

RSC response to [FRAP consultation](#)

Section one: purposes of research assessment

The current assessment exercise serves three primary purposes:

- inform the selective allocation of funding to HEIs for research;
- provide accountability for public investment in research; and
- provide benchmarking information. In addition, an independent review of REF 2014, carried out by Lord Stern in 2016 identified three further purposes:
 - provide an evidence base to inform strategic national priorities;
 - provide an evidence base for HEIs and other bodies to inform decisions on resource allocation;
 - create a performance incentive for HEIs.

The funding bodies have set out their intention to retain the link between assessment outcomes and funding, and to require any future exercise to provide accountability for public investment in research.

Questions

1. In addition to enabling the allocation of research funding and providing accountability for public investment in research, which purposes should a future UK research assessment exercise fulfil? Select all that apply.

- Provide benchmarking information
- Provide an evidence base to inform strategic national priorities
- Provide an evidence base for HEIs and other bodies to inform decisions on resource allocation
- Create a performance incentive for HEIs.

[Select none]

2. What, if any, additional purposes should be fulfilled by a future exercise?

During our engagement to inform this response, the purpose to: support a healthy thriving research system and a positive research culture, was suggested, alongside confirmed purposes to: inform allocation of funding and provide accountability. We heard that including the impact element had delivered positive real-life changes for chemistry departments, with the suggestion that a similar approach could be considered to drive positive changes in research culture. // BENCHMARKING: Our community has differing perspectives on including benchmarking as a purpose, so we set these out. Many of our members, throughout engagement informing this response as well as previous REF consultation responses [in 2018 and to Stern], have said they value the like-for-like comparison associated with the REF and that using the REF results for benchmarking against other institutions can drive improved performance within departments. However, some are concerned that the emphasis on comparison drives unhealthy forms of competition. One member noted that RAE/REF rankings in chemistry correlate with department size and may disadvantage smaller departments, which is supported by REF2014 data on 'Total number of FTE staff submitted' as a proxy for size correlating well with the grade point average ('GPA'), with some exceptions [<https://www.timeshighereducation.com/sites/default/files/Attachments/2014/12/17/g/o/l/sub-14-01.pdf>]. During a discussion of FRAP proposals at the spring conference of Heads of Chemistry UK, questions were raised around the value of benchmarking units within the UK against each other. It was suggested that the REF would benefit from a more international perspective, including consideration of what is recognised elsewhere and how potential differences might affect researcher mobility as well as the ability to compare research quality internationally. // INFORM STRATEGY: We

know that the work required to prepare REF submissions, as well as the results, are used by some chemistry departments to renew their strategies and that this is perceived as a positive. However, we have not considered what the consequences would be of including this as an explicit purpose and hence requiring all units of assessment to take this approach, and we are not in a position to recommend it.

3. Could any of the purposes be fulfilled via an alternative route? If yes, please provide further explanation.

Not answering

4. Do you have any further comments to make regarding the purposes of a future research assessment system?

Including the purpose to support a healthy thriving research system, will require establishing what such a system looks like for the UK research sector and recognising that there might be differences across disciplines. At the RSC, work is ongoing to better understand what a healthy research system looks like for the chemical sciences; this includes discussion on needs in terms of Research and Innovation Capability to ensure chemical researchers can contribute to science and society, as well as development of a Research Culture Framework to define what a 'good' research culture looks like for the chemical sciences. We would be happy to continue our engagement with the FRAP team as this work develops. // Inputs from our community, in relation to purposes of research assessment as well as other aspects, indicate that while some changes would be welcomed, there equally are concerns around continuity of the assessment exercise. Before making changes to the REF, including to its purposes, we suggest that potential impacts on individual researchers, units of assessment and institutions, including the costs of adapting to any changes, are assessed.

Section two: setting priorities

The roundtable discussions identified a number of priorities and guiding principles that participants believed should drive the development of a future assessment exercise. Some of these principles potentially preclude or conflict with others. It is therefore important for the funding bodies to understand which principles the sector would like them to prioritise when designing a future system.

Questions

5. To what extent should the funding bodies be guided by the following considerations in developing the next assessment system? Please rank the considerations from 1 (most important) to 9 (least important)

- a. Ability of the system to promote research with wider socio-economic impact.
- b. Comparability of assessment outcomes (across institutions, disciplines and/or assessment exercises)
- c. Ensuring that the bureaucratic burden of the system is proportionate
- d. Impact of the assessment system on local/regional development
- e. Impact of the system on research culture
- f. Impact of the system on the UK research system's international standing
- g. Maintaining continuity with REF 2021
- h. Providing early confirmation of the assessment framework and guidance
- i. Robustness of assessment outcomes

[No ranking]

6. Relating to research culture, to what extent should the funding bodies be guided by the following considerations in developing the next assessment system? Please rank the considerations from 1 (most important) to 6 (least important)

- a. Impact of the assessment system on research careers:
- b. Impact of the assessment system on equality, diversity and inclusion:
- c. Ability of the assessment system to promote collaboration (across institutions, sectors and/or nations)
- d. Impact of the system on inter- and transdisciplinary research
- e. Impact of the system on open research
- f. Impact of the system on research integrity

[No ranking]

7. What, if any, further considerations should influence the development of a future assessment system? Please set out the considerations and indicate where they should be located in the list of priorities.

We do not feel able to rank the considerations under questions 5 and 6. Question 5 in our view mixes considerations that are qualitatively too different to compare them with one another, with some related to very practical aspects of the process while others touch on deeper consequences of any chosen approach. Many of the considerations under question 6 are covered by our work and activities; they are all important to us and we feel unable to rank them. // Despite not being able to rank the considerations, we provide below relevant evidence in relation to these considerations: I) In previous REF consultation responses [in 2018 and to Stern], maintaining the quality of the REF (and hence the robustness of the outcomes) has emerged as the primary consideration for our members, with secondary considerations that the cost and bureaucratic burden of the exercise should be proportionate, and that impact on the continuity and clarity of the exercise should be assessed when considering any changes. II) Collaboration and interdisciplinarity, alongside curiosity and leadership, were identified as essential enablers for chemistry and science in our Science Horizons report. Collaboration between sub-fields of the chemical sciences, across science and engineering, between people in different countries and with industry were all highlighted as important. III) Despite improvements in REF2014 and REF2021 to better support interdisciplinary research, some members of our community continue to call for greater recognition of interdisciplinary research. In our Stern review response, we noted that some of our members had commented that there remains a perception within parts of the chemistry community that interdisciplinary research may not be understood and therefore not properly assessed. IV) Equality, diversity and inclusion is an area of importance to the chemistry community, as is reflected in the RSC's efforts to collect a large evidence base in this area over the past years. Key findings that are relevant in the context of this survey include: IV.i) our evidence suggests there are six interacting factors that impact retention and success for chemists who identify as minoritised; one of these factors is structural barriers including narrow definitions of success that are skewed towards a 'publish or perish' mentality and penalise people who take less traditional paths; IV.ii) our research has identified biases at each step of the publishing process, recognising that both the publication of research articles and the number of citations that those articles gather remain established markers of scientific success, putting women at a significant disadvantage, and with evidence suggesting this finding might be extrapolated across the experience of other minoritised groups.

[\[https://committees.parliament.uk/writtenevidence/42479/pdf/\]](https://committees.parliament.uk/writtenevidence/42479/pdf/) // We appreciate the challenge the FRAP team is facing trying to balance all these considerations and are open to engage in a follow-

up conversation to continue to feed in views from our community as our work on what a healthy research system looks like for the chemical sciences develops.

8. How can a future UK research assessment system best support a positive research culture?

At the RSC, work is ongoing to better understand what a healthy research system looks like for the chemical sciences; including development of a Research Culture Framework to define what a 'good' research culture looks like for the chemical sciences. We would be happy to continue our engagement with the FRAP team as this work develops.

Section three: identifying research excellence

The funding bodies agreed that the outcomes of the next assessment framework should continue to enable them to allocate funding based on research excellence. It is therefore important that the exercise adequately captures those elements that constitute excellent research and assesses them robustly against appropriate criteria.

Components of excellence

The REF currently assesses three elements:

- Outputs (60%)
- Impact (25%)
- Environment (15%)

Roundtable discussions suggested that a broader definition of excellence, which recognises and rewards a wider range of activities and inputs, may better support a healthy, inclusive research system. Participants recognised that some of these elements are already captured through the environment statement but called for increased weighting and/or a more structured approach to assessing elements such as open research practices and policies to support equality, diversity and inclusion.

At the same time, participants questioned how these components might be assessed robustly and consistently. It was agreed that robust indicators would be required and participants acknowledged that this may be challenging.

Questions

9. Which of the following elements should be recognised and rewarded as components of research excellence in a future assessment exercise? (Multiple options: 'Should be heavily weighted' – 'Should be moderately weighted' – 'Should be weighted less heavily' – 'Should not be assessed' – 'Don't know')

- Research inputs (e.g. research income, internal investment in research and in researchers) **Should be weighted less heavily**
- Research process (e.g. open research practices, collaboration, following high ethical standards) **Should be moderately weighted**
- Outputs (e.g. journal articles, monographs, patents, software, performances, exhibitions, datasets) **Should be heavily weighted**
- Academic impact (contribution to the wider academic community through e.g. journal editorship, mentoring, activities that move the discipline forward) **Should be moderately weighted**
- Engagement beyond academia **Should be moderately weighted**
- Societal and economic impact **Should be moderately weighted**
- Other (please specify)

10. Do you have any further comments to make regarding the components of research excellence

In reviewing definitions of excellence in the context of research assessment, we recommend considering the following aspects: I) As part of an independent review of our recognition programme [Re-thinking recognition: science prizes for the modern world], we have considered how we define excellence in the context of our prizes and awards and concluded that teamwork, collaboration, leadership, professionalism, and diversity are fundamental elements of excellence in 21st century science. II) Any increase in the weighting of the 'impact' element should consider any additional burdens associated with reporting, for example, if it requires additional case studies. During an RSC focus group on elements of assessment, participants agreed that it takes a lot of effort to evidence impact currently, particularly when this means seeking evidence from partner companies who lack incentives to do this extra work. They also suggested there was scope to reduce overlaps and double counting between impact and environment elements. III) Any changes in elements of assessment need to capture long-term effects that may take more than a single REF period to appear. These include: i) discovery science, where research discoveries can gradually change scientific fields and/or lead to later applications, on a longer timeframe; and ii) impact within science, where a scientist or team in one unit of assessment develops something used by other disciplines or units of assessment, here it is particularly important to recognise the impacts of all involved.

Assessment criteria

In assessing submissions, the REF expert panels assess three distinct elements of each submission, against the following generic criteria:

1. Outputs: The panels assess the quality of submitted research outputs in terms of their 'originality, significance and rigour', with reference to international research quality standards.
2. Impact: The panels assess the 'reach and significance' of impacts on the economy, society, culture, public policy or services, health, the environment or quality of life that were underpinned by excellent research conducted in the submitted unit.
3. Environment: The panels assess the research environment of the submitted unit in terms of its 'vitality and sustainability', including the approach to enabling impact from its research, and its contribution to the vitality and sustainability of the wider discipline or research base.

[The detailed criteria are set out at Annex B.]

Roundtable discussions revealed some concerns about the wider effects of the current REF assessment criteria. For example, the criterion of 'originality' in relation to outputs was seen to discourage the submission of replication studies and reviews, which are essential to driving forward high-quality research. Similarly, the criterion of 'reach' for impact was seen to discourage the submission of research with local impacts, despite clarifications in the Panel Criteria that reach should not be interpreted in this way.

Questions

11. Are the current REF assessment criteria for outputs clear and appropriate? (Yes/No/Don't know)

- a. Originality **Don't know**
- b. Significance **Yes**
- c. Rigour **Yes**

12. Do you have any further comments to make regarding the criteria for assessing outputs?

During an RSC focus group on assessment criteria, participants (several closely involved in REF submissions) indicated that criteria should allow for submission of reviews and replication studies where they include a new analysis or perspective as these could be impactful e.g., in policy discussions, and of studies with negative results as these could be significant e.g., in disproving a long-held position. // In previous REF consultation responses [in 2017 and to Stern], we recommended that better guidance on assessment criteria for outputs, particularly those other than journal papers, could encourage more diverse submissions, and that greater engagement with the chemistry community to dispel misconceptions could incentivise further interdisciplinary research. The RSC's new Horizon Prizes encourage that nominations are evidenced with broader outputs, including software, research tools, protocols and patents.

13. Are the current REF assessment criteria for impact clear and appropriate? (Yes/No/Don't know)

a. Reach **Don't know**

b. Significance **Yes**

14. Do you have any further comments to make regarding the criteria for assessing impact?

During an RSC focus group discussion on assessment criteria, participants (several closely involved in REF submissions) indicated that the perception still exists that reporting of small-scale impact and local projects is discouraged and that more efforts are needed to recognise these better, including through the assessment criteria. // In previous REF consultation responses [in 2018, 2017 and to Stern], we have recommended expanding the definition of impact to include the contribution of research to creating a highly skilled workforce, through the training of PhD and post-doctoral researchers in analysis, problem-solving and research. Most PhD and post-doctoral researchers will pursue careers outside academia and a key impact resulting from their research and research training will be how it shapes them as professionals to the benefit of the economy and society. // In previous REF consultation responses [in 2018 and 2017], we also recommended there should be clear guidance on i) how to write impact case studies, as well on the kind of information it is useful to include: ii) on how panels will assess the quality of bodies of underpinning research; and iii) on how continued impact case studies will be evaluated. This could increase the quality and breadth of impacts submitted.

15. Are the current REF assessment criteria for environment clear and appropriate? (Yes/No/Don't know)

a. Vitality **Yes**

b. Sustainability **Yes**

16. Do you have any further comments to make regarding the criteria for assessing environment?

During an RSC focus group on assessment criteria, participants (several closely involved in REF submissions) expressed concern that assessment of research environment statements is more subjective than assessment of the other elements. They also shared a perception that scores correlate with the pre-existing reputation and available resources of institutions. // Our community would welcome any changes to assessing environment statements that would increase objectivity and level the playing field e.g. reward those that make the most progress rather than those who have the resource to write the most eloquent statement. // In our 2018 response, we recommended that a mechanism should be outlined in the guidance to highlight the research contribution made by Research Assistants and Research Associates in the environment template; and that more guidance

is included on the data that is required on usage of major facilities, for example by providing a list of the facilities considered in-scope.

Section four: assessment processes

Frequency

Outcomes from the REF are used to inform the allocation of block grant funding to universities. This funding method ensures a degree of research stability and independence not provided by other funding sources, because the results of research assessment are used over a prolonged period and the funding can be used as providers choose rather than being directed to particular research programmes.

Participants at the roundtables were asked to consider the frequency and sequencing of assessment exercises. Currently, the REF takes place every 5-7 years and assessment of all disciplines takes place in parallel. It has been suggested that a more regular exercise could increase its formative element and would ensure that funding based on REF outcomes more accurately reflects recent performance. However, it was noted that this must be weighed up against the potentially destabilising effect arising from the uncertainty of funding outcomes on a more regular basis.

The funding bodies recognise that views on the frequency of a future exercise will depend on the overall design of the assessment system. For example, it would not be feasible to run the exercise as it currently stands every three years without significantly increasing the burden on the sector. However, the funding bodies are keen to understand in principle whether the sector considers the availability of more current information to be more important than the stability offered by a less frequent exercise.

Questions

17. When considering the frequency of a future exercise, should the funding bodies prioritise:

- a. stability**
- b. currency of information
- c. both a. and b.
- d. neither a. nor b.
- e. Don't know.

18. Do you have any further comments to make regarding the prioritisation of stability vs. currency of information?

Any change in frequency would need to be supported by evidence that there would be a substantial benefit, as it would require a lot of effort and resource to implement. During an RSC focus group on assessment processes, participants (several closely involved in REF submissions) said that they did not see any benefit in changing the frequency of the exercise.

Sequencing

During discussions on the frequency of the exercise, some roundtable participants expressed some appetite for moving to a rolling exercise, sequenced by main panel or by assessment element. It was suggested that this would remove some of the perverse behaviours linked to the cyclical nature of the REF, particularly around recruitment and publishing practices. It was suggested that this would also reduce burden at an institutional level as effort would be spread across a number of years, rather than focused on a single end point. As with the frequency of the exercise, any decision to move to a rolling exercise must be weighed up the potentially destabilising effect of such a change.

Questions

19. Should a future exercise take place on a rolling basis?

f. Yes, split by main panel

g. Yes, split by assessment element (e.g. outputs, impact, environment)

h. No

i. Don't know.

20. Do you have any further comments to make regarding conducting future research assessment exercises on a rolling basis?

Any change in sequencing would need to be supported by evidence that there would be a substantial benefit, as it would require a lot of effort and resource to implement. During an RSC focus group on assessment processes, participants (several closely involved in REF submissions) agreed that they did not see any benefit in moving to a rolling exercise. They anticipated that such a change could result in negative psychological impact on academics, especially in a scenario where they are in a continuous loop of assessment deadlines. They were sceptical that potential benefits would materialise, expecting that some will find ways to game the system regardless of the exact nature and intent of any changes. // During our engagement to inform this response, we did hear alternative suggestions to address some of the perverse behaviours a rolling exercise was suggested to address, including: i) to explore further broadening the academic staff that is included in the submission and ii) to consider allowing only submission of outputs developed within the respective unit of assessment. // The proposal to move to a rolling exercise prompted a lot of questions on whether this would mean increased frequency of REF elements, whether it would need to be supported by more emphasis on metrics to be feasible, and whether it would result in funding decisions on shorter timescales. None of these potential directions were regarded as favourable. Questions further arose on what sequenced assessment between panels would mean for assessment of interdisciplinary researchers, and whether this could open new ways to game the system, for example by moving between panels. // If there were a move to a rolling exercise, a split by assessment panel would be preferred over a split by assessment element because it would be much less disruptive and allow for departments to continue developing a narrative around the different assessment elements that often informs their strategy, which is seen as a positive.

Granularity

A number of the changes made between REF2014 and 2021 were intended to reduce the emphasis on the individual in order to shift the focus onto the submitting unit as a whole. At the same time, an institutional-level environment statement is being piloted alongside REF 2021.

Roundtable discussions emphatically rejected a return to a more individual-focused exercise. However, views were divided on the extent to which future exercises should retain the Unit of Assessment structure. Those in favour of a more institution-focused approach frequently cited the current (perception of) disadvantage to inter- and transdisciplinary research in a discipline-based system. It was also noted that many of the issues relating to research culture and environment can only be addressed at the level of the institution.

There was, however, concern amongst others that a move to a fully institutional-level assessment would conceal the 'pockets of excellence', particularly in less research-intensive HEIs, and would make REF assessment outcomes less robust indicators of excellence. This is an important consideration for the funding bodies, given the continued link with funding.

Questions

21. At what level of granularity should research be assessed in future exercises?

- a. Individual
- b. Unit of Assessment based on disciplinary areas
- c. Unit of Assessment based on self-defined research themes
- d. Institution
- e. Combination of b. and d.**
- f. Combination of c. and d.
- g. Other (please specify)

22. Do you have any further comments to make regarding the granularity of assessment in a future research assessment exercise?

Any change in granularity would need to be supported by evidence that there would be a substantial benefit, as it would require a lot of effort and resource to implement. During an RSC focus group on assessment processes, participants (several closely involved in REF submissions) indicated that they would favour continuation of the disciplinary unit of assessment for assessing outputs and environment and could see benefits of assessing impact at institutional level such as facilitating assessment of interdisciplinary research. // The proposal to potentially change to self-defined research themes as units of assessment led to concerns on whether the results would be useful from a comparative perspective or if research themes would be too numerous and disparate, and whether this approach would risk prescription of priority themes by funders and/or government. Regardless of how funders will break down the unit of assessment, no approach will be perfect, and any approach will require active efforts to maximise connection and minimise siloes. // IMPACT: During an RSC focus group on assessment processes, participants identified some potential benefits of focusing societal and economic impact more institutionally, as some disciplines inherently generate such impacts over shorter timescales. However, this might disadvantage smaller institutions that are less focused on such disciplines, and an alternative approach could be to broaden the definition of impact so that it captures impacts more applicable across disciplines. In our 2017 response we noted that institutional-level assessment of impact should only be introduced if it does not disadvantage the disciplinary unit of assessment where the research is carried out. Rewarding impact arising from interdisciplinary research could be facilitated in this way but any measures need to be implemented in a way which does not disadvantage individual units of assessment where they are assessed individually on the same assessment element. For example, please avoid introducing a scenario where the institution has been able to use the strongest case studies, making these unavailable for inclusion at the disciplinary level. // ENVIRONMENT: During an RSC focus group on assessment processes, participants said environment statements should stay at disciplinary level to stay meaningful. They noted that environment statements at institutional level risk having an averaging effect and becoming very generic. A change to institutional environment statements could also damage smaller or mostly teaching-focused institutions that have pockets of research excellence.

Metrics

Roundtable discussions suggest limited appetite for increasing the role of metrics in the assessment of outputs. However, there was greater support for exploring quantitative indicators in the environment section. The use of metrics in the REF has been discussed at length, most notably in the 2015 Metric Tide Report. However, discussions persist in the sector.

Questions

23. To what extent and for what purpose(s) should quantitative indicators be used in future assessment exercises? (Please select as many as apply)

- a. Move to an entirely metrics-based assessment
- b. Replace peer review with standardised metrics for: i. Outputs ii. Impact iii. Environment
- c. Use standardised metrics to inform peer review of: i. Outputs ii. Impact iii. Environment**
- d. Should not be used at all.
- e. Other (please specify)

24. Do you have any further comments to make regarding the use of metrics in a future research assessment exercise?

During our member engagement to inform this response, we heard concerns around the limitation that is presented by the current approach to use the same assessment criteria across disciplines, especially considering the use of metrics. It was suggested that an alternative approach would be to rely on metrics where it is relevant to do so, accepting that this may differ between disciplines. // **OUTPUTS:** In previous REF consultation responses [in 2018, 2017 and to Stern], we noted that it would be appropriate for assessment in the chemical sciences to use citation data alongside, rather than instead of, expert peer review. We cautioned against using field weighted citation data owing to the difficulty of identifying the correct category for each output. Use of citation data should also consider biases in such data and potential behaviours around recruitment and promotion they could result in; our research on gender bias in publishing has shown that basing research assessment on publication and citation-based metrics could disadvantage women. // **IMPACT:** In our 2017 response, we noted that the broad and deep definition of impact makes standardisation of evidence for impact difficult to implement. While there may be some areas where this would be possible, it is unlikely this would cover a meaningful proportion of the case studies. Institutions are in many cases reliant on data from partner bodies such as industry and the requirement to provide data in a standardised format could potentially be viewed as another disincentive to participate. // **ENVIRONMENT:** In our 2017 response we supported the proposal to provide more quantitative information in the environment template, alongside a narrative element to contextualise the data. Not all components of this area should be metricised, as this would decrease the value of the environment template in encouraging departments to think strategically. In our Stern review response, we noted that some of our members commented on the positive impact of the environment template on their departments' strategic development.

Burden

The cost and bureaucratic burden of the REF are frequently cited in criticism of the exercise. Roundtable discussions identified some sources of burden specific to the current exercise (e.g. special circumstances procedures), along with the overall scale and complexity of the exercise. However, several participants stated that the bureaucracy is, to a certain extent, generated by institutions' approaches to the REF and can be difficult to distinguish from activities that would be carried out as part of business as usual or in response to requirements elsewhere in the system (e.g. by research funders). Several respondents expressed scepticism that burden would increase or diminish significantly with changes made to the exercise. It was also noted that changes may, in themselves, create additional burden for institutions regardless of their nature or intent. While UK-wide research assessment falls outside the scope of the ongoing 'Independent review of research bureaucracy' commissioned by the Department for Business, Energy & Industrial Strategy, related discussions have largely echoed the views expressed in the roundtables.

Question

25. How might a future UK research assessment exercise ensure that the bureaucratic burden on individuals and institutions is proportionate?

During our engagement to inform this response, the perception came across from participants that some of the REF-associated burden is imposed by institutions. Given the stakes for institutions in terms of their funding and reputation, it is inevitable that they will put in significant resources. However, there was agreement that the burden of the REF currently feels disproportionate, and participants suggested that higher education funders have a bigger role to play in addressing this, for example by providing suggestions on approaches that institutions could consider for increasing the practicality and decreasing the burden of preparing submissions. // Our engagement also revealed appetite for the opportunity to introduce more radical changes to the REF where these would be able to positively influence research culture. There was recognition that there is tension between reducing burden and implementing substantial changes, and the question was raised whether further exploration of responsible uses of metrics could offer a way around this.