



BUSHFIRE AND NATURAL HAZARDS COOPERATIVE RESEARCH CENTRE

Submission to the CRC Programme Review

Beyond commercial outcomes

November 2014







INTRODUCTION

The Bushfire and Natural Hazards CRC makes this key recommendation:

The Bushfire and Natural Hazards CRC believes that the current focus and scope of the CRC programme is working well and addressing many key aspects of stated national research priorities. The Bushfire and Natural Hazards CRC recommends that CRCs continue to be led and driven by end-users and be judged on economic, social and environmental measures rather than just commercial outcomes. At a minimum, it must be on economic and commercial benefits.

The focus of the Review, as expressed in the terms of reference and the discussion paper, appears to be solely on commercial exploitation of the outcomes of the CRC programme by 'industry'. In the introduction to the Discussion Paper, it is noted that the CRC programme is a 'business-research collaboration programme'. However, in its current form, the CRC programme is broader than this. It is an end-user-researcher collaboration program, with some, but not all, end-users being businesses.

Throughout the Discussion Paper, reference is made to 'commercial' and 'industry' without defining what either is intended to encompass. In general, commercial appraisals are similar to economic appraisals but narrower in focus, mainly focusing on the perspective of a specific private company to test if a specific investment will generate profit over a specified period, whereas an economic assessment would consider the economy as a whole, and seek to establish all the costs and benefits to the country as a whole.

In proposing the use of a commercial test for the program, it is not clear how such a test could be applied, as what is in the commercial interests of one company or set of companies may in fact be detrimental to the Australian economy as a whole.

In determining what is meant by industry, the Bushfire and Natural Hazards CRC categorises its end-users as an industry or sector, albeit one that saves costs to the community rather than generate commercial profits; it does contribute to GDP.

One of the strengths of the CRC programme over the past few years has been the way in which it has produced economic, social and environmental benefits. In most cases, the last two of these can be expressed as economic benefits though proxy measures. It has achieved this through a rigorous selection and management process. This has seen a range of CRCs funded, with each delivering specific and measurable benefits to their own set of end-users. These benefits can be in the form of commercial products or in terms of economic value to the country, whichever best suits the needs of the end-user partners.

There are many benefits from CRCs set up to deliver economic value through the public sector that result in indirect private benefits. Even in CRCs that traditionally have been tagged 'public good', the research and utilisation programs link directly to economic benefits to the country. For example, in the Bushfire and Natural Hazards CRC, it is through reductions in the substantial disruptions and costs associated with disasters. Although many of these costs are incurred by the public sector, at Commonwealth, state or local government level, many are incurred by the community, or private sector, for example insurance, banks. These public costs are reflected in increased taxes, increased compliance costs, or reduced spending in other areas (opportunity costs).

Seeking a single outcome of commercial exploitation may in reality lead to poorer outcomes in an economic sense. It may be that investment in areas that are focused on economic outcomes may represent a better return on investment to the country than those where commercial exploitation is the focus.

Refocusing the CRC programme on commercial outcomes will leave a void in the funding for the longer-term investment in research that delivers more general economic benefit to Australia.



BUSHFIRE AND NATURAL HAZARDS CRC EXAMPLE

In a recent report, Deloitte Access Economics¹ shows that the economic costs of natural disasters to the country as a whole is around \$6.3 billion per annum and predicted to grow by 3.5% pa due largely to increasing asset values and demographic changes (impacts of a changing climate were not modelled). This cost is almost entirely related to the recovery stage following a disaster.

All of these costs need to be recouped from private wealth through insurance premiums, fees and taxes, amounting to an average of \$820 per year per household² in Australia. This total figure is predicted to rise to \$23 billion pa by 2050, assuming no changes to policy or practice. Post-disaster expenditure, although creating economic activity, is inefficient as in most cases it is spent on replacing public and private assets before the end of their useful life, indeed in some cases within 2 or 3 years.

The recent Productivity Commission draft report of its inquiry into Natural Disaster Funding Arrangements has canvassed the prospect of a transfer of funding from recovery to mitigation resulting in substantial potential savings, owing to mitigation potentially protecting multiple assets with mitigation to recovery cost ratios ranging from 1:4 to 1:10 being demonstrated.

The work of the Bushfire and Natural Hazards CRC directly feeds into this agenda, providing solutions and the evidence base to make investments in mitigation.

The Bushfire and Natural Hazards CRC is conducting and coordinating research that will help to underpin many of the draft recommendations in the report, particularly Recommendation 4.10³ and Draft finding 4.1.⁴

The Bushfire and Natural Hazards CRC is operating on a national scale through its linkages to the Australian and New Zealand Emergency Management Committee, a Council of Australian Governments (CoAG) committee and its Ministerial Standing Council on the Law, Crime and Community Safety Council. It is also operating on an international scale being Australia's linkage in the Integrated Research into Disaster Risk (IRDR) and initiative of the United Nations and the International Council for Science and the international Social Science Council.


In this, the Bushfire and Natural Hazards CRC will be creating substantial **economic** benefits, but few **commercial** outcomes.

¹ <http://australianbusinessroundtable.com.au/white-paper>

² Based on 7,760,314 households in Australia in 2011
<https://aifs.gov.au/institute/info/charts/households/index.html>

³ *'All governments should put in place best-practice institutional and governance arrangements for the provision of public infrastructure, including road infrastructure...'* Productivity Commission 2014, Natural Disaster Funding Arrangements, Draft Inquiry Report, Canberra, p. 43

⁴ *'The availability of information on natural hazards and exposure has improved significantly in recent years, especially in relation to floods. However, there is scope for greater coordination of natural hazard research activities across governments and research institutions.'* Productivity Commission 2014, Natural Disaster Funding Arrangements, Draft Inquiry Report, Canberra



TERM OF REFERENCE A: IS THE CRC PROGRAMME THE RIGHT VEHICLE FOR ACHIEVING THE GOVERNMENT'S PRIORITIES FOR APPLIED SCIENCE AND RESEARCH? IF NOT, WHAT SORT OF PROGRAMME WOULD BE MORE EFFECTIVE?

- 1. The current CRC programme is working to deliver diverse Government priorities.**
- 2. CRCs are effective hubs to create collaboration across sectors.**
- 3. CRCs provide a long-term funding base to address systemic issues not available from any other source.**

THE CURRENT CRC PROGRAMME IS WORKING

CRCs have been proved effective at returning benefit to the economy. For example, through the recent studies of the impacts of the CRC programme by Allen Consulting Group,⁵ it was found that *'Relative to the funds committed to the CRC programme by the Australian Government, the CRC programme has generated a net economic benefit to the community which has exceeded its costs by a factor of 3.1'*.

Although it stands to reason that the Department of Industry has a focus on matters of direct interest to its mandate, it must be noted that the CRC programme is currently also serving the priority needs of many other departments in the Commonwealth Government.

It could be argued that there are similar reasons for the CRC programme to be managing CRCs that clearly align with the Departments of Health, Attorney-General, Agriculture, Primary Industries, Education, Environment and Prime Minister and Cabinet. Further, to not have a central funding and management function in the Commonwealth Government would result in inefficient management and would lose all the cross-over benefits that exist between the different sectors in the CRC program.

In this vein, the Defence Material Technology Centre effectively elected to comply with and be monitored under the aegis of the CRC Programme even though it was separately established and funded. What the CRC programme and the Programme Office provide in particular is a uniform and highly skilled management and oversight function on behalf of the whole of the Commonwealth Government. For example, when the Department of Defence wished to establish and fund a Defence Future Capability Technology Centre, it asked that it be managed through the CRC Program, as that is where the Commonwealth's expertise sat for managing such ventures. The successful bidder in this instance was the Defence Materials Technology Centre.

Many CRCs recognise that at their core lies a set of common skills and roles. These include research provisioning, management and delivery, intellectual property management and exploitation, partnership management, education programme management and management of a small business. This has created a community of practice among CRCs that enables group learning and best practice management to grow.

By focusing purely on the commercial benefits of CRCs and maintaining a purely industry focus, the synergies developed through the CRC programme would be lost.

CRCs ARE EFFECTIVE HUBS

CRCs are effective vehicles for creating collaborative networks that lead to commercial, economic, environmental and social benefits. The creation of a funded hub through the CRC programme creates the bridges to link disparate groups together in an innovative setting.

⁵ <http://www.business.gov.au/grants-and-assistance/Collaboration/CRC/about-the-program/Documents/2012-crc-program-impact-study.pdf>



This capacity to draw together and align research users to address significant common problems has enabled many groups that would not normally openly communicate to do so in a constructive manner in the Bushfire and Natural Hazards CRC. For example, the Bushfire and Natural Hazards CRC can bring together the State and Territory government players with the Commonwealth and researchers in a non-threatening environment outside the more formal CoAG frameworks. The Bushfire and Natural Hazards CRC also provides a vehicle where the not-for-profit sector and private sector can discuss solutions to issues and problems with governments.

CRCS PROVIDE A LONG-TERM FUNDING BASE TO ADDRESS SYSTEMIC ISSUES NOT AVAILABLE FROM ANY OTHER SOURCE

The longer-term nature of funding for CRCs provides the ability to invest in people and to solve the more intractable problems. It also provides for longitudinal studies that are the fundamental resource for policy development and evaluation. This committed long-term funding is not available from any other public funding source, particularly not the ARC process.

The longer-term funding also allows the time to develop the trust within the networks and minimises the percentage of time taking in ramping up and closing down a centre.



TERM OF REFERENCE B: HOW CAN THE GOVERNMENT'S INVESTMENT IN THE CRC PROGRAMME BETTER DELIVER OUTCOMES FOR INDUSTRY?

- 1. The government needs to sell the programme more effectively.**
- 2. Engagement in the programme is hard for SMEs and NFP sectors.**
- 3. There are alternative ways to build a CRC.**

SELLING THE CRC PROGRAMME TO INDUSTRY

The Bushfire and Natural Hazards CRC believes that the government could do much more to sell the benefits of the programme to a wider audience of end-users. While the department does conduct roadshows and produce the CRC directory, the latter is almost entirely written by the existing CRCs.

At times, it appears that the promotion of the programme is left to the individual CRCs and the CRC Association. This in turn mainly promotes the benefits of the existing CRCs and not how other sectors or industries could benefit.

SME AND NFP ACCESS TO PROGRAM

Engagement in a major government programme is always daunting for small to medium enterprises (SME), and not-for-profit (NFP) companies. Needing to commit for multiple years is problematic for many. Few SMEs or NFP have the free resources to effectively engage. However, it is these sectors of business who would best benefit from engagement in CRCs. The programme needs to find better and more flexible ways to engage these companies.

ALTERNATIVE WAYS TO BUILD A CRC

The development of bids for the CRC programme has almost always been at the risk of those bidding. That is, unless there is a specific policy interest, there is little or no engagement by the Department of Industry staff or the Commonwealth Government owing to probity concerns. However, in a small number of cases, CRCs have been built in different ways.

In the case of the Bushfire and Natural Hazards CRC, the government, through the departments of Prime Minister and Cabinet, Attorney-General, and Innovation, Industry, Science and Research, determined that there would be a CRC examining the issues relating to natural hazards and bushfire. They allocated funds to the problem and through the Australia and New Zealand Emergency Management Committee, appointed an interim Chair and CEO and built a working team from the jurisdictional end-users and the Commonwealth Government.

This team then worked with the end-users to determine the research questions and problems that the Centre was to tackle before going out to the market to find researchers who might have an interest in solving them.

The selection panel for the projects was composed of end-users with a research background, and it chose the research projects that would be invited to be part of the broader discussions with the end-user community at a major gathering with all jurisdictions.

This approach had a number of advantages: it was clearly dictated by the problems as articulated by the end-users, and not driven by the researchers. The most able researchers who wanted to be involved in those particular areas responded. And as there was definite money, the quality of the proposal and matching funding from the research organisations was much better than seen in other CRC bids.

Because of how this bid was constructed, the Department and importantly the CRC committee could be involved in providing guidance rather than just acting as judges of the completed bids; this provided valuable information and help in the formulation of the process.



In the Bushfire and Natural Hazards CRC's case, it took about 9 months from the announcement until the finalisation of the research agenda, and a further 3–4 months to finalise most of the research contracts with the partners. The Bushfire and Natural Hazards CRC was operating like a traditional CRC within 12 months of the announcement.

So, in cases where there is a national need, it may pay for the Department to make an announcement of a particular challenge or need and then arrange for a targeted CRC creation that is driven by end-users to create the Centre.



TERM OF REFERENCE C: HOW CAN THE GOVERNMENT'S INVESTMENT IN THE CRC PROGRAMME FURTHER DRIVE MORE FREQUENT AND MORE EFFECTIVE COLLABORATION BETWEEN INDUSTRY AND THE RESEARCH SECTOR?

1. **Collaboration for a purpose.**
2. **Changing cultures of industry as well as academia.**
3. **CRCs role in building industry-ready PhD-qualified recruits.**

Collaboration needs a purpose beyond just collaborating. Professor Mary O'Kane in her last review of the CRC programme recommended that collaboration be formed to solve a specific and well-defined purpose.⁶ This concept should be maintained in a future CRC program.

There is much talk in the Discussion Paper regarding changing the culture of universities and academic researchers to focus on applied research outcomes in collaboration with industry. However, the paper is quiet on the culture of Australian business and its collaboration with universities. Pettigrew noted that Australian industry's investment in employing researchers has been low for an extended period compared with many competing countries.⁷ This low level of research intensity within industry can lead to an inability to effectively interact with academics and a lack of capacity to respond to new challenges, or define effective research questions. In short, industry cannot be an informed buyer of research services.

Pettigrew also notes: '*Strategies would be required to build business R&D and innovation. This would be challenging, given the low base from which business R&D must increase, and the time it takes to develop R&D capacity and capability.*' We would argue that the CRC programme provides one of those strategies to effectively engage with industry about the role of research and grow the low level of PhD-qualified researchers in Australia relative to our major competitors.⁸

The CRC programme is required to have an education role in supporting graduate students and creating 'industry-ready' researchers. Many CRCs have exchange programs that see research students placed in industry or working alongside industry partners. CRCs provide additional training to help develop the skills required by end-users. See for example the 2012 CRCA report on research training.⁹

TERM OF REFERENCE D: HOW COULD CONTRACTUAL AND ADMINISTRATIVE REQUIREMENTS OF THE CRC PROGRAMME BE STREAMLINED?

The CRC programme administration, on the whole, creates a good discipline with the need to report quarterly and annually and to have regular reviews. Well-informed and quality staff in the Department provide good support.

A number of the steps in the process could benefit from improvement:


- 1) The economic modelling framework in its current form, mainly its implementation in the Excel spreadsheet, is very poor and requires much more time to complete than should be necessary. The discipline in the process is good and we at the Bushfire and Natural Hazards CRC use the model to help understand and manage the process of utilisation.

⁶ '*...tackle a clearly-articulated, major challenge for the end-users addressing identified risk gaps...*' Collaborating to a Purpose: Review of the Co-operative Research Centres Program, 2008.

⁷ A. Pettigrew, <http://www.chiefscientist.gov.au/wp-content/uploads/OPS2-OECD-for-web-FINAL.pdf>

⁸ 'Low levels of researcher employment in industry may partly explain our relatively low level of doctorate holders overall. Australia has 8 doctorate holders per 1000 workers, less than the 11 per 1000 in the United States and much less than in Germany, which has 20 doctorate-holders per 1000 workers.' A. Pettigrew, <http://www.chiefscientist.gov.au/wp-content/uploads/OPS2-OECD-for-web-FINAL.pdf>

⁹ http://crca.asn.au/wp-content/uploads/2012/12/The_CRC_Contribution_to_RT_Final_Report.pdf

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- 2) The percentages asked for in the economic model, for example probability of output being achieved, encourage risk-taking and innovation, and lower probabilities are explicitly encouraged. However, when these are translated into the Funding Agreement milestones, they become fixed, expected and contracted.
 - 3) We have always found the requirement to list personnel level and commitment for the end-user partners to be difficult to get agreement on, and have mainly resorted to listing this in non-staff in-kind, rather than staff in-kind.
 - 4) The annual management data questionnaire (MDQ) creates a major compliance cost in our CRC as we have to put in place specific systems to enable reporting. However, it is unclear what the Department actually uses it for. It appears to be mainly counting things and box-ticking. Tracking total FTEs is difficult, as in our CRC, there are fractions of people contributing from many organisations. Also the process of tracking publications becomes tedious, as the date of publication is quite often in the years following its approval.



TERM OF REFERENCE E: IS THERE SUFFICIENT DEMAND WITHIN THE RESEARCH SECTOR AND INDUSTRY FOR A PROGRAMME THAT BUILDS COLLABORATIVE STRUCTURES THAT FACILITATE END-USER DRIVEN RESEARCH?

The Bushfire and Natural Hazards CRC has little to add to this issue except to state that measurement of the ratio between those attending briefing sessions and those submitting applications is not really meaningful, except to demonstrate that the filters are working. The fact that there are more submissions than Centres able to be funded illustrates that demand is higher than supply.