

SUBMISSION

Submission to the Australian Research Council

Submission to the Policy Review of the National Competitive Grants Program

13 May 2023

The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.

The Australian Research Council's (ARC) National Competitive Grants Program (NCGP) is the second largest direct source of research funding for Australian research, and the largest source of support for non-medical fundamental research¹. As such, the NCGP is a lynchpin of Australia's research and development (R&D) landscape. Nonetheless, it is just one of many sources of R&D support – with programs spread across around a dozen departments. Expecting the ARC to fulfil every role within the R&D ecosystem will result in funds being spread too thin and schemes being less effective. The ARC through its Discovery programs and advice to government should be a champion for the essential research that forms the foundation upon which major discoveries are built – curiosity-driven research, interdisciplinary projects, null finding research and replication studies. This would enable a more cohesive research funding landscape with other funding schemes responsible for R&D at later Technology Readiness Levels or that directly aligns with government priorities. While the current consultation focuses on the NCGP, a broader and more comprehensive review of the research landscape is needed with an aim to increasing Australia's overall R&D spending and improving the impact of Australian research.

ATSE makes the following recommendations:

Recommendation 1: Use the NCGP to champion fundamental, interdisciplinary, null result, and replication research by ensuring quarantined grant funding for these purposes that are not tied to government research priorities.

Recommendation 2: Initiate a broader review of the Australian R&D ecosystem with a view towards increasing overall R&D expenditure to 3% of GDP, in line with our international competitors.

Recommendation 3: Develop a funding scheme to cover the full cost of research to ensure institutions hosting NCGP awardees are not left out of pocket.

Recommendation 4: Implement a two-stage grant application process for all NCGP grants.

Recommendation 5: Embed structural and practical evidence-based measures to ensure diversity amongst grant recipients.

Recommendation 6: Increase the funding period of major grants through longer grant lengths or by allowing extension applications for world class impactful research.

Supporting both fundamental research and government priorities

One of the NCGP's greatest strengths has been its support for fundamental research. Fundamental and curiosity driven research leads to unforeseen breakthroughs, new research avenues and forms the basis upon which future products and services are developed. Not all fundamental research can or will produce an economic benefit within a defined timeframe, but determining which project will do so in advance is near impossible. The ARC must champion fundamental research, using the NCGP to promote high quality curiosity-driven research over incremental advances. Greater tolerance of null results is needed, recognising that findings that fail to support the hypothesis are important for scientific progress and reliability. Similarly, greater investment in replication research, which can corroborate previous research and prevent years of wasted research and research investment, needs to be more highly valued in grant funding.

This does not preclude support for research aligned to government priorities, nor should it stop the ARC from supporting research translation - both of which are essential to gaining the maximum societal benefit from research. This support, however, should be separate from schemes supporting fundamental research and must not impinge on the ARC's ability to support genuine curiosity driven research. There is a role for the ARC to play in supporting research translation and government priorities, but these must come as separate schemes that do not impinge on support for fundamental research. There are opportunities for the ARC to feed into programs supporting government priorities – for example, by establishing a coordinated grant application process that enables the ARC to feed near miss grant applications that address government priorities or are eligible for later stage research translation funding into other grant opportunities.

The research funding ecosystem needs to be considered as a whole, and support for changing government priorities can be effectively addressed through funding schemes that are separate from the Discovery or Linkage Programs. A broader review of the Australian research ecosystem is needed to ensure that the system is meeting the needs of the nation. This position is supported by the recommendations of the

¹ Based on 2023-24 Budget figures.

Australian Universities Accord, which also called for a comprehensive research funding review (O’Kane et al., 2024). Such a review should incorporate the ARC, NHMRC, R&D tax incentives and other grants and programs designed to support Australian R&D across the entire R&D pipeline.

This review should be a part of a concerted effort to raise R&D funding in Australia to meet our international competitors. The United States, Germany and Japan all spend more than 3% of their GDP annually on R&D – Australia currently spends just 1.68%. This imbalance gives highly skilled Australian researchers incentives to exit the Australian research sector in search of more secure careers elsewhere. It also risks the ARC’s vision of supporting “world-class research and innovation for the advancement of Australian society” (Australian Research Council, 2022). While funding decisions are outside the purview of the ARC itself, any review of the NCGP must recognise that the efficacy and adequacy of the program is dependent on the funding pool reflecting the desired size and impact of Australia’s R&D. Research funding outside of the ARC should not be entirely from government sources – Australian industry too must raise its R&D profile, as has occurred in comparable nations with higher levels of government research investment.

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Funding the full costs of research

While the NCGP can cover large proportions of the cost of doing research, indirect and systemic costs are typically not represented in grant allocations. This results in universities having to partially match funding – sometimes spending more than half the grant’s value in additional costs (Association of Australian Medical Research Institutes, 2024). This is a drag on university finances and draws funding away from other research projects and educational activities. The Australian Universities Accord recommendations have called for full funding of research by funding bodies like the ARC and NHMRC (O’Kane et al., 2024).

It would likely be near impossible to accurately estimate on-costs for each research project individually, so a simplified and standardised approach is needed. A non-competitive grants system, tied to the NCGP, could help to fill this gap in a standardised manner. For example, the Independent Research Institutes Infrastructure Support Scheme provides non-competitive grants to eligible awardees of NHMRC grants to cover indirect research costs (NHMRC, 2023). By tying the value of indirect cost support grants to NCGP funding (e.g. 30c for every dollar in NCGP funding), a similar scheme for ARC grants and aimed at universities could provide a simple way to fund indirect costs, while also enabling a pathway to scale up support over time by slowly increasing the equivalency value until it meets the average indirect costs.

Recommendation 3: Develop a funding scheme to cover the full cost of research to ensure institutions hosting NCGP awardees are not left out of pocket.

Equitably improving grant success rates

It has been well established that the level of rejections for Australian competitive grants are a significant drain on the time and capacity of Australian researcher, with recent ARC success rates being just 16.3% (Australian Research Council, 2024). Part of this issue is there are simply too many high-quality ideas that are deserving of exploration. This results in grant success often appearing arbitrary or chance based, and wastes years of researcher time every grant round². The Review of the ARC Act proposed a two-stage grant approval process to minimise this lost time and ensure the highest possible impact from the NCGP (Sheil et al., 2023)³, an approach the ARC has adopted for Discovery Project grants. ATSE supports the expansion of this two-stage process to other grant categories, as well as other measures to reduce the administrative burden required to apply for grants. These changes will not only help researchers who are applying for grants, but also those researchers reviewing grants – with fewer and shorter applications requiring far less review time.

² Estimates of the National Health and Medical Research Council competitive grants suggest that each funding round leads to 400+ years of researcher time spent on unsuccessful grants (Herbert et al., 2013).

³ A position supported in ATSE’s submission to the review of the Australian Research Council Act (ATSE, 2022).

Updating the grant approvals process provides an opportunity to examine the review process to ensure greater diversity of grant recipients. A structural approach to diversity is typically more effective than adopting an individualistic approach (Zilberstein, 2021), so review structures should be established that promote diversity. Increasing diversity amongst reviewers is a simple way to embed diversity within the assessment system, as is increasing reviewer accountability. This should be supported by experts in inclusion and diversity to ensure the ARC is taking all reasonable steps to improve opportunities for researchers from diverse backgrounds. Other possible options include giving greater credence to non-traditional research outputs or using the new two-stage review process to allow for second stage reviews to be anonymised – with investigator capacity already established in the first round. Anonymisation has been shown to reduce early career disadvantages and may have positive effects for other diversity measures (Kingsley et al., 2023). These decisions should be based on the best available evidence and the results of changes should be subject to regular reporting and assessment to monitor their efficacy. This should include gender reporting for applications for applicants and recipients of NCGP grants, broken down by host university and field of study.

Recommendation 4: Implement a two-stage grant application process for all NCGP grants.

Recommendation 5: Embed structural and practical evidence-based measures to ensure diversity amongst grant recipients.

Improving support for research careers

One of the most fundamental actions the ARC can take to ensure the long-term strength of Australia's research sector is to invest in the careers of Australian researchers. The current system, however, is failing in this. Nearly three quarters of Early Career Researchers (ECRs) would not recommend science as a career, and over three quarters of researchers believe a lack of job security is the factor most likely to make them leave academia (Christian et al., 2021). These issues are not solely due to the NCGP, but reliance on short-term, highly competitive grants, and the funding models for ECRs built around those (e.g. contracts that are rarely longer than a grant length) has created an employment culture that is seen as toxic or unsustainable by many young researchers. This is particularly damaging for researchers from diverse backgrounds who may not have the ability to risk their academic careers on winning a grant with a less than 1-in-5 success rate⁴. For example, women have been found to be more likely than men to have considered leaving research due to funding or work-life-balance pressures (ACOLA, 2023)

This is compounded by a funnel of research grants that gets more and more restrictive as you advance up the career ladder. 200 Discovery Early Career Researcher Awards are provided for ECRs each year, which funnels down to 100 Future Fellowships (for mid-career researchers) and 17 Laureate Fellowships (for late career researchers), meaning the number of ARC-supported researcher careers decreases as careers progress. While early support for research careers can be justified, this creates a perception of an ever more difficult career pathway, turning highly skilled and knowledgeable researchers away from continuing researcher careers at each stage.

In an ideal world, researcher employment should not be tied to grant funding, but this is beyond the scope of a review of the NCGP and would require a broader review of the research ecosystem. As an interim measure, providing longer grants would increase job security and reduce the time spend on grant applications or job hunting. Alternatively, the NCGP could allow for extensions to grants, where the research conducted on that grant has been high quality and impactful⁵. This could apply to most grant categories, including funding for ARC Centres of Excellence, which take significant time and effort to establish and are often dissolved at the end of their seven-year funding arrangement. While such extensions should not be automatic, success rates would ideally be higher than current initial application success rates, as the research would have already been awarded funding – demonstrating that it is a worthy research avenue.

Recommendation 6: Increase the funding period of major grants through longer grant lengths or by allowing extension applications for world class impactful research.

ATSE thanks the Australian Research Council for the opportunity to respond to the Policy Review of the National Competitive Grants Program. For further information, please contact academypolicyteam@atse.org.au.

⁴ For more on the impacts of insecure work, please see [ATSE's Submission to the Diversity in STEM Review](#).

⁵ Recognising that null-results and replication studies are important and impactful, even if they have not traditionally been viewed as such.

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