

Annex A

Consultation response form for the Research Excellence Framework

1. Respondents should complete the form below.
2. Responses should be e-mailed to refconsultation@hefce.ac.uk by **Thursday 14 February 2008**. HEIs in Northern Ireland should send a copy of their response to research.branch@delni.gov.uk
3. Institutions wishing to express an interest in taking part in the pilot of the bibliometrics indicator should e-mail their details to refconsultation@hefce.ac.uk by Thursday 31 January 2008.
4. We will publish an analysis of responses to the consultation. Additionally, all responses may be disclosed on request, under the terms of the Freedom of Information Act. The Act gives a public right of access to any information held by a public authority, in this case HEFCE. This includes information provided in response to a consultation. We have a responsibility to decide whether any responses, including information about your identity, should be made public or treated as confidential. We can refuse to disclose information only in exceptional circumstances. This means responses to this consultation are unlikely to be treated as confidential except in very particular circumstances. Further information about the Act is available at www.informationcommissioner.gov.uk.

Respondent's details

Are you responding: On behalf of an organisation
(Delete one)

Name of responding organisation/individual Royal Society of Chemistry

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Position within organisation (if applicable) Manager, Science Policy

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Consultation questions

(Boxes for responses can be expanded to the desired length.)

Consultation question 1a: Do you endorse our proposals for defining the broad group of science-based disciplines, and for dividing this into six main subject groups, in the context of our new approach to assessment and funding?

Given the approach to assessment proposed in the consultation document it is not entirely clear why it is necessary to group science-based disciplines into subject groups.

Whereas there are good reasons why physics and chemistry might be grouped together, there are equally compelling reasons why chemistry and the biological sciences should be linked not least because the chemistry-biology interface is extremely important and this is in fact recognised in research council funding.

Chemistry also has strong links with pharmacy (which it is proposed to group with biosciences in the Biological Sciences subject group), and with chemical engineering and Mineral, Metallurgy and Materials Engineering (which are proposed to be grouped together in the Engineering and Computer Science).

If the system which is eventually implemented uses a combination of indicators (e.g. bibliometrics combined with other metrics or even with an element of peer review) then it could be argued that there is a role for broad based subject groupings in order to ensure some consistency of approach between units of assessment. However, issues will still arise as to where the boundaries are drawn (see above).

However, whilst there may have been an argument for this approach where peer reviewers were applying their subjective judgements, application of quantitative indicators alone does not necessarily justify such an approach. A better approach is to allow groups of subject experts, including research users, to set the combination of metrics most appropriate for each subject.

Consultation question 1b: Are there issues in relation to specific disciplines within this framework that we should consider?

The RSC remains uncertain as to whether a purely bibliometrics-based system is capable of treating everyone fairly. Whilst noting that the proposed system will attempt to normalise indicators within particular sub-fields, it still may well be the case that citation behaviours vary between sub-groups within larger sub-fields. For example, some areas of organic chemistry such as natural product synthesis may well have much lower publication and citation rates than others. Such patterns also occur in other sub-fields of chemistry and in other subjects.

On the other hand, levels of research income required also vary widely within chemistry and it is important to bear this in mind when developing any compound quality indicator.

A problem in using bibliometrics is that they are not a good measure of quality of recent work in chemistry. Citations to a paper published 5 years previously might be quite a good measure of quality but that is not always true for a paper published one or two years previously - it takes time for citations on a chemistry paper to develop unlike some other areas of science. Also review papers or semi-reviews get many more citations than other papers and it is hard to weed these out.

Consultation question 2a: Do you agree that bibliometric indicators produced on the basis that we propose can provide a robust quality indicator in the context of our framework?

No. The driver for the change to a metrics based system of assessment is cost (both time and money) but no evidence has been presented that a single bibliometric indicator of citations per paper will provide a robust metric of quality of output.

The consultation document argues that the number of citations per paper is a measure of international excellence. In reality it is a measure of impact (or in some cases notoriety), which may or may not in some way correlate with research excellence. An obvious example of notoriety is work on cold fusion by Pons and Fleischmann. It is also not clear that high citations are necessarily a measure of quality of research output. Examples can be found within a particular sub-field where reviews receive significantly higher numbers of citations than other papers in the field. Such issues could in principle be accounted for by multiple metrics of excellence and a peer review panel (as in previous RAEs). It is hard to see how they can be accounted for in this single metric without some form of peer review.

Another danger of a bibliometrics approach is that to some extent the number of citations in a subject area may reflect the short lived popularity of a field rather than the quality of work. Consequently to some degree a bibliometrics measure has the danger of measuring how trendy a research field is rather than its quality.

Nonetheless the proposed approach to developing a bibliometrics measure does go some way to facing up to a number of specific criticisms of some bibliometrics systems. For example, the methodology proposed does attempt to take into account differences in citation behaviours between different sub-fields in each subject by producing a normalised citation per paper indicator. However, as indicated above there may still be individuals within larger sub-fields who suffer under the new system.

The RSC supports the approach of producing quality indicators for subject groups as this will serve to militate against spurious results that might occur for individuals.

The RSC believes that any new system will have behavioural consequences; indeed, the consultation recognises the importance of the RAE (or REF) return to an academic's research career, and to the UoA's bottom line, so the incentives to change behaviour are huge. Whilst the bibliometrics-based system proposed may be difficult to manipulate, it is

nonetheless possible that research managers will attempt to change the publishing behaviour of researchers and have them target higher impact journals in the belief that papers in these journals will be more highly cited. In extremis research managers may prevent members of their departments publishing in certain journals.

The proposed metric is very different those used previously, and might encompass all outputs rather than simply considering four papers. The drive to increase citations per paper will be large, and must lead to citation clubs. The issues are whether this is acceptable or desirable behaviour to encourage, how to identify these clubs, and how to deal with them, not whether they will form.

The RSC supports the intension to look more closely at interdisciplinary research and in particular checking that interdisciplinary journals are included in the WOS database.

Whatever the form of the final system selected for the REF, the community needs to have confidence in that system. Therefore the RSC supports running a shadow exercise the results from which are compared with those from the current RAE exercise. Once results from the shadow exercise are compared with those from the RAE any significant differences must be investigated. The results of the comparison must be discussed with respective subject communities and actions taken to address issues raised.

Consultation question 2b: Are there particular issues of significance needing to be resolved that we have not highlighted?

It is not clear from the consultation how many papers will be assessed for each individual. One can envisage that if the number of papers is capped then average citation scores per paper would be higher, but if not an individual who publishes a lot with some very high quality papers may suffer in comparison to an individual who publishes little but of very high quality only. The RSC recommends that either the number of papers is limited or a quality threshold is introduced.

It is not clear how long the publication period under review will be or exactly how the period examined will relate to the papers. That is, will the review look at all papers in a time period and all citations to those papers in the same period?

On a related issue the consultation document does not refer to the issues surrounding new staff, or staff that have had a career break. Staff in their first posts will not have the number of publications of more established staff, nor will they have had publications which will have had time to build up a citation history. Similarly, a researcher who is improving rapidly may not be picked up by a citation analysis which examines too long a period. Examination of a long period may also produce a measure that rewards consistency rather than looking at current quality, or research potential. There is a danger that the average age of first appointment to an academic position will rise as institutions become unwilling to appoint staff without publications which have had a chance to build up citations.

For staff that have recently moved from one HEI to another it is important to give credit to both their current and former HEIs. As the research for the papers to be examined was carried out at the researcher's former HEI it is sensible to give credit if the department wishes to include the researcher in their list of staff to be assessed. This is particularly the case as the nature of a bibliometrics approach is to examine the past. On the other hand it is important to credit the researcher's new department as the role of any assessment process should be to guide future investment.

The attribution of multi-author papers is an issue that needs to be examined carefully.

It is important that there is an element of output volume in the metrics, as this will enable support of research excellence at the level appropriate to group size. It is unclear what this volume will be although the document does mention research income and number of research students as possible measures; papers submitted, total staff, academic staff could also be considered; the introduction of volume measures will also influence behaviour.

Overall it is difficult to see how research quality, rather than research impact, can be measured without some element of peer review.

Consultation question 3a: What are the key issues that we should consider in developing light touch peer review for the non science-based disciplines?

The RSC is unclear why such a light touch peer review approach is not appropriate or suitable for science-based disciplines as well as for non science-based disciplines. Such an approach would enable a reduction in the administrative burden whilst retaining the essential elements of the last RAE; multiple metrics which assess research excellence in outputs, esteem and the influencing of behaviour and adoption of best practice across the whole range of research.

Consultation question 3b: What are the main options for the form and conduct of this review?

Consultation question 4: Is there additional quantitative information that we should use in the assessment and funding framework to capture user value or the quality of applied research, or other key aspects of research excellence? Please be specific in terms of what the information is, what essential element of research it casts light on, how it may be found or collected, and where and how it might be used within the framework.

Indeed the document acknowledges the real problems with assessing those science research outputs (e.g. patents and reports in industrially funded work, output in knowledge transfer and in multidisciplinary work) which have been promoted as of strategic importance to UK science research, and for which metrics have been included in previous RAEs; the use of this exclusive output metric must affect these activities.

The RSC supports moves to identify quantitative measures to capture user value or the quality of applied research. However, applied research in chemistry may well be further from the market than applied work in, for example, some engineering disciplines.

Use of a bibliometric indicator in science-based funding as proposed in the REF is insufficient to capture research quality in relation to innovative research collaborations with, for example, the pharmaceutical sector.

Metrics must be included that recognise and reward research which is of value to business users.

Nonetheless developing an effective quantitative indicator for user value is very difficult. As noted in the consultation paper, income data masks differences in the cost base of different sub-fields of a particular subject. It may be that an approach taking into account the advice of expert panels to weight, say, industrial research income for different sub-field should be explored. The RSC believes that this is an area where a peer review approach is the best way forward.

Whatever method is used in judging user value, fundamental research should not be threatened.

Measures which might be considered are:

- Extent of spin out activities
- Patents filed and published
- Licenses granted to industry and any income generated
- Joint authorship with industry of publications and/or IP filings
- Evidence of science/technology which has found its way into commercial application (measured by sales/margin and/or with supporting documentation from industrialists supporting their case)
- Funding raised from bodies apart from research councils including direct industrial funding, consortia etc.
- Number of Co-operative Awards in Science and Engineering (CASE students)
- Numbers of research students/Post docs transferred into industry (and retained in industry for longer than 3 years)
- Collaborations (numbers and value of commercial proposition) in "open" innovation partnerships (measured by supporting documentation from industrial partners), these are important because they often happen without formal funding arrangements
- Prizes awarded by recognised bodies for innovation performance (trade associations, learned societies, professional bodies)
- Number of academic personnel having industrial consultancy agreements.

Most of these indicators are of course trailing measures. It is very hard to do forward looking measurement. Furthermore it is difficult to envisage how a combination of some or all of the above indicators could be combined into a meaningful quantitative metric.

Consultation question 5: Are our proposals for the role of expert panels workable within the framework? Are there other key issues on which we might take their advice?

Assuming that a form of compound indicator is used then the role of expert panels is important in setting appropriate weighting between specific indicators. However, as noted in our response to Question 1, the RSC remains concerned about the groupings chosen, and also remains concerned that there is sufficient flexibility in the system and that, as may be inferred for the consultation document, subjects within each group are not necessarily treated alike.

The RSC is of the opinion that the involvement of research users (including the pharmaceutical and biotechnology sectors for chemistry) is vital if tangible measures of innovation and economic impact are to be achieved within REF.

Consultation question 6: Are there significant implications for the burden on the sector of implementing our new framework that we have not identified? What more can we do to minimise the burden as we introduce the new arrangements?

The whole thrust of this document is to minimise the burden on the sector carrying out the REF. The main issue is whether the proposed system will accurately reflect research excellence, and produce drivers to enhance this research excellence. This requires more than the minimal burden.

Consultation question 7: Do you consider that the proposals in this document are likely to have any negative impact on equal opportunities? What issues will we need to pay particular attention to?

As mentioned in our answer to Question 2b, the RSC is concerned about how new staff and those staff who have had career breaks might be treated in the proposed system. Specifically, staff without a publishing record, may not be able to be judged within the new system. Similarly, staff who have had a publishing break may suffer due to lower numbers of papers, and also staff returning from maternity may have their research affected for a period of time well beyond the maternity leave itself. Whatever system is eventually implemented, it is important that the system is monitored carefully for any effects on under represented groups.

In common with the Institute of Physics, the RSC suggests that if HEFCE wants actively to promote diversity it could insist that one of the inputs to the review is a comparison of the gender balance of the department compared with the national norms. In cases where there is substantial under-representation of women (there will be no cases of over-representation), the department could be asked to provide a plan to rectify the situation.

Consultation question 8: Do you have any other comments about our proposals, which are not covered by the above questions?

Although HEFCE has presented an argument that a robust bibliometrics-based indicator can be developed, the RSC does not believe that at the level of individuals or small groups bibliometrics can produce a reliable and consistent comparative indicator. Furthermore, as outlined in our response to other questions, there is a serious question as to whether bibliometrics are really measuring quality rather than impact.

HEFCE indicates that some kind of quality control role may be granted to departments/institutions, but the problems of citation databases are well known (misspelling of long names, variation of initials etc.). Also, can the community be sure that the database ultimately used includes all relevant journals?

HEFCE may argue that the QR monies form part of an institution's block grant and therefore the issue of how individuals are treated is not relevant. However, the reality is that decisions about individuals are made as departments attempt to maximise their RAE/REF scores, and institution heads do pay attention to the way in which their block grant is made up, that is they look at the QR contributions of individual departments and use this to drive their internal financial models. Therefore it is important that all researchers are treated fairly.

The RSC's stated view is that whatever metrics-based system is introduced it should incorporate an element of peer review.

We have commented on our concerns with the proposed bibliometrics-based approach, and with research income. An additional issue with the use of research income is that it is an input measure not an output measure.

Whatever system is eventually introduced, HEFCE needs to win the confidence of the research community by running a shadow exercise, the results of which are compared with the outcomes of the current RAE.