INNOVATIVE RESEARCH UNIVERSITIES AUSTRALIA

FUNDING THE FULL COST OF RESEARCH

SUPPLEMENT TO THE IRU AUSTRALIA SUBMISSION TO THE REVIEW OF THE NATIONAL INNOVATION SYSTEM

May 2008

IRU Australia Member Universities

Flinders University · Griffith University · JCU James Cook University · La Trobe University · Macquarie University · Murdoch University · The University of Newcastle Australia

INTRODUCTION

In its submission to the Review of the National Innovation System, IRU Australia argued for the full-cost funding of research. In response to questions put to representatives of IRU Australia by Senator Kim Carr in a meeting held on the 29th of April, 2008, this brief paper elaborates further on the case for full-cost funding and puts forward a proposed strategy for phasing in full-cost funding over a five year period.

In developing this paper, we highlight that the issues identified by IRU Australia and other Australian universities are remarkably similar to the issues that have been identified, analysed and responded to within the UK over the last five years. In recognising the critical importance of research and innovation to the economic, social and environmental wellbeing of nations, governments have sought to boost research activity and productivity and universities have been eager to cooperate in this and increase their contributions to their national innovation systems. In the rush to do so, however, some important detail about the sustainability of policy, practice and funding has been missed and the accrued impacts are now being seriously felt by universities in both the UK and Australia.

It is time to take stock and to examine how, as a nation, we can continue on a positive trajectory of boosting our international competitiveness in research and innovation whilst ensuring that we build a world class system which can sustain itself over the longer term.

DIMENSIONS OF THE FUNDING ISSUE

Backlog of deferred maintenance[1]

Most universities provide the Department with data on the estimated level of deferred maintenance backlog as part of their Capital Asset Management Plan workbook through the Institutional Assessment Framework process. Deferred maintenance involves capital maintenance which has been delayed and not performed when it should have been or when it was scheduled.

Based on data provided by universities the estimated amount of maintenance deferred is increasing. For 2005, the total value of deferred maintenance was estimated at $1.5 billion (an increase of 23.1% on estimated amount for 2004). The overall level of deferred maintenance represents 4.9% of total replacement value of assets. It is considered that a level of deferred maintenance higher than 3% is unacceptably high. The Department estimates that expenditure of around $918 million would be required to bring the level of deferred maintenance back to 3%. Ideally, there should not be a continuing level of deferred maintenance over the long term.[2]

[1] Reproduced from the Murdoch University submission to the Review of the National Innovation System.
[2] Strategic Asset Management Discussion Paper, prepared by the University Governance Professional Development (UGPD) Program with assistance from the Department of Education, Science and Training.

The extent of deferred maintenance is not uniform. In 2005, thirteen universities had levels of deferred maintenance in excess of 3% of the total replacement value of their assets. One university had a level of deferred maintenance in excess of 20% of the value of its assets.

Condition of the higher education estate[3]

There has been no survey of the condition of research infrastructure or space since the report in 1994 by the Sub-Group on Higher Education Research Infrastructure of the Inter-Departmental Committee on Higher Education Financing, which recommended increased infrastructure funding. Even then, only four institutions were surveyed – Sydney, UNSW, Flinders and the University of South Australia.

Anecdotal evidence suggests that research equipment, infrastructure and space are severely stretched in all universities as indexation of grants and funding levels have not kept pace with growth in research and research training activity. Requests for CDP funding are consistently over four times that available. True demand is even greater because many needs are not expressed in applications given the very inadequate CDP funds available. MNRF funding in 2002-04 was $55 million compared with requests of $443 million.

It is highly likely that a survey will find substantial deficiencies in the condition and adequacy of capital infrastructure of Australian universities.

Prior to 1994, capital funding was separately provided. The so-called Capital Roll-in of 5.6% was added to the Operating Grant (5.3% of the current funding including the Capital Roll-in). In the current Funding Agreement CGS plus HECS funding of about $5 billion, the 5.3% would constitute a notional capital component of $265 million. Assuming the Capital Development Pool to be additional to this, the total available would be $310 million up to 2008 and $335 million from 2009.

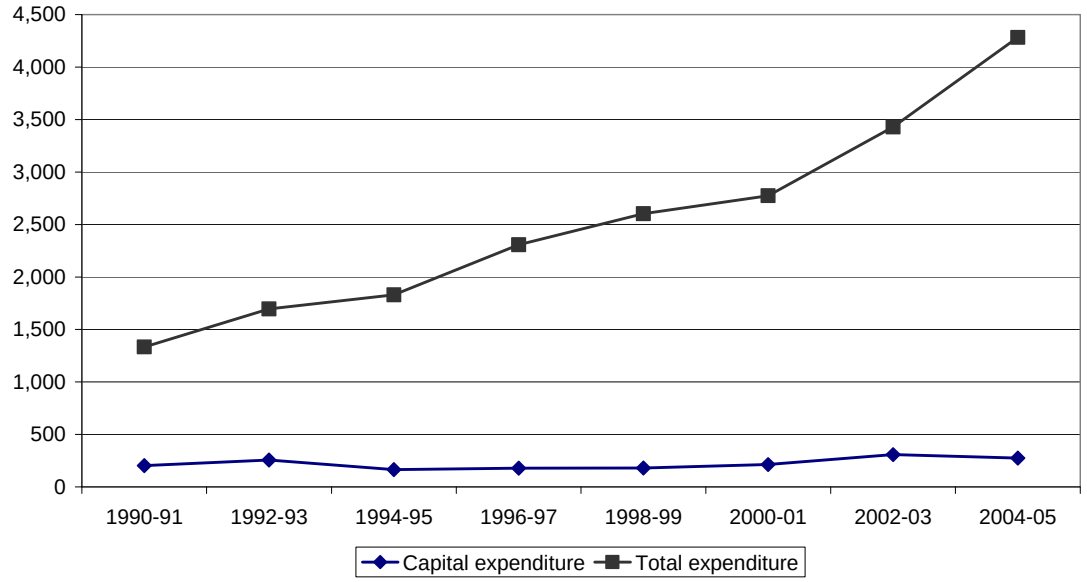
The capital assets of Australian universities are reported in the 2004 Higher Education Report as $20 billion. The available notional capital funding of $310 million is therefore only 1.55% of value of capital assets. The UK report by JM Consulting found that this level is only sufficient for the on-going maintenance component of capital expenditure. Including capital renewal and replacement costs, the requirement is 4.5%, which on $20 billion is $900 million per annum. This means that, including provision for growth, about a billion dollars per annum is required for about five years to bring the capital stock to a state adequate for meeting the needs of the teaching, research and research training tasks expected of Australian universities. It is a contention of this paper that a sustained and high quality infrastructure estate is a necessary condition for the sector to contribute to the national innovation system.

[3] Reproduced from the Murdoch University submission to the Review of the National Innovation System.

Declining capital expenditure on R&D

The ABS Survey of Research and Experimental Development shows a significant trend of declining investment in R&D capital[4] relative to total R&D expenditure. In 1990-91, capital expenditure represented 15% of total R&D expenditure compared with only 6% in 2004-05.

Total and Capital Expenditure on Higher Education R&D ($m)



Source: ABS 8112.0 1990-91 to 2004-05

In 2004-05, an additional $376 million would have needed to be expended by universities to restore the percentage of total expenditure spent on capital to the 15% recorded in 1990-91.

CAUSES OF THE DECLINE IN RESEARCH INFRASTRUCTURE: A SERIES OF COMPOUNDING FACTORS

Over-trading and under-pricing: unintended consequences of government policy

To borrow terminology adopted within the UK government[5], a major cause of the problem of declining research infrastructure relates to 'over-trading' and 'under-pricing'.

Australia faces increasingly complex economic, social and environmental challenges. These challenges extend beyond the domestic environment to the increasingly competitive global knowledge-based economy. These factors are driving increased demand for research and innovation services within Australia. Australian universities are committed to expanding their research effort to meet this demand, through increased activity in both publicly and privately funded research.

[4] The ABS defines capital expenditure as 'Expenditure on the acquisition of fixed tangible assets such as land, buildings, vehicles, plant, machinery and equipment attributable to R&D activity. It does not include capital maintenance.

[5] Office of Science and Technology, Regulatory Impact Assessment for Dual Support Reform, 2004.

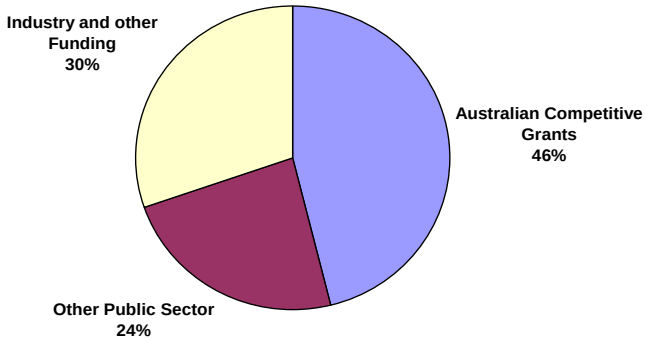
The Australian government has acknowledged the increased demand for research services and has accordingly increased its funding allocations through the ARC and NHMRC project funding schemes. This has further stimulated universities to drive up research applications, research activity and research productivity. The government has also been strongly encouraging universities to increase the quantum of research undertaken under contract for industry, business and government, in an effort to bring Australia's business R&D expenditure as a percentage of GDP more in line with other OECD countries.

While increased research effort is vital to ensuring Australia's international competitiveness, government and institutional ambitions to meet the demand for services have combined to unintentionally encourage a serious level of 'over-trading' (i.e. undertaking more research than can be afforded). A number of factors are contributing to over-trading and under-pricing:

- There are no well established research costing models operating in Australian universities, due in part to the complexity of the overall funding base, which makes activity-based costing very challenging. The wide variation between institutions adds to the difficulties in agreeing full-costing guidelines which might apply nationally.
- Australian Competitive Grant (ACG) funding only supports direct costs of research and does not cover the costs of all research personnel or general overhead costs. Success in attracting ACG funding, however, is a major source of university prestige and hence universities are compelled to seek to maximise their success in winning grants even in the knowledge that they will need to significantly cross-subsidise the cost of the research from other sources.
- In response to increased levels of research applications, research funding councils have struggled to maintain application success rates within the available pool of research funding. Funding councils have sought to manage this issue by choosing to provide successful projects with only a proportion of the allowable direct cost funding, thus enabling the volume of research to be sustained. This has further exacerbated the problem of grant amounts not covering the full costs of conducting the research.

The issue of over-trading and under-pricing extends beyond the Commonwealth research funding schemes. In 2006, Australian Competitive Grants accounted for 46% of university research project income (excluding CRC funding). This means, in loose terms, that 54% of university research income is derived from contractual arrangements where universities need to negotiate on price.

Research Income by Category, 2006 (exc CRC funding)



Failure by funding councils to meet the full costs of research undercuts institutions' attempts to negotiate full-cost funding for research contracted and supported by industry or government departments. This is exacerbated by comparatively low levels of industry funding of research in Australian universities, which essentially renders it a "buyer's market", especially when the government is strongly urging universities to increase their collaboration with industry and business.

The combination of factors outlined above has resulted in a situation whereby third parties only provide partial coverage for the full economic costs of the contracted research. Universities are challenged in arguing a convincing alternative case in the absence of government-endorsed costing and pricing guidelines and robust institutional costing systems.

The more successful universities become at attracting research contracts with industry, business and government, as is being urged by government, the greater will be the negative impact of the current culture and practice of under-pricing. The UK *Science and innovation investment framework 2004-2014* notes:

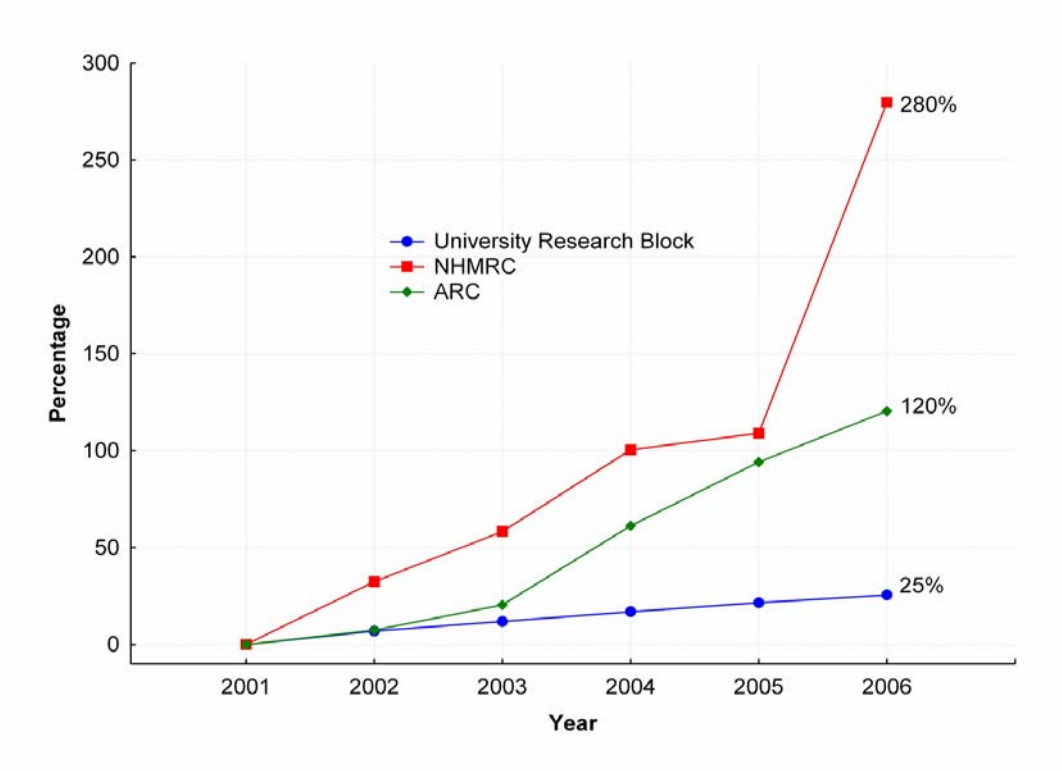
> *The behaviour of these third party funders is therefore also key in achieving a sustainable funding system. As partners in this system, users of the UK research base should, as a whole, contribute more, through the prices they pay for research and through other partnership programmes with universities, to the resources available to universities to reinvest to achieve a sustainable level of capital infrastructure and research skills, and to maintain the excellence of the research base*. (p. 40)

Declining relativities between research project and infrastructure funding

In its submission to the Review of the National Innovation System, Universities Australia presented a graph displaying the growing gap between research project funding through the ARC and NHMRC and research infrastructure funding through research block grants.

While project funding grew by 200% between 2001 and 2006, infrastructure funding has only grown by 25% over the same period.

Relative Increase in Research Funding by Entity, 2001 to 2006 (2001 base = 0)



IRU Australia argued the following in its submission to the Review of the National Innovation System:

> *The Productivity Commission concluded in its report on Public Support for Science and Innovation that there is a sound public policy rationale for dual streams of funding of higher education research – funding through the Commonwealth competitive grants schemes mainly the ARC and NHMRC, and funding for research infrastructure and support for emerging research areas and researchers through competitively allocated institutional block grants. Australia needs to maintain a strong dual system of research funding that ensures the continuing quality of research infrastructure. Given the experience over recent years of the ratio between competitive funding and block funding becoming incrementally distorted, it would be highly desirable for policy parameters to be established to ensure the maintenance of an appropriate ratio between the dual streams. In a number of research environments (e.g. the UK Engineering and Physical Sciences Research Council and the US federal research agencies), the norm is for approximately 80% of overhead costs to be tied to the grant and 20% funded through block grants.*

The current dual system provides an importance balance between project funding which varies from year to year and is tied to specific projects and individual academics or research teams and block funding which provides universities with some certainty of funding from year to year and a capacity and flexibility to make strategic investments in research infrastructure.

Ageing infrastructure

The IRU Australia member universities were established during the period of higher education expansion in the 1960s/1970s. Much of the capital stock of the universities is consequently reaching the end of its useful life and is due for replacement or will require ever increasing maintenance costs to remain operational and ensure compliance with legislative and regulatory requirements. This situation is also true for many other universities. As noted earlier, a national survey of the condition of the higher education estate has not been undertaken in Australia to inform funding and policy decisions.

Infrastructure funding programs which do not account for whole-of-life asset management

The major infrastructure funding schemes in Australia are restricted to funding new buildings and infrastructure and often focused on supporting new highly specialised and expensive developments.

The Major National Research Facilities Programme, for example, covers 'expensive, large equipment items or highly specialised laboratories that are vital to conducting leading-edge research in science, engineering and technology'. The reality is that these facilities also carry significant longer term maintenance and renewal costs that are not factored into ongoing funding arrangements.

The most recent of the government's infrastructure initiatives such as the (prior) Higher Education Endowment Fund (HEEF) and the National Collaborative Research Infrastructure Strategy (NCRIS) are also focused on expanding the national higher education and innovation asset base without adequate recognition of the need to account for whole-of-life costs.

'Robbing Peter to pay Paul': an inadequate and unsustainable strategy

With the research funding shortfalls discussed above, universities have been increasingly forced to fund research infrastructure through cross-subsidisation from non-research sources, particularly international student fees. As responsible managers of risk, universities have needed to factor in the possibility of significant downturns in the international student market and to be prudent in terms of the level of debt they can service. This has inhibited their capacity to commit expenditure to new projects or maintenance programs. The growth in international student numbers has also driven the need for considerable expansion of teaching facilities and infrastructure which in turn only attracts minimal funding from government.

In addition, as the impact of the lack of adequate indexation of the Commonwealth grant has continued to accrue over time, the capacity for institutions to responsibly cross-subsidise research from teaching budgets has been significantly eroded. It is critical that the quality of the student experience and university infrastructure more broadly be protected if Australia is to continue to be judged as a competitive destination for international students, researchers and staff.

It is important to note that the operating surpluses reported by many universities do not provide a complete reflection of the capacity of institutions to invest in infrastructure. Surpluses often include significant carryovers of committed funds or pre-commitments to core activities. This reflects the experience in the UK, with the Science *and innovation investment framework 2004-2014* noting:

Although most universities report operating surpluses in their accounts, Transparency Review data showed real deficits after adjustments for capital and exceptional items. This data will be robust from 2004-05, but early figures estimate that the annual deficit in the full economic cost of 'public interest' research undertaken by UK HEIs in 2005-06 is likely to fall in the range £0.8- 1 billion. Most of the balance is found by HEIs from other sources but some represents a shortfall in funding against actual volumes of activity and a shortfall in investment against medium term requirements.

MOVING FORWARD: A PLAN FOR INTRODUCING FULL-COST FUNDING FOR RESEARCH

IRU Australia recognises that the factors outlined above can not be resolved overnight. It is critical, however, for government to develop a strategy for addressing current funding deficiencies and ensuring that Australia has the research and innovation infrastructure it needs to prosper in the global knowledge economy.

IRU Australia puts forward the following plan for transitioning to full-cost funding for research. This plan substantially mirrors the approach adopted by the UK government in addressing the almost identical funding issues identified by the UK Treasury as seriously detrimental to the long term sustainability and vitality of the national research and innovation system.

The plan addresses the three funding elements that will collectively provide coverage of the full costs of research in Australian universities:

A. Funding through Australian Competitive Grants

We propose that the costs of all research personnel, including pro rata salaries and on-costs for university staff investigators and associated overhead costs (general administrative, technical and management support and general operating costs) are met for all ACG awards. We are assuming, based on systems in the UK and the US, that this would reflect approximately 80% of the real full-cost of research, with the remaining 20% reflecting the costs of associated research infrastructure.

IRU Australia believes that identifying and funding real costs at a project level for ACG are essential so as to establish the base level of costing for research which must also apply to industry and other government or private funding of contracted research[6].

It is clear that introduction of full-cost funding (even at the 80% level) for ACG at current budget levels would have the effect, for most agencies, of dropping success rates to unacceptably low levels (perhaps as low as 10%). We therefore propose that full-cost funding be phased in over a period of 5 years so that success rates for project grants are maintained at greater than 20% for the key agencies, ARC and NHMRC.

[6] An alternative approach to meeting full cost of ACG research might be to substantially increase the Research Infrastructure Block Grant (RIBG) funding alone. Our view, however, is that this approach would be far less effective since it avoids the necessity of establishing full-cost models which then apply to industry or other-government funding of research.

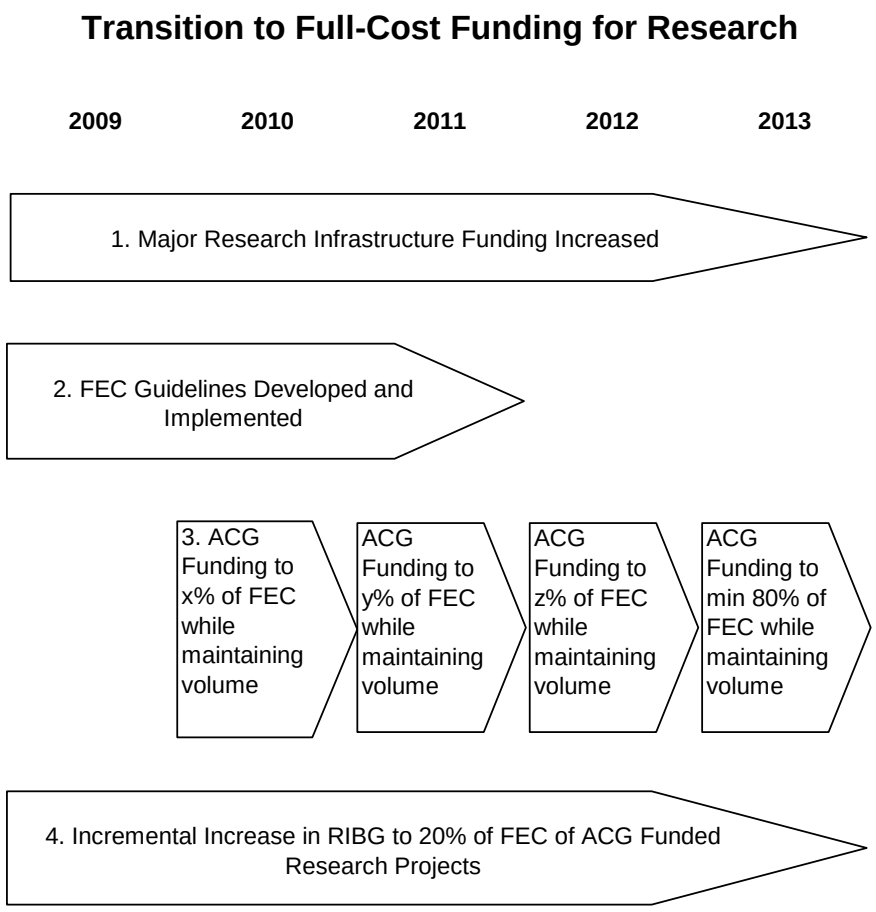
B. Research Infrastructure Block Grant

We propose that the remaining 20% of real research project costs associated with the research infrastructure required to support ACG projects be funded through a continuing and increased RIBG funding pool.[7]

C. Major Research Infrastructure Funding

The third element of covering the full costs of research concerns major national research facilities and locally-shared major research equipment and facilities. It is proposed that current major research infrastructure funds be continued and enhanced to ensure that the national research asset base is internationally competitive and fit for purpose in supporting the national innovation system.

Specific recommendations from IRU Australia for introducing full-cost funding for research in Australian universities are summarised in the following diagram and expanded upon further below.



[7] A logical consequence of introducing full-cost funding of ACG through a combination of project and RIBG funding, is that the rationale for the Institutional Grant Scheme, or at least the current index by which IGS is allocated, should be reconsidered.

1. Incrementally Increase Major Research Infrastructure Funding

The Australian Government should commit to long-term funding at increased levels (by a factor of two at least) for major multi-user research facilities at the national level through NCRIS or similar schemes. This needs to be coupled with substantially increased funding levels (by a factor of four) for locally-shared research equipment and facilities allocated through ARC LIEF and NHMRC Major Equipment schemes.

Factors such as advances in technology, growing specialisation in research equipment and infrastructure, globalisation of research infrastructure and increased emphasis on university partnerships with industry and business all point to the possibility of new models of research infrastructure ownership and management. In its submission to the Review of the National Innovation System, Murdoch University recommends that the Government explore models for the higher education estate that will attract private investment in the maintenance and development of the national asset base. In seeking to increase the funds available for major research infrastructure, the government could explore the feasibility, risks and benefits of new models, including public/private partnerships.

2. Develop Full Economic Costing (FEC) Guidelines and Tools

Universities need better systems for tracking research costs. If government and industry are to be required to fund the full economic costs of the research undertaken by universities, they need to have confidence that those costs are based on robust systems.

There are a number of models that could be drawn upon for this purpose. The previous Australian Vice-Chancellors' Committee developed proposals for the full costing of research[8]. The UK government has recently introduced the Transparent Approach to Costing (TRAC) method to help institutions calculate the full economic cost of the research they do for inclusion in research proposals to Research Councils[9].

The Australian government should commission a study to develop a set of full costing guidelines and associated methodologies for use in the Australian context. The guidelines should provide guidance to universities, Commonwealth and State government departments and industry/business in relation to the costing and pricing of research projects.

3. Progressively Shift to Full Funding of Research whilst Maintaining Research Volume

Once FEC Guidelines have been developed, the research funding councils should progressively shift to funding a higher percentage of real project costs whilst maintaining the volume of research. A progressive phasing in of full funding will prevent the undesirable outcome of significantly reduced application success rates and a reduction in research activity. The aim should be to achieve at least 80% funding of the full economic cost of research projects by the end of 2013. The rate of the progressive shift to full funding will need to be determined in light of more detailed analysis than is possible here.

[8] Australian Vice-Chancellors' Committee, *University Research: Some Issues*, February 1996.
[9] See http://www.hefce.ac.uk/research/funding/dual/.

[There is a legitimate separate argument, not progressed here, for an increase in the volume of research project activity in addition to an increase in the percentage of project costs funded through the research councils.]

4. Incrementally Increase RIBG to 20% of FEC of ACG Funded Research Projects

By 2013, the RIBG should be equivalent in value to at least 20% of the FEC of research projects funded through the major competitive granting schemes. The ratio between ACG and RIBG funding should then be maintained on an ongoing basis.

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