The Parliament of the Commonwealth of Australia

# Maintaining Australia's national interests in Antarctica

## Inquiry into Australia's Antarctic Territory

Joint Standing Committee on the National Capital and External Territories

May 2018

Canberra

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# Foreword

As Chair of the Joint Standing Committee on the National Capital and External Territories, I am pleased to present the Committee's report which examines Australia's Antarctic Territory.

Australian expeditioners were some of the earliest explorers on the Antarctic continent, with our nation's involvement beginning in the late 1800s and continuing into the present day. Some of Australia's earliest Antarctic scientists, including Douglas Mawson, would become synonymous with Australia's exploration of the continent. Mawson station was opened in 1954 and became Australia's first permanent scientific research presence in Antarctica.

The Australian Antarctic Program positions our nation amongst the world's most significant contributors on the continent. In supporting Australia's national interests in Antarctica, the Australian Government has announced investments in infrastructure that will significantly enhance Australia's scientific capabilities and capacity.

Just recently, after this report was finalised, the Australian Government announced that it would go ahead with a paved runway to provide year-round access to Davis research station. This is consistent with this report's recommendations and demonstrates Australia's commitment to protect its long-term interests in Antarctica. Australia is also investing in a new Antarctic icebreaker, *RSV Nuyina*, which is due to arrive in Hobart in 2020.

These initiatives will provide a more modern and efficient basis upon which Australia's international reputation in Antarctic science can grow. In particular, these investments will provide improved capacity for international engagement and opportunities for Australia's Antarctic scientists to collaborate with their colleagues from other nations.

Hobart is well situated to capitalise on Australia's renewed Antarctic focus. A number of initiatives, such as enhancements to aviation capability at Hobart Airport, a proposed Antarctic science hub, and the potential development of Antarctic tourism, give rise to valuable opportunities. The lure of the city's

burgeoning Antarctic potential may also see increased engagement with international Antarctic programs.

The Committee's inquiry, launched in June 2017, received well-informed contributions from key stakeholders in Australia's Antarctic sector including from various agencies of the Commonwealth and Tasmanian Governments, the Antarctic science community, academics, and those developing infrastructure and other support services in Tasmania to meet the needs of the growing Antarctic sector.

Members of the Committee spent time in both Hobart and Antarctica inspecting some of the key facilities comprising Australia's Antarctic operations. The visits provided the opportunity to see firsthand the infrastructure and science investment that has led to Australia's internationally renowned Antarctic capacity.

The Committee's report considers four key themes: Australia's leadership and governance with respect to Antarctica; the infrastructure and logistical support required for the success of the Australian Antarctic Program; Australia's world class research in Antarctic science; and the economic benefits, particularly for Tasmania, that can be derived from Australia's engagement with the continent.

The report's 22 recommendations provide the Australian Government with an opportunity to strengthen its work with respect to Antarctica and build on already impressive foundations. In particular, the Committee has recommended that the Australian Government consider the appointment of an Antarctic Ambassador, that Australia's formal inspections under the Antarctic Treaty System be increased, and that the Australian Government capitalise on developments in the city of Hobart through the co-location of relevant Antarctic institutions at a proposed Antarctic science hub.

I would like to thank the many contributors to the Committee's inquiry including those who made submissions and gave evidence at public hearings. This report is a reflection of those views and of the collective support that Australia's presence in Antarctica enjoys. In particular, I would like to thank the staff of the Australian Antarctic Division in Hobart for their dedication and commitment to the Australian Antarctic Program and express the Committee's appreciation for their warm, open and professional manner in engaging with this inquiry. I would also like to thank the committee secretariat for their hard work and advice through each stage of this inquiry. Finally, I would like to thank my Committee colleagues for their enthusiastic engagement with this inquiry.

Mr Ben Morton MP
Chair

# Membership of the Committee

| | |
|---|---|
| Chair | Mr Ben Morton MP |
| Deputy Chair | Ms Gai Brodtmann MP |
| Members | Mr Mark Coulton MP (to 5 March 2018) |
| | Senator Jonathon Duniam |
| | Senator Katy Gallagher (to 9 May 2018) |
| | Mr Kevin Hogan MP (from 26 March 2018) |
| | Mr Julian Leeser MP |
| | The Hon. Sussan Ley MP |
| | Senator Sue Lines |
| | Senator Malarndirri McCarthy |
| | Senator James Paterson |
| | Senator Lee Rhiannon |
| | The Hon. Warren Snowdon MP |

# Committee Secretariat

| | |
|---|---|
| Secretary | Ms Peggy Danaee |
| Inquiry Secretary | Mr Muzammil Ali |
| Research Officer | Ms Stephanie Lee (from 3 July 2017) |
| Office Manager | Ms Kathleen Blunden (from 13 July 2017)<br>Ms Sarah Brasser (to 11 August 2017) |

# Terms of reference

The Joint Standing Committee on the National Capital and External Territories will inquire and report into the adequacy of Australia's infrastructure assets and capability in Antarctica with regard to:

- maintaining national interests;
- serving the scientific program into the future;
- international engagement, including collaboration and resource sharing with other countries;
- fostering economic opportunities consistent with the Antarctic Treaty system obligations; and
- environmental considerations.

# List of abbreviations

| | |
|---|---|
| AAD | Australian Antarctic Division |
| AAP | Australian Antarctic program |
| AAT | Australian Antarctic Territory |
| ACE CRC | Antarctic Climate and Ecosystems Cooperative Research Centre |
| AMSA | Australian Maritime Safety Authority |
| ANSTO | Australian Nuclear Science and Technology Organisation |
| ATS | Antarctic Treaty system |
| CCAMLR | Commission for the Conservation of the Antarctic Marine Living Resources |
| COMNAP | Council of Managers of National Antarctic Programs |
| CSIRO | Commonwealth Scientific and Industrial Research Organisation |
| CSHOR | Commonwealth Scientific and Industrial Research Organisation |
| CTBT | Comprehensive Test Ban Treaty |
| DFAT | Department of Foreign Affairs and Trade |
| HIMI | Heard Island and McDonald Islands |
| IGY | International Geophysical Year |
| IMAS | Institute for Marine and Antarctic Studies |

| | |
|---|---|
| IMS | International Monitoring System |
| MARPOL | International Convention of the Prevention of Pollution from Ships |
| MPA | Marine protected areas |
| TPN | Tasmanian Polar Network |

# List of recommendations

## 3 Antarctic leadership and governance

### Recommendation 1

The Committee recommends that the Australian Government, through the Department of Foreign Affairs and Trade, appoint an Antarctic Ambassador to oversee diplomatic activities and to provide leadership in promoting Australia's interests in Antarctica internationally.

### Recommendation 2

The Committee recommends that the Australian Government consider ways in which it can further strengthen its search and rescue planning processes so that it can better respond to increased activity in the future.

### Recommendation 3

The Committee recommends that the Australian Antarctic Division conduct a formal site inspection in East Antarctica within the next year (2019–20 season). Once inland traverse capabilities have been restored, the Committee recommends that the Australian Antarctic Division set a target to conduct formal inspections annually, with an emphasis on inspections in East Antarctica. To meet these requirements, the Committee recommends that work to restore Australia's inland traverse capabilities be expedited and completed by the end of the 2019–20 season.

## 4 Infrastructure and logistical support

### Recommendation 4

The Committee recommends that the Department of the Environment and Energy, consistent with its commitments in the *Australian Antarctic Strategy and 20 Year Action Plan,* prepare a detailed plan and a timeline for the upgrade and modernisation of Australia's Antarctic research stations.

### Recommendation 5

The Committee recommends that the Department of the Environment and Energy prioritise waste remediation once the new icebreaker is operational, given the increased capacity to carry material including waste.

### Recommendation 6

The Committee recommends that the Australian Government provide the Department of Environment and Energy with an enhanced capacity to develop a business and strategic case for year-round aviation in Antarctic. The Committee further recommends that the investment decision be made by December 2019 at the latest.

### Recommendation 7

The Committee recommends that CSIRO explore further opportunities to ensure that the *RV Investigator* is able to operate at its full capacity. Consideration should be given to whether incentives can be developed to encourage non-government marine research activities using the vessel.

### Recommendation 8

The Committee recommends that the Australian Government examine options for the co-location of relevant institutions in the proposed Macquarie Point Antarctic Precinct, including the relocation of CSIRO, CCAMLR, the Tasmanian Polar Network, part of the Bureau of Meteorology, and components of the Australian Antarctic Division.

### Recommendation 9

The Committee recommends that the Australian Government consider how the strategic value of the Australian Antarctic Division to the Commonwealth is captured, and develop mechanisms to provide the Australian Antarctic Division with enhanced budget certainty and funding, in light of its work and capital requirements.

Recommendation 10

The Committee recommends that the Department of the Environment and Energy work to complete its assessment of Australia's ageing Antarctic asset base, separate from Australia's Antarctic stations, as soon as practicable. Where appropriate, relevant business cases should be developed, particularly where a new spending proposal is required to be managed through the Australian Government's budget processes.

## 5 Serving the scientific program into the future

Recommendation 11

The Committee recommends that the Australian Government release the review into Antarctic science governance as soon as practicable and provide a public response to its findings and recommendations in a timely manner.

Recommendation 12

The Committee recommends that the Australian Government provide clarity on how different sources of Australian Government Antarctic science funding can be utilised by funding recipients including whether such sources can be used for project or ancillary research support purposes.

Recommendation 13

The Committee recommends that the Australian Government consider the establishment of a body to determine both Antarctic science project priorities consistent with the *Australian Science Strategic Plan 2011–12 to 2020–21* and to provide a forum for overseeing the coordination of projects.

Recommendation 14

The Committee recommends that the Australian Government consider mechanisms by which the Antarctic Climate and Ecosystems Cooperative Research Centre can continue its operations in collaborative Antarctic science beyond June 2019. The Australian Government may consider opportunities to work with the Tasmanian Government to consider how the work of the Antarctic Climate and Ecosystems Cooperative Research Centre can continue.

Recommendation 15

The Committee recommends that the Australian Government assess how Australia can retain and further develop its Antarctic science workforce to ensure long term objectives under the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21* can be met. Such an assessment should consider opportunities to leverage cooperation from commercial and philanthropic entities, as well as jointly funded international ventures. The results of this assessment should be incorporated into future iterations of the *Australian Antarctic Science Strategic Plan*.

Recommendation 16

The Committee recommends that the Australian Government, through the Department of the Environment and Energy, consider a whole of government data management strategy to manage its store of Antarctic data as a matter of priority. In the short term, the Committee recommends that Geoscience Australia and the Australian Antarctic Division put forward a business case for an 'Antarctic Geoscience Data Cube' that could be included in an expanded version of the Digital Earth Australia program, and any other necessary data management infrastructure—including the tools Australia requires to access, read, and use data from other countries' Antarctic research.

Recommendation 17

The Committee recommends that the Australian Government, through the Department of the Environment and Energy develop a centrally coordinated repository of Antarctic science agreements which also capture the registration of any relevant intellectual property rights.

## 6 Economic opportunities

Recommendation 18

The Committee recommends that the Australian Antarctic Division in conjunction with the Department of Infrastructure, Regional Development and Cities, work with the Tasmanian Government and local government to outline the key Antarctic priorities under the Hobart City Deal including a broad funding agreement and project timeline, particularly with reference to the Macquarie Point Antarctic Precinct.

Recommendation 19

The Committee recommends that the Department of Foreign Affairs and Trade identify or establish an appropriate federal mechanism to create an Office of Antarctic Services. Such an office would oversee the promotion of Australia, and in particular Hobart, as an Antarctic gateway and hub to international Antarctic programs.

Recommendation 20

The Committee recommends that the Australian and Tasmanian Governments work with other nations' Antarctic programs that have or seek to have a presence in Hobart to ensure that their requirements are met through the provision of relevant infrastructure and services.

Recommendation 21

The Committee recommends that the Australian Government, through the Department of Infrastructure, Regional Development and Cities, consider providing assistance to TasPorts to improve the viability of the proposal to use a fuel barge to bring fuel from Self's Port to the port of Hobart.

Recommendation 22

The Committee recommends that the Australian Government, through the Department of the Environment and Energy, consider ways in which the work of the Australian Antarctic Program can be given further prominence. In doing so, consideration should be given to the needs of visitors, the educational objectives to be communicated, and how Australia's national interests can best be served.

# Executive summary

Australia has a long and proud history of involvement in Antarctica, having significantly contributed to shaping the region, both though the Antarctic Treaty System (ATS) and on the ground. Australia's continued presence on the continent through science and infrastructure has enabled Australia to contribute to world-class research, shape Antarctic governance, and to protect its sovereignty and national interests in the region.

Maintaining Australia's position in the Antarctic is critical, particularly at a time when international activity in the region is increasing. In order to ensure that Australia continues to maintain its leading role in the region, the Australian Government has recently committed to increase investment in infrastructure and science on the continent. This report provides a range of recommendations to ensure that this commitment is implemented successfully to enable Australia to continue its strong leadership in Antarctica.

Evidence to the Committee emphasised the unique challenges that infrastructure development presents in Antarctica. The Committee acknowledges that modernisation of existing infrastructure and the management of logistics in such a remote and hostile location would come at a significant cost. However, the benefit of maintaining Australia's national interests in the region and supporting Antarctic science is important. The Committee has made some recommendations to expedite the modernisation process, with particular emphasis on year-round aviation access, and upgrades to Australia's Antarctic research stations. Moreover, this will further enhance Australia's ability to collaborate with other nations through shared logistics arrangements.

The Committee's inquiry considered the potential affect that new infrastructure will have on the broader Australian Antarctic Program. This includes a greater number of assets that require trained staff to be fully utilised, increased collection of data, and opportunities to expand existing programs such as waste remediation and site inspections in accordance with the ATS. The Committee has made

recommendations to ensure that these matters are taken into consideration in future planning of the Australian Antarctic Program.

Antarctic science is a focus of many other countries' Antarctic programs. For Australia to remain at the forefront of science and engagement on the continent, a renewed focus on its own program is required. Evidence to the Committee highlighted that the Australian Antarctic science framework is undergoing a period of renewal and that a review into the governance of Antarctic science is forthcoming. While the Committee does not wish to pre-empt the review's findings, there is a need to consider improved funding and coordination of Antarctic science, in line with established governance structures.

One of the key concerns brought to the attention of the Committee is that the funding to the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) is due to end in June 2019. The Committee received significant evidence that highlighted the important ongoing contribution that the ACE CRC has made to Antarctic science. The Committee has therefore recommended that the Australian Government consider mechanisms to ensure that the ACE CRC can continue its operations beyond June 2019.

Beyond science, the Australian Antarctic program also provides significant economic opportunities consistent with the ATS. In particular, this includes promoting Australian-based Antarctic businesses and Antarctic tourism. The Committee is also supportive of initiatives to strengthen Hobart's role as an Antarctic gateway and science hub. To this end, a number of recommendations are made to streamline promoting Antarctic businesses, and tourism opportunities in both Hobart and Antarctica.

# 1

# Introduction

1.1 Since the establishment of Mawson station in 1954, Australia has maintained a permanent presence in Antarctica, undertaking scientific research and providing leadership in Antarctic and environmental governance.

1.2 With an emphasis on peaceful collaboration through science, the Antarctic Treaty system provides Australia with a region of peace and security at its southern borders.[1] Moreover, the Antarctic climate presents unique opportunities for researchers to gain a greater understanding of critical issues including climate science, the conservation of Antarctic and Southern Ocean wildlife, and the sustainable management of Southern Ocean fisheries.[2]

1.3 Antarctica has witnessed an increase in activity with some nations expanding their existing infrastructure and research capabilities. Recently Australia has strengthened its commitment to its Antarctic program with the *Australian Antarctic Strategy and 20 Year Action Plan*. The Plan lays the foundation for new operational funding and modernisation of Australia's Antarctic Program. Central to this, is the construction of a new research and resupply icebreaker, the development of overland transport capabilities, improved aviation access, and strengthening Tasmania's role as an Antarctic Gateway.[3]

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1 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014, p. 2.

2 Australian Antarctic Division (AAD), Department of the Environment and Energy, 'Science', 27 November 2015, <http://www.antarctica.gov.au/science>, viewed 28 July 2017.

3 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan,* 2016.

## Recent reports

1.4 Antarctica has been the subject of a number of parliamentary committee reports in previous years, which have covered a broad range of topics in the region.[4] This has included the adequacy of funding of Australia's Antarctic Program, the redevelopment of bases, and Antarctic tourism.

1.5 Recently, Australia's Antarctic Program and science more generally has received increased attention. In particular, a 2014 report commissioned by the Australian Government and led by former Director of the Australian Antarctic Division (AAD), Dr Tony Press, examined the challenges facing Australia's Antarctic Program and made a number of recommendations for Australia's future engagement in Antarctica.[5] Simultaneously, the Senate Foreign Affairs, Defence and Trade Reference Committee released a report into *Australia's future activities and responsibilities in the Southern Ocean and Antarctic waters* which made a number of recommendations relating to Antarctica.[6]

1.6 In response to both reports the Australian Government in 2016 released the *Australian Antarctic Strategy and 20 Year Action Plan*. The Plan outlined the most significant measures ever developed by the Australian Government to enhance Australia's role as a leader in Antarctica.[7]

### Ongoing reviews

1.7 There are also a number of ongoing reviews into various aspects of the Australian Antarctic Program (AAP) and Australia's Antarctic sector, and it should be noted that some of these reviews are occurring in parallel with the Committee's current inquiry. Such reviews are discussed throughout the present report, and include:

- an assessment of the existing status of Antarctic station infrastructure;

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4 For example: the Joint Standing Committee on Public Works, *Report Relating to the Redevelopment of Australian Antarctic Bases, Fifth Report of 1981*, 1981; House of Representatives Standing Committee on the Environment, Recreation and the Arts, *Tourism in Antarctica*, 1989; the Joint Standing Committee on the National Capital and External Territories, *Antarctica: Australia's Pristine Frontier – Report on the adequacy of funding of Australia's Antarctic Program*, 2005.

5 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014.

6 Senate Foreign Affairs, Defence and Trade Reference Committee, *Australia's Future Activities and Responsibilities in the Southern Ocean and Antarctic Waters*, 2014.

7 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016.

- the development of a business case for the proposed year-round runway in Antarctica;
- a 'capital budget review committee' to examine longer term asset management plans under development aimed at countering the effect of the ageing Australian Antarctic asset base
- the engagement of an external consultancy to develop a strategic framework and priority asset replacement process for the lifespan of Australian Antarctic assets;
- an evaluation of the *Australian Science Strategic Plan 2011–12 to 2020–21*; and
- consideration of co-locating a range of Antarctic entities in a proposed Antarctic science hub at the new Macquarie Point Development in Hobart.

## The current inquiry

1.8 On 21 June 2017, the Minister for the Environment and Energy, the Hon. Josh Frydenberg MP, wrote to the Committee requesting that it inquire into and report on the adequacy of Australia's infrastructure assets and capability in Antarctica, with regard to:

- maintaining national interests;
- serving the scientific program into the future;
- international engagement, including collaboration and resource sharing with other countries;
- fostering economic opportunities consistent with the Antarctic Treaty system obligations; and
- environmental considerations.

1.9 On 29 June 2017, the Committee adopted the inquiry in the terms referred by the Minister.

## Conduct of the inquiry

1.10 The inquiry was advertised on 29 June 2017. Submissions were invited from a range of government and non-government organisations that

operate in the Australian Antarctic Territory or provide support to the AAP or the programs of other nations, some of the contributors to previous inquiries, and other relevant stakeholders.

1.11 The Committee received 32 submissions and 20 supplementary submissions, which are listed at Appendix A. The Committee also received 1 exhibit, which is listed at Appendix B.

1.12 The Committee resolved to undertake a program of public hearings and site inspections in Hobart and Canberra. The Committee sought to hear firsthand about the range of specialist work carried out in support of the AAP.

1.13 Hobart's central location as an Antarctic logistics and science hub provided the Committee with an opportunity to undertake a program of public hearings and site inspections in Hobart. The Committee also held a program of public hearings in Canberra. The witnesses are listed at Appendix C.

## Antarctic visit

1.14 As part of the inquiry, the Committee considered it vital to gain firsthand experience of the on the ground working environment and infrastructure of the AAP.

1.15 Four members of the Committee undertook a round-trip visit to Wilkins Aerodrome. This visit allowed members to learn more about the logistical infrastructure that supports Australian scientific efforts within the Antarctic continent.

1.16 In addition, three members of the Committee undertook a longer stay at Casey station. Their comprehensive program of meetings enabled members to learn more about the complexity of infrastructure and maintenance challenges faced by the AAD, and other issues such as waste management, and remediation.

1.17 Members were pleased to have secured very productive and insightful meetings with a wide range of staff from the AAD. Throughout their meetings and site inspections, the members heard from infrastructure engineers, ice core chemists, krill scientists, the Casey Station Leader, and a range of other experts working within Antarctica.

1.18 The visit enabled the Committee to gain genuine insights into the purpose of the AAP and the different options for strengthening Australia's role in

Antarctic leadership, science and logistics. In particular, the visit reinforced the complexities of replacing end-of–life assets in a remote location such as Antarctica. Members were extremely impressed by the enthusiasm from the AAD staff in relation to the role that they play in Antarctica.

1.19 On their return to mainland Australia, the members shared their newly acquired insights with their Committee colleagues. Learnings from the visit have made a very strong contribution to the Committee's deliberations and to shaping the conclusions and recommendations in this report.

## Report structure

1.20 Chapter 2 provides an overview of the history of Australia's Antarctic Program as well as the current state of the program, including research stations, and scientific and logistical capabilities. It also notes the broader international context in which the AAP sits.

1.21 Chapter 3 review Australia's collaboration with international parties and its contribution to Antarctic governance. The chapter also assesses Australia's role as a policy leader in a range of areas including site inspections, search and rescue and environmental protection.

1.22 Chapter 4 reviews the infrastructure and logistical support in both Hobart and Antarctica that contribute to the success of the AAP.

1.23 Chapters 5 considers how Australia's Antarctic science program can best be served into the future. This includes a range of matters including the Australian Antarctic science framework, resourcing, training opportunities for researchers, and the sharing of data between different Antarctic programs.

1.24 Chapter 6 reflects on economic opportunities, consistent with Antarctic Treaty System obligations. This includes Tasmania's role as an Antarctic Gateway, tourism opportunities, and public outreach.

1.25 Recommendations appear throughout the relevant chapters.

## Scope of the inquiry

1.26 Whilst the terms of reference of the inquiry require that the Committee closely consider issues related directly to Antarctica, there is a range of overlapping considerations in respect of Australia's activities in the Southern Ocean, including Macquarie Island. Where these issues have been raised by inquiry participants, the Committee has given them due consideration in the context of Australia's Antarctic activities. However, thorough consideration of the Southern Ocean does not fall within the scope of this report.

# 2

# Background

2.1 A continued presence in Antarctic permits Australia to deliver world-class science, and to be a leader in environmental and marine protection in the region. This presence requires a substantial scientific program, supported by complex infrastructure and a range of experts including scientists, engineers, policymakers, and tradespeople.

2.2 Due to Australia's long history on the continent, a significant portion of the nation's Antarctic infrastructure is reaching the end of its asset life. Consequently, recent efforts by the Australian Government have been concentrated on strengthening Australia's commitment to its Antarctic program and supporting infrastructure.

2.3 This chapter provides a broad overview of Australia's engagement with the Antarctic Treaty System (ATS) and the current state of the Australian Antarctic Program (AAP). This includes a brief outline of the ATS, the overarching framework that regulates relations among states within Antarctica, and the impact this has on Australia's activities within the continent.

2.4 The chapter considers the AAP and the Australian Antarctic Division (AAD). This includes the purpose of the AAP, as well as infrastructure and capabilities.

2.5 Finally, this chapter considers recent developments, on both a national and international level, that affect Australian operations in Antarctica.

## The Antarctic Treaty System

2.6 The Antarctic Treaty and associated agreements, collectively known as the ATS, regulate international relations regarding Antarctica. It is the overarching framework for international governance of both the land and waters south of 60° South latitude.[1] The ATS ensures that international engagement in Antarctica is underpinned by the principles of non-militarisation, environmental protection and freedom of scientific engagement.[2]

2.7 The ATS emerged during the height of the Cold War as scientific programs on the continent began to proliferate. In 1957–58, 12 nations[3] participated in the first substantial multinational research program in Antarctica, known as the International Geophysical Year (IGY).[4]

2.8 In 1959, the nations that had been active during the IGY negotiated the Antarctic Treaty to preserve the continent as a demilitarised zone for cooperative science, free from international discord.[5] As a claimant state, Australia played a key role in the negotiations. Moreover, this role ensured Australia's decision-making status in the Antarctic Treaty.[6]

2.9 Of particular importance, the Treaty addresses disagreement over territorial claims by suspending existing territorial claims, prohibiting new claims, and preventing states from asserting, supporting or denying a claim.[7]

2.10 Over time the ATS has been strengthened by the addition of several instruments dedicated to protecting the Antarctic environment and wildlife, encouraging scientific research, and minimising potential sources of rivalry by introducing a prohibition on non-scientific mineral resource

1 Department of Foreign Affairs and Trade (DFAT), *Submission 17*, pp. [1–2].

2 DFAT, *Submission 17*, p. [1].

3 The 12 nations active in the International Geophysical Year were: Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, United Kingdom, United States and the Union of Soviet Socialist Republics (USSR).

4 A Jackson , 'Antarctica without borders', *Australian Antarctic Magazine*, Issue 22: Mawson Centenary Special, 2012.

5 *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS71, (entered into force 23 June 1961).

6 Australian Academy of Science, *Submission 4*, p. 2.

7 *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS71, (entered into force 23 June 1961).

activity.[8] This includes the *Convention on the Conservation of Antarctic Marine Living Resources (1988)* (*CAMLR Convention*) and the 1991 *Protocol on Environmental Protection to the Antarctic Treaty* (*Madrid Protocol*).

2.11 Since 1959, 41 additional countries have acceded to the Treaty.[9] Currently, 29 of these countries are recognised as 'Consultative Parties' that actively engage in Antarctic research and are entitled to participate in decision-making through Consultative Meetings, and 21 'Non-Consultative Parties' that are invited to attend these meetings but are unable to participate in decision-making processes.[10]

## Australia's key role in the ATS

2.12 As a claimant state and original signatory to the Antarctic Treaty, Australia has a longstanding commitment to the ATS values and principles, which it balances with its national interests.[11] Australia has played a significant role in the development and negotiation of a number of Antarctic governance instruments including the *CAMLR Convention* and the *Madrid Protocol*. Australia continues to influence Antarctic governance through a range of avenues including hosting the secretariat and annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).[12] Australia's contribution to Antarctic governance is discussed in further detail in chapter 3 of this report.

## The Australian Antarctic Territory

2.13 Australia claims sovereignty over 42 per cent of the Antarctic continent, known as the Australian Antarctic Territory (AAT), as illustrated in figure 2.1. This claim extends to the surrounding offshore waters. This represents the largest territorial claim in Antarctica. Sovereignty was transferred from Britain to Australia under the *Australian Antarctic Territory Acceptance Act 1933*, which came into effect on 24 August 1936.[13]

2.14 As the Antarctic Treaty prohibits any acts or activities that support or deny territorial claims, Australia's Antarctic claim is only recognised by

8 DFAT, *Submission 17*, p. [3].

9 Secretariat of the Antarctic Treaty, 'Parties', <https://www.ats.aq/devAS/ats_parties.aspx?lang=e>, viewed 2 January 2018.

10 Secretariat of the Antarctic Treaty, 'Parties', <https://www.ats.aq/devAS/ats_parties.aspx?lang=e>, viewed 2 January 2018.

11 Institute for Marine and Antarctic Studies (IMAS) University of Tasmania, *Submission 8*, p. 1.

12 IMAS, University of Tasmania, *Submission 8*, p. [1].

13 IMAS, University of Tasmania, *Submission 8*, p. [1].

the United Kingdom, France, New Zealand and Norway, all of which are original claimant states.[14] Consistent with established practices under the Antarctic Treaty, Australia takes responsibility for the management of this area and exercises sovereign rights. Australian domestic law in the AAT applies only to Australian nationals.[15] This also applies to the AAT's adjacent maritime zones, including its exclusive economic zones.[16] Currently, a number of other countries are active within the AAT and some countries, including China, France, Italy and Russia, operate bases within the territory, as illustrated in figure 2.2.[17]

## Heard Island and McDonald Islands

2.15 Australia exercises sovereignty over the sub-Antarctic Heard Island and McDonald Islands (HIMI) in the southern Indian Ocean. HIMI is an external territory of Australia and is administered by the Department of the Environment and Energy, through the AAD. While its territorial sea and exclusive economic zone are predominantly located outside of the jurisdiction of the Antarctic Treaty, it is covered by the *CAMLR Convention*.[18]

## Macquarie Island

2.16 Australia also exercises sovereignty over Macquarie Island in the sub-Antarctic Southern Ocean. While Macquarie Island and its surrounding Exclusive Economic Zone are not within the Antarctic Treaty area and are not covered by *the CAMLR Convention*, the AAD maintains a permanent research station there.[19] As a dependency of Tasmania, the island is managed by the Tasmanian Parks and Wildlife Service, but the research facilities are maintained by the Commonwealth.[20]

14 R Woolcott AC, 'Foreword', in M Haward and T Griffiths, eds, *Australia and the Antarctic Treaty System: 50 Years of Influence*, UNSW Press, Sydney, NSW, 2011, p. xiii.

15 DFAT, *Submission 17:1*, Answer to Question on Notice, pp. [4–5].

16 DFAT, *Submission 17:1*, Answer to Question on Notice, pp. [4–5].

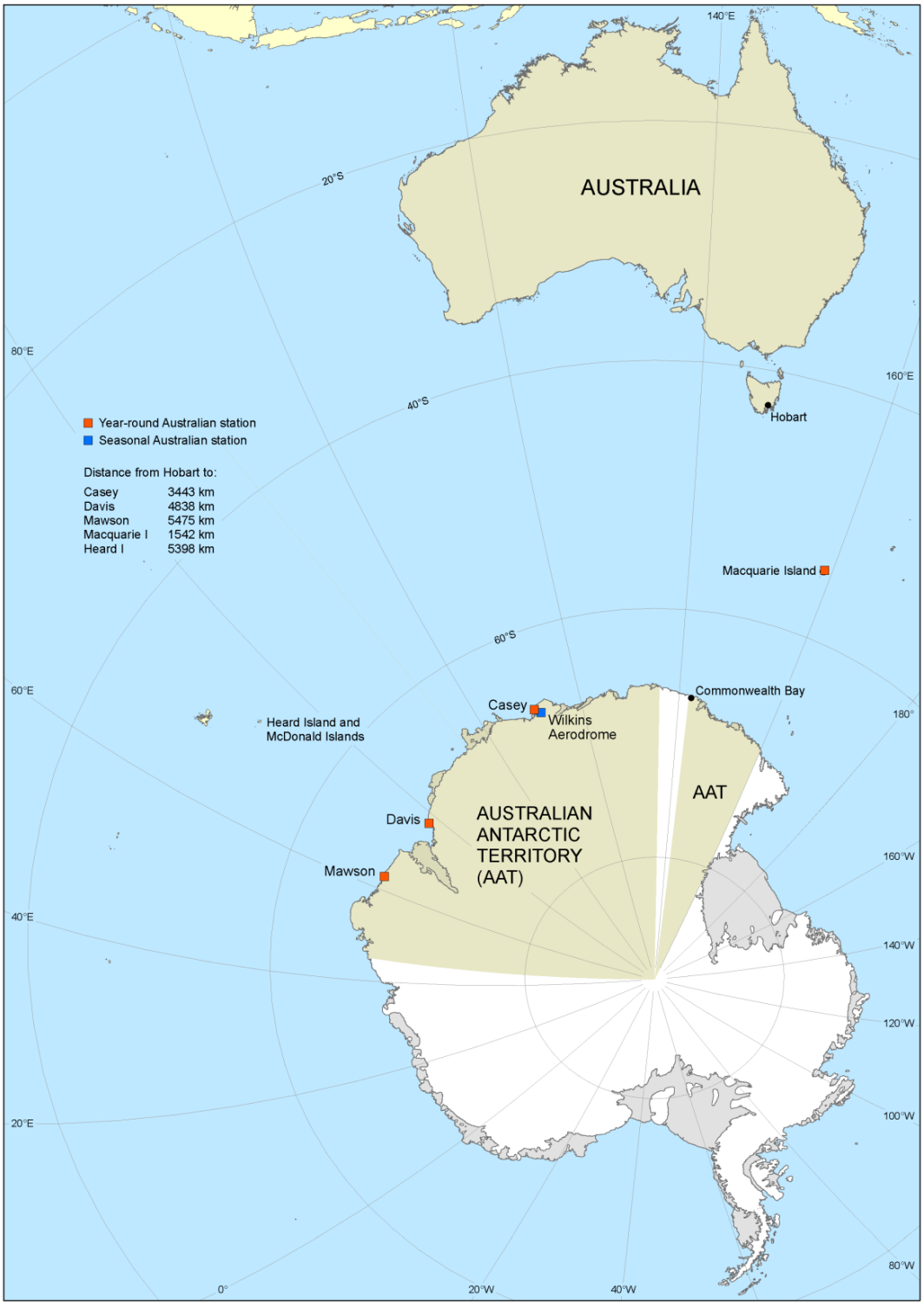
17 Mr James Larsen, Senior Legal Adviser, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 5; Embassy of the Russian Federation, *Submission 21.*

18 Australian Antarctic Division (AAD), Department of the Environment and Energy, 'Convention on the Conservation of Antarctic Marine Living Resources,' 8 April 2016, <http://www.antarctica.gov.au/law-and-treaty/ccamlr>, viewed 3 January 2018.

19 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014, p. 56.

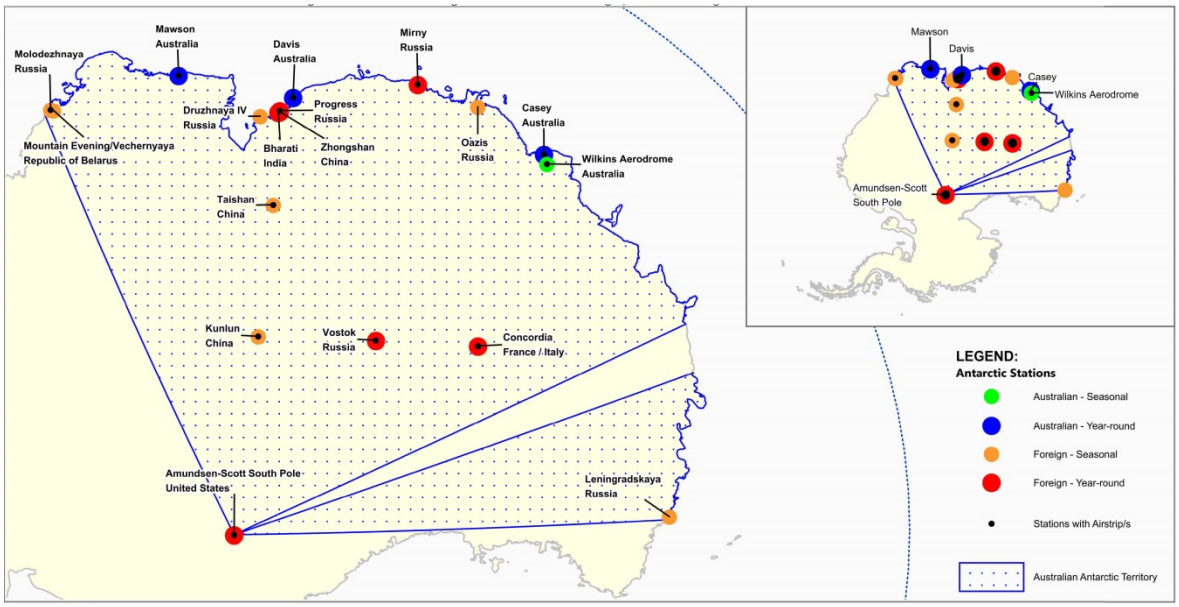
20 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014, p. 56.

Figure 2.1 Australian Antarctic Territory




*Source* *Department of the Environment and Energy, Submission 13, p. 4.*

Figure 2.2 Map of Australian and foreign bases in the Australian Antarctic Territory




*Source* *Council of Managers of National Antarctic Programs – Antarctic Station Catalogue: August 2017 (image credit: Australian Parliamentary Library, May 2018)*

## Australia's Antarctic Program

2.17 The AAP aims to maintain the integrity of the ATS and enhance Australia's influence within it. It also strives to protect the Antarctic environment, understand the role of Antarctica in the global climate system, and to undertake scientific work of practical, economic and national significance.[21] The program is led by the Commonwealth Department of the Environment and Energy through the AAD.

2.18 The majority of work under the AAP is conducted in the AAT. This work focuses on Antarctic science that is aligned with Australia's national interests and integrated with operation capabilities.[22]

### Australia's history in Antarctica

2.19 Australia has a long history of operating in Antarctica, with its first Antarctic expedition dating back to the early 1900s. Since the

21 AAD as quoted in J Jabour and M Haward, 'Resources', in M Haward and T Griffiths, eds, *Australia and the Antarctic Treaty System: 50 Years of Influence*, UNSW Press, Sydney, NSW, 2011, p. xiii.

22 Department of the Environment and Energy, *Submission 13*, p. 5.

establishment of Mawson station in 1954, Australia has maintained a permanent presence within the continent.[23] Over this time Australia has been a leader in the region and played a significant role in shaping Antarctic governance.[24]

2.20 Australia continues to have direct interests in Antarctica and the Southern Ocean due to its 'geographical proximity to the continent and the regional connections through climate and Southern Ocean ecosystems.'[25] Moreover, the non-militarisation of Antarctica and the way in which it is governed ensures a region of peace and security at Australia's southern borders.[26]

2.21 Due to the ATS emphasis on scientific research combined with the unique Antarctic climate, the continent provides unique opportunities for researchers to gain a greater understanding of critical issues including climate processes, terrestrial and nearshore ecosystems, Southern Ocean ecosystems, and frontier science.[27] This includes long-term observational and monitoring programs that support Australia's engagements and commitment to key international forums, including those under the ATS.[28]

## Australia's national interests

2.22 Australia's activities in Antarctica serve a broader strategic purpose in protecting sovereignty and national interests in the region. While Australia's scientific and logistical presence allows the country to contribute world-class research, it also plays an integral role in preserving Australia's claim to 42 per cent of the continent beyond the life of the Antarctic Treaty.

2.23 The Australian Government formally set out the national interests in the *Australian Antarctic Strategy and 20 Year Action Plan*. These interests determine the policy settings that frame Australia's engagement in Antarctica. At present, these interests are:

- maintaining Antarctica's freedom from strategic and/or political confrontation;

23 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 4.

24 Mr Larsen, Senior Legal Adviser, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1.

25 IMAS, University of Tasmania, *Submission 8*, p. [1].

26 Dr Anthony (Tony) Press, Private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 41.

27 Department of the Environment and Energy, *Submission 13*, p. 5.

28 Department of the Environment and Energy, *Submission 13*, p. 5.

- preserving our sovereignty over the AAT including our sovereign rights over adjacent offshore areas;
- supporting a strong and effective ATS;
- conducting world-class scientific research consistent with national priorities;
- protecting the Antarctic environment, having regard to its special qualities and effects on our region;
- be informed about and able to influence developments in a region geographically proximate to Australia; and
- fostering economic opportunities arising from Antarctica and the Southern Ocean, consistent with our ATS obligations, including the ban on mining and oil drilling.[29]

## The Australian Antarctic Division

2.24 The Department of the Environment and Energy, through the AAD, is responsible for leading and coordinating the AAP and administering the AAT, and, in the sub-Antarctic, the Territory of Heard Island and McDonald Islands.[30] This includes the management of over 3,300 Antarctic infrastructure assets with a value of over $880 million.[31] The AAD employs approximately 70 scientific staff and some 60 associated research, technical and administrative support staff.[32]

2.25 In collaboration with other agencies, the AAD provides advice to the Commonwealth on Australia's national and international policy positions and obligations, from environmental protection issues to policy and legal questions regarding the administration of the Antarctic territories.[33] Furthermore, the AAD plays a central role in facilitating Australia's participation in international forums.

2.26 Currently, the AAD is located in Kingston, near Hobart, Tasmania. The site houses laboratories for science, electronics and electron microscopy,

29 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 17.

30 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016.

31 Department of the Environment and Energy, *Submission 13*, p. 1.

32 AAD, Department of the Environment and Energy, 'Meet our scientists', <http://www.antarctica.gov.au/science/meet-our-scientists>, viewed 26 March 2018.

33 Department of the Environment and Energy, *Submission 13*; Department of Foreign Affairs and Trade, *Submission 17*.

mechanical and instrument workshops, a krill research aquarium, equipment stores, and other operational and support facilities.[34]

## Emphasis on collaboration

2.27 The AAP is highly collaborative, comprising partnerships with government, national and international research institutions, and other nations. Collaboration is in part necessitated by the remote location and extreme weather conditions associated with Antarctica.

2.28 In particular, science in Antarctica and the Southern Ocean is conducted by a wide range of organisations in Australia including universities and agencies such as the AAD, Geoscience Australia, the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), the Bureau of Meteorology, the Australian Nuclear Science and Technology Organisation (ANSTO), and some divisions of the Commonwealth Scientific and Industrial Research Organisation (CSIRO).[35]

2.29 The Department of Foreign Affairs and Trade leads Australia's Antarctic Treaty engagement and works closely with the AAD on Antarctic policy and strategy.[36] The Department of Defence provides substantial but niche operational and logistical support to the Antarctic program including heavy-lift aviation capabilities.[37] Furthermore, agencies such as the Department of Immigration and Border Protection and the Australian Maritime Safety Authority exercise maritime safety and security responsibilities in Antarctic and Southern Ocean waters including search and rescue coordination.[38]

34 AAD, Department of the Environment and Energy, 'About Us', 8 August 2017, <http://www.antarctica.gov.au/about-us>, viewed 8 January 2018.

35 Australian Academy of Science, *Submission 4*, p. 2.

36 DFAT, *Submission 17*, p. [1.]

37 Department of Defence, *Submission 14*, p. 2.

38 Department of Immigration and Border Protection, *Submission 15*, p. 1.; and Australian Maritime Safety Authority (AMSA), *Submission 19*, p. 2.

# Recent developments

2.30 Over the past four years the Australian Government has placed significant emphasis on renewing the AAP through increased investment in infrastructure and science in the region. The following section outlines some of the motivations behind this change.

## International investment in Antarctic infrastructure

2.31 The past decade has witnessed an increase in interest in Antarctica with a range of countries expanding their investment in infrastructure in the region. This highlights the growing recognition of the broader benefits that infrastructure assets and capability have for science and leadership in the region.[39] Recent investments include: France's new icebreaker, which will be delivered in 2017; the United Kingdom's major modernisation program, which includes a new £200 million icebreaker and planned upgrade of their Antarctic stations; New Zealand's redevelopment of Scott Base, with NZ$9 million allocated for initial scoping work; China's plans to build a fifth Antarctic research station at Inexpressible Island and a new skiway at its existing Zhongshan station in the AAT; and the United States' major Antarctic Infrastructure Modernisation for Science program, which includes development of new facilities and infrastructure at McMurdo Station.[40]

## Growing emphasis on strengthening the AAP

2.32 While other countries have invested significantly in infrastructure, some commentary has noted Australia's 'historical under-investment at a time when new players are emerging in Antarctica.'[41] In the 20 Year Antarctic Strategic Plan, which was commissioned by the Government, Dr Tony Press, former Director of the AAD and Adjunct Professor at ACE CRC, argued that due to this, '... Australia's standing in Antarctic affairs is eroding…' and the leadership that it '… has naturally assumed by its proximity, history and experience, risks decline.'[42]

39 The Department of the Environment and Energy, *Submission 13*, p. 14.

40 The Department of the Environment and Energy, *Submission 13*, p. 14.

41 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014, p. 2.

42 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014, p. 2.

2.33 In order to address this, the Dr Press report made 35 recommendations on a range of issues including: protecting Australia's national interests in Antarctica; supporting and leading national and international Antarctic science; increasing Tasmania's role as an Antarctic Gateway city; strengthening Australia's Antarctic station's operations, transport and deep field traverse capabilities; and the effective administration of the AAT.[43]

2.34 Simultaneously, the Senate Foreign Affairs, Defence and Trade References Committee's 2014 inquiry focusing on Australia's future activities and responsibilities in the Southern Ocean and Antarctic waters, made a number of recommendations regarding the allocation of funding for scientific research and securing national interests within the region.[44]

## The Australian Antarctic Strategy and 20 Year Action Plan

2.35 In 2016 the Australian Government responded to the Dr Press report and the Senate Foreign Affairs, Defence and Trade References Committee's 2014 inquiry by committing to revitalise the program with the release of the *Australian Antarctic Strategy and 20 Year Action Plan*. The Plan outlines Australia's national Antarctic interests and sets out major action the Government will undertake over the next two decades to safeguard these interests.

2.36 The Plan includes the acquisition of a new world-class icebreaker, renewal of inland traverse capabilities including ice core drilling, preliminary work to develop year-round aviation access, review Antarctic research station infrastructure, and strengthening Antarctic science funding and infrastructure.[45] The Plan was supported by an additional $2.2 billion in investment.[46]

2.37 The Department of the Environment and Energy said that key actions the Government has delivered to date include:

- $1.9 billion to deliver and run a new icebreaker, a world-class scientific and logistical capability, over its four-year build program and 30-year operational life;

43 A J Press, '20 Year Australian Antarctic Strategic Plan', July 2014.

44 Foreign Affairs, Defence and Trade References Committee, *Australia's Future Activities and Responsibilities in the Southern Ocean and Antarctic Waters*, 2014.

45 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016.

46 The Department of the Environment and Energy, *Submission 13*, p. 1.

- $200 million over 10 years in additional funding for the AAD's operations;
- $50 million for a new research station on Macquarie Island to replace current aging infrastructure with a more efficient and environmentally friendly station;
- $45 million to re-establish an overland science traverse capability to enable research in all parts of the AAT, including to locate and drill a million year ice core; and
- $10 million for scoping work and the development of a business case to inform options for establishing year-round aviation access between Hobart and Antarctica, including estimated infrastructure and associated costings of options through their whole lifecycle.[47]

## Government reports

2.38 The Government's renewed focus on the AAT was highlighted in the 2017 Foreign Policy White Paper, which emphasised the importance of Antarctica to Australia and reinforced Australia's commitment to the ATS, including its principles of environmental protection and non-militarisation, and its indefinite ban on mining and oil drilling.[48] The paper highlighted the additional $2.2 billion the Government is spending to protect Australia's Antarctic interests, and noted the importance of supporting Tasmania's status as the premier gateway for science and operations in East Antarctica.[49]

2.39 The most recent Defence White Paper also emphasised the importance of a continued commitment to the ATS. The paper also made the assessment that the AAT '… faces no credible risk of being challenged in such a way that requires a substantial military response for at least the next few decades.'[50]

## Funding

2.40 The 2016–17 Budget included commitments to provide funding in support of the *Australian Antarctic Strategy and 20 Year Action Plan.* This included:

- providing $55 million over 10 years from 2016–17 to undertake scoping studies and commence delivery of enhanced infrastructure capabilities

47 The Department of the Environment and Energy, *Submission 13*, p. 2.

48 DFAT, *2017 Foreign Policy White Paper*, p. 85.

49 DFAT, *2017 Foreign Policy White Paper*, p. 85.

50 Department of Defence, *2016 Defence White Paper,* p. 54.

in the AAT. This includes support for an over-ice traverse science capability and preliminary work to develop year-round aviation access to Antarctica; and

- providing $83.1 million over four years from 2016–17 and further funding of $413.1 million over 29 years from 2020–21 with $10.3 million per annum ongoing funding from 2049–50, to contribute to maintaining a sustainable level of operations to protect Australia's environmental, economic, scientific, security and strategic interests in Antarctica.[51]

2.41 The 2017–18 Budget confirmed the commitment of $49.8 million over 11 years from 2016–17 to the building of a new research station on Macquarie Island.[52] This is in addition to the money set aside for the *Australian Antarctic Strategy and 20 Year Action Plan*.

2.42 Whilst significant funds have been allocated to strengthening Antarctic infrastructure, at the same time, CSIRO and other agencies and programs have been subject to reduced budget appropriations that have impacted Australia's Antarctic science program.

2.43 For example, the Committee heard that in 2016 the CSIRO underwent significant restructuring to revise the organisation's key areas of focus from climate science to decadal forecasting.[53] This included a number of staff reductions.[54]

2.44 A significant portion of the evidence to the Committee highlighted concerns around funding to multiple scientific programs. This is discussed in further detail in chapter 4.

## Committee comment

2.45 Australia has a long and proud history of involvement in Antarctica and has significantly contributed to shaping the region, both through the ATS and on the ground. The Committee agrees with the assessment that the dominance of the AAP has enabled Australia to contribute to world-class research, and to protect its sovereignty and national interests in the region. Maintaining Australia's dominance in Antarctica is critical, particularly at

51 Commonwealth of Australia, *Budget Measures Budget Paper No. 2 2016-17*, pp. 87–88.

52 The Department of the Environment and Energy, *Portfolio Budget Statements 2017-18*, p. 20.

53 Dr Anthony Worby, Director, Oceans and Atmosphere, Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Committee Hansard*, Hobart, 10 November 2017, p. 31.

54 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 31.

a time in which international activity on the continent is increasing. To that end, the Committee welcomes recent commitments to increase investment in the AAP to ensure that Australia continues to maintain a leading role on the continent. The following chapters provide recommendations to ensure that this commitment is implemented successfully to enable Australia to continue its leadership in Antarctica.

# 3

# Antarctic leadership and governance

3.1 As discussed in chapter 2, the Antarctic Treaty System (ATS) is the overarching framework for international governance of both the land and waters south of 60° South latitude.[1] The ATS includes the Antarctic Treaty, the *Protocol on Environmental Protection to the Antarctic Treaty* (*the Madrid Protocol*), the *Convention on the Conservation of Antarctic Marine Living Resources* (CAMLR Convention) and a range of other instruments. This ensures that international engagement in Antarctica is underpinned by the principles of non-militarisation, environmental protection, and freedom of scientific engagement.[2]

3.2 This chapter reviews Australia's contribution to Antarctic governance and role in ensuring that the principles of the ATS are maintained into the future. This includes assessing Australia's role as a policy leader in a range of areas including site inspections and environmental protection.

3.3 The chapter also considers more broadly Australia's collaboration with international partners in Antarctica. This includes Australia's search and rescue efforts.

3.4 Many inquiry participants stressed that the ATS provides a strong foundation for international engagement in Antarctica. Witnesses argued that the ATS remains relevant in addressing a broad number of issues including sovereign claims, environmental protection, demilitarisation,

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1 Department of Foreign Affairs and Trade (DFAT), *Submission 17*, pp. [1–2].

2 DFAT, Submission 17, p. [1].

and freedom of scientific investigation.[3] In particular, participants noted that the ATS provides Australia with security to its southern borders.[4] Appearing in a private capacity, the former Director of the Australian Antarctic Division (AAD), Dr Tony Press, stated that the Antarctic Treaty:

> … is a peace treaty. It is a nuclear disarmament treaty and it's a demilitarisation treaty. In that sense, it means that Australia doesn't have to be armed to fight battles to our south, so it provides an area of important national security interest for us, in the fact that it is demilitarised and we don't have to fight wars there. This is really important for our standing in the world.[5]

3.5 Similarly, the Department of Defence reiterated the assessment made in Australia's most recent Defence White Paper, that the Australian Antarctic Territory (AAT) '… faces no credible risk of being challenged in such a way that requires a substantial military response for the at least the next few decades.'[6] However, Defence did note that '… international interest in Antarctica is increasing …'[7] and that Australia is committed to collaborating with other Antarctic nations to prevent future strategic competition and to uphold the principles of the ATS.[8]

## Changing dynamics in Antarctica

3.6 Whilst evidence to the Committee suggested that military conflict was unlikely in the near future, some inquiry participants noted that international activity and interest in the region was increasing and that this could affect the dynamic in Antarctica.[9] The Department of the Environment and Energy highlighted increased investment in Antarctic infrastructure by a number of countries, including France, the United Kingdom, New Zealand, and China.[10] Some inquiry participants

3 For example: Mr James Larsen, Senior Legal Adviser, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1; Dr Anthony (Tony) Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 41.

4 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November, 2017, p. 41.

5 Dr Press, private capacity, *Committee Hansard,* Hobart, 10 November 2017, p. 41.

6 Department of Defence, *Submission 14,* p. 1.

7 Dr Peter Sawczak, Assistant Secretary, Strategic Policy, Department of Defence, *Committee Hansard*, Canberra, 19 October 2017, p. 1.

8 Department of Defence, *Submission 14*, p. 1.

9 Professor Anne-Marie Brady, private capacity, *Committee Hansard,* Canberra, 15 February 2018, p. 1.

10 Department of the Environment and Energy, *Submission 13*, pp. 14–5.

suggested that this increased activity could lead to future conflict between those nations that promote environmental protection and those that may be interested in extracting the regions natural resources.[11] Matters relating to natural resources are discussed in further detail later in this chapter.

3.7 Some evidence to the inquiry also noted concern that some equipment and technology used in Antarctica, such as satellite communication, have multiple applications.[12] In particular, appearing in a private capacity Professor Anne-Marie Brady, a specialist in Chinese and polar politics at the University of Canterbury in New Zealand, expressed concern that a number of nations have conducted activities in the region that have not always been in line with the principles of the ATS.[13] However, Dr Peter Sawczak, appearing on behalf of the Department of Defence, noted that dual use technologies such as satellite communication, geospatial devices and remotely sensed data are essential for operating in Antarctica.[14] Furthermore, he emphasised that compliance is monitored through the ATS inspection regime and that no breaches have been brought to the attention of the Department of Defence.[15] The inspection regime is discussed in further detail in this chapter.

## Australian leadership in the Antarctic Treaty System

3.8 As activity in the region increases, Australia's position as a policy leader in Antarctic affairs remains critical to ensure that the principles of the ATS are maintained into the future.[16] The Department of Foreign Affairs and Trade (DFAT) noted that Australian leadership can be demonstrated through '… high-level expert engagement in key treaty system forums, pursuing strong relationships with other Antarctic nations …' and promoting and engaging in regular use of the Antarctic Treaty's inspections regime.[17] Moreover, Dr Press noted that Australia must continue to reach out to like-minded nations in order to ensure that Australia remains '… vigilant about [any] changes in norms and modes of

11 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 1.

12 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 2.

13 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 2.

14 Dr Peter Sawczak, Assistant Secretary, Strategic Policy, Department of Defence, *Committee Hansard*, Canberra, 15 February 2018, p. 7.

15 Dr Sawczak, Department of Defence, *Committee Hansard*, Canberra, 15 February 2018, p. 7.

16 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 2.

17 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 2.

operation' in Antarctica.[18] Further to this, he stressed that Australia needs to maintain 'the courage and capacity' to challenge parties that are believed to be doing something that is 'contrary to the spirit' of the Antarctic Treaty.[19]

3.9 The following section considers how Australia maintains its ability to demonstrate policy leadership in Antarctica. This includes reviewing Australia's contribution to Antarctic governance, and considering how it collaborates with its international partners to ensure that the principles of the ATS are maintained.

## Science and logistics

3.10 As discussed throughout this report, Australia's continued presence on the ground through science and infrastructure is crucial in maintaining Australia's ability to demonstrate policy leadership. Moreover, the remote location of the continent makes arrangements that '… leverage and share resources, including ships, aircraft, personnel and scientific equipment' crucial.[20] Evidence to the Committee noted that Australia is supportive of international collaboration as promoted by the ATS and that Australia often engages in science and logistical projects with both traditional and non-traditional partners.[21] This is discussed in further detail in chapters 4 and 5.

### Collaboration

3.11 Collaboration is an integral aspect of the ATS. The Committee witnessed Australia's engagement with other Antarctic nations firsthand while visiting Antarctica. Nationals of other countries used the Australian aircraft to access the continent, while Australian researchers utilised the aviation assets of other nations for intracontinental travel.

3.12 A number of these relationships have been formalised through memorandums of understanding and other bilateral agreements on Antarctic cooperation. These countries include China, France, Italy, Japan, the Republic of Korea, New Zealand, Russia, the United Kingdom and the United States of America.[22] Moreover, government agencies such as the

18 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November, 2017, p. 43.

19 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November, 2017, p. 43.

20 Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), *Submission 11*, p. [3].

21 Institute for Marine and Antarctic Studies (IMAS) University of Tasmania, *Submission 8*, p. [2].

22 DFAT, *Submission 17.3,* p. [1].

Bureau of Meteorology and Geoscience Australia have formal arrangements that relate to Antarctica with other nations.[23]

3.13 Cooperation in Antarctica allows Australia to enhance its diplomatic engagement with a wide range of nations. In its submission to the inquiry, the Embassy of the Russian Federation noted that collaboration between Australia and Russia had been a 'positive experience' and the Embassy welcomed future cooperation '… on the basis of pragmatic and mutually beneficial approaches.'[24]

3.14 Some evidence to the Committee suggested that additional opportunities currently exist for Australia to collaborate with other countries. In particular, the Embassy of Uruguay noted opportunities to learn from nations operating in West Antarctica, where conditions differ significantly from the East.[25]

## Comprehensive Test Ban Treaty

3.15 The Australian Radiation Protection and Nuclear Agency highlighted that Australia's presence in Antarctica also provides the opportunity to support international nuclear non-proliferation efforts through the Comprehensive Test Ban Treaty (CTBT) Preparatory Commission.[26] Whilst the CTBT, which aims to ban all nuclear explosion tests, has not yet entered into force, its Preparatory Commission is mandated to coordinate the interim operation of the International Monitoring System (IMS) which is able to identify the time, location and nature of potential nuclear events.[27]

3.16 As a signatory to the CTBT, Australia is required to carry out a verification regime for the IMS.[28] This includes the operation of radionuclide stations, a number of which are located in territory overseen by the AAD.[29]

3.17 DFAT emphasised the importance of the IMS in providing:

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23 Dr Sue Barrell, Group Executive Science and Innovation, Bureau of Meteorology, *Committee Hansard,* Canberra, 19 October 2017, p. 21; and Dr James Johnson, Chief Executive Officer, Geoscience Australia, *Committee Hansard,* Canberra, 19 October 2017, p. 18.

24 Embassy of the Russian Federation, *Submission 21,* p. 7.

25 Embassy of Uruguay, *Submission 18,* p. 2.

26 Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), *Submission 12*, p. 1; DFAT, *Submission 17*, p. 4.

27 ARPANSA 'Comprehensive Nuclear-Test-Ban Treaty, <https://www.arpansa.gov.au/about-us/what-we-do/international-collaboration/ctbt>, viewed 21 March 2010.

28 ARPANSA, *Submission 12*, p. 1.

29 ARPANSA, *Submission 12*, p. 1.

> … significant assurance that, with the sole exception of the Democratic People's Republic of Korea, states are observing a moratorium on nuclear testing.[30]

3.18 The Department also noted that the IMS provides additional civil and scientific benefits, including accurate and timely data on earthquakes, tsunamis and nuclear accidents.[31] Evidence to the Committee suggested that continued funding of Australia's Antarctic infrastructure is fundamental to Australia's ongoing ability to contribute to the IMS.[32]

## Search and rescue

3.19 The Committee heard that there are substantial challenges in coordinating and responding to search and rescue incidents in Antarctica, which include:

- a challenging environment with freezing temperatures, permanent and shifting ice, extreme wind and sea conditions, which impact survival time and can seriously delay rescue operations;
- long distances from search vessels or aircraft, which extends the time it takes to respond to an incident and reduces the number of resources available for the incident; and
- the remoteness of Antarctica limits the assets of opportunity that can be used in a search and rescue incident.[33]

3.20 These factors limit the search and rescue capabilities in the region, and highlight the importance of proper planning and incident prevention. Often, they require international collaboration and logistical support to respond to an incident in a timely and appropriate manner.[34] Subsequently protocols have been developed to address how countries communicate and coordinate in response to incidents that require international collaboration.[35] Moreover, to prepare for incidents, Australia also maintains a number of formal bilateral arrangements for search and rescue cooperation with countries such as South Africa and New Zealand.[36]

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30 DFAT, *Submission 17*, pp. [4–5].
31 DFAT, *Submission 17*, p. [5].
32 DFAT, *Submission 17*, pp. [5].
33 Australian Maritime Safety Authority (AMSA), *Submission 19*, p. 4.
34 AMSA, *Submission 19*, p. 4.
35 AMSA, *Submission 19.1*, p. 4.
36 AMSA, *Submission 19*, p. 4.

3.21 The Australian Maritime Safety Authority (AMSA) oversees a national search and rescue service that is conducted in a manner that is consistent with these international obligations.[37] Moreover, AMSA noted that Australia maintains a number of arrangements with international partners that enhance data sharing, capacity building activities, and patrols that contribute to search and rescue efforts.[38]

3.22 When queried on the financial impact of Australia's international search and rescue arrangements Mr Jamie Storrie, Manager Crisis Preparedness and Response at AMSA, noted that:

> Our obligation is to assist. We don't seek compensation. But, in a similar manner, for Australian citizens and ships in similar situations in other jurisdictions compensation would generally not be sought by those jurisdictions either. So it is a complimentary arrangement.[39]

3.23 Similarly, the Department of the Environment and Energy emphasised that Australia has both contributed to and benefited from search and rescue arrangements.[40] For example, in 2016 the Japanese icebreaker, *Shirase*, provided support in transferring expeditioners from the *Aurora Australis* to Casey research station after the *Australis* ran aground at Mawson research station during a blizzard.[41] Similarly, the *Aurora Australis* rescued 52 passengers from the Russian ship *MV Akademik Shokalskiy* after it became trapped in sea ice in 2014.[42]

3.24 In order to limit the impact that search and rescue operations have on the AAP, the Australian government has made efforts to reduce the likelihood of incidents occurring.[43] Mr Simon Moore, Manager International Engagement at AMSA, noted that this has included contributing, through the International Maritime Authority, to work:

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37 AMSA, *Submission 19*, p. 3.

38 AMSA, *Submission 19.1*, p. 4.

39 Mr Jamie Storrie, Manager, Crisis Preparedness and Response, AMSA, *Committee Hansard*, Canberra, 19 October 2017, p. 2.

40 Department of the Environment and Energy, *Submission 13*, p. 14.

41 Department of the Environment and Energy, *Submission 13*, p. 14.

42 Department of the Environment and Energy, *Submission 13*, p. 14; Embassy of the Russian Federation, *Submission 21,* p.6.

43 Mr Simon Moore, Manager, International Engagement, AMSA, *Committee Hansard*, Canberra, 19 October 2017, p. 3.

> … on international standards that regulate the quality of vessels that are travelling the high seas that don't call in to Australian ports.[44]

3.25 Evidence to the Committee was supportive of the current search and rescue systems and coordination arrangements in Antarctica. AMSA suggested that these arrangements have proven effective for managing incidents in the region, and that while Australia continues to look for opportunities to improve these arrangements, 'the system is fundamentally sound.'[45] However, AMSA did note that projected increases in activity in the region highlight the importance of continuing to strengthen '… collaboration, exchange of information and cooperation between both national and international organisations …'[46]

3.26 Collaboration on search and rescue arrangements has been demonstrated by Australia's recent work with the Council of Managers of National Antarctic Programs (COMNAP), in which further development of COMNAP web-based tools were discussed. AMSA noted that these tools provide Antarctic nations with an:

> … overall view of asset location, communication and equipment on a near time basis and is fundamental to ensuring a more effective search and rescue response.[47]

## Site inspections

3.27 In order to verify compliance with the various ATS principles, such as the prohibition on military activity and the ban on mining, Article VII of the Treaty provides Contracting Parties with the ability to conduct inspections in all areas of Antarctica.[48] As outlined by DFAT, this includes '… all stations, installations and equipment, aircraft, cargo and personnel …' in Antarctica.[49] Initially inspections focused on ensuring that activities in the region remained peaceful. However, with the advent of the *Madrid Protocol,* inspections have become increasingly focused on ensuring that the environmental protocol is being observed.[50]

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44 Mr Simon Moore, AMSA, *Committee Hansard*, Canberra, 19 October 2017, p. 3.

45 AMSA, *Submission 19*, p. 5.

46 AMSA, *Submission 19*, p. 5.

47 AMSA, *Submission 19*, p. 4.

48 DFAT, *Submission 17.1*, p. [3].

49 DFAT, *Submission 17.1*, p. [3].

50 Ms Gillian Slocum, Manager, Territories, Environment and Treaties, Australian Antarctic Division (AAD), Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, p. 20.

3.28 While inspections can be conducted throughout Antarctica, the Director of the AAD, Dr Nicholas Gales, noted that the majority of inspections occur on the Antarctic Peninsula, where stations are located close to each other. Conversely, inspections are less frequent in East Antarctica, where significantly more logistical support is required to reach each station.[51] Despite these challenges, Australia is an active participant in the inspections regime, and has conducted nine inspections since 1963.[52] Moreover, evidence to the Committee highlighted that Australia's ability to conduct inspections has significantly increased over the past decade with the advent of Australia's inter- and intracontinental aviation system in Antarctica.[53]

3.29 Australia's contribution to the inspection regime is administered by DFAT and the AAD.[54] Most recently, Australia inspected the American Amundsen-Scott South Pole Station in 2016 in the first South Pole inspection any country has conducted without logistics support from the United States.[55] DFAT noted that 'the ability to conduct inspections independently is critical to [Australia's] interest in promoting compliance with key Treaty system obligations.'[56]

3.30 Dr Gales highlighted more informal arrangements as part of the *Larsemann and Vestfold Hills Management Group* in which Australia, China, India and Russia work closely together in the Vestfold Hills.[57] These arrangements include regular station visits and exchange of station personnel.[58]

3.31 When asked if Australia could have greater involvement in conducting inspections, Dr Gales suggested that Australia is 'doing as many inspections as [it] can within [its] operational capacity at the moment.'[59] However, Dr Gales also noted that it would be desirable for Australia to

51 Dr Nicholas Gales, Director, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 54.

52 DFAT, *Submission 17.1*, p. [3].

53 Ms Slocum, AAD, Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, p. 20.

54 Dr Sawczak, Department of Defence, *Committee Hansard*, Canberra, 19 October 2017, p. 2.

55 DFAT, *Submission 17.1*, p. [3].

56 DFAT, *Submission 17*, p. [6].

57 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, p. 20.

58 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 20.

59 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 21.

have the 'capability to undertake treaty inspections a little more regularly' than it currently does within East Antarctica.[60]

### Antarctic Ambassador

3.32 Evidence to the Committee noted that some nations have special counsels for Antarctic relations or Antarctic Ambassadors.[61] Such roles lead engagement in the Antarctic Treaty meetings and diplomatic engagement with their counterparts.[62] Professor Brady recommended that Australia appoint an Antarctic Ambassador to oversee diplomatic activities and to protect Australia's national interests in the region.[63] It was suggested to the Committee that this would provide Australia with 'a bit more muscle' in Antarctic affairs.[64]

3.33 Mr Justin Whyatt, a legal adviser from DFAT, suggested that current arrangements for leading Australia's engagement in Antarctic matters were sufficient and that appointing an Antarctic Ambassador would not be of benefit.[65] Mr Whyatt stressed that Australia is currently '… represented at very senior levels comparatively in the [ATS].'[66]

## Environmental engagement

3.34 One of the fundamental principles of the ATS is the protection of Antarctica's unique and pristine environment.[67] The *Madrid Protocol* designates Antarctica as a natural reserve and provides wide-ranging protection of the environment and its related ecosystems.[68]

3.35 Some of the inquiry participants drew the Committee's attention to Australia's ongoing commitment to protecting the Antarctic environment.[69] For example, the Institute for Marine and Antarctic Studies

60 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 21.

61 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 4.

62 Mr Justin Whyatt, Legal Adviser, Sanctions, Treaties and Transnational Crime Legal Branch, DFAT, *Committee Hansard*, Canberra, 15 February 2018, pp. 9–10.

63 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 4.

64 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 4.

65 Mr Whyatt, DFAT, *Committee Hansard*, Canberra, 15 February 2018, pp. 9–10.

66 Mr Whyatt, DFAT, *Committee Hansard*, Canberra, 15 February 2018, pp. 9–10.

67 *The Antarctic Treaty*, opened for signature 1 December 1959, 402 UNTS 71, (entered into force 23 June 1961).

68 *The Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol)*, opened for signature 4 October, 1991, (entered into force 14 January, 1998).

69 Department of the Environment and Energy, *Submission 13*, p. 16; IMAS University of Tasmania, *Submission 8*.

(IMAS) at the University of Tasmania emphasised Australia's longstanding commitment to these principles, highlighting the nation's role in establishing a range of mechanisms under the ATS to protect the environment.[70] For example, Australia played a major role in negotiating both CCAMLR and the *Madrid Protocol*.[71] IMAS also noted that Australia has been active in the Committee on Environment Protection, including twice serving as its chair.[72]

3.36 The Department of the Environment and Energy stressed that Australia aims to be a leader and to 'promote best practice in environmental stewardship in Antarctica across all aspects of its Antarctic Program.'[73] Mr James Larsen, Senior Legal Adviser at DFAT, mirrored these sentiments when he highlighted Australia's role in encouraging and supporting the efforts of non-members to accede to the *Madrid Protocol*.[74] In particular, Mr Larsen noted that Australia is working with Malaysia as it develops legislation to make protocol obligations part of its domestic law.[75]

3.37 The Australian Academy of Science noted the important role that Australia's infrastructure assets and capability play in enabling:

> Australia to take an exemplary and leading role in developing and implementing the strong environmental protections that are required to meet international obligations under the [ATS].[76]

3.38 Australia's infrastructure assets and capability are discussed in further detail in chapter 4.

3.39 The following section explores the leadership role Australia has taken in regards to the protection of the Antarctic environment.

## Preservation of the Antarctic marine system

3.40 The Antarctic marine system is unique both ecologically and biologically from other marine systems, and its preservation is threatened by a range of sources.

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70 IMAS University of Tasmania, *Submission 8*, p. [1].
71 IMAS University of Tasmania, *Submission 8*, p. [1].
72 IMAS University of Tasmania, *Submission 8*, p. [1].
73 Department of the Environment and Energy, *Submission 13*, p. 16.
74 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1.
75 Mr Larsen, DFAT, *Committee Hansard,* Canberra, 14 September 2017, pp. 1–2.
76 Australian Academy of Science, *Submission 4*, p. 1.

## Marine pollution

3.41 The Antarctic Treaty covers over 20 million square kilometres of the Southern Ocean, extending from the Antarctic coast to 60 degrees South latitude.[77] Over time the international community has taken steps to minimise the occurrence of sea pollution from vessels operating within this area, and in 1990 the International Maritime Organisation designated these waters as a 'Special Area' which introduced mandatory requirements to prevent sea pollution.[78] Moreover, Annex IV to the *Madrid Protocol* prohibits the discharge of oil, noxious liquid substances, sewage and garbage in the ATS region.[79]

3.42 Evidence to the Committee focused particularly on Australia's management of maritime environmental emergencies, and vessel safety to minimise the environmental impacts of shipping in Antarctic waters.

3.43 Australian Government agencies take a collaborative approach to the management of maritime environmental emergencies within Antarctic waters as outlined in the *National Plan for Maritime Environmental Emergencies*.[80] Moreover, in conjunction with the AAD, AMSA has recently developed the *Australian Antarctic Marine Pollution Contingency Plan* which outlines the responsibilities of the Australian Government and other agencies in the event of a marine pollution incident in the Australian Antarctic Territory, the subantarctic, and Southern Ocean.[81]

3.44 AMSA noted that, as a party to the *International Convention of the Prevention of Pollution from Ships* (MARPOL), Australia has multiple measures in place to prevent the discharge of pollution from ships into the sea.[82] In particular, AMSA highlighted Australia's role in influencing international best practice by contributing to the development of the International Maritime Organisations mandatory *Polar Code*.[83] The *Polar Code* aims to increase the safety of vessel operations and to minimise the environmental impacts of shipping, in both Arctic and Antarctic waters.[84] This included

77 Secretariat of the Antarctic Treaty, 'Prevention of Marine Pollution', <http://www.ats.aq/e/ep_marine.htm>, viewed 15 February 2018.

78 Secretariat of the Antarctic Treaty, 'Prevention of Marine Pollution', <http://www.ats.aq/e/ep_marine.htm>, viewed 15 February 2018.

79 Secretariat of the Antarctic Treaty, 'Prevention of Marine Pollution', <http://www.ats.aq/e/ep_marine.htm>, viewed 15 February 2018.

80 AMSA, *Submission 19*, p. 2.

81 AMSA, *Submission 19*, p. 2.

82 AMSA, *Submission 19*, p. 3.

83 AMSA, *Submission 19*, p. 2.

84 AMSA, *Submission 19*, p. 1.

the introduction of mandatory safety requirements relating to things such as vessel structure, machinery installations, operational safety, communications, and voyage planning, manning, and training.[85]

### Illegal fishing

3.45 In a previous report of this Committee, illegal fishing was identified as a major concern as it had resulted in the depletion of fish stocks, led to high levels of seabird and bycatch mortality, and negatively impacted the environment through the disposal of rubbish and fishing equipment at sea.[86] To address this, the *Australian Antarctic Strategy and 20 Year Action Plan* committed to establish 'a clear approach in conjunction with key international partners to prevent, deter and eliminate illegal fishing.'[87]

3.46 The Department of Defence noted that, through the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), Australia continues to play a role in the regulation of fishing activity in Antarctic waters.[88] The Department emphasised its ongoing role in supporting Australia's maritime resource protection operations, particularly in the fisheries of Australia's Heard and McDonald Islands Exclusive Economic Zone.[89]

3.47 Illegal fishing was not raised as a significant issue in the current inquiry. This could indicate improvements in this area since the previous report of this Committee. Commodore Jaimie Hatcher AM, of the Department of Defence, suggested that issues surrounding illegal fishing, particularly in relation to the Patagonian toothfish, is a more 'subdued issue at the moment' than previously.[90]

### The Commission for the Conservation of Antarctic Marine Living Resources

3.48 The *CAMLR Convention*, which came into force in 1982, ensures the conservation and reasonable use of krill, fin fish and other marine living

85 AMSA, *Submission 19*, p. 1.

86 Joint Standing Committee on the National Capital and External Territories, *Antarctica: Australia's Pristine Frontier: Report on the adequacy of funding for Australia's Antarctic Program*, June 2005, p.54.

87 Department of the Environment and Energy, 2016, *Australian Antarctic Strategy and 20 Year Action Plan*, p. 24.

88 Department of Defence, *Submission 14*, p. 4.

89 Department of Defence, *Submission 14,* p. 4.

90 Commodore Jaimie Hatcher, AM, RAN, Acting Head, Military Strategic Commitments, Department of Defence, *Committee Hansard,* Canberra, 19 October 2017, p. 3.

resources in the convention area.[91] Under the *CAMLR Convention* the CCAMLR was established to oversee the management of these resources.[92] CCAMLR's Secretariat is located in Hobart, Tasmania. The Secretariat supports the regular meetings and daily functions of the Commission and the Scientific Committee.[93]

3.49 IMAS stressed the substantial role Australia has played in the governance and leadership of the *CAMLR Convention*, noting that Australia was heavily involved in negotiating the Convention, is the depository state for the treaty, and hosts the secretariat and annual meeting of the Commission in Hobart.[94]

3.50 Mr Larsen noted that DFAT is responsible for paying Australia's assessed annual contributions which support CCAMLR. In 2017 these contributions amounted to approximately A$139,000 to the CCAMLR Secretariat.[95] Moreover, DAT also covers the cost of the Hobart CCAMLR headquarters lease in a 55-45 split between the Commonwealth and the Tasmanian state Government.[96] DFAT's contribution to that is currently approximately $150,000 a year.[97]

### Marine protected areas

3.51 In order to mitigate some of the threats to Antarctica's marine systems CCAMLR uses marine protected areas (MPA) as one part of its approach to marine spatial protection.[98] In general, an MPA is an area that has been designated to provide protection to all or parts of the natural resources contained within it.[99] Protection is provided through the limitation or

91 Secretariat of the Antarctic Treaty, 'Antarctic Treaty: Related Agreements', <http://ats.aq/e/ats_related.htm>, viewed 15 February 2018.

92 AAD, Department of the Environment and Energy, 'Convention on the Conservation of Antarctic Marine Living Resources', <http://www.antarctica.gov.au/law-and-treaty/ccamlr>, viewed 15 February 2018.

93 Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), 'Secretariat', <https://www.ccamlr.org/en/organisation/secretariat>, viewed 26 February 2018.

94 IMAS University of Tasmania, *Submission 8*, p. [1].

95 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1.

96 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1.

97 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 1.

98 CCAMLR, 'Marine Protected Areas (MPAs)', <https://www.ccamlr.org/en/science/marine-protected-areas-mpas>, viewed 26 February 2018.

99 CCAMLR, 'Marine Protected Areas (MPAs)', <https://www.ccamlr.org/en/science/marine-protected-areas-mpas>, viewed 26 February 2018.

prohibition, of particular activities.[100] This can include the prohibition of activities such as fishing, research and other human activities.[101] There are currently two MPAs established under CCAMLR: one in the South Orkney Islands southern shelf (established in 2009), and the other in the Ross Sea region (established in 2016).[102]

3.52 Since 2012, Australia has collaborated with France and the European Union to advocate for an MPA to be established in East Antarctica through CCAMLR.[103] The proposed MPA would:

> … conserve examples of biodiversity in the high latitudes of the Indian sector of the Southern Ocean … [and] provide for comprehensive management, research and monitoring plans for managing multiple uses, including fishing, within the MPAs.[104]

3.53 To date, unanimous support from the members of CCAMLR has not been reached, however, Dr Gales, noted that 'Australia is committed to continuing [its] approach to support the acceptance of marine protected areas …'[105]

## Madrid Protocol

3.54 Whilst there are deposits of minerals such as coal and iron ore in Antarctica, currently Article 7 of the *Madrid Protocol* prohibits 'any activity relating to mineral resources, other than scientific research.'[106]

3.55 A number of inquiry participants highlighted Australia's ongoing commitment to the *Madrid Protocol*, with many emphasising that Australia played a leading role in its negotiation.[107] This mirrors the *Australian*

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100 CCAMLR, 'Marine Protected Areas (MPAs)', <https://www.ccamlr.org/en/science/marine-protected-areas-mpas>, viewed 26 February 2018.

101 CCAMLR, 'Marine Protected Areas (MPAs)', <https://www.ccamlr.org/en/science/marine-protected-areas-mpas>, viewed 26 February 2018.

102 AAD, Department of the Environment and Energy, 'A proposal for a Marine Protected Area in the East Antarctic planning domain', 13 October 2017, <http://www.antarctica.gov.au/law-and-treaty/ccamlr/marine-protected-areas>, viewed 27 February 2018.

103 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 51.

104 AAD, Department of the Environment and Energy, 'A proposal for a Marine Protected Area in the East Antarctic planning domain', 13 October 2017, <http://www.antarctica.gov.au/law-and-treaty/ccamlr/marine-protected-areas>, viewed 27 February 2018.

105 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 52.

106 *Article 7 of the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol)*, opened for signature 4 October, 1991, (entered into force 14 January, 1998).

107 IMAS University of Tasmania, *Submission* 8, p. [1]; DFAT, *Submission 17.1*, p. [6].

*Antarctic Strategy and 20 Year Action Plan* which notes that 'Australia will be a leader and promote best practice in environmental stewardship in Antarctica across all aspects of its Antarctic programme,' including 'maintain[ing] the Environmental Protocol's ban on mining and oil drilling.'[108]

3.56 Some inquiry participants suggested that aspects of the Protocol are misunderstood.[109] DFAT noted that '… media and academic commentary on the Protocol will sometimes suggest that the ban expires in 2048'.[110] This concern stems from Article 25 of the Protocol which provides for amendments to the *Madrid Protocol* including parties to the Treaty being able to call for a conference to review the Protocol 50 years after it has been in force.[111]

3.57 DFAT emphasised that, rather than signalling an expiration date, Article 25 acts as a 'review mechanism common to many treaties'.[112] Mr Whyatt noted that a review is not automatic after 2048; rather any party has the opportunity to call for a review conference after this time.[113] Once a conference is called, three quarters of state parties would need to agree to any proposed amendments.[114] Moreover, there is an additional threshold that requires all parties that were consultative parties at the time of the adoption of the *Madrid Protocol* to agree to the proposed amendments.[115]

3.58 Moreover, DFAT highlighted that:

> No Contracting Party has expressed any desire to revisit the mining ban, and at the Antarctic Treaty Consultative Meeting in 2016 the Parties unanimously adopted the *Santiago Declaration,* which reaffirmed their strong and unequivocal support for the mining ban.[116]

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108 Department of the Environment and Energy, 2016, *Australian Antarctic Strategy and 20 Year Action Plan*, p. 19.

109 Professor Marcus Haward, Professor, Ocean and Antarctic Governance, IMAS University of Tasmania, *Committee Hansard*, Hobart, 10 November 2017, p. 37; DFAT, *Submission 17.1,* p. [6].

110 DFAT, *Submission 17.1*, p. [6].

111 *Article 25 of the Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol*), opened for signature 4 October, 1991, (entered into force 14 January, 1998).

112 DFAT, *Submission 17.1*, p. [6].

113 Mr Whyatt, DFAT, *Committee Hansard*, Canberra, 15 February 2018, p. 9.

114 Mr Whyatt, DFAT, *Committee Hansard,* Canberra, 15 February 2018, p. 9.

115 Mr Whyatt, DFAT, *Committee Hansard*, Canberra, 15 February 2018, p. 9.

116 DFAT, *Submission 17.1,* p. [6].

3.59 By contrast, the Committee received evidence from Professor Brady who suggested that countries are already considering the feasibility of accessing Antarctic mineral resources.[117] Moreover, she suggested that the recent increase in activity in Antarctica is, in part, driven by the desire to access the region's natural resources in the future.[118] Highlighting these concerns, Professor Brady suggested that multiple countries are engaging in research to better understand Antarctic minerals, and that during internal discussions they are 'openly … declaring an interest in exploring' these resources, and in some cases 'talking about utilising them.'[119]

3.60 Mr Larsen noted that whilst the Antarctic Treaty bans mining it does not prohibit work to understand the extent of resources in Antarctica.[120] He also conceded that countries may be currently conducting such work '… under the guise of scientific research.'[121] Professor Brady shared a similar sentiment when she noted that to what extent current activity is 'exploration and to what extent is it normal academic scientific research is in the eye of the beholder.'[122] In regards to the dual use nature of such scientific research, some inquiry participants suggested that inspections play an integral role in understanding what other countries are doing and ensuring that activities remain within the limits of the ATS.[123]

## Committee comment

3.61 It was evident to the Committee that there is a great sense of pride in Australia's longstanding role in the ATS. In particular, Australia has played a significant role in influencing Antarctic governance on issues related to environmental conservation through activities such as hosting the CCAMLR Secretariat. The Committee strongly supports the principles of the ATS and agrees with the assessment that it has served Australia's national interests well and promoted peace and security in a region close to Australia.

117 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 1.

118 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 1.

119 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 2.

120 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 3.

121 Mr Larsen, DFAT, *Committee Hansard*, Canberra, 14 September 2017, p. 3.

122 Professor Brady, private capacity, *Committee Hansard*, Canberra, 15 February 2018, p. 2.

123 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 54.

3.62 The Committee welcomes the *Australian Antarctic Strategy and 20 Year Action Plan* and its commitment to strengthening Australia's influence within the ATS by building and maintaining strong and effective relationships with other Antarctic Treaty nations. However, as the dynamics of Antarctica continue to change, the Committee has some concerns that maintaining established norms in the region may become more challenging in the future. To ensure that the ATS remains the best framework for addressing challenges within the region, Australian leadership in Antarctica needs to be further strengthened.

3.63 To address this, the Committee recommends appointing an Antarctic Ambassador to oversee diplomatic activities and to provide leadership in promoting Australia's national interests internationally. While noting DFAT's advice that the current arrangements are satisfactory, the Committee believes that the appointment of an Antarctic Ambassador will further demonstrate Australia's leadership and commitment to promoting discussion and engagement on Antarctic norms and principles. Moreover, an Antarctic Ambassador would be able to assess on a regular basis Australia's leadership in the region to ensure it remains relevant in addressing issues related to the ATS.

3.64 The Committee acknowledges that the AAD and DFAT work together closely and handle different aspects of international engagement in Antarctica. Subsequently, both agencies would need to be involved in considering how such a position can make the best contribution.

**Recommendation 1**

**The Committee recommends that the Australian Government, through the Department of Foreign Affairs and Trade, appoint an Antarctic Ambassador to oversee diplomatic activities and to provide leadership in promoting Australia's interests in Antarctica internationally.**

## Collaboration

3.65 During its visit to Antarctica, the Committee was impressed by the way Australia collaborates with other nations. It is clear that cooperation in Antarctica is necessary in order to support research and work in such a remote and hostile location. Moreover, collaboration allows Australia to enhance its diplomatic engagement with a wider range of nations, including those that it does not traditionally collaborate with beyond Antarctica.

3.66 While the Committee applauds the *Australian Antarctic Strategy and 20 Year Action Plan's* emphasis on strengthening collaboration in East Antarctica, the Committee notes that there are also opportunities to learn from nations operating in West Antarctica where conditions differ significantly from the East.

## Comprehensive Test Ban Treaty

3.67 The Committee welcomes the work being overseen by the AAD to operate radionuclide stations as part of the International Monitoring System for the *Comprehensive Test Ban Treaty*. The Committee acknowledges DFAT's comments that increases in funding to Australia's Antarctic infrastructure must consider Australia's ongoing ability to contribute to the IMS.

## Search and rescue

3.68 The Committee recognises the substantial impact that search and rescue operations in Antarctica have on the work of the AAP, and more broadly on the nation. However, the Committee also notes that these contributions enhance Australia's standing in Antarctica. Moreover, this complementary arrangement has been beneficial to Australia during incidents involving the *Aurora Australis*.

3.69 The Committee acknowledges the contribution AMSA has made to reduce the likelihood of incidents occurring, and encourages the continuation of these efforts. In particular, with activity in the region projected to increase significantly in the future, the Committee encourages greater planning for the future to ensure that Australian search and rescue efforts will be able to respond appropriately.

**Recommendation 2**

**The Committee recommends that the Australian Government consider ways in which it can further strengthen its search and rescue planning processes so that it can better respond to increased activity in the future.**

## Site inspections

3.70 The Committee acknowledges the integral role that the ATS inspection regime plays in ensuring compliance with the treaty principles and enhancing collaboration and cooperation with other Antarctic nations. The

Committee welcomes Australia's independent inspection of the American Amundsen-Scott South Pole Station in 2016.

3.71 The Committee notes that the commitment made in the *Australian Antarctic Strategy and 20 Year Action Plan* to restore Australia's inland traverse capability would significantly enhance Australia's ability to conduct inspections more frequently. It is essential that once this capability has been restored it is used to conduct more frequent inspections in East Antarctica. This will enhance Australia's ability to ensure compliance with key Treaty system principles within East Antarctica.

3.72 As Australia further strengthens its ability to conduct site inspections there may be opportunities to lead training both domestically and with countries that have limited experience in conducting site inspections.

3.73 The Committee also welcomes the AAD's informal arrangement with the *Larsemann and Vestfold Hills Management Group* which includes regular station visits that allow the opportunity for informal site inspections. The Committee encourages further such arrangements, in particular in East Antarctica.

**Recommendation 3**

**The Committee recommends that the Australian Antarctic Division conduct a formal site inspection in East Antarctica within the next year (2019–20 season). Once inland traverse capabilities have been restored, the Committee recommends that the Australian Antarctic Division set a target to conduct formal inspections annually, with an emphasis on inspections in East Antarctica. To meet these requirements, the Committee recommends that work to restore Australia's inland traverse capabilities be expedited and completed by the end of the 2019–20 season.**

## Environmental engagement

3.74 The Committee applauds Australia's ongoing commitment to protecting Antarctica's pristine environment. The Committee encourages the AAD to continue to consider how best to minimise the impact of Australia's operations on the region and to demonstrate this to other nations.

3.75 The Committee notes that Australia hosts the CCAMLR secretariat and that this role enhances Australia's influence in the ATS and confirms

Australia's status as a responsible manager of marine services. Moreover, the presence of the CCAMLR Secretariat in Hobart strengthens Tasmania's position as an Antarctic Gateway. The Committee encourages the Australian Government to consider similar opportunities that could further strengthen Australia's role as an advocate for the continued protection of Antarctica's unique environment.

## Marine protected areas

3.76 While Australia has been successful in influencing a range of issues relating to the protection of Antarctica's environment, the Committee notes that Australia continues to work towards establishing a marine protected area in East Antarctica. While the Committee acknowledges Australia's commitment to continuing its approach to support the acceptance of marine protected areas, the Australian Government may need to carefully evaluate the success of this approach and make changes if necessary.

## Madrid Protocol

3.77 The Committee acknowledges that a number of inquiry participants expressed concern that aspects of the *Madrid Protocol* are misunderstood and that some media and academic commentary of the protocol suggests that the mining ban will expire in 2048. The Committee also acknowledges that this concern was also voiced by Dr Press in his *20 Year Australian Antarctic Strategic Plan.* The Committee reiterates Dr Press's recommendation that Australia should undertake diplomatic activities such as capacity building efforts and education on Parties' obligations under the *Madrid Protocol* and its provisions with respect to mining. Such efforts should also include educating commentators and the public on the mining ban and the process required to modify this.

3.78 Without these efforts, misinformed perspectives could significantly impact discussions on the future of the mining ban. The Committee also notes that, in any future discussions about possible changes, Australia would need to consider all aspects in order to make informed decisions, and work with countries to maintain a robust ATS into the future.

# 4

# Infrastructure and logistical support

4.1 Meeting Australia's international obligations and maintaining Australia's strategic and scientific interests in Antarctica is a significant undertaking. As such, the Australian Government, through its recent *Australian Antarctic Strategy and 20 Year Action Plan*, has signalled a clear intention to further these objectives, in part through the development of Australia's Antarctic infrastructure.

4.2 The operations of the Australian Antarctic Program (AAP) require a range of infrastructure and logistical support in both Tasmania and Antarctica. Antarctic infrastructure in particular is required to operate in a high risk environment and is expensive to build and maintain.[1] The Department of the Environment and Energy advised that that the majority of the Australian Antarctic Division's (AAD) assets are located in Antarctica and includes:

- 610 mechanical plant and equipment assets totalling $66.7 million;
- 736 science plant and equipment, including a unique cold-water krill aquarium, assets totalling $23.5 million;
- 66 corporate property assets totalling $17.3 million; and
- 648 telecommunications and information technology assets totalling $16.2 million.[2]

4.3 With respect to Hobart, infrastructure is required to adequately administer and support the needs of the AAP, including the ability to respond to any critical issues that may arise for staff or equipment in Antarctica. Infrastructure in Antarctica, along with logistical arrangements, must also

1 Department of the Environment and Energy, *Submission 13*, p. 2.

2 Department of the Environment and Energy, *Submission 13*, p. 6.

be able to withstand the harsh climate and be appropriate to meet the objectives of the Program.

4.4 From a strategic perspective, Australia has the capacity to use its infrastructure investments in Antarctica to demonstrate leadership on the continent. As is highlighted in chapter 4, Australia's significant presence in Antarctica also underpins its international diplomatic and scientific engagement strategy and, as such, the development of infrastructure supports the national interest.[3] Other nations Antarctic programs also have significant infrastructure assets in Antarctica, and while there are many opportunities to work collaboratively and share resources in Antarctica, it is helpful for Australia to understand the infrastructure assets of its Antarctic partners.[4]

4.5 This chapter considers evidence to the inquiry relating to the infrastructure and logistical support in both Hobart and Antarctica that contribute to the success of the AAP. In particular, it considers:

- Australia's assets in Antarctica;
- transport and logistics capabilities, including intra-continental transport; and
- infrastructure and assets in Hobart.

## Infrastructure assets in Antarctica

4.6 Without its network of Antarctic stations, the support provided through the vast range of specialised equipment and highly skilled staff, the program's mandate to operate in such a harsh and remote environment would not be possible.[5]

4.7 The Committee received evidence which highlighted the breadth of assets under administration to support the AAD's work —some 3,300 assets 'ranging from buildings and boats to cranes and quad bikes.'[6]

4.8 Given the extensive Antarctic portfolio, the Antarctic infrastructure objectives outlined in the *Australian Antarctic Strategy and 20 Year Action*

3 Dr Nicholas Gales, Director, Australian Antarctic Division (AAD), Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 24.

4 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 47.

5 Department of the Environment and Energy, *Submission 13*, p. 6.

6 Department of the Environment and Energy, *Submission 13*, p. 2.

*Plan* form a substantial undertaking by the Australian Government. Antarctic infrastructure was brought into sharper focus as it was named a priority as part of the *2016 National Research Infrastructure Roadmap*.[7] The roadmap outlines 'the research infrastructure priorities essential for building Australian research excellence into the future.'[8]

4.9 The Plan highlights key infrastructure-related actions to be taken that support Australia's national interests in Antarctica, including:

- a new world-class research and resupply Antarctic icebreaker;
- new and stable funding to support an active AAP;
- developing modern and flexible infrastructure, including:
  - ⇒ restoring traverse capabilities and establishing mobile stations in the Antarctic interior;
  - ⇒ further scoping options for expanded aviation capabilities to establish a year-round aviation capability between Hobart and Antarctica; and
  - ⇒ progressing options for more efficient and flexible use of existing research stations;
- agreeing to priority proposals with industry to enhance Tasmania's status as an Antarctic Gateway, including expanded infrastructure in Hobart for the new icebreaker; and
- a major review on building research infrastructure in Hobart to establish Australia as the world's leader in krill research.[9]

4.10 Inquiry contributors, including from Australian Government agencies, provided the Committee with insight into the range of issues concerning current and future infrastructure requirements.

## Australia's Antarctic stations

4.11 Australia currently maintains three year-round research stations in Antarctica. Australia's oldest research station, Mawson, is located on the coast at the edge of the Antarctic plateau and has been continually

7 Department of Industry, Innovation and Science, *Submission 16*, p. 2.

8 The Hon. Arthur Sinodinos AO, Minister for Industry, Innovation and Science and Senator the Hon. Simon Birmingham, Minister for Education and Training, 'National roadmap for research infrastructure shows the way', *Media Release*, 12 May 2017.

9 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016.

operating since 1954.[10] Davis station, which is located on the coast near the ice-free Vestfold Hills was built in 1957.[11] Casey station, which is located in the Windmill Islands, just outside of the Antarctic Circle was built in 1969 to replace the nearby Wilkes station.[12]

4.12 Australia also maintains a year-round research station on the sub–Antarctic Macquarie Island.[13] Macquarie Island station is in the Southern Ocean, and is situated approximately 1,500 km south south-east of Tasmania and 1,300 km north of Antarctica, it was built in 1948.[14]

Figure 4.1 Members of the Committee near Casey station

*Source* *Supplied*

10 Department of the Environment and Energy, *Submission 13*, p. 6.

11 AAD, Department of the Environment and Energy, 'Davis Station', 22 June 2016, <http://www.antarctica.gov.au/living-and-working/stations/davis>, viewed 26 July 2017.

12 Department of the Environment and Energy, *Submission 13*, p. 2.

13 Department of the Environment and Energy, *Submission 13*, p. 2.

14 Department of the Environment and Energy, 'World Heritage Places—Macquarie Island', <http://www.environment.gov.au/heritage/places/world/macquarie-island>, viewed 4 January 2018.

4.13 Australia's four year-round Antarctic stations consist of over 370 buildings.[15] Each station houses a range of facilities including scientific equipment and laboratories, medical facilities, power generation, telecommunication and waste management facilities, as well as accommodation, kitchen and dining room, and recreational spaces for occupants.[16]

4.14 In addition to these year-round stations, there are a number of summer-only facilities, including Law Base in Larsemann Hills, Edgeworth David Camp in the Bunger Hills and a network of field-huts spanning outwards from Australia's year-round research stations.[17] Wilkins Aerodrome, which also only operates in summer, serves as Australia's only inter-continental aviation access point into East Antarctica.[18]

4.15 The year-round stations house total populations of around 80 in winter and 200 in summer.[19] The Department of the Environment and Energy highlighted that the stations were staffed by a broad range of personnel. Dr Nicholas Gales, Director of the AAD, advised that:

> Every season is an enormous logistics planning exercise because we have a certain number of beds on stations. We have a basic template of the number of people you need to safely run a station. You need your doctor, your plumber, your electrician—the basic trades. There are beds available for projects, some of which are non-science type projects. They might be rebuilding type projects and so forth on infrastructure and then there are all of the science beds.[20]

4.16 Rather than increasing the number of buildings to increase the number of staff able to be housed, Dr Gales explained that paramount considerations were the safety of staff and ensuring the efficiency of capacity to balance the needs of Antarctic science and infrastructure development.[21]

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15 Department of the Environment and Energy, *Submission 13*, p. 6.

16 AAD , Department of the Environment and Energy, 'Living and working in Antarctica', 14 October 2013, < http://www.antarctica.gov.au/living-and-working>, viewed 4 January 2018; see also: Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 49.

17 Department of the Environment and Energy, *Submission 13*, p. 8.

18 Department of the Environment and Energy, *Submission 13*, p. 7.

19 Department of the Environment and Energy, *Submission 13*, p. 6.

20 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 49.

21 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 50.

## Efficient use of Australia's Antarctic research stations

4.17 Australia's Antarctic research stations form the core of Australia's scientific capabilities on the continent. Evidence to the inquiry drew attention to the fact that to support the Australian Government's significant infrastructure and scientific commitments in Antarctica necessitated a modernisation of this ageing asset base.

4.18 The Department of the Environment and Energy advised the Committee that the last major upgrade to infrastructure at the stations occurred in the 1980s, while 'minor upgrades and running repairs' have been conducted since that time.[22] The Department expressed concerns that the asset base was ageing and that further investment in station infrastructure would be required.[23] Incidents, such as the collapse of part of a wind turbine in late 2017[24], highlight this need.

4.19 The *Australian Antarctic Strategy and 20 Year Action Plan* states that one of the Australian Government's key actions is to progress 'options for more efficient and flexible use of existing research stations'.[25] The Department of the Environment and Energy highlighted the Australian Government's plan, noting that a 10 year horizon is in place to 'implement an overhaul' to 'create a station network that is efficient, flexible and well-suited to our future needs.'[26] A modernisation project on Macquarie Island is currently underway to construct a new research station that will minimise the station's physical size, simplify and reduce long-term station maintenance, and incorporate new technologies.[27]

4.20 It was noted however that, while some preliminary work was being done to assess the status of the Antarctic stations within the Department of Environment and Energy's existing funding, the upgrade of '… Antarctic station infrastructure is not an immediate priority for the Department and is currently an unfunded liability.'[28]

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22 Department of the Environment and Energy, *Submission 13*, p. 6.

23 Department of the Environment and Energy, *Submission 13*, p. 6.

24 Mr Matt Cahill, Acting Deputy Secretary, Strategy and Operations Group, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 47.

25 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 3.

26 Department of the Environment and Energy, *Submission 13*, p. 6.

27 AAD, Department of the Environment and Energy, 'Macquarie Island Modernisation Project', 18 August 2017, <http://www.antarctica.gov.au/living-and-working/stations/macquarie-island/modernisation>, viewed 31 October 2017.

28 Department of the Environment and Energy, *Submission 13*, p. 6.

## Future modernisation of Australia's Antarctic stations

4.21 Inquiry contributors impressed upon the Committee that, when a broader modernisation program commences, there was a need to ensure that Australia's Antarctic stations were upgraded with regard to modern design and engineering principles.

4.22 The Tasmanian Polar Network, for example, advised the Committee that any modernisation program should be required to consider 'environmentally cutting edge design and technology is applied to all station and equipment renewal.'[29] It was further suggested that consideration be given to sustainability, use of renewable energy and a well thought out approach to station logistics.[30]

4.23 The Australian Institute of Architects submitted that, while the extreme conditions in Antarctica must be accounted for, 'construction methods need to take into account the remote location, and minimise any effects on the pristine environment.'[31] The Institute conveyed a recent observation that '…almost without exception, Antarctic stations are designed by engineers with minimal aesthetic regard for living conditions …'[32]

4.24 The Institute suggested that any future Australian Antarctic station modernisation program incorporate architecturally-informed design and construction methods, such as modular station buildings.[33] The Institute cited the design of Antarctic bases belonging to other countries including Britain, Belgium and the United States, as examples which provided:

> … laboratories and residences that can both withstand the extreme conditions and provide the best planned and highest quality habitable environment possible for researchers and support staff.[34]

4.25 It should be noted that, during the course of the Committee's inquiry, a number of other international Antarctic programs announced plans to upgrade their own Antarctic infrastructure.[35]

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29 Tasmanian Polar Network, *Submission 1*, p. 4.

30 Tasmanian Polar Network, *Submission 1*, p. 4.

31 Australian Institute of Architects, *Submission 24.1*, p. 1.

32 Australian Institute of Architects, *Submission 24.1*, p. 1.

33 Australian Institute of Architects *Submission 24.1*, p. 1.

34 Australian Institute of Architects, *Submission 24.1*, p. 1; Tasmanian Polar Network, *Submission 1*, p. 4.

35 For example, New Zealand: NZ City, 'Scott Base to undergo a makeover', 28 February 2018, <http://home.nzcity.co.nz/news/article.aspx?id=264778>, viewed 28 February 2018. See also Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 49.

## Waste remediation

4.26 The *Australian Antarctic Strategy and 20 Year Action Plan* states that part of Australia's national interests with respect to Antarctica incorporates the capacity to demonstrate leadership in environmental stewardship in Antarctica.[36]

4.27 Historically, waste remediation and management practices in Antarctica have had a negative impact on the environment.[37] Under the *Protocol on Environmental Protection to the Antarctic Treaty*, all nations operating in Antarctica are committed to comprehensive protection of the environment. The Protocol specifies that all newly generated waste should be removed from Antarctica and that member countries are obliged to remove legacy waste, unless removal will have a greater adverse environmental impact than leaving the waste where it is.[38] Despite this, past waste disposal practices continue to impact the region with contaminated sites at both occupied and abandoned research stations.[39]

4.28 The Department of the Environment and Energy noted that Australia's commitment to the Antarctic environment includes the development of an Antarctic clean-up strategy for legacy waste.[40]

4.29 WWF-Australia submitted to the Committee that, under the strict Antarctic governance regime, scientists and tourists are required to repatriate waste and ensure that it is not dumped in Antarctic waters.[41] The exception to this protocol is untreated sewage.[42] WWF-Australia highlighted research that found untreated sewage from research bases could introduce bacteria, such as *E. coli,* into the Antarctic ecosystem.[43] Other bacterial strains and antibiotic resistant genetic material commonly

36 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 3.

37 AAD, Department of the Environment and Energy, 'Human impacts and remediation', 10 March 2016, <http://www.antarctica.gov.au/science/human-impacts>, viewed 22 February 2018.

38 AAD, Department of the Environment and Energy, 'Human impacts and remediation', 10 March 2016, <http://www.antarctica.gov.au/science/human-impacts>, viewed 22 February 2018.

39 AAD, Department of the Environment and Energy, 'Human impacts and remediation', 10 March 2016, <http://www.antarctica.gov.au/science/human-impacts>, viewed 22 February 2018.

40 Department of the Environment, *Submission 13*, p. 16.

41 WWF-Australia, *Submission 9*, p. 2.

42 WWF-Australia, *Submission 9*, p. 2.

43 WWF-Australia, *Submission 9*, p. 2.

found in humans has also been identified in Antarctic marine ecosystems and shellfish.[44]

4.30 The Tasmanian Polar Network, citing a new Tasmanian waste facility that can receive high grade waste, suggested that the Australian Government ensures that Australian businesses, particularly those based in Tasmania be 'considered [to provide services] in the removal and repatriation of materials, waste and other items during the modernisation program.'[45]

## Transport and logistical capabilities

4.31 Antarctica is a vast continent and requires that the AAP is supported by timely and efficient transport and logistical capabilities. The AAP employs a combination of air, sea, inter-continental and intra-continental transport capabilities to carry out its functions in a broad range of marine, ice and aviation based research activities, personnel transfer, station operation and resupply, and waste management and removal.[46]

4.32 Evidence to the Committee related to a broad range of these capabilities including aviation and marine capacity along with a reinvigorated overland traverse capacity. A variety of assets are deployed to assist the AAP which are operated either by the AAD or under a memorandum of understanding, such as that with Defence.

4.33 Many inquiry contributors supported improved Antarctic infrastructure, particularly with respect to air and port facilities.[47]

### Aviation capability and inter-continental air transport

4.34 Aviation is a crucial component of the AAP, and under the *Australian Antarctic Strategy and 20 Year Action Plan*, the Australian Government has outlined its plan to strengthen Australia's Antarctic aviation capabilities over the next two decades.[48]

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44 WWF-Australia, *Submission 9*, p. 2.

45 Tasmanian Polar Network, *Submission 1*, p. 4.

46 AAD, Department of the Environment and Energy, 'About us', <http://www.antarctica.gov.au/about-us>, viewed 22 February 2018.

47 For example: Tasmanian Polar Network, *Submission 1*, p. 2; Hobart Airport, Submission 2, p. 1; Geoscience Australia, Submission 6, p. 11; Institute for Marine and Antarctic Studies (IMAS) University of Tasmania, *Submission 8*, p. 3.

48 Australian Aviation, 'RAAF completes C-17 Antarctic trial flights', 22 February 2016, <http://australianaviation.com.au/2016/02/raaf-completes-c-17-antarctic-trial-flights/>, viewed 28 July 2017.

4.35 Currently, Antarctic aviation capabilities comprise both an inter-continental air service between Hobart Airport and the Wilkins Aerodrome near Casey research station, and intra-continental services within Antarctica.[49] Inter-continental flights are limited to between October and March each year, with a six week shutdown period during the height of summer due to runway melt.[50] This service, operated by an A319 aircraft under contract, facilitates the movement of personnel for both the Australian program and other national Antarctic programs, and carries approximately 250 passengers per summer season.[51]

4.36 The AAP is also supported by a range of small aircraft including helicopters and Twin Otter aircraft for intra-continental travel. Each summer season, Australia constructs ski ways from prepared ice or snow at its three bases for this purpose.[52] In addition to accessing stations and field locations, aviation assets provide support to scientific research that utilise aerial sensing, data collection, and monitoring equipment.[53]

4.37 The AAD also has a strong relationship with the Department of Defence, formalised through a memorandum of understanding on Antarctic cooperation and logistical support. Since 2016, Defence has operated up to six heavy-lift flights annually using C–17A Globemaster aircraft.[54] These arrangements are considered later in this chapter.

## Wilkins Aerodrome

4.38 Wilkins Aerodrome is currently Australia's only inter-continental aviation access point into East Antarctica from Hobart, and one of few such access points across all of Antarctica.[55] In 2017, the AAD marks a decade of service delivered by the Aerodrome.

4.39 Defence submitted to the inquiry that while the facilities at Wilkins are adequate for its current operations supporting the AAP, greater mission capability and mission assuredness could be achieved by implementing a number of additions and improvements.[56] The Department lists these as:

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49 AAD, Department of the Environment, 'Australia's Antarctic aviation', 3 November 2015, <http://www.antarctica.gov.au/living-and-working/travel-and-logistics/aviation>, viewed 28 July 2017.

50 Department of the Environment and Energy, *Submission 13*, p. 9.

51 Department of the Environment and Energy, *Submission 13*, p. 7.

52 Department of the Environment and Energy, *Submission 13*, p. 9.

53 Department of the Environment and Energy, *Submission 13*, p. 8.

54 Department of the Environment and Energy, *Submission 13*, p. 7.

55 Department of the Environment and Energy, *Submission 13*, p. 7.

56 Department of Defence, *Submission 14*, p. 3.

- Aviation turbine fuel available for upload (increases payload to/from Antarctica);
- Provision of suitable ground support equipment including power carts, air carts and aircraft towing (negates the need to use aircraft payload to carry Defence ground support equipment to and from Wilkins);
- An aircraft de-ice capability;
- Additional accommodation/passenger handling facilities (enables greater passenger loads);
- Airfield lighting;
- Airfield instrument approach;
- Hanger or storage facility to hold Air Drop Equipment.[57]

Figure 4.2 Australian Defence Force delivering the new 'Priscilla' bus to Casey station using a C17–A Globemaster aircraft

*Source* *Supplied*

## Proposal for year-round aviation access

4.40 As part of the *Australian Antarctic Strategy and 20 Year Action Plan*, the Australian Government has committed $10 million to commence preliminary work towards a business case for a year-round runway in Antarctica which is currently being prepared by the AAD. The business

57 Department of Defence, *Submission 14*, p. 3.

case, which will canvass a range of options to support different types of aircraft, [58] is designed to support an investment decision on a year round, hard surface runway to be located in the vicinity of Davis station—the only such facility in East Antarctica.[59] The allocation of funds for the project includes ensuring that the proposed runway is 'in accordance with domestic and Antarctic Treaty System environmental approval requirements.'[60]

4.41 The business case, according to Dr Gales, would encompass:

> … important strategic and security discussions around what is in Australia's best interest, and the way you would invest in such an asset—as to whether you wish to own the asset and operate it and allow other countries to use it, or whether you wish to go into an agreement with another country for them to co-fund it, as well.[61]

4.42 The development of the year-round aviation capacity was supported by a wide range of inquiry participants.[62] The Department of the Environment and Energy, for example, outlined that one of the benefits of the proposed year-round runway would be to cement 'Australia's position as a leader in Antarctica and the logistics collaborator of choice in East Antarctica'.[63]

4.43 Dr Gales underlined the strategic importance to Australia of the proposed runway, noting that it would allow Australia to further develop arrangements with other countries so that Australian aviation support can essentially be traded for operational support and assistance from other national Antarctic programs.[64]

4.44 Defence supported the proposal to develop year-round aviation access,[65] noting that it would engage with the process following the development

58 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 50.

59 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 1.

60 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, pp. 26–27.

61 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 51.

62 See for example: IMAS University of Tasmania, *Submission 8*, p. 2; Department of Defence, *Submission 14*, p. 3; Geoscience Australia, *Submission 6*, p. 19.

63 Department of the Environment and Energy, *Submission 13*, p. 9.

64 Dr Gales, AAD, *Committee Hansard*, Hobart, 10 November 2017, p. 48.

65 Commodore Jaimie Hatcher, AM, RAN, Acting Head, Military Strategic Commitments, Department of Defence, *Committee Hansard*, Canberra, 19 October 2017, p. 2.

of the business case.[66] Defence stressed, however, that the proposed new runway would benefit from similar facilities as those it had previously suggested should be implemented at Wilkins Aerodrome.[67]

4.45 Dr Tony Press, a former Director of the AAD, suggested the project would need to be supported across government. He said that the benefits of the runway included immense strategic and practical advantages for Australia as well as a 'platform for collaboration but also more security for Australia's Antarctic interests and for the people that work in Antarctica.'[68]

4.46 Hobart Airport suggested that the development would further enable Hobart and Hobart Airport in particular to develop into an:

> … international Antarctic aviation hub and offer opportunities for other national programs from China, India and others to operate their programs through Hobart.[69]

4.47 As a comparison with similar facilities in Antarctica, Defence further advised that there were approximately 50 active airfields in Antarctica, of which many were small and medium airfields maintained by the many national Antarctic programs present on the continent.[70] Defence stated that there were 10 airfields that supported intra-continental flights which predominately operated during the summer months.[71] The proposed year-round runway would be only one of four year-round airfields in Antarctica.[72]

## Aviation support from the Department of Defence

4.48 Despite the ban on militarisation in Antarctica, there is some scope for national defence programs to provide limited non-military support to national Antarctic programs.[73] Defence provides 'niche support to whole-of-government (WoG) efforts in Antarctica', through its Operation Southern Discovery.[74] As noted above, Defence contributes logistical

66 Commodore Hatcher, Department of Defence, *Committee Hansard,* Canberra, 19 October 2017, p. 4.

67 Department of Defence, *Submission 14*, p. 3.

68 Dr Anthony (Tony) Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 42.

69 Hobart Airport, *Submission 1*, p. 1.

70 Department of Defence, *Submission 14.5*, p. 1.

71 Department of Defence, *Submission 14.5*, p. 1.

72 Department of Defence, *Submission 14.5*, p. 1.

73 Department of Defence, *Submission 14*, p. 1.

74 Department of Defence, *Submission 14*, pp. 1–2.

support to the AAP through a memorandum of understanding with the Department of the Environment and Energy.[75]

4.49 As outlined in its submission, the Department of Defence's support efforts are niche but significant in the context of the AAP. Support provided includes air cargo equipment and support, assistance with search and rescue operations, aeromedical evacuation, as well as providing expert knowledge in areas such as meteorology, hydrography, and extreme climate operations.[76]

4.50 The Department of the Environment and Energy commented on its relationship with Defence, submitting that the relationship is strong and underpinned by a memorandum of understanding. [77]

4.51 One of the vital aspects of the support provided by Defence is through the provision of aviation support. While Defence's role in Antarctica is limited, it submitted that, as part of the Australian Government's commitments in the *Australian Antarctic Strategy and 20 Year Action Plan*, its operations utilising the C–17A Globemaster aircraft:

> … allow the delivery of cargo and equipment and can potentially contribute to emergency responses in the region such as search and rescue and aeromedical evacuation incidents.[78]

4.52 The Department of the Environment and Energy emphasised that the support provided through the C–17A Globemaster provides a significant heavy-lift cargo capability to both land at Wilkins Aerodrome and support 'deep field science projects with fuel, equipment and rations [which] is one of the major challenges for the AAP.'[79] The Institute for Marine and Antarctic Studies (IMAS) shared a similar sentiment, noting that the availability of the C–17A Globemaster aircraft in Antarctica provides significant opportunities for improving science capability.[80]

## Icebreaking and marine research capabilities

4.53 One of the key links to Australia's Antarctic and sub-Antarctic research stations is the Antarctic icebreaker *Aurora Australis*. It is due to be replaced by Australia's new icebreaker, the *RSV Nuyina* in 2020–21.

75 Department of Defence, *Submission 14*, p. 1.

76 Department of Defence, *Submission 14*, p. 1.

77 Department of the Environment and Energy, *Submission 13*, p. 9.

78 Department of Defence, *Submission 14*, p. 3.

79 Department of the Environment and Energy, *Submission 13*, p. 9.

80 IMAS University of Tasmania, *Submission 8*, p. 2.

4.54 The *Aurora Australis* is supported by a range of watercraft in Antarctica for cargo operations, personnel transfer, and search and rescue operations.[81] One of these is the research vessel, *Wyatt Earp*, which is due to be decommissioned in 2020.[82] In addition, the Commonwealth Scientific and Industrial Research Organisation's (CSIRO) research ship *RV Investigator* contributes research in the Antarctic region.[83]

## *Aurora Australis*

4.55 Commissioned in 1989, the *Aurora Australis*, is the main link to Australia's Antarctic and subantarctic research stations from Hobart and provides essential access for Australia's Antarctic and Southern Ocean scientific research.[84] The ship's scientific work includes experiments in biological, oceanographic and meteorological science.[85] The capability of the *Aurora Australis* was based on a two-ship support model without any aviation support, and at almost 30 years old, it is reaching the end of its service life.[86]

## New icebreaker: *RSV Nuyina*

4.56 The Australian Government has recently invested $1.9 billion to build a new Antarctic icebreaker, currently being constructed by the Australian company DMS Maritime Pty Ltd.[87] The company will also be responsible for the design, build, operation and maintenance of the ship over its expected 30 year life.[88] The new icebreaker will replace the *Aurora Australis* and be Australia's only icebreaking scientific research platform.[89] The new icebreaker will have greater icebreaking and cargo carrying capacity,

81 Department of the Environment and Energy, *Submission 13*, p. 8.

82 Geoscience Australia, *Submission 6*, p. 15.

83 Department of the Environment and Energy, *Submission 13*, p. 8.

84 AAD, Department of the Environment and Energy, 'Aurora Australis', 18 August 2010, <http://www.antarctica.gov.au/living-and-working/travel-and-logistics/ships/aurora-australis>, viewed 1 March 2018.

85 AAD, Department of the Environment and Energy, 'Aurora Australis', 18 August 2010, <http://www.antarctica.gov.au/living-and-working/travel-and-logistics/ships/aurora-australis>, viewed 1 March 2018.

86 Department of the Environment and Energy, *Submission 13*, p. 8.

87 AAD, Department of the Environment and Energy, 'New icebreaker contract signed', 7 June 2016, <http://www.antarctica.gov.au/magazine/2016-2020/issue-30-june-2016/in-brief/new-icebreaker-contract-signed>, viewed 28 July 2017.

88 AAD, Department of the Environment and Energy, 'Australia's new icebreaker', 7 July 2017, <http://www.antarctica.gov.au/icebreaker>, viewed 28 July 2017.

89 AAD, Department of the Environment and Energy, 'Australia's new icebreaker', 7 July 2017, <http://www.antarctica.gov.au/icebreaker>, viewed 28 July 2017.

increased endurance, higher environmental standards, and increased research, rescue and resupply capabilities.[90]

4.57 The new icebreaker is faster through Antarctic ice, with an icebreaking rate of 1.65 metres at 3 knots, compared with the *Aurora Australis*' capability of 1.23 metres at 2.5 knots.[91] It will have the ability to handle, stow and transport up to 1,200 tonnes of solid cargo and 1,900,000 litres of bulk liquid cargo (mainly the Special Antarctic Blend diesel that is used for station operations).[92] This compares to a solid cargo capacity of 800 tonnes and a bulk liquid cargo capacity of 1,100,000 litres for the *Aurora Australis*. The new ship will also have a slightly increased capacity to carry 117 passengers, compared to 116.[93] Construction of the icebreaker began in June 2017 and it is expected to be operational in 2020–21.[94] Figure 4.1 illustrates some of the differences between the two ships.

4.58 A variety of inquiry contributors provided evidence of the opportunities that would become available as a result of the new icebreaker. Geoscience Australia, for example, submitted that the new icebreaker would have the capacity to provide increased marine geoscience capabilities including the ability to:

> … map and sample the seafloor primarily along the Australian Antarctic Territory continental shelf and slope as well as the adjacent deep ocean abyssal basins.[95]

4.59 Similarly, the Australian Academy of Science noted that an opportunity existed for the new icebreaker to provide an increased number of available research days for marine research when compared with the current funded availability of the *RV Investigator* (see below).[96]

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90 AAD, Department of the Environment and Energy, 'Australia's new icebreaker', 7 July 2017, <http://www.antarctica.gov.au/icebreaker>, viewed 28 July 2017.

91 AAD, Department of the Environment and Energy, 'Icebreaker specifications' 9 October 2017, <http://www.antarctica.gov.au/icebreaker/about-the-ship/capability>, viewed 27 April 2018.

92 AAD, Department of the Environment and Energy, 'Icebreaker specifications' 9 October 2017, <http://www.antarctica.gov.au/icebreaker/about-the-ship/capability>, viewed 27 April 2018.

93 AAD, Department of the Environment and Energy, 'Icebreaker specifications' 9 October 2017, <http://www.antarctica.gov.au/icebreaker/about-the-ship/capability>, viewed 27 April 2018.

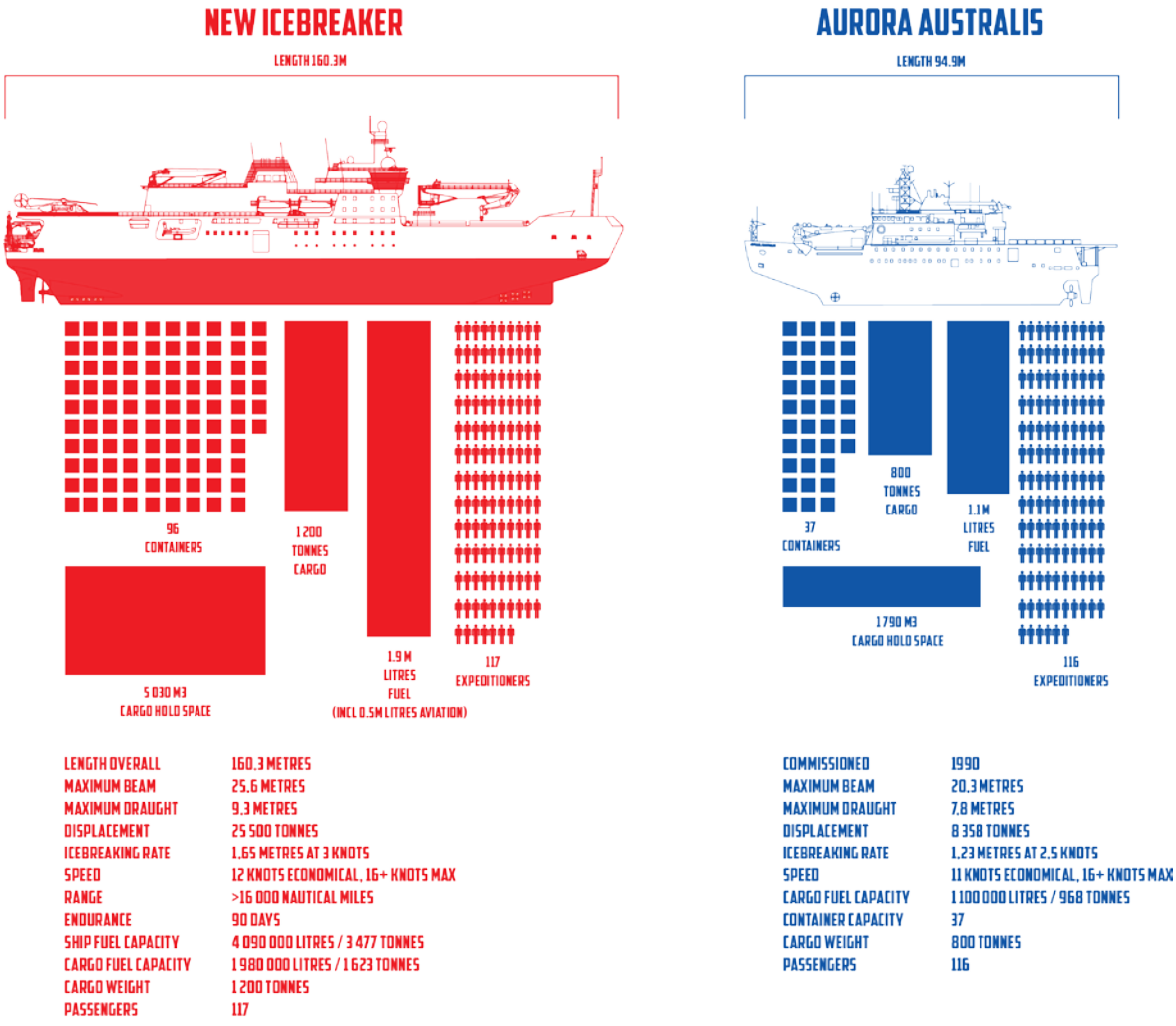
94 AAD, Department of the Environment and Energy, 'Construction of Australia's new icebreaker commences' 1 June 2017, <http://www.antarctica.gov.au/news/2017/construction-of-australias-new-icebreaker-commences>, viewed 2 May 2018.

95 Geoscience Australia, *Submission 6*, p. 16.

96 Australian Academy of Science, *Submission 4*, p. 5.

4.60 While the new icebreaker will provide Australia with a range of new and enhanced scientific capabilities, some concerns were raised about the need to ensure that skilled staff were available to operate some of the more complex on board equipment, such as multibeam sonar. This is addressed further in chapter 5.[97]

Figure 4.3 Differences between RSV Nuyina and Aurora Australis




*Source* *Australian Antarctic Division*

## Polar Code

4.61 Evidence to the Committee suggested that both the *Aurora Australis* and the new icebreaker, the *RSV Nuyina,* are subject to the International Maritime Organisation's Polar Code which came into force on 1 January 2018. The mandatory Polar Code is designed:

97 Geoscience Australia, *Submission 6*, p. 16.

> … to increase the safety of vessel operations and mitigate the impact of shipping on the people and environment in the isolated waters in both the Arctic and Antarctic regions.[98]

4.62 As part of transition arrangements under the Polar Code, the Australian Maritime Safety Authority advised the Committee that vessels built before 1 January 2017:

> … including the Aurora Australis, will have to comply with all requirements of the Polar Code by the first intermediate or renewal survey whichever comes first after 1 January 2018. This may mean that there could be a period between the delivery of the new vessel and the completion of one of the above mentioned surveys where the vessel will be required to comply with the Polar Code.[99]

4.63 The AAD advised the Committee that the ship was currently compliant with the Polar Code as per its charter arrangement and was expected to remain compliant until it is replaced.[100]

## CSIRO's *RV Investigator*

4.64 The research ship *RV Investigator*, operated by CSIRO's Marine National Facility, was commissioned in 2009 to replace the outgoing *Southern Surveyor*.[101] The ship is capable of spending up to 300 days a year at sea, can accommodate up to 40 scientists and support staff, and can go to sea for up to 60 days at a time, covering some 10,000 nautical miles.[102]

4.65 The *RV Investigator* contributes to research in the Antarctic region but does not provide the AAD with any resupply capacity.[103] Its work includes geoscience, atmospheric, biological and oceanographic research.[104]

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98 Australian Maritime Safety Authority (AMSA), *Submission 19*, p. 1.

99 AMSA, *Submission 19*, p. 2.

100 Mr Robert Bryson, Program Manager, Modernisation Taskforce, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 48.

101 Commonwealth Scientific Industrial Research Organisation (CSIRO), 'Research vessel: Investigator', <https://www.csiro.au/en/Research/Facilities/Marine-National-Facility/RV-Investigator>, viewed 22 March 2018.

102 Commonwealth Scientific Industrial Research Organisation (CSIRO), 'Research vessel: Investigator', <https://www.csiro.au/en/Research/Facilities/Marine-National-Facility/RV-Investigator>, viewed 22 March 2018.

103 Dr Jodie Smith, Marine Geoscientists, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, p. 17.

104 Commonwealth Scientific Industrial Research Organisation (CSIRO), 'Research vessel: Investigator', <https://www.csiro.au/en/Research/Facilities/Marine-National-Facility/RV-Investigator>, viewed 22 March 2018.

4.66 Dr Anthony Worby of CSIRO advised the Committee that while *RV Investigator* conducts marine research around Australia, it is also able to complement the capability of the *Aurora Australis* in Southern Ocean research. An independent and competitive process is conducted for scientists wishing to conduct research during the vessel's available research time.[105]

4.67 In its submission to the inquiry, Geoscience Australia advised that:

> The *RV Investigator* conducted its maiden voyage to Antarctica in early 2017 … However, it is worth noting that the *RV Investigator* has had its research expedition time cut from 300 days to 180 days per year, limiting opportunities available to scientist[s] to utilise its facilities …[106]

4.68 The Committee was interested to learn more about the reasons for why the *RV Investigator* had its marine research operating time reduced. Dr Stuart Minchin of Geoscience Australia advised that the Marine National Facility was only funded for the vessel to operate for 180 days—and not exclusively in Antarctica.[107] The *RV Investigator*, according to Geoscience Australia:

> … was never funded for the full 300 days. There is spare capacity on the Investigator that could be used for a range of marine survey purposes, but the Marine National Facility has funding to support operations only for around half its available capacity.[108]

4.69 CSIRO further clarified the issue of availability, noting that while there was 180 days of government funding available for the ship's operation, access is open to all Australian marine researchers and their international collaborators. Access to the ship's 180 day annual research program was oversubscribed, with some 700 days worth of applications received.[109]

4.70 Outside the 180 days of funded operation, the Committee was advised that the vessel was available for commercial use.[110] Ms Toni Moate, Director, National Collections and Marine Infrastructure at CSIRO, advised the Committee that CSIRO looked for opportunities to collaborate

105 Dr Anthony Worby, Director, Oceans and Atmosphere, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 26.

106 Geoscience Australia, *Submission 6*, p. 15.

107 Dr Stuart Minchin, Chief of Division, Environmental Geoscience Division, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, pp. 16, 18.

108 Dr Minchin, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, p. 16.

109 Ms Toni Moate, Director, National Collections and Marine Infrastructure, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 32.

110 Dr Smith, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, p. 17.

with research partners through industry. She noted that, for example, CSIRO:

> … have had a contract that was signed with CSIRO Oceans and Atmosphere and also with CSIRO Energy, where they partnered, through their normal research activities, with industry partners.[111]

## Overland traverse capabilities

4.71 A traverse is a major over-snow transport train comprising tractors, vehicles, sledges and living accommodation.[112] Due to the shift in Australia's focus to shipping and aviation capacity in Antarctica, Australia's traverse capability has not been funded for some years.[113] The *Australian Antarctic Strategy and 20 Year Action Plan* signalled the Australian Government's interest in reinvigorating this capability through a $45 million investment to build an over-snow science traverse, a modular mobile inland research station, and a deep ice drilling capacity.[114]

4.72 An increased overland traverse capacity was supported by Geoscience Australia.[115] The Department of the Environment and Energy advised that the new traverse capability would 'include the ability to prepare field landing sites to provide a scientific and logistics aviation link.'[116] It would also further the international search for a million-year ice core (discussed in chapter 4) and the ability to conduct site inspections as discussed in chapter 3.[117]

4.73 The Tasmanian Polar Network submitted that a modern, well equipped traverse capability, as well as the development of relevant support such as storage capacity, would 'enable Australia to successfully engage in international collaboration in ice core research, among other science areas'.[118]

4.74 Ms Karen Rees of the Tasmanian Department of State Growth, advised that a number of countries such as France and Italy have well developed

111 Ms Moate, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 32.

112 Department of the Environment and Energy, *Submission 13*, p. 9.

113 Ms Karen Rees, Director, Antarctic Tasmania and Maritime Industries, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 18.

114 Department of the Environment and Energy, *Submission 13*, p. 9.

115 For example: Geoscience Australia, *Submission 6*, p. 19.

116 Department of the Environment and Energy, *Submission 13*, p. 9.

117 Department of the Environment and Energy, *Submission 13*, p. 10.

118 Tasmanian Polar Network, *Submission 1*, p. 3.

traverse capabilities.[119] According to Ms Rees, these programs rely on infrastructure such as tractors and other equipment that are engineered in Tasmania specifically for Antarctic traverse.[120] As such, the state has developed a highly specialised industry with companies such as William Adams and Elphinstone Engineering having provided modified and engineered products to various national Antarctic programs.[121]

## Infrastructure and assets in Hobart

4.75 Hobart is well-positioned as a key gateway to Antarctica and this notion is strengthened by the Australian Government's commitment under the *Australian Antarctic Strategy and 20 Year Action Plan*. The Plan aims to 'build Tasmania's status as a global Antarctic research hub', with Hobart being its centrepiece.

4.76 Hobart's location and emerging infrastructure capacity makes it a major international hub for Antarctic science (as discussed in chapter 5) and also allows for the city to capitalise on the economic opportunities that its location brings (see chapter 6).

4.77 In catering for the growth in the Antarctic sector, evidence to the Committee discussed how a range of new infrastructure initiatives could bring together Hobart's Antarctic capacity in a way not previously contemplated.

4.78 Evidence to the Committee canvassed the framework and resources available to the AAD to manage its operations particularly in relation to its asset management capacity. The supporting role played by Hobart airport was also discussed.

### Australian Antarctic Division facilities

4.79 The AAD maintains extensive administrative, scientific and maintenance facilities in Hobart, most notably at its premises in Kingston.[122] As part of the inquiry, a range of matters were raised with respect to the ability of the

119 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 18.

120 Ms Rees, Tasmanian Department of State Growth, Committee Hansard, Hobart, 10 November 2017, p. 18.

121 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 18.

122 Department of the Environment and Energy, *Submission 13*, p. 6.

AAD to continue its work in the most efficient and effective manner possible. The Committee received evidence on matters including:

- governance and funding of the AAD;
- asset management capacity; and
- the possibility of the AAD relocating its offices to the new Macquarie Point Development.

## Current facilities

4.80 The AAD is located in Kingston which around 13 kilometres from the Hobart CBD. The Division employs over 300 permanent and temporary staff which includes 'operational, policy, science, and administrative and other support personnel, based at Kingston …'[123]

4.81 The facilities at Kingston, which are leased by the Australian Government until 30 June 2024[124] house:

- laboratories for science;
- electronics and electron microscopy;
- mechanical and instrument workshops;
- a krill research aquarium;
- equipment stores;
- communications and other operational and support facilities.[125]

4.82 With the lease of the AAD's current premises expiring in 2024, there is an opportunity to consider the location of its operations. While no commitment has been entered into regarding the possible relocation of the AAD into the new precinct, Dr Gales advised the Committee that the Division is actively engaged in discussions relating to Macquarie Point and the proposed Antarctic precinct. He noted that discussions relating to the type of presence the AAD may have at the precinct is an important discussion in which the AAD is engaged.[126]

123 AAD, Department of the Environment and Energy, 'About us', <http://www.antarctica.gov.au/about-us>, viewed 1 February 2018.

124 Department of the Environment and Energy, *Submission 13.2*, p. 1.

125 AAD, Department of the Environment and Energy, 'About us', <http://www.antarctica.gov.au/about-us>, viewed 1 February 2018.

126 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 51.

4.83 The proposed Macquarie Point Development is discussed further at chapter 6 of this report.

## Governance and funding

4.84 Capital and operating costs relating to the work the AAD comprises a significant portion of the resources of the Department of the Environment and Energy.[127] As part of the *Australian Antarctic Strategy and 20 Year Action Plan*, the Australian Government has committed $200 million over 10 years in additional funding for the AAD's operations. However, the need to ensure that the AAP is appropriately resourced through asset and infrastructure investment is also an issue that has been raised in previous inquiries conducted by the Commonwealth Parliament, including by this Committee.[128]

4.85 In describing the nature of the operating costs incurred by the AAD, its former Director, Dr Tony Press, said that during his time with the Division:

> … about 85 per cent of the Antarctic Division's budget was actually fixed in the sense that you have to have people on station, you have to maintain the stations, you have to pay for the ship, you have to buy fuel and you have to do all the provisioning of what are basically three or four small towns. That means that the 15 per cent of your budget that is flexible, which you put towards science and outreach activities, is the first bit that starts to get eroded with efficiency dividends.[129]

4.86 Dr Press suggested that, due to the nature of the work conducted by the AAD, there was a need to ensure that there was certainty with respect to the way that the Division was funded.[130] As such, he argued that the agency should be treated like other Australian Government agencies of a strategic nature and which are not subject to efficiency dividends.[131] The AAD also noted that it was subject to the efficiency dividend as a result of it being administered via a Department of state, unlike a number of

127 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

128 See for example, Senate Foreign Affairs, Defence and Trade References Committee, *Australia's future activities and responsibilities in the Southern Ocean and Antarctic waters*, 29 October 2014, p. 61.

129 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 41.

130 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 45.

131 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 45.

standalone agencies such as the Australian Nuclear Science and Technology Organisation and CSIRO.[132]

4.87 Dr Tony Press told the Committee that his understanding was that the efficiency dividend had a significant impact on the AAD's capital expenditure. Financial impacts were also felt by the AAD because its 'small but proportionally fixed budget' was also required to be used in the long-term management of its extensive asset portfolio.[133]

## Asset management and replacement

4.88 The assets utilised by the AAD in its work are required to operate in some of the most extreme conditions on the planet. As such, matters such as ensuring that assets are either maintained or replaced as required is not a trivial matter and in some circumstances could be considered a safety issue.[134]

4.89 The requirements of the AAD are not insignificant in the context of the Department of the Environment and Energy's capital budget. The Committee was advised that the capital expenditure of the AAD comprised around half of the Department's approximately $25 million capital budget.[135]

4.90 The Department advised that the asset base had a total replacement value of some $880 million, but that total replacement of Australia's Antarctic asset base 'would take nearly 61 years at the current rate of investment.'[136] With respect to the assets solely at the four year-round research stations, the Department advised that there was a total replacement cost in the order of $650 million (making up 73.8 per cent of total assets).[137]

4.91 The Department commented on the remaining life of its assets, stating that:

> … 48.5 per cent of the Australian Antarctic Division's assets (1,600 assets) have a net value of $168 million with no remaining

132 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 53.

133 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 45.

134 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 52.

135 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

136 Department of the Environment and Energy, *Submission 13*, p. 6.

137 Department of the Environment and Energy, *Submission 13*, p. 6.

> asset life, and a further 16 per cent have three years or less of their asset life remaining.[138]

4.92 Of the assets with no remaining asset life, the Department advised the Committee that the replacement cost of those assets would be $139.4 million. Importantly, the Department notes that the assets with no remaining asset life 'are still in use, so they do have an economic value, but are being used beyond their normal economic life.'[139]

4.93 In line with the ageing Antarctic asset base, the Australian National Audit Office advised the Committee of its 2015-16 audit, *Supporting the Australian Antarctic Program*, which recommended:

> … to underpin an effective approach to the management of Antarctic Program assets, the Department of the Environment develop a fit-for-purpose strategic asset management policy supported by asset management plans and procedures that are regularly reviewed and updated.[140]

4.94 The Department of the Environment and Energy's submission to the inquiry suggests that the Australian Government has begun to develop longer term asset management plans to counter the effect of the ageing Antarctic asset base and particularly recognises the longer time frames required in the management of Antarctic infrastructure.[141]

4.95 Evidence to the Committee highlighted that, in terms of Antarctica, there are limitations to any asset replacement program in the Antarctic context. This includes:

> … freight capacity on the ship or heavy lift aircraft, numbers of beds on station for capital labour, inclement weather which restricts capital works achievable in any one year, and a 4-5 month construction window a year for all outside works.'[142]

4.96 The Department of Environment and Energy highlighted that the cost of asset management in Antarctica—in terms of logistics, staffing and the time to manage an asset—is amplified simply because it is located in Antarctica.[143]

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138 Department of the Environment and Energy, *Submission 13*, p. 6.

139 Department of the Environment and Energy, *Submission 13.1*, p. 2.

140 Australian National Audit Office, *Submission 3*, p. 3.

141 Department of the Environment and Energy, *Submission 13*, p. 6.

142 Department of the Environment and Energy, *Submission 13*, p. 6.

143 Mr Bryson, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 25.

4.97 In assessing its asset replacement requirements, the Department advised the Committee that a 'capital budget review committee' has been established to examine the asset management plans and approach to the priority placed on the replacement of assets. This process will also assist in the development of a forward budget to inform the Australian Government of requirements.[144]

4.98 Furthermore, an external consultancy has been engaged to 'develop a framework for strategic management of the whole life of those Antarctic assets.'[145] The Department highlighted that the work of this external consultancy would be to:

> … go through and help us with an evaluation of whatever our asset base is looking like, from a best practice point of view. That's the first stage that we're going through. And then they're going to help us establish a framework and a prioritisation process to help us to keep that asset base working.[146]

### The process of replacing Antarctic assets

4.99 The Committee heard that the Department of Finance regularly engages with the Department of the Environment and Energy to establish an awareness of issues, such as the need for assets to be replaced and other possible financial requirements.[147] The Department of Finance advised that its role was to assist the Department of the Environment and Energy to:

> … help them develop and put forward new policy proposals and new spending proposals and we assist them with their reporting and all matters relating to the budget and general good governance …[148]

4.100 Evidence to the Committee detailed some of the process by which Antarctic asset replacement should occur. Following an Australian Government commissioned review, asset replacement processes had changed. At present, the Department of Finance advised the Committee that two mechanisms existed for this process.

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144 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 47.

145 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Hobart, 10 November 2017, p. 47.

146 Mr Bryson, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 10 November 2017, p. 53.

147 Ms Chris Schweizer, Assistant Secretary, Department of Finance, *Committee Hansard*, Canberra, 15 February 2018, p. 15.

148 Ms Schweizer, Department of Finance, *Committee Hansard*, Canberra, 15 February 2018, p. 14.

4.101 For 'minor assets'—those valued at $10 million or less—the Committee was advised that agencies could fund such projects from within their current budget appropriations.[149] The second mechanism—which applied to assets which were valued at above that threshold amount—would need to meet the requirements for a new spending policy proposal and would need to go through the ordinary budget processes and comply with all the budget process rules.[150]

4.102 The Department of the Environment and Energy expressed a concern that:

> The problem we have with Antarctica assets is, of our 3,300 assets, most are below the $10 million threshold and that is the practical effect of that. In essence, if you think over four years, that can amount to $80 to $100 million of capital funding that hasn't been available to manage those assets because of the difference in the depreciation funding. It's the cumulative effect of your ability to maintain minor assets.[151]

4.103 In terms of the Department of the Environment and Energy's internal processes to identify its priorities for asset replacement, the Committee was advised that the AAD participated in the wider internal budget bidding process conducted within the Department.[152] The AAD advised that it maintained a list of its asset replacement priorities in the order in which replacement was required. Urgent asset replacement was undertaken within the Division's capital budget.[153]

4.104 It was stressed that, consistent with the Department of Finance's processes, funding for minor projects required an offset within the Department's existing budget.[154] The Department of Finance noted however that, as part of the budget process, Ministers were also able to determine relevant priorities within their portfolios. These priorities were:

> … choices that individual ministers and portfolios make in any budget as to which is their greatest priority and what the minister

149 Ms Amanda Lee, First Assistant Secretary, Department of Finance, *Committee Hansard*, Canberra, 15 February 2018, p. 14.

150 Ms Lee, Department of Finance, *Committee Hansard*, Canberra, 15 February 2018, p. 14.

151 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

152 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

153 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

154 Mr Cahill, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 23.

> then decides to put forward in the budget process, and it may or may not be asset replacement at that time.[155]

4.105 From a more strategic perspective, the AAD noted that, apart from the Department's engagement with the Department of Finance to manage its asset replacement requirements it has used the *Australian Antarctic Strategy and 20 Year Action Plan* to assess its stations and provide the Australian Government with an assessment of modernisation and refurbishment requirements.[156] Since the commencement of the inquiry, the AAD advised that this process had taken a 'system-level approach' to ensure that analysis could be conducted to assess when it was likely that assets may fail.[157]

## Hobart Airport

4.106 In addition to Hobart's port facilities, which are discussed in chapter 6, Hobart Airport is one of the key international gateways into Antarctica from Australia. The airport is a key element of the AAP's aviation capacity. The *Australian Antarctic Strategy and 20 Year Action Plan* states that the Australian Government has previously committed:

> Funding of $38 million to extend the runway at Hobart International Airport to stimulate international engagement, growth in Tasmania's Antarctic sector, and support for the Australian Antarctic programme.[158]

4.107 While the Committee was advised that the runway extension would be completed in March 2018[159], the project was actually completed in February 2018.[160]

4.108 Mr Matthew Cocker from Hobart International Airport advised that Hobart Airport was building facilities to accommodate both the capacity for cargo freight facilities and Defence's ongoing C–17A Globemaster

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155 Ms Schweizer, Department of Finance, *Committee Hansard*, Canberra, 15 February 2018, p. 16.

156 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 24.

157 Mr Bryson, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 25.

158 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 25; and Hobart Airport, *Submission 2*, p. 1.

159 Mr Matthew Cocker, Interim Chief Executive Officer, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 2.

160 The Hon. Paul Fletcher MP, Minister for Urban Infrastructure and Cities, 'Hobart Airport to soar thanks to $40 million runway extension', *Media release PF012/2018*, 21 February 2018.

operations.[161] In addition, Hobart Airport was conducting a feasibility study regarding how its services could be supported and also be made attractive to other countries.[162]

4.109 Mr Cocker told the Committee that the airport had a strong relationship with the AAD. The airport had seen an increase in aviation activity as a result of the aviation support provided to the AAP through use of both the C–17A Globemaster and A319.[163]

4.110 The appeal of Hobart Airport's capacity to support Antarctic activity was supported by a variety of inquiry stakeholders. IMAS noted that further development at Hobart Airport would:

> … provide important opportunities to enhance collaboration with traditional partners such as France, but also open up potential logistic arrangements with other Antarctic programs active in East Antarctica (including China and India).[164]

4.111 The Tasmanian Polar Network also suggested that commercial opportunities for aviation tourism into East Antarctica should be explored along with related infrastructure assets that would be required, 'without impacting on the operational capacity of the AAD.'[165]

## Committee comment

4.112 Australia's Antarctic stations and the overall AAP form the core of Australia's international and scientific engagement in Antarctica. This engagement is underpinned first and foremost by the committed Australians whose work supports the objectives outlined in the *Australian Antarctic Strategy and 20 Year Action Plan*.

4.113 The *Australian Antarctic Strategy and 20 Year Action Plan* forms part of the Australian Government's significant investment in its Antarctic science engagement and infrastructure assets and the Committee is pleased to see that there is a clear intention to enhance both of these sectors.

161 Mr Cocker, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 2.

162 Mr Cocker, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 7.

163 Mr Cocker, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 2.

164 IMAS University of Tasmania, *Submission 8*, p. 2.

165 Tasmanian Polar Network, *Submission 1*, p. 4.

4.114 Australia maintains a significant base of Antarctic assets which include its four major Antarctic stations, a broad range of transport and logistical capabilities and, science, policy and administration facilities in Hobart.

## Infrastructure assets in Antarctica

4.115 Australia's four major Antarctic stations—Davis, Casey, Mawson and Wilkins Aerodrome—provide the AAP with a strong base from which to further its scientific and international engagement.

4.116 The Committee acknowledges observations from the AAD that highlight the need for stations to be safe and efficient. The Committee also notes that Australia's Antarctic stations are ageing, with the last major works having been conducted some 20 years ago.

4.117 While the Committee commends the Australian Government for undertaking a much needed overhaul of the facilities at Macquarie Island, and for stating its intention to upgrade key Antarctic stations, detailed planning for the modernisation of the other facilities needs to begin now. This is particularly important in the Antarctic context because of the long timeframes required due to the conditions on the continent.

4.118 Members of the Committee were fortunate to have had the opportunity to visit the stations at Wilkins Aerodrome and at Casey during the inquiry. The visit allowed a unique opportunity for the Committee to keenly understand the extreme temperatures, isolation and logistical issues experienced by personnel supporting the AAP, and to appreciate how these factors contribute to a difficult working and operational environment. The Committee was struck by the scale of the efforts required to support the AAP, and was impressed by the clear commitment and dedication of staff supporting the Program.

4.119 In the Committee's view, there is an urgent need to ensure that Australia's Antarctic scientists and infrastructure specialists are able to work in safe and modern facilities—such plans have already been progressed by a number of other national Antarctic programs. As such, the Australian Government must give more immediate consideration to planning the Antarctic station modernisation program.

4.120 In developing plans to modernise the Antarctic stations, the Australian Government should consider a broad range of design, environmental and occupational health and safety principles with broad consultation of architectural and engineering professionals. Any construction activity should be consistent with international best practice and make the most efficient and effective use of Commonwealth funds. Consideration should

be given to opportunities to innovate, such as through building modular station facilities in Australia.

**Recommendation 4**

**The Committee recommends that the Department of the Environment and Energy, consistent with its commitments in the *Australian Antarctic Strategy and 20 Year Action Plan*, prepare a detailed plan and a timeline for the upgrade and modernisation of Australia's Antarctic research stations.**

### Waste remediation

4.121 The Committee notes the Australian Government's commitments relating to waste remediation under the *Australian Antarctic Strategy and 20 Year Action Plan*. The Committee considers that the proposed development of a clean-up strategy for legacy waste should be completed in a timely manner. Waste remediation should also be considered as part of the future modernisation program for Australia's Antarctic stations. Where appropriate, the Australian Government should work with the Tasmanian Government to provide Tasmanian businesses with access to the economic opportunities that may arise as a result of waste repatriation from Antarctica.

**Recommendation 5**

**The Committee recommends that the Department of the Environment and Energy prioritise waste remediation once the new icebreaker is operational, given the increased capacity to carry material including waste.**

## Transport and logistical capabilities

4.122 The distances that are required to be covered both from Australia to Antarctica and within the continent itself are immense. The Committee is pleased to have received evidence that highlights Australia's strong and growing capacity in Antarctic aviation. In particular, some members of the Committee had the opportunity to fly to and inspect the facilities at

Wilkins Aerodrome. The visit provided the Committee with an opportunity to see first-hand some of the infrastructure that is available to the AAP and importantly, to meet the dedicated staff without whom, Australia's aviation capacity would not be possible. It should also be acknowledged that without the support of both commercial and Defence aviation capabilities, that many of the science and infrastructure projects along with staffing movements in Antarctica would be very difficult.

4.123 With respect to Wilkins Aerodrome, the Committee notes evidence provided by Defence that a number of improvements to the Aerodrome would provide greater mission capability and mission assuredness. As part of its program to assess the needs of Australia's Antarctic stations, the Department of the Environment and Energy should consider these proposals and work with the Department of Defence to implement these in a timely manner. The Australian Government should also consider how aviation assets in Tasmania, such as Hobart Airport, can continue to provide strategic value for the Commonwealth.

## Proposal for year-round aviation access

4.124 The Committee strongly endorses the Australian Government's commitment to developing a business case for year-round aviation capacity in Antarctica. The proposal was met with enthusiasm by inquiry participants and in the Committee's view would bring the AAP's aviation capacity in line with that of other major international Antarctic programs.

4.125 The Committee acknowledges that development of a year-round runway in such a remote and hostile location would come at a significant cost, beyond what might be considered appropriate on the mainland. Nevertheless, the Committee considers this an exceptional opportunity that has both practical and strategic benefits, particularly when other nations might be considering bolstering their capabilities in East Antarctica. Consequently, the Committee considers that as a matter of priority the Australian Government should provide the Department of the Environment and Energy with an enhanced capacity to develop the business case for a year-round runway, along with a detailed strategic case to underpin the proposal.

4.126 It should be noted that the Committee has concerns about the term 'business case' as it is used in the context of the proposal for the year-round runway in Antarctica. Given the naturally higher cost of infrastructure projects in Antarctica, as discussed above, such costs may exceed the expected benefits as assessed under a standard 'business case'. The Committee is concerned that the vital strategic considerations may not

be appropriately factored into a traditional business case process, and therefore calls for a 'strategic case' to be prepared. Such business and strategic cases must also consider the activities of other countries in East Antarctica, and how this may affect Australia's strategic interests and opportunities to cooperate. Following the development of these cases, the investment decision should be expedited.

**Recommendation 6**

**The Committee recommends that the Australian Government provide the Department of Environment and Energy with an enhanced capacity to develop a business and strategic case for year-round aviation in Antarctic. The Committee further recommends that the investment decision be made by December 2019 at the latest.**

## Icebreaking and marine research capabilities

4.127 Icebreaking and marine research capability are a major strength of the AAP. The Committee is pleased to note that the AAD's new icebreaker, *RSV Nuyina,* will be in service in 2020–21 and notes that it will provide the AAP with significantly enhanced icebreaking and marine research capabilities. Until that time, the Australian Government must ensure that the current icebreaker, the *Aurora Australis,* remains compliant with the International Maritime Organisation's Polar Code and any other international instruments as required.

4.128 While the Committee welcomes the development of *RSV Nuyina*, it is mindful that a range of other factors must be considered in order to ensure that the benefits of this new capability are fully realised. This includes ensuring that staff are trained to use the new capabilities that the ship will bring, increasing data management capabilities to store the data that it will collect, and ensuring that supporting infrastructure—such as port facilities—are able to meet the ships requirements. More broadly, accommodation and facilities in Antarctica will need to be re-examined as more staff are able to access the continent. These factors are considered in further detail throughout this report, and each should be considered a matter of priority to enable full utilisation of *RSV Nuyina* when it becomes operational.

4.129 During the course of the inquiry, the Committee raised concerns with CSIRO and others about the availability of CSIRO's research vessel, the *RV Investigator*. In particular, the Committee is concerned that, while

designed to be operated for up to 300 days, the vessel was currently only funded by the Australian Government to operate for 180 days. The Committee considers that this is a significant gap in Australia's marine research capabilities and believes that the Australian Government should take steps to ensure that the vessel is operating at full capacity or seek to ensure that appropriate commercial arrangements are made. Consideration should be given as to how this may be encouraged—such as through matching the financial commitments of any non-government funding arrangements that are made.

**Recommendation 7**

**The Committee recommends that CSIRO explore further opportunities to ensure that the *RV Investigator* is able to operate at its full capacity. Consideration should be given to whether incentives can be developed to encourage non-government marine research activities using the vessel.**

### Overland traverse capabilities

4.130 The Committee notes the Australian Government's commitment to restoring its overland traverse capability to enhance its scientific research activities in Antarctica. As part of its visit to Tasmania in November 2017, the Committee visited the premises of William Adams Pty Ltd, a company that specialises in the customising of vehicles used for Antarctic overland traverse capability. The Committee was advised that William Adams had supplied a range of such vehicles to a number of national Antarctic programs, including the AAP. While this matter is addressed in more detail in chapter 6, the Committee supports the importance of this capacity in terms of its usefulness in Antarctica and also as an economic development opportunity within Tasmania.

## Infrastructure assets in Hobart

4.131 Hobart is strategically located as an international Antarctic gateway. While the economic opportunities available to the city are addressed later in this report, there are a number of issues which pertain to the infrastructure assets of the AAP that are considered here.

4.132 The AAD's facilities in Kingston provide key science, policy and maintenance capacity for the AAP. The Committee considers that the AAD's location, some 13 kilometres from the Hobart CBD, presents

challenges in engaging with key stakeholders, efficient operations and effective community education, and outreach and tourism opportunities.

4.133 The Committee notes evidence from the AAD that its lease in Kingston is due to expire in 2024. The Committee understands that a dedicated Antarctic science hub can be developed at the Macquarie Point Precinct adjacent to the Hobart CBD and port. To facilitate this, the Committee considers that the AAD should pursue the lease of new facilities at Macquarie Point for some of their operations. In the Committee's view, relocation of some functions could create a range of synergies with other Antarctic stakeholders and Hobart's growing Antarctic infrastructure capabilities. It could also positively impact Antarctic tourism from Australia, and provide the AAD with more engaging public facing facilities. The development of a business case should be commenced at the earliest opportunity so to minimise any disruption to the operations of the AAP.

**Recommendation 8**

**The Committee recommends that the Australian Government examine options for the co-location of relevant institutions in the proposed Macquarie Point Antarctic Precinct, including the relocation of CSIRO, CCAMLR, the Tasmanian Polar Network, part of the Bureau of Meteorology, and components of the Australian Antarctic Division.**

## Governance and funding

4.134 The AAD's important operations come at a significant cost to the Commonwealth, and the Committee acknowledges the substantial additional commitment to be made by the Australian Government as part of the *Australian Antarctic Strategy and 20 Year Action Plan*. However, the Committee notes that this commitment is necessary to meet Australia's national and strategic interests.

4.135 Evidence to the inquiry suggests that there may be a need to consider how the strategic value of the AAD to the Commonwealth is captured. The Committee is concerned that current business cases relating to the AAP do not adequately account for the strategic value of continued operations within the region. For example, there may be benefit in formalising input from the Department of Foreign Affairs regarding the AAD's contribution to Australia's strategic interests. Mechanisms to provide the Division with enhanced budget certainty given the longer term horizon of its work and

capital requirements may also be required. This could include reconsidering the application of efficiency dividends to the AAD's portion of the broader Department of the Environment and Energy budget.

**Recommendation 9**

**The Committee recommends that the Australian Government consider how the strategic value of the Australian Antarctic Division to the Commonwealth is captured, and develop mechanisms to provide the Australian Antarctic Division with enhanced budget certainty and funding, in light of its work and capital requirements.**

## Asset management and replacement

4.136 Australia's Antarctic asset base is significant and evidence to the Committee suggests that there are significant proportions of this base that have either reached or will reach the end of its usability over the coming years. In particular, the Committee was concerned at the Department of Environment and Energy's contention that its current asset replacement trajectory would take some 61 years to complete at the current rate.

4.137 The Committee notes the work that the Department of the Environment and Energy has begun to conduct in the assessment of the life of these assets. The Committee also appreciates the engagement of the Department of Finance with the inquiry to clarify the process by which Antarctic asset replacement can occur. In the Committee's view, there is a paramount need for the Department's assessment of its ageing asset base to be completed and where necessary, appropriate business cases prepared for replacement assets. This is particularly important where a case needs to be made for new spending proposals through the Australian Government's budget process.

### Recommendation 10

**The Committee recommends that the Department of the Environment and Energy work to complete its assessment of Australia's ageing Antarctic asset base, separate from Australia's Antarctic stations, as soon as practicable. Where appropriate, relevant business cases should be developed, particularly where a new spending proposal is required to be managed through the Australian Government's budget processes.**

# 5

# Serving the scientific program into the future

5.1 Australia's Antarctic science program has been an enduring feature of Australia's engagement on the continent. The nation's leadership and engagement in Antarctic science underpins Australia's presence. As highlighted in this report, Antarctic science is a focus of many national Antarctic programs and, for Australia to remain at the forefront of science and engagement on the continent, a renewed focus on its own program is required.

5.2 This chapter considers a range of matters including:

- Australia's Antarctic science framework including Australia's leadership in Antarctic science and the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*;
- Australia's particular areas of Antarctic science expertise;
- how Australian Antarctic science is resourced including the future of the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), the development and maintenance of a scientific workforce, improved training opportunities and how data is stored, managed and used;
- consideration of scientific collaboration agreements and intellectual property issues; and
- some of the wider applications for which Antarctic science may be utilised.

## Antarctic science framework

5.3 Science is the currency of influence in Antarctica, and Australia's expertise in Antarctic science is globally renowned. As such Australia's Antarctic science capabilities are a major strand of Australian engagement and influence on the continent.[1]

5.4 Australia's scientific effort is led by the Department of the Environment and Energy's Australian Antarctic Division (AAD). The AAD is responsible for the delivery of the Australian Antarctic Program (AAP), including one third of the projects undertaken under the auspices of the Australian Antarctic Science Program. The remainder are undertaken by Australian research institutions, and in some cases in partnership with international collaborators.[2]

5.5 Australia's Antarctic science framework is underpinned by the Australian Government's commitments as part of the *Australian Antarctic Strategy and 20 Year Action Plan*. The Plan outlines the Australian Government's commitment to delivering a revitalised science program.[3]

5.6 In particular, the Plan provides for a coordinated and effective approach to the funding of Antarctic science. It also considers opportunities for public-private partnerships to conduct new and iconic scientific research endeavours, through an Antarctic Foundation. The Plan also provides for a review of the *Australian Antarctic Science Strategic Plan 2011-12 to 2020-21* to be completed, revising and extending the Plan for a further five years.[4]

## Australian science leadership in Antarctica

5.7 Australia has played a leadership role in Antarctic affairs since the inception of the Antarctic Treaty System (ATS). As outlined in chapter 3, Australia has an extensive record in international leadership and collaboration in Antarctica.

5.8 With respect to Australia's leadership in the field of Antarctic science, the Department of Environment and Energy advised the Committee that Australia works closely with a range of government agencies and research

1 Department of the Environment and Energy, *Submission 13*, p. 12.

2 Department of the Environment and Energy, *Submission 13*, p. 12.

3 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 3.

4 Department of the Environment and Energy, *Submission 13*, p. 1.

establishments in supporting 'Australia's reputation as a science leader in Antarctica.'[5]

5.9 The Institute of Marine and Antarctic Studies (IMAS) noted that Australia has shown its leadership credentials through its active participation—and in some cases chairing—a range of international Antarctic forums.[6] The Institute noted that Australia's unique Antarctic scientific research program which links the AAD with other cooperative research partnerships sets it apart from the scientific efforts of other 'long-established Antarctic nations and [has been] materially responsible for the significant scientific contribution Australia has made to the ATS.'[7]

5.10 The Institute, however, highlighted its concern that Australia's leading role in Antarctica was at risk:

> Fundamentally Australia will lose its scientific capability for Antarctic science if it cannot maintain critical mass of scientific expertise and an ability to provide the necessary logistical support to undertake Antarctic science programs, especially deep-field science, ice shelf and ice sheet observations, and a maintained presence for Southern Ocean observations (physical, chemical and biological).[8]

5.11 This sentiment was echoed by a number of inquiry participants. In particular, concerns were raised about a perceived decline in Australia's standing as a scientific leader on the continent. Commentary also focussed on how Australia's relative position in the field could be impacted by the recent work of other Antarctic nations.

5.12 The Australian Academy of Science, for example, submitted that Australia's 'ability to influence affairs in the region is dependent on its scientific credibility and noted that those:

> … countries that are not original signatories to the Treaty only achieve decision-making status by conducting substantial research activity in the region.[9]

5.13 The Academy also submitted that, while Australia has a strong record in the production of scientific papers,[10] Australia's 'scientific activity and output have declined substantially.'[11]

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5 Department of the Environment and Energy, *Submission 13*, p. 10.

6 Institute for Marine and Antarctic Studies (IMAS) University of Tasmania, *Submission 8*, p. 1.

7 IMAS University of Tasmania, *Submission 8*, p. 2.

8 IMAS University of Tasmania, *Submission 8*, p. 2.

9 Australian Academy of Science, *Submission 4*, p. 2.

## *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*

5.14 The *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21* was launched in 2010 and is intended to guide the Australian Antarctic Science Program over the period of a decade.[12] The Department of the Environment and Energy advised that Australia's research program covers physical and life sciences in the terrestrial, marine and atmospheric domains built around four themes:

- Climate processes and change;
- Terrestrial and nearshore ecosystems: environmental change and conservation;
- Southern Ocean ecosystems: environmental change and conservation; and
- Frontier science.[13]

5.15 The *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21* establishes the framework under which Australian entities contribute to Australia's Antarctic science effort. The Plan notes that there are 'logistical and budgetary limits on the amount of science that can be supported by the Australian Government in the Southern Ocean and Antarctica, which will vary from time to time in line with government priorities.'[14] As such, there will be a need to prioritise across and within these themes.[15]

5.16 The Department of the Environment and Energy advised that the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21* was currently being evaluated to 'identify new and emerging strategic drivers for Antarctic science'.[16] The Department advised that this evaluation will include assessing the progress made toward achieving the Plan's goals since its launch. The evaluation will inform the revision and extension of the Plan consistent with the commitments under the *Antarctic Strategy and*

10 Australian Academy of Science, *Submission 4*, p. 4.

11 Australian Academy of Science, *Submission 4*, p. 4. See also Professor Steven Chown, Chair, National Committee for Antarctic Research, Australian Academy of Science, C*ommittee Hansard*, Canberra, 19 October 2017, p. 5.

12 Department of Sustainability, Environment, Water, Population and Communities,, *Australian Antarctic science strategic plan 2011–12 to 2020–21*.

13 Department of the Environment and Energy, *Submission 13*, p. 5.

14 Department of Sustainability, Environment, Water, Population and Communities, *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21,* p. 2.

15 Department of Sustainability, Environment, Water, Population and Communities, *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, p. 2.

16 Department of the Environment and Energy, *Submission 13*, p. 12.

*20 Year Action Plan*.[17] Following evaluation, a revised Plan will be made available for public consultation.

## Australian expertise

5.17 Australia's Antarctic scientists are producing world class research. Through the AAP and other international and domestic scientific collaborations, there are abundant examples of Australian scientific expertise at work. While it is beyond the scope of this report to provide a complete assessment of the entire scientific endeavour being undertaken by Australians, the Committee's inquiry uncovered a vast array of scientific projects being undertaken by Australians or by Australian Antarctic entities.

5.18 For example, evidence to the Committee highlighted Australian scientists' contributions to global Antarctic science efforts through a broad range of projects including:

- A joint initiative between the Commonwealth and Tasmanian governments to develop a virtual centre for Antarctic remote and maritime medicine based on Australia's particular strength in remote medicine in Antarctica.[18]
- CSIRO collaborative research into the Antarctic atmosphere through observations of greenhouse gases and related tracers at Casey, Mawson, and Macquarie Island,[19] as well as the management of a number of major research projects through the Integrated Marine Observing System.[20]
- A broad range of accelerator-based programs linked to Australia's Antarctic activities and conducted by the Australian Nuclear Science and Technology Organisation, such as 'paleo-climate studies based on the characterisation of naturally occurring cosmogenic isotopes in rock,

17 Department of the Environment and Energy, *Submission 13*, p. 12. See also Mr Mark Kelleher, Chief Executive Officer, Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), *Committee Hansard*, Hobart, 10 November 2017, p. 22.

18 Ms Karen Rees, Director, Antarctic Tasmania and Maritime Industries, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 17.

19 Department of Industry, Innovation and Science, *Submission 16*, p. 4.

20 Dr Anthony Worby, Director, Oceans and Atmosphere, Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Committee Hansard*, Hobart, 10 November 2017, p. 26.

ice, firn (old snow), firn air and ice core bubbles samples from Antarctica.'[21]

- A broad range of scientific activity conducted under the auspices of Geoscience Australia including geophysical monitoring, marine and terrestrial geoscience (research and mapping), Earth observations from space, and geospatial information and advice.[22]

5.19 Perspectives during the inquiry differed on whether Australia had a particular Antarctic science strength. Mr Mark Kelleher, Chief Executive Officer of ACE CRC, suggested that, rather than individual countries holding particular types of expertise, these skills were held by individuals as part of various collaborations. Scientific results derived through the expertise of individual researchers were then shared between collaborators.'[23]

5.20 In contrast, some contributors suggested that Australia did possess a range of expertise in Antarctic science. For example, it was suggested that Australia held specialisations in Antarctic medicine,[24] biogeochemistry (such as understanding the effects of ocean acidification), astronomy,[25] and marine geo-engineering.[26]

5.21 The Department of the Environment and Energy was supportive of the emphasis that the *Australian Antarctic Strategy and 20 Year Action Plan* placed on the management of krill and the strengthening of ice core science.

5.22 Antarctic krill is the main food source of numerous Antarctic vertebrates[27] and sustainable harvesting is critical to ensure that large predators can continue to rely on krill as their main source of food.[28] As part of the *Australian Antarctic Strategy and 20 Year Action Plan*, the Australian Government has committed to build research infrastructure in Hobart to

21 Australian Nuclear Science and Technology Organisation (ANSTO), *Submission 28*, p. 3.

22 Geoscience Australia, *Submission 6*, p. 5.

23 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 21.

24 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 17.

25 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 28.

26 Dr Jeffrey McGee, Senior Lecturer in Climate Change, Marine and Antarctic Law, IMAS and Faculty of Law University of Tasmania, *Committee Hansard*, 10 November 2017, p. 38.

27 IMAS University of Tasmania, 'Antarctic & Marine Plankton', 30 October 2015, <http://www.imas.utas.edu.au/research/ecology-and-biodiversity/antarctic-and-marine-plankton>, viewed 1 August 2017.

28 Department of Sustainability, Environment, Water, Population and Communities, *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, p. 47.

strengthen these capabilities to better contribute to the sustainable harvesting of krill.[29]

5.23 Another of the Australian Government's key scientific endeavours under the Plan focusses on its ice core research capability. The Department of the Environment and Energy advised that the *Australian Antarctic Strategy and 20 Year Action Plan* included a $45 million commitment to re-establish an overland science traverse capability to enable research in all parts of the Australian Antarctic Territory, and assist in locating and drilling a million year ice core.[30]

5.24 The Department of Industry, Innovation and Science submitted that CSIRO maintains an ice core 'library'. These ice cores:

> … contain climate and atmospheric composition information over the past three centuries with unparalleled resolution and precision. There are also air samples in tanks filled directly from the upper 'firn layer' of the Antarctic and Greenland ice sheets.[31]

5.25 The Department of Industry, Innovation and Science advised that data from the ice core records produced by CSIRO 'have appeared in all Intergovernmental Panel on Climate Change (IPCC) scientific assessments and numerous other scientific and policy documents by CSIRO …'[32]

## Resourcing Australian Antarctic science

5.26 Conducting Antarctic science requires a broad range of supports in addition to the core scientific assets and infrastructure maintained and operated by the Department of the Environment and Energy.[33] In particular, the inquiry was told that there is a need to maintain capabilities including a skilled scientific workforce. Scope also existed to further expand Australia's international education sector with respect to Antarctic science as well as improve communications, data, and information technology capacity. These issues are considered below.

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29 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 24.

30 Department of the Environment and Energy, *Submission 13*, pp. 2 and 9.

31 Department of Industry, Innovation and Science, *Submission 16*, p. 2. See also Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 26.

32 Department of Industry, Innovation and Science, *Submission 16*, p. 3.

33 Department of the Environment and Energy, *Submission 13*, p. 6.

## Funding and support for Australian Antarctic science

5.27 The manner in which Antarctic science is both funded and prioritised was an important theme of the Committee's inquiry, with inquiry participants commenting on the issue and proposing improvements.

5.28 The Committee heard that the AAD provides support for scientific research through logistical support and direct grants.[34] Approximately $1.05 million per year is allocated to scientists that are from organisations not funded by the Commonwealth.[35]

5.29 The Australian Academy of Science suggested that, while this direct grant initiative has provided excellent support for scientists in the past, there are signs that the overall support has declined.[36] In particular, the Academy noted that such grants:

> … often remain insufficient to cover employing research staff nor the running expenses of the kinds of high-end scientific research that is required to stay competitive in the Antarctic science arena, let alone maintain Australian leadership in world-class, high-priority Antarctic science.[37]

5.30 While some scientists have sought additional funding from entities such as the Australian Research Council, the Academy noted that there is no ability to coordinate different types of funding for research and logistical support.[38] It is hoped that the newly announced Antarctic Foundation under the *Australian Antarctic Strategy and 20 Year Action Plan* may alleviate part of this issue.[39]

5.31 Inquiry participants also commented on how Antarctic science is prioritised. As previously noted under the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, Antarctic science needs to be prioritised based on logistical and budgetary limits imposed by the priorities of the government of the day.[40]

5.32 Mr Mark Kelleher, ACE CRC, advised that '… within the Antarctic Division, there is a process to prioritise the proposals that come through

34 Australian Academy of Science, *Submission 4*, p. 3.

35 Australian Academy of Science, *Submission 4*, p. 3.

36 Australian Academy of Science, *Submission 4*, p. 3.

37 Australian Academy of Science, *Submission 4*, p. 6.

38 Australian Academy of Science, *Submission 4*, p. 6.

39 Australian Academy of Science, *Submission 4*, p. 6; University of Queensland, *Submission 32*, p. 6.

40 Department of Sustainability, Environment, Water, Population and Communities, *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, p. 2.

and how closely they align …' to the *Australian Antarctic Strategy and 20 Year Action Plan*.[41]

5.33 The Australian Academy of Science proposed further direct funding of science and larger total grants to enable complex projects to be conducted. It also recommended that an enhanced formal collaboration between the Academy's National Committee on Antarctic Research and the AAD would help 'facilitate coordination of national scientific interests in the Antarctic region and help inform the Australian Antarctic Program of new scientific developments in the region.'[42]

5.34 Dr Tony Press, a former Director of the AAD, submitted that the Australian Government should maintain the 'hybrid system' of science delivery that involves government agencies and the non-government research sector. He recommended that 'priorities be set from time to time and regularly reviewed to ensure that the Antarctic science program is relevant to Government.'[43]

5.35 Geoscience Australia told the Committee that in terms of its own work, it both competes on merit against other scientific researchers during 'open calls for scientific research' and also collaborates with the AAD, where strategic projects such as mapping could be prioritised and used to enable other scientific activity.[44]

## Future of ACE CRC funding

5.36 One of the areas of concern during the inquiry was in relation to the future funding of the ACE CRC. The ACE CRC, which was established in 1991 and is based in Hobart,[45] conducts multidisciplinary research in Antarctica and the Southern Ocean that delivers directly against Australia's national research priorities and *Australia's Antarctic Science Strategy 2011–12 to 2020–21*.[46]

5.37 According to the Department of Industry, Innovation and Science, the ACE CRC is '… currently in its fifth round of CRC Programme funding with a commitment of Australian Government funding of $25 million over

41 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 24.

42 Australian Academy of Science, *Submission 4*, pp. 6–7.

43 Dr Tony Press, *Submission 5*, p. 2.

44 Dr Stuart Minchin, Chief, Environmental Geoscience Division, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, p. 14.

45 Department of Industry, Innovation and Science, *Submission 16*, p. 1.

46 ACE CRC , *Submission 11*, p. 1; Department of Industry, Innovation and Science, *Submission 16*, p. 1; Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 25.

the period 2014–19.'[47] The Committee heard that in June 2019, Australian Government funding for the ACE CRC would cease.

5.38 Mr Mark Kelleher of the ACE CRC, explained that its funding would cease for two reasons. Firstly, under changes to the guidelines underpinning cooperative research centres 'organisations that had been in the CRC program for more than 10 years would no longer be eligible …'[48] Secondly, the guidelines now directed funding to organisations that are 'more about business-led and more direct commercial outcomes than long-term public benefit or national interest science'.[49] Given this ineligibility, for its work to continue, Mr Kelleher advised the Committee that 'we need an alternative funding source and pathway for that funding which has not been identified at this stage.[50]

5.39 Mr Kelleher told the Committee that Australia had made significant investment in its Antarctic infrastructure and assets. This however was not matched by science funding and he told the Committee that scientific activity in Antarctica was required to ensure Australia's Antarctic presence was optimised.[51]

5.40 Mr Kelleher advised the Committee the value of his organisation's funding over a five year period — about $25 million — could be translated into about $160 million worth of scientific activity once leveraging from its collaborative engagement was accounted for.[52] The cessation of funding would also impact staff at ACE CRC. Mr Kelleher advised that while the employment of some staff was funded from the direct allocation provided by the Australian Government, other staff are provided on an 'in-kind' basis by joint-venture partner entities.[53]

5.41 Inquiry contributors impressed on the Committee the impact that ACE CRC's closure would have. The Australian Academy of Science submitted its concerns to the Committee; noting that the loss of ACE CRC would result in a significant erosion of Antarctic science capability.[54]

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47 Department of Industry, Innovation and Science, *Submission 16*, p. 1; Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, pp. 21–22.

48 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 23.

49 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 23.

50 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 22.

51 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 23.

52 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 23.

53 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, pp. 21–22; Dr Worby, Director, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 33; CSIRO, *Submission 29.1*, p. 1.

54 Australian Academy of Science, *Submission 4*, p. 5.

Dr Anthony Worby from CSIRO, told the Committee that the CRC was one of CSIRO's collaborative partners and that the 'loss of that funding stream would be a significant hit to CSIRO and the work that we do in that space.'[55]

5.42 Some inquiry contributors called for the Australian Government to consider how ACE CRC's funding could continue.[56] In response, the Department of Industry, Innovation and Science advised the Committee that it is working with ACE CRC and the Department of the Environment and Energy to explore options post 2019 for the Government's support of Antarctic research.[57]

5.43 Mr Richard Fader, Chairman of the Tasmanian Polar Network, told the Committee that the Network views the ACE CRC as an important part of the Antarctic science collaborative effort, particularly given its links to other Antarctic programs and industry.[58] With respect to the programs being run by ACE CRC, Mr Fader noted that:

> They're not something we can stop at the end of that period of funding without doing some significant damage to our standing in the science community. That's why we believe that the continued funding is essential. It brings together a lot of different disciplines into one spot.[59]

5.44 Mrs Lara Hendriks, of the Tasmanian Department of State Growth, also said that the Tasmanian Government called upon the Australian Government to provide funding certainty to ensure that the work of the ACE CRC could continue.[60]

5.45 It should also be noted that, in 2014, the Senate Standing Committee on Foreign Affairs, Defence and Trade also recommended that the Australian Government commit to the extension of funding for existing

55 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 32.

56 Department of Industry, Innovation and Science, *Submission 16*, p. 2; Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 10.

57 Department of Industry, Innovation and Science, *Submission 16*, p. 1; Dr Nicholas Gales, Director, AAD, Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, p. 10.

58 Mr Richard Fader, Chairman, Tasmanian Polar Network , *Committee Hansard*, Hobart, 10 November 2017, p. 10.

59 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 10.

60 Mrs Lara Hendriks, Acting General Manager, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 13.

collaborative initiatives that support Antarctic and Southern Ocean scientific research.[61]

## Australian science workforce

5.46 Two key concerns were raised regarding the state of Australia's Antarctic science workforce.

5.47 Firstly, despite the improvement to Australia's Antarctic infrastructure, such as the new icebreaker, the Australian Academy of Science submitted to the Committee that:

> … staff capability to make scientific use of these assets has not kept pace with the developments. Indeed, the numbers of research scientists capable of making full use of the assets has declined …'[62]

5.48 Geoscience Australia shared a similar view, noting that the operation of multibeam sonar equipment, which will be used for the collection of 'unprecedented amounts of…data' on board the new icebreaker, will require skilled staff at sea to:

> … operate the systems, oversee the data collection process and manage the data. Further, processing the data in real time maximises the value of the equipment. Experience with multibeam sonar systems to date shows that the processing of data after the survey requires 10 times as long as during acquisition.[63]

5.49 Secondly, some concerns were also raised about the ability of Australian government agencies to staff their Antarctic science programs effectively. In particular, the Australian Academy of Science cited staff reductions at the AAD and CSIRO, and reduced funding through the national competitive grants process, as contributing to the declining scientific workforce.[64] In some cases, full time positions had been replaced with short term contract work.[65] CSIRO submitted that its Antarctic science workforce had been reduced as a result of a restructure of programs.[66]

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61 Senate Foreign Affairs, Defence and Trade References Committee, *Australia's future activities and responsibilities in the Southern Ocean and Antarctic waters*, 29 October 2014, p. 61.

62 Australian Academy of Science, *Submission 4*, p. 4; Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 5.

63 Geoscience Australia, *Submission 6*, p. 16; ACE CRC, *Submission 11*, p. 2.

64 Australian Academy of Science, *Submission 4*, p. 4.

65 Australian Academy of Science, *Submission 4*, p. 4.

66 *CSIRO*, *Submission 29*, p. 2.

5.50 The Committee heard that the impacts of reduced staff had been felt across the Antarctic science community. For example, the Australian Academy of Science highlighted that some Australian Antarctic scientists had either redirected their skills to other research areas or 'transferred their efforts to collaborations led by other countries.'[67] CSIRO noted that its collaboration with the AAD was mainly through projects conducted by ACE CRC, and the loss of staff at the AAD had had limited impact on CSIRO in terms of its Antarctic and Southern Ocean research.[68]

5.51 The Community and Public Sector Union also highlighted significant reductions to Australia's Antarctic science staffing levels in recent years. In particular, it cited reductions to scientific staff levels at the AAD which had disproportionately affected areas involved in science and data collection.[69] The Union submitted that these reductions had meant 'significant increased workloads for the remaining staff.'[70] Evidence to the Committee also suggested that scientific research staff at collaborative organisations, such as the ACE CRC, would be affected by an impending loss of funding.[71]

## Antarctic science education and training

5.52 Education, research and training are further areas of significant opportunity for Australia, both economically and in the development of its Antarctic science workforce.

5.53 IMAS told the Committee of its own degree program that partners with a university in China to deliver a joint program, and its outreach education programs which run in countries such as Iceland and Iran.[72] As part of this and other international programs, Australian Antarctic researchers are involved in teaching.[73]

5.54 In Australia, there is a range of educational opportunities for domestic and international students to participate in Antarctic science programs in

67 Australian Academy of Science, *Submission 4*, p. 5.

68 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 33.

69 Community and Public Sector Union (CPSU), *Submission 7*, p. 2.

70 CPSU, *Submission 7*, p. 2.

71 ACE CRC, *Submission 11*, p. 2.

72 IMAS University of Tasmania, *Submission 8*, p. 3.

73 Dr McGee, IMAS and Faculty of Law, University of Tasmania, *Committee Hansard*, 10 November 2017, p. 36 and 38.

Hobart, adding to the city's multicultural diversity.[74] The Institute stated that it works with partners such as the Australian Research Council in:

> … providing significant opportunities for young scientists at postdoctoral and junior research level to undertake really amazing research and innovative science with new technologies that also links with the Australian Maritime College and the University of Tasmania … .[75]

5.55 Mr Mark Kelleher advised that, in addition to undertaking its scientific work, the ACE CRC was a critical pathway for new graduates and postdoctoral staff who are supervised by more experienced researchers. Early career researchers, he said, build up:

> … expertise, capability, confidence and networks across the world move on from us over time into other organisations both in Australia—partners and otherwise—and internationally.[76]

5.56 The Committee heard that additional opportunities exist for Australian expertise to be used in providing technical training, such as through training courses on the International Maritime Organization's International Code for Ships Operating in Polar Waters in January 2017.[77]

## Data storage, management and use

5.57 As Antarctic science is not 'owned' by any nation, it requires a collaborative approach to data storage and management. Geoscience Australia suggested that there was a need to both develop a data acquisition and data management plan for the new icebreaker,[78] and develop digital infrastructure capabilities which will enable scientists to store, manage, discover, share and use Antarctic data.[79] This was supported by other inquiry contributors.[80]

5.58 Geoscience Australia submitted that, in order to provide comprehensive seabed mapping, Antarctic research vessels need to be equipped with

74 Professor Marcus Haward, Professor, Ocean and Antarctic Governance, IMAS, University of Tasmania, *Committee Hansard*, Hobart, 10 November 2017, p. 35.

75 Professor Haward, IMAS, University of Tasmania, *Committee Hansard*, Hobart, 10 November 2017, p. 34.

76 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, pp. 21–22.

77 IMAS, University of Tasmania, *Submission 8*, p. 3.

78 Geoscience Australia, *Submission 6*, p. 4.

79 Geoscience Australia, *Submission 6*, p. 4.

80 See for example: Professor Chown, ACE CRC, *Committee Hansard*, Canberra, 19 October 2017, p. 5.

suitable equipment such as multibeam echosounders.[81] The data produced by such devices can have multiple applications including the production of full-bottom coverage maps of seafloor topography and seafloor composition and texture, providing an improved understanding of broad-scale physical interpretation and marine biodiversity.[82]

5.59 As such, Geoscience Australia advised the Committee that the current icebreaker, *RV Aurora Australis*, has limited capacity to undertake these activities but that such facilities are available on CSIRO's *RV Investigator* vessel with support also available through smaller vessels operated by the AAD and Royal Australian Navy.[83]

5.60 Geoscience Australia added that the new icebreaker will have 'the capability, equipment and technology needed to map and sample the seafloor primarily along the Australian Antarctic Territory continental shelf and slope as well as the adjacent deep ocean abyssal basins.'[84] There will also be increased capability through a new tender vessel that is part of the new icebreaker specifications.[85]

5.61 It is clear that Australia's new Antarctic capabilities will produce large amounts of data. Geoscience Australia advises that while it currently operates some digital infrastructure to store, manage and share marine geoscience datasets,[86] there is a need for additional data management capacity that also requires 'enhanced storage and management systems to avoid loss of data …'[87] This was a concept that was also supported by the University of Queensland.[88]

5.62 Geoscience Australia also commented on the steps it is taking to expand the capacity of its own digital infrastructure for its Antarctic scientists:

> Geoscience Australia is expanding the capability of its digital infrastructure in support of the National Collaborative Research Infrastructure Strategy and the Government's National Innovation and Science Agenda and Digital Transformation Agenda.[89]

81 Geoscience Australia, *Submission 6*, p. 14.
82 Geoscience Australia, *Submission 6*, pp. 14–15.
83 Geoscience Australia, *Submission 6*, p. 15.
84 Geoscience Australia, *Submission 6*, p. 15.
85 Geoscience Australia, *Submission 6*, p. 15.
86 Geoscience Australia, *Submission 6*, p. 15.
87 Geoscience Australia, *Submission 6*, p. 16.
88 University of Queensland, *Submission 32*, p. 7.
89 Geoscience Australia, *Submission 6*, p. 9.

5.63 Geoscience Australia highlighted the Australian Government's Digital Earth Australia initiative, a platform for satellite imagery and other Earth-related observations which will provide a 'unique capability to process, interrogate, and present Earth observation satellite data …'[90] Geoscience Australia advised that this system will allow for 'rapid answers to environmental policy issues such as water quality, biomass, and habitat mapping.'[91]

## Antarctic telecommunications

5.64 Given the Antarctic working environment, telecommunications infrastructure is necessary so that staff can both be in contact with counterparts outside of the continent and transmit scientific data.

5.65 The AAD maintains a range of telecommunications systems that include a network that links Australia's Antarctic research stations, summer stations, field bases, ships, and aircraft, and its headquarters in Kingston, Tasmania. It includes the broad spectrum of satellite systems, HF and VHF radio systems, computer networks and telephone systems which are maintained and operated by dedicated telecommunications personnel.[92]

5.66 The Department of the Environment and Energy advised that its assets included '648 ICT telecommunications and IT assets totalling $16.2 million.'[93] During the course of the inquiry, the Department entered into a contract with Australian telecommunications company Speedcast, to provide improved satellite communications infrastructure between its facilities.[94]

5.67 A number of inquiry participants commented on the communications infrastructure in Antarctica and how it could be improved. The Bureau of Meteorology advised the Committee that it uses the limited bandwidth provided by the AAD to transmit its data back to mainland Australia from

90 Geoscience Australia, 'Digital Earth Australia', <http://www.ga.gov.au/about/projects/geographic/digital-earth-australia>, viewed 22 February 2018.

91 Geoscience Australia, *Submission 6*, p. 9.

92 AAD, Department of the Environment and Energy, 'Telecommunications', 12 August 2010, <http://www.antarctica.gov.au/living-and-working/station-life-and-activities/telecommunications>, viewed 22 February 2018.

93 Department of the Environment and Energy, *Submission 13*, p. 6.

94 N Arboleda, 'Speedcast ousts Telstra with $4 million satellite deal in Australian Antarctic', 12 January 2018, <https://www.crn.com.au/news/speedcast-ousts-telstra-with-4-million-satellite-deal-in-australian-antarctic-480917>, viewed 16 January 2018.

its collecting facilities in Antarctica. [95] Dr Sue Barrell of the Bureau suggested that better communications infrastructure would improve the Bureau's use of data. [96]

5.68 Geoscience Australia submitted that improved telecommunications capacity could provide an economic opportunity for Australia. Earth observation satellites pass over Antarctica each day and collect a variety of information about the continent. According to Geoscience Australia, developing the capacity to 'up-link' scientific data between a satellite ground station in either Antarctica or Australia to orbiting satellites as they pass over Antarctica would provide Australia with an opportunity to 'make Australia the focus of attention for southern hemisphere remote sensing, a sought-after co-operator in international agreements, and provide new economic opportunities.'[97]

5.69 Such capacity would be attractive given Australia's time zone relative to Europe and North America.[98] Additionally, the development of an undersea communications cable to transmit such data from the ground station site would reduce operating costs providing value for many international satellite operators. Geoscience Australia proposed that data from this remote sensing capability could be stored in an 'Antarctic Geoscience Data Cube' which would attract scientists from around the world and be of interest to international space agencies.[99] Geoscience Australia advised that this could be included in an expanded version of the Digital Earth Australia program, which currently covers information about continental Australia's changing landscape and coastline.[100]

## Data sharing and intellectual property

5.70 The ATS specifies that information collected from Antarctic research should be open and shareable.[101] Evidence to the Committee supported this, with participants advising that intellectual property stemming from Antarctic Research is usually deemed to be in the 'global public benefit'.[102]

95 Dr Sue Barrell, Group Executive Science and Innovation, Bureau of Meteorology, *Committee Hansard,* Canberra, 19 October 2017, p. 22.

96 Dr Sue Barrell, Bureau of Meteorology, *Committee Hansard*, Canberra, 19 October 2017, p. 22.

97 Geoscience Australia, *Submission 6*, p. 18.

98 Geoscience Australia, *Submission 6*, p. 18.

99 Geoscience Australia, *Submission 6*, p. 25.

100 Geoscience Australia, *Submission 6,* p. 18.

101 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

102 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 21.

The Committee was interested to hear whether in practice data was being shared openly and if any concerns existed regarding intellectual property.

5.71 The AAD noted that, while Antarctic science data was often available to all researchers, in some circumstances data was embargoed for a period to allow researchers to write and publish their work.[103]
Professor Steven Chown from the Australian Academy of Science noted that countries such as Australia and the United Kingdom take very seriously the obligation to share data.[104] However, evidence to the Committee suggested that data is not always available on an open and shareable basis.[105] Professor Chown suggested that, in some cases, countries are limited in their ability to share data as they do not necessarily have the requisite capability.[106] He also highlighted that the AAD often assists countries to gain this capability.[107] Evidence to the Committee also suggested that issues concerning the sharing of data could often be resolved between individual researchers.[108]

5.72 Some inquiry contributors also highlighted that intellectual property ownership of scientific research would be dependent on the nature of the research and exact funding arrangements.[109] Professor Chown cited an example of a research expedition which was privately funded by a philanthropist and not associated with an academic or governmental organisation.[110] The intellectual property from the research conducted is owned formally by Switzerland but the Australian researchers who participated in the expedition 'have a non-exclusive world-wide guarantee

103 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, p. 19.

104 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

105 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

106 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

107 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

108 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 8.

109 See for example: Dr Minchin, Geoscience Australia, *Committee Hansard*, Canberra, 19 October 2017, p. 18; and Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 29.

110 Australian Academy of Science, *Submission 4.1*, p. 6.

to use the information.'[111] As such, the relevant intellectual property is 'co-owned'.[112]

## Collaboration

5.73 Antarctic science is underpinned by a global collaborative effort. The Committee took evidence that highlighted the nature of collaborative science in Antarctica including its international focus and governance.

5.74 A number of inquiry participants commented on the nature of the collaborative science undertaken in Antarctica. Mr Mark Kelleher, of ACE CRC, advised that Antarctic research and related protocols are unique, relying on soft diplomacy and scientific collaboration.[113] He suggested that Antarctic science was very much occurring collaboratively between nation states, rather than independently. Similarly, Dr Andreas Schiller of CSIRO, noted that most Antarctic science occurs on an international level and is coordinated through international networks to 'minimise overlap but to optimise the benefits'.[114]

5.75 This section explores some of the agreements on cooperation, and considers matters such as intellectual property.

### Agreements on cooperation

5.76 The Committee was advised of memorandums of understanding between Australian and international Antarctic entities which underpin much of the scientific work undertaken in Antarctica.

5.77 As outlined in this report, agreements exist between the Department of the Environment and Energy and the Department of Defence for the latter to provide niche support to the Antarctic program. This includes geospatial, hydrographical and meteorological support as well as the

111 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 7.

112 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 7.

113 Mr Kelleher, ACE CRC, *Committee Hansard*, Hobart, 10 November 2017, p. 21.

114 Dr Andreas Schiller, Science and Deputy Director, Oceans and Atmosphere, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 28; Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard,* Canberra, 15 February 2018, pp. 18–19.

sharing of expertise in extreme climate, remote, maritime and airborne medicine.[115]

5.78 The AAP also has agreements with the Bureau of Meteorology which provides it with services and information in Antarctica. This includes providing weather services to Australians operating in the AAT, as well as mariners, aviators, and for search and rescue operators working in close proximity to Antarctica. The Bureau outlined its role in supporting this mandate. This includes operating a range of meteorological assets, and conducting observations and climate computer modelling, and research and development.[116]

5.79 Internationally, the Committee was advised that the AAP and other Australian Government entities have entered into memorandums of understanding and other agreements with Antarctic nations with respect to collaborative Antarctic science activities.

5.80 One such agreement is the China–Australia memorandum of understanding on Cooperation in the Field of Antarctic and Southern Ocean Affairs was established in 2014.[117] Discussions under this agreement included 'those on ICECAP, of which both countries are part. ICECAP is a multination project to map the thickness and underlying bedrock topography of the East Antarctic Ice Sheet.'[118]

5.81 CSIRO noted that Australia also has deep relationships with a range of international Antarctic partners, similar to the manner of Australia's defence partners. China and France were both cited as examples of this type of enduring partnership.[119] Both nations have a range of projects undertaken in conjunction with Australian scientists.

5.82 One of these key partnerships with China is through the Centre for Southern Hemisphere Oceans Research (CSHOR) which brings together Antarctic scientists from CSIRO, Australian universities, the University of Tasmania, and the University of New South Wales, as well as the Qingdao National Laboratory for Marine Science and Technology.[120] Dr Worby from CSIRO noted that the partnership provided a mechanism by which Chinese financial investment could be coupled with in-kind

115 Department of Defence, *Submission 14*, p. 2.

116 Bureau of Meteorology, *Submission 25*, p. 2.

117 Australian Academy of Science, *Submission 4.1*, p. 5.

118 Australian Academy of Science, *Submission 4.1*, p. 5.

119 For example: Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 29; Dr Schiller, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 29.

120 Dr Schiller, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 29.

support from CSIRO to collaborate on Southern Oceans-focussed research based in Australia.[121]

5.83 The Bureau of Meteorology highlighted its own memorandum of understanding with the Chinese Meteorological Administration, advising the Committee that it works collaboratively on a number of research topics including weekly stratospheric ozonesonde flights.[122]

5.84 The Bureau of Meteorology told the Committee of its membership of the World Meteorological Organisation which ensures that the Bureau's observations, including those made in Antarctica, are shared openly with other members. In exchange, according to Dr Sue Barrell of the Bureau:

> … we have access to the observations of the 190 other countries that are made by their met services and other agencies and, importantly, by space programs. In simple terms, we get access to all of the satellite data and surface based observations collected, which is roughly valued at between $5 billion to $10 billion per year … We have access to that for basically what the bureau spends on providing those observations. It's roughly 100-to-one leveraging.[123]

## Applications of Antarctic science

5.85 The vast majority of Antarctic science conducted, at least in the East Antarctic, is government supported or funded, with limited commercial interest.[124] However, a range of inquiry participants demonstrated that aspects of their work have commercial or economic applications.

5.86 Geoscience Australia highlighted that its own geophysical observatories support a range of purposes besides its work in Antarctica. For example, the agency's work supports drivers of economic activity such as global positioning system signals for Australia.[125]

5.87 CSIRO also advised that its Southern Ocean research projects—such as detailed measurements of ocean properties, temperature and salinity—

121 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, pp. 29–30.

122 Dr Barrell, Bureau of Meteorology, *Committee Hansard*, Canberra, 19 October 2017, p. 21.

123 Dr Barrell, Bureau of Meteorology, *Committee Hansard*, Canberra, 19 October 2017, p. 20.

124 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 6.

125 Dr Minchin, Geoscience Australia, *Committee Hansard,* Canberra, 19 October 2017, p. 14.

have underpinned its collaboration with the Department of Defence and the Bureau of Meteorology, particularly in relation to Defence's strategic planning.[126] Other aspects of its work examine the impacts of ocean acidification on food security, such as the management of fisheries.[127]

5.88 The Committee was also interested in the concept of bioprospecting which involves, according to Professor Chown:

> … looking for natural products in plants and animals for medical uses; it also includes uses such as antifreeze products that might be used in foodstuffs.[128]

5.89 Dr Press told the Committee that some scientists have worked with industry to identify genetic resources in Antarctica.[129] Professor Chown gave an example of how bioprospecting in Antarctica has been used in the food industry to prevent the recrystalisation of ice cream.[130] Dr Anthony Worby of CSIRO also cited several examples of scientific work that has commercial applications including a fish with antifreeze in its blood and another with sunscreen properties.[131]

5.90 CSIRO was asked whether the requirement to share intellectual property would be a hindrance to private sector investment in Antarctic science. Dr Worby advised the Committee that, quite often 'research will be done as part of a publicly funded research program, but the commercialisation of it may actually be done by a private company under some IP agreement.'[132]

126 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, pp. 27, 30.

127 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 27.

128 Professor Chown, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 9.

129 Dr Press, private capacity, *Committee Hansard*, Hobart, 10 November 2017, p. 43.

130 Professor Chown, Chair, Australian Academy of Science, *Committee Hansard*, Canberra, 19 October 2017, p. 9.

131 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 27.

132 Dr Worby, CSIRO, *Committee Hansard*, Hobart, 10 November 2017, p. 27.

Figure 5.1 Members of the Committee receiving a briefing at the Australian Antarctic Division in Hobart

*Source* *Supplied*

## Committee comment

5.91 Australia's Antarctic science capabilities are amongst the best in the world and, as has been evident throughout this inquiry, these capabilities are supported by a skilled Antarctic science workforce. Antarctic science has, however, become an internationally competitive and crowded field. As such, to maintain Australia's standing as a leading Antarctic science nation, it is imperative that the Australian Government and Australia's Antarctic community increase investment and foster growth in this area.

5.92 As highlighted previously, the Committee was pleased to visit Hobart and Antarctica to meet with and hear the perspectives of the dedicated staff that comprise some of Australia's Antarctic science community. The Committee also had the opportunity to inspect a range of facilities that facilitate Australia's Antarctic science capacity—in particular, the AAD in

Kingston, the University of Tasmania's Institute of Marine and Antarctic Studies, and Casey station in Antarctica. The close knit Antarctic science community were welcoming of the Committee and provided valuable insights.

## Australian science framework

5.93 The Australian Antarctic science framework is undergoing a period of renewal. From the *Australian Antarctic Strategy and 20 Year Action Plan* to the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, an effort is being made to position Australian Antarctic science at the forefront of international efforts on the continent. In the Committee's view, this is a welcome development, however, the inquiry was an opportunity to enhance these efforts.

5.94 Evidence to the inquiry suggested that Australia's leadership in Antarctic science is declining, demonstrated by diminishing publication output in recent years. Despite the perceived decline, it is imperative that Australia continue to engage with, and where appropriate, seek to lead the various international scientific forums of which it is a member.

5.95 As Australia's Antarctic science program aligns itself further with the objectives of both the *Australian Antarctic Strategy and 20 Year Action Plan* and the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*, the Australian Government should consider ways to bolster its scientific publication output. In particular, increased funding to research areas deemed to be scientific priority and an improved effort to coordinate Antarctic science research are required.

5.96 The Committee is aware of the review into the governance of Antarctic science currently being undertaken by former senior public servant Mr Drew Clarke AO PSM. The Committee understands that the Australian Government intends to soon release this review. While the Committee does not wish to pre-empt the review's findings, there is a need to consider improved funding and coordination of Antarctic science, in line with established governance structures.

**Recommendation 11**

**The Committee recommends that the Australian Government release the review into Antarctic science governance as soon as practicable and provide a public response to its findings and recommendations in a timely manner.**

## Resourcing Australian Antarctic science

5.97 Antarctic science is expensive due to the type of logistical support required. In line with commitments under the *Australian Antarctic Strategy and 20 Year Action Plan*, the Committee believes that additional Australian Government funding aimed at improving research support is required. This should be supplemented by the provision of further clarity on scientific project priorities and guidance on the use of public funds.

5.98 The Committee is concerned by commentary suggesting that the sum of Australian Government grants for Antarctic science is not sufficient. It is clear that, there is a need to ensure funding for ancillary expenditure associated with the high cost of conducting research in Antarctica. Additionally, consideration must be given to clear guidelines that outline the manner in which funds from all Australian Government sources can be used, particularly when seeking research support. Understandably, such considerations can only be determined as the Australian Government considers its budgetary position each year.

**Recommendation 12**

**The Committee recommends that the Australian Government provide clarity on how different sources of Australian Government Antarctic science funding can be utilised by funding recipients including whether such sources can be used for project or ancillary research support purposes.**

5.99 To provide clarity for Antarctic researchers, the Australian Government must consider how science is prioritised and coordinated. A body comprising representatives from key Antarctic science stakeholders, such as that suggested by the Australian Academy of Science, may provide an avenue to establish scientific project priorities, consistent with the *Australian Science Strategic Plan 2011–12 to 2020–21*. Such a body may also be tasked with coordinating Australia's scientific research projects in conjunction with stakeholders to limit overlap and maximise valuable research capacity.

### Recommendation 13

**The Committee recommends that the Australian Government consider the establishment of a body to determine both Antarctic science project priorities consistent with the *Australian Science Strategic Plan 2011–12 to 2020–21* and to provide a forum for overseeing the coordination of projects.**

5.100 The Committee notes with concern that Australian Government funding for ACE CRC is due to cease in June 2019. The Committee also notes that the continued operation of ACE CRC beyond that date would not be consistent with the updated Australian Government guidelines for the funding of cooperative research centres.

5.101 The Committee received significant evidence as part of the inquiry that highlighted the important ongoing contribution that ACE CRC has made to Antarctic science. It would appear to be a successful model for collaborative Antarctic science. Many inquiry participants also commented on the impact on Antarctic science that the loss of ACE CRC's funding will have.

5.102 In the Committee's view, the loss of such a capacity would cause a significant gap in Antarctic science conducted out of Hobart and collaborative efforts in the field. As such, there may be opportunities for the Australian Government to work with ACE CRC and the Tasmanian Government to consider available options for its continued operation.

### Recommendation 14

**The Committee recommends that the Australian Government consider mechanisms by which the Antarctic Climate and Ecosystems Cooperative Research Centre can continue its operations in collaborative Antarctic science beyond June 2019. The Australian Government may consider opportunities to work with the Tasmanian Government to consider how the work of the Antarctic Climate and Ecosystems Cooperative Research Centre can continue.**

5.103 The development of Australia's Antarctic science workforce is vital and inextricably linked to the strategic objectives under both the *Australian Antarctic Strategy and 20 Year Action Plan* and *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21*. Australia's push to increase its Antarctic infrastructure stock will require skilled staff to operate equipment, such as the multibeam sonar equipment on board the new icebreaker. The growth of Australia's Antarctic science workforce is also linked to the capacity for Antarctic science entities such as the AAD and CSIRO to employ research staff and train the next crop of researchers—a capacity which has diminished due to funding reductions.

5.104 While additional funding support is one answer, the development of critical skills is not a short term goal. The Committee is concerned that the Antarctic science workforce is becoming a less viable long-term career choice for young scientists, and that this will eventually have an impact on Australian Antarctic science. The Australian Government should consider innovative ways to meet the need for a skilled Antarctic science workforce in order to achieve its longer terms objectives in Antarctica. This could include leveraging cooperation from commercial and philanthropic entities, as well as continuing to strengthen learning experiences through international cooperation.

**Recommendation 15**

**The Committee recommends that the Australian Government assess how Australia can retain and further develop its Antarctic science workforce to ensure long term objectives under the *Australian Antarctic Science Strategic Plan 2011–12 to 2020–21* can be met. Such an assessment should consider opportunities to leverage cooperation from commercial and philanthropic entities, as well as jointly funded international ventures. The results of this assessment should be incorporated into future iterations of the *Australian Antarctic Science Strategic Plan*.**

## Data storage, management and use

5.105 As technology advances, so does the amount of data that is generated. The Committee has heard that Australia's new icebreaker will be fitted with a multitude of advanced scientific capability that will require an efficient means to capture, store and access scientific data for analysis.

5.106 While the Committee notes and welcomes the recent announcement of improved satellite communication facilities available to the AAD, it is not clear that a strategic plan exists for the management of the vast scientific data generated through Antarctic research. While entities such as the AAD and Geoscience Australia each have mechanisms to manage vast amounts of scientific data, there does not appear to be a coordinated approach to data management including capacity to readily share and disseminate that information.

5.107 Furthermore, the Committee is concerned that the Australian Government does not have sufficient visibility of the data being gathered by other countries, especially in East Antarctica. The Committee notes with concern that technological shortcomings may be compromising Australia's capacity to engage in important opportunities to collaborate with Antarctic partners.

5.108 The Australian Government should consider a coordinated approach to the management of its Antarctic data. One suggestion that merits further investigation is the data cube as proposed by Geoscience Australia. In the Committee's view, such a concept could provide a central data repository and enable increased collaboration with international Antarctic partners.

### Recommendation 16

**The Committee recommends that the Australian Government, through the Department of the Environment and Energy, consider a whole of government data management strategy to manage its store of Antarctic data as a matter of priority. In the short term, the Committee recommends that Geoscience Australia and the Australian Antarctic Division put forward a business case for an 'Antarctic Geoscience Data Cube' that could be included in an expanded version of the Digital Earth Australia program, and any other necessary data management infrastructure—including the tools Australia requires to access, read, and use data from other countries' Antarctic research.**

5.109 The Committee also notes the suggestion by Geoscience Australia to improve its capacity in remote sensing technology. While the Committee believes this may be a meritorious suggestion, particularly given its attractiveness to international space agencies, the Australian Government may wish to conduct further analysis on the viability of this project.

5.110 Whilst the Committee notes that the ATS specifies that information collected from Antarctic research should be open and shareable, evidence suggested that this was not always the case. Both during site inspections in Antarctica and through public hearings, the Committee observed that some countries were sharing data more readily than others. The Committee accepts that this may be due to a lack of capability of some countries, and the Committee is therefore pleased to hear that the AAD has made efforts to assist countries to develop this capability. However, the Committee is concerned that more may need to be done to ensure that data remains open and shareable. The Committee considers that any future memorandums of understanding Australia enters into, relating to Antarctica, include clear provisions requiring data sharing. This should also apply to reviews of existing MOUs.

## Collaboration

5.111 Collaboration is at the heart of Antarctic science. The Committee heard about an array of projects being worked on by Australia's talented Antarctic scientists in collaboration with Australian and international colleagues. The Committee is also pleased to see that Australian scientists have developed expertise across a range of fields.

5.112 The Committee was interested in the range of agreements on cooperation struck between Australian and international entities with respect to Antarctic science. It was also interested in the manner in which intellectual property rights are allocated under such agreements. Given the various agreements in force, it would be beneficial for the Australian Government to consider whether these agreements should be centrally coordinated. Such a repository would ensure visibility for the Australian Antarctic science community so that valuable efforts are not duplicated. The Australian Government may also wish to consider how such a mechanism would also capture the registration of any relevant intellectual property rights.

5.113 The Committee also received some evidence that considered the economic or commercial use of Australian Antarctic science discoveries. In the Committee's view, economic or commercial imperatives are linked to the cooperative agreements and intellectual property considerations underpinning these agreements.

### Recommendation 17

**The Committee recommends that the Australian Government, through the Department of the Environment and Energy develop a centrally coordinated repository of Antarctic science agreements which also capture the registration of any relevant intellectual property rights.**

# 6

# Economic opportunities

6.1 The *Australian Antarctic Strategy and 20 Year Action Plan* outlines that one of Australia's national interests in Antarctica is to 'foster economic opportunities arising from Antarctica and the Southern Ocean, consistent with Australia's Antarctic Treaty System (ATS) obligations, including the ban on mining and oil drilling.'[1] These opportunities, with respect to the so-called 'blue economy'[2] in the Southern Ocean and Antarctica, can enable Australia to promote its significant role in Antarctica, both domestically and overseas. As such, it is important that Australia emphasise its scientific, international engagement and economic achievements relating to Antarctica.

6.2 The economic benefits of scientific activity, such as international education and commercialisation of research, are considered in chapter 5. This chapter examines the evidence to the Committee regarding the other economic benefits of Antarctic activity, including what roles there might be for relevant governments. It appraises the growing role of Hobart as an Antarctic gateway and looks at ways to improve the city's international competitiveness. Lastly, the development of Antarctic-related tourism and improved public outreach are considered.

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1 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 17.

2 Dr Jeffrey McGee, Senior Lecturer in Climate Change, Marine and Antarctic Law, Institute for Marine and Antarctic Studies (IMAS) and Faculty of Law, University of Tasmania, C*ommittee Hansard*, Hobart, 10 November 2017, p. 35.

# Roles for government

6.3 The nature of the ATS requires that governments play an increasingly important role in developing an Antarctic presence through provision of infrastructure or the funding of scientific research. This, as described earlier in this report, is largely due to the otherwise prohibitive costs and the national-level diplomatic and scientific engagement required to maintain a presence on the continent. As such, this section considers the role of both Commonwealth and Tasmanian Governments.

## Australian Government

6.4 The Australian Government, through the federal Department of the Environment and Energy's Australian Antarctic Division (AAD), is one of the key drivers of Australia's Antarctic activity and engagement. Its work is complemented by other Commonwealth-level agencies including the Department of Defence, Department of Foreign Affairs and Trade, Geoscience Australia, the Australian Maritime Safety Authority and Bureau of Meteorology amongst others.

6.5 The Australian Government's *Australian Antarctic Strategy and 20 Year Action Plan* recognises Tasmania's significant and growing contribution to the Antarctic sector, with many aspects of the plan geared towards increasing the sector's presence in the state. The Department of the Environment and Energy quantified the scope of the Antarctic sector in Tasmania, noting that:

> The Antarctic sector is a major contributor to the Tasmanian economy and is a key component of the state's long term, economic growth potential. In 2011-12, the sector contributed $442 million to Tasmania's economy and it was estimated that 1,185 people were employed in the sector.[3]

6.6 In Tasmania, Australian Government investment accounts for some 75 per cent of the Antarctic sector's contribution to the local economy. [4] The AAD is a significant contributor to this activity. The Department of the Environment and Energy submitted to the Committee that:

> … the Government is committed to further enhancing Tasmania as the leading international Antarctic research hub and logistics

3 Department of the Environment and Energy, *Submission 13*, p. 16.

4 Mrs Lara Hendriks, Acting General Manager, Tasmanian Department of State Growth, C*ommittee Hansard*, Hobart, 10 November 2017, p. 12.

> Gateway for East Antarctica. This includes delivering associated infrastructure in Tasmania to maximise the efficient and effective use of the new icebreaker. The Government has already committed $38 million over three years from 2014-15 for the Hobart Airport Runway Extension.[5]

## Hobart City Deal

6.7 The Australian Government's *Smart Cities Plan* outlines a broad policy framework to help Australian cities to grow. One of the key aspects of the plan is the implementation of a series of 'City Deals', which bring together federal, state and local governments to 'align the planning, investment and governance necessary to accelerate growth and job creation, stimulate urban renewal and drive economic reforms'.[6]

6.8 In January 2018, the Commonwealth and Tasmanian Governments entered into a memorandum of understanding to develop a City Deal in conjunction with local governments in Hobart. In particular, Hobart's City Deal will consider a range of opportunities to:

- cement Hobart's position as the gateway to East Antarctica and a world leader in Antarctic and Southern Ocean scientific research;
- build stronger partnerships between governments to promote coordinated strategic planning outcomes and service delivery;
- a coordinated approach to transport planning including assessing the feasibility of future public transport options;
- support innovation and build capabilities in science, technology, engineering and mathematics (STEM) disciplines;
- support affordable housing, improved amenity and residential options; and
- provide a catalyst for private sector investment and urban renewal opportunities at strategic inner city sites.

6.9 In its submission to the inquiry, the Department of the Environment and Energy told the Committee that the Hobart City Deal and Hobart's proposed Macquarie Point development 'both offer interesting opportunities to increase the visible presence of Antarctic affairs in

5 Department of the Environment and Energy, *Submission 13*, p. 15.

6 Department of Infrastructure, Regional Development and Cities, 'City Deals', <https://cities.infrastructure.gov.au/city-deals>, viewed 8 April 2018.

Hobart.'[7] The Tasmanian Government suggested that these opportunities included the development of the science and Antarctic workforce with a particular focus on 'STEM initiatives in Hobart' as part of the City Deal.[8]

## Tasmanian Government

6.10 The Committee heard that since 1981, the Tasmanian Government has worked closely with its federal counterparts to develop the state's Antarctic sector.[9] Its work involves working with federal bodies such as the AAD, Austrade and the Department of Foreign Affairs and Trade.[10] The Tasmanian Government submitted that it supports joint initiatives with the Australian Government such as the Integrated Marine Observing System, which provides a wide range of data 'accessible to the marine and climate science community, other stakeholders and users, and international collaborators.'[11] It will also work with the Australian Government to develop a Centre for Antarctic, Remote and Maritime Medicine.[12]

6.11 During the course of the Committee's inquiry, the Tasmanian Government also released its Tasmanian Antarctic Gateway Strategy,[13] which is complementary to the Australian Government's own strategy. The strategy outlines the Tasmanian Government's vision as being:

> … for Tasmania to be the world's Antarctic gateway of choice that delivers economic growth and increasing opportunity for our community and supports a strong and vibrant Antarctic and Southern Ocean sector.[14]

7 Department of the Environment and Energy, *Submission 13*, p. 15.

8 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 14.

9 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 12.

10 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 13.

11 Australian Government, Integrated Marine Observing System, 'What is IMOS' < http://imos.org.au/about/> viewed 8 April 2018.

12 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, pp. 17–18.

13 Tasmanian Department of State Growth *Tasmanian Antarctic Gateway Strategy,* 2017.

14 Tasmanian Department of State Growth Tasmanian Antarctic Gateway Strategy, 2017, p. 6.

# Hobart as an Antarctic gateway

6.12 Hobart is the home of the AAD and thus the focal point of Australia's Antarctic efforts. Given the Australian Government's commitment to significantly increasing its Antarctic infrastructure and scientific research capabilities, the city will become Australia's key Antarctic gateway.

6.13 The *Australian Antarctic Strategy and 20 Year Action Plan* provides that, in relation to Tasmania, the Australian Government's intention is to:

- Build Tasmania's status as the premier East Antarctic Gateway for science and operations, including through:
  - ⇒ streamlined Government regulatory and approval processes to facilitate increased use of Hobart as an Antarctic Gateway port
  - ⇒ agreeing priority proposals with industry to enhance Tasmania's status as an Antarctic Gateway, including expanded infrastructure in Hobart for the new icebreaker
  - ⇒ a major review on building research infrastructure in Hobart to establish Australia as the world's leader in krill research.[15]

## Enhancing Hobart's competitiveness

6.14 The Committee was informed of efforts being made by the Commonwealth and Tasmanian Governments to develop the Antarctic sector, and enhancing Hobart's position as a key Antarctic gateway. The Committee was told that Hobart's developing Antarctic infrastructure assets in areas including aviation, shipping and construction would lead to a variety of economic opportunities for many associated industries with a Tasmanian presence.[16]

6.15 Evidence to the Committee compared Hobart to Christchurch in New Zealand—one of the cities that has positioned itself as an Antarctic gateway and geographically, Hobart's nearest competitor. The Committee was advised that a number of international Antarctic programs use Christchurch as a base, including the significant United States Antarctic program that has well-built and developed Antarctic infrastructure in the

15 Department of the Environment and Energy, *Australian Antarctic Strategy and 20 Year Action Plan*, 2016, p. 3.

16 Tasmanian Polar Network, *Submission 1*, p. 2.

city.[17] The Committee was also told that Christchurch held a port pricing advantage over Hobart.[18]

6.16 However, it was suggested that Hobart held a geographic advantage over Christchurch given the proximity of its Antarctic science and port facilities.[19] Evidence also highlighted that the recent earthquake in Christchurch had impacted access to the port facilities in the town of Lyttelton—particularly as it is located some distance from the Christchurch Antarctic logistics hub.[20] This has caused some concern for Antarctic entities that use the city as a base.[21]

6.17 The Committee was also advised that other cities, such as Cape Town in South Africa and Punta Arenas in Argentina, also host a number of national Antarctic programs. It was noted, for example, that 'nations that go through South Africa have stations closer to South Africa. You're not going to draw countries to Tasmania where it's not economic to bring their ships or aircraft—it doesn't make sense.'[22]

## Promoting Hobart's Antarctic credentials

6.18 Mrs Lara Hendriks advised the Committee that the Department of State Growth participates in a range of trade promotion activities both in Tasmania and overseas, which seeks to 'highlight the Antarctic and science efforts of the state and the nation.'[23] Such trade missions have been to China and Europe, for example.[24]

6.19 Ms Karen Rees of the Department of State Growth, advised that trade missions play a vital role for the growth in the Antarctic sector. She advised that the Tasmanian Government plays a role in introducing the

17 Mr Matthew Cocker, Interim Chief Executive Officer, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 4; Mr Richard Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

18 Mr Paul Weedon, Chief Executive Officer, Tasmanian Ports Corporation (TasPorts), *Committee Hansard*, Hobart, 10 November 2017, p. 3.

19 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

20 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

21 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

22 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

23 Mrs Hendriks, Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, pp. 13 and 15.

24 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 16.

Tasmanian Polar Network to representatives of international Antarctic programs to foster industry-based relationships.[25]

6.20 Mr Richard Fader, Chairman of the Tasmanian Polar Network, highlighted that both industry and the Tasmanian Government would play a role in the future growth of the Antarctic sector in the state. In particular, he highlighted the state government's role was to develop business with international Antarctic delegations that already had a presence in the state including France, China, Italy and South Korea.[26]

6.21 The Tasmanian Government has begun to see the benefits of these relationships including through the recent visit of a Chinese Antarctic mission to Hobart.[27] Mr Cocker, from the Hobart International Airport, noted that the delegation:

> … took the opportunity to view the Hobart Airport site and were extremely interested in opportunities for building some type of base out of Hobart on airport land.[28]

6.22 This engagement, according to the Department of the Environment and Energy, would be 'expected to increase the number of international visitors to the state, create new jobs and attract investment, generating further economic growth.'[29]

6.23 The Tasmanian Government advised that it already has memorandums of understanding with both the French lnstitut Polaire Français Paul-Emile Victor (IPEV) and the State Oceanic Administration of China (SOAC) on Antarctic gateway cooperation.[30] In the longer term, opportunities to engage further with the national Antarctic Programs of countries such as South Korea are also being pursued.[31]

6.24 The Committee's visit to Hobart in 2017 provided some insight into the strong collaborative effort being undertaken to promote the Tasmanian Antarctic industry through engagement with domestic and international Antarctic entities. Highlights of the Committee's trip included viewing

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25 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 16.

26 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

27 Ms Rees, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 16.

28 Mr Cocker, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 7.

29 Department of the Environment and Energy, *Submission 13*, p. 16.

30 Tasmanian Government, *Submission 27*, p. 1.

31 Ms Karen Rees, Tasmanian, Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 16.

first hand the work of William Adams Pty Ltd, a Caterpillar tractor distributor supplying and maintaining traverse machinery to various national Antarctic programs. The Committee was also able to observe the various facilities around the Macquarie Point Development and port of Hobart, many of which are used by the Antarctic sector.

6.25 The Committee was keen to hear about how Hobart's competitiveness as an Antarctic gateway city could be improved. These included:

- the development of Antarctic infrastructure;
- the promotion of Tasmanian industry; and
- the development of Hobart as a an international Antarctic science and research hub.

## The development of Antarctic infrastructure

6.26 The Tasmanian Government is in the process of developing a significant precinct adjacent to the Hobart waterfont. The $1.5 billion dollar project, managed by the Macquarie Point Development Corporation, will be developed over some 30 years and cover 9.3 hectares. It will include a range of visitor accommodation and incorporate a mixture of art, science, culture and tourism facilities.[32] In the future, shopping and cruise facilities would also be considered as part of the site, with cues taken from similar facilities overseas.[33]

6.27 As part of the Macquarie Point precinct, an integrated Antarctic science and logistics hub has been proposed. The Tasmanian Government advised that it viewed the proposed Antarctic science hub as important for collaboration and engagement, and it was hoped that the site 'visualises the Antarctic program and its future.'[34]

6.28 According to Ms Mary Massina of the Macquarie Point Development Corporation, the proposed hub offers the opportunity to bring key Antarctic agencies together, providing innovation and collaboration opportunities.[35] The Committee was advied of ongoing discussions with

32 Ms Mary Massina, Chief Executive Officer, Macquarie Point Development Corporation, *Committee Hansard*, Hobart, 10 November 2017, p. 9.

33 Ms Massina, Macquarie Point Development Corporation, *Committee Hansard*, Hobart, 10 November 2017, p. 10.

34 Mrs Hendriks, Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 14.

35 Ms Massina, Macquarie Point Development Corporation, *Committee Hansard*, Hobart, 10 November 2017, pp. 1 and 8; Tasmanian Polar Network, *Submission 1*, p. 4.

key entities about the feasibility of relocating to the proposed Antarctic science hub.[36]

### Port infrastructure in Hobart

6.29 The port of Hobart is a key maritime hub for Antarctic activity. It supports full port services for Antarctic research and supply vessels in Hobart.[37] Operators of Antarctic vessels have access to pilotage, towage, fuel provisioning, stevedoring, secure expedition storage facilities, cold storage, quarantine and maintenance.[38]

6.30 The increased development in Hobart's Antarctic sector has provided the impetus for the revitalisation of its ports infrastructure—both by the port authority and through the proposed Macquarie Point Development. The Tasmanian Ports Corporation (TasPorts) advised the Committee that each visit by Antarctic vessels were worth some $1 to $1.5 million to the state.[39]

6.31 TasPorts told the Committee that the port had hosted a range of vessels including those operated by the AAP and by a variety of international Antarctic programs and services. As a result, the port had developed:

> … a network of service providers/contractors with experience and expertise in supporting Antarctic- related activities, including the supply of waterside workers, victuals, fuel, engineering services, as well as plant and machinery.[40]

6.32 Mr Paul Weedon of TasPorts described his organisation's significant investments in Hobart's port facilities, including the development of the Macquarie No. 2 facility, which has become the home of the AAD's logistics and shipside operations, which has been a success.[41] Mr Weedon told the Committee that the construction of berth infrastructure, mooring infrastructure, related warehouse capacity, quarantine services, fuel and shore power were all currently under development.[42]

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36 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 14.

37 TasPorts, *Submission 20*, p. 1.

38 TasPorts, *Submission 20*, p. 1.

39 TasPorts, *Submission 20*, p. 1.

40 TasPorts, *Submission 20*, p. 1.

41 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 2.

42 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 7; Department of the Environment and Energy, *Submission 13*, p. 15.

6.33 TasPorts' focus has now shifted to the development of facilities to accommodate the new icebreaker and the development of infrastructure and services to attract international Antarctic programs to use Hobart as a base.[43]

6.34 In the future, there was potential for further integration of industries associated with Hobart's Antarctic activity such as a cruise terminal. The fact that Hobart's port was located in an urban setting would be an advantage in this respect.[44] Ms Mary Massina added that as part of its proposed development, Macquarie Point aimed to ensure that it did not interfere with the industrial aspect of the existing port and would ensure that boundaries were in place.[45]

*Supporting the RSV Nuyina*

6.35 The Committee was advised that in preparation for the arrival of the new icebreaker, the *RSV Nuyina*, a range of new infrastructure investments are being made including new and permanent port infrastructure to accommodate the vessel in Hobart. This will improve the current arrangements with respect to the current icebreaker, the *Aurora Australis*, which does not have a permanent berth and is often moved to enable the port's cargo operations to take precedence.[46]

6.36 TasPorts advised the Committee that, the new icebreaker's berthing arrangements will allow cargo, scientific and maintenance work to be conducted while the ship is in one berth. [47] The Committee was advised that the new facility would also provide improved cargo storage and biosecurity options for Antarctic operations.[48]

*Refuelling capabilities*

6.37 TasPorts advised the Committee that Antarctic vessels may load more than one million litres of fuel required for either voyages or station use in Antarctica.[49] As this cannot be done at the port itself, vessels are required to be towed to the nearby Self's Point fuel terminal, passing under Hobart's Tasman Bridge. Movement is restricted due to a prohibition of

43 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 2.

44 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 8.

45 Ms Massina, Macquarie Point Development Corporation, *Committee Hansard*, Hobart, 10 November 2017, p. 8.

46 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 7.

47 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 7.

48 Mr Kevin Moore, General Manager, Customer Management, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 9.

49 TasPorts, *Submission 20*, p. 3.

passage under the bridge during peak periods or when there are tankers at Self's Point. There are a number of vessels, such as those operated by the United States, that are too large to pass under the bridge.[50]

6.38 This issue has long been considered a safety risk and adds significantly to the cost base for vessels, which are required to move to be refuelled, subsequently impacting on the ports' international competitiveness.[51] TasPorts has considered a number of solutions. The first, extending a fuel line from Self's Point to the port, at a cost of around $50 million, is considered prohibitively expensive.[52] The second solution, utilising a fuel barge to bring fuel from Self's Point to refuel vessels berthed at the port would cost around $6 to $8 million.[53]

6.39 TasPorts notes however that while its investigations have found the fuel barge to be an operationally viable option, projections of demand would not make it a commercially viable investment.[54] This was also noted by the Tasmanian Government, the representatives of which suggested that without a co-contribution from governments, the initiative would not be viable. [55]

## Promoting Tasmanian industry

6.40 The Tasmanian Government described the breadth of its commitment to growing the state's Antarctic sector. Through the Antarctic Tasmania and Maritime Industries unit located in the Department of State Growth, the Tasmanian Government assists and supports industry to capitalise on Antarctic sector opportunities. The Tasmanian Government also provides support for workforce development for the marine industry and events such as Antarctic conferences and the Antarctic Festival.[56]

6.41 The Tasmanian Government provides funding and secretariat support for the Tasmanian Polar Network to leverage opportunities for Tasmanian business.[57] Mrs Lara Hendriks from the Department of State Growth,

50 TasPorts, *Submission 20*, p. 3.

51 Mr Moore, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 8.

52 TasPorts, *Submission 20*, p. 3.

53 TasPorts, *Submission 20*, p. 3.

54 TasPorts, *Submission 20*, p. 3.

55 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 17.

56 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 12.

57 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 12.

advised the Committee that that the Department works with the Tasmanian Polar Network and the AAD to identify opportunities for Tasmanian industry and engage with the Antarctic sector.[58]

6.42 Mrs Hendriks also advised that Australian businesses could compete for tender opportunities, through the Australian Government's AusTender service, arising from the AAD's requirements. She noted that the Tasmanian Government 'has a focus on helping Tasmanian businesses to try to make a submission and compete on a national scale'.[59]

6.43 The opportunities available within Tasmania's Antarctic sector are broad and include infrastructure projects in shipping, aviation and Antarctic science within the proposed Macquarie Point Development.[60] The Tasmanian Polar Network highlighted that new Antarctic infrastructure developments in Tasmania would lead to:

> …significant opportunities for Tasmanian businesses in areas including engineering, construction, fabrication, waste management, provedoring, power generation, specialised equipment manufacture and maintenance.[61]

6.44 The Tasmanian Government drew the Committee's attention to how Tasmanian businesses are engaging with and developing new opportunities through leveraging with the Antarctic sector:

> Tasmanian businesses have years of undertaking world leading design, engineering and manufacture of traverse equipment. Tasmanian businesses are experienced in specialised Antarctic construction, prefabrication, waste management, renewable power systems and training for Antarctic conditions and can supply logistics, environmental services, ice forecasting, ship repair and specialised professional services for Antarctic activities.[62]

6.45 Through the Department of State Growth, the Tasmanian Government also provides support for local industry participants to bid for work as part of the AAD's modernisation program, such as station renewal and

58 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 13.

59 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 17.

60 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, pp. 12–13.

61 Tasmanian Polar Network, *Submission 1*, p. 2.

62 Tasmanian Government, *Submission 27*, p. 3.

traverse capability[63] and assistance through programs that consider advanced manufacturing and the needs of small business.[64] A particular highlight of this engagement is Tasmania's comparative strength in tractor sales and traverse technology.[65]

6.46 Tasmanian businesses are also involved in assisting the Antarctic science sector's requirements. The Tasmanian Government submitted that local businesses produce and provide products and services to support the complex science undertaken in Antarctica including:

> … scientific instrumentation, ship outfitting and food provisioning, technical and mechanical products and services, waste management, medical services, weather and ice forecasting, and marine engineering.[66]

## Hobart as an international science and research hub

6.47 Ensuring that Hobart's offerings as an Antarctic gateway are internationally competitive requires consideration beyond its infrastructure capabilities. In particular, Hobart's growing reputation as an Antarctic science hub, in part due to its proximity to Antarctica, aims to enhance its attractiveness to national Antarctic programs. The prospect of increased scientific collaborative opportunities coupled with its infrastructure offerings will enable Australia and other nations with an interest in Antarctica to meet their obligations under the ATS.

6.48 The Tasmanian Government told the Committee that Hobart serves as a port of call for visiting international Antarctic missions or research and supply vessels from countries including France, the United States, South Korea and China.[67] Other nations, such as Japan also make occasional visits.[68] Other inquiry contributors also highlighted the impact of specific visiting international Antarctic programs and their significance to the Tasmanian economy.[69]

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63 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 12.

64 Mrs Hendriks, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 12.

65 Ms Rees, Director, Tasmanian Department of State Growth, *Committee Hansard*, Hobart, 10 November 2017, p. 16.

66 Tasmanian Government, *Submission 27*, p. 3.

67 Tasmanian Government, *Submission 27*, p. 1; IMAS University of Tasmania, *Submission 8*, p. 2.

68 Tasmanian Government, *Submission 27*, p. 1.

69 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

6.49 France, for example, has a strong and longstanding presence in Hobart, and the Committee was advised that the French economic contribution to Tasmania had been in excess of $30 million.[70] The Committee was advised that the French national Antarctic program has used Hobart as a base for many years and have a local agent to manage its affairs, including maintaining a warehousing facility.[71]

6.50 Mr Richard Fader noted that French expeditioners contribute to the local economy during stays in the city before and after visits to Antarctica.[72] A significant portion of the French Antarctic program's stores—including fresh food, meats, drinks and items required to sustain their station—are supplied out of Tasmania.[73] This relationship remains strong and, as Mr Fader advised, the French Antarctic program's new vessel is based in Hobart for the summer Antarctic season.[74]

6.51 Mr Fader also discussed the presence of the South Korean Antarctic program in Tasmania. While the South Korean program does not base itself in Hobart, the city does have the storage facilities for a special blend of Antarctic fuel used by it and a number of other national Antarctic programs, such as China.[75]

## Developing Antarctic tourism and outreach

6.52 While Hobart's growing Antarctic science and infrastructure assets form the core of the city's Antarctic engagement, the Committee received evidence that the development of a tourism industry would complement Hobart's growing role as an Antarctic science and infrastructure hub. In particular, evidence to the Committee suggested that Hobart could be used as a base for outbound Antarctic tourism and also that the city itself

70 Mr Fader, Chairman, Tasmanian Polar Network, , *Committee Hansard*, Hobart, 10 November 2017, p. 5.

71 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

72 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

73 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

74 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 5.

75 Mr Fader, Chairman, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, pp. 5–6.

could be used to further promote and raise the profile of Australia's Antarctic engagement.

## Outbound Antarctic tourism

6.53 Evidence to the Committee suggested that an Antarctic tourism sector could be enhanced by the development of a cruise terminal and related infrastructure as part of the development of Hobart's port infrastructure.[76] TasPorts advised the Committee that both the Antarctic science and broader cruise sectors could co-exist and were both viewed as very important for future of the city. [77]

6.54 For a Hobart-based cruise sector to be competitive, TasPorts suggested that the city's would need competitive port pricing.[78] TasPorts advised that it had evaluated its cruise pricing against the offerings in New Zealand and had found Hobart's offerings to be uncompetitive by comparison.[79] Hobart's pricing structure was revised as a result and had led to engagement with cruise operators. TasPorts told the Committee that it had been receiving enquiries from cruise operators about the possibility of operating from Hobart, this would allow replication of cruise experiences available from other international ports, such as in South America.[80] Other companies were also using the port to offer non-Antarctic cruises from Hobart.[81]

6.55 From a regulatory perspective, the Institute for Marine and Antarctic Studies noted that 'Antarctic tourism is regulated under the ATS, but also relies heavily on national controls by Antarctic Treaty Parties and self-management by tour operators through an industry body, the International Association of Antarctica Tour Operators (IAATO).'[82]

6.56 Mr Fader suggested that cruise offerings from Hobart to Antarctica would provide a different type of experience, from those leaving from other Antarctic gateways that he described as 'much more of an adventure than cruising'.[83] He suggested that unlike Antarctic cruises that departed from South America, cruises that departed from Hobart to East Antarctica in

76 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 3.
77 Mr Moore, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 2.
78 Mr Moore, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 6.
79 Mr Moore, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 6.
80 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 3.
81 Mr Moore, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 6.
82 IMAS University of Tasmania, *Submission 8*, p. 2.
83 Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 4.

particular, would not have the opportunity to land on the continent.[84] Nevertheless, Mr Weedon of TasPorts suggested that tourists who embarked on Antarctic cruises from Hobart would have access to Antarctic science education information available in the city.[85]

6.57 A number of inquiry contributors also highlighted that tourism to Macquarie Island was also an option as part of any consideration of Antarctic Tourism.[86] Tourism operator Chimu Adventures suggested that the island's unique geology and wildlife including king penguins, elephant seals and royal penguins made it a potential tourism drawcard.[87] At present, according to Chimu Adventures, government 'regulation currently places unnecessary restrictions on what could be an export earning tourism product for Australia and Tasmania more specifically. On Macquarie Island Tasmania Parks and Wildlife service allows very few visitors onto the island by tourists and at only at tightly restricted sites.'[88] Chimu Adventures believes that relaxing such regulatory burdens would open up significant tourism opportunities.[89]

6.58 With respect to leveraging aviation assets in the tourism sector, Chimu Adventures suggested that opportunities existed for flying passengers to Antarctica while utilising Australia's blue ice runway at Wilkins Aerodrome and providing purpose built accommodation.[90]

6.59 Given Antarctica's pristine environment, any proposed outbound tourism initiatives would need to be consistent with Australia's Antarctic Tourism Policy. The Policy provides that any tourism activities are required to be consistent with Australia's obligations under the ATS. Activities consistent with the policy must be ecologically sustainable and socially responsible.[91]

## Promoting the Australian Antarctic Program

6.60 As part of its visit to Hobart, the Committee had the privilege of inspecting the AAD's facilities in Kingston, Tasmania. Part of this visit

84 Mr Fader, Tasmanian Polar Network, Committee Hansard, Hobart, 10 November 2017, p. 4.

85 Mr Weedon, TasPorts, *Committee Hansard*, Hobart, 10 November 2017, p. 3.

86 See for example: Mr Fader, Tasmanian Polar Network, *Committee Hansard*, Hobart, 10 November 2017, p. 4.

87 Chimu Adventures, *Submission 26*, p. 1.

88 Chimu Adventures, *Submission 26*, p. 1; IMAS University of Tasmania, *Submission 8*, p. 2.

89 Chimu Adventures, *Submission 26*, p. 1.

90 Chimu Adventures, *Submission 26*, p. 1.

91 AAD, Department of the Environment and Energy, 'Australian policy' 17 October 2005, <http://www.antarctica.gov.au/about-antarctica/tourism/australian-policy>, viewed 22 February 2019.

entailed inspection of both the AAD's public display and the krill aquarium, which is not open to the public.

6.61 In describing the role of the AAD with respect to tourism, the Department of the Environment and Energy advised that it maintains a small public display at its headquarters in Kingston, Tasmania.[92] The Committee was told that this attracts some visitors although the number of visitors[93] and visitor experience are not assessed.[94]

6.62 Ms Massina, of the Macquarie Point Development Corporation advised that the growth in the visitor accommodation sector coupled with positive reviews of Hobart from international tourism organisations made Tasmania:

> … a key place for a combination of tourism experiences, both in terms of natural as well as art and culture, which underpins ultimately the purpose of Macquarie Point development site from a science and tourism perspective.[95]

6.63 Hobart Airport also submitted to the inquiry that it believed that it had a role to play in the development of the Antarctic tourism industry as the new runway extension would provide further reach in terms of passenger movements. This could already be seen in the numbers of Chinese and American tourists who had visited Hobart in the previous year.[96]

## Committee comment

6.64 The Committee's inquiry shows that Australia's Antarctic sector is growing and that Hobart is a key beneficiary of this. Opportunities exist for both Australia and Tasmania to capitalise upon recent investment in the sector, consistent with Australia's obligations under the ATS.

6.65 The Committee, which travelled to Hobart and Antarctica in November 2017 to inspect various scientific and infrastructure facilities, observed a

92 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 18.

93 Department of the Environment and Energy, *Submission 13.3*, p. 1.

94 Dr Gales, AAD, Department of the Environment and Energy, *Committee Hansard*, Canberra, 15 February 2018, p. 18.

95 Ms Massina, Macquarie Point Development Corporation, *Committee Hansard*, Hobart, 10 November 2017, p. 4.

96 Mr Cocker, Hobart International Airport, *Committee Hansard*, Hobart, 10 November 2017, p. 4.

very tight-knit community that openly supports the development of the Antarctic industry as a whole.

## Roles for government

6.66 Australia's Antarctic program is a key driver of the nation's Antarctic infrastructure, science and international engagement priorities. This inquiry has demonstrated that while these priorities are important and form core planks of the *Australian Antarctic Strategy and 20 Year Action Plan*, scope exists to realise economic benefits, particularly for Tasmania, as a result. As such, the Committee believes that it is in the interests of both the Australian and Tasmanian Governments to continue collaboration and maximise this potential.

6.67 The Committee is pleased to see that engagement between federal, state and local government has been formalised through the Australian Government's *Smart Cities Initiative*. The resulting City Deal will provide a coordinated approach to the long term development of infrastructure, including Antarctic infrastructure, for the city of Hobart. Such development is likely to generate a range of employment and business opportunities for further economic growth.

6.68 While the Committee understands that funding arrangements and specific projects under the City Deal are to be determined, the tripartite memorandum of understanding provides a basis from which a range of Antarctic infrastructure projects for Hobart can be planned.

**Recommendation 18**

**The Committee recommends that the Australian Antarctic Division in conjunction with the Department of Infrastructure, Regional Development and Cities, work with the Tasmanian Government and local government to outline the key Antarctic priorities under the Hobart City Deal including a broad funding agreement and project timeline, particularly with reference to the Macquarie Point Antarctic Precinct.**

6.69 While the Committee is encouraged by the engagement between federal, state and local government through the *Smart Cities Initiative,* the Committee is of the view that the federal government should play a greater role in promoting Tasmania, and more broadly Australia, as an

Antarctic gateway and hub. In particular the Committee was unable to identify Australian Government agencies within the federal trade portfolio with responsibility for this. The Committee therefore encourages the Australian Government to take a more active role in promoting Australian-based Antarctic businesses to the world.

### Recommendation 19

**The Committee recommends that the Department of Foreign Affairs and Trade identify or establish an appropriate federal mechanism to create an Office of Antarctic Services. Such an office would oversee the promotion of Australia, and in particular Hobart, as an Antarctic gateway and hub to international Antarctic programs.**

6.70 The Committee is pleased to see the Tasmanian Government's extensive commitment to the Antarctic which is resulting in growing economic benefit for the state. Underpinned by the Tasmanian Antarctic Strategy, the Tasmanian Government's partnership with industry is beginning to yield impressive results. In particular, the support provided to the Tasmanian Polar Network to collaborate with various industry sectors provides the Committee with confidence of the strength of the Antarctic sector in Tasmania.

6.71 In the Committee's view, the Commonwealth and Tasmanian Governments should also continue to pursue opportunities to attract further international engagement with Australia's Antarctic gateway. In particular, the Committee notes the interest of some national Antarctic programs in either using Hobart as a base for their Antarctic ventures or expanding current operations. The city's growing Antarctic infrastructure presents a compelling case for some national Antarctic programs to make better use of Hobart as an Antarctic base and both Australian and Tasmanian Governments should work to accommodate this possibility.

**Recommendation 20**

**The Committee recommends that the Australian and Tasmanian Governments work with other nations' Antarctic programs that have or seek to have a presence in Hobart to ensure that their requirements are met through the provision of relevant infrastructure and services.**

## Hobart as an Antarctic gateway

6.72 The Committee notes the Australian Government's commitment under the *Australian Antarctic Strategy and 20 Year Action Plan* to build Tasmania's status as the premier East Antarctic gateway for science and operations. The growing science and infrastructure developments in Hobart support this objective, however, there are a range of ways in which the city's international competitiveness in the Antarctic space could be enhanced.

6.73 Evidence to the Committee highlighted cities in New Zealand, South Africa and Argentina as competing with Hobart for international Antarctic business. In the Committee's view, the positioning of Hobart as a science hub in addition to its growing infrastructure credentials is a factor that sets this Australian city apart.

6.74 The proposed Macquarie Point Development on the Hobart waterfront could provide a unique opportunity to develop an Antarctic science hub within close proximity of Hobart's port facilities. The Committee understands that there are ongoing discussions between the Macquarie Point Development Corporation and a range of Antarctic stakeholders to assess the feasibility of an Antarctic science hub being developed as part of the larger Macquarie Point precinct. The Committee looks forward to being updated on this proposal.

## Port infrastructure in Hobart

6.75 The Committee heard evidence that highlighted the importance of port of Hobart to the local economy. In particular, evidence tendered to the Committee painted a picture of a vibrant port precinct which includes a mix of commercial, tourism and administrative facilities. From an Antarctic perspective, evidence suggested that the port welcomed a range of national Antarctic programs and their vessels. In particular, the Committee would like to acknowledge the work of the TasPorts in

continuing to develop the facility that will eventually house Australia's new Antarctic icebreaker, the *RSV Nuyina*.

6.76 The Committee did have some concerns around difficulties experienced by various vessel operators with respect to refuelling. The Committee notes the proposal by TasPorts to use a fuel barge to bring fuel from Self's Point to the port to resolve this issue, however note that it would not be commercially viable at this stage.

**Recommendation 21**

**The Committee recommends that the Australian Government, through the Department of Infrastructure, Regional Development and Cities, consider providing assistance to TasPorts to improve the viability of the proposal to use a fuel barge to bring fuel from Self's Port to the port of Hobart.**

## Developing Antarctic tourism and promoting Antarctica

6.77 In recent years, Australia's cruise industry has flourished however Antarctic tourism presents an untapped opportunity which has otherwise only been available from ports such as in Punta Arenas in Argentina. At the same time, the Committee considers there are significant opportunities for maximising Antarctica-related tourism that do not involve leaving Australia.

6.78 In the Committee's view, the development of a Hobart-based Antarctic cruise sector is an interesting opportunity for the city. The Committee applauds the work already undertaken by TasPorts to improve its pricing competitiveness in the sector—a move which has begun to draw enquiries from cruise operators. To ensure that the industry is supported to enable growth, the Commonwealth and Tasmanian Governments should assist relevant government and private stakeholders to manage the regulatory framework and assurance processes required for the industry to operate.

6.79 The Committee notes the suggestion by a number of inquiry participants that cruise tourism access be granted to Macquarie Island so that more people can experience the island's unique wildlife. While the Australian Government might wish to consider the feasibility of this proposal, the Committee would not wish any change to access arrangements to compromise the important scientific and monitoring

work undertaken on the island. Any proposed tourism activity should also be consistent with Australia's Antarctic Tourism Policy.

6.80 The Committee also notes the suggestion that the Australian Government consider allowing Antarctic tourist flights to operate using the runway at Wilkins Aerodrome. While this infrastructure is currently available for use by the AAD, the Committee does not consider it feasible for an Antarctic tourism operation to be conducted using this facility at the present time given the need to ensure that Australia's scientific and infrastructure priorities can continue unhindered.

6.81 The AAD's headquarters in Hobart are primarily used for the AAP's administration, policy development, scientific analysis and maintenance needs. The facilities include a small public display with information on the AAP and a krill aquarium, which members of the committee were pleased to have the opportunity to inspect.

6.82 In the Committee's view, both the display and the aquarium are facilities that should be leveraged to enhance the broader awareness of Australia's Antarctic Program and Australia's national interests. The current facilities at Kingston are some distance from the Hobart CBD and the proposed Antarctic science hub at Macquarie Point. However, the Australian Government may wish to consider the options available to promote the work of the AAD and the AAP to a wider audience. Such a move would boost tourism in Hobart and enable visitors to be provided with an Antarctic experience without the need to travel to the continent. In considering options, an assessment should be made of the scale and impact of the visitor experience, with consideration given to the most appropriate site for such a venture. The proposed Macquarie Point Development, in time, may be an appropriate location for this.

### Recommendation 22

**The Committee recommends that the Australian Government, through the Department of the Environment and Energy, consider ways in which the work of the Australian Antarctic Program can be given further prominence. In doing so, consideration should be given to the needs of visitors, the educational objectives to be communicated, and how Australia's national interests can best be served.**

6.83 In concluding this report, the Committee would like to acknowledge the AAD and the very dedicated staff with whom the Committee engaged during its visit to Hobart and Antarctica. It is clear that the AAD has a good story to share with the Australian community about Australia's work in Antarctica. There are opportunities available to promote the AAP to a much wider audience, and consideration should be given to how this is achieved.

Mr Ben Morton MP
Chair
10 May 2018

A

# Appendix A: List of Submissions

1 Tasmanian Polar Network
2 Hobart Airport
3 Australian National Audit Office
4 Australian Academy of Science
  4.1 Supplementary
5 Dr Tony Press
  5.1 Supplementary
6 Geoscience Australia
  6.1 Supplementary
7 Community and Public Sector Union
8 Institute for marine and Antarctic Studies (IMAS) University of Tasmania
9 WWF-Australia
10 Mr Maozeng Jiang and Dr Stuart Pearson
11 Antarctic Climate & Ecosystems Cooperative Research Centre
  11.1 Supplementary
12 Australian Radiation Protection and Nuclear Safety Agency
13 Department of the Environment and Energy
  13.1 Supplementary
  13.2 Supplementary
  13.3 Supplementary
14 Department of Defence
  14.1 Supplementary
  14.2 Supplementary
  14.3 Supplementary
  14.4 Supplementary
  14.5 Supplementary
15 Department of Immigration and Border Protection
16 Department of Industry, Innovation and Science

17 Department of Foreign Affairs and Trade
17.1 Supplementary
17.2 Supplementary
17.3 Supplementary
18 Embassy of Uruguay
19 Australian Maritime Safety Authority
19.1 Supplementary
20 Tasmanian Ports Corporations
21 The Embassy of the Russian Federation
22 Attorney-General's Department
23 Macquarie Point Development Corporation
24 Australian Institute of Architects
24.1 Supplementary
25 Bureau of Meteorology
25.1 Supplementary
26 Chimu Adventures
27 Tasmanian Government
27.1 Supplementary
28 Australian Nuclear Science and Technology Organisation
29 Commonwealth Scientific and Industrial Research Organisation
29.1 Supplementary
30 Department of Finance
31 Confidential
32 University of Queensland

B

# Appendix B: List of Exhibits

1 Geoffrey Flügge, *Beyond the Status Quo: Australia's strategic policy options in Antarctica*, An Australian National Internships Program report drafted for the JSCNCET.

C

# Appendix C: List of Public Hearings

## Thursday, 14 September 2017 – Canberra

*Department of Foreign Affairs and Trade*

- Mr James Larsen, Senior Legal Adviser

## Thursday, 19 October 2017 – Canberra

*Department of Defence*

- Commodore Jaimie Hatcher AM RAN, Acting Head, Military Strategic Commitments
- Dr Peter Sawczak, Assistant Secretary, Strategic Policy

## Thursday, 19 October 2017 – Canberra

*Australian Academy of Science*

- Dr Stuart Barrow, Senior Policy Analyst
- Professor Steven Chown, Chair, National Committee for Antarctic Research

*Australian Maritime Safety Authority*

- Mr Simon Moore, Manager, International Engagement
- Mr Jamie Storrie, Crisis Preparedness and Response

*Bureau of Meteorology*

- Dr Sue Barrell, Group Executive Science and Innovation

*Geoscience Australia*

- Dr James Johnson, Chief Executive Officer
- Dr Stuart Minchin, Chief, Environmental Geoscience Division
- Dr Jodie Smith, Marine Geoscientist

## Friday, 10 November 2017 – Hobart

*Antarctic Climate and Ecosystems Cooperative Research Centre*

- Mr Mark Kelleher, Chief Executive Officer

*Commonwealth Scientific and Industrial Research Organisation*

- Ms Toni Moate, Director, National Collections and Marine Infrastructure
- Dr Andreas Schiller, Science and Deputy Director, Oceans and Atmosphere
- Dr Anthony Worby, Director, Oceans and Atmosphere

*Department of the Environment and Energy*

- Mr Robert Bryson, Program Manager, Modernisation Taskforce, Australian Antarctic Division
- Mr Matt Cahill, Acting Deputy Secretary, Strategy and Operations Group
- Dr Nicholas Gales, Director, Australian Antarctic Division
- Ms Briony White, Senior Policy Advisor, Australian Antarctic Division

*Department of State Growth*

- Mrs Lara Hendriks, Acting General Manager
- Ms Karen Rees, Director, Antarctic Tasmania and Maritime Industries

*Hobart International Airport*

- Mr Matthew Cocker, Interim Chief Executive Officer

*Macquarie Pont Development Corporation*

- Ms Mary Massina, Chief Executive Officer

*Tasmanian Polar Network*

- Mr Richard Fader, Chairman

*Tasmanian Ports Corporation*

- Mr Kevin Moore, General Manager, Customer Management
- Mr Paul Weedon, Chief Executive Officer

*University of Tasmania*

- Professor Marcus Haward, Professor, Ocean and Antarctic Governance, Institute for Marine and Antarctic Studies
- Dr Jeffrey McGee, Senior Lecturer in Climate Change, Marine and Antarctic Law, Institute for Marine and Antarctic Studies and Faculty of Law

*Private capacity*

- Dr Anthony (Tony) Press

## Thursday, 15 February 2018 – Canberra

*Department of the Environment and Energy*

- Mr Robert Bryson, Program Manager, Modernisation Taskforce, Australian Antarctic Division
- Mr Matt Cahill, Acting Deputy Secretary, Strategy and Operations Group
- Dr Nicholas Gales, Director, Australian Antarctic Division
- Ms Gillian Slocum, Manager, Territories, Environment and Treaties, Australian Antarctic Division

*Department of Defence*

- Commodore Richard Boulton, Director General, Military Strategic Commitments
- Dr Peter Sawczak, Assistant Secretary, Strategic Policy

*Department of Finance*

- Ms Amanda Lee, Frist Assistant Secretary
- Ms Chris Schweizer, Assistant Secretary

*Department of Foreign Affairs and Trade*

- Mr Justin Whyatt, Legal Adviser, Sanctions

*Private Capacity*

- Professor Anne-Marie Brady