

Science Consultation
c/o Fiona Mackay
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Office of Science and Innovation
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Dear Ms. Mackay

Further to the invitation to submit responses to the Science and innovation investment framework 2004-2014: next steps document issued on 22 March 2006, please find the response of The 1994 Group attached.

Paul M. Marshall
Executive Director

Science and Innovation Investment Framework 2004-2014: Next Steps

Response from The 1994 Group

The 1994 Group (membership, aims and objectives detailed in Annex A attached) **offers the following response to the Science and innovation investment framework 2004-2014: next steps document issued on 22 March 2006:**

- 1. The Government would be interested in views about whether the existing framework for supporting science and innovation enables an appropriate level of risk-taking, and if not, suggestions of how any gap might be addressed.**

The existing framework does not adequately support high risk innovative research. Most research funders, particularly the Research Councils, are inherently conservative when making funding decisions, due to the shortage of funding available and the need to deliver on 'value for money'. Interdisciplinary research often fares particularly poorly, despite mechanisms such as Foresight, as proposals are often not seen as being sufficiently central to the remits of particular funding committees. In addition, funding committees tend to be more conservative when making decisions about more costly applications. Thus, it is important to ensure that funding is available to support smaller stand-alone projects (including those by newer researchers) that might be more speculative in nature. Programmes that are aimed at supporting large multi-institutional bids that address key challenges could still include ring-fenced streams of funding for some smaller more speculative projects.

Given the recent, and likely future, increase in application rates, it is important to ensure that the Research Councils do not introduce mechanisms to ease administrative burden that further bias against the funding of high risk innovative research. Thus setting institutional 'application quotas' that require HEIs to carry out internal pre-selection, or allocating funding to 'favoured groups' with proven track records with the Council concerned, are likely to increase conservatism rather than innovation.

History has shown that it is not easy to predict where the next major breakthrough will occur. There are numerous examples of what was initially perceived to be 'blue skies' research being translated into application, to the significant benefit of UK PLC. It is therefore important that responsive mode funding streams are protected. In addition, once an initial research project has ended, there are difficulties engaging funders in the proof of concept stage, that is the development of research findings, prior to commercialisation. This is one area where there are significant difficulties in attracting funding and encouraging staff to continue with this more applied research. In general, businesses (particularly SMEs) are reluctant to support high risk, speculative projects. Support in encouraging a more risk taking attitude would be beneficial.

Whilst there are pressures on institutions with respect to the level of risk that they are prepared to undertake, it should be recognised that the dual funding mechanism of QR enables limited pump priming of new research areas within Universities. In particular, the importance of QR funding should not be underestimated in relation to the ability it gives to institutions to support innovation and interdisciplinarity in

research. It is particularly important that QR is available independently of Research Council decisions. QR is an essential part of a research intensive university's research strategy, which allows it to invest in its basic infrastructure, which in turn permits it to take more risk with the research that it chooses to undertake.

- 2. The Government invites views on measures to remove any remaining bias which unfairly favours established research fields over innovative ones. The Government also invites views on how funding mechanisms can be made more responsive to new research challenges.**

We have partly responded to this in our comments to question 1. In addition, there are some difficulties particularly with innovative ideas that sit across discipline specific research councils (plus see above comment on risk taking in research councils). For example, the EPSRC Integrated Knowledge Centres were specific to EPSRC and hence ruled out interdisciplinary subjects such as bio-refining. In addition, much of the most exciting new research will involve international collaborations, particularly with the NSF/NIH, and more streamlined systems for encouraging joint programmes are needed.

- 3. The Government would welcome views on the barriers limiting greater business innovation and business-university collaboration in the regions, and on what more could be done on a national and regional level to tackle these barriers effectively.**

The aspirations of British business are too low and they need to be encouraged to put a higher priority on innovation and collaboration with universities.

There are significant benefits to both universities and businesses in working together but there is concern that the current model of incentivisation and support tends to be too regionally focused. RDAs, for example, need to ensure that business is put in touch with the most appropriate science expertise, which may not be in the same region. As such, there needs to be a clear national framework for promoting and rewarding business-university collaboration.

A major obstacle is the mismatch between the expectations of industry and academia. Problems in industry, particularly in SMEs, tend to occur, and have to be solved, on a short time scale. University academic, research, and technical staff are generally not in a position to respond immediately to the urgent needs of SMEs, due to other University related commitments and the nature of funding sources / contracts. Furthermore, the objectives of undertaking internationally leading research (for Universities) and problem solving (for SMEs) may often be mutually exclusive. The amount of time leading University researchers can give to 'low level' industrial interaction tends to be relatively small, given career progression and RAE related pressures. Chapter 2 of the Next Steps document states that there need to be greater incentives for business to work with the science base. However, the reverse is also true.

One way of addressing some of the issues is for industry to accept that interactions with top University researchers will mostly come from building long term relationships, and from addressing challenging problems and providing funding on a longer term basis (e.g. three years). The LINK programme is excellent in this respect, but is currently restricted to specific programme areas. It could usefully be opened up to additional areas of science and engineering, and the DTI evaluation process should be simplified.

- 4. The Government would welcome views – in particular from outside Higher Education - which can be taken into account in developing best practice models for business-university collaboration. In addition, the Government would welcome views on how to encourage businesses to work with universities for the first time, perhaps by introducing short-term, low-cost mechanisms for business-university interaction.**

It is important not to neglect the work that has already gone on nationally (such as that identified in, and built on since, the Lambert review). We should look nationwide at what the HEROBC and HEIF programmes have achieved and build on existing good practice, disseminating this within the sector and regions.

There are already a number of good (low cost, short term) schemes for encouraging businesses to work with universities. It is important to ensure that more use is made of these and that both parties are aware of the options available and have in place efficient mechanisms for agreeing to the different forms of support. Additional schemes could be aimed at supporting ‘job swaps’ or providing support for established academics to work in business for short periods of time, or for company staff to spend a period in a research laboratory. The purpose is to increase the knowledge of both parties of the priorities and constraints of the other party, thus making future negotiations and co-working easier.

- 5. The Government would welcome views on whether all large facilities operations should be integrated under a new Large Facilities Council, or whether there is a case for some facilities to remain under the management of other Research Councils; and**
- 6. Furthermore, in the event of a merger, should the grant-giving functions of PPARC be moved to EPSRC?**

The infrastructure required by researchers in particle physics and astronomy varies enormously according to the research area: from postdocs and small-scale computing to access to high performance computing and experimental facilities both small and large. Most of the large facilities are at the leading edge of technology, and the ability to access these facilities enables the UK to play a powerful international leadership role in both subjects. The discoveries made add to the intellectual health of the nation and inspire young people towards a scientific future. The technological developments needed to achieve these discoveries stimulate innovation by scientists, by engineers and by industry.

Since its establishment over ten years ago, PPARC has undergone various modifications, not least in the way which the astronomy and particle physics elements of the research programme are now integrated into a single strategic plan. PPARC has served the scientific community (and the UK) very well in terms of its long term planning, the management and delivery of high impact science, and its rigorous and transparent peer review process. But there is room for significant improvement in the present way it operates, and there is a strong case for commissioning an independent external panel (with international members) to review all aspects of the research council’s operation and come up with proposals for improvement.

The PPARC programme is science driven, but has well recognised benefits beyond this; such as in the areas of detectors for industrial and medical applications, and in

terms of enthusing young people to study science at school and university, many of whom will eventually pursue careers in diverse fields where their scientific training and broad-based skills are highly valued. These benefits are by now generally accepted. However, other aspects of PPARC's operation have also been examined independently and judged as good practice and excellent value for money. The recent "International Perceptions of UK Research in Physics and Astronomy" review (published by the Institute of Physics in 2006), underlines the strengths of the PPARC programme.

We do recognise that there is a problem in the way in which future large-scale science facilities are considered and funded in the UK. In particular, we agree that there is a need for "a more coherent priority-setting process across the spectrum of large facilities..." [para. 3.10, Science and Innovation Investment Framework 2004-2014: Next Steps]. In addition, under the current system the all-important PPARC grants line is susceptible to fluctuations in international subscriptions, for example to CERN and ESA. However we are not convinced that a new Large Facilities Council is the best way to address these problems. For example, an alternative approach could be to set up an overarching strategic large facilities (LFs) planning process that tensions all calls for future large facilities across all science areas, and prioritises them using a set of well defined scientific and strategic criteria. This would allow a full and transparent overview, and well informed long-term planning. An example of how this might be achieved is provided by the US National Science Board, an advisory panel of distinguished scientists. Separating out international subscriptions from the overall PPARC budget would also allow for more stable planning for exploitation.

Our preference, therefore, is to retain PPARC in its present form but to (a) commission an external review of its operation, and (b) introduce a new overarching structure to address the concerns set out in the Treasury paper.

However, if a new Large Facilities Council is to be set up, it must be justified by potential improvements in the ability to plan and deliver science, and care must be taken not to lose the strengths of the existing system. In particular, it must be capable of addressing the needs of fundamental science and small projects which are not linked to LFs. We would like to stress the importance of distinguishing between the prioritisation and funding of LFs and their operational management and scientific exploitation. Unlike in other research council areas, the PPARC LFs are highly specialised and closely linked to the key strategic science aims. It is therefore important that the exploitation process, via research grants, is intimately associated with the operation of the facilities themselves. The suggestion that PPARC's grant-giving functions might move to EPSRC, and thus be separated from PPARC's facilities, would break this model; these facilities and the instruments used to exploit them are intimately linked and functionally inseparable. Much of the design work for large facilities is also funded through the grants lines. The Large Facilities Council should therefore be responsible for the whole suite of activities currently funded through PPARC, not just those concerned with large projects.

Interestingly, it also appears to be a widely held view among EPSRC physicists that the UK does not get 'value for money' from access to large facilities in their area (for example, ISIS, ILL and PSI) precisely because of the perceived mismatch of the EPSRC and CCLRC agendas. The peer review processes for access to beam time are disjoint from those (e.g. responsive mode grants) that award research students and postdoctoral research associates. If the Large Facilities Council is also to be responsible for other non-PPARC major facilities, then there is a strong case for adopting the 'PPARC model' of including grant lines for exploitation of all the facilities, and moving to a system of rolling grants where appropriate.

In summary, while we recognise the need to address shortcomings in the way our large scientific facilities are currently prioritised and selected, we believe that any scheme that separates the operation and exploitation of PPARC LFs could result in serious damage to the high international prestige of UK particle physics and astronomy and a reduction in our capability to deliver world class science.

7. The Government would welcome views on what further measures could be taken by the Research Councils to improve their effectiveness.

There are still significant differences in the practices of the different research councils and, as yet, the RCUK harmonisation scheme has not reduced these differences to any significant degree. Whilst some of the differences are understandable, and indeed welcomed, many do not seem to be justified.

As noted in our response to Questions 1 & 2, it is important that the Research Councils do not introduce mechanisms, aimed at improving efficiency / effectiveness, that concentrate funding in 'favoured centres'. Such measures are likely to increase, rather than decrease, conservatism in the system.

Currently, considerable effort tends to be spent on funding schemes that have relatively low success rates (sometimes less than 10%). More effort should be put into developing schemes that provide co-funding with other sponsors in order to increase the overall amount of funding that is available for allocation (and thereby increase success rate, without considerably increasing administrative burden).

The effectiveness of the councils would be improved if they were able to support international collaborations more effectively.

Additional comments

While we welcome much of the content of the Next Steps document, we are concerned that the statement made in Chapter 4, about a possible change to RAE 2008, has considerably detracted attention from many of the other important proposals in the document. The vast majority of discussion within Universities and in the academic press has understandably focussed on the future of the RAE, including the possibility of a switch to 'metrics' in 2008. We are firmly against such a change, as was made clear in our earlier press statement. A change at this point in time would result in a loss of confidence in, and perceived credibility of, RAE 2008, would seriously disrupt institutional planning and management, and would not allow the necessary shadowing exercise to take place before the move to a new system of assessment. We welcome the consultation being led by Sir Alan Wilson and Professor David Eastwood and will respond to this in due course.

The 1994 Group

The 1994 Group of internationally renowned universities engaged in leading-edge research and high-quality teaching is committed to meeting the diverse needs of students, staff and policy makers. The 1994 Group provides a framework for collaboration between research-intensive universities in the UK. The aim of this collaboration is to enhance the ability of member universities to act collectively where appropriate whilst maintaining their individuality and thriving in the highly competitive higher education sector.

The Group's main aims are to:

- secure widespread recognition that enables it to influence decision and policy making groups;
- achieve awareness and profile that underpins the ambitions of member universities in global markets;
- promote the need for diverse and distributed centres for research and teaching excellence;
- share good practice that enhances the staff and student experience;
- provide services that enable members to respond flexibly and rapidly to developing market conditions.

Group members are committed to shared values. These are that:

- institutional identities and tradition can be respected and aligned with innovative thinking;
- research intensive universities should play a full role at local, regional, national and international level;
- high quality research and teaching are mutually supportive and should reinforce each other;
- students and staff from diverse backgrounds should be enabled to maximise their potential in a well-maintained environment that provides a stimulating choice of academic, cultural, and social opportunities.

The current members of the 1994 Group are:

University of Bath, Birkbeck College, University of Durham, University of East Anglia, University of Essex, University of Exeter, Goldsmiths College University of London, Royal Holloway University of London, Lancaster University, London School of Economics, University of Reading, University of St Andrews, University of Surrey, University of Sussex, University of Warwick, and University of York.