

# SCIENCE & TECHNOLOGY AUSTRALIA

## POLICY SUBMISSION

14 DECEMBER 2022

### REVIEW OF THE AUSTRALIAN RESEARCH COUNCIL

Science & Technology Australia is the peak body for the nation's science and technology sectors, representing 120 member organisations and more than 105,000 scientists and technologists. We connect science and technology with governments, business and the community to advance science's role in solving some of humanity's greatest challenges.

Science & Technology Australia's President, Professor Mark Hutchinson is one of the eminent panel members leading this review. Accordingly, Professor Hutchinson has not been involved in developing this submission, which reflects the views of the broad Science & Technology Australia membership.

#### 1. SCOPE AND PURPOSE OF THE ARC

Q1. *How could the purpose in the ARC Act be revised to reflect the current and future role of the ARC?*

*For example, should the ARC Act be amended to specify in legislation:*

- a. *the scope of research funding supported by the ARC;*
- b. *the balance of Discovery and Linkage research programs;*
- c. *the role of the ARC in actively shaping the research landscape in Australia; and/or*
- d. *any other functions?*

*If so, what scope, functions and role?*

*If not, please suggest alternative ways to clarify and define these functions.*

The Australian Research Council (ARC) is the cornerstone of Australia's research funding system.

It supports Australia's world-leading research and science capabilities by delivering more than \$800 million to researchers every year to pursue discovery and applied research.

Many of the ARC's critical functions are not explicitly stated in the [Australian Research Council Act 2001](#) (the ARC Act), yet they are crucial to the continued success and vitality of Australia's research capability and community. This glaring omission should be rectified.



### *Research supported by the ARC*

Currently, the National Health and Medical Research Council (NHMRC) awards \$800 million each year in grants and the Medical Research Future Fund (MRFF) awards around \$600 million each year to support health and medical research in Australia. The Australian Research Council awards around \$800 million a year by comparison.

Given the primacy and scale of the NHMRC and MRFF's roles to support health and medical research in Australia, the ARC should not broadly fund medical research.

The ARC's role is to support all of the other types of research Australia needs.

The key sections of the NHMRC Act that deal with research funding (Section 7(c); Section 51) clearly indicate the NHMRC's remit and the Medical Research Endowment Fund extends to medical research only.

The ARC Act should mirror this scope. It is not the role of the Australian Research Council to fund laboratory-based, clinical or community-based health and medical studies.

However, there remains a role for the ARC to fund research in areas of fundamental biological processes and understanding, and to develop new technologies, as defined by the [ARC Medical Research Policy](#). The ARC Medical Policy, issued in December 2020, is due for review in December 2022. The scheduled policy review is an opportunity to make the policy clearer and more explicitly delineate the boundaries for ARC funding.

A clearer policy would be of great benefit to both researchers and industry. We are aware of cases where researchers have had ARC grant applications ruled ineligible because part of the proposal was deemed to include elements of medical research. This suggests the definitions and boundaries of the ARC funding scope need to be better defined.

This ARC funding eligibility challenge is especially acute in the research fields of engineering and computing (especially in developing new devices and technology to improve our health). Researchers from these disciplines would typically not apply to the NHMRC nor be competitive in their programs. Precluding these types of research from the ARC would mean new sensor development for disease-screening or new apps and data tools for predictive health analytics research would not have any grant-funded support in Australia. Once such devices are developed, researchers can apply to the MRFF for funding to run patient trials – but they need earlier-stage funding not available through the NHMRC.

The ARC Medical Research Policy [examples](#) highlight this complex challenge. Science & Technology Australia recommends the ARC to address this issue in policy by placing an explicit limitation on budget usage for an ARC grant. Just as many other spending categories are excluded, the ARC should stipulate that grant funds cannot be spent on clinical, animal, and human research and trials.

### *Balance between Discovery and Linkage Programs*

The ARC's crucial role as the primary funding agency for discovery research in Australia supports the very foundations of Australia's STEM research capability.



The importance of this role has profound implications for Australia’s ability to produce world-leading science and research. This is especially important noting the biggest seismic breakthroughs in science and research have historically come from discovery or blue-sky research, not from translational or applied research. The ARC’s crucial role and responsibility for funding discovery research should be written into the legislation.

The ARC Act should specify a minimum split between funding for the Discovery and Linkage Programs – with at least 60 per cent of the ARC funding budget allocated to the ARC Discovery Program, and a maximum of 40 per cent of the ARC funding budget allocated to the ARC Linkage Program.

These percentages would reflect the fact that the ARC Linkage Program – by definition – involves external partners. Most often these are industry partners, and the project focuses on applied research that will benefit those industries. However, not all Linkage projects have a commercial nature and this scheme also supports ‘public good’ research with huge benefits to community partners and Australian society.

The ARC Linkage Program should be supported with ARC funding, but it is reasonable that industry partners commit to the research and contribute financially to these projects.

While the total size of ARC funding allocations are not in the scope of this review, as Australia’s research sector grows and strengthens Australia’s place in global research, the ARC budget must also grow. The annual funding determinations should be pegged to the size of the research sector – it is not tenable to expect Australian researchers to simply do more with less in an already competitive and constrained budget context for research institutions.

Australia’s investment in R&D sits at 1.79% of GDP – well below the average for the world’s advanced economies who are our fiercest competitors for the next wave of science and technology breakthroughs that will deliver new jobs, industries and sovereign capability. Ramping up investment in the ARC grants budget would be a powerful way to advance the Government’s election pledge to start to lift our national R&D investment “getting it closer to 3% of GDP”.

#### *Support for diversity and equity*

The Australian Research Council plays an important role supporting equity and diversity in the research sector, including through initiatives such as the Georgina Sweet and Kathleen Fitzpatrick Laureate Fellowships, and the Discovery Indigenous scheme. The goal of supporting equity and diversity should be included in the ARC purpose in the Act. The specifics of these schemes could then be detailed outside of the legislation.

Across the most recent grant rounds in both the Discovery and Linkage Programs, only one in three grants was awarded to women (see the data in Section 7 – Process improvements). There is vast scope for the ARC to bolster equity with policies to boost the proportion of women receiving grant funding. While the success *rates* of men and women applying for ARC funding are admirably around a 50:50 split across all assessment panels, there is still a significant disparity in the overall numbers of grants awarded to men compared to women. Shifting the culture across the sector will require targeted and focussed efforts to improve gender balance in funding.



Diversity extends beyond gender equity. Our research sector can only be strengthened by drawing on a broader range of perspectives from people from different social and ethnic backgrounds. We offer further insights on ways to strengthen diversity at Section 7 – Process Improvements.

#### *Clear articulation of funding scheme goals*

The ARC Act does not outline the purpose and strategic objectives for each ARC funding scheme. These schemes have all been designed to support specific areas of the research community, often in very specific ways. However, some schemes have evolved over time, with some of their original intent becoming diluted, lost or forgotten.

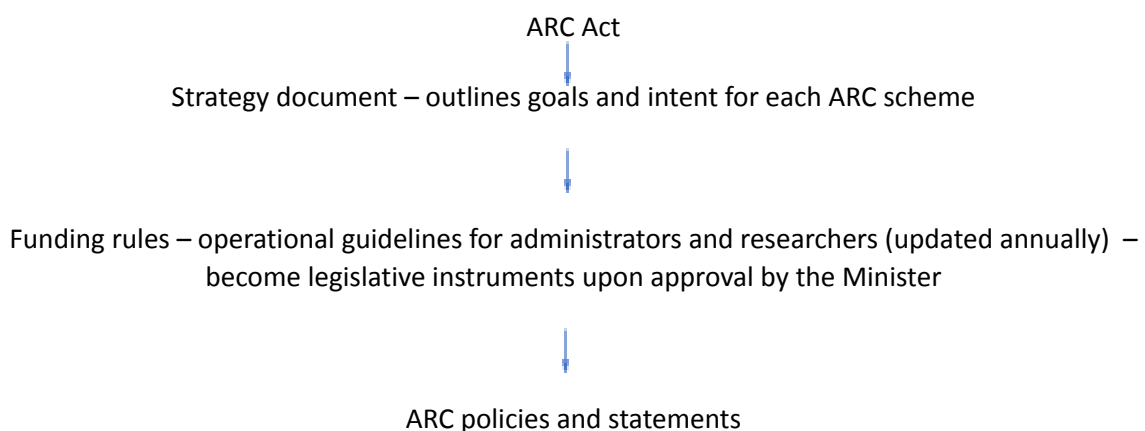
There is a gap in the current ARC documentation – somewhere between the ARC Act and scheme Funding Rules – where the purpose and goals of its funded schemes should be clearly articulated and documented. Without this important record, the purpose can become lost, leaving schemes vulnerable to changes and iterations that can undermine the original intent.

The specific goals and intent of each funding scheme should be clearly articulated in a transparent and robust strategy document. This could include:

- the targeted career stage
- the mode of support (project and/or salary)
- if equity and diversity measures are being supported
- targeted level of industry engagement
- if funding is to support infrastructure that ARC grantees need
- if the goal is to attract researchers back to Australia

This document should not be overly prescriptive – the ARC must retain flexibility and agility to adapt to the sector’s changing needs. But it should give clarity to all stakeholders – from researchers to Ministers – about the goals and purpose of each ARC funding scheme. To ensure accountability and transparency, the Act could require that the ARC Annual Report include data and trends reporting on progress towards equity and diversity goals.

This would produce a hierarchy of documentation to support the ARC operations:



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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 1:

The ARC purpose outlined in the Act should be amended to include its role to:

- Fund research across all non-medical disciplines, noting the NHMRC's primary role in funding medical research;
- Fund discovery research by enshrining in legislation a minimum split of total ARC funding allocated to the Discovery and Linkage Programs of 60:40; and
- Support equity and diversity in the research sector, including through:
  - specific funding schemes and fellowships; and
  - targeted policies to improve gender balance in funding.

### Science & Technology Australia recommendation 2:

Supplementary to the ARC Act, a comprehensive strategy document that outlines each ARC funding scheme and its goals should be developed. This document would give guidance to researchers, administrators, and government on the goals, intent and design of each scheme, and would link to the broader goals specified in the ARC Act (see above).

### Science & Technology Australia recommendation 3:

The ARC Act should mandate that:

- The ARC must produce and maintain a strategy document that outlines the goals, intent and design of each of its funding schemes; and
- In its annual report, the ARC must report on its progress towards achieving equity goals, or produce a separate dedicated report on progress towards these goals.

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## 2. GOVERNANCE AND MANAGEMENT

Q2. *Do you consider the current ARC governance model is adequate for the ARC to perform its functions?*

*If not, how could governance of the ARC be improved? For example, should the ARC Act be amended to incorporate a new governance model that establishes a Board on the model outlined in the consultation paper, or another model;*

*Please expand on your reasoning and/or provide alternative suggestions to enhance the governance, if you consider this to be important.*

The ARC governance structure must comprise people with direct and deep expertise in the sector. This helps to avert policy mis-steps and unintended consequences from changes to policy or initiatives. There are several ways to strengthen these arrangements.

Re-establishing an ARC Board as a statutory body would strengthen the agency's governance and accountability. A Board would have a stronger formal governance oversight role than an Advisory



Committee. This would also align the ARC governance structure more closely with bodies such as Industry Innovation and Science Australia.

While the current ARC CEO Advisory Committee offers valuable advice to guide the CEO on major issues, it currently has a limited remit and scope.

The Executive Director roles could be bolstered to play a stronger role in liaising with the sector and providing expert advice to the CEO and Executive team. This would provide important discipline-specific perspectives and representation. Empowering these roles to engage and consult with the sector would strengthen the ARC's operations enormously.

To strengthen the ARC's engagement with Aboriginal and Torres Strait Islander researchers, Science & Technology Australia proposes the ARC establish an Indigenous Advisory Group. This would be a high-level grouping of senior leaders from the research community who are Aboriginal and Torres Strait Islander people to advise the ARC on further expanding the ARC's support for Indigenous research and researchers.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 4:

**A statutory ARC Board should be re-established to strengthen the agency's governance and accountability.**

### Science & Technology Australia recommendation 5:

**The ARC Executive Director roles should be bolstered to play a stronger role in research sector liaison and engagement.**

### Science & Technology Australia recommendation 6:

**The ARC should establish an Indigenous Advisory Group to guide the ARC's expansion of support for Aboriginal and Torres Strait Islander research and researchers.**

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## 3. ACADEMIC EXPERTISE AND PEER REVIEW

*Q3. How could the Act be improved to ensure academic and research expertise is obtained and maintained to support the ARC?*

*How could this be done without the Act becoming overly prescriptive?*

The robust expert peer review system is the cornerstone of the ARC's competitive research selection process. It ensures the research funded by the ARC is of the highest quality.

Australia's competitive grants assessment systems are rigorous and thorough. The ARC College of Experts is drawn from Australia's leading scientists and researchers, who assess their peers' work in a comprehensive, multi-stage process. This work is done by reviewers mostly free of charge – a contribution that researchers make back to the sector. This ensures our nation's research is judged by



experts with the relevant expertise to understand highly specialised projects, their broader applications and international relevance. In some ARC grant schemes, typical grant applications can range from more than a hundred pages to several hundred pages long. Reviewers scrutinise this information carefully to ensure only top-quality research is recommended for funding.

[The Haldane Principle](#), a Westminster concept first articulated in 1918, holds:

*“decisions on individual research proposals are best taken by researchers themselves through peer review. This involves evaluating the quality, excellence and likely impact of science and research programmes and ensuring subsidiarity in decision making. It is accepted that there must be ministerial input into high level allocations between research themes, for national infrastructure and broader sector sustainability but that more granular decisions, for example the awarding of grants to specific research activities, should not be taken by Ministers or central government.”*

Enshrining in the ARC Act that ARC processes should adhere to the Haldane Principle would ensure that the peer review process is maintained and respected, without going to the length of detailing the peer review process itself in the Act.

While members of the College of Experts are remunerated for the time spent assessing applications, the primary level of peer review is conducted by researchers who volunteer their time. While researchers acknowledge that reviewing papers and grant applications is part of their job, without the contribution of their time the ARC’s peer review system would not function. This should be acknowledged, and administrative burden for reviewers kept to a minimum, but also their expertise be respected, as per the Haldane Principle.

As an example, the [Higher Education and Research Act 2017](#), which governs research funding in the UK, includes a stipulation that the minister must take the Haldane Principle into account when making grant funding decisions:

**103 Haldane principle, balanced funding and advice from UKRI**

(1) *The Secretary of State must have regard to the matters mentioned in subsection (2) when—*

- (a) *deciding to make a grant under section 101,*
- (b) *determining any terms and conditions of a grant under that section, or*
- (c) *giving a direction under section 102.*

(2) *The matters are—*

(a) *the Haldane principle, where the grant or direction mentioned in subsection (1) is in respect of functions exercisable by one or more of the Councils mentioned in section 95(1) pursuant to arrangements under that section,*

(b) *the balanced funding principle, in any case, and*

(c) *any advice provided to the Secretary of State by UKRI about the allocation of funding in relation to its functions.*

(3) *The “Haldane principle” is the principle that decisions on individual research proposals are best taken following an evaluation of the quality and likely impact of the proposals (such as a peer review process).*

(4) *The “balanced funding principle” is the principle that it is necessary to ensure that a reasonable balance is achieved in the allocation of funding as between—*





(a) *functions exercisable by the Councils mentioned in section 95(1) pursuant to arrangements under that section, and*

(b) *functions exercisable by Research England pursuant to arrangements under section 97.*

#### *Assessment by people with essential expertise*

It is essential that grant proposals be assessed by experts who appreciate the research proposal's full breadth. This is particularly relevant for inter- and trans-disciplinary research, where a proposal may not sit neatly in a single assessment panel. Appreciating the merit and value of such proposals is complex, but improvements should be made to the expert peer assessment process to give inter-disciplinary projects proper consideration.

One solution would be for the ARC to establish interdisciplinary panels, with dedicated expertise, to assess and carry proposals through the selection process, rather than assigning members from multiple panels to interdisciplinary projects.

Another option (also outlined in Section 7 – Process improvements) is to adjust the review process to have greater granularity against specific assessment criteria. This would give a more solid basis for assessments and improve accountability.

ARC Linkage Program grant proposals should also be assessed by discipline-specific assessment panels. The current system involves a unified/single panel with limited representation from expert domains. As proposals contain detailed and complex project descriptions, it is critical that assessors have sufficient expertise to properly understand and fairly assess projects' merit.

It would also be sensible for ARC Linkage, Infrastructure, Equipment and Facilities grant applications to be reviewed by national research infrastructure experts. Applicants should also indicate if and how the proposed new infrastructure would align or complement (and not duplicate) existing National Collaborative Research Infrastructure Strategy (NCRIS) facilities.

To properly support a robust and expert peer review process, the ARC could consider establishing diverse cohorts of expert reviewers who would serve as assessors for 2–4 years. The reviewers would receive training and be compensated for their time. This would also enhance equity and accountability in the system.

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### **RECOMMENDATIONS:**

#### **Science & Technology Australia recommendation 7:**

**To enshrine the importance of expert peer review in legislation, the ARC Act should be amended to state that the Minister's decisions must take account of the Haldane Principle.**

#### **Science & Technology Australia recommendation 8:**

**Expert peer review panels for ARC schemes should have capacity and the appropriate discipline/domain expertise to properly assess:**

- **inter- and trans-disciplinary research proposals;**





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- Linkage Program grant proposals – through inclusion of discipline/domain experts; and
  - ARC Linkage Infrastructure and Equipment and Facilities proposals – through inclusion of national research infrastructure experts.

Science & Technology Australia recommendation 9:

Grant proposals should be assessed against more granular assessment criteria.

Science & Technology Australia recommendation 10:

- The ARC should consider establishing cohorts of reviewers who serve for a set period of 2–4 years, receive training and are compensated fairly for their time.
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## 4. GRANT APPROVAL

Q4. *Should the ARC Act be amended to consolidate the pre-eminence or importance of peer review?*

*Please provide any specific suggestions you may have for amendment of the Act, and/or for non-legislative measures.*

The expert peer review process is rigorous and robust, ensuring that only the very best research proposals are recommended to the Minister for funding.

Academic freedom and the independence of research are key to the healthy operation of liberal and Westminster democracies. They are also crucial to the advancement of science and knowledge.

Adherence to the Haldane Principle would see the responsibility for assessing and awarding grant funding sit with experts within the relevant fields – the people best equipped to make such decisions.

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### RECOMMENDATIONS:

Science & Technology Australia recommendation 11:

**To enshrine the importance of peer review in legislation, the ARC Act should be amended to state that the Minister’s decisions must take account of the Haldane Principle.**

Science & Technology Australia recommendation 12:

**Where the Minister has doubts about the merits of a grant proposal, the Minister should approve the rest of the proposals in that round immediately so successful recipients can be advised under embargo. The Minister should refer any remaining proposals to the ARC Advisory Council/reprised ARC Board to assess for research excellence and whether proposals advance Australia’s National Science and Research Priorities and the national interest.**

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## 5. NATIONAL INTEREST TEST

Q5. *Please provide suggestions on how the ARC, researchers and universities can better preserve and strengthen the social licence for public funding of research?*

The [recently announced changes to the National Interest Test](#) are sensible.

These include a new stipulation that the NIT statement will be considered by assessors as part of expert peer review process, and that Deputy Vice-Chancellors Research at universities are required to sign off on the NIT before applications are submitted.

Science & Technology Australia suggests the National Interest Test be renamed the National Interest Statement. This reframes the intent from being a 'test' - language which has caused significant consternation in Australia's research sector.

The National Interest Statement differs from other 'plain English' or brief project descriptions on grant applications. The 'application project summary' is intended for academic peers, or perhaps the broader research community.

By contrast, the National Interest Statement is another way to communicate research and its value to a broader audience – an audience that encompasses policymakers, the Minister who signs off on the grants, Parliamentarians and the general public. ARC communications should reflect this purpose clearly, and acknowledge that the 'national interest' is also strongly served through work that deepens Australia's relationships with global partners, or benefits countries in our region.

To further strengthen research communication, the ARC should also resource advanced communications training for researchers. As an experienced provider of high-quality communications training and resources to the research sector, Science & Technology Australia would be an ideal partner to deliver such training.

Finally, to assist with searchability of research projects (including by the public, industry, philanthropists and policymakers), the ARC could add to its application form a simple checkbox list of the sectors or areas of Australian society the research will benefit – agriculture, the arts, social policy, health, future technologies, etc. This would enable industry partners and others to more easily identify research projects that could be applied to their work. This could enable philanthropic funders to boost funding for promising research and extend the impact of ARC grant funding.

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### RECOMMENDATIONS:

**Science & Technology Australia recommendation 13:**

**The National Interest Test should be renamed the National Interest Statement.**

**Science & Technology Australia recommendation 14:**

**ARC communications should clearly explain the purpose and benefits of the National Interest Statement to the research community.**

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**Science & Technology Australia recommendation 15:**

**The ARC should invest in advanced communications training for ARC-funded researchers to deepen the impact and public visibility of ARC-funded research.**

**Science & Technology Australia recommendation 16:**

**The ARC should create a simple checkbox list of the sectors or areas of Australian society the research will benefit – such as agriculture, the arts, social policy, health, future technologies, etc. This would enable industry partners and others to easily identify research projects that could benefit their sectors.**

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## 6. ADMINISTRATIVE BURDEN

*Q6. What elements of ARC processes or practices create administrative burdens and/or duplication of effort for researchers, research offices and research partners?*

ARC grant application processes are detailed and complex, generally requiring extensive information about a project's aims, methodology and granular budget. While the ARC grant application process must be rigorous and require enough information to effectively judge the proposal's merits, currently countless hours of researchers' time is spent preparing very large grant applications every year. Given the very low success rates on grant applications, this workload is a productivity sinkhole that devours vast amounts of the time, talents and deep expertise of Australia's scientists and researchers.

*Remove duplication and unnecessary detail in grant applications*

A careful audit should be conducted of all ARC processes to remove duplication and unnecessary bureaucratic requests. For example, rather than rejecting/penalising applications for using the incorrect font size, an alternative approach could be to clearly note that all parts of the application must be clearly legible or reviewers will not assess part or all of the proposal. This puts responsibility on the applicant to provide a clearly presented proposal, rather than unnecessarily demanding researchers and the ARC to check minor typographical details in grant proposals.

*Move to a two-stage application process*

Science & Technology Australia recommends the ARC shift as many schemes as possible to a two-stage process. A stripped-down proposal would be assessed as the first stage, with a more detailed proposal then requested for proposals that are deemed of sufficient quality to progress to the next round. This would significantly reduce the unnecessary burden to researchers and expert assessors, and the ARC itself. This is a powerful reform whose time has come.

Australia's research community strongly supports such a move – a 2013 survey of NHMRC applicants found that 73 per cent of respondents favoured a two-stage application process.



### *Streamline budget details in grant applications*

The current ARC grant application process requires excessively detailed budget descriptions that ask researchers to predict the costs – to the dollar – of very specific aspects of a project years in advance of doing the actual work. These budgets are then scrutinised in detail by assessors, which also takes valuable time that could be used more efficiently. Given that Discovery Projects are only funded on average at a rate of around 72 per cent<sup>1</sup>, requiring such detailed budgets, and spending extended amounts of assessors' time scrutinising them is a waste of time for applicants and assessors alike.

A practical solution would be to establish budget 'bands' according to project discipline and the type of work it entails – theoretical, experimental, field-based or a combination of these. These bands would need to be set to appropriate levels to be internationally competitive.

Applicants would select the appropriate band for their proposed project, and provide a justification should their project require increased funding. Given that expenditure is governed by funding rules and audits, and researchers must all provide a detailed budget acquittal at the project's conclusion, this simplified budget mechanism would not pose any risks, and save countless hours in lost productivity.

### *Improve visibility and access for other funding sources*

A simple yet potentially powerful tool to boost support for university researchers is to make all unsuccessful ARC grant proposals available in a searchable database for external funders – other government agencies, philanthropic organisations – to identify projects of interest. This would potentially streamline government granting processes and enable other research funding agencies to better reach into the vast array of university research. ARC application forms would need to include an additional tick box for applicants to indicate they agree to their proposal's details being made available to external agencies should it be unsuccessful for ARC funding.

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## **RECOMMENDATIONS:**

### **Science & Technology Australia recommendation 17:**

**The ARC (or an independent entity) should conduct a comprehensive audit of all scheme application processes to identify and remove duplication and requests for unnecessary levels of detail.**

### **Science & Technology Australia recommendation 18:**

**Grant processes should be streamlined wherever possible, with applications moving to a two-stage process in all schemes where this can be applied.**

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<sup>1</sup> According to [ARC Discovery Project Selection Outcome Reports](#), return rates on requested funds for projects during the past 5 rounds were: DP 2019: 73.6%; DP 2020: 70.7%; DP 2021: 70.0%; DP 2022: 71.4%; DP 2023: 72.5%.



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**Science & Technology Australia recommendation 19:**

To dramatically bolster productivity, the ARC should create budget ‘bands’ based on the project discipline and the type of work it entails – theoretical, experimental, field-based or a combination of these. Applicants would select the relevant band for their project (with a justification if they wish to apply for a higher level).

**Science & Technology Australia recommendation 20:**

The ARC should make unsuccessful proposal details available in a searchable database for external funders to identify any projects of interest. This would require amending ARC application forms to give their consent for their project details to be included.

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## 7. PROCESS IMPROVEMENTS

Q7. *What improvements could be made:*

- a. *to ARC processes to promote excellence, improve agility, and better facilitate globally collaborative research and partnerships while maintaining rigour, excellence and peer review at an international standard?*
- b. *to the ARC Act to give effect to these process improvements, or do you suggest other means? Please include examples of success or best practice from other countries or communities if you have direct experience of these.*

**Of all the urgent issues to be considered in this review, the single most imperative issue that Australia must fix is the chronic job insecurity we inflict on too many of our nation’s brilliant scientists and researchers.**

**We urge the Review Panel and the Minister not to miss their moment in history and take this chance to fix this.**

Currently, too many of Australia’s scientists – especially in the early years of a research career – are stuck in morale-sapping repeated cycles on short-term research contracts.

Chronic job insecurity in science is driving too many great Australian scientists and technologists overseas or out of research altogether. It is a powerful factor driving the loss of talented women out of STEM research careers, exacerbating the ‘leaky pipeline’ for women in STEM.

**Given we invest up to million dollars in training each highly skilled researcher across their education and research careers, this is a shocking waste of talent and expertise. It undermines Australia’s returns on this powerful national strategic investment.**

More secure conditions and better support for STEM research will help attract great Australian science and technology talent back home – and entice the world’s best and brightest minds here to Australia.



*A fixed timetable, delivered on time*

Adding to workforce uncertainty, the timelines for ARC grant processes have become less defined over recent years, with long delays between applications closing and announcements being made.

We welcome the Minister for Education Jason Clare's instruction in his [Statement of Expectations to the ARC](#) that all future 'grants rounds are delivered on time, to a predetermined timeframe.'

Science & Technology Australia recommends a fixed timetable for future ARC grant rounds be included in the annual amendment to the Act that must pass the Parliament to determine the annual funding cap.

This would include:

- The opening date for each scheme
- The closing date for each scheme
- The announcement date of all grants under each scheme

This would set the timeline for grant processes in stone, giving both researchers and industry the certainty they need to plan their work, recruit key staff, and confirm industry partnerships. The time between applications closing and announcements being made should be kept to a minimum. While this will vary from scheme to scheme, this time should not exceed 6 months for Discovery Program proposals, and 4 months for Linkage Program proposals.

The established timeframe should take into account the NHMRC grant timelines as well as holiday periods. Deadlines should be set that do not force researchers – particularly those with family and caring responsibilities – to develop grant applications over holiday periods, especially the Christmas and summer period.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 21:

**The amendment to the ARC Act that must pass Parliament each year to determine the annual funding cap should include specific dates for each scheme for at least the next year, and ideally the next two years, specifying:**

- **The opening date for each scheme;**
- **The closing date for each scheme; and**
- **The announcement date of all grants under each scheme (ideally no more than 6 months after applications close for Discovery Program proposals and 4 months for Linkage Program proposals).**

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*Improved job security through longer grant lengths*

The ARC's Discovery Program includes both fellowships (which fund researchers' salary and project funding) and grants for project funding:



- Discovery Early Career Research Award Fellowships – 3 years
- Future Fellowships – 4 years
- Laureate Fellowships – 5 years
- Discovery Indigenous
  - Discovery Australian Aboriginal and Torres Strait Islander Awards – up to 5 years
  - Discovery Indigenous projects – \$30,000–500,000 for up to 5 years
- Discovery Projects – \$30,000–500,000 for up to 5 years

Although Discovery Project grants can be requested for a 5-year duration, grants are rarely ever funded for their full budget, and a 3-year duration is the norm. To properly fund their work, researchers often hold two Discovery Project grants concurrently as the Chief Investigator.

This can create a perverse situation where the prestige and boost to a researcher’s track record gained from holding an ARC grant helps them to win another grant – to the disadvantage of promising early- and mid-career researchers who are yet to establish their track records.

A shift in ARC policy to stipulate that researchers can only be Chief Investigator on a single grant at any given time would help address this issue. However, such a bold rule change should only be contemplated as a package of reforms with an increase in grant lengths and funding amounts – and significantly better success rates overall.

While a researcher could only hold one ARC Discovery Project grant at a time, that grant would be better funded, and likely longer-term, giving them greater security and stability. The ARC should consult the sector to explore the implications of such a reform before implementing such a plan.

These longer-term grants could have a 3-year review point at which researchers are required to report on progress to the ARC – sufficient progress would be required to approve the additional two years of funding.

This limit would only be applied to Chief Investigators. Early- and mid-career researchers submitting applications in collaboration with more senior researchers could still name the senior researchers on the grant proposal ‘Associate Investigator’ role or similar.

Extended grant lengths are also critical for disciplines in which longitudinal studies are essential to improving understanding of physical and natural processes. Changes in ecosystem dynamics, as one example, occur over decades – not a three-year funding cycle. In many cases, the quantum of funding needed would not be significantly greater – researchers just need security of long-term funding to properly design and carry out effective research projects, particularly on crucial environmental science.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 22:

**Discovery Project funding should be increased to fully cover the project costs and extended grant lengths, making grants of five years the norm instead of the exception. Projects with**

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**specific needs for longer-term funding should be permitted to apply for funding to extend for up to 10 years, with review periods.**

**Science & Technology Australia recommendation 23:**

**The ARC should explore the option and consult with the sector on the potential implications of allowing researchers to be the Chief Investigator on only one Discovery Project grant at any one time**

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*Extended Fellowships for the best and brightest*

Another powerful way to improve job security in the early stages of research careers and shore up Australia's research talent pipeline would be to fund a selected number of longer-term – 7 or 10-year – fellowships for the top five percent of DECRA applicants.

While this would deliver more job security for a small number of people, it would be a strong reform to secure our best and brightest talent and deliver security early in their career. This would give Australia the best chance to develop the deep expertise needed to realise Australia's ambition to become a global STEM superpower. Given the DECRA scheme is currently extremely competitive, the ARC could model how this might affect the scheme and consult with the sector on the potential implications.

To help end the brain drain, a new targeted funding scheme for long-term Fellowships could be created to bring home brilliant Australian scientists and researchers working overseas, in countries where they currently have access to apply for long-term Fellowships.

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**RECOMMENDATIONS:**

**Science & Technology Australia recommendation 24:**

**The ARC could consider awarding the top five per cent of ARC DECRA applicants a 'Special Talent' Fellowship that runs for seven or 10 years. The ARC should model the implications of this change and consult with the sector.**

**Science & Technology Australia recommendation 25:**

**The ARC should introduce a 'Returning Australians Fellowship' – a long-term fellowship (including project funding) to entice top Australian STEM researchers back to Australia.**

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*End the repeated cycles of short-term contracts*

To break the insecure cycle of researchers being hired on repeated short-term contracts throughout their careers, employing institutions should be required to employ researchers funded by grants for the full length of the grant, or a minimum of three years, as a condition of each ARC grant.



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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 26:

**Employing institutions should be required to employ researchers funded by grants on contracts covering the full grant length, or a minimum of three years, as a funding condition on all ARC grants.**

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#### *Allow early- and mid-career researchers to draw salary from Discovery Project funding*

Science & Technology Australia recognises ARC funding is not the sole funding source for Australia's university researchers. The Department of Education also delivers the Research Block Grant funding, which supports university research (the Research Support Program) and PhD students (the Research Training Program). Australia's medical research institutes do not have access to this funding pool, and as such, NHMRC grants allow researchers to also draw salaries. However, early- and mid-career researchers who do not hold a continuing position at their university are disproportionately affected by being unable to draw any salary from an ARC Discovery Project grant.

Another way to support Australia's research talent pipeline is to allow early- and mid-career researchers who do not hold a continuing position at their university to draw salary (or part of it) from Discovery Project funding. This would give greater security to talented researchers and reduce their need to spend their valuable time searching for both salary and project funding during critical career stages – which often coincide with the time of a researcher's life when they may be considering starting a family or trying to secure a mortgage.

This would also give greater recognition to the many early-career researchers who invest time and expertise developing grant applications with their teams. They effectively 'ghost-write' significant sections – the clause that currently prevents them from drawing salaries means they can not be named on the grant. They are reduced to just hoping that they will be employed should the proposal be successful. Allowing early- and mid-career researchers to draw salaries would replace this questionable practice with a transparent process and effectively mirror approaches in NHMRC schemes.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 27:

**Early- and mid-career researchers who do not hold a continuing position should be allowed to be named as Chief Investigators and draw salary from Discovery Project funding.**

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#### *Security for PhD students*

Our PhD students are a powerhouse of Australia's research workforce – our students carry out a vast amount of research work, assist with teaching, tutoring and often fill other support roles for senior



researchers. The PhD process is challenging and arduous, and our students deserve to be well supported. The [Department of Education Research Training Program minimum PhD stipend for 2023 will be \\$29,863](#) a year. While tax free, this is well below [minimum wage](#), and students do not get superannuation payments.

Where ARC project funding is used to support a higher degree by research candidate (PhD or Masters by Research student), the ARC should mandate a minimum stipend amount – whether this is drawn wholly from ARC funds or through a combination of ARC funding and other top-up funding.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 28:

**Where ARC funding is used to support a PhD student, the ARC should mandate a minimum level of stipend funding (either through ARC funds or other funding top-ups).**

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#### *More emphasis on ideas, less emphasis on track record*

The extremely competitive nature of the Discovery Project scheme means the vast majority of proposals rely on previous work, or preliminary data as part of the project application – pure ideas are rarely funded. Given the Discovery Program’s purpose to support truly foundational, blue-sky research, it would be a huge boost to the sector if more ideas-based proposals could be funded.

For non-fellowship grant applications, there should be less emphasis placed on the Chief Investigator criteria. Many early- and mid-career researchers may not have as impressive a track record, even if their record clearly shows they are capable of carrying out the research. Track record assessments for Discovery Project grants should only consider whether or not the team is suitable for the project.

#### *Increased support for equity and diversity*

While the ARC funding programs have admirable results for success rates for women and men of a 50:50 split across the discipline panels, the overall numbers of grant recipients show a different story. Across the most recent grant rounds in both the ARC Discovery and Linkage Programs, only one in three grants was awarded to women.

**Table 1. Number of grants and success rates by Chief Investigator gender for the most recent rounds of the ARC Discovery and Linkage schemes.**

	Women			Men			Did not specify gender		
	No. of grants	% of grants	Success rate	No. of grants	% of grants	Success rate	No. of grants	% of grants	Success rate
Laureate Fellowships 2022	44	27.5	11.4	115	71.9	9.6	1	0.6	-



Future Fellowships 2022	209	33.3	15.3	415	66.2	16.4	3	0.5	-
DECRA 2023	539	40.4	16.0	785	58.8	14.4	11	0.8	9.1
Discovery Projects 2023	2111	32.5	19.6	4349	67.0	18.9	29	0.4	27.6
Discovery Indigenous 2023	64	68.8	41.0	29	31.2	30.0		0.0	
Linkage 2021 Rd 3	306	37.1	31.4	516	62.6	31.8	2	0.2	-
Linkage 2021 Rd 2	223	32.0	35.9	468	67.1	30.3	6	0.9	16.7
Linkage 2021 Rd 1	189	34.8	35.4	353	65.0	34.0	1	0.2	100.0
LIEF 2023	371	26.3	37.7	1037	73.6	34.5	1	0.1	-
<b>Total grants</b>	<b>4056</b>	<b>33.3</b>		<b>8067</b>	<b>66.2</b>		<b>54</b>	<b>0.4</b>	

Data sourced from [ARC Selection Outcome Reports](#).

Bold and ambitious measures are needed to shift the culture in the research sector and promote gender equity. Structural changes are urgently needed to boost the numbers of women at the higher levels of research careers. **Aiming for parity only in success rates will not actively shift the status quo – we must create conditions for equal application numbers as well as equal success rates.** This may require a nuanced approach, through a series of stepped targets over time, as women’s representation differs markedly across the disciplines supported by ARC funding.

There are several measures the ARC could consider:

- Ensure the parity in application success rates between women and men extends beyond the assessment panel level (which comprise several disciplines grouped together) to more granular discipline levels – and publish this data to enable transparency. While overall panel success rates show gender parity, this result is likely skewed by uneven success rates in some disciplines – this can not be judged effectively from the currently available data.
- Report publicly on gender balance of successful ARC grant applicants across the different career stages.
- Report publicly on the gender balance of project teams, as well as Chief Investigators.
- Report publicly on funding amounts allocated to men and women.

Shifting to a ‘banded’ budget method proposed earlier in this submission would also help improve equity in funding allocations. It is common across research funding areas that women request smaller overall budgets. Shifting to set budget bands would eliminate this underlying bias in total funding amounts awarded according to gender.

Diversity also extends beyond gender equity. While the ARC reports on funding allocated to ‘Australian citizens’, ‘Foreign nationals’ and ‘Returning Australians’ in Fellowship rounds, it would be



useful to report on other diversity factors: ethnicity of Fellows and Chief Investigators, geography and regionality, and reported career interruptions.

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### **RECOMMENDATIONS:**

#### **Science & Technology Australia recommendation 29:**

**To further support gender equity across ARC funding programs, the ARC should:**

- ensure the success rate parity between women and men extends beyond the assessment panel level to more granular discipline levels;
- report on the gender balance of successful applicants across the different career stages;
- report on the gender balance of ARC-funded project teams, as well as Chief Investigators; and
- report on funding amounts allocated to men and women.

#### **Science & Technology Australia recommendation 30:**

**To further support broader diversity across ARC funding programs, the ARC should report publicly on several additional diversity measures, including:**

- ethnicity of Fellows and Chief Investigators;
  - geography and regionality of Fellows and Chief Investigators; and
  - reported career interruptions
- 

#### *Funding rules consultation*

The Act requires the ARC to prepare funding rules for each scheme each year. The rules must be approved by the Minister and, upon approval, become legislative instruments.

It is important the ARC rebuilds a strong culture of consultation with the sector. In the past, funding rules have been shared with the sector as an 'exposure draft' with an opportunity for the ARC to receive and act on feedback. There is not currently any opportunity for the sector to provide feedback on proposed changes to funding rules, dramatically elevating the risk of unintended consequences and policy mis-steps. For individual researchers, this can be disastrous for careers when sudden changes to one funding scheme affects their participation in other schemes.

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### **RECOMMENDATIONS:**

#### **Science & Technology Australia recommendation 31:**

**To build trust and improve consultation across the sector, scheme funding rules should be prepared well in advance of new rounds and provided in exposure draft form for the sector to give feedback.**

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### *Stronger transparency*

Researchers would also benefit from stronger transparency in grant proposal assessment processes. During the process, applicants receive comments (but no scores). The applicants respond to these using the rejoinder process. It is well known in the community that the comments often do not align with the scores assessors submit in the system. At the final stage, unsuccessful applicants can view feedback in the application portal which is categorised by bands and a mix of 'normalised' and 'raw' scores. Even in this case, no scores are provided. The final bands of feedback often do not correlate to assessor comments during the rejoinder phase.

This lack of transparency has resulted in an increasing number of applications using Freedom of Information requests to seek actual scores. When this information is available and can be legally obtained, it would be more practical to provide it at every stage. Most significantly, if assessor scores do not match the comments, applicants and research offices can then flag the discrepancy.

Weightings and scores applied to various elements in the proposal should also be made clearer, with assessors assigning scores against every criteria. This information should be available to applicants.

Grant proposal assessment should also include a clear process for valuing applicants' contributions to the nation and their local community. This may include researchers who do outreach to disadvantaged schools and community groups, who share their research publicly with the wider community or contribute to public policy development. These contributions are often not well recognised or valued in the assessment process.

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## **RECOMMENDATIONS:**

### **Science & Technology Australia recommendation 32:**

**Assessment processes should be made more transparent, with mandated weightings assigned to each selection criteria. Granular scoring against each category, which is common in most international schemes, should be adopted. Scores against each criteria should be made available to applicants as a matter of standard procedure.**

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## **8. ERA AND EI**

*Q8. With respect to ERA and EI:*

*Do you believe there is a need for a highly rigorous, retrospective excellence and impact assessment exercise, particularly in the absence of a link to funding?*

*What other evaluation measures or approaches (e.g. data driven approaches) could be deployed to inform research standards and future academic capability that are relevant to all disciplines, without increasing the administrative burden?*

*Should the ARC Act be amended to reference a research quality, engagement and impact assessment function, however conducted?*

*If so, should that reference include the function of developing new methods in research assessment and keeping up with best practice and global insights?*



Given the Provider Category Standards now rely on universities meeting a required level of research excellence, some reporting capability will need to be maintained. However, the current ERA process is arduous and burdensome for both universities and the ARC, and draws funding and resources that could otherwise fund research.

The imperative is to create a more streamlined, data-driven, efficient approach that delivers valuable data to highlight Australia's research excellence, and also properly acknowledges the many and varied contributions research makes to Australian society. This should be done without consuming vast amounts of staff time at both universities and the Australian Research Council.

The ARC should develop a research excellence analysis unit to produce field-weighted citation analysis and other metrics-based assessments of Australia's research quality. However, this approach must consider how best to assess inter-disciplinary work and collaborative projects so as not to inadvertently create a disincentive to engaging in these.

However, metrics and citations only tell part of the story. Research impact and measures of contributions university research makes to the public good can not necessarily be measured through academic citations. It is important to recognise the broader benefits of research and the benefits it brings to the broader community. One way to do this that would be significantly less burdensome than the current Engagement and Impact assessment would be to conduct random audits of a small percentage of publicly funded research projects. These audits would assess the contributions the research made and its value to society.

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## RECOMMENDATIONS:

### Science & Technology Australia recommendation 33:

**The ARC should develop a data analysis and research excellence unit that could carry out a significantly less burdensome research excellence process that includes measures to assess research impact and broader community contributions.**

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## 9. OTHER COMMENTS

Q10. *Having regard to the Review's Terms of Reference, the ARC Act itself, the function, structure and operation of the ARC, and the current and potential role of the ARC in fostering excellent Australian research of global significance, do you have any other comments or suggestions?*

The importance of Australia's STEM research capability to the nation can not be overstated.





To thrive, our nation requires a strong economy, driven by innovation and advancements in science and technology that push the boundaries of knowledge and advance our nation's productivity, wellbeing and prosperity.

Indicators like the global [Economic Complexity Index](#), the [Harvard Atlas of Economic Complexity](#) and the [Global Innovation Index](#) show strong connections between robust R&D funding and economic complexity and innovation.

Investment in R&D – every dollar the ARC allocates in research funding – is money well spent. To keep our place in the global research race and become a global STEM superpower, we need to support our research workforce and draw on their skills, knowledge and expertise. To do this, we need to equip our scientists with secure funding, and the secure conditions they need to flourish.

The Medical Research Future Fund dramatically changed the game for applied medical research in Australia. This targeted and long-term investment has yielded a pool of funding that will – and already has) – enable critical breakthroughs in medical research and its application to benefit our nation.

**It's time for a new Science and Technology Future Fund that will shore up our nation's capability in both discovery and applied research – a fund that can support long-term, patient investment in our talented scientists and technologists and science entrepreneurs to lead Australia into the future that will rely on scientific and technological expertise.** Projects supported through a STEM Future Fund will generate solutions and technologies for opportunities and challenges of the future. Establishing such a fund led by government, but also attractive to corporate and philanthropic donors, will allow stable and high-impact research that will secure Australia for 2050 and beyond.

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