

OUTCOME 5

SCIENCE, RESEARCH AND INNOVATION – AUSTRALIA MAINTAINS THE STRONG SCIENCE, RESEARCH AND INNOVATION CAPACITY REQUIRED TO GENERATE AND UTILISE KNOWLEDGE.

Outcome 5 resourcing

Table 3.5.1 shows how the 2007-08 Budget appropriations translate to total resourcing for outcome 5, including administered expenses, revenue from government (appropriation), revenue from other sources, and the total price of outputs.

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Table 3.5.1: Total resources for Outcome 5 (\$'000)

	Estimated Actual 2006 - 07 \$'000	Budget Estimate 2007 - 08 \$'000
Departmental appropriations		
Output 5.1 – Policy Services	15,270	14,760
Output 5.2 – Programme Management	15,723	15,198
Output 5.3 – Service Delivery	244	237
Output 5.4 – Questacon	11,887	11,162
Total revenue from government (appropriations) contributing to price of departmental outputs	43,124	41,357
Revenue from other sources		
Departmental	8,983	6,722
Total price of departmental outputs (Total revenue from government and from other sources)	52,107	48,079
Administered expenses		
Research Quality and Accessibility	0	23,712
Research Infrastructure Block Grants	203,907	207,985
Research Training	674,543	688,550
Institutional Grants Scheme	302,035	308,076
Regional Protection Scheme	6,234	3,211
Higher Education Research Promotion	3,307	4,582
Systemic Infrastructure Programme	29,739	0
National Collaborative Research Infrastructure Strategy	78,196	120,597
Synchrotron	50,000	0
Anglo-Australian Telescope Board	4,701	4,810
Framework for Open Learning	2,928	3,068
Cooperative Research Centres	189,382	212,288
Radio Active Waste Management	3,480	5,016
Science Connections Programme	5,141	4,123
International Science Linkages	11,071	11,435
Defence of Common Law – Atomic Tests	543	543
Total administered expenses	1,565,207	1,597,996
Total administered revenues	853	853
Total estimated resourcing for Outcome 5 (Total price of outputs and administered appropriations)	1,617,314	1,646,075
Equity Injection (Appropriation Bill 2)	1,625	3,693
Average staffing level	381	379

Measures affecting Outcome 5

Australian Square Kilometre Array Pathfinder radio-telescope – design, development and building

Expense (\$m)

	2007-08	2008-09	2009-10	2010-11
Department of Education, Science and Training	1.5	1.1	1.3	1.1

Learned Academies – support of operations

Expense (\$m)

	2007-08	2008-09	2009-10	2010-11
Department of Education, Science and Training	1.0	1.0	1.0	1.0

Contributions to achievement of Outcome 5

A high quality science, research and innovation capacity is critical to Australia's economic and social development.

Governments make major contributions to research and development (R&D) expenditure. Underinvestment in R&D would occur in the absence of such contributions, since the scope and timing of its benefits are frequently unpredictable and difficult for individual R&D providers to capture. In 2004-05, expenditures in the public sector contributed around 43.3 per cent of total R&D performed (or \$6.8 billion) in Australia. The Australian Government provided 35.8 per cent (or \$5.6 billion) of total funding for R&D in 2004-05.

The Australian Government's initiatives are aimed at promoting the development of Australia's science, research and innovation capacity and seek to:

- promote research outcomes that are of high quality and/or high impact
- support research effort through investment in research infrastructure and other supporting activities
- promote collaboration both within Australia (within the research community, between it and the wider Australian community) and internationally
- raise science awareness within the Australian community.

In this context, a key focus for the department is the ongoing implementation of *Backing Australia's Ability—Building Our Future through Science and Innovation* (2001-2011). The package provides \$8.3 billion over ten years to strengthen Australia's ability to generate ideas, undertake and accelerate research commercialisation and develop and retain skills.

The department seeks to strengthen national systems by promoting innovation and building Australia's research infrastructure and international research competitiveness, and by supporting the effective use of technology for the delivery of education and training.

OVERVIEW OF OUTPUTS

The department distributes Australian Government funding for R&D through block and targeted programmes, as follows:

Administered activities

Research quality and accessibility

In 2007-08, funding will commence for the implementation of the Research Quality Framework (RQF). A Reference Committee has been established to provide advice to the Minister and oversee the first cycle of the RQF. During 2007-08, funding will be provided for:

- *Implementation Assistance Programme* - assists universities in meeting the costs of implementing the new requirements for data gathering

- *Australian Scheme for Higher Education Repositories (ASHER) Programme* - assists with the establishment of university digital data storage systems that will allow research outputs to be submitted for RQF assessment.

Linked to the RQF, the Accessibility Framework is intended to provide a strategic framework to improve access to research outputs so that they are discoverable, accessible and shared, in order to improve the quality of research outcomes, reduce duplication and better manage research activities and reporting. Work on the Accessibility Framework is being advanced through the ASHER programme and the "Platforms for Collaboration" capability being developed as part of the National Collaborative Research Infrastructure Strategy (see below).

Research infrastructure

The department administers Australian Government support for research infrastructure in universities and publicly funded research agencies through:

- *National Collaborative Research Infrastructure Strategy (NCRIS)* – supports medium to large-scale investments in research infrastructure in accordance with priorities identified in the *NCRIS Roadmap* (NCRIS aims to strengthen the strategic planning underpinning research infrastructure investment decisions, encourage collaboration in the funding of investments and enable access to NCRIS-funded infrastructure to researchers on the basis of merit, regardless of their institutional or jurisdictional affiliations.)
- *Research Infrastructure Block Grants (RIBG) Scheme* – supports the development and maintenance of institution-level research infrastructure (The Scheme aims to ensure that areas of recognised research potential, in which institutions have taken steps to initiate high quality research activity, have access to the support necessary for development.)
- *Anglo-Australian Telescope Board* – the Board operates and maintains world-class optical telescope facilities. The facilities include the Anglo-Australian Telescope (AAT), the United Kingdom Schmidt Telescope (UKST) at Siding Spring Mountain outside Coonabarabran and a laboratory in Sydney, New South Wales.

Research training

- The department administers Australian Government support for research training in universities through:
- *Research Training Scheme (RTS)* – supports higher education providers (HEPs) with research training for students undertaking Doctorate and Masters degrees by research, specifically to: improve the responsiveness of HEPs to the needs of their research students; encourage HEPs to develop their own research training profiles; ensure the relevance of research degree programmes to labour market requirements; and improve the efficiency and effectiveness of research training
- *Australian Post Graduate Awards (APA) Scheme* – supports postgraduate research training in the higher education sector by providing financial support to postgraduate students of exceptional research promise
- *Commercialisation Training Scheme* – supports the provision of research commercialisation training for the next generation of Australian researchers to

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- equip them with the skills, knowledge and experience necessary to bring research-based ideas, inventions and innovations to market.

Other research and research training support

The department manages two other programmes that support university research and research training at an institutional level:

- *Institutional Grants Scheme (IGS)* – provides general-purpose support for the research and research training activities of eligible higher education institutions which is important for enhancing support for areas of research strength
- *Regional Protection Scheme (RPS)* – helps protect designated regional higher education providers against losses of IGS and RTS income that would otherwise have flowed from policy changes introduced in 2001 following the release of the 1999 White Paper *Knowledge and Innovation*

The department also administers programmes that provide targeted support outside the higher education sector, through:

- *Higher Education Research Promotion* – funds the Learned Academies, the National Academies Forum, the Federation of Australian Scientific and Technological Societies, and the Council for Humanities Arts and Social Sciences to promote research and scholarship in the natural and applied sciences, technological development and applied technology, the social sciences and the humanities
- *Framework for Open Learning Programme (FOLP)* – supports projects which catalyse information and communication technology (ICT) developments for the whole of the education and training sector, fostering collaboration and innovation in the educational use of ICT, and promoting national and international engagement in such innovation in accordance with *Building a Knowledge Economy*, the MCEETYA education and training action plan for the information economy for 2005-07. FOLP will be informed by the shape and direction of the RQF and the Accessibility Framework, and by consideration of the E-Research Strategic Framework developed by the E-Research Coordinating Committee.

Key points of focus for the department in 2007-08 also include promoting innovation by continuing to support Australian scientists' engagement in national programmes, including those which advance space, biotechnology and nanotechnology and foster world class astronomy through:

- working to promote the attractiveness of Australia as the site for the Square Kilometre Array radio telescope
- engagement with the National Committee for Astronomy to help ensure that their other priorities in the optical/infra-red domain are appropriately advanced
- working with the Anglo-Australian Telescope Board to provide world-class optical and infra-red observing facilities enabling Australian and British astronomers to do excellent science.

The department seeks to raise the quality of outcomes by increasing accountability for publicly funded research through undertaking research and analysis in order to maintain an assessment of Australia's science and innovation performance, and report annually through the Australian Government's *Innovation Report*.

Assistance for collaboration and innovation

In 2007-08 the department will promote collaboration and innovation through its administration of the following programmes:

- *Cooperative Research Centres (CRC) programme* –encourages collaboration between industry and researchers and enhance Australia's industrial, commercial and economic growth through the development of sustained, user-driven, cooperative public-private research centres that achieve high levels of outcomes in adoption and commercialisation. Key activities for 2007-08 are:
 - support the new CRCs which were selected in the 2006 selection round
 - finalising arrangements for the 2008 selection round
 - regular engagement and meetings with universities and industry partners, including industry associations, to better understand their requirements of the programme
- *Radioactive Waste Management* – funds the establishment of the Commonwealth Radioactive Waste Management Facility in the Northern Territory for managing low and intermediate level radioactive waste generated by Australian Government agencies (Site investigations to determine a preferred site have been completed for the three Department of Defence sites identified in 2005. Discussions have been held with the Northern Land Council in the context of possible nomination of a volunteer site on Aboriginal land for the site selection process.)
- *Science Connections Programme* – funds a range of activities promoting awareness of science and innovation and its importance to the Australian community, particularly amongst young people. The programme:
 - increases awareness of the important roles that science, technology and innovation play in ensuring the well-being of our society and the environmentally sustainable growth of our economy
 - highlights the outstanding contributions to science and science education made by our researchers and science teachers
 - encourages our young people to consider continuing studies in science, mathematics and engineering beyond the compulsory years of schooling, and to consider entry into science-based careers.

In 2007-08 the department will strengthen Australia's science outcomes by promoting a strong international programme of science and technology engagement through:

- *International Science Linkages Programme* – supports collaboration between Australian and international scientists on leading edge science and technology in order to contribute to Australia's economic, social and environmental well-being. Associated activities managed by the department include:
 - key science and technology meetings with Japan, China, the European Union, South Africa, Mexico, France, Indonesia and India
 - concluding a formal science and technology cooperation agreement with South Africa

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- building the science and technology relationship with the United States following the ratification of the treaty on science and technology cooperation
- *Australia India Strategic Research Fund programme* – provides \$20 million over five years for Australian researchers to increase their participation in leading edge scientific research with Indian scientists, to raise the profile of Australian research, and to support the development of strategic alliances between Australian and Indian researchers.

The department will continue to engage in key science and technology work of the Organisation for Economic Co-operation and Development (OECD), and Asia-Pacific Economic Co-operation (APEC).

The department will continue to provide effective support to the Office of the Chief Scientist and the Prime Minister's Science, Engineering and Innovation Council and its working groups to ensure a Whole of Government perspective on science and related issues.

Departmental outputs

Engaging people in science and technology

Questacon's innovative programmes and exhibitions are developed in response to Government strategic priorities, innovation agenda and stakeholder feedback. Interactive exhibits and travelling programmes run by skilled science communicators, on-line content and science theatre are delivered at the Centre in Canberra and across Australia and overseas. There is particular emphasis on the delivery of programmes in rural, regional and remote locations in Australia.

In developing its national role in communicating science, Questacon builds partnerships in science communication with the broader science community, industry and education providers. It works to deliver programmes aimed at supporting science learning in schools and encouraging life long learning in the wider community.

Performance information for Outcome 5

Performance information for administered items, individual outputs and output groups relating to the Department of Education, Science and Training are summarised in Table 3.5.2.

Effectiveness Indicators for outcome 5

Programmes and initiatives delivered by DEST which contribute to Outcome 5 form part of a wider set of factors that affect that Outcome. The indicators in table 3.5.2A provide an indication of the overall trends under Outcome 5.

Table 3.5.2A: Effectiveness Indicators for outcome 5

<i>Science and Research</i>
<ul style="list-style-type: none"> • Trends in Australian research publications per million Australian population • Trends in the number of research publications in the higher education sector • Trends in patents granted to Australian residents in Australia • Trends in Universities' research income from industry and other sources

Table 3.5.2B: Performance in delivery of Administered Outputs

Performance Indicator	2006-07 Estimate ¹	2006-07 Est Actual	2007-08 Estimate
Research Quality and Accessibility			
<i>- Implementation Assistance Programme</i>			
Number of universities supported	-	-	21
<i>- Australian Scheme for Higher Education Repositories</i>			
Number of universities supported	-	-	21
Higher Education Funding			
<i>- Research Training</i>			
Number of Higher Education Providers receiving funding under:			
• Research Training Scheme	42*	42*	42*
• Australian Postgraduate Awards	42	42	42
• Commercialisation Training Scheme	-	-	40
<i>- Institutional Grants Scheme</i>			
Number of Higher Education Providers supported	42*	42*	42*
<i>- Research Infrastructure Block Grants</i>			
Number of Higher Education Providers supported	40*	40*	40*

¹ * indicates Calendar Year 2006 (instead of 2006-07) or 2007 (instead of 2007-08).

Table 3.5.2B: Performance in delivery of Administered Outputs (cont)

Performance Indicator	2006-07 Estimate ²	2006-07 Est Actual	2007-08 Estimate
- Regional Protection Scheme			
Number of Higher Education Providers supported	7*	7*	7*
- Higher Education Research Promotion			
Number of scholarly institutions supported	6*	6*	7*
Anglo-Australian Telescope Board			
Percentage of total available observing time used on AAO facilities	100	100	100
National Collaborative Research Infrastructure Strategy			
Number of NCRIS research capabilities funded	9	9	12
Framework for Open Learning			
Number of projects funded	9	9	11
Cooperative Research Centres			
Number of Cooperative research centres	54	57	57
International Science Linkages			
Number of International Science Linkage projects supported	305	348	328
Science Connections Programme			
Number of National Science Week projects (registered on the National Science Week website)	500	706	600

² * indicates Calendar Year 2006 (instead of 2006-07) or 2007 (instead of 2007-08).

Table 3.5.2C: Performance in delivery of Departmental Outputs

Performance Indicator	2007-08 Estimate
Programme Management	
<i>Quality</i>	
Payments are made in accordance with approved timelines	All programmes to meet relevant administrative targets set by quality assurance processes in DEST
Payments made are based on calculations which are accurate and in accordance with approved guidelines	All programmes to meet relevant administrative targets set by quality assurance processes in DEST
Timeliness of Parliamentary reports (including interim responses where appropriate) provided to Parliament and its Committees	At least 90% meet deadlines
High quality Ministerial replies as measured by the level of satisfaction of Ministers and the Parliamentary Secretary with the quality and timeliness of the replies.	Qualitative evaluation of satisfaction using feedback from the Ministers and Parliamentary Secretary to the Secretary. Analysis of trends over time to monitor percentage delivered within agreed timeframes.
Establishment of Australian Government radioactive waste management facility	Preferred site identified in 2007
Progress of bilateral science and technology agreements	Agreement with South Africa submitted to Joint Standing Committee on Treaties Agreement with Indonesia ratified
Policy Services	
<i>Quality</i>	
High quality policy advice as measured by the level of satisfaction of Ministers and the Parliamentary Secretary with the quality and timeliness of policy advice.	Qualitative evaluation of satisfaction and timeliness using feedback from the Ministers and Parliamentary Secretary to the Secretary
High quality research and evaluation reports as measured by the level of satisfaction of Ministers and the Parliamentary Secretary with the quality and timeliness of the reports	Qualitative evaluation of satisfaction using feedback to the Secretary from Ministers and Parliamentary Secretary.
Prime Minister's and Minister's satisfaction with the timeliness and usefulness of independent and external advice received from the Chief Scientist and the Prime Minister's Science, Engineering and Innovation Council	Qualitative evaluation of satisfaction and timeliness using feedback from the Prime Minister and Minister
Ministers' satisfaction with the annual Science Prize event	Ministers satisfied
Research activities are completed according to plan	At least 90% delivered on time

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Table 3.5.2D: Performance in delivery of Departmental Outputs - Questacon

Performance Indicator	2006-07 Estimate	2006-07 Est Actual	2007-08 Estimate
<i>Quantity</i>			
Questacon visitor and audience reach	>1,200,000	>1,200,000	>1,200,000
<i>Quality</i>			
Number of Questacon visitors that rate satisfaction as good or very good	>90%	>90%	>90%
Reasonable cost per visitor as benchmarked against the international science and technology industry	\$14.80	\$14.80	\$14.80
Evaluation of Questacon's programmes and activities demonstrating Questacon is making a difference	Evaluations confirm programme efficacy	Evaluations confirm programme efficacy	Evaluations confirm programme efficacy