

EU Framework Programme: Call for Evidence response form

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The closing date for this call for evidence is 4 January 2011

Name: David Robertson

Organisation (if applicable): UK Computing Research Committee (UKCRC)

Address: School of Informatics, University of Edinburgh, 10 Crichton St,
Edinburgh EH8 9AB

UKCRC (UK Computing Research Committee) is an expert panel of the Institution of Engineering and Technology and the British Computer Society for computing research in the UK. Its members are leading computing researchers from academia and industry. Website <http://www.ukcrc.org.uk/>

Please return completed forms to:

Amy Ackroyd
International Science and Innovation Unit
Department for Business, Innovation and Skills
1 Victoria Street
London SW1H 0ET

Tel: 020 7215 1211

Email: Amy.Ackroyd@bis.gsi.gov.uk

Please indicate your affiliation:

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Question1: What should the UK's high-level objectives be for FP8?

The UK has gained upwards of 14% of FP7 funding to date but it does this against a background of low European R&D intensity (measured as domestic expenditure on R&D as a percentage of GDP) running at about two thirds that of the US and half that of Japan. This disappointing result overall across Europe masks wide differences between European nations; while most European nations have at least made progress in attaining national R&D intensity targets set in 2005, the UK has actually gone backwards and is now near the bottom of the league (according to the 2008/9 ERA Science, Technology & Competitiveness key figures report). A key strategic objective overall for the UK is therefore to increase its R&D intensity. However, we are unlikely to improve this simply through competing more strongly in FP8 because we already obtain a large share of FP7 funding, so it will be hard to close the widening R&D gap simply by competing on all fronts for a greater share. We suggest below five ways of re-gaining competitive R&D intensity in computer science under the assumption that the UK's proportion of FP8 funding is unlikely to rise much above that of FP7. We base these on the five key recommendations of the "Impact of the UE RTD Framework Programme in the UK" report commissioned by BIS in May 2010:

(a) Continue to promote the simplification agenda. The UK computing research community is one of the strongest, academically, in Europe but many of the best groups engage with FP projects reluctantly because they are over-complex at all stages (the application process is cumbersome; monitoring is bureaucratic; the level of EU-focused documentation is much greater than with UK research councils).

(b) Push for inclusion of broader innovation issues. In computer science two forces interact to drive innovation: opportunism in exploiting immediate discoveries and persistence in developing and re-interpreting key insights. The rigid operational frameworks imposed by FP programmes leave little opportunity for either of these two forces to have effect.

(c) Push for early elaboration of the purpose, shape and balance of important new concepts like Grand Challenges and Joint Programming. The UK computer science community has made productive use of "grand challenges" to help sections of our community focus on common long-term goals (see for example the UKCRC Grand Challenges Web site). We are therefore prepared to engage in shaping grand challenge efforts at a European level. This must be done with care, however. We must ensure that European grand challenges align with those established by the UK community. We must also ensure that grand challenges that obtain (very substantial) funding remain open across the computer science community, rather than becoming "closed shops" for those initiating the challenge activity.

(d) Explore ways in which it might encourage the Commission to implement more flexible, trust- based contracts, or grants, as the most appropriate vehicle for international applied research. This is crucial as a means of achieving the sort of simplicity we describe in item (a) above. Leading-edge research (whether theoretical or applied) is more productive when it is allowed to be agile and agility on large European projects requires trust between partners within the project and between the project and the Commission.

(e) Push for an increased focus on research results and outcomes as a means of control. This is particularly important for large scale, thematic programmes (such as those in item (c) above). FP grants tend to emphasise management structure and coordination within projects rather than the development of scientific and innovation communities that transcend narrow project boundaries.

Question 2: How can FP8 help deliver economic growth throughout the life of the programme and beyond?

To stimulate economic growth, FP8 needs to loosen the ties that bind results of a research project to the consortium operating within that project; this means: (a) following through after projects with support for innovation and (b) reducing lock-in of IP within project consortia. FP8 also needs to find ways of encouraging engagement in European research from industrial research centres outside the EU, since in computer science centres of expertise in industry are widely dispersed across the globe. According to the BIS "Impact of the UE RTD Framework Programme in the UK" report, there is no equivalent in FP7 of the Digital Economy theme promoted by the UK research councils; perhaps the UK could influence a digital economy (or related) theme in FP8.

Question 3: How should FP8 support the wider European context including Europe 2020 and the European Research Area?

Question 4: The study *Impact of the EU RTD Framework Programme on the UK* has indicated a number of broad benefits to the UK of the programme. Are these benefits identified appropriately and there other impacts that should be considered in addition?

The broad benefits are identified appropriately.

Question 5: How can FP8 make a positive contribution to the UK economy – and the low-carbon economy in particular?

ICT can make a major contribution to the low-carbon economy. Broadly, the research impact will be in two areas: lowering the "carbon footprint" of computing through better design and utilisation of computer systems; and developing technologies that enable low carbon innovation in non-ICT areas (such as transport) through use of ICT in system analysis and/or deployment. To take advantage of this, however, will require a more concerted effort to promote UK involvement in ICT themes in these areas.

Question 6: How can FP8 support innovation in the UK?

The UK has various regional and national initiatives supporting innovation, with similar efforts underway in other European nations, so one role for FP8 might be to network these initiatives. For this to be worthwhile, the value of these sorts of networks has to be more than the sum of its parts (for example, a European innovation network might provide nations with easier access to untapped markets across the EU). Cultures of innovation often surround particular areas of engineering, with ICT being one of the strongest areas of innovation worldwide, so it may be strategic for the UK to engage with the EU innovation agenda in ICT specifically.

Question 7: What are your views on the split of the FP7 budget between these specific programmes? Should this change in FP8?

The split of funding in FP7 to favour "cooperation" over the more open "ideas" category is, to an extent, justified in that the requirement for cooperation across nations gives additional benefits in extending the European network of researchers. However, the requirement for involvement of three countries in each project has a whiff of social engineering that may have been necessary in earlier FPs but feels less optimal now. The likely emphasis on larger scale, thematic research may further blur the distinction between "ideas" and "cooperation" (the current FET-Flagship initiative being an example of "ideas" being solicited from pre-established European research networks).

Question 8: Which areas of Framework Programme funding provide the most EU added-value (see paragraph 6)? And which the least?

Question 9: Can efficiencies be found in the Framework Programme because of overlaps between different areas of funding?

Question 10: What are the arguments for and against FP8 moving towards funding research and development which addresses grand challenges?

For:

- It provides a means of gaining critical mass, assuming consensus on challenges, that would (arguably) be unattainable by a less concerted effort.
- It gives a driver for interdisciplinarity, since GCs appear by their nature to require the combined efforts of several disciplines.
- If sufficient diligence is conducted in raising a GC from the research community, it provides a means by which the community itself can take control of the effort at a strategic level.

Against:

- A vehicle for addressing a grand challenge could be difficult to manoeuvre so as to take advantage of the full range of EU research capability in the GC area and could be even more difficult to brake if the GC turns out not to be viable.
- A "grand challenge" can mean different things within ICT. It could be a technological challenge (e.g. in architectures or security or some other sub-discipline of computer science) or it could be a societal challenge (e.g. in healthcare or food security or some other pressing social problem). The drivers for a successful GC are different depending on which it is.

Question 11: Which grand challenges (see above) are best tackled on an EU-wide rather than a national level? Within these areas which particular aspects would benefit from an interdisciplinary focus?

The "grand challenges" listed above are not grand challenges; they are broad thematic areas. All of them could (and we expect would) be addressed to some extent at both EU and national levels. All of them are interdisciplinary. This question requires more work in order to elicit more specific grand challenges from within the thematic areas and, at that point, it would be possible to distinguish features of challenges such as their EU/national scale and their degree of interdisciplinarity.

When eliciting proposals for Grand Challenges from the scientific community, it is helpful to define criteria that help the scientific community calibrate their ideas to the ambition of the challenge. To enable this, we recommend that calls should meet one or more of the following criteria.

- 1. A timescale longer than a single Framework Programme.**
- 2. A need for collaboration of the best scientists, working in different disciplines and specialisms, theoretical, experimental, and tool-building.**
- 3. Certainty of contributing to the underlying science across a broad front.**
- 4. A realistic prospect of generating a new industry, or regenerating an old one.**
- 5. Prospect of an exponential boost to the progress of the project by exploitation of enhanced tools, developed in the project itself**

Question 12: How should FP8 engage with countries outside the EU or associated to the Framework Programme in addressing global challenges?¹

Perhaps the most fundamental form of engagement is in identifying and scoping the grand challenges themselves, since many of the most major challenges are likely to loom large in areas outside, as well as inside, the EU. Although there is scope for healthy competition between groups on the same challenge (as we saw in the space race) there is danger of duplication of effort. This is an argument for engaging major centres outside the EU early in the inception of a GC and retaining their engagement as the GC unfolds. The degree to which this is necessary would, of course, depend in the specific GC but the barriers to justified levels of engagement need to be lowered in cases where synergy with a broader global effort can be justified.

From a UK perspective, we should ask “which are the countries close to us, operating in the EU research sphere, and from which we could benefit more?” One answer is Turkey which has a large and viable research, a highly growing ICT/SME environment, and a large internal market. We recommend that the UK develop a significant research collaboration with this country, and others with similar properties in the EU sphere, in ICT research.

Question 13: Should FP8 still provide some thematic focus e.g. in areas such as space and transport? Should any of the current themes be revisited over the course of FP8 – and if so, how?

¹ FP7 participants can in principle be based anywhere. There are different categories of country which may have varying eligibility for different specific and work programmes: the EU-27; associated countries– with science and technology cooperation agreements that involve contributing to the framework programme budget; EU accession candidate countries; and third countries whose participation is justified in terms of the enhanced contribution to the objectives of FP7.

Information and Communication Technologies is not only a theme in its own right but also is an enabler for other themes. It is important to preserve both of these aspects of ICT without diluting our excellence in core ICT.

Question 14: What should be the role of key enabling technologies e.g. ICT and nanotechnology in FP8?

A worrying feature of the BIS "Impact of the UE RTD Framework Programme in the UK" report is that ICT levels of engagement in FP7 by UK researchers are below the overall average level of engagement of UK researchers with EU themes. This "low performance" is highlighted also for the analysis of FP6. ICT is now so pervasive, however, that computation and computer science would have been an enabler (in a variety of ways) for almost all of the themes. It is, unfortunately, difficult to assess how strongly UK research performs across themes in this way.

Question 15: Services form a crucial part of the UK economy. Should research into services be addressed specifically in the Framework Programme, and if so, how?

In the ICT context, there has already been quite considerable EU research on computational infrastructures for services. This has tended in the past to fit within ICT but as services become a more dominant paradigm in society we should also see computational aspects of services become pervasive. It is not clear whether this justifies making research into services be a major research area on its own in FP8 - on the contrary, its ubiquity may make it difficult to disentangle from other themes and grand challenges.

Question 16: What are your views on how the Framework Programme allocation for collaborative research should be apportioned between themes; enabling technologies and underpinning areas of research e.g. social sciences and humanities?

We recommend also more attention on links with the physical and biological sciences.

Question 17: To what extent should ERC funding focus on supporting frontier research? Are there other areas in which ERC could add value?

ERC should maintain its focus on frontier research.

Question 18: Should ERC's current emphasis on funding a single investigator continue into FP8?

Yes, this emphasis should continue, as a counterbalance to thematic and grand challenge led research.

Question 19: Are there any options that could better link ERC activities with private sector interests?

Yes: one typically views private sector interests as being related to commercial products. In fact there is another area where the UK could benefit – and serve – the research agenda better while dealing with private sector interests and this is in the field of research dissemination (conferences, books, journals) and the production of research. The UK should could be very useful in this area thanks to its active commercial publishing sector.

Question 20: What priority should researcher mobility and skills development have in FP8? What is the best way to address this?

This remains a high priority because stimulation of mobility between groups, particularly for early career researchers, ensures grassroots vigour for the networks of collaborating institutions in Europe. A mixture of opportunities, from individual fellowships through to broader agreements between groups of institutions, gives a variety of routes for involvement and this diversity is beneficial.

FP8 should implement a balance between the individuals' participation in EU FP projects and the personal cost to individual research careers in anchoring major collaborative projects. One way to do this is via a "sabbatical" programme in which, for example every academic who has had a leadership role in (say) at least FP6/FP7 projects over a period of at least six years might be offered a six month sabbatical period funded by FP8, that could be held in any top laboratory/university in the world.

Question 21: The capacities specific programme currently covers several policy initiatives relating to capacity-building. Which of these are of most value? Are there other areas which would merit funding?

Question 22: What should the relative priority be for the Joint Research Centre under FP8? On which activities should it focus?

Question 23: Please comment on the COST framework and its links with the Framework Programme

The COST programme should receive more ample funding since it is one of the very few programmes that creates a link between national research programmes and interaction across the European academic world.

Question 24: Should FP8 directly support activities aimed at integrating the three sides of the knowledge triangle e.g. KICs?

KICs could provide a physical focus of effort on key research themes and, when these coincide with FP8 themes, direct FP8 support may be appropriate. The KIC concept is, however, still under development and experience with the first of the KICs over the coming year or two should enable a more informed decision on the viability of direct FP8 support.

Question 25: Which instruments (e.g. JTIs, article 185 initiatives) should be retained for FP8? Are any new instruments required?

Question 26: Please comment on the Risk Sharing Finance Facility. Should a scheme of this kind be included within FP8?

Question 27: What should the balance be between funding large-scale programmes e.g. the article 185 *programmes* above and smaller *projects* individually administered by the Commission?

In addition to the ERC we would encourage funding more individual projects at the 400-600,000 Euro level over 3 years.

Question 28: What should be the role of public-private partnerships in FP8?

We would encourage FP8 to support more academic lead public-private partnerships.

Question 29: What lessons from evaluations of previous framework programmes can help with the development of FP8?

Question 30: What steps could be taken to ensure that knowledge gained from FP8 is disseminated and exploited – and remains easily accessible over time?

We feel that academic driven dissemination through high impact journals and conferences should represent at least 50% of the FP8 dissemination effort, since this remains the mainstream for dissemination within the academic community. The precise means of dissemination employed by journals and conferences continues, of course, to adapt over time.

Long term dissemination and exploitation of results would be enhanced by a shift of emphasis from the generation of large numbers of

intermediate reports, with very narrow readership, to the development of longer term assets for the scientific community. These include technical papers and other high impact documents but, increasingly commonly, the primary and most immediate means of technology transfer between scientists and engineers is by development and enhancement of professional and technological software toolsets. The innovation and evolution of these toolsets requires collaboration between users, experimentalists, tool-builders, algorithm designers, and theoretical scientists, drawn from academia, major companies and start-ups. The encouragement of these collaborations could be funded without reducing the volume of scientific research if this was accompanied by a corresponding reduction in low impact, contractual, intermediate reports of activity.

Question 31: Would any proactive effort to alter the current balance of funding between universities, research organisations and businesses be appropriate or effective? If so, what might be involved?

The best model here (as in the UK) is open competition based on peer review. Although Russell Group universities may dominate overall, this masks dominance of other universities in narrower areas of specialisation.

Question 32: What could be done at EU level to encourage more businesses – especially SMEs - to apply?

Question 33: What could the Commission do to reduce bureaucracy of FP8 over and above the current simplification proposals (including changes to the Financial Regulations and Implementing Rules)?

The proposals described are presented in three "strands". Strand 1 isn't really a simplification; it is a collection of improvements to the efficiency of the process (none of which makes the process itself simpler). Strand 2 offers some simplification but, like Strand 1, is mostly concerned with streamlining bureaucracy for the FP8 administration. Strand 3 is the most radical, in that it suggests different models for the contractual nature of the projects themselves. Of the options presented, the "high trust" approach is basically the approach adopted by UK funding councils and this accounts in large part for the popularity of funding from the likes of EPSRC versus the unpopularity of comparatively "low trust" FP7 contracts. The worst (by far) of the options presented is the one in which consortia, effectively, bid against each other to promise specific "scientific output" against a fixed pot of money - it is hard to imagine credible basic research being funded by this means.

Question 34: Is there a role for a two-stage applications process analogous to that used by the Technology Strategy Board²?

We would encourage a white paper based application process, similar to that of certain key agencies in the USA (e.g. ONR, ARO).

Question 35: Should the programme move away from a cost/input-based funding model to one based more on results/outcomes/performance?

It should move to the "high trust" approach (see Question 33) with increased emphasis on transparency; identification of results; and assessment of performance following completion of projects.

Question 36: Should the rules on intellectual property in FP7 be changed for FP8?

Question 37: Is the proportion of overheads funded by FP7 appropriate? Should this be adapted in FP8 to create more consistency with other sources of funding?

It is important to encourage movement to funding on a full economic cost basis. Without this (and also the trust-based approach to research described in the Council conclusions of May 2010) there is a risk that FP8 projects become viewed as a means of obtaining research volume rather than research quality.

Question 38: Within the current UK public expenditure constraints³, could the UK do more on a cost-neutral basis to encourage participation in FP generally?

The notion of cost-neutral action should include the sums that the UK economy recovers from EU projects by amortising its investments in the EU budget. Thus, an economic incentive to universities for their success in EU programmes may be justified if it can be administered with the existing legal framework.

Question 39: How effective are the current UK support services?

Question 40: What could be done at UK level to encourage more businesses – especially SMEs - to apply?

² For details of Technology Strategy Board processes see www.innovateuk.org

³ See http://www.hm-treasury.gov.uk/spend_index.htm

Question 41: Are there any lessons from other countries that could help raise UK participation?

Question 42: Please add additional comments here in relation to UK interests in the Framework Programme.

Do you have any other comments that might aid the consultation process as a whole?

Please use this space for any general comments that you may have, comments on the layout of this consultation would also be welcomed.

Thank you for your views on this consultation.

Thank you for taking the time to let us have your views. We do not intend to acknowledge receipt of individual responses unless you tick the box below.

Please acknowledge this reply

At BIS we carry out our research on many different topics and consultations. As your views are valuable to us, would it be okay if we were to contact you again from time to time either for research or to send through consultation documents?

Yes

No