



22 September 2016

Go8 response to the National Research Infrastructure Capability Issues Paper

The Group of Eight (Go8) welcomes the opportunity to comment on the National Research Infrastructure Capability Issues Paper in support of the development of the 2016 National Research Infrastructure Roadmap led by the Chief Scientist of Australia.

The Go8 has responded to the consultation paper outside of the prescribed template and authorizes it to be published alongside template-based submissions.

This decision primarily reflects two factors:

1. Individually Go8 universities may make their own, more detailed, submissions in response to the specific questions raised in the Issues Paper; and
2. This response takes the opportunity to comment on high level issues which we feel are important to the development of the 2016 National Research Infrastructure Roadmap.

The Go8 represents Australia's leading research-intensive universities, accounting for over two-thirds of Australian university research activity, spending around \$6 billion per year on research with the Go8 investing \$3 billion annually in applied research and experimental development.

Collectively and individually, the Go8 universities have a significant role in leading, developing and managing Australia's major national research infrastructure facilities. A Go8 institution headed 14 of the 15 university led facilities in the KPMG review of 27 NCRIS facilities¹, 25 of which had key Go8 involvement. This includes NCRIS facilities such as the Australian National Fabrication Facility (ANFF) in which all Go8 institutions collaborate.

Go8 universities are also at the forefront of leading Australia's participation in key international research infrastructure endeavours, such as the Giant Magellan Telescope and the European Molecular Biological Laboratory.

More broadly, Go8 members have a strong track record in collaborating within the research and academic sector, with industry, and government all of which informs this response.

¹ KPMG 2014, *National Collaborative Research Infrastructure Strategy Project Reviews – Overarching Report*, available at <https://docs.education.gov.au/node/38305>

Go8 Recommendations:

1. A holistic approach to funding for national research infrastructure, that encompasses funding not only for the infrastructure itself, but also for the ongoing maintenance and operation of the infrastructure.
2. Infrastructure funding should be supported by the establishment of an independent, advisory body to the Government to make recommendations regarding the prioritisation, development and implementation of research infrastructure.
3. Financing for national research infrastructure should leverage the remaining \$3.7 billion EIF funds currently in the Future Fund, in keeping with the original intent for those funds to be used to support education and research infrastructure.
4. Translation activities and skills should be explicitly supported as a supplement to continued support for user and technical skills.
5. The streamlining of governance arrangements to apply to the two high performance computing facilities funded under NCRIS, the National Computational Infrastructure (NCI) and the Pawsey Supercomputing Centre
6. Funding for national research infrastructure should include a principle that custodians and users leverage the infrastructure wherever possible to seek out, promote and enable productive engagement and partnerships between researchers and industry.
7. National research infrastructure funding programs should have explicit provision for researchers to access priority international research infrastructures.

Detailed Discussion

Funding and oversight

The Go8 advocates strongly for a holistic approach to national research infrastructure funding. Since the initial NCRIS program was implemented, successive funding programs for national research infrastructure have provided either funding for infrastructure only, such as under the Super Science EIF regime, or solely for operation and maintenance support as under subsequent NCRIS injections up to now, but never both. While significant co-investment by universities and others has often resulted in productive implementation over a limited period of time, the constraints of needing to seek out and maintain commensurate support can result in sub-optimal outcomes including major delays to projects and the loss of key and almost irreplaceable skilled personnel.

The Go8 also advocates for the establishment of a national independent coordinating and advisory body to guide investments in national research infrastructure, particularly where new and substantial funding is made available. The initial NCRIS program benefited significantly from the guiding hand of the NCRIS committee, in enabling the establishment of new yet largely well-governed and implemented capabilities regardless of the type, breadth and variety of infrastructure being funded.

Financing models

The Go8 acknowledges that successive periods of fiscal constraint make it critical that any investment in national research infrastructure by the Australian Government, universities, and others needs to be carefully considered and prioritised, with a view to where benefits can be most optimised in the national interest and for maximum return on investment. Yet, foundational and significant investment by the Australian Government remains essential both to the continued health of the national research infrastructure system and to leveraging the levels of co-investment and support from the research sector, state governments and others that are necessary to truly reap the benefits of the system. Indeed, NCRIS has demonstrated the extraordinary leveraging power of the government's investment with \$1.06 co-investment attracted for every \$1 of funding².

Noting the constraints that apply, the Go8 points to two, non-mutually exclusive, possible avenues for consideration in leveraging resources at hand:

1. The application of the remaining \$3.7 billion³ in the Education Investment Fund (EIF) currently sitting in the Future Fund to support national research infrastructure. The EIF was established by the Nation-building Funds Act 2008 with an objective to build a modern, productive, internationally competitive Australian economy by supporting world leading, strategically focused transformative infrastructure investments.

In the 2014-15 Australian Government Budget it was announced that unallocated EIF funds would be transferred to a new fund to support Asset Recycling by the States. However, the enabling legislation was never passed and as a consequence the \$3.7 billion EIF balance remains in the Future Fund invested on a cash mandate resulting in a low rate of return currently being earned from the fund.

It would be consistent with the aims of the original EIF program to fund infrastructure investment in research and education more broadly for the remaining EIF balance to be invested in a program of national research infrastructure, given those funds are currently sitting unused.

2. The further and consistent leveraging of private, including industry and business, partnerships in the management, development and use of national research infrastructure, assisted by a clear framework for how non-government reinvestment into national research infrastructure facilities can be activated through these partnerships.

Financing models should focus to a greater degree than previously on leveraging private investment, including from industry participants - as users, beneficiaries, or developers - in the individual infrastructures, in keeping with the renewed interest by government, industry and research for shared investment and collaboration.

NCRIS has many significant examples – such as with the National Computational Infrastructure and the Australian National Fabrication Facility – of where industry partners help develop cutting edge

² From NCRIS Project Survey, cited in KPMG 2014, *National Collaborative Research Infrastructure Strategy Project Reviews – Overarching Report*

³ The \$3.7 billion figure is taken from Future Fund Portfolio Update June 2016 available at <http://www.futurefund.gov.au/-/media/Files/FutureFund/05---Portfolio-Updates/Portfolio-update-at-30-June-2016.pdf?la=en>

infrastructure, make productive use of the facilities and assist in translating ensuing research findings. These interactions also exist in other parts of the national research infrastructure landscape, including those arising from Australia's participation in the Square Kilometre Array and the Giant Magellan Telescope. Yet the potential for attracting consistent and predictable private investment to complement government and university support remains largely untapped. Such potential can be pursued with further vigour and would be consistent with both the renewed focus on researcher-industry engagement under the National Innovation and Science Agenda (NISA), and the government's stated interest in attracting private investment to support innovation. It would require a clearer view of the types of partnerships that exist beyond industry researcher use of such facilities. For example, the creation of spin-off companies as a result of NCRIS, the winning of lucrative international research infrastructure contracts by Australian industry resulting in Australian jobs, and the development of novel and impactful new products to market need to be better illustrated.

Translational skills and training

The Go8 supports further consideration of how researchers can be trained and supported to effectively locate, understand and use the national research infrastructure available to them. A strong and comprehensive skills base must be further supported and built to ensure effective and optimal use of our national research infrastructure, and focus not just on the user, the supporting technical staff but also on developing personnel who can effectively translate the opportunities the infrastructure presents. Emphasis must be placed not only on having the right technical skill and resources to run the infrastructure and in training researchers to use the infrastructure, but also on translational skills.

The Go8 also considers that translational skills are needed to assist in making the opportunities of adopting available research infrastructure clear and well-known to potential users and other beneficiaries. These translational skills, assisted potentially by expert mentors, are especially critical to user uptake of new or ground-breaking research infrastructure, as was demonstrated during the implementation of the last major tranche (2009-2013) of NCRIS eResearch infrastructure. Translational skills of a different kind, focussed more on articulating the potential outcomes and opportunities at a conceptual level, are also vital to promoting engagement and outreach by research infrastructure users to industry and others. It is important in developing these skills to pay heed to also creating future and diverse career pathways for such infrastructure-ready personnel.

Governance

The Go8 recognises that the variability of governance models applied to major national research infrastructure facilities, and particularly NCRIS facilities, has been a factor in their success given the freedom to flexibly apply a best-fit model as the infrastructure requires. Yet such flexibility without more granular guidance from the government funders has sometimes resulted in models that have attracted criticism⁴. While the Go8 regards it as important to allow leaders of facilities to develop appropriate governance with the benefit of experience, and to adjust such governance as needed, stronger across the board guidance and statement of expectations on governance should accompany funding for national research infrastructure. This would ensure and should focus on: consistency in access; fair distribution of costs among beneficiaries of the

⁴ For example KPMG's 2014 *National Collaborative Research Infrastructure Strategy Project Reviews – Overarching Report* noted five NCRIS projects that had specific issues with governance, while the 2015 *Status Report on the NCRIS eResearch Capability – Summary* also indicated controversy around the lead agent model and that it would be more effective with greater clarity about governance, expectations, and coordination.

infrastructure (including partner institutions); a better understanding of how the infrastructure will be deployed and is expected to be used, including provenance and application of personnel and other support resources; and appropriate contribution to forward planning for the infrastructure – including use, sustainability, and decommissioning. As a minimum, guidance could be provided on the types of skillsets expected to be covered by governance bodies established to oversee national research infrastructure facilities, while transparency of lessons learned by individual facilities in relation to their governance arrangements would help inform future governance arrangements.

On a specific note, the Go8 supports the investigation of more streamlined governance arrangements to apply to the two high performance computing facilities funded under NCRIS, the National Computational Infrastructure and the Pawsey Supercomputing Centre. The common expertise, skills and resources needed to support these facilities, the need for the two facilities to work together in allocating merit-based time to common users, and the advisability of a joint approach in planning for future high performance computing needs in Australia would make common governance arrangements attractive. Developing streamlined arrangements for the two facilities must, however, be undertaken with care, with the utmost priority placed on the outcomes for the users so that existing benefits are augmented rather than compromised.

Fostering engagement between researchers and industry/ business

As noted at above, the Go8 considers that there is great potential for national research infrastructure facilities to foster productive partnerships between research stakeholders and private and commercial players, and that this significant opportunity must be capitalised. For instance, the development and subsequent sale for \$76 million of the spinoff company Digitalcore (now Lithicon) whose business was based on a National Computational Infrastructure advanced computational model that provides critical information to mining industry on fluid behaviour in oil reservoirs was a significant achievement for the ANU and the UNSW. Digitalcore was also a long-time client of the Australian National Fabrication Facility (in which all Go8 members are partners) which has itself rolled out significant partnerships with industry across numerous sectors – as well as with international parties such as the US Defense Force. In addition to the possibility of attracting private investment to support the infrastructure to the benefit of all concerned, the facilities as collaborative hubs in themselves can offer ideal environments for researchers to be exposed to and become familiar with industry and business, while acquiring valuable skills and job pathway prospects. While access by publicly funded researchers to publicly funded research infrastructure facilities should remain a paramount principle, national research infrastructure facility custodians and users should also adopt a principle of leveraging the infrastructure in all ways possible that are not contrary to the intent and the purpose of the individual facilities to seek out, promote and enable productive engagement and partnerships between researchers and industry.

International access

The Go8 supports the continuation of research funding practices that enable Australian researchers to access international research infrastructure facilities, recognising that Australia cannot afford to meet all infrastructure needs in-country nor would necessarily want to do so. The Go8 notes that such practices have often supported subscriptions that enable Australian researchers to acquire time on specific overseas facilities, such as the European Molecular Biological Laboratory and Magellan and Gemini telescopes, and therefore have relied on government grants – including under NCRIS – that allow this flexibility. For the most part, however, this has occurred on an ad hoc basis and future provision would be assisted by dedicated resources to support such access to priority overseas facilities within any future national research infrastructure funding program.



The Go8 notes that access may be further promoted if Australia were able to offer like access in return, perhaps under strategic frameworks or agreements with overseas jurisdictions. The Go8 would support exploration of alternative models that might enable Australian researchers access to overseas facilities on the basis of like-to-like exchange of time for corresponding overseas researchers on similar or commensurate local infrastructure. New models for access to international research infrastructure could promote or encompass the possibility of gaining access and time on overseas facilities (of one kind) in exchange for matched access to Australian research infrastructure facilities (of another kind). The Go8 notes the release in 2016 of a European Charter for Access to Research Infrastructures that could help inform future approaches to international infrastructure access.

Lessons from NCRIS

It goes almost without saying that the high degree of productive collaboration engendered by NCRIS over the years, encouraging and driving partnerships and new modes of working amongst universities, and with government and private sector parties, remains the key achievement of NCRIS. The open approach adopted by many national research infrastructure facilities to sharing lessons and experiences with each other has been essential. In this spirit, the government should consider providing greater access to key reports or reviews of NCRIS and national research infrastructure to enable Go8 universities and others to learn from previous implementation of facilities and to be aware of key risks and pathways to success. These include, for example, the findings of the Report from the 2015 Review of Research Infrastructure led by Mr Phil Clark, a more detailed 2015 Status Report on the NCRIS eResearch Capability review conducted by Professor Tom Cochrane, as well as access under appropriate conditions to capability specific reviews or findings.