Playing Our Part in Europe

Statement on Horizon 2020

March 2012

Forfás

Advisory Council for Science
Technology and Innovation
An Comhairle Eolaíochta

Playing Our Part in Europe[1] - ACSTI Statement on Horizon 2020

The Advisory Council for Science, Technology and Innovation (ACSTI) welcomes the European Commission proposals for the new Framework Programme for Research and Innovation, Horizon 2020, and its aim to provide supports for the full range of research and innovation activity "from research to retail" including development, demonstration and deployment of technology. In this, its first response to the Commission on Horizon 2020, the Council takes note of the current proposals for the new Framework Programme, with the intention of continuing to input to the negotiations as they progress.

Horizon 2020 mirrors many national priorities which were put to the Commission in the submission "Response from Ireland to the EC Green Paper" (May 2011)[2] – funding research excellence, seeking to engage with SMEs and wider industry, enabling public-private partnerships, enhancing researchers' careers and encouraging technology diffusion through mobility, assisting researchers to engage in new and enabling fields of technology while also supporting the wider range of research required to address societal challenges and achieving a good balance between open and structured research approaches e.g. bottom-up and top-down research.

Irish Performance in the European Framework Programmes

Irish researchers have performed well in the Framework Programmes, securing more than the national target[3] and engaging in wide-ranging partnerships and projects. It is important that Ireland continues to perform at this level, not only in terms of funding but also in the valuable contribution which Irish researchers make to the acquisition and use of research knowledge and their constructive engagement with the rest of the global research community. To ensure the continuous quality of our research and innovation training and education we need to engage as widely as possible – and to impart our knowledge and skills to others in the global economy – through national, European and global research programmes and projects.

If we are to capitalise on the investments made to date, it is essential that research in Ireland is well-co-ordinated and engages with the rest of Europe and globally on national priority areas, in particular those identified in the report of the recent National Research Prioritisation Exercise. Where national priorities and European priorities match we will find the greatest opportunity, through a strategic and focused approach, to sustain and grow our research and innovation capability and capacity. An appropriate balance must be achieved, and sustained, between the support of both applied research and research excellence within basic science at national and European levels alike.

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1 This Statement has been informed by the national consultative process for Horizon 2020 including the ACSTI workshop of 7 December 2011. The workshop was managed by Forfás and requested by the Department of Jobs, Enterprise and Innovation. For a report of that workshop and further information on the consultative process see http://www.sciencecouncil.ie/

2 Submitted to the European Commission by the Department of Jobs, Enterprise and Innovation, the national response was developed through a national consultative process led by ACSTI and managed in process and content by Forfás.

3 The target for FP7 was a drawdown for Ireland of 1.25% of total funding. Currently the Irish drawdown stands at almost 1.5%. See also the "Eighth Interim Report of Irish Involvement in the Seventh European Union Framework Programme for Research and Technological Development (FP7)", FP7 Office, Research & Innovation, Enterprise Ireland (December 2011) and http://www.fp7ireland.com/page.aspx?SP=257

The Horizon 2020 Proposals

The research community has benefited in the current Seventh Framework Programme (FP7) from the creation of a National Support Structure (NSS) comprising a national Framework Programme Support Unit[4] with National Contact Points and National Delegates. *The National Support Structure for Horizon 2020 will be central to Irish participation in the next Framework Programme* but actions also need to be taken by researchers, funding agencies, the wider academic and industrial communities and their institutions and organisations to prepare for and maximise opportunities for researchers in Ireland, both in academia and industry.

The European Research Council (ERC) will be one important and wide-ranging mechanism to fund excellent scientists in Horizon 2020, covering all disciplines, the only mechanism for which evaluation is based on excellence alone. Irish researchers are achieving some success now in ERC applications but, inevitably, the competition is fierce. *In the view of the Council, there is a role for the national system to step in to support excellent researchers who work in nationally important research areas where Ireland has critical mass and to encourage and support more applicants, through the National Support Structure.* Where Irish research priorities match European research priorities we should focus our efforts to engage at European level, not disregarding other research and innovation areas but using our curtailed resources where they can best secure added value.

The value of research training is in pursuing a research career and in enabling new discoveries but also in the development of a well-equipped population ready to meet the needs of the workplace and the needs of their daily lives with appropriate skills and knowledge. Industry leaders and advocates have identified the importance of training and skills in fields of science and technology so that Ireland can have a balanced and productive population[5]. Ireland needs to have a research community which is well-funded, amply supported and suitably facilitated in terms of its employment and training opportunities. Mobility is an important aspect of that but so too are stable and transferable employment conditions. *Where any national issues affecting mobility are identified, these should be addressed in a timely manner to ensure the maximum mobility to and from research in Ireland.* One of many useful ways is through mobility which provides training and technology transfer through the movement of researchers and, in this context, there is a particular need for more industrial PhDs.

Throughout Europe, Framework Programmes have struggled to engage with industry, especially with small and medium-sized enterprises (SMEs). It is important that the connections between industry and academics be established early in the research as in this way collaborations can be fostered throughout the development process. It can be very difficult to engage industry late in the research cycle and also

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4 The Unit is based at Enterprise Ireland's Seventh Framework Programme Office for Research & Innovation and its web site is http://www.fp7ireland.com/page.aspx?SP=257

5 In its end of year statement 2011, IDA Ireland stated that "over €700 million in new RD&I (research, development and innovation) investments were won for Ireland in 2011. RD&I remains significantly important to Ireland's FDI landscape embedding existing employment and putting in place the framework for future employment creation". Such investments are attracted in part due to the availability of a good research environment and the quality of the workforce in Ireland. IDA Ireland further notes that "Ireland's technology centre programme is a vital part of our attractiveness as a location for RD&I investment".

difficult for industry to direct research towards commercially-viable solutions if it is not fully engaged from the start.

Questions will again arise as to how Ireland can best enable its SMEs to engage in Horizon 2020 and how the industrial development bodies, the academic and industrial communities, and the National Support Structure might be able to assist them. It can often be difficult for smaller companies to engage as they do not have the spare capacity to deal with application and reporting processes, for example. Possible actions to address these concerns will appear as the proposals for Horizon 2020 are fleshed out, and Ireland should continue to express its views through programme committees and other consultative groups. At local level, the Council commends the support provided to SMEs under the heading of "Research for the Benefit of SMEs" within the FP7 Support Network.

Research infrastructure is an essential tool both to sustain the quality of research and training at national level and to enable Irish researchers to compete and collaborate at European levels. Ireland has put substantial resources into infrastructure under its Programmes for Research in Third Level Institutions[6] and is well-placed to engage in globally-relevant research as a result. The benefits of infrastructure include training and exchange of expertise as well as research and technological development. *Maintenance and updating of national infrastructure will be central to Ireland sustaining national research excellence.*

The aim under Horizon 2020 is to build on work of ESFRI[7] but this still leaves the bulk of the investment in infrastructure in the hands of the national governments. Ireland is particularly involved at present on ESFRI roadmap infrastructures in areas including social sciences and humanities, marine and medical/biotechnology. *There are many opportunities for Ireland to engage at European level through its national infrastructure if multi-annual investment here is sustained.*

The Council welcomes collaborative efforts to address Societal Challenges and, in particular, concurs with the view that there is "merit in addressing the challenge of active and healthy ageing as it is relevant globally and is a horizontal theme across sectors such as health, information technology, food and environment"[8]. *The Council encourages the fostering of complementarity between all the mechanisms which can help to address these complex problems, under Horizon 2020 and elsewhere. This is an area which needs to involve the whole research community and there is work to be done in Ireland and across Europe in engaging industry more fully.* Much more needs to be done to bring SMEs into this process and the Council welcomes the recognition of this in the proposal that the Innovation in SMEs initiative will be allocated funding under Societal Challenges.

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6 Since 1998, the Programme for Research in Third-Level Institutions (PRTLI) has awarded €1.22 billion of exchequer and private matching funds for institutional strategies, programmes and infrastructure in key areas of research spread across all disciplines (humanities, science, technology and social sciences, including business and law) (http://www.hea.ie/en/prtli).

7 European Strategic Forum for Research Infrastructure http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri

8 "Response from Ireland to the EC Green Paper" (http://www.sciencecouncil.ie/publications/2011/title,7867,en.php).

Council Recommendations

The Council sees opportunities for Ireland in many areas of Horizon 2020 but a strategic and focused approach will be needed. Ireland has recently engaged, at the request of the Minister for Jobs, Enterprise and Innovation, in a National Research Prioritisation Exercise[9]. That prioritisation must be the foundation for a comprehensive and agreed blueprint for national research and must enable Ireland's continued engagement in Europe.

With the aim of strengthening Ireland's participation in European research, according to national priorities, the Council recommends that:

- Work should begin, as soon as the final form on Horizon 2020 is agreed, on developing the right National Support Structure for that new Framework Programme, drawing on the experiences of the research community and the current NSS and building on that of the Seventh Framework Programme, to support and encourage Irish participation in Horizon 2020.

- There should be a substantial strengthening of support for industry and SMEs, building on the already successful national support for "Research for the Benefit of SMEs". That support should be provided through that National Support Structure for Horizon 2020 and the industrial development bodies, working with the academic and industrial communities.

- Commitment should be given, at the highest levels, to sustained multi-annual funding for research infrastructure in areas of national importance to enable Ireland to benefit from being a full partner in European Research Infrastructure.

- Measures in Ireland should complement those at European levels in ensuring optimal mobility for researchers in Ireland, both those researchers from other countries and Irish researchers, both researchers from academia and industry. Any national barriers to mobility should be addressed now.

- The selection process of the European Research Council identifies researchers of the highest excellence but cannot fund all of them. Excellent researchers in Ireland should continue to be supported nationally[10] to keep specific expertise here, to work on areas of national priority[11] and to maintain and reinforce the attractiveness of Ireland for research and technology-based industry alike. A further flexible and rapidly reacting research fund could support Irish researchers to compete for European funding for basic research excellence including the large and prestigious grants awarded by the European Research Council.

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9 The National Research Prioritisation Exercise was a consultative process (2010-2011) with national stakeholders, managed by Forfás. The report was submitted to the Minister for Jobs, Enterprise and Innovation in early 2012.
10 For example, Science Foundation Ireland currently provides funding of up to €1 million per annum for up to five years for excellent researchers to work in Ireland (www.sfi.ie).
11 As identified through the National Research Prioritisation Exercise.

ANNEX

Advisory Council for Science, Technology and Innovation

Consultative Workshop on Horizon 2020, 7 December 2011

Summary

This is an Advisory Council for Science, Technology and Innovation (ACSTI) summary of the national consultative workshop on Horizon 2020 which took place in Dublin on 7 December 2011. The agenda is given in the Annex.

The content of the report has been prepared by the ACSTI Secretariat. The report summarizes the views given on the day as perceived by the Council members and Secretariat present and provides background and views from the documents and presentation by the European Commission and the national submissions of November 2010[12] and May 2011[13]. This report forms the basis of the ACSTI Statement on Horizon 2020 "Playing Our Part in Europe".

1.   Background to the Workshop

In its end of year statement 2010 'Staying the Course', ACSTI highlighted the importance of Irish research institutions being able "both to compete in the international arena and to collaborate equally on international terms". In order to benefit from investment to date in Irish research and innovation, Ireland needs to continue to foster its research community in the highly competitive environment in which we find ourselves in Europe and across the globe. Research is not only a source of new knowledge and new ideas but it is also a generator of skills and expertise. Increasingly, countries are recognising the value of supporting a robust research and technological base on which to build and sustain industry and a secure society.

Irish researchers continue to perform well at European levels. The most recent report on participation in the EU's Seventh Framework Programme for Research and Technological Development (2007-2013) (FP7) shows a success rate of 23 % for Irish researchers in terms of applicants and 21% in terms of funding[14.] This translates into Ireland securing almost 1.5% of total available funding (i.e. over 360 million euro of funding to Irish participants) ahead of the national target of 1.25%. Irish industry is performing well in programmes targeted towards its needs. The European Commission's Fourth FP7 Monitoring Report[15] (4 August 2011) shows the share of the budget going to SMEs under the Cooperation Programme at 20.7% for Ireland, substantially above the average of 14.0% for the EU-15 Member States.

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12 Joint DETI/Forfás submission to the European Commission "Ireland's Priorities for FP8", www.forfas.ie.
13 "Response from Ireland to the EC Green Paper" (http://www.sciencecouncil.ie/publications/2011/title,7867,en.php)
14 Enterprise Ireland's Seventh Framework Programme Office for Research & Innovation, December 2011
15 http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/fourth_fp7_monitoring_report.pdf

In 2014, Europe will begin a new Framework Programme for Research and Innovation, Horizon 2020. In that context, Ireland is contributing to the preparation of the Framework Programme. The programme is aiming to combine research, innovation and competitiveness funding under one umbrella to support research from the laboratory to the potential customer through the most market-driven approach to date in any Framework Programme while maintaining its support for excellent and ideas-driven science.

Contributing to the development of that Framework Programme, Ireland put forward its initial ideas though a submission to the European Commission (hereafter "the Commission")[16] in late 2010.

In May 2011, Ireland responded to the proposals of the Commission as laid out in its Green Paper "From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation Funding". That response[17] from the research community in Ireland, submitted to the Commission by the Department of Jobs, Enterprise and Innovation, was developed through a national consultative process led by ACSTI and managed in process and content by Forfás.

The main thrust of the "Response from Ireland to the EC Green Paper" was that the Member States should "consolidate their efforts, maintain their strengths and develop, from largely existing mechanisms, a fully complementary set of funding instruments for European research and innovation". It highlighted:

- The need to foster co-operation, both through small, strategically and scientifically important projects by small groups of researchers and through large consortia and the potential benefits of increasing support for "bottom-up" and researcher-led activities;

- The value of mobility in the development of researcher skills and experience and the opportunity offered by increasing the amount of exchanges between industry and academia in fostering innovation;

- The potential for Europe to mainstream innovation in the new Framework Programme by offering complementary support mechanisms across the full innovation cycle including technology demonstration, diffusion and deployment and with targeted supports for small and medium-sized enterprises; and

- That the mechanisms and funding instruments of the common strategic framework must not lead to the exclusion of researchers from particular Member States, institutions or companies.

The inputs from Member State countries, other stakeholder countries, many organisations and individuals were considered by the Commission in formulating its Communication on "Horizon 2020 - The Framework Programme for Research and Innovation"[18] which was released on 30 November 2011. It outlines proposals for an 80 billion euro research and innovation funding programme (2014-2020) complementing Structural

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16 The proposals were developed through consultation with stakeholders, a process managed by Forfás at the request of the then Department of Enterprise, Trade and Innovation (DETI). The joint DETI/Forfás submission ("Ireland's Priorities for FP8") and a list of participating organisations can be found at www.forfas.ie.

17 "Response from Ireland to the EC Green Paper" (http://www.sciencecouncil.ie/publications/2011/title,7867,en.php)

18 http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents

Funds, education funding, etc. and responding to the economic crisis by investing in jobs and growth, addressing the concerns of citizens about livelihood, environment and safety and strengthening the position of the European Union in research, innovation and technology.

On 7 December 2011, ACSTI led a national consultative workshop, managed by Forfás, at the request of the Department of Jobs, Enterprise and Innovation.

2. Horizon 2020 – the Proposed New Framework Programme

The workshop welcomed the aim of the Commission that Horizon 2020 would provide supports for the full range of research and innovation activity "from research to retail" including development, demonstration and deployment of technology. It acknowledged the aim to create a single programme by bringing together the RTD Framework Programme with the innovation aspects of the Competitiveness and Innovation Framework Programme (CIP) and the EU contribution to the European Institute of Innovation and Technology (EIT) with the intention of providing better access to supports at all stages of the value chain.

The Communication from the Commission, which is structured around three pillars:

- Excellent Science
- Industrial Leadership
- Societal Challenges

and the workshop participants provided their views under these three headings.

2.1 Excellent Science

Within *Excellent Science*, the Commission states that "World class science is the foundation of tomorrow's technologies, jobs and wellbeing". To further improve and sustain its position in global research, Europe needs to develop, attract and retain research talent, and researchers need access to the most appropriate and best infrastructures.

Excellent Science will be provided for under the Framework Programme within the mechanisms of the *European Research Council* (ERC); the programme on *Future and Emerging Technologies; Marie Curie Actions; and Research Infrastructures.* "These activities should aim at building competence in the long term, focusing strongly on the next-generation of science, systems and researchers, and providing support for emerging talent from across the Union and from associated countries.... should help consolidate the European Research Area and make the Union's science system more competitive and attractive on a global scale.... (and) should be determined according to the needs and opportunities of science, without pre-

determined thematic priorities. The research agenda should be set in close liaison with the scientific community. Research should be funded on the basis of excellence."[19]

The workshop participants identified that there were opportunities for Ireland in all of these areas but that a strategic and focused approach would be needed. Irish researchers have begun to secure significant funding from the *European Research Council* and their success should prompt the needed increase in confidence in others applying for ERC funding. The funding of excellence at European level will complement funding at national level, such as that provided through Science Foundation Ireland[20]. There were some concerns that national funds are being increasingly focused onto applied research while the European funds in the ERC are for research which is strongly basic in nature.

It is not possible for the ERC to fund all excellent scientists and it was proposed that the national system should step in to support researchers who narrowly miss receiving ERC support, in nationally important research areas where Ireland has critical mass.

There were concerns expressed there may be a capacity problem in that the most competitive researchers in the country, i.e. those most likely to secure substantial Horizon 2020 support such as ERC funding, are often over-committed. The critical mass which has been created in research areas of particular strength in Ireland may also begin to dissipate if national funding is reduced. There was a sense that Ireland must continue to hold its nerve if it is to reap the benefits of investment to date just when they are coming to fruition - as evidenced by the high level of involvement by Irish researchers internationally and the positive messages being received from industry about skills and expertise.

In addition to funding, researchers need other supports. The workshop praised the efforts of the National Support Structure (NSS) comprising the Framework Programme Support Unit (hosted by Enterprise Ireland), with its National Delegates and National Contact Points distributed throughout the system. It was proposed that more can be done in future, with continued commitment and the right resources, through mentoring, encouraging unsuccessful applicants to reapply, targeting applicants who are likely to achieve success, and continuing to learn from good FP7 support models abroad.

Experiences of both successful and unsuccessful applicants should increasingly be used in assisting those applying. There are also lessons to be learned from the nearly 300 Irish experts who have been engaged as evaluators for FP7 for the European Commission. In order to achieve success, it was felt that a full-time role may need to be established in key areas within the NSS support structure for Horizon 2020, ahead of it beginning in 2014. By investing time and effort in supporting applicants, the workshop agreed that Ireland can use its talent to best advantage in this global arena.

Both the preliminary submission of "Ireland's Priorities for FP8" and the "Response from Ireland to the EC Green Paper" stressed the value for European research and innovation of the *Marie Curie Actions*

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19 Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) [Doc 811]
20 www.sfi.ie

advocating "both continuing and growing the Marie Curie Actions to facilitate mobility through flexible mechanisms which sustain researchers at all points in their careers and which encourage them to develop diverse career paths". It sees Horizon 2020 as an opportunity to build on an existing success, to grow it to encourage more industry/academic exchanges and to broaden mobility actions to include doctoral training. Where the COFUND[21] mechanism is used, it will be essential for Ireland to have sufficient flexible funding to avail of opportunities which arise.

It was noted at the consultative workshop that proposals in the domain of social sciences and the humanities do particularly well in the competition for European funding and that they provide a dimension which has the potential to open up new fields within other areas of science and to complement other research strengths (e.g. in social networking, sensors).

Broader issues which were raised in the context of mobility during the national consultations included questions around contracts of employment, transferability of terms and conditions of employment, and pensions, all of which fall under national policies albeit outside of the research domain.

The workshop participants noted that Ireland is active in the area of *Future and Emerging Technologies* (FET) with strengths principally in biotechnology, micro- and nano-electronics and nanotechnology, and information and communication technologies and that there would be opportunities in these areas under Horizon 2020. Both company and academic researchers have shown their ability to adapt and adopt new technologies, high risk but high reward areas. There was a strong awareness expressed of the need to integrate social aspects into projects in this area and to undertake projects in social science to complement technological research and development.

Workshop participants reinforced the view that Ireland should be seeking for Horizon 2020 to present a good balance between open and structured research approaches e.g. bottom-up and top-down research. In the Commission documents, this FET theme aims to capture both by "... supporting a large set of embryonic, high risk visionary science and technology collaborative research projects ... for the successful exploration of new foundations for radically new future technologies..." and "... tackling grand interdisciplinary science and technology challenges (...science-driven, large-scale, multidisciplinary...built around a visionary unifying goal .... requiring co-operation among a range of disciplines, communities and programmes)"[22].

Throughout Europe, Framework Programmes have struggled to engage small and medium-sized enterprises (SMEs) and in Horizon 2020 questions will also arise as to how Ireland can best enable its SMEs to engage and how the industrial development bodies, the academic and industrial communities, and the National Support Structure might be able to assist them. It can often be difficult for smaller companies to engage as they do not have the spare capacity to deal with application and reporting processes, for example. Possible actions to address these concerns will appear as the proposals for Horizon 2020 are fleshed out,

21 http://cordis.europa.eu/fp7/mariecurieactions/cofund_en.html
22 http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents [Doc 811, p29]

and Ireland should continue to express its views through programme committees and other consultative groups.

Research Infrastructure is an essential tool for the research community, both academic and industrial. Maintenance and updating will be central to that infrastructure remaining at the levels required for research excellence and for training purposes. The term "Research Infrastructure" covers a wide range globally from e-infrastructure to data and sample collections to massive physical installations such as CERN[23]. The benefits of infrastructure include training and exchange of expertise as well as research and technological development. It will be important to develop synergies with other parts of Horizon 2020 and wider funding and co-operative mechanisms to ensure optimal use of infrastructure.

The aim under Horizon 2020 is to build on work of ESFRI[24] and its roadmaps with EU funding proposed for the preparatory phase (construction plans, legal arrangements, multiannual planning), implementation phase (R&D and engineering work, development of regional partner facilities); and operational phase (e.g. access, data handling, outreach, training and international cooperation activities) of European research infrastructures. This still leaves the bulk of the investment in infrastructure in the hands of the national governments. Ireland sees itself as having benefited from being engaged in the ESFRI roadmap projects and is particularly involved at present on infrastructures in areas such as including social sciences and humanities, marine and medical/biotechnology.

In many cases, research infrastructure is of value to multiple areas of science and the funding decision sits with more than one Government Department. In addition, multi-annual funding is needed for research infrastructure to enable Ireland to benefit from being a full partner in European Research Infrastructure. There are many opportunities for Ireland to engage at European level through its national infrastructure if investment here is sustained.

The research community at the workshop also highlighted the importance of clarity nationally in the approach to intellectual property, with respect to the use of infrastructure but also in all areas where public-private partnerships are formed.

The importance of the National Support Structure has already been mentioned. The current NSS contributes to awareness of existing infrastructure, mentoring and support for researchers to access infrastructure abroad through Framework Programme Funding and by inputting to policy discussions on infrastructure both nationally and at European levels. It also interacts strongly and shares some membership with the national group which works with the National Delegates[25] to the European Strategic Forum on Research Infrastructures (ESFRI). These are important functions and should continue into the next Framework Programme. For example, in Horizon 2020, consideration should be given to how researchers including industry can be supported to increase their access to European infrastructure,

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23 http://public.web.cern.ch/public/en/About/About-en.html
24 European Strategic Forum for Research Infrastructure http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri
25 The National Delegates to ESFRI are Dr Eucharia Meehan, Higher Education Authority, and Dr Jacqueline Allan, Forfás.

including SMEs, by using measures like the current Transnational Access (TNA) Opportunities under FP7 Integrating Activities Projects.

Finally, the opportunities for greater North-South co-operation on research infrastructure as well as in other areas of Horizon 2020 were highlighted.

2.2   Industrial Leadership

"..There is an urgent need to stimulate private sector research and development and innovation investment, promote research and innovation with a business driven agenda and accelerate the development of new technologies which will underpin future businesses and economic growth... support investments in excellent research and innovation in key enabling technologies and other

industrial technologies, facilitate access to risk finance for innovative companies and projects, and provide ..... support for innovation in small and medium-sized enterprises." [26]

The Industrial Leadership theme in Horizon 2020 aims to provide support for:

- Leadership in enabling and industrial technologies[27];
- Access to risk finance - leveraging private finance and venture capital through a loan and guarantee service and an equity instrument with the aim of supporting seed, early stage, expansion and growth; and
- Innovation in SMEs – mainstreaming support for SMEs across Horizon 2020, supporting research-intensive SMEs capable of exploiting their research in high-technology sectors, enhancing SME innovation capacity, and supporting market-driven innovation and addressing barriers to growth.

Leadership in Enabling and Industrial Technologies: It was noted that Ireland has a well-established research base in many of the enabling technology areas identified in the Horizon 2020 proposals – ICT (where Ireland performs best in monetary terms in FP7 with 24% of total funding to Ireland[28] and where it has a strong industrial base) and biotechnology (where the workshop felt that more might be done in the Framework Programmes given the size and nature of the pharmaceutical and chemical industrial base here) – and strengths in materials and in new and enabling technologies such as nanotechnology (with 10% of total Irish drawdown from FP7[29]). Ireland has long been involved in space technology, and it was suggested that Ireland could leverage more under Horizon 2020 from its international connections to

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26 Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) [Doc 811]

27 For example, ICT (new generation components and systems, next generation computing, future internet, content technologies and information management, advanced interfaces and robots, micro- and nano-electronics and photonics), nanotechnologies (next generation, safety, societal dimension, synthesis and manufacturing of systems, complex nano-materials and nano-systems), advanced materials (functional materials, materials development, transformation, management, materials for creative industries, metrology, standardisation and quality control, alternative uses), biotechnology (synthetic biology, bioinformatics, platform technologies, industrial processes), manufacturing (factories of the future, energy efficiency, low carbon, sustainable business models), and space (EU space sector, exploitation of data, international partnerships).

28 Eighth Interim Report of Irish Involvement in the Seventh European Union Framework Programme for Research and Technological Development (FP7), FP7 Office, Research & Innovation, Enterprise Ireland (December 2011).

29 Nano-sciences, Nanotechnologies, Materials and new Production Technologies in" Eighth Interim Report of Irish Involvement in the Seventh European Union Framework Programme for Research and Technological Development (FP7)", FP7 Office, Research & Innovation, Enterprise Ireland (December 2011).

researchers and to bodies such as the European Space Agency (ESA), and in the exploitation of data from that and many other sources.

Horizon 2020 proposes, through *Access to Risk Finance*, to help companies and other types of organisation to gain access to loans, guarantees and equity finance via two facilities: a debt facility and an equity facility:

The debt facility will "provide loans to single beneficiaries for investment in research and innovation; guarantees to financial beneficiaries making loans to beneficiaries; combinations of loans and guarantees, and guarantees or counter-guarantees for national and regional debt financing schemes. It will include an SME window targeting R&I-driven SMEs with loan amounts that complement finance to SMEs by the Loan Guarantee Facility under the Programme for the Competitiveness of Enterprises and SMEs." [30]

The equity facility will focus on early-stage capital funds to (i) provide venture and/or mezzanine capital to individual enterprises in the early stage (start-up window) and (ii) make expansion and growth-stage investments in conjunction with the Equity Facility for Growth under the Programme for the Competitiveness of Enterprises and SMEs. These measures will be available across all the specific objectives of Horizon 2020.

The workshop was interested in getting greater clarity on these supports as the proposals for Horizon 2020 are developed.

Under Horizon 2020, the measure for *Innovation in SMEs* will support (i) concept and feasibility assessment; (ii) research, development, demonstration and market replication; and (iii) commercialisation, with the objective of helping to fill the gap in funding for early stage high-risk research and innovation to stimulate break-through innovations and increase private-sector commercialisation of research results. A dedicated and simplified SME instrument compared with previous ones, Innovation in SMEs will be mainstreamed and apply across all the Societal Challenges and enabling and industrial technologies in a bottom-up manner across all fields of science, technology and innovation.

The national research community expressed concerns about a number of national and European issues under Industrial Leadership:

▪ Whether Horizon 2020 can achieve its goal of a seamless research and innovation support system given the differences inherent in those two areas;

▪ Whether national and EU research and innovation priorities will complement one another;

▪ How overheads will be provided for in Horizon 2020;

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30 Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) [Doc 811]

- The length of timeframes for projects and whether they can match, as appropriate, industrial timeframes and the timelines of national funding (to ensure that the combined Member State/EU support system will maximise its impact);

- The current long timeframe in the Framework Programmes for decisions on funding to be made, which impact small organisations more than large ones;

- Whether the risk finance provisions will suit all small businesses or only start-ups;

- That the minimum RSFF loan size may be set too high to meet Irish needs;

- How the mechanisms for the Joint Technology Initiatives can be unified and simplified given the wide variety of different national rules and structures;

- That the National Support Structure will be sufficient to meet the needs of all applicants and that there will be sufficient provision of supports at MS and EU levels for proposal preparation;

- What can be done by others (e.g. industrial development agencies, research and industry bodies, the financial advisory community) to support their own communities and others to engage in Horizon 2020?

- How the (largely national) issues around intellectual property rights, which can be a barrier to co-operation and commercialisation, are being addressed[31] (an issue of concern, for example, in the Irish food industry which does not currently perform as it might in the Framework Programmes); and

- Whether a suitable mechanism can be found for multi-institutional groups (such as the CSETs and PRTLI beneficiaries) to participate as one entity[32].

2.3   Societal Challenges

"Societal challenges should increase the effectiveness of research and innovation in responding to key societal challenges by supporting excellent research and innovation activities. ... using a challenge based approach which brings together resources and knowledge across different fields, technologies and disciplines... with an emphasis on innovation-related activities such as piloting, demonstration, test-beds, and support for public procurement, pre-normative research and standard setting, and market uptake of innovations... contribute to the overarching objective of sustainable development. Social sciences and humanities research is an important element for addressing all of the challenges."[33]

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31 It is noted that work is ongoing at the Intellectual Property Implementation Group (IPIG) and the Intellectual Property Policy Group (IPPG), established by the Department of Jobs, Enterprise and Innovation in 2010. These groups are currently developing a protocol, which establishes "ground rules" around ownership of and access to all State supported intellectual property and with implementing a number of other intellectual property-related recommendations of the Innovation Taskforce report
(http://www.taoiseach.gov.ie/eng/Publications/Publications_2010/Report_of_the_Innovation_Taskforce.html).
32 Subsequent to the workshop, the mechanism of Joint Research Units is being explored as the way to achieve this.
33 Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) [Doc 811]

The focus on societal challenges was accepted by the workshop (as no country can alone solve the problems, for example, of the ageing population and clean energy) although participants also cautioned against any system which excludes either researchers or research from contributing to those goals[34].

It was agreed that collaborative efforts could best address societal challenges and that this is an area which needs to involve the whole research community. The workshop reflected the view that there is work to be done in Ireland and across Europe in engaging industry more fully. Much more needs to be done to bring SMEs into this process and the recognition of this, in the proposal that the Innovation in SMEs initiative will be allocated funding under Societal Challenges, was broadly welcomed.

It was agreed that, where Irish research priorities match European research priorities, the research community should focus its efforts to engage at European level, not disregarding other research and innovation areas but using the currently curtailed resources where they can best secure added value. There is scope under this theme to develop technologies which will result in not only products but also processes and services. It was noted that licensing and patenting opportunities must be captured and any issues at national and EU level related to intellectual property must be resolved.

It was identified as important that the connections between industry and academics be established early in the research flow as in this way collaborations can be fostered throughout the development process. It was stated that it can be very difficult to engage industry late in the research cycle and also difficult for industry to direct research towards commercially-viable solutions if it is not fully engaged from the start. One of many useful ways is through mobility which provides training and technology transfer through the movement of researchers and there is a particular need for more industrial PhDs.

Social science and humanities are horizontal themes in Horizon 2020 and are areas in which Ireland has significant strengths. The workshop participants saw opportunities to grow this cross-cutting theme and encouraged the national funding bodies to take appropriate measures. The National Support Structure and other bodies can help researchers to form partnerships but opportunities should also be sought in infrastructure and key enabling technologies (where citizen involvement is important), for example.

Communication with stakeholders including the public was also seen as important in many technology areas. Citizens need to be engaged with and informed about the solutions which are being developed to address societal challenges as these solutions will impact directly on many, if not all, of them. Ireland is very active in communication with the public in the area of science education and awareness and, with the recent positioning of Discover Science and Engineering within Science Foundation Ireland, it is well-placed to engage in such activities at national level.

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34 "Ireland acknowledges that addressing grand challenges through concerted efforts by Member States could lead to more effective, and faster, solutions than any Member State is likely to achieve alone. The tool of Joint Programming should be implemented and tested at this stage as one mechanism to address grand challenges...... The mechanisms and funding instruments of the common strategic framework must not lead to the exclusion of researchers from particular Member States, institutions or companies. In particular, participation in and access to the results of Joint Programming Initiatives and Knowledge and Innovation Communities (KICs) should remain as open and inclusive as possible." Extract taken from "Response from Ireland to the EC Green Paper" (http://www.sciencecouncil.ie/publications/2011/title,7867,en.php).

Once again, the value of a strong national support structure should not be under-estimated. There are many roles including helping institutions and research groups to form appropriate consortia, assisting in the exchange of good practice between researchers and mentoring participants through the administrative processes. The workshop participants identified the need to standardise advice being provided across the Irish system (by agencies, for example), to provide more support for academics to engage internationally and with SMEs, and to provide different sectors with coaching and direction to match their needs.

ENDS

The Advisory Council for Science, Technology and Innovation would like to thank everyone who took part in the national consultative workshop on Horizon 2020. This report is the ACSTI view of the event, prepared by the Council Secretariat. Any imbalance in emphasis of issues reflects the composition of the group of participants as not all invitees were available on the day.

Consultative Workshop, 7 December 2011

EU Horizon 2020 Framework Programme

Chair: Professor Anita Maguire (ACSTI)
Secretariat :   Dr Jacqueline Allan (Forfás)

AGENDA

08.30   **Welcome to workshop**

08.40   **Background to workshop, purpose and structure**

08.50   **Presentation by Dr Brendan Hawdon,**

             Head of Unit, Directorate General for Research and Innovation, European Commission

09.20   **Discussion**

09.45   **Breakout sessions:**

             Excellence in the science base

             Creating industrial leadership and competitive frameworks

             Tackling societal challenges

11.15   **Plenary discussion: reports from workshops**

12.15   **Summary and next steps**

12.30   **Lunch**

13.00   **Departure**

Membership of Advisory Council for Science, Technology and Innovation

Dr. Tom McCarthy   (Chairman ACSTI), Chief Executive, Irish Management Institute

Dr. Sean Baker   Entrepreneur and Chairman of 3 Strata Technologies

Prof. Dolores Cahill   Professor of Translational Science, Conway Institute of Biomedical and Biomolecular Research, University College Dublin

Ms. Marion Coy   Former President, GMIT

Prof. David G. Lloyd   Bursar and Director of Strategic Innovation, Trinity College Dublin

Prof. Brian MacCraith   President, Dublin City University

Prof. Anita R. Maguire   VP of Research and Innovation, Director, Analytical and Biological Chemistry Research Facility, University College Cork

Mr. Paul McCambridge   Managing Director, Maxim Integrated Products International

Mr. John McGowan   Former VP (TMG) and Director Corporate Services, Intel Corporation, currently Director of Tualatin Ltd.

Mr. Kevin O'Leary   Chief Executive Officer, Qumas

Ms. Julie O'Neill   Vice President, Operations and General Manager, Gilead Sciences Limited

Mr. Martin D. Shanahan   Chief Executive, Forfás

Prof. Roger Whatmore   Former CEO, Tyndall National Institute

Head of Secretariat

Mr. John Dooley   Forfás

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