INTRODUCTION

Australia has significant and interacting national interests in Antarctica based on the region’s proximity to Australia and its strategic, economic, scientific and environmental importance.

Science is the currency of the Antarctic Treaty System. Ensuring Australia has a world class science program is critical to underpinning our leadership and influence in the Antarctic Treaty System. Australia’s Antarctic Science Program is answering questions that are fundamental to Australia’s future. For example, by analysing how Antarctica is driving global climate systems, we are better placed to understand, measure, and respond to the impacts of a changing climate on our industries.

In August 2017, the Department of the Environment and Energy commissioned Mr Drew Clarke AO PSM FTSE to undertake a review of the governance arrangements supporting the Australian Antarctic Science Program and to provide advice on a new governance model by early 2018.

The Review’s terms of reference at Appendix 1 required Mr Clarke to make recommendations and provide options to ensure the most efficient governance arrangements to deliver the best value for money for Australia’s national interests and scientific priorities in Antarctica. Mr Clarke met with over 50 people from 23 Australian Government, corporate and research organisations, including the CSIRO and the University of Tasmania. Discussions were also held with the leaders of the British and New Zealand Antarctic programs. Mr Clarke provided his final report to Government in mid-December 2017.

The Clarke Review did not examine the priorities for Antarctic science as these will be considered separately as part of the five-yearly review of the Australian Antarctic Science Strategic Plan 2011–12-2020–21.

Mr Drew Clarke, AO PSM FTSE

Mr Clarke served as Secretary of the Department of Resources, Energy and Tourism from 2010 to 2013, Secretary of the Department of Communications from 2013 to 2015 and Chief of Staff in the Office of the Prime Minister from 2015 to 2017.

He has degrees in Applied Science from RMIT and a Master of Science degree from The Ohio State University. Mr Clarke is a Fellow of the Academy of Technological Sciences and Engineering, and is currently a Director of CSIRO and of NBNCo.

Mr Clarke has completed two summer seasons in Antarctica, working as a surveyor and glaciologist. He has chaired the international body responsible for coordinating Antarctic science mapping and geodetic science, and was a member of an international panel tasked with reviewing the coordination of Antarctic science. Mr Clarke previously reviewed the Australian Antarctic Data Centre within the Australian Antarctic Division, and managed the Cooperative Research Centre program.
SUMMARY OF RECOMMENDATIONS

In undertaking his review, Mr Clarke made nine recommendations relating to the structure, strategy and administration of Australia’s Antarctic Science Program. As shown in the table below, the Government supports five of the recommendations and supports the remaining four in principle. Over the coming months, the Government will be consulting with key members of the Antarctic science community to ensure these recommendations are addressed in the most efficient and effective way possible.

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<td>1. Science Program Governance Structure</td>
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<td>1.1</td>
<td>Establish an Australian Antarctic Council.</td>
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<td>2. Science Program Strategy</td>
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While options for future funding of Australia’s Antarctic science effort were not included in Mr Clarke’s terms of reference, the Government announced its decision to provide long term funding certainty for Antarctic science through two initiatives, amounting to $13 million per year, in the 2018-19 Budget.

The Australian Research Council will establish a Special Research Initiative in Excellence in Antarctic Science. The Initiative will commence on 1 January 2020, with $8 million in annual funding to 31 December 2026 and be administered in accordance with the Australian Research Council Act 2001.

In addition, the Australian Government will continue to support the types of collaborative activities undertaken by the Antarctic Climate and Ecosystems Cooperative Research Centre when it ends on 30 June 2019 through the establishment of a new 10 year Antarctic Science Collaboration Initiative grants program within the Department of Industry, Innovation and Science, with $5 million in annual funding.

To ensure maximum value of the Australian Government’s significant investments in Antarctic infrastructure, these new Antarctic science funding initiatives will be aligned with Australia’s national Antarctic priorities, as detailed in the Australian Antarctic Science Strategic Plan and Australian Antarctic Strategy and 20 Year Action Plan.

Australia’s Antarctic Science Strategic Plan and Antarctic Strategy and 20 Year Action Plan are reviewed every five years. These review points provide an opportunity to evaluate and report on the effectiveness of Australia’s national Antarctic science effort and the resourcing and activities conducted by Australian Government agencies.
DETAILED AUSTRALIAN GOVERNMENT RESPONSE

Recommendation 1: Science Program Governance Structure

The Clarke Review found that the current governance model is complex and opaque with eight institutions having key roles and many others having some role. It recommended “...the overall structure of Australian Antarctic science should be strengthened through three initiatives: establishment of a new science council to provide independent strategic advice; establishment of a new and enduring research body to institutionalise collaboration; and a joint approach being taken to the planning and delivery of the program.”

In conducting the review, Mr Clarke found that the abolition of the Antarctic Science Advisory Committee has had an unintended consequence of at least leading to a perception of a conflict between the Australian Antarctic Division’s role as national operator, science leader and employer of some scientists. In particular Mr Clarke noted that “the Australian Antarctic Division’s Chief Scientist is now in the invidious position of drafting the strategic plan, chairing the panel that assesses the applications made against the plan, and employing some of the staff who are making applications.”

Collaboration between disciplines, institutions and nations is required to answer the bigger Antarctic science questions, with the Antarctic Treaty itself holding scientific collaboration in Antarctica as a key principle (Article III). The Clarke Review identified there is room to strengthen collaboration at the institutional level to a model based on partnership.

Mr Clarke found that it is important to have broad participation in Antarctic science planning, with the Australian Antarctic Division as the final decision maker, given its logistics, policy and budget responsibilities.

This recommendation is split into three sub-recommendations, which are listed in the boxes below, followed by the Australian Government’s response.

Recommendation 1.1 Council

A new science Council be created to provide independent expert advice to the Australian Antarctic Division and the Government on the Australian Antarctic Science Program. The new ‘Australian Antarctic Science Council’ would be fully integrated into the overall governance model. It should comprise an independent Chair and two independent members (one each from the life and physical sciences) appointed by the Government, and around five ex-officio members including the Chair of the Australian National Committee for Antarctic Research.

Australian Government Response

Support.

The Australian Antarctic Science Council will be established to advise Government on the Australian Antarctic Science Program and implementation arrangements for this response. Key areas of focus include:

- Oversee the revision of the Australian Antarctic Science Strategic Plan 2011–12 to 2020–21, due in 2018, including Antarctic science priorities in the context of the Australian Antarctic Strategy and 20 Year Action Plan.
• The design and operation of a potential new overarching collaborative Antarctic research partnership (working title the Australian Antarctic Program Partnership), likely in Hobart, to bring together government and non-government entities involved in Antarctic science (see response to recommendation 1.2 below).

- The Partnership would build upon the capabilities of the existing Antarctic Climate and Ecosystem Cooperative Research Centre and the Australian Research Council Special Research Initiative Antarctic Gateway Partnership, and the recently announced Australian Research Council’s Special Research Initiative in Excellence in Antarctic Science and Antarctic Science Collaboration Initiative grants programs, and align to the priorities of the Australian Antarctic Science Strategic Plan and Australian Antarctic Strategy and 20 Year Action Plan.

• The design of a streamlined Antarctic science funding and governance system that aligns and integrates Australia’s national Antarctic interests and science priorities and appropriately sequences allocation, application and assessment processes involved in funding and supporting Antarctic science, where access to the Southern Ocean and Antarctica is required.

• Options to transparently assess, prioritise, balance and support science that directly aligns to Australia’s national and international Antarctic priorities as outlined in the Australian Antarctic Science Strategic Plan 2011–12 to 2020–21 and the Australian Antarctic Strategy and 20 Year Action Plan and deliver policy-critical science, excellent science and long-term monitoring and mapping.

• Options to maximise the science undertaken using the Government’s significant investment in Antarctic infrastructure, including new logistic capability, such as the state-of-the-art research and resupply icebreaker RSV Nuyina, overland traverse capability, and rebuilt research station on Macquarie Island.

The Australian Government will establish the Australian Antarctic Science Council as soon as practicable, including appointing an eminent chair, two independent members, as well as ex-officio members from Australian Government agencies involved in Antarctic Science, including the Chair of the Australian National Committee on Antarctic Research, the Chief Executive Officer of the Australian Research Council, the Director of the Australian Antarctic Division and members from the Bureau of Meteorology, CSIRO, GeoScience Australia and the Department of Industry, Innovation and Science. It is expected that the Council will begin operating by the end of 2018.
**Recommendation 1.2 Institute**

A new institution be created in Hobart under the sector-funded Cooperative Research Centre model to focus on the Australian Antarctic Science Program. The core participants would be the Australian Antarctic Division, the University of Tasmania, CSIRO and the Bureau of Meteorology, as now, plus other participating Commonwealth agencies (including Geoscience Australia) and any other interested Australian Universities. The new body would differ from the Antarctic Climate and Ecosystems Cooperative Research Centre in a number of critical ways: its core funding would come from the Department of the Environment and Energy, all Commonwealth agencies undertaking Antarctic science would be core members, and its scope would include both the Australian Antarctic Science Program roles of the core members plus any other Antarctic-related science as the non-Australian Antarctic Division participants may choose. All current Australian Antarctic Division science staff would work within the new institution, on a similar basis to those currently working in the Antarctic Climate and Ecosystems Cooperative Research Centre. A working title is the Australian National Antarctic Research Institute.

**Australian Government Response**

Support in principle.

The Australian Government considers it is critical to retain and build upon the considerable Antarctic scientific capability that has already been developed through decades of investment, including the 25 year old Antarctic Climate and Ecosystems Cooperative Research Centre and the more recent Australian Research Council Special Research Initiative Antarctic Gateway. This is why the Australian Government has decided to provide long-term funding certainty to Antarctic science through the Australian Research Council’s Special Research Initiative in Excellence in Antarctic Science and the Antarctic Science Collaboration Initiative grants program.

The Australian Government, with advice from the Antarctic Science Council, will streamline governance arrangements within the Australian Antarctic Program promoting science collaboration and partnerships, and to strengthen Hobart as global Antarctic research hub.

Further consideration of institutional and administrative arrangements is required before this recommendation can be implemented. This process will be coordinated by the Environment and Energy Portfolio in close consultation with the Australian Antarctic Science Council, the Education and Jobs and Innovation portfolios. It will involve extensive consultation with partners and the Antarctic science community.

Consultation will be undertaken on the basis that the potential new Partnership, as part of its core operating principles, will:

- be made of those existing Antarctic science partners who wish to continue to participate such as the Australian Antarctic Division, CSIRO, the Bureau of Meteorology and GeoScience Australia, with new partners welcome and encouraged to collaborate
- be Australia’s leading research partnership in Southern Ocean and Antarctic Science, and be focused on the Australian Antarctic Territory, Southern Ocean and Australia’s sub-Antarctic islands
- deliver its objectives within the Australian Antarctic Program in accordance with the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*
• focus research effort on high priority strategic science, lead and coordinate major collaborative field and marine projects, and undertake long-term monitoring

• maximise data availability and visualisation of Australian Antarctic data including development of a digital model of the Australian Antarctic Territory / East Antarctica

• secure strong scientific collaborations nationally and internationally to support the Australian Antarctic Program.

The Australian Government will use the working title ‘Australian Antarctic Program Partnership’ instead of the Australian National Antarctic Research Institute (a working title proposed by Mr Clarke) to avoid confusion with long established Australian National Antarctic Research Expedition, which was the former name of the Australian Antarctic Program and currently the name of the society of past and present Antarctic expeditioners.

The new $5 million annual Antarctic Science Collaboration Initiative grants program will support the proposed collaborative research partnership, once established, to bring together government and non-government entities to deliver research under the Australian Antarctic Science Program.

Recommendation 1.3 Planning

The planning of the Australian Antarctic Science Program, from strategy to delivery, to be undertaken jointly by Australian Antarctic Division and the new Science Council.

Australian Government Response

Support.

The Australian Antarctic Division will maintain responsibility for the planning of Australia’s Antarctic Science Program as it has primary responsibility to administer the significant investment the Australian Government makes in Antarctic logistics support and infrastructure.

The Australian Antarctic Science Council will be empowered through its terms of reference to provide planning advice and support to the Australian Antarctic Division and the Education and Jobs and Innovation portfolios. This includes, but is not limited to, annual planning advice for each Antarctic season and through the five-yearly review of the Australian Antarctic Science Strategic Plan 2011–12 to 2020–21 and successor plans and documents. This will provide greater opportunity for the research community to participate in the planning of the Australian Antarctic Science Program.
Recommendation 2: Science Program Strategy

The Clarke Review recommended that “the Australian Antarctic science strategy should be strengthened in three areas: by specifying the policy-critical, long-term monitoring and mapping programs; by incorporating development of a data model of the Australian Antarctic Territory; and by engaging with the non-Australian Antarctic Science Program Antarctic science community.”

Mr Clarke found there is a tension between science of a standard that has attracted or would attract an Australian Research Council grant, and strategic, policy-critical research and long-term programs that underpin some of the big science questions. Both forms of science are essential, and not mutually exclusive, but the current model lacks a transparent way of managing the tension between them.

The Clarke Review determined that, while the data function provided through the Australian Antarctic Data Centre is the minimum necessary to meet Australia’s Treaty obligations, it falls short of a modern data-centred science program. The data capability of the Australian Antarctic Science Program should be treated as core science infrastructure.

Mr Clarke found that the Australian Antarctic Division has limited awareness of non-Australian Antarctic Science Program science. It is in Australia’s national interest for Australian Antarctic Division (and hence the Government) to have a comprehensive understanding of Australian science activities relating to Antarctica and the Southern Ocean, particularly for scientific, geopolitical and Treaty compliance purposes.

This recommendation is split into three sub-recommendations, which are listed in the boxes below, followed by the Australian Government’s response.

Recommendation 2.1 Strategic Science
The Australian Antarctic Science Strategic Plan to separately identify the policy-critical and strategic long-term monitoring and mapping programs that are needed to underpin Government priorities and excellent science, and include mechanisms to better enable major science campaigns in designated priority locations and disciplines.

Australian Government Response
Support.

The terms of reference for the Australian Antarctic Science Council will include advising Government and taking on a role in the oversight of the revision of the Australian Antarctic Science Strategic Plan 2011–12 to 2020–21 by 31 December 2018 (and then successor plans). The revised Plan will apply to projects commencing in the 2020–21 Antarctic season.

In undertaking the review, the Council will provide advice to Government on the best ways to transparently assess, prioritise, balance and support science that directly aligns to Australia’s national and international interests, delivers policy-critical science, excellent science and long-term monitoring and mapping.
**Recommendation 2.2 Data**

The Strategic Plan to explicitly task the Australian National Antarctic Research Institute with developing a comprehensive digital model of the Australian Antarctic Territory, building on the Australian Antarctic Data Centre capability and that of the current Cooperative Research Centre participants.

**Australian Government Response**

Support in principle.

The Australian Government supports in principle the establishment of a comprehensive digital model of the Australian Antarctic Territory that furthers Australia’s Antarctic national interests and builds on the capability of the Australian Antarctic Data Centre, and Australia’s Antarctic scientists.

The design, location, funding and maintenance of such a model will require further consideration, particularly by the Australian Antarctic Science Council. Options for the most appropriate model will be determined through consultation with relevant portfolios including Education and Jobs and Innovation and other stakeholders across Government, universities and the broader Antarctic sector. Prospective models will be assessed against the Australian Government’s Digital Service Standard.

**Recommendation 2.3 Non-AASP Science**

The Australian Antarctic Division, through the Science Council and Australian National Antarctic Research Institute, to develop and maintain a comprehensive view of Australian Antarctic science beyond the Australian Antarctic Science Program. A feature of this process could be an annual Australian Antarctic Science conference in Hobart and a comprehensive engagement strategy to help gain a greater knowledge of the total Australian Antarctic science effort.

**Australian Government Response**

Support.

From 2020, the Australian Government will establish reporting mechanisms to document all science (and associated data) undertaken with Australian Government funding or support or undertaken by Australian researchers within the Antarctic Treaty area (below 60 degrees south), including the Australian Antarctic Territory and Southern Ocean.

Implementation details will be developed in consultation with the Australian Antarctic Science Council the Education and Jobs and Innovation portfolios and other stakeholders to ensure that associated administrative processes are streamlined and complement other outcomes of the Clarke Review, including the proposed digital model.
Recommendation 3: Science Program Administration

The Clarke Review recommended that “the administration of the Australian Antarctic Science Program should be streamlined by integrating all ‘science excellence’ competitive grant assessments in the Australian Research Council process, and integrating access to marine research vessels in the Southern Ocean through the Marine National Facility process. A more comprehensive set of performance measures should be developed to assess the impact of the program and help guide the science assurance process.”

Mr Clarke identified several clear areas of duplication and inefficiency, particularly around funding and grants programs and marine (ship-supported) science in the Southern Ocean. Marine, ship-supported science was one of three key areas of duplication and inefficiency. For marine science in the Southern Ocean, researchers can apply for either or both the Australian Antarctic Division for icebreaker support or the Marine National Facility for Investigator support (up to ice edge only support).

The Clarke Review found that the science done under the Australian Antarctic Science Program has impact in multiple areas, such as supporting Australia’s national interests in Antarctica, contributing to global science in critical areas such as climate change, and has commercial applications, but these impacts are not currently measured.

This recommendation is split into three sub-recommendations, which are listed in the boxes below, followed by the Australian Government’s response.

Recommendation 3.1 Process Duplication

The Australian Antarctic Science Program, Australian Research Council and Australian Antarctic Division (cash and non-cash grant) processes to be integrated, eliminating duplication of competitive science excellence assessment and aligning the key dates.

Australian Government Response

Support in principle.

The Australian Government aims to reduce duplication and increase efficiency while continuing to meet existing legislative requirements. It supports streamlining assessment processes and, consistent with the response to Recommendation 3.2 below, will develop an approach to maximise the integration and/or alignment, scheduling and sequencing of processes conducted by (or to be conducted by) the Australian Antarctic Division, Australian Research Council (Antarctic research initiatives only), the new Antarctic Science Collaboration Initiative grants program (Department of Industry, Innovation and Science), and the Marine National Facility.

New Antarctic science funding initiatives will be aligned with Australia’s national Antarctic priorities, as detailed in the Australian Antarctic Science Strategic Plan and Australian Antarctic Strategy and 20 Year Action Plan. The advice of the Australian Antarctic Science Council will be critical in ensuring there are transparent options available to balance Antarctic Science priorities with other science objectives. The Council will also play an important role to assist Government implement this recommendation by consulting with stakeholders to identify options to increase efficiency and align and streamline assessment processes.
**Recommendation 3.2 Marine Planning**

The administrative processes of the Australian Antarctic Science Program marine science component (as delivered by the Aurora and its replacement, RSV Nuyina) to be integrated with the Marine National Facility (Investigator) process. The new arrangement to enable a single application and assessment process to optimize the use of the two ships in their overlapping areas of tasking and capability in Southern Ocean research (between the convergence and sea ice edge).

**Australian Government Response**

Support in principle.

The Australian Government supports streamlining assessment processes and, consistent with the response to Recommendation 3.1, will develop an approach to maximise the integration and or alignment, sequencing and scheduling of processes conducted by (or to be conducted by) the Australian Antarctic Division, Australian Research Council (Antarctic research initiatives only), the new Antarctic Science Collaboration Initiative grants program (Department of Industry, Innovation and Science), and the Marine National Facility.

**Recommendation 3.3 Impact Measurement**

The Science Council to recommend a more comprehensive set of impact (performance) measures for the Australian Antarctic Science Program, for inclusion in the Strategic Plan and Australian National Antarctic Research Institute measurement and reporting.

**Australian Government Response**

Support.

The Australian Antarctic Science Council will be tasked to develop and recommend a comprehensive set of new performance measures to evaluate science projects to be included in the implementation guidance for the revised Australian Antarctic Science Strategic Plan 2011–12-2020–21 and implemented for science projects commencing in 2020–21 (the first year of the revised plan). Impact measures will also be developed to evaluate the effectiveness of the Australian Government’s response to the Australian Antarctic Program Governance Review, December 2017, by 30 June 2020.
Appendix 1: Terms of Reference

Review of the Australian Antarctic Program’s Governance and Funding Efficiency

Background

Antarctic science that is aligned with our policy interests and integrated with our operational capabilities is at the heart of the successful delivery of the Australian Antarctic Program. Australian and international scientists participate in the inclusive program to deliver world-class scientific research consistent with Australia’s Antarctic science strategic priorities.

As part of the 2016 Australian Antarctic Strategy and 20 Year Action Plan, the Australian Antarctic Division will implement a coordinated and effective Antarctic science funding model to increase Antarctic research by leading Australian institutions together with international and industry partners. Mr Drew Clarke AO will lead a Review to help inform the way in which this commitment is delivered.

Objective and Scope

The Review will provide recommendations and options to ensure the most efficient governance arrangements are delivering the best value for money for Australia’s national interests and scientific priorities in Antarctica. With the Antarctic Program already fully funded through a range of mechanisms, this Review will focus on improving the efficiency of existing funding arrangements.

Within the frameworks of the 2016 Australian Antarctic Strategy and 20 Year Action Plan the funding model will take account of:

• Leadership:
  o Australia’s prominence as a science, policy and operational leader in Antarctica.
  o The ongoing role of the Australian Antarctic Division, domestically and internationally, in leading Australia’s Antarctic Program, including in the context of other institutions engaged in Antarctic work.
  o The role of Tasmania as the leading international Antarctic research hub and logistics gateway for East Antarctica.

• Governance and Funding Pathways:
  o The functional governance arrangements in place through which the Department of Environment and Energy’s Australian Antarctic Division delivers the Australian Antarctic Program.
  o The range of other programs in place, outside the Environment and Energy portfolio, through which outcomes in Antarctica are delivered (particularly ACE CRC, Antarctic Gateway Partnership and ARC grants).
  o Integration with the soon to be established Antarctic Science Foundation which will provide opportunities for the private and philanthropic sectors to contribute to Antarctic research.

• Operations:
  o Options for improved integration of existing assets and activities such as the National Marine Facility, RV Investigator, and the Bureau of Meteorology.
  o Ensuring alignment with new Antarctic infrastructure coming on line over the next few years, such as the new Icebreaker, new ice traverse capabilities, and the new station on Macquarie Island.
Consultation

A key element of the Review will be close consultation with interested portfolios across the Commonwealth and Tasmanian governments, and with stakeholders from the corporate, scientific, academic and philanthropic sectors.

Out of scope

The current priorities for Antarctic science will not be included as part of the Review. These are being considered separately as part of the review of the *Australian Antarctic Science Strategic Plan 2011-2021*.

Review timing and process

The Department of Environment and Energy will provide administrative support for the Review.

The Review will commence in August 2017 and is expected to be submitted to Government for consideration early in 2018.