

Powering Discovery



Today's research funders face formidable challenges. With limited resources to meet diverse and changing demands, they play a vital role by directing investment into new scientific advances. **Powering Discovery** examines how funders around the world support natural sciences and engineering (NSE) research, and how their experiences can inform funding practices in Canada.



In many countries, government R&D spending is flat or declining.



Researchers face increased competition and declining funding success rates.



Balancing support for discovery- and priority-driven research is an enduring challenge.

NSE FUNDING CONTEXT

Funders are grappling with how to reduce administrative burdens while enhancing impact. They are also increasingly active in shaping research practices and norms.



COLLABORATIVE

About 2/3 of research funding initiatives in OECD countries require collaboration.



RISKY

Researchers may be reluctant to propose transformative projects that often go unfunded.

50%

Australia, Canada, France, Germany, Spain, and the UK have international collaboration rates of 50% and over.



CROSS-DISCIPLINARY

Complex global challenges demand a broad range of skill and knowledge.



COVID-19 has upended research across the globe

Researchers and funders pivoted to focus on the pandemic but it was curiosity-driven research from decades earlier that made mRNA vaccines possible. Meanwhile, the pandemic exacerbated existing inequalities and increased stress on scientists.

SUPPORTING RESEARCHERS

Often, those who have funding keep getting funding. Funders are working to better support researchers throughout their careers and cultivate a robust, resilient, and diverse scientific workforce.



EQUITY, DIVERSITY & INCLUSION

Underrepresented or marginalized researchers continue to face biases and structural barriers.



EARLY CAREER RESEARCHERS (ECRs)

ECRs can struggle to compete with established researchers in competitive funding environments.



HYPER-COMPETITION

Limited funding can interrupt or end careers.



SIZE

Smaller institutions and communities are often at a disadvantage in funding competitions.



For one funding call in Australia, the time spent by researchers preparing unsuccessful proposals exceeded

400 years.

PROMISING PRACTICES

- ✓ **Innovations in application and review process**, e.g., longer grants and expanded support for collaboration can benefit interdisciplinary and high-risk research.
- ✓ **Experimenting** with alternative funding practices, data sharing, and rigorous evaluations could provide funders with a better understanding of their options.
- ✓ While small grants risk being unproductive and increase application burdens, most empirical evidence supports prioritizing **broader distribution** of funds and higher success rates.
- ✓ **Segmenting awards by career stages** allows researchers to compete with those at similar stages and supports a balanced workforce.
- ✓ **Novel approaches in competition design**, e.g., shortened proposals, double-blind reviews, have shown promising results in encouraging creativity and risk-taking.
- ✓ **Sustained funding** helps all researchers and may be particularly important in enabling high-impact research.
- ✓ **Bridge funding** improves stability by providing limited short-term funding to researchers who narrowly miss a funding cut-off.
- ✓ **Dedicated support** for improving equity and diversity in the research community.



The Danish Villum Foundation's **Experiment program** supports high-risk/high-reward research with some novel approaches for proposal assessment including anonymizing applicants to peer-reviewers (double-blind review), and providing reviewers with a 'golden ticket' — such that they can fund a project even if the other reviewers score it poorly.



A 2017 evaluation of the **European Research Council's awards program** found that 83% of projects receiving an Advanced grant, and 75% of those receiving a Starting grant, produced either a major scientific advance or a breakthrough.



Equality charters such as **Athena SWAN** have led to higher proportions of women researchers and staff, and greater reported career satisfaction.



CULTIVATING EQUITY, DIVERSITY, AND INCLUSION (EDI) & SUPPORTING INDIGENOUS RESEARCHERS

NSE funders are exploring many practices to enhance EDI in the research community, including:

- Funding Indigenous community research teams
- Dedicated funding programs for Indigenous research and researchers
- Indigenous research review committees
- Equality charters
- Diversity targets
- Programs and fellowships for marginalized applicants