters around new market opportunities such as Enhanced Energy (smart grids, energy storage, etc.), Innovating to Zero, Premium and Provenance, Enhanced Health and Big Data. Considering the case of Premium and Provenance, this opportunity is visualised as grouping sub-sectors such as luxury textiles, Golf, Business Tourism, Bakery, Fish & Seafood, Whisky, Heritage and Nature, etc. Such work underlines the existing and future potential for cross-sectoral co-operation and interaction. One obvious option would be to launch and run dedicated innovation programmes or centres around these emerging cluster themes in order to give a kick-start to more intensive co-operation; similar to what has been done say in Finland with the technology programmes in the past.

However, the interest in cross-clustering is not necessarily as present yet at the operational delivery level of policy: concrete actions to foster specific linkages or cross-sectoral innovation projects are still limited. For instance, the innovation centres being launched by SFC are required to be focused on a specific sector but prove how they will be open to firms from other sectors. Yet many interviewees underlined existing cases and the potential for enhanced cross-sectoral linkages both in terms of business development in general but also in terms of innovation. Examples given included aerospace expertise in wind-turbines, obvious linkages between food and drink and tourism products and services, engineering services related to oil and gas, biotech applications across a range of sectors, etc. Hence, this appears to be one area where further operational developments are required to support a perceived opportunity.
The intensity of entrepreneurship and the growth performance of Scottish firms have been long cited as a weakness of the Scottish economy and innovation system. SE sums up the situation of the ‘market’ for company growth in Scotland as follows (see also Figure 15): “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”.

Box 3: Evidence on high-growth and technology based firms in Scotland

Recent studies suggest that the main issue for business growth is not the absolute or relative (per capita) numbers of entrepreneurs. It appears to be rather about as the level of ambition (and internal capabilities) and barriers to Scottish firms sustaining growth and attain sufficient scale to compete on European and global markets. In the context of smart specialisation, the body of evidence in the academic literature and recent research in Scotland, itself, calls into question a common policy focus on ‘high-tech-high-growth firms’.

Research by Mason & Brown (2010) has shown that HGFs in Scotland are: firstly, located in a variety of sectors and technology sectors do not account for a disproportionate share; secondly, HGFs are not small firms – medium and large-sized firms dominated the Scottish HGF population; thirdly, HGFs are not young firms – few are less than 5 years old.

In a 2012 follow up study, Mason and Brown concluded that ‘Scotland performs well in relation the rest of the UK in terms of the presence of high-growth businesses. However, Scotland performs less well in terms of high growth, high-tech firms’. They suggest that the main reason is that Scotland’s proportion of high tech firms in its business base is the second lowest amongst UK regions. At the same time, they find that in Scotland, as in the UK as a whole, the proportion of high tech firms which achieve high growth (18.4...}

Source: Scottish Enterprise Business Plan 2012-15, Evidence Base

---

52 The Global Entrepreneurship Monitor Report for Scotland (2011) reports some positive developments in entrepreneurial aspirations with Scotland now performing similarly to the rest of the UK. However, overall, shows that Scotland remains ranked in the third quartile of innovation-driven countries for total entrepreneurial activity. See: http://www.strath.ac.uk/huntercentre/research/gem/


54 High-tech firms represent around 12% of the overall population of HGFs. High-tech HGFs exhibit considerable diversity in terms of age, size and sector. Only 20% are less than 20 years old. Many are long-established engineering companies with a tradition of innovation. Technology companies vary in size from under £1m turnover to over £1,000m turnover, but concentrated in the under £50m range. Perhaps not surprisingly, they found that the energy sector, particularly oil and gas, is a significant source of technology businesses and also as a major market for technology firms in other sectors.
percent, or 188 firms) is greater than for non-high tech firms.

Mason & Brown’s work also reinforces the view that the barriers to growth of high-tech HGFs are a lack of strong ambitious leadership and management ambition, or weak management capabilities and ownership (just 30% are Scottish owned and headquartered) rather than access to finance or university-linkages (which they argue are of marginal importance to high-tech HGFs).

Mason & Brown argue that one possible route to boosting high-tech HGFs is to acknowledge the strategic role that ‘companies of scale’ play in their development in Scotland, notably as a source of market pull and important supply for emerging companies. They also argue that given the nature of the successful TBFs in Scotland (low R&D, applied focus, end-user engagement) that there is merit in ascertaining the types of problems less successful TBFs face in terms of their ‘absorptive capacity’.


The discussion on the contribution and nature of high growth firms in the Scottish economy has been fuelled by a number of recent studies which tend to conclude that Scotland does not under-perform compared to the UK average but that the Scottish HGF are less employment rich and may suffer from a lack of ambition (see The intensity of entrepreneurship and the growth performance of Scottish firms have been long cited as a weakness of the Scottish economy and innovation system. SE sums up the situation of the ‘market’ for company growth in Scotland as follows (see also

Figure 15): “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”.

Box 3). The evidence suggests that while an over emphasis in focus on high-tech high-growth firms is not optimal there is a relative deficit in Scotland of high-tech firms in the business base that could if resolved give a further boost to business growth. However, this should not be equated with a call for even more support for university spin-offs.

First of all, Scottish universities perform relatively well in comparison to other parts of the UK over the decade to 2010: Scottish institutions created 172 firms, followed by London (115) and the south east (85).53 Secondly, the evidence on the relative contribution of the spin-offs created in Scotland to the Scottish economy is at best mitigated. A 2008 study54 found that there of 200 spin-outs from Scottish universities (the vast majority created since 1997), of these: 30% are no longer trading, 55% employ less than 10 people, while just 15% employ more than 50 people. Around 3,000 people overall are currently employed by Scottish spin-out companies. However, the study underlined that only six spin-outs had developed to become substantial businesses (200-400 employees at the time of the study). The authors concluded that ‘a choice needs to be made between spreading resources (both private sector investment and public sector support) thinly to give as many as possible a chance, or progressively focussing on an selective few’.

Business support in Scotland has evolved over several decades (it can be traced back to the late 1970s and the creation of the Scottish Development Agency) and is today multi-faceted combining business advisory services (Business Gateway for general start-up firms, account management of selected firms by SE and HEI, Interface Scotland, ICASS, etc.) with financial support, including seed capital funding for start-up firms and later stage funding for growth companies (from the Scottish Investment Bank division of SE but also a vibrant business angel community55 which works on a distinct, and arguably more successful, co-investment model from the rest of the UK business angel sector56). Most recently, the Scottish Government has announced

53 http://www.bbc.co.uk/news/uk-scotland-scotland-business-13147563
55 http://www.lincscot.co.uk/
support for four thematic enterprise areas spread over 14 sites (see Box 4) with the aim to further reinforce business development.

In terms of the focus of the work of the two enterprise agencies, Scottish Enterprise give a particular emphasis to two types of companies:

- Companies of Scale: identifying in the portfolio companies in the £15-20m range which merit support to fast-track their growth to reach the £100m scale. According to data provided by SE, the largest number of firms either currently in the COFS portfolio, being considered or which are ‘alumni’ are from the energy sector (12 out of 30), followed by (business) services (7) and software firms (5).

- High growth companies: the aim is to increase the number of companies in the portfolio which achieve three consecutive years of 20% growth.

Data provided by SE on the 140 or so high growth companies in their portfolio of account managed companies provides an interesting insight into the sectoral distribution of these account managed HGFs, with the oil and gas sector followed by ICT and construction, see Error! Not a valid bookmark self-reference. In its business plan for 2012-15, SE sets itself the target of increasing the number of account-managed companies achieving ‘High Growth’ status to 200 by 2014-15. This would suggest that there is a need for SE to target growth in a number of the other key sectors than oil and gas which is apparently already the dominant sector. The relatively low number of HGS in low carbon, life sciences and food and drink in the current portfolio suggests that these may be areas where additional HGFs may be ‘lurking’.

Figure 16: forecast High-Growth Firms account managed by Scottish Enterprise (2010-13) by sector

In the Highlands & Islands region, interviewees underlined that HIE supports companies for other reasons than growth. Indeed, it was argued that there is a need for a diversity of approaches, “there is no one size fits all support model”, and policy makers need to take into account that rural Scotland faces different challenges. For example, HIE has a ‘fragile areas’ policy, which is not something that SE prioritises. Hence, HIE will intervene to secure jobs when it contributes to the sustainability of communities. For instance, an investment that would create 10 jobs in South Uist in customer care services would get significant support. Hence, ERDF investments in infrastructure like broadband can be crucial enablers for such business development.

Box 4: Enterprise Areas policy

In January 2012, the Scottish Government decided to create four enterprise areas: one in Life Sciences, two in Low Carbon / Renewables in North and East Scotland and one in General Manufacturing / Growth Sectors. The four enterprise areas, covering 14 strategic sites, will benefit from enhanced incentives for five years. Each Enterprise Area site will offer the following

reflecting the impact of the Scottish Co-Investment Fund which is drawn down in the majority of angel deals in Scotland.

57 High Growth Companies are defined by growth of 60%+ over 3 years from a base of £1m+ turnover.
financial incentives: Business Rates Discounts or Enhanced Capital Allowances for investment in plant and machinery.

As well as the financial benefit of rates relief or capital allowances, the package of incentives available at Enterprise Area sites will include: A streamlined approach to planning; High speed broadband connections; International promotion and marketing of Enterprise Areas by Scottish Development International; and advice to help businesses grow in global markets; and skills and training support.

The incentives available at each location are designed to encourage businesses to bring forward investment decisions while also providing the support necessary to enable business start-ups to become established and to compete internationally, leveraging the human knowledge and natural resource advantages of each location, when the incentive period ends.

Source: Scottish Government

The third specific policy area concerns the improvement of demand side conditions. As noted earlier, public procurement for innovation is a stated priority of the SGES and a number of actions have been taken to improve the degree of innovation within the scope of the existing regulatory framework (Scottish procurement policy handbook, etc.). In addition, there is a broader attempt to use public sector ‘demand’ to drive the development of key sectors and this is clearly visible in the low carbon strategy and related investments in the renewable energy field. The importance of inspirational target setting or pricing of renewables (where Scotland has a much more generous system than the rest of the UK) by the current Government was underlined as being of critical importance in influencing business investment decisions by a number of interviewees.

The SNP Government in it’s 2011 election manifesto underlined that “The NHS has a big part to play …as a major public procurer” and that they would “examine different approaches to incentivise research within the NHS, building on the work of NHS Research Scotland so that Scotland becomes an even more attractive location for investment by international pharmaceutical companies”. One example of this type of policy approach that illustrates rather well an “entrepreneurial discovery process” is the digital health cluster in north-east Scotland (see the box below).

Box 5: A96 corridor digital health cluster – entrepreneurial discovery in rural areas

The digital health cluster in the Inverness and Moray area is one example of an emerging niche cluster that brings together about 40 organisations including 10 main companies as well as social enterprises, the NHS, etc. The majority of cluster activity is geographically focussed along the A96 (the main road between Inverness and Aberdeen on the north-east coast of Scotland) corridor between Inverness and Elgin, even if a number of important capabilities lie in more peripheral areas such as Skye, Wester Ross and the Western Isles.

A range of incentives are being designed to support investors that are keen to become part of this cluster of expertise available along the Inverness-Elgin corridor. For example, both the Forres Enterprise Park and the Inverness Campus have been designated as Enterprise Areas by the Scottish Government. In addition, HIE, Moray College, NHS Grampian and the European Regional Development Fund are investing £6m in a Moray Life Science Centre in Elgin, which will provide opportunities for new businesses and research in the sector with a specific focus on digital healthcare. It will create important links between the private sector, medical practitioners and academia.

Like in the marine energy sector, the aim in the digital healthcare field is to create a test bed for innovation in Moray. NHS Grampian is working with health sector firms to make records available for particular groups of patients (by type of illness, etc.) and as the records go back several generations this allows for ground-breaking research and testing to take place. This is a good example of how public-private-non profit partnerships are being built to allow for innovative
In general, there is a relatively good understanding in policy circles of the potential to use public procurement and other forms of demand side policy (regulations, etc.) and a strong emphasis on aligning innovation and business support policies to market demand and customer needs. The development of public-private partnerships to test or develop technologies and service solutions is growing in importance. However, there is probably room to do more for instance in the fields of low carbon technologies, Interviewees mentioned a number of pilot projects in the field of low carbon vehicles: e.g. support for Alexander Dennis to develop hybrid buses or Caledonian MacBrayne to invest in a hybrid ferry. However, there is nothing as yet of the scale of ambition shown, for example, by the Estonian Government in using the sale of carbon offset credits (AAUs) to create the first nationwide electric car network (EEMO). Similarly, interviewees pointed to opportunities in the urban built environment (applying retrofitting technologies, in particular, given the age of buildings in Scotland’s cities) but that this would require a significant scale of funding. Launching a programme of retrofitting and/or ‘urban mining’ on a significant scale could create a competitive cluster of engineering, architecture and construction know-how if associated with an appropriate funding programme of technology development for the sector.

3.2 Grant and equity finance for innovation and commercialisation

As noted above, one of the weaknesses of the Scottish research and innovation policy is an absence in the main strategy documents of a multi-annual financial framework enabling an assessment of the extent to which available resources are being focused on the stated priorities. This in part reflects the annual budget process and the fact that more detailed instructions to the implementing agencies are set out in annual letters from their respective ministers (or cabinet secretaries to use the Scottish Government’s terminology). However, in its 2011 election manifesto, the current SNP Government made a commitment “to invest £45 million through SMART: SCOTLAND to support near market R&D projects by SMEs”. They also committed to provide £17 million, ‘specifically to stimulate growth in the key industries set to drive the global economy, like life-sciences, digital and energy’. Interviewees welcomed the practice of government ministers to set out expected outcomes with respect to specific financial allocations in annual ‘letters’ as an additional element helping the agencies to steer and focus their efforts over time.

In 2012, the three main agencies (SE, HEI and SPF) were requested by the Scottish Government to ‘review their interventions knowledge exchange, innovation and commercialisation activities area to ensure that they are fully aligned and that investment is focussed into those areas with the greatest contribution to Scotland’s economic growth objectives’. A team from all three agencies reviewed their interventions, their alignment and the context within which they operate and add value to the Scottish Innovation System. The over-riding conclusion of the resulting report (Knowledge Exchange, Innovation & Commercialisation: Alignment and Connectivity, June 2012), is that Scotland’s agencies are performing well in generating economic benefit from research driven activities with a return on investment of between 1:6 and 1:10 across programmes.

As part of the review, the agencies mapped spending during 2011/12 and identified investment of £53.9m across 62 projects and programmes, with a rise in both spend levels and project numbers anticipated during 2012/13. The review considered was where spend in incurred within Scotland’s innovation system and found that the majority of spend takes place in supporting two-way knowledge transfer from academia into business with £26.1m focused on this area during 2011/12. A second group of 34 projects or programmes aim towards funding new innovation activities which attract £18.8m of spend across the three agencies.


59 http://votesnp.com/campaigns/SNP_Manifesto_2011_lowRes.pdf The SNP Government also made a committee to continue to support the expansion of the International Technology and Renewable Energy Zone (ITRZ), a hub of engineering excellence in Glasgow.

60 The Scottish National Party won the 2007 elections as the largest party but without a majority, leading them to operate as a minority Government for four years. In 2011, the SNP were re-elected (for a five year-term) after a landslide victory secured a clear majority of seats in the Scottish Parliament.

61 Primarily a result of (i) the ramp up in spend of projects approved in 2011/12, such as ‘ITREZ’ and ‘WATERS’; and (ii) significant new investments such as ‘Innovation Centres’ which will contribute an additional £10m of investment.
If this balance is compared with data available via the Commission’s Innovation TrendChart-ERAWATCH platform on the allocation of funding in, say, the Nordic countries then the key differences would be a much stronger focus on thematic collaborative innovation programmes, on innovation in the service sector, and on public-private partnership funding. For instance, the 2011 TrendChart Mini-Country Report for Finland underlined that thematic funding plays an important role in the innovation funding. In 2010, 16% (€99m) of Tekes funding went to six sector specific SHOKs and further 36% of funding was channelled to thematic programmes. Hence, there is scope in Scotland’s innovation system for a re-balancing of funding towards projects involving more collaboration partners with a nearer to market/industry or demand led focus.

The new innovation centres call can be seen as a first test of such an approach but the funding levels when compared to the Finnish example are clearly relatively low.

Finally, the review team felt that there were no obvious overlaps at the broader level between the initiatives funded by each of the agencies but that “A secondary exercise should be undertaken to better understand whether there is duplication of any activities (e.g. the range of mechanisms to support R&D in the renewables sector) and ensure that alignment is maximised and associated spend reductions are tailored accordingly”.

Interviewees underlined that a major policy shift in the last few years has been the decision to make explicit the financial allocations for specific initiatives (notably in the energy sector). A key plank of the new approach is to launch ‘calls for opportunities’ with pre-announced financial envelopes (example WATERS, POWERS). This is in contrast to the general practice where agencies have an annual budget and companies can bid for funds on an open basis with no pre-set allocation of funding between measures. This new approach has led to a change of mentality within the enterprise agencies and helped to stimulate competition for funds by the business sector (and other stakeholders). Similarly, the fact that up to £70m was set aside for investment in ports that serve the offshore wind and marine energy sectors was considered, by an interviewee, to give a clear signal to the business sector about the intentions of the public sector to support long-term development62.

The Commission is increasingly concerned that support for innovation should foresee an appropriate mix of grants, loans and financial engineering (venture capital). In this context, the Scottish experience is positive as over the last two decades a suite of equity and loan finance instruments have been developed. Recently, the Scottish Investment Bank, a division of Scottish Enterprise has been created recently in order to regroup the financial engineering actions supported over a number of years by the Scottish Government and developed by Scottish Enterprise. At the current time it is not a separate financial institution although this may happen in the future.

Box 6: Scottish Investment Bank equity and loan instruments

<table>
<thead>
<tr>
<th>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 capital91. SIB offers a suite of investment funds:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>• the Scottish Venture Fund (SVF) can invest £500,000 to £2m alongside private sector partners, in finance deals of between £2m and £10m</td>
</tr>
<tr>
<td>• the Scottish Loan Fund (SLF) provides mezzanine loans ranging from £250,000 to £5m to qualifying Scottish SMEs on a wholly commercial basis.</td>
</tr>
</tbody>
</table>

The SSF, SCF and SVF are equity products which adopt an innovative co-investment and share 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

---

62 Scottish Enterprise have established a £70m National Renewables Infrastructure Fund to support private sector investors in the development of manufacturing locations. The fund aims to stimulate an offshore wind supply chain to help realise the opportunity for off-shore wind in Scotland.
Scottish Enterprise, in the evidence base report for its 2012-15 business plan, summarises the results of 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. 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. Importantly Scottish Enterprise concluded 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".

The Commission is also concerned that a Smart Specialisation strategy should the seek to produce synergies between different policies and funding sources. The interviewees underlined that there is ongoing work being done by a inter-agency committee on the steps required to align and leverage EU funds (both Structural Funds and future Horizon 2020 funding) to support the Scottish economic and innovation policy agendas. The Scotland Europa paper on Smart Specialisation specifically references the Scottish National Reform Programme (NRP) and notes that the main aim is to create a dynamic infrastructure for research and innovation to enable Scotland to compete in those industries set to drive the global economy; such as low-carbon and digital. Chapter 3 of the Scottish NRP addresses specifically research and innovation policy. The Scottish Government did not set specific targets in its NRP, but instead will monitor its progress against the EU headline targets (in this case the 3% of GDP on R&D expenditure target). However, the Scottish NRP also underlines the importance of other indicators such as the knowledge transfer index.

The Commission in its response to the UK NRP recommended an increased focus on public investment in R&D and other forms of growth-enhancing expenditure. However, in Scotland, the main issue that should be a cause for concern is rather increasing business expenditure. Indeed, there is a risk that public expenditure on the higher education sector may even be 'crowding-out' some potential business R&D (if not directly then at least in terms of the competition of the academic sector for skilled scientific personnel and engineers).

While innovation policy is largely, but not exclusively designed, funded and delivered in Scotland, research policy is a field where Scottish institutions continue to receive a large share of funding from UK wide institutions. As noted above, the UK research councils provide approximately 39% of funding for research carried out at Scottish universities.

Interviews with Scottish policy makers tend to suggest that there is a relatively good and continuous level of co-operation with the UK level institutions that provide additional and complementary support for research and innovation actors in Scotland. Aside from the UK research councils, the main additional UK level sources of funding and support come from the Technology Strategy Board and the R&D tax credits system, managed by HMRC. NESTA is also active in supporting pilot initiatives in several areas of innovation policy in Scotland, however, these tend to be pilot projects and are not a significant source of funding.

Since 2010, the Scottish agencies have sought to build a stronger and more structured co-operation with the UK wide Technology Strategy Board (TSB). Interviewees underlined that this was done to help influence TSB priorities and align them with Scottish research and innovation actions in support of the growth sectors. An example of recent TSB joint co-operation on innovation funding with Scottish Enterprise is the support for collaborative projects in a broad range of growth-creating technology areas, from biosciences to advanced materials and from nanotechnology to electronics and ICT. Grant funding totalling over £18 million, from the Technology Strategy Board, Scottish Enterprise and the Biotechnology and Biological Sciences Research Council (BBSRC) will be invested in over 40 major business-led collaborative research and development projects that will lead to the creation of new products and processes to be used across a variety of different application areas.

66 The Technology Strategy Board will invest £15m in 41 of the collaborative R&D projects while Scottish Enterprise has offered support totalling £2.68m to 12 projects and BBSRC has offered grants to two projects, totalling £434,000. In addition, the Technology Strategy Board will invest £2m in 82 feasibility studies.
According to figures from HMRC, in 2008-9, Scottish based companies received a total of £25m or 2.5% of the total cost to the UK Treasury of support claimed by UK companies through the R&D tax credit scheme. London (30%) and the South-East of England (34%) account for the lion’s share of the R&D tax credit funding, although, as HMRC notes, this may be due in part to a HQ effect. Given the relatively low share of tax credits obtained by Scottish companies, even taking into account the weaker rates of business R&D expenditure, an information campaign was undertaken in 2011 to try and increase take-up.

Several interviewees from different parts of rural Scotland recognised the potential value of the UK wide Knowledge Transfer Partnerships in terms of providing access for firms to specialised know-how, but criticised the imbalance in risk taking between business and academic partners. One interviewee noted that “KTPs are a fantastic programme but often prohibitive to SMEs since it is a resource burden and return is uncertain” while another noted that a ‘business can end up investing £60k and get nothing out of the project, while university partners have their costs fully covered’.

In terms of the third corner of the knowledge triangle, education policy is a devolved power and hence, there is no UK wide policy framework to align with. A key divergence between Scottish and rest of UK higher education policies is that that the principle of free higher education has been retained in Scotland. This has led to some discussion on the relative impact on university finances, a topic which this report will not consider further. Although education policy is devolved, other powers ‘reserved’ by the UK Parliament, such as immigration policies, have negatively impacted Scottish policy objectives to attract and retain skilled students and graduates.

Finally, interviewees underlined the importance of the various sources of EU funding as inputs to the Scottish innovation system. The focus of the current Structural Fund programmes has been discussed in an earlier section. In terms of the EU’s Research Framework Programmes, the Scottish Parliament European Committee recently concluded a consultation on the future Horizon 2020 programme and current experience with the FP7 (and previous rounds). The Committee found that there was a poor awareness of European funding opportunities in general and Horizon 2020 opportunities in particular. Evidence received by the Committee show that business engagement in Scotland is lower than other parts of the EU. The Committee considered that the key to accessing EU funds was the nature and scale of support available to applicants. It called on the Scottish Government to maintain the PACER scheme (Programme Assistance for European Research) which is undergoing a review.

The Committee underlined the importance of establishing networks to share good practice, provide mentoring and resource and early warning offer of developments. One possibility is clearly for the Scottish HEI to use their experience and networks to leverage opportunities to involve more Scottish SMEs. A social network analysis undertaken by Technopolis using FP7 participant data (see Appendix E) suggests that the main Scottish HEI play slightly different roles. In the only Scots network, the University of Edinburgh clearly plays a pivotal role in linking Scottish organisations, but the University of Strathclyde is in second position and it is well connected with private sector participants. Looking at Scottish participants in the overall FP7 health sub-network, the University of Edinburgh is again top, followed by University of Glasgow in second place. There are only two other Scottish participants in the top 100 at European level: University of Dundee and University of Aberdeen but which are much less influential ‘network players’.

Figure 17 : Scottish Performance in FP7

Scotland’s performance in FP7 has been slightly better than the EU averages. The total amount of funds secured in Scotland from 2007 to April 2012 is equal to € 351 Million, with a national success rate of about 20%. Participation is particularly high across the country, with 789 Scottish organisations being...

67 Scotland has already pursued separate policies, albeit this is tinkering at the edge as long as immigration policy remains under Whitehall control. There is a separate Scottish list of shortage occupations for the points-based system, for example, and students from abroad are encouraged to stay in Scotland to work.


69 The PACER scheme, which began in 2003, was designed to assist Scottish research institutions in preparing submissions to European research funds. A Scottish Government review of 2006 noted that in the financial year 2004 – 2005 institutions received £104,290 of PACER funding and attracted £9,895,295 of research funds. Six of the nine institutions making applications to PACER were successful in attracting FP6 funding. The PACER scheme is currently undergoing review.
Involved in a total of over 4000 projects submitted at the EU level. The number of leading organisations is also growing, with 255 Scottish leaders directly involved in managing large projects with a long term and increased impact on the local growth.

According to Scotland Europa, Scotland has exceeded the EU target of 15% SME involvement, with an overall 18% participation from SMEs, accounting for 10% of the total Scottish funding. This represents a 17% increase in SME participation from FP6/FP5. However, Scotland Europa concede that, in Scotland, the Programme remains dominated by the Further Education and Research sectors that together account for nearly 80% of the funding attracted to Scotland.


Despite an overall improvement in Scottish SME participation, the Scottish Parliament argued that there was a need to go “beyond the ‘usual suspects’ and get fresh talent into the system. It suggested that SMEs in certain Scottish growth sectors, such as finance and health may still be unaware of the Horizon 2020 programme entirely. With this goal in mind, the Parliament recommended that the Scottish Government ensures that a proportion of the available funds is ‘market reactive’, thereby allowing enterprises (particularly SMEs) to respond to market opportunities and emerging demands in the market place. However, it noted that the SPAF (Scottish Proposal Assistance Fund)\(^7\) is to be discontinued, although the Scottish Government argued that sufficient advice and assistance was still available through networks such as the Enterprise Europe Network Scotland, which works in partnership with Scotland Europa to provide a dedicated support service.

---

\(^7\) The SPAF scheme provided grant support for Scottish companies preparing proposals for the EU’s Framework Programme. The scheme provided financial assistance to small and medium sized companies (SMEs) based in Scotland. The grant (of up to 50% of eligible costs) could be used to engage a consultant to assist in the preparation of an application and/or to contribute towards travel costs to meet potential consortium partners. The Scottish Government announced the end of the scheme in the 2011 spending review.
The governance system and stakeholder involvement

One of the five guiding principles of the Commission's smart specialisation agenda is that RIS3 should ‘get stakeholders fully involved and encourage innovation and experimentation’. As this topic is cross-cutting, it has already been touched upon in previous sections. Accordingly this section summarises the evidence on: how the innovation policy governance system works in Scotland, the degree of stakeholder involvement in strategy development and delivery and the extent to which policy innovation and experimentation is encouraged.

The Scottish Government research and innovation strategies all place emphasis on strong partnerships and identify not only what the Government should do but also what is expected of different stakeholders in the system. For instance, Innovation for Scotland (2009) argues that the “challenge is to create, in partnership with all those involved in the innovation system, a shared vision of how we stimulate and increase innovation demand; a recognition of the interdependent roles each of us plays in meeting that increased demand; and how, working together towards shared outcomes, we maximise the innovation capacity of Scotland and its contribution to the Purpose of increased sustainable economic growth”.

As has been seen from the discussion in previous sections, such declarations are not just a statement of intent but are part and parcel of a structured process of consultation and stakeholder involvement at both the level of the Government and of the various agencies. The processes for consulting stakeholders and interested parties on strategies, on delivery and during the evaluation of policy are multiple in Scotland and space and time limits what could be reviewed in this report.

In addition the discussion in previous sections of two growth sectors, two examples are worth highlighting and considering since they illustrate, on the one hand, the intensity of cross-agency co-operation within the governance system and, on the other, the diversity forms in which stakeholder involvement in business development and innovation policies has developed.

Interviewees regularly used the term ‘Team Scotland’ to refer to the structured co-operation that has developed between the Government services, the three main agencies and Scotland Europa. An extended version of ‘Team Scotland’ could be considered to include a range of additional networks and service (Enterprise Europe Network Scotland, Interface Scotland) and industry (see below on industry leadership groups) and academic (Universities Scotland) representative bodies. The recent (June 2012) submission by the three main agencies to the Scottish Government concerning ‘Knowledge exchange, innovation and commercialisation’ reviews some of the practices that have been put in place over the last few years to ensure ‘alignment and connectivity’. Other Member States, and constitutional regions, could learn from and seek to apply a number of these tools and processes, including for example:

- The application of a single project evaluation methodology across agencies and the systematic involvement of officials from other key agencies in the assessment of proposals;
- A ‘default mindset’ shift towards highlighting major project opportunities brought to one agency to the other agencies and a high degree of regular contact between all three agencies at both senior and operational level;
- A recognition that while the funding system functions at the project level that there is a need to foster a ‘portfolio view’ across all project to avoid approval of competing proposals that add to the complexity of the landscape (notably from a business view point).

The report recommended that in order to further improve cross-agency synergies that there should be a focus on funding ‘transformational projects’ with a smaller number of larger scale opportunities supported and overseen by a cross-agency team. Annual joint strategy days between the three agencies are also recommended. Finally there is a proposal to create

The ‘Team Scotland’ approach is also very present at the level of the joint preparation of future strategic orientations for Scotland’s economic and innovation funding programmes, including the ERDF/ESF programmes and their integration with other EU funds such as Horizon 2020. A number of working groups are currently operating across agencies and other stakeholders to prepare for the negotiations with the Commission services, etc.

Industry advisory boards, now called Industry Leadership Groups (ILG) were initially set up by and to support the sectoral work of SE. Interviewees underlined that the work in a variety of ways from more formal structures with a CEO to more informal ‘lunch clubs’. A recent review (not publicly available) of the ILG has been carried out and led to a clarification of their remit: "Industry Leadership Groups are responsible for developing and delivering forward looking industry strategies. The Groups provide strategic leadership and
advice to industry and the public sector in Scotland, drawing on their members’ national and international expertise on global trends and issues and the niche areas where Scotland has global competitiveness”.

SE interviewees were positive about the role the ILGs play as a filter for the agencies by ‘endorsing projects’ that are going forward for funding. This approach, while not so formal, (this approach could be compared usefully with say the competitiveness clusters in France or other partnership based structures, e.g. Vinnvaxt in Sweden or regional R&D plans in Norway). Despite the remit of the ILG being extended to working with all agencies, interviewees in the H&I still tended to consider the ILG as an ‘SE vehicle’ that was not always relevant to regional firms.
4. Conclusions and recommendations

The European Commission’s RIS3 Guide argues that “Smart specialisation is not about creating technology monoculture and uniformity; on the contrary, it is likely to promote greater diversity. Indeed, regions can sustain multiple lines of smart specialisations (priorities). Most of the above structural changes generated by smart specialisation strategies actually involve the creation of variety, such as the transition to new activities or the diversification of existing sectors.” In this context, Scotland provides an excellent example of a country that has adopted a focused approach on a limited number of key ‘growth sectors’ that allows for sufficient flexibility in delivery to take account of the diversity of industrial, market and technological trends as well as distinct corporate and societal governance cultures.

Scottish stakeholders interviewed for this report underlined repeatedly that they view themselves as being on a smart specialisation journey and that there is not at this stage a dedicated strategy that can be assessed. From one perspective, this may be considered to be an overdose of modesty since the Scottish policy framework is highly sophisticated in comparison to many, if not most, EU regions and bears comparison with those of the neighbouring Nordic countries. However, this feeling of being on a journey also reflects a recognition that while the Scottish policy objectives, governance practices and measures may be well developed and relatively comprehensive, that there are still areas where there is room for improvement, that for a policy to be effective it needs to be constantly reviewed and adjusted to demand conditions and that, to paraphrase the smart specialisation jargon, a process of entrepreneurial discovery needs to be fostered on a continuous basis.

This report has sought to review the evidence on Scottish research and innovation policy objectives and challenges and then to explore the current state of development and effectiveness of policies and the governance processes that will contribute to “smarter specialisation”. Given the Team Scotland view that they are on a journey, the report should be seen as a modest contribution that will hopefully provide fuel to the debate rather than a definitive appraisal of Scottish innovation policy.

4.1 Summary conclusions

As noted in the introduction the European Commission define national/regional research and innovation strategies for smart specialisation (RIS3) as “integrated, place-based economic transformation agendas”. The conclusions are structured according the five key principles of the RIS3 concept.

Does the strategy focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures?

The Scottish Government’s Economic Strategy provides a solid framework for policy intervention in a number of key growth sectors. The strategy is implemented and pursued in a coherent and unified way by the various agencies which translate a set of national goals and objectives. In doing so, the agencies appear to be given sufficient autonomy to further refine the focus on specific sectors and enabling technologies. There is an almost continuous process of consultation and strategy development at sectoral level through industry leadership groups, co-chaired by industry and senior government members (to the level of the First Minister in the case of energy) or officials. Similarly, the translation of medium-term objectives set in the SGES are regularly updated at the operational level through the three-year business/operating plans of the agencies. A number of elements of the Scottish economic policy strategy process may be considered good practice at European level (e.g. the setting of a number of inspirational targets such as for export growth or renewable energy production, the clear performance framework and regularly published reports on progress to target or the process of definition and renewal of the sectoral strategies).

If there is a less positive side side to the story, the two separate research and innovation policy frameworks (which while they were the subject of considerable stakeholder consultation lacked a multi-annual funding framework) are largely ‘redundant’ since they no longer appear to influence the implementation of policy.

Does it build on national/regional strengths, competitive advantages and potential for excellence?

As noted above, the existing strategic framework is strongly focused on a number of growth sectors and also takes account of the importance of the influence of a key enabling technologies. The choice of key

sectors is broadly justified (as is underlined by the recent analysis of the cluster portfolio, and as noted above, at the operational level there is sufficient room for manoeuvre for the agencies to adapt policy implementation to local or sub-sector needs. The major driving sector in the Scottish economy (and to a large extent in the innovation system) is clearly energy: currently this means oil & gas, followed by offshore wind (where the technology is mature enough to be in the production phase but where Scotland has less of a technological lead. However, the real opportunity for Scotland is to emerge as both a technological and market leader in marine energy (wave and tidal). This will not be easy despite significant natural resource and technological know-how advantages. There is a real risk of a repeat of what has happened to some extent the life science sector start-ups in Scotland, i.e. that the current group of smaller Scottish marine energy firms will be acquired by large multinational firms before they can coalesce into one or more ‘national champions’.

Does it support technological as well as practice-based innovation and aim to stimulate private sector investment?

In both the strategic documents and in interviews with stakeholders, the understanding of the new to boost ‘innovation activity’ and not just R&D or technological development was manifest. The terms market-driven, customer-focused, etc. are used regularly not just as catch-words but as a reflection of both a strategic and operational focus on making sure policy is helping Scottish businesses to become or stay aware of the market opportunities (whether it be export markets or new emerging opportunities). Across a range of stakeholders interviewed, the idea that innovation through testing can allow Scottish firms to gain a competitive advantage is growing and the recent focused measures in the field of renewable energy are good examples.

This said, Scotland faces a significant and real challenge to increase the number of firms that are innovation active: 5000 more innovation active SMEs are neede, according to Scottish Enterprise. There has been too much focus on academic spin-offs and commercialisation with limited returns in terms of high-growth firms from this investment. The understanding that high-growth firms are not only to be found in a few select fields of technology and that scientific specialisation (e.g. in medicine and other life sciences) does not necessarily translate easily into business growth is present amongst stakeholders.

Yet, the balance of funding still focuses heavily on commercialisation support. Given the relatively low internal financial and human means available to many smaller firms, the various R&D and innovation grant schemes (awarding 100+ grants annually) are not sufficient if Scotland is to achieve the BERD/GDP target that has been set.

Are stakeholders fully involved and is innovation and experimentation encouraged?

The Scottish policy-making and implementation process involves stakeholders (industry, education, social economy, etc.) in both the design phase and to a degree in the implementation of policies (e.g. Scottish Food and Drink). While the Scottish Government may set a series of targets and priorities in the economic strategy, there is an almost constant process of adaptation and refreshing of strategies at sectoral level. Interviewees underlined the need for policy implementation to remain flexible in order to respond rapidly to changing market conditions or to grab opportunities such as major inward investment, etc.

As was noted in the report, there is an increasing discussion about ‘Scotland’s economic geography’ and a real concern to avoid an ‘urbanisation of innovation policy’ or a one-size-fits all policy. Attempts are being made to tailor innovation support to firms in specific-sector (e.g. in food and drink), specific areas (e.g. the new Enterprise Areas policy) or rural and peripheral (sparsely populated) regions. In the latter, innovation policy needs to have a very human face in order to support small but ambitious firms, irrespective of their sector, that can make all the difference to the development prospects of isolated communities.

Is the policy evidence-based and include sound monitoring and evaluation systems?

There has been a considerable amount of analysis and reflection over the last decade in Scotland on the scientific potential, innovation system and specific sectoral or thematic technological strategies. As can be seen from Appendix C, a range of both general and sector specific policy documents and reports on research and innovation have been issued in Scotland since 2006.

The Scottish Government and the principle agencies (SE, HEI and SFC) apply good practice principles in terms of making available online almost all studies and evaluation reports commissioned. Scottish Enterprise has created a single repository of all reports (see http://www.evaluationsonline.org.uk) which is organised thematically and is searchable. Other agencies and the Scottish Government itself similarly
publish systematically research and evaluations conducted on their behalf. The evaluations are generally of good quality, however, there tends to be a focus on ‘market failure’ rationale in the analysis and relatively simplistic ‘multiplier’ calculations (GVA, etc.) which is at odds with the more dynamic systems approach mentioned in the strategy document, where the intervention logic and expected outcomes may be related to system failures as much as direct effects on specific beneficiaries.

4.2 Recommendations

1. Innovation policy in Scotland is an integrated element of a broader and coherent economic development strategy. The strategy is already highly focused on a number of key sectors, is further enhanced and developed at operational level by the main agencies and has broad stakeholder backing and indeed involvement. The current policy framework could, however, benefit from an overhaul of the innovation and research policy documents that are now outdated. The aim here should be to bring together and critically examine progress made on the commitments of the previous strategies and applying the ‘Team Scotland’ philosophy propose a multi-annual cross-agency action plan that could serve as a medium-term framework for prioritising available budgets.

2. The critical weakness in the Scottish innovation system remains the low number of enterprises involved not only in formal R&D but also in other forms of innovation activity. Inspirational target setting has proved effective, it seems, in mobilising business stakeholders in each sector to work towards raising export intensity in the economy. The same type of process is urgently required to raise the ‘game’ in terms of innovation and broaden innovation activity away from the usual suspects. Target setting alone will not be sufficient and there is a need to rebalance funding away from the commercialisation of academic research, which has failed to significantly impact on the Scottish economy, to funding supporting thematic or sectoral collaborative innovation projects of small and medium sized firms and larger ‘companies of scale’ as well as partners from the HEIs. A second strand of support should be to expand the number of science and engineering graduates working in business in order to raise internal capabilities of smaller firms and to foster a better balance of human resources in innovation system, currently dominated by the academic sector. Finally, the experience of the dedicated sectoral innovation services (of Interface Scotland and contracting in of a private specialised RTO to provide hands-on practical innovation support) in the food and drink sector, should be considered as an option for other sectors where overall innovation activity is well below par.

3. In governance terms, the Scottish experience is broadly highly positive and could be looked at by other EU countries as a model of cross-agency co-operation and industry and stakeholder involvement (indeed, ownership) in both strategy development and implementation. The recommendations in the recent Alignment and Connectivity review are well-grounded and appropriate. For instance, the idea of moving towards a single Knowledge Exchange office would appear relevant in order to reduce the number of specific ad hoc projects funded in each of the Scottish universities. At the same time, the advantage of moving to national knowledge exchange, innovation and commercialisation services needs to be balanced with the need for focused interventions in specific areas (see the discussion on rural innovation in this report) or sectors. Similarly, there is a need to ensure that industry groups are broad and representative and are regularly challenged and refreshed in order to avoid ‘lock-in’ to specific technologies or sub-sectoral interests. The need for flexibility in the policy response and continuous review of sectoral strategies should be enshrined in the sectoral strategy process.

4. Concerning the evidence base, there is a need to enhance investment into the analysis of innovation processes at enterprise level and within emerging clusters. This would require greater access for researchers and analysts to micro-data that is currently difficult to access due to UK wide restrictive rules on access to business data. However, the Scottish Ministers have the latitude, within the current legislative framework, to grant greater freedom of access to this data. Equally as underlined in the 2012 ‘Alignment and Connectivity’ report there is a need to gather and share disaggregated company data across agencies. Finally, the Scottish Government should consider sponsoring or co-funding (e.g. with a UK wide Research Council) a multi-annual programme of research into innovation in the Scottish economy. This could programme could be used to fund both doctoral and post-graduate research on specific sectoral innovation systems as well as commissioning studies in support of the various sectoral industry leadership groups.
Appendix A: Guidance for expert assessment from DG REGIO

1. Is the strategy based on an appropriate stakeholder involvement? How does it support the entrepreneurial discovery process of testing possible new areas?
   1.1 Has the strategy been developed through a broadly-based process of direct stakeholder involvement, including mainly regional government/regional agencies, entrepreneurs, knowledge providers but also other/new stakeholders with the potential for innovative contributions, through measures such as surveys, consultations, dedicated working groups, workshops, etc.
   1.2 Has this process been adequately described or referred to in the submitted document?
   1.3 Is there an identified leader of the RIS3 process? If yes, who is it? Does the strategy identify the leading entrepreneurs involved in the process?
   1.4 Is the priority-setting in the strategy based on an identification of market opportunities/economic potential informed by an entrepreneurial search/discovery process, i.e. by a process foreseen to identify and test specific entrepreneurial opportunities?

2. Is the strategy evidence-based? How have areas of strength and future activity been identified?
   2.1 Does the strategy include/build on a sound analysis of the country's/region's existing situation with regard to scientific/technological and economic specialisations or refer to such an analysis/related studies?
   2.2 Is it based on a sound assessment of the competitive assets of the region, including an analysis of its strengths, weaknesses and bottlenecks
   2.3 Besides a SWOT analysis, what other quantitative and qualitative information/methods have informed the strategy (e.g. cluster analysis, value chain analysis, peer review, foresight)
   2.4 Does the document propose a vision for the region? Is this vision clearly described, credible and realistic?

3. Does the strategy set innovation and knowledge-based development priorities? How have potential areas of future activity been identified? How does it support the upgrading of existing activities?
   3.1 Does the strategy outline a limited set of innovation and knowledge-based development priorities?
   3.2 Are these priorities sufficiently specific identifying existing/potential niches for smart specialisation and related upgrading of existing activities or potential future activities?
   3.3 Do the thematic priorities chosen in the strategy reflect the description and analysis of the regional economic structure, competences and skills?
   3.4 Does the strategy take into account considerations of achieving critical mass and/or critical potential in the priority areas selected?

4. Does the strategy identify appropriate actions? How good is the policy mix?
   4.1 Does the strategy include action lines and/or realistic roadmaps in line with the objectives? Are these sufficient to reach the objectives?
   4.2 Does the strategy indicate which bodies are responsible for the implementation of these action lines/roadmaps?
   4.3 How does the strategy support/facilitate:
      • cross-clustering and the identification of innovation opportunities at the interface between different disciplines/industries/clusters?
      • entrepreneurship and the innovation capabilities of SMEs, for instance by facilitating the diffusion and adaption of technologies, incl. key enabling technologies?
      • the improvement of demand-side conditions and especially public procurement as a driver for innovation?
   4.4 Does the document outline measures to stimulate private R&D&I investments, for instance through public private partnerships? Does it demonstrate/aim at financial commitment of the private sector with the strategy?
   4.5. Does the strategy identify budgetary sources, and does it present indicative budget allocations?
   4.6 Does it include a sufficiently balanced mix of soft innovation support services and financial instruments? Does it foresee an appropriate mix of grants, loans and financial engineering (venture capital)?

5. Is the strategy outward looking and how does it promote critical mass/potential?
   5.1 Does the strategy take into account the competitive position of the country/region with regard to other countries/regions in the EU and beyond, as well as its positioning within global value chains?
5.2 Does it foster the internationalisation of SMEs and does it stimulate regional clusters/initiatives to make connections within international/global value chains?
5.3. Does it foster strategic cooperation with other regions (please note whether the regions foresee the allocation of mainstream Structural Funds within their Operational Programmes and/or cooperation through INTERREG)?
5.4 Are sufficient efforts being made with regard to avoiding imitation, duplication and fragmentation, in particular with regard to what is happening in neighbouring regions,

6. Does the strategy produce synergies between different policies and funding sources? How does it align/leverage EU/national/regional policies to support upgrading in the identified areas of current and potential future strength?
6.1 Is the strategy and its priority-setting complementary to national-level priorities, e.g. is it in line with the National Reform Programme, and is it in synergy with national research/education policies?
6.2 Is the strategy based on inter-departmental/inter-ministerial/inter-agency coordination and cooperation covering relevant policies, in particular between research/science policies and , economic development policies, but also with regard to other relevant policies such as for instance education, employment and rural development policies? Does it assess/take into account the existing level of policy coordination within the region?
6.3 Does the strategy include a clear reflection/proposal on how to exploit synergies between different European, national and regional funding sources, in particular between ERDF and Horizon 2020, but also with other key programmes such as ESF, EAFRD and COSME?
6.4 Does it consider both, upstream and downstream actions to and from Horizon 2020 financed by Cohesion Policy? How does the strategy link to relevant European (ESFRI) as well as to smaller national and regional partnering facilities?

7. Does the strategy set achievable goals, measure progress? How does it support a process of policy learning and adaptation? How is it to be communicated?
7.1 Does the document identify concrete, achievable goals? Does it identify output and result indicators and a realistic timeline for these goals?
7.2 Does the region have a sound governance and monitoring system in place to implement, monitor and evaluate the regional innovation strategy? Does this support a process of continuous policy learning and adaptation? If not, are actions foreseen to build up capabilities for that?
7.3 How is the strategy to be communicated to stakeholders and the general public? What are the mechanisms for ensuring support for the strategy from critical groups and the active participation of such groups in its implementation?

8. What are the conclusions and which advice can be given to improve the strategy?
8.1 In case the strategy is based on an earlier strategic exercise/innovation strategy, has it been appropriately reviewed and updated? What is done-going to be done differently as a consequence of the strategy and process compared to the previous/existing economic strategy?
8.2 Can the strategy be regarded as a regional research and innovation strategy for smart specialisation? What are its strong aspects? What are its weaker parts?
8.3 What needs to be changed/improved? Feel free to add any other comment you may have that could help the region to improve its RIS3 process and strategy.
Appendix B Statistics on Scottish scientific and innovation potential

Figure 18: growth in scientific publications (2000-2011)

![Graph showing growth in scientific publications from 2000 to 2011 for Scotland, UK, and EU27.]

Source: SCOPUS, calculations authors

Figure 19: Scotland versus England – relative citation impact 2003-07

![radar chart comparing Scotland and England across various scientific fields from 2003 to 2007.]

Source: Science Watch, calculations authors
Figure 20: Scotland versus Finland, relative citation impact 2003-7

Source: Science Watch, calculations authors
### Appendix C: Studies, policy documents and programmes on research and innovation

<table>
<thead>
<tr>
<th>Title</th>
<th>Year</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth, talent, ambition, the Government’s Strategy for the Creative Industries</td>
<td>2011</td>
<td>Summarises action being taken to support the creative industries sector. Includes some key sector statistics such as growth in real terms of 25% in GVA from 2000-2010. Lead agency is Creative Scotland supported by the Scottish Creative Industries Partnership (SCIP). Strategy includes a specific chapter on innovation.</td>
</tr>
<tr>
<td>Towards a Low Carbon Economy for Scotland: Discussion Paper</td>
<td>2010</td>
<td>Innovation and technology development are identified as a core dimension of a low carbon strategy (chapter 3). Systemic challenge of transition to low carbon economy recognised. Low carbon sector predicted to expand to 130,000 jobs by 2020 from 70,000 in 2008. Contribution of universities is mentioned, including at least 25 relevant research centres and research pooling such as Energy Technology Partnership. Summary of low carbon R&amp;D support in Scotland and UK provided.</td>
</tr>
<tr>
<td>International comparative performance of Scotland’s research base</td>
<td>2010</td>
<td>Updates previous analysis in 2007</td>
</tr>
<tr>
<td>CAMERAS: A Co-ordinated Agenda for Marine, Environment and Rural Affairs Science</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>Innovation for Scotland</td>
<td>2009</td>
<td>Scottish Government’s framework for innovation highlights how Government agencies are supporting business and helping stimulate innovation.</td>
</tr>
<tr>
<td>Demanding Growth in Scotland: why Scotland needs a recovery plan based on growth and Innovation</td>
<td>2009</td>
<td>NESTA think piece outlining options for a demand driven approach to industrial policy.</td>
</tr>
<tr>
<td>Enterprise in Scotland: insights from Global Entrepreneurship Monitor</td>
<td>2009</td>
<td>Report for Scottish Enterprise by Hunter Centre for Entrepreneurship</td>
</tr>
<tr>
<td>Key sectors reports on:</td>
<td>2009</td>
<td>Seven separate reports summarising the context of the sector, description of scope and performance, productivity and rational for key sector status. The reports identify challenges and opportunities and public sector intervention at both strategic and operational and an assessment of the effectiveness of interactions and interventions. Finally, the reports conclude with an international perspective (notably Nordic comparator countries)</td>
</tr>
<tr>
<td>Life Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative industries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food and drink sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial and business services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Universities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Year</td>
<td>Comment</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Highlands &amp; Islands ERDF Operational Programme 2007-13</td>
<td>2007</td>
<td>Notably Priority 1: Enhancing business competitiveness, commercialisation and innovation</td>
</tr>
<tr>
<td>Investment and Economic Growth</td>
<td>2007</td>
<td>Scottish Enterprise review of evidence</td>
</tr>
<tr>
<td>Scottish Innovation System: Review and Policy</td>
<td>2007</td>
<td>ERDF co-funded under regional innovative actions programme</td>
</tr>
<tr>
<td>Scottish Innovation System: actors, roles and actions</td>
<td>2006</td>
<td>ERDF co-funded under regional innovative actions programme</td>
</tr>
</tbody>
</table>
Appendix D Scottish innovation policy governance system
Appendix E Scottish participation in FP7 - a social network analysis (Scottish Participants only)