

# 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