Australian Government
Australian Research Council

ERA 2023

ERA 2023 Benchmarking and Rating Scale – Consultation Paper

ISBN: 978-0-6453208-6-2

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Executive Summary

Australia's national research assessments – Excellence in Research for Australia (ERA) and the Engagement and Impact (EI) assessment – are most effective when the performance information they produce helps drive universities in their quest for excellence. In June 2021, the ARC published its review into ERA and EI, which found that while the fundamentals of the assessments are strong, some aspects need updating to keep pace with the evolving global research environment.

In particular, the review recommended that the ERA benchmarks and rating scale be revised to account for changes in the global research environment and to provide greater granularity to identify our best universities and their strengths.

In response to the recommendations, the ARC has prepared this paper for broad consultation across the sector, with feedback closing on 22 April 2022. In preparing the paper, the ARC convened the ERA Benchmarking and Rating Scale (BRS) Working Group for the period August to December 2021 to assist in developing a revised rating scale. This substantially informed option A of the paper and the development of the underpinning citation metrics and peer review guidance.

In December 2021 the Australian Government highlighted the importance of fast-tracking implementation of the ERA review and particularly the development of assessments that drive the quest for excellence. Option B was developed by the ARC based on internal analysis and in consultation with the Department of Education, Skills and Employment.

To ensure that a revised rating scale is in place within the tight timeframes for ERA 2023, this paper presents both options (A and B) to help generate wider discussions with stakeholders.

Both options are supported by two key benchmarks – the 'high performer' and 'world' benchmarks:

- The **high performer benchmark** would be a new addition to ERA which is designed to compare Australian universities with the top 10% of universities in the world in a given field.
- The **world benchmark** is a modified version of the benchmark used in previous ERA rounds and is a way of comparing research to the average standard worldwide.

The benchmarks play a different role in each option. **Option A** is a 5-point rating scale that uses both the high performer benchmark and world benchmark. **Option B** is a 6-point rating scale that focusses on the high performer benchmark only for the top three ratings and complements this with the world benchmark for lower ratings.

Both options are intended to provide robust best practice assessments and allow for comparison of universities against the average standard of performance in the discipline worldwide. In addition, both are intended to set a new elite standard for universities to strive for.

The ARC is seeking feedback on the rating scale options, changes to the citation metrics and the peer review guidance that underpin the ERA assessments.

Proposed changes to the citation methodology include a high-performance indicator (HPI) that calculates performance against the high-performing (top 10%) research institutions worldwide, and dynamic relative citation impact (RCI) classes to provide more granular, discipline-specific information to assessors and keep pace with changes in global citation performance (see Section 3).

Proposed changes to peer review guidance include new questions to prompt peer reviewers to consistently identify world leading performance, instructions to peer reviewers that are more inclusive of disciplinary differences and guidance on producing useful peer review reports. There will also be specific guidance to support the assessment of Indigenous studies (see Section 4.2).

This paper contains detailed explanations of the proposed options, the underpinning methodologies and their likely impacts. The ARC welcomes all feedback from stakeholders.

The table on page 5 provides a quick reference guide to rating scale Options A and B. Comparisons with ERA 2018 ratings are illustrative only. Due to changes in ERA methodology, citation indicators, and peer review guidance, ERA 2023 ratings will not be directly comparable with ratings from previous rounds. Rating labels are subject to change.

Quick reference comparison of new ERA rating scale options				
ERA 2018	**Option A**		**Option B**	
RATING	**RATING**	**KEY BENCHMARK(S)**	**RATING**	**KEY BENCHMARK(S)**
5 – Well above world standard *(Note: ERA 2018 used the world benchmark only as the key comparator for all rating levels)*	**World leading**	***High performer*** *and* ***world*** *benchmarks* – this rating represents universities that are clearly above the average expected of high performing institutions and at the very top of universities worldwide	**AAA**	***High performer*** *benchmark* – this rating represents universities that are among the very small number of the best of the high performing institutions
	Well above world standard	***High performer*** *and* ***world*** *benchmarks* – this rating represents universities that are comparable to, or better than, other high performing institutions and well above the standard of universities worldwide	**AA**	***High performer*** *benchmark* – this rating represents universities that are clearly above the average expected of high performing institutions
			A	***High performer*** *benchmark* – this rating represents universities that are comparable to other high performing institutions
4 – Above world standard	**Above world standard**	***High performer*** *and* ***world*** *benchmarks* – this rating represents universities that are below the high performers but above the standard of other universities worldwide	**B**	***High performer*** *and* ***world*** *benchmarks* – this rating represents universities that are below the high performers but above the standard of other universities worldwide
3 – At world standard	**World standard**	***World*** *benchmark* – this rating represents universities that are around the average standard of universities worldwide	**C**	***World*** *benchmark* – this rating represents universities that are around the average standard of universities worldwide
2 – Below world standard	**Not at world standard**	***World*** *benchmark* – this rating represents universities that are below the average standard of universities worldwide	**D**	***World*** *benchmark* – this rating represents universities that are below the average standard of universities worldwide
1 – Well below world standard				

Note: Comparisons with ERA 2018 ratings are illustrative only. Due to changes in ERA methodology, citation indicators, and peer review guidance, ERA 2023 ratings will not be directly comparable with ratings from previous rounds. Rating labels are subject to change.

1. Introduction

The ERA and EI Review (2020-2021) found that the fundamental features of the ERA methodology (including the use of citation analysis or peer review as key quality indicators) were strong. However, the review also found that ERA would benefit from a revised rating scale and benchmarks to reflect changes in the global research environment and to accommodate improvements in Australian research performance since 2010.

On 6 December 2021 the Hon Stuart Robert MP, Acting Minister for Education and Youth, provided a Letter of Expectations to the ARC. The letter included the request that the ARC fast-track the implementation of the ERA EI Review and ensure that ERA and EI generate information that drives the quest for excellence in Australian universities. The Statement of Expectations and the ARC's response (Statement of Intent) can be found on the ARC website.

This consultation paper details the Australian Research Council's (ARC) proposed approach to implementing two key recommendations in the ERA EI Review concerning the ERA rating scale and benchmarking, and addressing the expectations outlined by the Minister. These recommendations are:

> **Review Recommendation 6:** that the ARC convene an expert working group to revise the ERA rating scale, the benchmarks for citation and peer review assessment, the definition and appropriateness of 'world standard' and the relevant guidance material for ERA assessors.
>
> **Review Recommendation 20**: that further steps be taken to ensure the robustness of the peer review and citation methodologies used in ERA. In particular:
>
> **a.** Improve the application of the peer review methodology to ensure the appropriate application of 'world standard' (in consultation with the expert working group referred to in Recommendation 6) …

The aim of the options detailed in this paper is to address these recommendations and the Minister's expectations by further enabling ERA to drive the quest for excellence by Australian universities. The options will do this by providing granular and meaningful information on the achievements of Australian universities. They are underpinned by benchmarks that adapt to a continuously evolving global research environment. They make it possible to identify universities performing at the forefront of research in each field.

In developing this paper, the ARC received advice from August to December 2021 from the ERA Benchmarking and Rating Scale (BRS) Working Group. This substantially informed option A and the development of the underpinning citation metrics and peer review guidance. Option B was developed by the ARC in the first few months of 2022 based on internal analysis and in consultation with the Department of Education, Skills and Employment. More detail on the working group is at Appendix A.

This consultation paper assumes that readers are already familiar with ERA and the outcomes of the ERA EI Review. More information on ERA and the review can be found on the ARC website.

1.1 Approach to consultation

The ARC is seeking the views of stakeholders on the ERA rating scale options, benchmarks and indicators proposed in this paper. The ARC seeks feedback from all stakeholders, including universities, researchers, end-users and industry.

Sections 1 and 2 of the paper provide general context and overview of rating scale options A and B that may be of most interest to a wide range of stakeholders.

Sections 3, 4 and 5 include more technical information on how assessments are conducted, which may be of particular interest to universities, researchers, former ERA assessors, and other stakeholders who are regularly involved with ERA.

Feedback received through this consultation will inform the assessment methodology that will be used for ERA 2023. A full list of questions is at Appendix E.

Written responses to the questions should be submitted to the ARC by 22 April 2022 using the feedback form found here. Respondents may upload a response in PDF or Word format, or answer the discussion questions from this paper in an online survey format.

2. Options for a more granular rating scale

ERA is a comprehensive assessment of the quality of research produced by Australian universities. ERA assessments are made by expert reviewers who determine the overall research quality of each research-active discipline at a university, using either citation analysis or peer review (as appropriate for the discipline) as key quality indicators to inform their judgments.

ERA assessments will continue to be made by panels of academic expert reviewers who determine the overall research quality of each research-active discipline at a university. ERA 2023 will use the Australian and New Zealand Standard Research Classification 2020 (ANZSRC) Fields of Research (FoR) to define research disciplines. The unit of evaluation (UoE) is the discipline at the submitting university.

Starting with ERA 2023, ERA will use a revised rating scale with increased granularity, clearer definitions and appropriate key benchmarks that reflect the objectives of ERA and the contemporary research landscape. As recommended in the *ERA EI Review Final Report*, and consistent with the objectives of ERA, the revised rating scale and definitions should:

- enable differentiation between strong and outstanding performers
- be clear and informative for assessors, universities and researchers
- enable comparisons between Australian universities and against world performance in each discipline
- be relevant for use by a variety of stakeholders including universities, government, industry and the broader community.

This section presents two options for a new rating scale that will clearly identify universities performing at the forefront of research worldwide. The options for a new scale are underpinned by new benchmarks that take changes in world performance into account and respond dynamically to an evolving research landscape. They are also supported by defining characteristics for each rating level which will improve the clarity and consistency of benchmarking in peer review as well as citation analysis.

To better identify the highest levels of excellence, the options will add new rating levels at the top of the scale (supported by quality indicators discussed in Section 3). In contrast, granularity at the bottom of the scale is less important, as most Australian universities are now performing at or above world standard and the lower levels are rarely used. Option A provides more clarity on the meaning of 'world standard.' Option B does away with the term 'world standard' and focuses on research performance relative to global leaders.

Finally, the proposed rating scales address the need for clear definitions and relevance to a range of stakeholders. The proposed rating scale will be accompanied by characteristics for each rating level. Characteristics would be a new addition to ERA, which would provide additional clarity and definition to the rating scale. The characteristics define each rating level and provide additional information about the distance between each rating and the range of performance that units are likely to demonstrate at each level. The characteristics are intended to improve assessors' and university stakeholders' understanding of each rating level. To assist a broader range of stakeholders, plain English explanations of the characteristics will also be provided.

The intention of this consultation paper is to seek feedback on the options for the rating scales and their high-level characteristics. The exact details of terminology will be finalised after this public consultation phase.

2.1 Key benchmarks

The two rating scale options put forward in this paper (Option A and Option B) both use two key benchmarks.[1] The new **high performer benchmark** allows comparisons to a profile of the top institutions in the field. This is the top 10% of world institutions in citation disciplines and recognised world-class international institutions in peer review disciplines. The second benchmark, similar to the 'world standard' concept in ERA 2018, compares UoEs to a complete world average[2] – the **world benchmark**. The use of two benchmarks in ERA will ensure the program can meet its dual purpose of driving universities in the quest for excellence, while providing a comprehensive understanding of the performance of Australia's universities across the sector regardless of their size, focus, or location.

High performer benchmark

The high performer benchmark is designed to set a higher bar against which to compare Australian university research performance. The purpose of the high performer benchmark is to:

- enable comparisons between universities against the high-performing institutions in the discipline worldwide
- recognise Australian universities performing at the forefront of each discipline worldwide
- provide additional granularity at the top end of the scale, in recognition of the significant improvements in performance in many disciplines since the introduction of ERA
- encourage further improvements in Australian research quality.

World benchmark – world standard vs world average

The world benchmark indicates an average performance across all institutions in the world. This is a very broad standard, and lower than most UoEs in previous ERA rounds have achieved. It provides a basic standard of research quality comparable to international institutions and more suitable information for assessing lower-performing UoEs that fall below the high performer benchmark. The world benchmark is applied slightly differently in Option A and Option B.

In Option A, the 'world standard' terminology is retained for continuity with previous ERA rounds, but additional detail will be provided on the application of this standard. However, this term may not always be well-understood, and Option B presents a rating scale where rating point characteristics refer instead to 'world average.' In previous rounds, 'world standard' was understood to be a broader (and slightly higher) quality standard than 'world average,' but its exact definition required expert judgement from Research Evaluation Committee (REC) members, responsible for evaluations. 'World average' is potentially easier to understand, and in citation disciplines can be unambiguously defined by an RCI of 1.0 and RCI class and centile distributions matching the world average (explained further at Appendix C).

The purpose of the world benchmark is to:

- measure universities against the typical performance in the discipline worldwide
- support TEQSA legislation, which refers to ERA ratings as a research quality indicator for the purpose of determining higher education provider categories[3]

[1] Note: For ERA purposes, a 'benchmark' refers to a quality standard applicable across all disciplines. An 'indicator' refers to a specific data point or set of data points used in citation disciplines.
[2] In citation disciplines, this 'world sample' is limited to indexed journal articles.
[3] Tertiary Education Quality and Standards Agency (Quality of Research) Determination 2021 (legislation.gov.au)

- retain the capacity for smaller, developing or new institutions, and emerging disciplines, to track their performance against a strong foundational benchmark.

2.2 New rating scale options

Two new rating scale options are proposed. Option A (which was based on the work of the Benchmarking and Rating Scale Working Group) is designed to maintain some consistency with previous ERA rounds, while increasing the focus on high-performing disciplines and increasing granularity at the top end of the rating scale to identify world-leading performance. Option B even further increases granularity at the top end of the rating scale. The proposed rating points are explained in plain English below. Draft criteria for each rating point, and a comparison between the two options and the existing scale, are shown in the rating matrices in Section 2.5.

Option A – Continuity with previous ERA rounds

Option A includes five rating points, broadly collapsing the previous 'below world standard' and 'well below world standard' ratings into a single point and adding an additional 'world leading' rating at the top of the scale. Each rating would be determined by reference to both the high performer and world benchmarks, although with more focus on the world benchmark at the lower rating points.

A **plain English** description of the ratings is (noting rating labels are subject to change):

> **World leading:** Units achieving a 'world leading' rating are among a small number of elite institutions worldwide for the field of research. This rating reflects outstanding research outputs that are defining works in their fields and are setting the direction of global research into the future. A world leading unit could sit among a very small proportion of international research institutions – a handful of institutions in specialised fields ranging to a few dozen for broader subjects. This group would include highly recognisable names such as the Massachusetts Institute of Technology for computer science, as well as universities that are less well-known but recognised leaders among experts in the field, such as ETH Zurich for Mathematics.[4]
>
> **Well above world standard:** Units rated 'well above world standard' fall within a group of highly competitive universities that are at the forefront of research (but outside the world leading category). The research will be making major contributions to the field, with publications that are highly innovative and rigorous. These units may be aspiring to world leading status.
>
> **Above world standard**: Units rated 'above world standard' fall within a larger group of internationally recognised and competitive universities. These universities are producing research that is high quality, innovative and rigorous, addressing big questions in the field.
>
> **World standard:** Units rated 'world standard' are performing at the standard expected of a competent university compared to global competitors. A large proportion of universities in comparable countries worldwide would be expected to have research that falls into this category. Units may include some excellent individual outputs.
>
> **Not at world standard:** Units rated 'not at world standard' are performing below the level that would be expected of an average research-active university in the field internationally.

[4] The example is intended to be illustrative only and is drawn from ARC analysis of the HPI and other sources. The number of organisations that would be comparators for the world leading rating will vary by discipline. Note: Units do not have to produce internationally focused research to receive a 'world leading' or 'world standard' rating. 'World leading,' refers to a quality standard, rather than the content of the research or publication venue of outputs. Similarly, 'worldwide performance in the field' refers to research produced worldwide during the ERA reference period.

Option B – Greatest ambition

Option B further increases the detail at the top end of the rating scale, to identify extremely high performance and motivate continuous improvement for already high performing institutions that may have comfortably achieved a 5 in previous ERA rounds. Letters are used to designate ratings for the purpose of this consultation paper but may be replaced with descriptors in the final scale.

The highest three rating points in Option B could be considered world class units, at or above the high performance benchmark. These would be assessed primarily by reference to the high performance benchmark. The lower three ratings in Option B relate more to the world benchmark.

A **plain English** description of the ratings is (noting rating labels are subject to change):

> **AAA:** This rating reflects the very highest research performance. Units receiving this rating are among a small number of **world leaders** in the field.
>
> **AA:** This rating reflects research that is at the **forefront of its field**. Units receiving this rating perform exceptionally well, even when compared to other high-performing research institutions in the field.
>
> **A:** This rating reflects **world class** research performance. Units receiving this rating are competitive in their field with the world's high-performing research institutions.
>
> **B:** This rating reflects **very strong research performance** that is not at world class level. Units receiving this rating are not among the highest performers when compared to international peers but are comfortably above world average performance.
>
> **C:** This rating reflects research performance that is **similar to the world average** in the field.
>
> **D:** This rating reflects research performance that is **below the world average** standard.

2.3 How assessment panels will use the revised rating scale

The ARC proposes replacing the existing rating scale with a revised rating matrix for ERA 2023 and subsequent rounds. To support RECs in interpreting the revised scale, the ARC intends to emphasise the following points in training and guidance:

- The highest ratings should be a highly exclusive category reserved for UoEs performing at the forefront of their field worldwide. In particular, under Option B, it is expected that only a very small number of 'AAA' ratings would be awarded across all UoEs.
- In Option A, the rating levels 'World standard', 'Above world standard' and 'Well above world standard', which appeared in the original rating scale, are conceptually similar quality standards to those used in past rounds. Similarly, in Option B, ratings of B and C might be considered equivalent to the ratings 'above world standard' and 'at world standard' respectively from previous ERA rounds.
- However, the proposed changes to citation indicators and peer review guidance will affect the way in which assessors make distinctions between ratings. Assessors in both citation analysis and peer review disciplines will be provided with additional useful, relevant and precise information that will contribute to more consistent standards across disciplines and will take into account global trends in research performance. The change to updated ANZSRC classifications also means that no unit ratings will be directly comparable between ERA 2023 and previous rounds.

In citation disciplines, the new rating scale will be supported by two new or revised indicators. These are the HPI and the dynamic RCI classes. These indicators will provide more granular and precise information about university performance above world standard, supporting assessors to make precise distinctions, while also allowing assessors to benchmark Australian performance against

world leaders in each discipline. Section 3 discusses each citation indicator in further detail, with detailed examples to demonstrate how they will work together to support a robust, granular assessment that drives Australian research performance higher.

In peer review disciplines, the new rating scale will be supported by enhancements to the peer review guidance (discussed in Section 0). Peer review is already capable of identifying world leading research, so the ARC proposes revisions to ensure a consistent approach to highlighting and contextualising world leading research where present. The revised guidance also includes revisions for disciplinary equity and clarity, as well as a set of supplementary questions to assist reviewers and assessors in applying the peer review guidance to the new Indigenous studies classification.

To ensure the longevity of the scale and comparability between peer review and citation analysis, the ARC will also consider enhancements to the training provided to RECs and to the assessment process. This may include:

- providing RECs with more granular information on both methodologies, to improve understanding of quality standards and the way in which they are applied across disciplines
- additional training for ERA peer reviewers using webinars and other virtual formats
- developing stronger processes for cross-panel calibration.

2.4 Questions

Q2.1 Which rating option (A or B) is preferred?

Q2.2 Are there particular features of either option that should be adopted or modified?

Q2.3 How will the change in ratings shift university research efforts?

Q2.4 To what extent would the proposed options be more challenging for universities than the existing ERA rating scale?

Q2.5 What changes, if any, are required to the characteristics that accompany each rating level?

Q2.6 Would it be feasible for expert reviewers to draw meaningful distinctions between each rating points using the characteristics provided?

Q2.7 What kind of additional training or guidance may be required in ERA 2023 to support the revised rating scale?

The rating scale matrix is provided below (Section 2.5)

2.5 Rating scale matrix

The rating scale matrices for option A and B show the rating level and the characteristics that will guide assessment. The characteristics are primarily aimed at the assessors and universities involved in the ERA process. Plain English explanations of the ratings are provided in Section 2.2 above. Note: rating labels are subject to change.

Option A	
New Rating	**Characteristics that will guide assessment**
World leading	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **exceptional** compared to worldwide performance in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs is **at the forefront of the field.**
Well above world standard	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **well above** worldwide performance in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs performs **well above world standard**.
Above world standard	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **above** worldwide performance in the field**,** regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs performs **above world standard.**
World standard	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **comparable** with worldwide performance in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs performs **at world standard.**
Not at world standard	Characteristics of units receiving this rating are: • Evidence that unit's overall research quality **does not demonstrate comparability with** worldwide performance in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have some higher-performing research, a significant proportion of the unit's outputs **does not perform at world standard**.

Option B	
New Rating	**Characteristics that will guide assessment**
AAA	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **world leading** even by comparison to high-performing institutions in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs is at the **forefront of the field**.
AA	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **clearly ahead of other high performing institutions** in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs is at the **forefront of the field.**
A	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **comparable to high performing institutions** worldwide in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs performs **above the high performance benchmark**.
B	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **above average** compared to worldwide performance in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have a range of performance, a significant proportion of the unit's outputs performs **above average** and some outputs are of **exceptional** quality.
C	Characteristics of units receiving this rating are: • Evidence that unit's overall research quality is **around world average** in the field, regardless of whether its substantive focus or publication venues are national or international. • While the unit may have some higher-performing research, a significant proportion of the unit's outputs **does not excel** compared to the world average.
D	Characteristics of units receiving this rating are: • Evidence that the unit's overall research quality is **below world average** in the field. • While the unit may have some high-quality individual research outputs, these do not form a significant proportion of the unit and most research is **underperforming** compared to the world average.

3. How can the citation metrics support the options for a revised rating scale?

Citation metrics are used in ERA as the primary indicator of research quality in most science and engineering disciplines (excluding computing and pure mathematics). Starting with ERA 2023, ERA will use updated citation metrics that respond to changes in the global research landscape – including the growth in research publications worldwide and the implications for benchmarks based on world standard – and enable assessors to differentiate between strong and outstanding performance. These new benchmarks are applicable to either of the rating scales (A and B) outlined in Section 2 above.

The ARC proposes that for ERA 2023, RECs in citation disciplines will be presented with enhancements to the ERA citation metrics that will support the new world leading rating level and be adaptable to changes in world benchmarking. As in past ERA rounds, RECs will use a suite of indicators (including the revised metrics) to make a holistic assessment of the performance of a UoE. The proposed new metrics will be the:

- **High-performance indicator (HPI)** – which is a new indicator that will provide RECs with information about high-performing organisations as an additional comparator in each field and assist RECs in applying ratings at the higher end of the rating scale.
- **Dynamic relative citation impact (RCI) classes** – which will replace the existing RCI classes and dynamically respond to worldwide changes in citation performance in each field. It will provide RECs with greater clarity on different levels of performance between comparators especially at the higher end of the rating scale.

These metrics are intended to support the proposed rating scales (discussed in section 2), provide improved granularity and robustness in an evolving research environment, and assist RECs in distinguishing between the highest levels of excellence.

In addition to the methodological requirement for robustness, ERA citation indicators should also cater for discipline-specific needs and provide relevant information to assess Australian university research performance. While the primary role of the citation indicators is to capture past research achievements, they should also incentivise the pursuit of higher quality research in future, by supporting a higher benchmark.

3.1 High-performance indicator

A new HPI is proposed for ERA 2023 to support the revised rating scale, specifically by enabling an increased level of granularity at the top end of the scale and responding to changes in world research performance.

By identifying high-performing research organisations in the world for each discipline, it is possible to provide a new indicator set to compare the citation performance of each UoE against a much more selective group of institutions than was available in past ERA rounds. The high-performing organisations are identified using the citation performance of their research outputs in each respective discipline. This approach should provide a more robust and adaptable assessment of high-level worldwide performance than other approaches, such as using a predetermined group of comparator organisations. This is because the performance of international research organisations will vary over time.

This measure provides additional context for interpreting citation performance especially at the higher end of the rating scale. The HPI is not equivalent to world leading performance but is clearly below it. However, having the HPI as a reference point will assist RECs in applying the rating levels.

The HPI will allow assessors to separate the highest performing universities into more exclusive groups. The ARC anticipates that the world leading rating will be given to UoEs that perform consistently 'higher' than the benchmark represented by the HPI in all indicators, and that only a small portion of the UoEs that received a rating of 5 in 2018 are likely to receive a world leading rating under the new methodology.

ARC analysis indicates that the HPI will:

- allow assessors to compare the citation performance of each UoE against the organisations at the forefront of the world in each respective discipline.
- provide a useful threshold for splitting this high-performing group into more than one rating
- support assessors when considering the new 'world leading' rating.

The calculation method for the HPI is set out in Appendix B.

3.1.1 How the HPI will be implemented in ERA

The ARC proposes the following specifications for the HPI:

- The top 10% of organisations, with a minimum of 10 organisations[5], is to be selected for this indicator for each FoR. The indicator is intended to provide RECs with supplementary information on the high performers in the FoR, and the 10% range is recommended to ensure sufficient coverage across fields. Selection of organisations for the indicator is based on the ranking of citations per paper (CPP) performance of each organisation within the relevant FoR, also taking into account the publication year. Smaller or highly specialised disciplines may not have a sufficient number of organisations conducting research in the discipline. The minimum of 10 organisations ensures that there is a sufficient number of organisations included in the indicator.
- To be consistent with the ERA methodology, a low volume threshold of 50 indexed journal articles for the entire six-year reference period should also apply to each organisation in this indicator. This also ensures that the organisation was research active in the FoR during the reference period.
- This indicator uses the same ERA world dataset and the ERA Journal List for identifying organisations and disciplines (FoRs), as used for the existing ERA citation indicator calculations.
- The selection of the top 10% of organisations will include all organisation types and will not be restricted to universities, consistent with the current ERA citation indicator calculation methodology, which includes papers from all organisation types.
- Identification of organisations will be based on meta data as supplied by the citation data provider.
- The new indicator is to be included as an additional indicator among the existing suite of indicators in the RCI indicator profile.
- The HPI is *not* designed to align with a 'world leading' or AAA rating. World leading will typically be much more exclusive than the high performers represented in the HPI.

[5] Note: the HPI is drawn from a world sample without restrictions in terms of country. For example, it may be possible that for some disciplines the institutions in the HPI may represent only a small group of countries. However, for many disciplines the range of countries that have institutions in the HPI will be much larger.

3.2 Dynamic RCI classes for discipline-specific benchmarking

The ARC will adopt dynamic RCI classes to address fluctuations in world citation performance and provide increased granularity. The dynamic RCI classes will support RECs in differentiating between high degrees of citation performance and allow the standard to automatically rise over time to keep pace with global trends. They will also provide a more accurate representation of citation performance in individual disciplines compared to world performance over time.

The existing RCI class profile in the ERA citation methodology, which groups papers into different RCI bands (termed RCI classes) is a useful indicator to understand where a unit's papers are concentrated, based on their citation performance. The class boundaries of the current 7-class system are fixed – that is, the same class boundary applies to all the disciplines, not distinguishing the discipline-specific citation performance variations. Further, higher classes do not provide sufficient detail and granularity to distinguish the high performing UoEs from the exceptional ones.

The RCI class profile can be enhanced by adopting discipline-specific class boundaries which are calculated using the world citation data for each FoR. This variation in class boundaries will more accurately reflect how citations are distributed within the individual disciplines. With the dynamic nature of these classes, the methodology also provides flexibility for any fluctuations in citation performances over time in any discipline.

Dynamic RCI classes will provide a consistent measurement across large disciplines (e.g., clinical medicine and materials engineering) and small disciplines (e.g., ecological applications), and provide greater granularity at the top end of the rating scale to distinguish world leading performance more accurately.

ARC analysis indicates that the dynamic RCI classes will:

- make it easier to recognise different levels of performance above world standard
- provide higher benchmarks in most disciplines
- simultaneously account for disciplinary differences and keep pace with global progress in research citation performance.

The calculation method for the discipline-specific dynamic RCI classes is at Appendix C.

3.2.1 How the dynamic RCI classes will be implemented in ERA

The ARC proposes the following specifications for the dynamic RCI classes:

- The new ERA dynamic RCI classes are to be formulated using the ERA world data set.
- The optimum number of classes is 6 (0 to 5) including the class 0 which is used for uncited papers.
- For 2-digit UoEs, the RCI and the class that each paper belongs to will be derived from their respective 4-digit UoEs as there are no indicators calculated at the 2-digit level. This process is consistent with the current ERA methodology.
- The new dynamic class profile should also include the high performing group of organisations as a comparator indicator, along with the existing world and Australian higher education institution indicators within each class, allowing the UoE performance to be compared against these comparators.
- With the introduction of the dynamic RCI classes, the existing *RCI Class Comparison* will not be necessary.

3.3 Questions

Q3.1 How appropriate is the HPI as a method of supporting the rating scale options?

Q3.2 How appropriate are the dynamic RCI classes as a method of discipline-specific benchmarking?

Q3.3 How would the proposed citation methodologies impact research planning?

Q3.4 Do the new citation metrics support the drive for increased performance (especially in already high-performing disciplines)?

Q3.5 Is any additional criteria or information required in the citation disciplines to support the ratings at the highest end of each rating option?

Q3.6 Please provide any additional comments on the proposed citation methodology.

4. How can the peer review indicator support the options for a revised rating scale?

In ERA, peer review is used as the primary indicator of research quality in the humanities, arts, social sciences, computing and pure mathematics. Starting from ERA 2023, the ARC will introduce measures to support the use of the revised rating scale in peer review disciplines and to improve alignment between peer review and citation analysis. This will ensure that ERA continues to provide robust, granular and meaningful information on university research performance across all disciplines, and that RECs in peer review disciplines will be able to identify universities performing at the forefront of the field worldwide.

This section proposes enhancements to the peer review guidance. The proposed changes aim to ensure that ERA assessors in peer review disciplines will have sufficient information to assess against the revised rating scale, including the world high performer benchmarks. They also aim to ensure that the revised benchmarks will be interpreted consistently across the peer review and citation analysis methodologies. This includes consideration of the newly classified Indigenous studies discipline, which will be evaluated as a discipline for the first time in ERA 2023 using the peer review methodology.

The ARC is aiming to revise the guidance given to peer reviewers when writing their peer review reports, as these reports form the main quality indicator used by RECs in the ERA peer review methodology. This guidance includes the ERA peer review criteria, instructions for writing peer review reports, common do's and don'ts, and examples. While feedback to the ARC suggests that the 2018 peer review guidance is largely appropriate, RECs may need additional information from peer reviewers to support the revised rating scale and benchmarks and the evaluation of Indigenous studies.

To evaluate units against the revised rating scale and benchmarks, RECs will need to be able to identify outputs at the forefront of the field. As a qualitative assessment methodology based on the disciplinary knowledge of expert reviewers, peer review already has the capacity to identify world leading research. In past rounds, peer reviewers have occasionally noted the presence of 'world leading', 'paradigm shifting' or 'ground-breaking' research in high-performing units. Consequently, it may be unfeasible to introduce a direct equivalent of the HPI proposed for citation disciplines. Instead, ARC intends to revise the existing questions to prompt reviewers to consistently identify high performing and world leading research.

To support the evaluation of Indigenous studies, additional guidance will be provided on applying the peer review criteria to this discipline. The ARC will also work with experts to develop additional examples of peer review reports for Indigenous studies.

Finally, the ARC intends to update the peer review guidance to be more inclusive of different disciplinary practices, perspectives, and values; more explicit about what is required from peer reviewers; and to encourage reviewers to emphasise the strengths of the sample in addition to any limitations.

4.1 Proposed questions for peer reviewers

This section contains the proposed revisions to the peer review guidance, which are designed to improve clarity for peer reviewers and ensure that peer review reports are useful and relevant for RECs. This guidance will be subject to further refinement based on feedback from this consultation and additional testing with former ERA peer reviewers and RECs.

The ERA 2018 guidance included a list of questions and criteria for reviewers to consider when writing the main sections of their reports, on Approach (the overall approach of the outputs within a sample, including methodologies and disciplinary context) and Contribution (the overall contribution to the field represented by the sample). It also included a set of example reports and advice on what makes a good report.

This consultation focuses on revisions to the questions for Approach (now split into 'Discipline context' and 'Research practices') and Contribution, and the inclusion of a set of supplementary prompts to assist assessors in applying the peer review criteria to Indigenous studies (see Section 4.2). The ARC intends to revise other sections of the peer review guidance – such as the example reports – at a later date, in order to incorporate feedback from this consultation.

The proposed ERA peer review guidance would use the following questions to guide peer reviewers when completing their peer review reports. The reports would address the discipline context, the research practices in the outputs sampled and the contribution of the research sampled to the discipline.

Discipline context

Please provide a brief overview of any necessary disciplinary context required for RECs to interpret your assessment of the sample. The following questions may be useful in guiding your report (please note you **do not** need to answer all of them):

- Should RECs be aware of any disciplinary practices or perspectives on research that are specific to this field?
- Should RECs be aware of any disciplinary characteristics of world-leading research that are specific to this field?

Research practices

Please discuss the research practices evident in the outputs you have reviewed. Research practices may include approach(es) to research, perspectives and/or methodologies, as appropriate for the discipline. The following questions may be useful in guiding your report (please note you **do not** need to answer all of them):

- To what extent is the approach to research (or range of approaches) in the sample consistent with standard disciplinary practices? If not, please explain the strengths and/or limitations of any notable differences.
- Are the research methods, theoretical perspectives or other practices appropriate for the research questions, or to fulfil any other aims of the research?
- Do any outputs in the sample demonstrate characteristics of a world leading approach to research in the discipline? If so, why? (Please note that you should **not** give the sample a rating, only indicate whether or not any elements of the research approach in the sample could be characterised as world leading for the field.)
- Please explain what the overall approach (or range of approaches) demonstrates about the quality of the research in the sample.

Contribution

Please discuss the contribution that the outputs you have reviewed have made, or have the potential to make, to the field and/or practice. The following questions may be useful in guiding your report (please note you **do not** need to answer all of them).

- How timely is the research? This may include:
    - Whether the research methods and/or theoretical foundations are up to date
    - Whether the research intervenes in current conversations within the field

- Whether any elements of the research are ahead of their time and/or could be considered paradigm-shifting
- The currency or relevance of the research for stakeholder communities

- How significant are the research questions? How significant are the findings? This may include:
  - Advancing disciplinary knowledge (including scrutiny of past research)
  - Addressing important applied problems
  - Questions/findings that are meaningful to a stakeholder community
- How robust and/or rigorous is the research? This may include:
  - Methodological robustness, including the credibility of findings
  - Theoretical, conceptual and/or creative rigour
  - The depth of discussion and analysis
- To what extent is the research original, innovative and/or creative? Are the original or innovative elements of the research supported by robust and credible research practices?
- Would you consider any research in the sample to be world leading in quality? If so, why? (Please note that you should *not* give the sample a rating, only indicate whether or not any of the outputs in the sample demonstrate world leading contributions to the field.)
- Please explain the overall contribution, nationally and/or internationally, that the research makes to the further development of knowledge and understanding.

4.2 Proposed guidance for Indigenous studies

The ARC proposes the inclusion of the following guidance in the ERA 2023 Peer Review Handbook, to assist assessors in applying the peer review criteria to FoR 45 Indigenous studies.

Considerations for the evaluation of Indigenous studies

Assessors in FoR 45 Indigenous studies may wish to focus on particular features of Indigenous studies research when addressing the considerations in the Contribution section.

When assessing in Indigenous studies, please also consider the following (non-exhaustive) list of considerations (please note you **do not** need to answer all of them):

ERA Peer Review Criteria	Possible Indigenous Assessor Considerations
How timely is the research?	To what extent does the research address issues that are seen as critical to the Indigenous communities that are participating or interested in the research?
How significant are the research questions? How significant are the findings?	How does framing of the significance of the research incorporate Indigenous research frameworks? Is the research Indigenous-led?
How robust and/or rigorous is the research?	To what extent are Indigenous theories and research privileged above pre-existing (and dominant) Western theory? To what extent do analyses and discussion incorporate Indigenist methods and perspectives (including Indigenous forms of creative practices where relevant)?

	To what extent is the discussion and analysis Indigenous-led? To what extent does the discussion and analysis consider the time taken to develop and maintain trust and ongoing working relationships with Indigenous communities?
To what extent is the research original and/or innovative, as per the ERA definition of research? Are the original or innovative elements of the research supported by robust and credible research practices?	How does the approach to research and research questions consider originality and/or innovation from an Indigenous perspective?
Please explain the overall contribution, nationally and/or internationally, that the research makes to the further development of knowledge and understanding.	To what extent does the contribution advance Indigenous self-determination and sovereignties as opposed to simply speaking to non-Indigenous theory and research? How accessible are the research outputs to relevant Indigenous stakeholders? How have the research findings been disseminated?

4.3 How the revised peer review guidance will be used

The ARC proposes implementing the revised guidance for peer reviewers for ERA 2023. As ERA guidance is normally revised between rounds, it is likely that revisions to the guidance will be ongoing after ERA 2023 based on feedback from RECs, peer reviewers and the sector (including Indigenous studies researchers).

The peer review methodology will operate in the same way as in previous rounds. Peer reviewers will continue to review a sample of outputs in their assigned UoE and will write a peer review report on that sample, based on the criteria outlined in the revised guidance. RECs will then use these peer review reports as their key quality indicator when evaluating the performance of the UoE.

The main changes to the peer review guidance will be:

- the inclusion of questions in the peer review criteria designed to prompt peer reviewers to flag the presence of world leading research, and
- the inclusion of guidance on applying the peer review criteria to Indigenous studies research.

As these aspects of the peer review guidance will be new to ERA, it may be beneficial to address these changes in the training for peer reviewers and RECs. For example, both peer reviewers and RECs may benefit from training to emphasise that world leading research in an ERA context refers to the quality of the output alone, and that information such as the prestige of publication venues does not factor into the evaluation.

Overall, the changes to peer review guidance aim to improve the clarity and inclusivity of the guidance, leading to more informative, consistent and useful reports. The ARC will continue to work with relevant stakeholders (especially those with experience in ERA peer review) as it develops the specific wording of the peer review guidance based on the issues described above.

4.4 Questions

Q4.1 To what extent are the proposed changes to peer review guidance likely to result in reports that are useful, informative and relevant for assessment panels? Please comment on any improvements that could be made, particularly with reference to disciplinary inclusivity and relevance to the options for the revised rating scale.

Q4.2 How feasible would it be for peer reviewers to address the proposed peer review guidance? Please comment on any improvements that could be made, particularly with reference to clarity and workload for reviewers.

Q4.3 How appropriate is the proposed guidance for Indigenous studies? Please comment on any improvements that could be made.

Q4.4 How would the proposed changes to peer review guidance impact universities and/or researchers?

Q4.5 Is any additional criteria or information required in the peer review disciplines to support the ratings at the highest end of each rating option?

Q4.6 Are there any other changes to peer review that the ARC should consider?

Appendix A – Benchmarking and Rating Scale Working Group

The ARC convened the Benchmarking and Rating Scale Working Group from August to December 2021. This group comprised senior Australian academics, the majority of whom had previously served as ERA Research Evaluation Committee (REC) Chairs. Working group members represented a range of disciplines – including Humanities, Arts and Social Sciences (HASS), Science, Technology, Engineering and Mathematics (STEM), and Indigenous studies – and a range of universities, as well as having familiarity with both peer review and citation analysis methodologies. The working group received technical advice from three Australian and international bibliometricians. The material presented for consultation in this paper draws on the advice of this working group to inform the development of Option A and the material on citation analysis and peer review guidance.

Working Group members:	
Professor Mark Western (Chair)	Director, Institute for Social Science Research, The University of Queensland
Professor Rose Amal	Scientia Professor, Particle and Catalysis Group, The University of New South Wales
Distinguished Professor Larissa Behrendt	Director, Jumbunna Institute for Indigenous Education and Research, University of Technology Sydney
Emeritus Professor Brenda Cherednichenko	Faculty of Arts and Education, Deakin University
Professor Andrew Francis	Deputy Dean of the School of Computer, Data, and Mathematical Sciences, Western Sydney University
Emeritus Professor John O'Connor	College of Engineering, Science and the Environment, The University of Newcastle
Emeritus Professor Joanne Tompkins	School of Communication and Arts, The University of Queensland
Bibliometrics experts:	
Mr Adam Finch	Manager of Science Performance Analytics, The Commonwealth Scientific and Industrial Research Organisation (CSIRO)
Dr Sybille Hinze	Head of Centre for Open and Responsible Research, Objective – Advancing Research Quality and Value, Berlin University Alliance, Berlin, Germany
Dr Gunnar Sivertsen	Head of Bibliometric Research at the Nordic Institute for Studies in Innovation, Research and Education (NIFU), Norway

Appendix B – Calculation of high-performance indicator

Methodology

The high-performance indicator (HPI) is calculated using bibliometric data of all eligible outputs published in the world in journals included in the ERA Journal List. Only document types of journal article, conference publication and review article are included. This approach is consistent with the calculation of the world indicators. For an organisation to be included in this indicator, it must also meet the low volume threshold of 50 indexed articles within the FoR code for the entire six year reference period.

To select the top 10% organisations, each organisation is ranked based on their citations per paper (CPP) for each FoR code and for each year. The CPP of each organisation was calculated as follows:

$$\text{Individual organisation CPP (Year, FoR)} = \frac{\Sigma \text{ citations for all eligible articles published by the organisation } (Year, FoR)}{\Sigma \text{ eligible articles published by the organisation } (Year, FoR)}$$

Once the top 10% organisations, with a minimum of 10 organisations, are selected, the high-performance indicator is calculated:

$$\text{High} - \text{performing organisations CPP } (Year, FoR) = \frac{\Sigma \text{ citations for unique eligible articles published by the group of organisations } (Year, FoR)}{\Sigma \text{ unique eligible articles pubished by the group of organisations } (Year, FoR)}$$

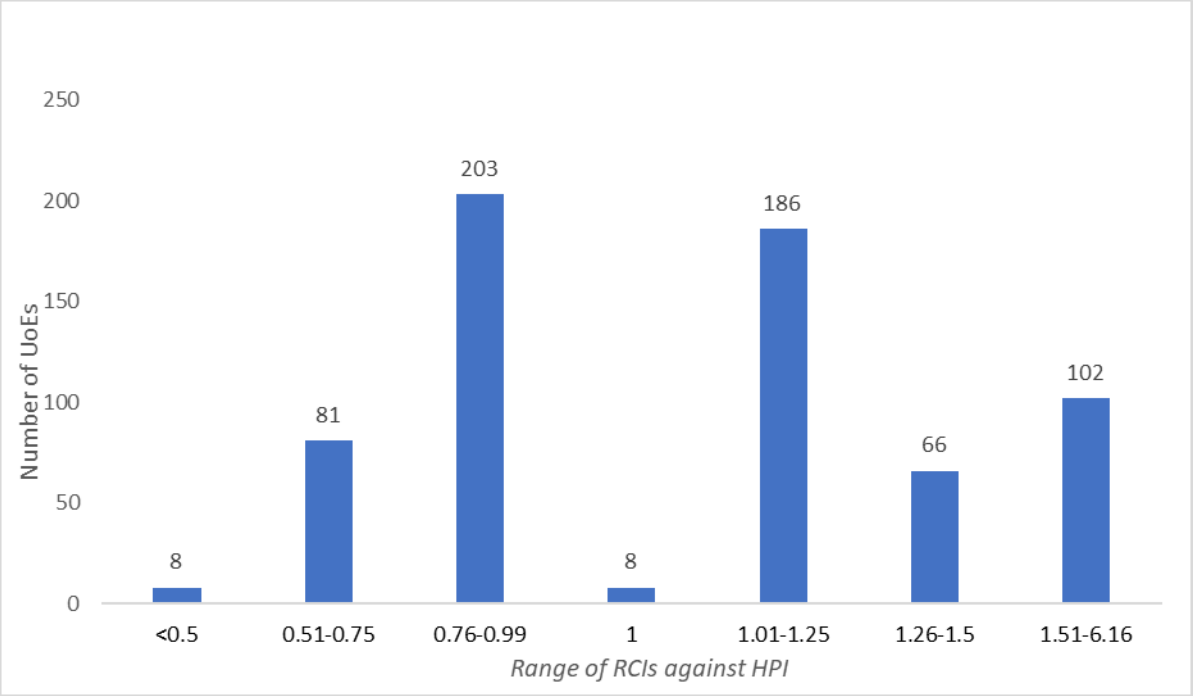
The CPP indicator of the high-performing group enables the calculation of the UoE RCI against this group.

All comparisons to both world indicators and HPI would be presented to REC members for all UoEs under either rating scale option A or B. However, the focus of assessors may change. Under option A, UoEs would primarily be compared to the world data set, with the HPI used to distinguish between high performers for the top ratings. Under option B, the focus is shifted to the HPI, with the world indicator mostly being used to distinguish between the lowest rating points.

Analysis of units rated 5 in 2018 using HPI

The HPI would allow assessors to divide well performing UoEs into more granular categories that distinguish between well above world standard and world leading. ARC analysis shows that 44% of the 654 UoEs rated 5 in ERA 2018 have an RCI *below* 1 when compared to the HPI, meaning that they demonstrated lower performance than the world's top 10% of organisations in their field (Figure 1). Further it demonstrates that most UoEs rated 5 had RCIs that were very close to the HPI with a small but significant group performing well above the HPI.

Figure 1: Number of UoEs rated 5 in ERA 2018 and their RCI performance against HPI indicator



The ARC cannot estimate the actual number of UoEs that would have received a specific rating, due to the crucial role of expert review[6]. It is likely that only those UoEs that perform significantly above the HPI, in accordance with the expert assessors' knowledge of the field, would be considered a top rating. However, this analysis demonstrates that the HPI can be used to produce greater differentiation and granularity at the top end of research performance.

More information on how the HPI will enhance assessment can be found in Appendix C, which includes an overview of the interaction between HPI and the dynamic RCI classes, and Appendix D, which contains a comparison between the 2018 indicator profile and the proposed indicator profile to be used for ERA 2023.

[6] Note that RCI is only one component of the overall indicator suite and contextual factors that assessors use to evaluate a UoE.

Appendix C – Calculation of dynamic RCI classes

Methodology

The dynamic RCI classes are adapted from Characteristic Scores and Scales (CSS) methodology which groups the citation impact of papers into class-specific categories.[7] The calculation methodology involves ranking of all the RCI per paper in the ERA world data set for each FoR code and calculating the mean distribution of RCIs, $\beta_1 = \mu$. The first range of RCI class is formed between the lowest RCI and the β_1 inclusively. The papers with RCIs above the β_1 form the data set which the second range of RCI class is calculated, $\beta_2 = mean(x_i | x_i > \beta_1)$. For the rest of the distribution, the top boundary of the next class is defined by

$$\beta_k = mean(x_i | x_i > \beta_{k-1})$$

where x_i is the observed Relative Citation Index received by paper i; β is the mean citations; and k is the class defined by the pair of threshold values $(\beta_{k-1}, \beta_k]$.

This formula iterates if a defined threshold of number of classes has been reached or if the value in k class drops below a previously defined threshold.

The dynamic RCI classes are determined based on the RCI values of papers in the ERA world dataset to ensure that the full scope of research is considered. In the proposed application of CSS methodology, for each FoR code, uncited papers are placed in class 0. The class 1 consists of papers with RCIs higher than 0 to the RCIs of 1.00 (average RCI of all papers). The average RCI of all the remaining papers determines the next upper boundary of the class 2. All the papers between RCIs of 1.01 and the upper boundary limit of this class will form part of the class 2. The average of the remaining papers again determines the upper limit of the next class, that is, the class 3, and the process continues to class 4 in the same way. All the remaining papers with RCIs greater than the upper boundary of class 4 belong to class 5, which being the last class is an open-ended class. Once the class boundaries are determined, papers of the relevant UoEs are allocated into the respective classes according to RCI values of individual papers.

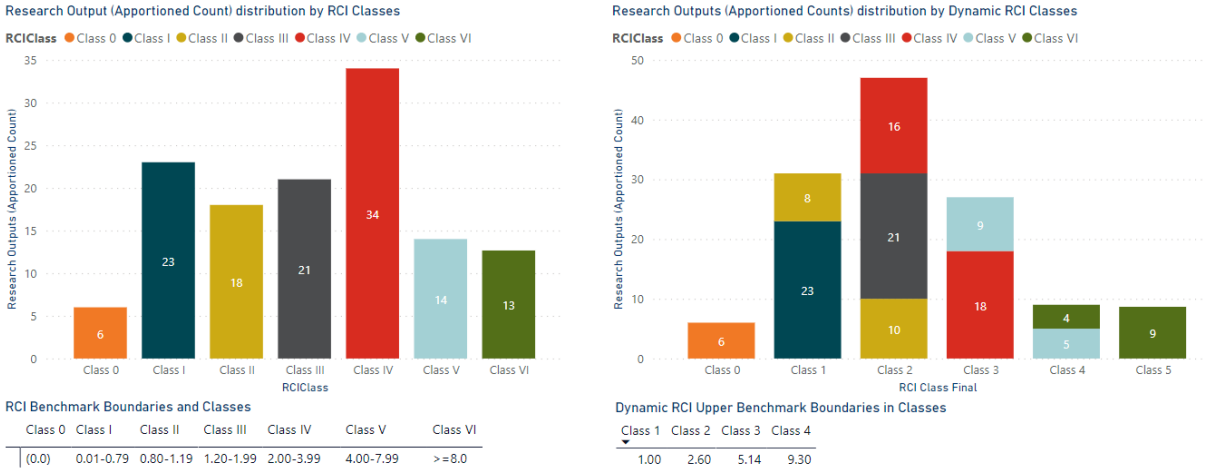
A comparison of static vs dynamic RCI Class profiles

This section compares the static and dynamic RCI Class profiles in terms of the paper distribution within classes with two example UoEs using ERA 2018 data. Figure 2 shows the example UoE, 'UoE A', with both static RCI classes (left) and dynamic RCI classes (right) visually demonstrating how papers are distributed based on the RCI boundaries in respective classes.

In this UoE some papers that were in Class II in ERA 2018 have moved into Class 1 under the new methodology. Similarly, about half of the papers in Class VI, the highest class in 2018 methodology, have moved into the second-highest Class 4 in the new methodology. This demonstrates the impact of the higher dynamic RCI class thresholds: under the new methodology, papers with citation counts above world average are spread out across multiple classes, allowing for greater distinction between high performers.

[7] See Glänzel, W., & Schubert, A. (1988). Characteristic scores and scales in assessing citation impact. Journal of Information Science, 14(2), 123–127.

Figure 2: RCI distributions for UoE A under original static RCI classes (left) and dynamic RCI classes (right)



The dynamic RCI classes can also be used to compare the performance of a UoE against the high performer benchmark (see Figure 3). The distribution of papers can reveal any outliers or concentrations of papers that may be skewing the overall RCI performance of a UoE, compared to the distribution of world and high-performance indicators.

Figure 3 shows the performance of UoE A in each dynamic RCI class in comparison with both RCI World and RCI HPI. The example demonstrates significantly larger concentrations of papers in higher dynamic RCI classes in comparison to the world or the HPI. This UoE performs consistently above the HPI group in all higher classes (2 to 5). Taken together, these factors would provide strong support for UoE A to be considered by the Research Evaluation Committee (REC) for the higher rating compared to the high performer benchmark.

Figure 3: Dynamic RCI class distribution for UoE A against World and HPI distributions

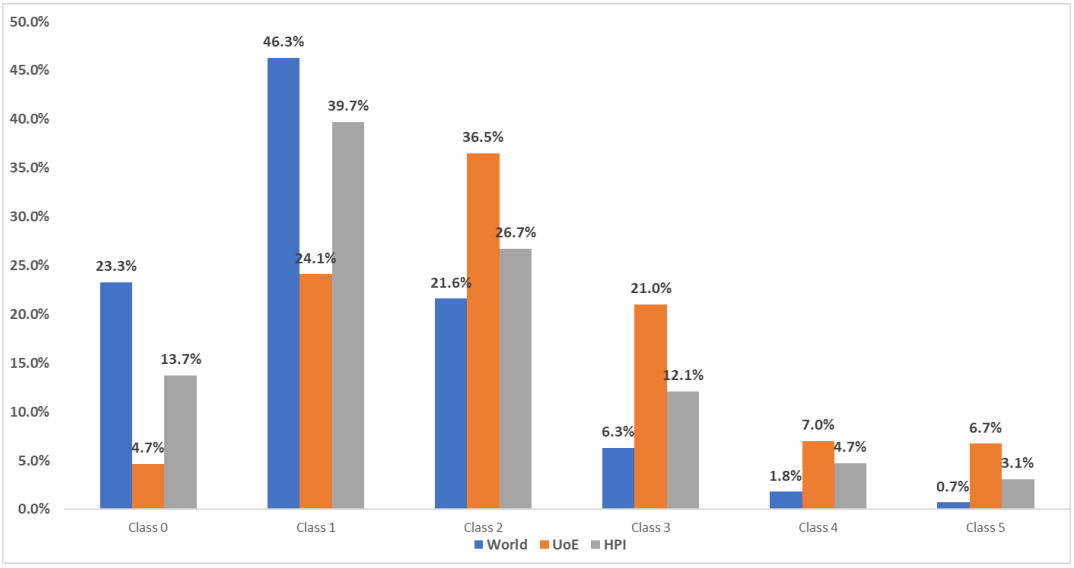
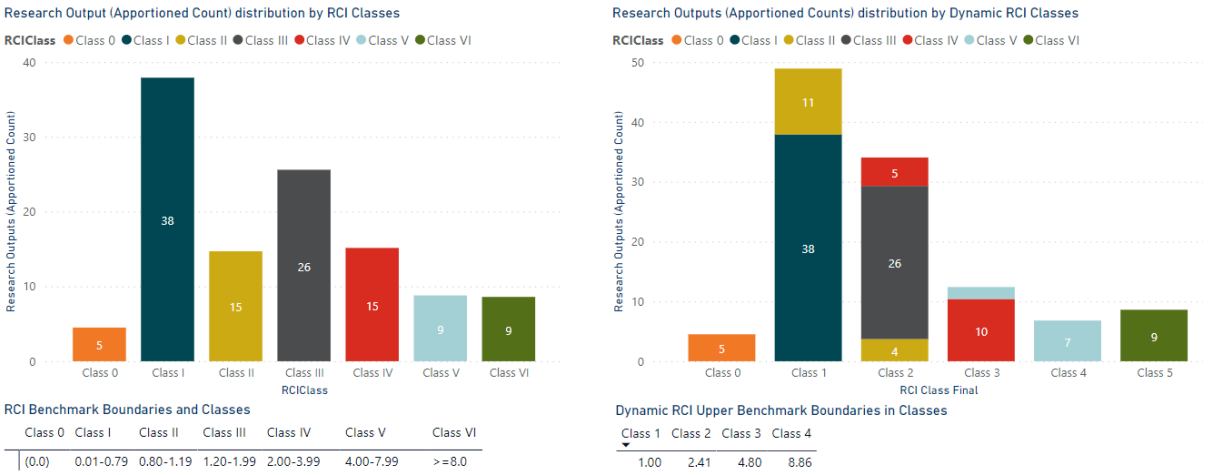


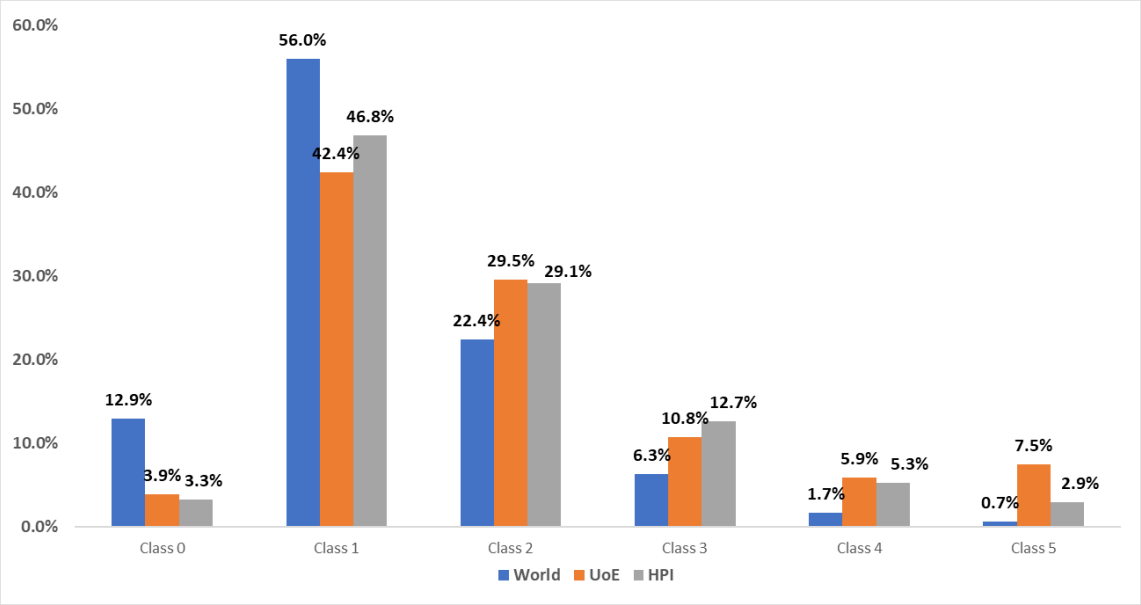
Figure 4 shows another scenario of the redistribution of papers for 'UoE B'.

Figure 4: RCI distributions for UoE B under original static RCI classes (left) and dynamic RCI classes (right)



Similarly, plotting the dynamic RCI class distribution for this UoE against the World and HPI distributions, in Figure 5, shows a small concentration of uncited and lowly cited papers in class 0 and class 1. While the UoE is performing better than world average, it is only comparable to the high performer benchmark, a factor that would be taken into consideration by the REC members in deciding its final rating.

Figure 5: Dynamic RCI class distribution for UoE B against World and HPI distributions



Appendix D – ERA indicator suite

The following is an example of the ERA indicator suite, compiled with ERA 2018 data. It demonstrates how a UoE in a citation analysis discipline would look when presented to the RECs for evaluation, comparing ERA 2018 methodology (left) with the new ERA 2023 methodology discussed in this paper (right). The example UoEs in this demonstration are same as the those discussed in Figure 2 to 5.

Example UoE A

ERA 2018 methodology

RCI Indicator

Indexed Publications and Citations against the World and Australian Benchmarks

Total Indexed Papers (Apportioned)	Institution RCI against:		% Papers Indexed	Contribution to Australian HEP FoR Total	
	World Benchmark	Aust. Benchmark		Papers	Citations
128.7	6.6	3	98%	3%	6%

World Centile Analysis Indicator

Distribution of papers based on world centile threshold and field average

Centile	UoE		Aust. HEP FoR Average % of papers (cumulative)	% Contribution to Aust. HEP FoR Total	% Papers Indexed
	No. of papers (cumulative)	% of papers (cumulative)			
1	12.7	10%	5%	7%	
5	33.7	26%	17%	5%	
10	53.7	42%	31%	5%	
25	89.70	70%	58%	4%	
50 (median)	112.70	88%	80%	4%	
Total	**128.70**	**100%**	**100%**		**98%**
Uncited	**6**				

ERA 2023 methodology

RCI Indicator

Indexed Publications and Citations against the World and HPI average

Total Indexed Papers (Apportioned)	Institution RCI against:		% Papers Indexed
	World Average	HPI Average	
128.7	6.6	3.0	98%

World Centile Analysis Indicator

Distribution of papers based on world centile threshold and field average

Centile	UoE		HPI FoR Average % of papers (cumulative)	% Papers Indexed
	No. of papers (cumulative)	% of papers (cumulative)		
1	12.7	10%	5%	
5	33.7	26%	14%	
10	53.7	42%	22%	
25	89.70	70%	41%	
50 (median)	112.70	88%	61%	
Total	**128.70**	**100%**		**98%**
Uncited	**6**			

RCI Class Profile Indicator - Table

Class	RCI Range	No. of papers	% papers	Aust.HEP FOR Average	% Contribution to Aust HEP FoR Total
Class 0	0	6	5%	9%	2%
Class I	0.01-0.79	23.00	18%	25%	2%
Class II	0.80-1.19	18	14%	14%	3%
Class III	1.20-1.99	21	16%	17%	3%
Class IV	2.00-3.99	34	26%	21%	4%
Class V	4.00-7.99	14	11%	9%	4%
Class VI	>=8.0	12.7	10%	5%	7%
Total		**128.70**	**100%**	**100%**	

RCI Class Comparison Indicator

Low RCI Class Count (Class 0 - I)	High RCI Class Count (Class IV - VI)	Proportion of High to Low
29	60.7	2.09

Dynamic RCI Class Profile Indicator - Table

Class	RCI Range	No. of papers	% papers	% Distribution of World Papers	% Distribution of HPI Papers
Class 0	0	6.0	4.7%	23.3%	13.7%
Class 1	0.01-1.00	31.0	24.1%	46.3%	39.7%
Class 2	1.01-2.60	47.0	36.5%	21.6%	26.7%
Class 3	2.61-5.14	27.0	21.0%	6.3%	12.1%
Class 4	5.15-9.30	9.0	7.0%	1.8%	4.7%
Class 5	>=9.31	8.7	6.7%	0.7%	3.1%
Total		**128.7**	**100.0%**	**100.0%**	**100.0%**

RCI Class Comparison Indicator (removed)

Example UoE B

ERA 2018 methodology

RCI Indicator

Indexed Publications and Citations against the World and Australian Benchmarks

Total Indexed Papers (Apportioned)	Institution RCI against:		% Papers Indexed	Contribution to Australian HEP FoR Total	
	World Benchmark	Aust. Benchmark		Papers	Citations
115.3	4.1	1.8	99%	1%	2%

World Centile Analysis Indicator

Distribution of papers based on world centile threshold and field average

Centile	UoE		Aust. HEP FoR Average % of papers (cumulative)	% Contribution to Aust. HEP FoR Total	% Papers Indexed
	No. of papers (cumulative)	% of papers (cumulative)			
1	8.6	7%	5%	2%	
5	22.1	19%	14%	2%	
10	29.8	26%	23%	1%	
25	59.20	51%	42%	2%	
50 (median)	83.90	73%	69%	1%	
Total	**115.30**	**100%**	**100%**		**99%**
Uncited	**4.5**				

RCI Class Profile Indicator - Table

Class	RCI Range	No. of papers	% papers	Aust.HEP FOR Average	% Contribution to Aust HEP FoR Total
Class 0	0	4.5	4%	4%	1%
Class I	0.01-0.79	37.90	33%	42%	<1
Class II	0.80-1.19	14.7	13%	13%	1%
Class III	1.20-1.99	25.6	22%	15%	2%
Class IV	2.00-3.99	15.2	13%	15%	1%
Class V	4.00-7.99	8.8	8%	6%	1%
Class VI	>=8.0	8.6	7%	4%	2%
Total		**128.70**	**100%**	**100%**	

RCI Class Comparison Indicator

Low RCI Class Count (Class 0 - I)	High RCI Class Count (Class IV - VI)	Proportion of High to Low
42	32.6	0.77

ERA 2023 methodology

RCI Indicator

Indexed Publications and Citations against the World and HPI average

Total Indexed Papers (Apportioned)	Institution RCI against:		% Papers Indexed
	World Average	HPI Average	
115.3	4.1	1.7	99%

World Centile Analysis Indicator

Distribution of papers based on world centile threshold and field average

Centile	UoE		HPI FoR Average % of papers (cumulative)	% Papers Indexed
	No. of papers (cumulative)	% of papers (cumulative)		
1	8.6	7%	6%	
5	22.1	19%	18%	
10	29.8	26%	27%	
25	59.20	51%	46%	
50 (median)	83.90	73%	69%	
Total	**115.30**	**100%**		**99%**
Uncited	**4.5**			

Dynamic RCI Class Profile Indicator - Table

Class	RCI Range	No. of papers	% papers	% Distribution of World Papers	% Distribution of HPI Papers
Class 0	0	4.5	3.9%	12.9%	3.3%
Class 1	0.01-1.00	48.9	42.4%	56.0%	46.8%
Class 2	1.01-2.41	34.1	29.5%	22.4%	29.1%
Class 3	2.42-4.80	12.4	10.8%	6.3%	12.7%
Class 4	4.81-8.86	6.8	5.9%	1.7%	5.3%
Class 5	>=8.86	8.6	7.5%	0.7%	2.9%
Total		**115.3**	**100.0%**	**100.0%**	**100.0%**

RCI Class Comparison Indicator (removed)

Appendix E – Summary of Questions

Section 2: Options for a more granular rating scale

Q2.1 Which rating option (A or B) is preferred?

Q2.2 Are there particular features of either option that should be adopted or modified?

Q2.3 How will the change in ratings shift university research efforts?

Q2.4 To what extent would the proposed options be more challenging for universities than the existing ERA rating scale?

Q2.5 What changes, if any, are required to the characteristics that accompany each rating level?

Q2.6 Would it be feasible for expert reviewers to draw meaningful distinctions between each rating points using the characteristics provided?

Q2.7 What kind of additional training or guidance may be required in ERA 2023 to support the revised rating scale?

Section 3: How can the citation metrics support the options for a revised rating scale?

Q3.1 How appropriate is the HPI as a method of supporting the rating scale options?

Q3.2 How appropriate are the dynamic RCI classes as a method of discipline-specific benchmarking?

Q3.3 How would the proposed citation methodologies impact research planning?

Q3.4 Do the new citation metrics support the drive for increased performance (especially in already high-performing disciplines)?

Q3.5 Is any additional criteria or information required in the citation disciplines to support the ratings at the highest end of each rating option?

Q3.6 Please provide any additional comments on the proposed citation methodology.

Section 4: How can the peer review indicator support the options for a revised rating scale?

Q4.1 To what extent are the proposed changes to peer review guidance likely to result in reports that are useful, informative and relevant for assessment panels? Please comment on any improvements that could be made, particularly with reference to disciplinary inclusivity and relevance to the options for the revised rating scale.

Q4.2 How feasible would it be for peer reviewers to address the proposed peer review guidance? Please comment on any improvements that could be made, particularly with reference to clarity and workload for reviewers.

Q4.3 How appropriate is the proposed guidance for Indigenous studies? Please comment on any improvements that could be made.

Q4.4 How would the proposed changes to peer review guidance impact universities and/or researchers?

Q4.5 Is any additional criteria or information required in the peer review disciplines to support the ratings at the highest end of each rating option?

Q4.6 Are there any other changes to peer review that the ARC should consider?