

Monash University Submission

**Submission to the Senate
Standing Committee on
Finance and Public
Administration into
the *Emergency Response
Fund Bill 2019* and the
*Emergency Response Fund
(Consequential
Amendments) Bill 2019***

September 2019



Executive Summary

Monash University welcomes the opportunity to make a submission to the Committee regarding the provisions of the *Emergency Response Fund Bill 2019* and the *Emergency Response Fund (Consequential Amendments) Bill 2019*.

Schedule 2 of the Consequential Amendments Bill proposes to abolish the Education Investment Fund (EIF) and repeal the *Nation-building Funds Act 2008* which established the EIF.

Part 2 of the Emergency Response Fund Bill proposes to transfer the balance of the Education Investment Fund Special Account (\$3.9 billion) to the Emergency Response Fund Special Account.

Passage of these Bills has the effect of abolishing the EIF.

Monash strongly objects to the EIF being abolished. To be clear, Monash is supportive of the Emergency Response Fund; our objection lies with the abolition of the EIF as a means to fund the Emergency Response Fund.

The EIF has been essential in helping to build world-leading research and education infrastructure, which has contributed significantly to Australia's competitive advantage on the global stage as an education provider of choice and enabled our universities to attract the world's best researchers.

The EIF has created jobs and economic growth, not just through the construction of research and education infrastructure but also through the implementation and use of these facilities. The EIF has helped forge critical partnerships with industry and has enabled research that has saved lives and improved the productivity and performance of key economic sectors

The EIF has been an invaluable source of funds that universities, including Monash, have accessed to contribute towards the development and refurbishment of critical research and teaching infrastructure.

The Minister for Education, the Hon Dan Tehan MP, has correctly identified that Australia's productivity and economic prosperity over the coming years will increasingly depend on how successfully we are able to enhance our culture of international collaboration and innovation. Having globally competitive education and research infrastructure is critical to this endeavour.

While there is no question that Australia should support those affected by emergencies including floods and fires, it would be short sighted to fund emergency responses by taking funding away from higher education and research. Indeed, research conducted by Monash and other Australian universities, in partnership with government, industry and international partners increases our capacity to predict, prevent and respond to these national emergencies.

One example of research created through infrastructure funded by the EIF, and which will aid in emergency response situations, is a water filtration device for remote locations. Developed within Monash University's New Horizons building, crystalline material has been built into 3D structures that can help with water filtration, with potential for commercial portable filtration devices for remote locations affected by natural disaster.

Recommendations

- 1. Monash University recommends that the Committee oppose passage of the Emergency Response Fund Bill 2019 and the Emergency Response Fund (Consequential Amendments) Bill 2019.**
- 2. Monash University also recommends that the Bills be amended to exclude the abolition of the EIF and to include provision for new legislation that preserves existing EIF funding for national research infrastructure.**

Monash University

Over six decades, Monash University has emerged as a research and education institution of the highest quality and is currently one of the highest-ranked universities in the world.

Monash directly accounts for \$5.2 billion in economic activity annually in Australia. Our operating revenue is more than \$2.7 billion with direct employment of over 17,000 people. Monash generates \$6.60 for every \$1 of government funding.

More than 22,000 international students come to our Australian campuses each year. Education remains Australia's third largest export sector. Monash contributes 25% of Victoria's education exports – \$2.3 billion annually. This equates to 5% of Victoria's total exports.

Our Clayton campus sits at the heart of the thriving Monash Technology Precinct - Melbourne's largest non-CBD hub of employment and innovation which contributes nearly \$10 billion to the economy and supports nearly 13,000 business and 90,000 jobs.

Monash attracts the highest international competitive research income of any Australian university and our leadership in health research is evidenced through our ranking as one of the top universities for National Health and Medical Research Council awarded medical research funding.

This contribution to the Australian community was not achieved by chance alone – it has been hard won by fostering and encouraging collaboration between researchers, industry and community, and investment in the required accompanying infrastructure.

Education Investment Fund - background

The EIF replaced the Higher Education Endowment Fund (HEEF). HEEF was established in 2007 as a perpetual fund to provide a guaranteed source of funding for capital works and research facilities to ensure Australia's universities continued to grow as first class teaching and research institutions¹.

Similarly, the EIF aimed to build a modern, productive, internationally competitive Australian economy by supporting world-leading, strategically-focused infrastructure investments that would transform Australian tertiary education and research². In doing so, the EIF has contributed to Australia's economic development, talent pipeline and global competitiveness.

Both the HEEF and the EIF offered universities, via annual competitive rounds, the opportunity to compete for funds for priority infrastructure projects. Taken together, the HEEF and EIF funds have supplemented individual university contributions to develop world class research facilities infrastructure that supports Australian industry.



Monash Immersive Visualisation Platform (CAVE) – Monash University, Clayton campus

¹ A Higher Education Endowment Fund - http://www.budget.gov.au/2007-08/overview2/html/overview_05.htm

² Education Investment Fund - <https://www.education.gov.au/education-investment-fund>



The need for research and education infrastructure in Australia

The EIF has delivered significant benefits to the Australian community and our economy.

The EIF has helped fund ambitious infrastructure to help position Australia as an education and research powerhouse, encouraging deeper collaboration with industry both domestically and internationally, and helping to recruit world-class talent to our shores.

To take one example, Monash University's New Horizons building, funded by the EIF, has boosted collaboration between Monash, the CSIRO and industry partners such as Honeywell, CSL and Baosteel and has helped attract Woodside to establish a significant energy research partnership with Monash at our Clayton campus.

Research excellence helps Australia punch far above its weight in university rankings, which in turn helps to drive economic growth and innovation across the nation.

This requires attracting international investment and talent, advancing a knowledge economy, and developing new economic opportunities for the community. Building research and teaching infrastructure that allows Monash and Australia's other world-leading universities to sustain our competitive international reputation is vital for this endeavour.

Without the world-leading education and research infrastructure our students and academics deserve, Monash and our university partners will not be able to deliver the research needed to fuel the growth of Australia's economy or make as many life-saving breakthroughs.

Earlier this year, Minister Tehan said that "the research done by our universities can lead to the development of new products and innovations that drive job growth, business opportunities and productivity gains. In the coming years, universities will be front and centre of job creation, job growth, and productivity improvements in this nation"³.

The proposed abolishment of the EIF stands in stark contrast with the Government's objective of universities driving these future job and productivity gains.

In 2015, the Review of Research Infrastructure signalled the need for \$6.6 billion in new research infrastructure across the next decade. Any move to abolish the EIF will put Australia's competitive advantage in research and education at risk.

Dedicated Commonwealth funding available for universities to invest in critical research and education infrastructure is exceedingly scarce. Without EIF funding, vital development and renewal of research and education infrastructure cannot occur. Closing the EIF will therefore directly impact Monash University's ability, as well as the ability of other universities, to attract and sustain local and international research and teaching talent in an increasingly competitive international environment.

Case studies: the benefit of EIF to Monash and the communities we serve

Since 2007, Monash has received in excess of \$100 million in infrastructure funding from EIF and its predecessor, HEEF. This funding has supplemented other investment in research infrastructure, however there are two examples notable for the benefits realised by the community: the Green Chemical Futures building and the New Horizons building.

Green Chemical Futures

Opened in 2015, the Green Chemical Futures (GCF) building is a benchmark, 9,500 m² multi-level collaborative teaching and research facility located at our Clayton campus. It is dedicated to facilitating academic and industrial research within the chemicals, polymers, health and clean energy sectors.

The GCF provides world-class research to expand Australia's 'green workforce', housing over 100 chemists and engineers and fostering the growth of basic science research to targeted industry-driven research. It has 10 specialist sectors, training programmes for industry practitioners and teaching and research laboratory spaces available for over 1000 students and has housed over 100 projects with industry partners.

In addition to housing state of the art facilities for students, GCF also operates as a hub for industry. The facilities and infrastructure contained within GCF support targeted industry-driven research. The co-location

³ Minister for Education, the Hon Dan Tehan MP, 28 August 2019 - <https://ministers.education.gov.au/tehan/boosting-australias-manufacturing-industry>

of various related industry, research and student teams, provides opportunities for collaboration and innovation that would not occur otherwise.



Green Chemical Futures building, Monash University Clayton campus

A number of world-leading research and industry teams are currently housed within GCF including:

- a) Chemicals and Polymers Manufacturing Innovation Network – a consortium of academic, government and industry associations and commercial partners including Monash, Environment Protection Authority, and the industry associations Chemistry Australia and Accord, supporting innovative research and training. The programme includes PhD research projects undertaken in close partnership with over 10 businesses and provides support to researchers in the form of industrial training and best practice.
- b) The PerkinElmer Flagship Facility – housing world leading analytical equipment, the Facility provides important support for both academic and industrial research.
- c) Monash Food Innovation (MFI)⁴ – an industry shared world class facility operated by industry experts and researchers. Food innovation is immensely important for Australia’s economic future, and MFI opens up new pathways to export markets for Australian food businesses, as well as providing food and agriculture businesses with the support and expertise to rapidly adapt and develop products for domestic and export markets. Since opening in April 2016, MFI has been visited and services accessed by more than 1500 businesses, with another 850 companies reached through external workshops, conferences and site visits. Its capabilities have also been used to support businesses in industries as diverse as cosmetics, paints and nappies.
- d) Monash Centre for Membrane Innovation (MCMi)⁵ – a multidisciplinary research centre focused on membrane science, technology and innovation. MCMi creates applied scientific and technological solutions in membrane science, and explores novel materials for membrane construction. An established contributor in the membrane field, Monash researchers have already attracted more than \$30 million in external research funding in the last five years.
- e) Australian Research Council (ARC) Research Hub for Energy Efficient Separation⁶ – as the largest research hub awarded by the ARC in 2017, and with over \$15 million invested by the ARC, industry partners and participating universities, EESep is working to transform key Australian industries to be more energy-efficient, cost-competitive and environmentally sustainable. The Research Hub is a world first in energy-efficient separation research and is accelerating Australia’s manufacturing capabilities to be world-leading providers in separation technologies and machinery.

4 Monash Food Innovation - <https://www.foodinnovationcentre.com.au/>

5 Monash Centre for Membrane Innovation - <https://www.monash.edu/mcmi>

6 ARC Research Hub for Energy Efficient Separation - <https://www.arc-eesep.org/>

- f) Collaboration labs for the ARC Training Centre for Future Energy Storage Technologies⁷, ARC Centre of Excellence for Electromaterials Science⁸ and the Australian Centre for Advanced Photovoltaics⁹.

New Horizons

Opened in 2013, the New Horizons building is a multi-level collaborative technological innovation hub, also on our Clayton campus.

The New Horizons building is a collaborative research environment that creates new multi-disciplinary research opportunities for industry, engineers, scientists, researchers and government in the fields of future manufacturing, modelling and simulation, biological engineering and renewable energy. Over 400 CSIRO and Monash researchers are working with visionary industries and Australian manufacturers in areas such as advanced manufacturing, medtech, metal processing, aerospace and fibre industries.



New Horizons building, Monash University, Clayton campus

A number of world-leading research and industry platforms are located within New Horizons:

- a) The Monash Immersive Visualisation Platform (known as the 'CAVE')¹⁰ - CAVE is a platform available to researchers and industry to visualise data. By offering new ways of seeing connections within data, CAVE allows the emergence of new paradigms to visualise, manipulate and comprehend data such as engineering models, multi-dimensional images across the size scale from nanoscopic to cosmic, and the outputs of scientific, computational and engineering simulations across the physical and life sciences.
- b) Future Control Room¹¹ - built on a terabit-scale video hub, the room's workstations, touch tables and head-mounted displays, as well as content from the adjacent Monash CAVE, can be mirrored to any part of the full pixel drive display wall at once, at original fidelity and resolution. The Future Control Room is designed to be a proxy to energy system control rooms of the near future, enabling graduate and professional training purposes and research into improved monitoring and control systems, reaching into advanced data integration, mining and ultimately the autonomous operation of smart energy systems.
- c) Woodside Innovation Centre¹². Opened in June 2016, the Woodside Innovation Centre forms part of Woodside's FutureLab network and is a transformational hub that accelerates advances in Materials

⁷ ARC Training Centre for Future Energy Storage Technologies - <https://www.storenergy.com.au/>

⁸ ARC Centre of Excellence for Electromaterials Science - <https://electromaterials.edu.au/facilities/>

⁹ Australian Centre for Advanced Photovoltaics - <http://www.acap.net.au/>

¹⁰ Monash Immersive Visualisation Platform - <http://www.monash.edu/mivp>

¹¹ Future Control Room - <https://www.monash.edu/researchinfrastructure/mivp/access/facilities/future-control-room>

¹² Woodside Innovation Centre - <https://woodside-innovation-centre.monash.edu/>

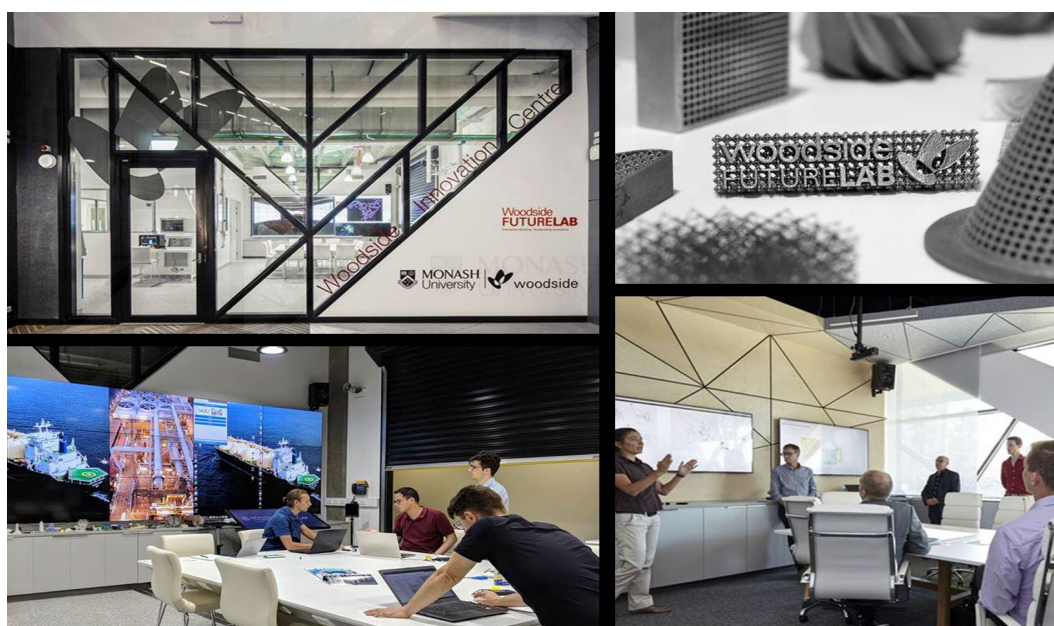
Engineering, Additive Manufacturing and Data Science. Woodside and Monash's leading researchers in Materials Engineering and Information Technology are working together to research industry-wide technology innovation opportunities in the Australian and global oil and gas industry and are pioneering the use of rapid prototyping to deliver immediate benefits to the sector.

Woodside contributed \$10m over five years to establish and operate the Innovation Centre – then the largest philanthropic donation in Monash University's history.

This year, Woodside and Monash have joined forces to develop a state-of-the-art 'living laboratory' and a long-term research partnership to support Australia's low-carbon energy transition. The Woodside-Monash Energy partnership will enable us to explore the possibilities for achieving affordable hydrogen and valuable carbon solutions.

Woodside and Monash will jointly invest more than \$40 million into the ongoing research partnership over the next seven years.

All of this would not have been possible without the New Horizons building.



Woodside Innovation Centre, Monash University Clayton campus

- d) The New Horizons building has also enabled:
- Groundbreaking x-ray imaging to examine in real-time changes in the lungs in response to treatment for cystic fibrosis;
 - 3D printing of complex jet engine components cutting down significantly on time needed to manufacture from 6-24 months to 1-2 weeks; and
 - Building crystalline material into 3D structures that can help with water filtration, with potential for commercial portable filtration devices for remote locations, aviation and other purposes.

Emergency responses and research infrastructure – not competing interests

Monash strongly disagrees with the assertion that the abolition of the EIF is required to fund the Emergency Response Fund.

While the Emergency Response Fund must be properly and sustainably funded, it is short sighted to do so at the expense of the nation's teaching and research effort.

With a world-leading economy and a significant projected budget surplus, Australia is well positioned to support Australians coping with natural disasters as well as adequately funding our research and education



infrastructure to help ensure our future economic prosperity. We should not have to choose between one or the other.

The EIF, particularly through the National Collaborative Research Infrastructure Strategy (NCRIS), has helped Australia to gain our reputation as an international leader in research and attracted world-leading talent from all over the world.

Australia's ability to help solve global challenges and make breakthrough discoveries and our proud reputation of collaborating with international partners is threatened by the cut to research infrastructure funding and our lessened attractiveness to prominent international researchers.

If the EIF is abolished, future research and education infrastructure will instead need to be funded by alternative revenue streams; for many universities this will primarily come from domestic and international student fees. Over time, Australia's research infrastructure quality will undoubtedly be weakened. Our international reputation, which relies heavily on the quality of our education and research in a highly competitive global market, will also be diminished.

If Australia chooses to sacrifice its investment in research, as a nation we risk curtailing not only research that helps us better understand extreme weather, predict natural disasters or help us to manage our responses to these phenomena, but we also risk hampering the economy which underpins the funding of these responses in the long term.

Australian research is valued at \$160 billion – more than the entire value of our mining industry¹³. Funding research and education infrastructure into the future is critical to our continued economic growth.

Like all other countries, Australia will desperately need to create new jobs and industries as significant numbers of jobs become obsolete over the coming decades. To achieve this, Australia will increasingly rely on the research breakthroughs that are being delivered by our university graduates and researchers.

Instead of being abolished, the EIF should be reimplemented as a sustainable funding program to ensure Australia invests in the infrastructure we need to meet the challenges of the future.

Conclusion

It is recommended that the Senate Standing Committee on Economics oppose the passage of the *Emergency Response Fund Bill 2019* and the *Emergency Response Fund (Consequential Amendments) Bill 2019*.

Monash University also recommends that the Bills be amended to exclude the abolition of the EIF and to include provision for new legislation that preserves existing EIF funding for national research infrastructure.

¹³ <http://keepitclever.com.au/the-facts/>



Further information

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