European R&D Policy - A Scottish position paper

1 Context

Scotland believes that achieving long term sustainable economic growth will require a step change in R&D and innovation culture. We will achieve greater impact when regional, national and European R&D policy agendas are complimentary and better aligned.

We recognise the benefits of being engaged in European R&D activity – it provides access to European networks, increases scientific and business reputation, improves ability to attract and retain world class researchers, and provides access to new markets and funding.

Scotland is therefore keen to have more productive and strategic engagement with the European Commission. Scotland as a region has a wealth of expertise and we want to share our learning and experience with the European Commission and other European partners in order to help shape the future of European R&D policy.

We are working with our key stakeholders across Scotland and Europe to develop a more co-ordinated and strategic Scottish approach. We believe having such an approach will help to raise Scotland's profile and the level of influence at a strategic level. The aim of this approach is to share our wealth of expertise and also to strengthen our performance, particularly the participation of our business community whilst maintaining and improving our academic engagement.

Through this approach, we have already been gathering evidence and views from stakeholders on the priorities for future R&D policy, including the framework programmes.

2 Introduction

The Scottish Government's Economic Strategy makes it clear that increasing sustainable economic growth is our Purpose – at the heart of everything we do. To realise that vision, we need to prioritise action that, in the short term hastens economic recovery and in the longer term ensures Scotland emerges in a stronger and more competitive position in the global marketplace.

Scotland is committed to the Europe 2020 Strategy – it is very much aligned with the principles set out in the Scottish Government's Economic Strategy and our Economic Recovery Plan.

We believe that the European Commission is in a unique position to support collaboration and add real value to work at a member state and regional level.

3 Supporting excellence and creative approaches to communicate science and work collaboratively

Research is vital as it supports Europe's economic development, enriches our cultural lives, informs decision making and helps us to understand the world around us.

Excellence should be the only driving force behind any future framework programme in order to produce long-term impacts and contribute substantially to economic growth.

To fully deliver on the potential impact, the Framework Programme needs to address the perceived 'distance' between European citizens and the actual activity of the various R&D platforms across Europe. Improved connectivity and interactivity across these structures should assist in conveying clear messages and coherent direction for R&D priorities. Improved communication which addresses the myth of science as being far-removed from the reality of citizens' daily lives would be welcomed.

Public awareness and support could be increased through better engagement with national and regional media, perhaps via increased support and coordination from NCPs and other national, regional bodies/agencies.

There is a need for a greater policy focus on bringing together scientists and ordinary citizens to create new forms of dialogue and new stimulus for innovation, concerning the direction of the work of scientists. Opportunities engaging business, public sector and society in 'user-driven design' and 'living labs' are good examples of how this interaction can create new thinking and provide an effective setting for such dialogue to take place.

3.1 Scottish excellence

Scotland has one of the strongest university research bases in the world. It produces 1.2 per cent of all new knowledge and is second in the world in terms of impact of its research. These are considerable achievements for a region of only five million people. Scottish scientists are world leaders in specialist areas of research such as health, biological and clinical sciences, informatics and energy technologies.

Scotland's main research strengths are closely aligned with European priorities and include:

- Renewable Energy and Marine Technologies/Sustained environment
- Biomedicine and Life Sciences (including Regenerative Medicine and Priority Health Areas)
- Food and drink, including Animal Health
- Security (water, food, energy, information)
- Built environment, including Power Transmission and Transport Infrastructure

- Creative industries/digital media
- Mobile/digital technologies/informatics
- Medical imaging and diagnosis

3.2 Working collaboratively – new ideas

Our university research base is one of the strongest in the world and our main research strengths are already closely aligned with European priorities. Scotland's priority is to deliver a collaborative research base that remains highly competitive internationally; nurtures, attracts and supports world-class international researchers in Scotland; and attracts high levels of project support from research councils, Europe, charities, business and the public sector. This regional expertise could help the development of thematic priorities, global challenges and Joint Programming Initiatives.

We have developed the concept of "**research pooling**" to encourage greater collaboration between networks of researchers across universities. Research pooling has helped to create a new and distinctive research landscape within Scotland. By concentrating investment on networks of excellence with our partners, we have created powerful, well resourced communities that are now attracting research talent from across the world.

Scotland has 11 research pools so far covering a broad range of research expertise, including life sciences, imaging, informatics and computer science, marine science, engineering and geoscience.

Our approach to research pooling could be considered as an example of good practice in the implementation of new and innovative instruments supporting the engagement of business in EU RTD and narrowing the gap between industry and academia.

SINAPSE (Scottish Imaging Network: A Platform for Scientific Excellence)

SINAPSE brings together experts from the universities of Aberdeen, Dundee, Edinburgh, Glasgow, Stirling, and St Andrews to advance significantly research into conditions such as strokes, Alzheimer's disease, schizophrenia and cancer. It is the world's first virtual clinical imaging laboratory.

The £40 million initiative, backed by the Scottish Funding Council, focuses primarily on imaging of the brain, using state-of-the-art technology that includes magnetic resonance imaging and positron emission tomography. Pooling resources across Scotland, the partnership combines the collection of different types of brain information such as structure, function and brain waves, and develops new radioactive tracers for different diseases. This will enable further research into strokes, dementia, diabetes, cancer, and mental health.

Scotland wants to build on this expertise by working with research partners to establish new pools where there are benefits and clear links with European priorities.

In particular, we will explore how we can bring together our research expertise and develop research pools that are aligned to the Joint Programming Initiatives and ensure improved exploitation of research results across the EU.

4 Supporting the engagement of SMEs in EU RTD through new approaches and harmonisation

The Framework Programme has consistently struggled to achieve the targets for business engagement and commercialisation. These gaps limit the long term impact of the programmes. Building in business capacity and knowledge will make a positive contribution to this and wider economic growth.

Like most other member states, participation of our business base in European R&D activity, particularly our SMEs, has been relatively poor to date. A key priority for Scotland is to improve participation in European R&D activity and increase business R&D spending. This will help to ensure a long term positive impact on Scotland's sustainable economic growth.

Effective support for SME engagement in the FP is patchy across the EU as demonstrated by the level of participation and funding to the SME sector. More SMEs involvement in the setting of research priorities would increase understanding and recognition of the FP within the business community and foster more active engagement of SMEs.

Within Scotland we have extensive experience of knowledge transfer initiatives, particularly those aimed at the SME community, and currently have a number of successful programmes aimed at enhancing knowledge transfer from the research base into business. This knowledge application could help the EU ensure that the design of new R&D policy and programmes fully addresses SME needs and circumstances.

4.1 New approaches

We want to see greater translation of European research excellence into business opportunities and growth.

Scotland has a wealth of expertise, including its world class research base, its experience of implementing successful knowledge transfer and commercialisation initiatives and supporting Scottish business to invest in innovation and R&D.

A number of initiatives have already been successfully introduced in Scotland including SEEKIT, Interface and the Innovation Voucher Scheme and Proof of Concept. These programmes form a key part of the Scottish Government's Innovation Framework, and aim to enhance collaboration between business and the science base; improve business innovation and investment in R&D; and therefore result in greater economic growth.

In terms of developing new instruments for the future framework programme, these initiatives could serve as useful best practices examples.

SEEKIT funds public sector organisations, such as universities, to develop demand-led business focused solutions to help Scottish companies access research expertise. The scheme started in 2004, has supported over 40 projects and awarded over £16M in grants to date. SEEKIT has helped to:

- Create 145 new spinouts/SMEs
- Increase business investments in innovation and R&D of over £25M
- Develop over 350 new products and 450 new processes

SEEKIT has also helped to maximise the impacts of European Regional Development Funds (ERDF) as many of the projects have attracted ERDF funding – approximately £11M in total.

Interface acts as a brokerage service and provides information to companies regarding specialist expertise that is available in Scotland's 20 Higher Education Institutions and nine Research Institutes. Since 2005, over 720 businesses to academic partners have been introduced, and as a result more than 270 academic-industry collaborative projects have been initiated.

The Innovation Voucher Scheme helps SMEs to draw upon the world class research and expertise within Scotland's universities and colleges. Universities and colleges can use the funding to offset costs for a broad range of activities to support SMEs in the development of new products and processes, new services, improving production processes and experimental testing and measuring. The demand for Innovation Vouchers is exceeding expectations after successfully matching more than 80 businesses to university research and development expertise, and the SFC recently announced an increase in funding for the scheme from £300,000 to £500,000.

The Proof of Concept Programme supports the pre-commercialisation of leading-edge technologies emerging from Scotland's universities, research institutes and NHS Boards. It helps researchers to export their ideas and inventions from the lab to the global marketplace and create new sustainable businesses for Scotland.

4.2 Better coordination and harmonisation

With a large number of R&D and innovation programmes initiatives run at international EU, national and regional levels, all with different thematic and

call structures, there is a need for considerable attention to be given to better coordination of such opportunities through new and holistic governance structures, giving clearer rules to those supporting and engaging in research activities at all level across Europe (from national governments to development agencies business networks, cluster alliances, European networks).

At present a perceived 'silo mentality' is believed to exist as a consequence of different structures which operate at Member State, regional and even sectoral level. Improved connectivity and interactivity across these structures should assist in conveying clear messages and coherent direction for R&D priorities, which will deliver greater impacts.

Making better use of knowledge, capacity and intelligence concerning future R&D needs for all those level and stakeholders groups will ensure research excellence is funded wherever it occurs across Europe and not solely in those "golden triangles" which are already well trusted.

5 Multidisciplinary Research, mobility and grand challenges

The most recent development of pooling initiatives is inter-pooling activity. Multidisciplinary research provides the best opportunities to work across the sectors and in between the sectors. Experience has shown that innovation occurs thanks to new approaches applied to different sector and at different levels.

The Scottish Government wants Scotland to lead the world in the development of a low carbon economy. The Government's forthcoming Low Carbon Economic Strategy will set out how this can be achieved. The low carbon economy is not a sector, but a change in the way the whole economy operates, with emissions reduction and energy efficiency at its heart. Research and innovation is at the heart of the low carbon transition – developing the new technologies by 2020 that will achieve the significant emissions reductions needed by 2050.

Scotland's focus on a low carbon economy is also a major catalyst for multi-disciplinary innovation activity. There are huge opportunities for the development of new low carbon products and services which can drive future sustainable economic growth and achieve the emissions reductions necessary to meet our climate change obligations. The Scottish Government is directly supporting low carbon research, development, demonstration and deployment, with partners across the public sector through initiatives such as the Scottish European Green Energy Centre (SEGEC).

Scottish European Green Energy Centre (SEGEC)

The Scottish European Green Energy Centre (SEGEC) opened in Aberdeen in summer 2009. The Centre has a key role in fostering research collaboration between Scotland and other parts of the EU, levering in the significant

resources of the EU Framework Programmes, and disseminating Scotland's low carbon expertise. SEGEC has funding of £1.6 million from the European Regional Development Fund and £1 million from the Scottish Government over the next three years. SEGEC has already been instrumental in supporting bids from Scotland for funding under the European Union Recovery Package. Two Scottish projects have made the final list for funding: a Shetland North Sea grid node and the Aberdeen offshore wind-farm project. These projects are seeking funding of over €100 million and will place Scotland at the technological forefront of renewables in the UK and Europe.

5.1 Mobility and ERC

One issue related to participation which we would raise is that the world's best researchers are not always involved in the Framework Programme. This is particularly the case with regard to the People programme, where opportunities are not well promoted and publicised. Although remuneration levels are appropriately set to attract the best researchers', publicity of the excellent career opportunities on offer is not effective. Many researchers have not heard of the Framework Programme and are not aware of the excellence of the Marie Cure Fellowships.

We would welcome increased promotion of these activities, together with a restructuring to encourage both young researchers just beginning their careers and senior researchers already leading in their field to apply for Fellowships, much like and extension of the ERC Starting and Advanced grants scheme which has itself proved successful.

Expanding the European Research Council (ERC) would be welcomed. The ERC's main aim is to stimulate scientific excellence by supporting and encouraging the very best, truly creative scientists, scholars and engineers to be adventurous and take risks in their research. The scientists are encouraged to go beyond established frontiers of knowledge and the boundaries of disciplines.

Co-operation and mobility without boundaries is a key success factor in supporting institutional excellence and individual talents. Nevertheless more should be done to support the mobility of PIs (Principal Investigators). Incentives for PIs' career development (such as European and international awards and prizes, better pension packages, etc.) should be taken into account to support the mobility of researchers who have already established themselves as senior "investigators" in public or private sector research. International prizes could also play a key role in attracting funding from the private sector.

The Saltire Prize promotes transformational technologies that help unlock the marine renewable energy potential in Scotland, helping to achieve Scotland's renewable energy carbon reduction targets.

The Scottish Government has created the opportunity to award one of the biggest international innovation prizes in history through its plans for the Saltire Prize. The Saltire Prize is a £10 million challenge prize for technological advances in wave and tidal energy.

5.1 Grand Challenges and international cooperation

Looking ahead towards FP8 and addressing global challenges requires an overarching set of EU policy principles and guidelines, setting up how Europe has defined and determined which global challenges it intends to address. The mechanisms for such collective decision making should be improved and made clear to all players. Understanding market failure should guide this activity and Inter-disciplinary research should be promoted as a key route to addressing these challenges.

There is in fact a need to boost international co-operation across disciplines and sectors. Research teams do not need to belong to the same scientific environment and domain. Indeed, the injection of new thinking across disciplinary settings can be very effective in triggering innovative and ground-breaking ideas. Nevertheless, barriers persist when it comes to putting together international research teams accessing EU research infrastructures across Europe. Better long-terms agreement should be fostered across such infrastructures to facilitate access, mobility, transfer of results and a better management of intellectual property (IP) ownership, generation, protection and exploitation in line with the ambitions of EU as a global player.

SMEs require to be better engaged in such activity and could play a unique role in acting as potential developers in the exploitation phase, in a context of fair royalties share across Europe and beyond. But SMEs will benefit from this approach only if a significant administrative and financial simplification process is agreed and put in place.

6 Simplification and high trust research

Funding streams should be simplified to allow greater support and flexibility to find innovative solutions when facing European and global challenges.

Scotland supports the continued efforts of the European Commission towards simplification of the Framework Programme, including mechanisms for reducing the complexity of the administrative and financial systems and structural design of the programme.

The simplification measures taken have generally been effective; however we would caution that more time is required for them to have full impact, both in terms of current and future projects. For example, recent changes to increase the level of error acceptable during audits will over time lead to improved perceptions and increased willingness to participate in European projects.

Finally, groundbreaking research is normally derived from a reliable evidence base of key results, but at the European level there is little harmonisation in terms of common measurement methodologies and the sharing of knowledge and best practice. This limits the effectiveness of FP7 in developing a critical mass of knowledge, and action to address this issue would be welcomed.

In our view the balance between risk and cost of control is, in general, over controlling. Institutions that have an audited track record of managing and reporting well could have the frequency or need for audits reduced. For example an organisation who has had not major exceptions reported might only have to provide an audit certificate on 1 in 3 of those reaching the €375k limit, not all. External Commission audits could also be reduced in these cases so that resources can be directed to higher risk participants from low-risk participants.

Further work is still required though, and despite measures taken for many SMEs the FP7 proposal process remains too costly and time consuming. Many are unable to assume any other role than that as a partner of a project led by a large enterprise, and other funding streams such as Eurostars represent much more cost-effective routes to funding. It is understood why there is a level of complexity, but measures to shorten decision times and reduce paperwork will help companies to get involved.

Benefits in reduced administration would also accrue from the re-introduction of fixed dates for call publication - increase the number of open calls with fixed cut-off dates. Such scheduling would decrease the management and planning burden for prospective participants, and help co-ordinate the promotional activities of the European Institutions. This could be accompanied by common deadline for all calls, i.e. after 3/4 months from the publication.

At present, the 12- week period afforded for formation of an international consortium and production of a fully-costed project bid is rather short. By opening this up to standing calls, researchers will be afforded greater time to devote to project development and resources will be less stretched as they will not need to rush to react to the publication of calls.

A much more consistent approach to negotiation and reporting across thematic areas is required, including reducing the number of ICT tools and portals used. For HEI's and RTO's the level of co-financing should be consistent across the programme, this is particularly with reference to JTI's.