

**SUBMISSION TO THE NATIONAL INNOVATION SYSTEM REVIEW**

**DEPARTMENT OF THE ENVIRONMENT, WATER, HERITAGE AND THE ARTS**

The Department of the Environment, Water, Heritage and the Arts strongly supports innovation in public policy. The proposals in this submission are aimed at:

1. Ensuring appropriate environmental information and tools support decision-making for sustainability;
2. Supporting informed decision-making regarding creative industries and occupations; and
3. Enabling whole-of-government approaches to sustainability.

The submission is in two parts; the first summarises these three issues and, where relevant, refers to specific proposals with further detail; the second component contains six specific proposals.

**1. Appropriate environmental information and tools to support decision-making**

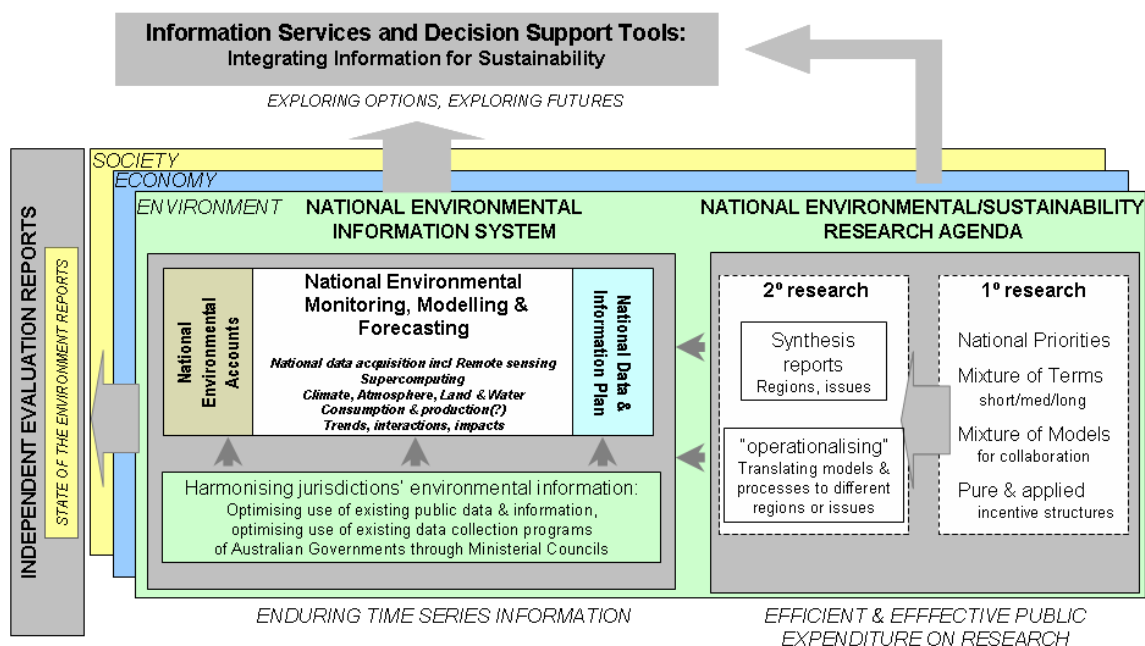
Most public policies affect the natural environment in some way: most environmental policy decisions have economic and/or social policy dimensions; and similarly, most economic and social policy decisions have environmental dimensions. Leaving aside socio-economic information for the present, the Department considers the information base and information services regarding environmental information to be inadequate to support strategic decision-making. As such there is limited capacity to forecast likely outcomes in an integrated manner to include environmental, economic and social considerations, limited capacity to identify and therefore avoid perverse, unintended outcomes from our decisions.

Australia needs innovations aimed at supporting decision-making by developing an environmental information framework (illustrated in Diagram 1) that includes:

- A National Environmental Information System (proposal 1.1) incorporating:
  - Open access to public sector information, across all Australian jurisdictions (proposal 1.2);
  - A national plan for environmental data and information needs;
  - National environmental monitoring, modelling and forecasting;
  - National environmental accounts as part of the National Accounts (proposal 1.3);
- A National Environmental Research Agenda (proposal 1.4) incorporating:
  - Specific public policy environmental research priorities within the National Research Priorities;
  - In addition to support for pure research, support for applied public good environmental research with both long and short term timeframes;
  - Capability for secondary research to synthesise existing information and thereby improve the evidence-base for public policy;

- Capability to ‘operationalise’ research outputs, such as tools or models, particularly to translate complex models or tools from one location/region to another.
- A National Information Service to integrate the social, economic and environmental information needed for cogent environmental public policy, including:
  - Decision support tools to assist exploration of options and futures against social, economic and environmental considerations; and
  - Standards and protocols to optimise access to information across Australian governments.

WISE DECISIONS involve Environmental, Social & Economic considerations  
*How to ensure appropriate quality environmental information is available & incorporated?*



**Diagram 1: Ensuring adequate information and tools to support decision-making**

Whilst there are many existing initiatives in this general ‘space’ which need to continue, there is also a need to supplement these with new initiatives and/or increased efforts in key areas to deliver structural changes, better alignment and circuit-breakers.

National Environmental Information System

Australia needs a National Environmental Information System (NEIS) that captures available information created by all levels of government and makes it accessible to end-users. Ideally, environmental information developed by other parties such as universities, non-government organisations and industry would also eventually contribute to a National Environmental Information System.

The capacity to forecast and explore options is essential for environmental policy development and decision-making. Currently there are several excellent enduring agencies that manage major components of the national environmental information base – such as Geosciences Australia, the Bureau of Meteorology and the Australian Bureau of Statistics. There is, however, neither overarching co-ordination nor adequate investment to provide a coherent national monitoring, modelling and forecasting capacity for the Australian environment. Australia has sophisticated climate and weather modelling and forecasting capability, and is moving towards a similar water modelling capability, but lacks an enduring program of data collection that would allow for integrated modelling of the complex interaction of our land, biota, oceans and the atmosphere. Such a capability would support the production of national environmental (ie biophysical) accounts to supplement the current set of National (monetary) Accounts.

The first step in developing an enduring monitoring capability is the development of a national plan for environmental data and information, with identified cost-effective priorities for acquiring environmental data. This would enable jurisdictions, particularly the Australian Government, to make informed investments in new information capabilities.

#### National Environmental Research Agenda

Existing data, even if accessible through a National Environmental Information System, does not meet the information needs of all short and longer term public policy priorities.

The Australian environment is complex and diverse and much knowledge still needs to be gained. The threats to the environment are also complex and diverse and many solutions will only be found with long-term research. Sustained funding is, therefore, required to deliver the long term results and knowledge that are needed to manage the Australian environment in a sustainable way.

Innovation is severely compromised if cooperation and collaboration are absent. Unfortunately, there are structural impediments to cooperation and collaboration within Australia's research processes. Among them are: the diversity of contractual and Intellectual Property rights arrangements that apply to the commissioning of research; the differences in pricing and cost recovery policies across the different Australian jurisdictions for research data; the design of research grant programs and the funding models for Australian research agencies and institutions.

Much environmental research is designed to produce information to support public policy development and is funded under a range of models. This includes: major funding agencies such as the Australian Research Council and the National Health and Medical Research Council; targeted research programs such as Cooperative Research Centres; in-house by Australian Government agencies such as the Australian Bureau of Agriculture and Resource Economics; a diversity of research and grant programs such as the Commonwealth Environment Research Facilities program, and individual consultancies.

None of these research programs, however, readily address the needs of both researchers and policy professionals in part because of the differences between pure

and applied science which often work to very different time lines and different reward systems. This can lead to a mis-match of expectations between researchers and funding agencies and a breakdown in cooperation and collaboration.

Much 'on-ground' environmental research requires sustained funding to generate useful results, which is often outside of the duration of grant funds. Whilst Co-operative Research Centres have met some of the needs for public good environmental research, the model also poses some problems – the research centres become politically active when funding support is withdrawn and allocated to other priorities; the requirement for co-investment can generate perverse outcomes for the Australian Government because first-order research priorities are not necessarily addressed if they are not also priorities for co-investors; the participating research institutions often 'rebadge' existing research programs rather than genuinely shift in research to address the real priorities.

Australia needs a National Environmental Research Agenda to ensure that the collection of new data and the synthesising of existing data are well targeted to public policy needs. The national agenda would supplement Australia's National Research Priorities and would also guide priorities for Australian Government research funding programs.

A National Environmental Research Agenda would help to prioritise environmental research needs such as:

- developing an integrated system for access to biological resource collections;
- finding better ways to use taxonomic research to underpin other biological research;
- addressing research programs for Antarctica and the Southern Ocean;
- linking Indigenous communities, who are custodians of considerable traditional knowledge, with general research programs for the Kimberley region; and
- researching innovative control methods for invasive species, a major threat to Australia's environmental assets.

In addition, the methods used by the Australian Government to commission research and making research grants would greatly benefit from standardisation so that the complexity of administering intellectual property rights is simplified, leading to shorter times to negotiate research contracts and grants (proposal 1.5).

#### National Information Service

A National Information Service is needed to integrate the social, economic and environmental information needed for cogent environmental public policy

By definition, public policy must take account of competing ideas and agendas, not all of which can be satisfied. The social, economic and environmental dimensions of public policy decisions should not, however, be seen as competing in a win-lose scenario. Rather, they should be addressed holistically and decision-support tools should address the complex interplay of these different dimensions with a view to delivering the wisest possible public policy decisions.

## **2. Supporting informed decision-making regarding creative industries and occupations (proposal 2.1)**

### Creative Industries

Creative industries have their origin in individual creativity, skill and talent. They have the potential to create wealth and jobs through the generation and use of intellectual property. The success of the creative industries in Australia will increasingly rely on businesses that can produce, retain and exploit their creative intellectual property within a globally competitive market, using new technologies and innovative business models. We need a clear and agreed definition of creative industries to support our understanding and exploration of the role these industries play in our society.

## **3. Enabling whole-of-government approaches to sustainability**

The Australian Government has long recognised the need to address complex policy challenges by working in a collegiate manner across portfolio boundaries. Such whole-of-government approaches can be formal and informal and can focus on policy development, program management or service delivery.

The issues raised by the imperatives of managing a sustainable environment are quintessentially whole-of-government and require sophisticated policy responses supported by enablers such as research, data, guides and tools. Often the enablers themselves need to be developed on a whole-of-government basis. Often, these imperatives go beyond government and embrace industry, researchers and the wider community. For instance:

- A wide range of government policy settings (largely outside the environment portfolio) send signals to industry that may or may not support sustainability and the environmental performance of industry. Concepts of sustainability (e.g. the OECD concepts of reduce, reuse and recycle) have become more prevalent and accepted internationally. Trading partners like the European Union and more broadly the community now expect a consistent and holistic approach from Australian policy makers and from industry. This requires government, industry and consumers to play active roles in the design of products and production processes with the whole life-cycle of a product in mind – from production, through consumption to end of life. In doing so, great care must be taken to ensure we avoid perverse incentives. The mix of policy settings must provide consistency and deliver economically efficient, socially equitable and environmentally effective results.
- With 10 per cent of the world's biodiversity, 'nature' is one of Australia's greatest natural advantages. Australia's existing scientific and research capabilities mean that we are particularly well placed to develop new technologies, expand biological knowledge and generate fresh intellectual capital. Biotechnology has the potential to create new products, modify and develop new industrial processes, make Australian industry more competitive and reduce the environmental impacts of manufacturing.

Australia seeks to be a leader in the dynamic field of biodiscovery. The coordinated efforts of government, Indigenous people, biotech companies, research scientists and managers of biodiversity will ensure practices and

advances in biodiscovery are sustainable, inclusive and rewarding. A nationally consistent approach to access to Australia's genetic and biochemical resources would ensure the protection of our biodiversity as well as supporting the expansion of knowledge without unnecessarily holding back the development of biotechnology.

**Index to specific proposals**

Specific proposals addressing the issues raised above are attached. They are:

<i>Proposal</i>	<i>Page #</i>
1.1 Develop a National Environment Information System	7
1.2 Maximise accessibility to publicly funded environmental data	9
1.3 Develop a practical whole-of-government regime to account for the nation's environmental assets	10
1.4 Develop a National Environment Research Agenda	12
1.5 Enhancing Australian Government research grant contracts and administration	14
2.1 Evidence- based decision making for creative industries and occupations	15

## 1.1 NATIONAL ENVIRONMENT INFORMATION SYSTEM

### Innovation proposal

To develop a National Environment Information System to enhance the public sector capacity to hold, access, amalgamate, harmonise and make environmental data available:

- across jurisdictions;
- for infrastructure, utilities and transport planning and development;
- to service industry development and management (fisheries, mining, forestry, agriculture, property services, construction) on a regional rather than single project basis;
- to meet environmental policy development and monitoring needs at all levels of government; and
- to better inform the planning for and provision of public goods and services.

This project would need to examine both non-technical and technical aspects of access to environmental data, including information frameworks, data availability, classifications, standards and quality issues, enabling technologies, skill requirements and stakeholder needs.

### What this proposal builds on

The National Collaborative Research Infrastructure Strategy (NCRIS) is a program to enable researchers to access major research facilities, supporting infrastructure and networks necessary for world-class research.

The Terrestrial Ecosystem Research Network (TERN) provides infrastructure that builds on the significant past and present investments of State, Territory and Commonwealth Governments to facilitate the development of an integrated approach to understanding Australia's ecosystems

ACIL Tasman has undertaken an assessment of the impact of modern spatial information technologies on the Australian economy (ACIL Tasman, The Value of Spatial Information March 2008) as part of the CRC for Spatial Information and ANZLIC. The assessment is unequivocal in its conclusion that high quality spatial information makes a significant contribution to the Australian economy, that there are considerable cost inefficiencies in accessing data, and that there are considerable economic social and environmental gains to be made by improving access to such information. It is mooted that these conclusions could be extended to cover all environmental information collection and provision.

While some of this information is collected and provided via commercial enterprises, the collection and provision of the majority is publicly funded via government agencies at all levels. Inefficiencies exist through:

- duplication of effort (the same information being collected by different agencies for different purposes);
- transaction costs in the provision of/access to the information by the public, industry and decision making bodies (eg harmonisation, amalgamation, payment policies, search costs); and
- a lack of concerted cross jurisdictional cooperation to develop open access to environmental information.

What is missing

A framework for the cooperative development of environmental information portals/nodes across environmental themes that systematises the collection, processing, assessment and presentation of environmental data and information based on a continuous improvement/development basis.

What the proposal would achieve

- Greater industry, government and public access to environmental information.
- Less duplication of effort in collection of environmental information.
- Higher quality environmental policy development, decision-making and monitoring.
- A higher level of competitiveness in areas where policy and investment decisions are hampered by gaps in fundamental environmental data.
- Greater efficiencies in planning for future infrastructure, environmental and natural resource management.

## 1.2 PUBLIC OWNERSHIP OF ENVIRONMENTAL DATA

### Innovation proposal

To research the public ownership of environmental data, the types of contractual and Intellectual Property (IP) rights restrictions currently used and to develop a series of approaches to redeveloping and systematising such arrangements in order to maximise public (including commercial/industry) access to such information. This would need to build on, but go beyond creative commons and would need to examine the differences in pricing and cost recovery policies across the different Australian jurisdictions and the effects of these on government policy development and industry investment capacities.

### What this proposal builds on

This proposal builds on the initial work of the Government Information Licensing Framework (GILF) and the principles for pricing for fundamental data that were set out by the Productivity Commission in a report released in 2001.

In building on the GILF base, the project would need to explicitly address means of facilitating information sharing across jurisdictions, going well beyond creative commons to examine means to reduce constraints on the use of data in order to:

- increase the capacities for different jurisdictions to harmonise information;
- develop cost efficiencies across jurisdictions and agencies in data collection;
- reduce restriction on governments, industry and communities to assess regional rather than project specific infrastructure requirements and environmental impacts; and
- increase the quality of environmental, natural resource and infrastructure policy formulation.

### What is missing

Australian governments do not have a consistent (environmental) information management framework for government collected data/information that:

- acknowledges the public cost of collecting information;
- addresses the governmental, industry and community needs for access to information (particularly at low to no cost); and
- explicitly addresses the risks associated with information and who should bear those risks (producer or user).

Consequently there are growing inefficiencies developing around the nexus between: user pays approaches and public access to public funded information; and Intellectual Property Rights and networks to share information.

### What the proposal would achieve

Information, in particular environmental information, is likely to play an increasing role in the economic development of Australia. Information collected will be of increasing value to economic, social and environmental outcomes in Australia. By developing the next generation of thinking around maximising access to information, the proposal will provide a fundamental framework for consideration of public policy on information availability. The framework would go beyond technologies to develop philosophies and legal and other approaches to maximising the use of information while reducing its transaction costs.

### 1.3 ENVIRONMENTAL ACCOUNTING

#### Innovation proposal

There is an important need to innovate our approach to economic and community planning so that ‘growth’ is more attuned to and responsive to the limits and dynamics of natural resources. It is proposed to:

- undertake a survey of the Australian Government’s existing work on accounting for environmental assets; and
- Develop a practical whole-of-government regime to account for the nation’s environmental assets.

#### What this proposal builds on

The Department considers expenditure on environmental programs to be an investment in the future of our nation.

The Australian Government has a number of programs that go some way toward to assessing the condition, trend or limitations of Australia’s economic, community and natural resources, including:

- Department of Agriculture, Fisheries and Forestry - National Land and Water Resources Audit - <http://nlwra.gov.au/>
- Department of Environment, Water, Heritage and Arts - State of the Environment Reporting - <http://www.environment.gov.au/soe/index.html>
- Australian Bureau of Statistics - Australia’s National Accounts; ad hoc series of environmental accounts – most recently ‘soil accounts’ and previously ‘water accounts’; Report - Measures of Australia’s Progress; Report - Australia’s Environment Issues and Trends ([www.abs.gov.au](http://www.abs.gov.au))

There are also a number of Australian Government research initiatives that may lead to advances in our capacity to account for environmental assets. For instance, the CSIRO is undertaking research on Environmental Benefit Indices; the Environmental Economics Research hub, within the Commonwealth Environment Research Facilities (CERF) program, promotes collaboration, integration, innovation, learning and research in environmental, ecological and resource economics in the Australian National University; and the Applied Environmental Decision Analysis research hub, also within CERF, was established to develop tools and test methods to support transparent decision-making for environmental management.

#### What is missing

The Australian Government’s current approach to accounting for the economy and the community is well developed. However, the same cannot be said for approaches to accounting for natural resources. Given that natural resources are the cornerstone to building the future of Australia’s economy and communities, it is clear we have an important gap that needs to be filled. Generally, there are two things missing from the current approach:

- Practical and effective methods that can be used to ‘account’ for Australia’s natural resources and ecosystem processes, particularly with respect to understanding their ‘real value’ and limitations (e.g. carrying capacity); and

- A whole-of-government framework to effectively integrate accounting of economic, community and natural resources.

What the proposal would achieve

The key outcome of this proposal is to significantly improve the Australian Government's capacity to plan for and manage the sustainable growth of Australia's economy, communities and natural resources. The current realities of climate change, water supplies and future energy sources are a timely reminder that continued growth, whether considered sustainable or otherwise, requires governments, industries and communities to better understand the trends and limits of natural resources and ecosystem services – not just those associated with finances and communities.

## 1.4 NATIONAL ENVIRONMENT RESEARCH AGENDA

### Innovation proposal

Develop a National Environment Research Agenda to guide the collection of new environmental data and the synthesising of existing data.

### What this proposal builds on

Australia's National Research Priorities are designed to enhance the quality and impact of our research effort by building critical mass priority areas and by promoting collaboration between research organisations and with industry. There are four national research priorities, each with associated priority goals. They are:

- An Environmentally Sustainable Australia;
- Promoting and Maintaining Good Health;
- Frontier Technologies for Building and Transforming Australian Industries; and
- Safeguarding Australia.

Research that can inform the development of public policy in these areas is funded under a range of models.

### What is missing

There is no coherent research plan designed to meet the environmental public policy priorities over the short, medium and longer term.

Further, none of the existing research grant programs readily addresses the needs of both researchers and policy professionals in part because of the differences between pure and applied science which often work to very different time lines. In addition, the knowledge gained through such programs tends to be inaccessible beyond the people directly involved in them.

### What the proposal would achieve

The National Agenda would provide focus for policy-relevant research under the National Research priority 'An Environmentally Sustainable Australia' and would significantly enhance the return on investment in scientific, social and economic environmental research.

In addition to the existing funding models for pure research, consideration should be given to the development of funding models that would supplement:

- Longer term applied research that would foster collaboration without dependency on co-investments;
- Synthesis of existing research and the translation of its outputs to new areas or issues;
- Transfer of knowledge to policy makers and the Australian public.

A National Environmental Research Agenda would establish a framework for addressing new and emerging ideas for environmental research. This could include:

- Developing an integrated system for access to biological resource collections. This might include developing new networks to overcome the fragmented reality

of current investigation in the many scientific disciplines that feed biotech innovation.

- Finding better ways to use taxonomic research to underpin other biological research. This might include creating new arrangements for taxonomy and biological collections, that:
  - significantly decrease time wasted on grant applications;
  - enhance co-funding opportunities with industry, government and NGOs;
  - focus jointly on the need for public good research and capacity-building; and
  - place a stronger emphasis on national collaborative research.
- Strengthening research programs for Antarctica and the Southern Ocean. This might include enhancing international science in Antarctica and the Southern Ocean to provide the scientific information recognised as being the cause of much uncertainty in current climate prediction models, and to provide detailed assessments of the effects for environmental change on the sustainability of the Southern Ocean.
- Linking Indigenous communities, who are custodians of considerable traditional knowledge, with general research programs for the Kimberley region. This might include collaborative approach to linking existing and future Kimberley studies to provide a cost effective base of operations for government, academic, industrial and Indigenous culture researchers to build research synergies.
- Researching innovative control methods for invasive species, a major threat to Australia's environmental assets. This might include establishing a more collaborative environment for national research, supporting the development of cost-effective controls for nationally significant invasive species control.

## **1.5 ENHANCING AUSTRALIAN GOVERNMENT RESEARCH GRANT CONTRACTS AND ADMINISTRATION**

### Innovation proposal

Enhancing Australian Government research grant contracts and administration by:

- Examining how to simplify Australian Government research grant contracts;
- Developing standardised clauses and/or processes in Australian Government research grant contracts, where possible, for recurring issues such: as Intellectual Property; public accessibility of research results; financial accountability; and accountability for deliverables.
- Examining the feasibility of a national research and development register for Australian Government research contracts. Such a register could be expanded to include other research.

### What this proposal builds on

The Government has announced a review of higher education funding. Simplified contractual arrangements could be further considered in the context of that review.

The Australian Government has indicated that it plans to rationalise grant management systems in Departments. A national research and development register for Australian Government research contracts could be further considered in this context.

### What is missing

Researchers apply for grants from major tertiary funding agencies such as the Australian Research Council (ARC) and the National health and Medical research Council (NHMRC) and from many smaller programs under which departments directly contract research organisations. There is limited contractual and administrative consistency between the various grant programs. This adds an unacceptable administrative overhead to grant management in both the funding agencies and the research organisations.

A simplified Australian Government research contract could be negotiated with universities through a forum such as the Australian Vice Chancellor's Committee. There would be merit in including Australian Government research agencies, such as the CSIRO, in these negotiations.

### What the proposal would achieve

Simplified contracting would deliver administrative efficiencies.

A national research and development register for research funded by the Australian Government would give researchers and funding agencies better access to research findings. This would reduce the potential for research to be duplicated and increase the potential for linkages between existing research and future research proposals enabling multi-disciplinary platforms of collaboration to be established.

## **2.1 EVIDENCE- BASED DECISION MAKING FOR CREATIVE INDUSTRIES AND OCCUPATIONS**

### Innovation proposal

In order to formulate evidence-based policy for the creative industries in Australia, the Australian Government would seek to establish and promulgate an agreed definition of the creative industries and creative occupations.

Creative industries have their origin in individual creativity, skill and talent. They have the potential to create wealth and jobs through the generation and use of intellectual property. The success of the creative industries in Australia will increasingly rely on businesses that can produce, retain and exploit their creative intellectual property within a globally competitive market, using new technologies and innovative business models.

### What this proposal builds on

The size and character of the creative industries has been quantified in various jurisdictions (for example in Western Australia, Queensland, South Australia and at the Commonwealth level by the Creative Industries National Mapping Project) using a range of methodologies and industrial classification groupings.

This proposal aims to build on the work that has already been achieved at the Commonwealth level, with the aim of settling a definition of the creative industries for the purposes of policy formulation and program development across the Australian Government and possibly other levels of government.

### What is missing

There is not settled understanding of the scope of creative industries. As an example, the Australian Bureau of Statistics (ABS) National Centre for Culture and Recreation Statistics has recently produced a report, 'Employment in Culture 2006' (Cat. No. 6273.0), based on the most recent census data available. This report, however, treats 'culture' quite broadly and is based on the Australian Culture and Leisure Classifications, which include employment in such places as cemeteries, national parks and religious bodies. At this point, the ABS does not plan to develop a definition of the creative industries.

### What the proposal would achieve

These definitions would enable the collection of data that would assist in consolidating the Australian Government's understanding of how creative industries, occupations and businesses operate within the Australian economy. They could also be used to inform Australian Government activities not only in the area of creative industries, but also for the arts and culture, education, communications infrastructure, innovation and industry more broadly.

The following definitions could be pursued:

- Creative industries – capture the industries (according to the Australian and New Zealand Standard Industrial Classifications – ANZIC) that make up the commercially-oriented creative industries in Australia;

## DEWHA Submission to the NIS Review

- Creative occupations – identify core creative occupations across the creative industries and other industries, according to the ANZSIC; and
- Creative businesses – establish the types of business within the defined creative industries.

It is envisaged that these definitions could be pursued in a partnership arrangement between the Department, the ABS and the Australian Tax Office.