

CHAPTER 3

Australia's research infrastructure is under threat

3.1 The Abbott government's mismanagement of Australia's world-leading research infrastructure could see some of the world's best and brightest move on and not return. The current government has failed to comprehend the need for funding certainty for major research infrastructure, if it is to be efficiently managed and key personnel are to be retained. The cuts proposed to research funding in this package are an absurdity: research indisputably delivers the dual national benefit of preparing for the workforce needs of the future and providing a boost to the research and innovation output.

The value of the Research Training Scheme (RTS) and PhDs

3.2 The bill would see funding for the Research Training Scheme (RTS) cut by more than \$173 million over four years, representing a 10 per cent reduction.¹ The bill allows universities to recoup this shortfall by charging PhD students up to \$3 900 per year in fees, which students could borrow through HECS-HELP.²

3.3 The Abbott government's proposal to reduce RTS funding is both concerning and surprising as Australia needs to keep a pace with breakthrough ideas that deliver new technologies or wholly new ways of seeing the world. Deakin University echoed this sentiment:

The world is moving into the second machine age. The need for innovation and new applications has never been greater and the signal from Government is that research and innovation training is a cost rather than an investment and must be borne by the public purse. The nation already lags in science skills and careers and, in our view, this cut sends a shocking signal to the wider community of the value Australia places on research, innovation and development.³

3.4 Enabling universities to charge RTS students capped fees is bad policy. The position of the majority Australians is that research benefits the public good and therefore should be publicly funded. The Politics, Philosophy and Economics Society of La Trobe University explained that:

Research is one of the main areas that the public has a legitimate case in heavily subsidising, specifically basic research. If budgetary pressures require savings, undergraduate subsidies are a more rational place to look for reform... it is unwise to start charging people to undertake research.

1 National Tertiary Education Union, *CAPA President: Postgrads shocked by Budget cuts*, 28 July 2014, <http://www.nteu.org.au/article/CAPA-President%3A-Postgrads-shocked-by-Budget-cuts-16574> (accessed 11 March 2015).

2 Higher Education and Research Reform Bill 2014, Schedule 5, Part 2.

3 Deakin University, *Submission 28*, p. 1.

This may be a legitimate role for government subsidies. If the Government is requiring students to pay more for their education, it would make sense to reallocate public funds into areas like research where the students are least likely to benefit.⁴

3.5 Charging RTS students a capped fee is not a sustainable funding solution. The Council of Australian Postgraduate Associations (CAPA) emphasised that:

Universities must already subsidise funding gaps from other sources, an important example is the existing gap between the full cost of research training, and Research Training Scheme (RTS) funding – estimated in 2011 by Deloitte economics to be on average 27%... No formula has been disclosed which explains how the \$1,700 and \$3,900 rates have been calculated. As a result while the fee could cover a 10% cut to the Research Training Scheme it would not cover the existing 27% funding gap. Also the fee is set at a fixed rate by the legislation with no means of adjustment, meaning it is unlikely to keep pace with inflation or the increasing cost of research training.⁵

3.6 In presenting their argument against the proposed changes, CAPA explained that the difference between monies raised from the capped RTS student fee to the total funding gap would be \$81.2 million.

In 2013 there were 42,612 EFTSL PhD and Masters by Research students according to DET data, if those postgraduate students all paid a \$3,900 fee it would raise \$166.19M. In 2013 10% of RTS funding was \$66,864,010 and 27% of RTS funding was \$180,532,829.⁶

3.7 As the Australia Institute succinctly explains: '[r]esearch that benefits the public good ought to be publicly funded. It is unreasonable to expect it to be funded by student debt.'⁷ Moreover, the government's own Legislation and Working Financing Group recommended that the RTS measure not proceed and that savings be found elsewhere.⁸

The National Collaborative Research Infrastructure Strategy (NCRIS)

3.8 The NCRIS infrastructure is essential to building strong partnerships between the research sector, business, industry and government to actively support world-class research. NCRIS projects have received numerous positive external reviews and there can be no doubt that the infrastructure is well regarded by all stakeholders – and yet this is also under threat as a result of this package.

3.9 NCRIS is an extremely important program that allows Australian research to work more efficiently and effectively at higher levels. It underpins very important

4 The Politics, Philosophy and Economics Society of La Trobe University, *Submission 36*, p. 9.

5 Council of Australian Postgraduate Associations Incorporated, *Submission 17*, p. 4.

6 Council of Australian Postgraduate Associations Incorporated, *Submission 17*, p. 5.

7 The Australia Institute, *Submission 66*, p. 48.

8 Regulation Impact Statement, HERR Bill 2014, p. 53.

global partnerships, helps us to address key research challenges not just for the science but for the people it impacts downstream.⁹

The thing that is magnificent about it is that it crosses the disciplines. What makes science particularly exciting in this day and opens up enormous opportunities for new businesses in Australia is that all the action is bringing together fields that were previously in their own little silos. NCRIS is one of the most successful vehicles that I think Australia has come up with to make that happen.¹⁰

3.10 In an open letter to the Prime Minister, dated 6 March 2015, the peak body representing Australia's Universities, University Australia, warned that Australia's national public research infrastructure is preparing for a shutdown because of the continued uncertainty over NCRIS.¹¹

Since 2004, NCRIS and its predecessor program has sensibly and successfully guided Australia's national research infrastructure investment; committing over \$2 billion of taxpayer money to 27 major research facilities. Together, these facilities:

- allow Australia's scientists to undertake world-class research;
- enable significant science industry linkage, including the capacity for innovative Australian companies to access high-tech infrastructure; and
- facilitate international research collaboration, which provide substantial economic and intellectual value to Australia.

Over 35,000 Australian and international researchers use NCRIS facilities, and the 27 national facilities employ over 1,700 highly skilled scientists, and support and management staff. The facilities underpin much of Australia's \$30 billion annual spend on science, research and development at an operational cost of just \$150 million per annum (0.5% of total, and 1.6% of the Australian Government science funding).

As with any major public infrastructure, the NCRIS facilities depend on secure funding to enable forward planning and efficient operation. **However, with continued uncertainty over the 2015-16 operational funding included in the last budget, many of the NCRIS facilities are preparing to close.**

The damage to Australia's domestic and collaborative international research effort that will result from such closures is immense. Continuity and

9 Professor Timothy Clancy, Director, Terrestrial Ecosystem Research Network, *Proof Committee Hansard*, 6 March 2015, p. 48.

10 Professor Chris Goodnow, Lead Scientist, Australian Phenomics Network, *Proof Committee Hansard*, 6 March 2015, p. 54.

11 Universities Australia, Media Release, *Open letter to the Prime Minister of Australia: Australia's national public research infrastructure preparing for shutdown*, 5 March 2015, <https://www.universitiesaustralia.edu.au/news/media-releases/Open-letter-to-the-Prime-Minister-of-Australia--Australia-s-National-public-research-infrastructure-preparing-for-shutdown#.VPj5YE0cSfA> (accessed 6 March 2015).

productivity of critical research programs will be set back by several years, with some innovative Australian companies will be forced to take their operations offshore, many profitable international research collaborations will cease, and 1,700 highly skilled NCRIS staff could become unemployed.

Importantly, with just four months until the end of the financial year, the uncertainty is already having an impact. Many NCRIS staff have been put on provisional notice of termination, and the consequent exodus of highly specialised skills has begun and will only accelerate as the end of the year draws closer.

Furthermore, many of the facilities cannot be viably maintained if taken offline for significant periods. This means that if operational funding for 2015-16 is not confirmed in the next two months, the Government will be effectively decommissioning high-cost public infrastructure that in many cases has years if not decades of productive working life remaining.¹²

3.11 The committee received a great deal of evidence from a diverse range of NCRIS-funded facilities, providing the committee with insight into the need to urgently secure funding to enable planning for 2015–16.

3.12 Terrestrial Ecosystem Research Network (TERN) outlined the significant private and public value of the investment in research infrastructure and argued that it is a cost effective and appropriate role for the Australian government that should be continued.¹³

...existing NCRIS is an excellent model for guiding future programmatic investment and should be funded adequately going forward and over time lines of sufficient duration to permit required planning, ongoing review, and the development of stable and enduring national and international partnerships.¹⁴

3.13 AuScope also provided specific evidence to the committee to demonstrate the importance of NCRIS institutes to Australian industry:

Industry users access AuScope NCRIS infrastructure. Rio Tinto global Head of Exploration, Mr Stephen McIntosh has commented the minerals exploration process relies on knowledge and data and having the tools to effectively make judgments on investment in exploration industry. Mr McIntosh has linked the infrastructure of the AuScope Program to the needs of industry through the process of exploration stating: "There is no doubt

12 Universities Australia, Media Release, *Open letter to the Prime Minister of Australia: Australia's national public research infrastructure preparing for shutdown*, 5 March 2015, <https://www.universitiesaustralia.edu.au/news/media-releases/Open-letter-to-the-Prime-Minister-of-Australia--Australia-s-National-public-research-infrastructure-preparing-for-shutdown#.VPj5YE0cSfA> (accessed 6 March 2015).

13 Terrestrial Ecosystem Research Network, *Submission 56*, pp 1–2.

14 Terrestrial Ecosystem Research Network, *Submission 56*, p. 2.

that these advances are pushing us ahead as a country and as a group like Rio Tinto, we are leveraging off those investments to be fast followers'.¹⁵

3.14 The Australian Phenomics Network also provided the committee with some insight into the importance of their infrastructure¹⁶ and emphasised the urgent need for sustained investment in research infrastructure:

What the Australian Phenomics Network does is to bring the right people together in the right place at the right time and with the right support—not only through the NCRIS capabilities and funding direct from the Commonwealth government, but directly from the host institutions and from any other resources that we can obtain—international or industrial. It is critical. We have worked for this. We have poured our lives into this. We are scientists; this is what matters to us. To think that this is at stake—that it is tied to something which is also very important to someone else—is fine, but we really want to make sure that you understand that there is a lot at stake. We have leveraged a lot. We have a lot of momentum. There is a lot of trust and we have a huge amount of capacity, which is now sitting on the edge of a cliff.¹⁷

3.15 The Australian National Fabrication Facility (ANFF) who provide access to state-of-the art micro and nanofabrication facilities with a focus on fabricating new materials and devices, argued that 'stop-start' NCRIS funding has reduced the sector's productivity.¹⁸

Last year, 2,200 researchers accessed ANFF. Of the 128,000 hours used, 23% of the activity was associated with industry projects. However ANFF, together with other NCRIS capabilities faces an uncertain future. This activity will cease, with the loss of 90 highly skilled technical staff, unless further funding for NCRIS is released.¹⁹

3.16 Australian National University academic and Nobel Laureate Professor Brian Schmidt put the situation facing NCRIS quite simply:

Catastrophe is if we still do not have a resolution before the 2015 budget in May. At this point it will be necessary for a wholesale winding down of the nation's scientific infrastructure capability.²⁰

3.17 The Australian Microscopy and Microanalysis Research Foundation also outlined a number of risks associated with the failure of the Abbott government to

15 AuScope, *Submission 49*, p. 3.

16 The Australian Phenomics Network, *Submission 58*, p. 4.

17 Dr Michael Dobbie, Chief Executive Officer, Australian Phenomics Network, *Proof Committee Hansard*, 6 March 2015, p. 48.

18 Australian National Fabrication Facility, *Submission 18*, p. 2.

19 Australian National Fabrication Facility, *Submission 18*, p. 1.

20 Professor Brian Schmidt, *Why funding science infrastructure is essential*, The Conversation, 5 March 2015, <http://theconversation.com/brian-schmidt-why-funding-science-infrastructure-is-essential-38303> (accessed 5 March 2015).

allocate 2015–16 NCRIS funds, including equipment utilisation and maintenance, and subsequent costs.

Instrument utilisation is influenced by two main factors. Firstly the presence of highly skilled support staff who... work to drive the use of instrumentation by researchers to enable top quality research outputs. A reduction in support staff will result in a reduction in instrument utilisation and therefore in quality research outcomes. Secondly, the sophisticated flagship instrumentation within the AMMRF requires routine maintenance and servicing to maximise availability and reduce down time. In addition these instruments are maintained as state-of-the-art platforms, incorporating latest developments in software and hardware systems, so that Australian researchers have access to the world-leading technology. Microscopy and microanalysis instrumentation are complex systems and almost entirely sourced from overseas suppliers. The costs of replacement components and annual maintenance contracts from these suppliers drives the need for maintenance budgets for flagship instruments up to \$200,000 per annum.²¹

3.18 Atlas of Living Australia also discussed the critical need for NCRIS investment to ensure long term growth and triple bottom line sustainability. In discussing the expiration of the current NCRIS investment in June 2015, Atlas stated:

[t]o ensure proper workforce planning and effective communication with staff about their future options, it is important to have advance knowledge about the availability of funds post June 2015. The closer we come to June without a commitment of funding, the greater the likelihood that the Atlas will start losing quality staff. Even if funding is subsequently made available for this period, the potential loss of trained staff could cause substantial damage.²²

3.19 NCRIS institutes provided details to the committee about the impact of this looming expiration of funding on their staff profile. TERN stated:

[T]here is a lot of impact on the staff. People are, quite rightly, proud of their involvement in a high-value program. They recognise that people see it as high value, but the uncertainty is crippling. You see it, especially, with junior staff. They want to keep working, they are committed to what we are trying to achieving—and I am sure that is the case across a lot of things—but they are now caught in this situation. What do they do? It is a very awkward time at the moment.²³

3.20 ANFF explained to the committee that they would be closing parts of their facilities at the end of June 2015. With reference to their current workforce, Chief Executive Officer, Ms Rosie Hicks stated:

21 The Australian Microscopy and Microanalysis Research Foundation, *Submission 62*, p. 4.

22 Atlas of Living Australia, *Submission 5*, p. 2.

23 Professor Timothy Clancy, Director, Terrestrial Ecosystem Research Network, *Proof Committee Hansard*, 6 March 2015, p. 51.

[t]he people that we have working for us, in many cases, are PhD qualified in a very specific area that has the possibility for massive impact. They are looking for very rewarding, fulfilling areas of work and finding those may take longer than the three months of funding that they have left. So whilst we might not need to issue a redundancy notice, they need to look after their future careers and seek out the best possible opportunities, and we have to support them in doing that.²⁴

3.21 The committee received an overwhelming amount of evidence that without funding agreements in place, NCRIS facilities will lose high-quality staff and our research infrastructure will be severely damaged.

3.22 The President of the Australian Academy of Science, Professor Andrew Holmes, has said publicly that '[a] continuing commitment to NCRIS is a perfect example of what is needed. It is part of the long-term investment that is needed and is really serious business'.²⁵

3.23 A 2010 evaluation on both scientific and economic parameters, carried out by the Department of Innovation, Industry, Science and Research, found NCRIS to be an appropriate, cost-effective and efficient model for the development of critical research infrastructure.²⁶ NCRIS deserves independent and sustainable investment.

3.24 An appropriate and independent investment model should be set up for research infrastructure which would include the release of the committed NCRIS funding for 2015-16. With the current review underway, there is no valid reason or justification not to extend NCRIS 2015–16 operational funding.

Committee view

3.25 The committee and all of the contributors to the inquiry were in no doubt as to the value of RTS and NCRIS and the committee received near-universal opposition to the proposed changes to Australia's research infrastructure.

3.26 The committee notes that RTS supports Australia's brightest and most academically driven students to do research that benefits the nation. The proposed changes to RTS do not align with the national objectives to build Australia's research, innovation and entrepreneurial capacity. Evidence before the committee clearly demonstrates that this is another regressive policy introduced by the Abbott government that goes against a long tradition of public investment in research training in Australia. The committee believes that research that benefits the public good ought to be publicly funded and that is unreasonable to expect it to be funded by student debt. For this reason, the committee strongly opposes the amendments to the RTS.

24 Mrs Rosie Hicks, Chief Executive Officer, Australian National Fabrication Facility Ltd, *Proof Committee Hansard*, 6 March 2015, p. 56.

25 Andrew Trounson, 'NCRIS threat ignores science plan', *The Australian*, 27 February 2015.

26 Department of Innovation, Industry, Science and Research, *National Collaborative Research Infrastructure Strategy – Evaluation Report*, June 2010.

3.27 The committee notes that NCRIS is a world-leading infrastructure program that needs stability of funding. A continuing commitment to NCRIS will ensure the continued success of our research institutes. The committee urges the government to immediately release the committed NCRIS 2015–16 funding, and to work together with NCRIS Institutes to ensure that this asset to the country is not weakened by instability in funding.

Recommendation 2

3.28 The committee recommends that the government immediately release the committed NCRIS funding for 2015–16.