

Chapter 4

Suggestions for improving coordination within Defence

4.1 In addition to advocating better climate security policy coordination at a whole of government level, submissions provided specific suggestions for Defence. This chapter outlines proposals, including developing a strategy, establishing a new leadership position, and considering climate security issues in relation to estate management, capabilities, and energy security. This chapter ends with perspectives on whether Defence should be restructured to respond to increasing demands to provide humanitarian assistance and disaster relief (HADR).

Consideration of climate security issues

4.2 The committee heard varying views regarding the extent to which climate security considerations have been integrated across Defence. For example, the Climate Council indicated Defence should further embed climate security considerations into its planning and reporting activities, and proposed Defence 'mainstream climate change into...all key national strategic (military) planning'.¹ This could include analysis and risk assessments of the impacts of climate change on:

- force posture (military base locations and capacity);
- force structure (how the military is organised for combat missions, stabilisation operations and disaster relief);
- military training of Australian personnel; and
- military preparedness to respond to operational requirements, including emergencies on multiple fronts.²

4.3 Dr Anthony Bergin and Ms Zoe Glasson of the Australian Strategic Policy Institute (ASPI) identified the United States Department of Defense (US DoD) 2016 directive as a potential model.³ This stated that US DoD mission planning and execution must include:

- a. Identification and assessment of the effects of climate change on the DoD mission.
- b. Taking those effects into consideration when developing plans and implementing procedures.
- c. Anticipating and managing any risks that develop as a result of climate change to build resilience.⁴

1 *Submission 18*, p. 10.

2 Climate Council, *Submission 18*, pp. 10–12.

3 Dr Anthony Bergin and Ms Zoe Glasson, *Submission 3*, p. 9.

4 United States Department of Defense (US DoD), *Directive 4715.21 Climate Change Adaptation and Resilience*, 14 January 2016, p. 3, <http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/471521p.pdf> (accessed 23 January 2018).

4.4 Dr Michael Thomas, representing the Climate Council, reiterated the importance of considering climate change in military planning. He described 'reading the Australian Defence Force posture review in 2012 and being aghast that climate change was not a consideration in that'.⁵ Dr Thomas was also critical of the Global Change and Energy Security Initiative (GCESI).⁶ This initiative was intended to 'raise awareness, develop an integrated energy strategy and link the military with scientific, industry and academic experts on global change'.⁷ While Defence indicated the GCESI supported the integration of climate change in Defence's core business functions, Dr Thomas found 'no major policy documents or reforms changes were identified as flowing from the GCESI', suggesting it 'was really an information-scoping initiative rather than a major effort to mainstream climate change via reformation of ADF [Australian Defence Force] policies, practices and doctrine'.⁸

4.5 Defence stated the work of 'progressively embedding climate change in its core business functions' is now undertaken by the Defence Climate and Security Adviser.⁹ Air Vice Marshal Mel Hupfeld, Head Force Design, explained how Defence is considering the impact of climate change in its policy settings:

These settings inform planning for operations, preparedness, our capability life cycle and the estate and environmental management. Defence's force design process considers climate changes as a key element of the future operating environment. Currently, Defence is reviewing its investment business processes and our Smart Buyer framework to ensure that there is adequate consideration of climate change and assessment of risks in future capability and infrastructure decisions.¹⁰

4.6 He further stated:

The Chief of Defence Force provides a preparedness directive to the ADF that outlines the level of readiness and what we call the notice to move will be for various elements of capability and for various missions and roles. That direction is provided each year. Within that, when we look at the full range of security capabilities and the risk that we need to be able to manage, then it does include the opportunity to deliver against those threats. We include climate change and the impacts of climate change in our assessments for preparedness, and of course that then allows us to assess what the likelihood would be during a high-risk weather season not just

5 *Committee Hansard*, 8 December 2017, p. 38. See Defence, *Australian Defence Force Posture Review: Final Report*, May 2012.

6 Michael Thomas, *The Securitization of Climate Change Australian and United States' Military Responses (2003–2013)*, UNSW, Springer, Canberra, Australia, 2017, pp. 140–141.

7 Climate Council, *Submission 18 Attachment 1*, p. 53.

8 Defence, *Submission 63*, p. 4; *The Securitization of Climate Change Australian and United States' Military Responses (2003–2013)*, pp. 140–141.

9 Defence, *Submission 63*, p. 4.

10 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, pp. 3–4.

domestically but within the region, in particular, to assess where we may be called upon for humanitarian assistance and disaster relief.¹¹

4.7 Air Vice Marshal Hupfeld also noted:

Our preparedness directive is an annual document that Chief of the Defence Force provides, but he will update the level of readiness as he assesses the threats that might be there, whether that is a climate related risk or a more-strategic or other state or non-state based risk, depending on the security environment at the time.¹²

Climate security strategy

4.8 The Climate Council recommended that Australia emulate the US DoD and United Kingdom Ministry of Defence (UK MoD) by 'mainstreaming climate change into *public* national strategic documents such as the Defence White Paper as well as in key *internal* national strategic documents used by Defence'.¹³ Therefore, the Climate Council recommended Defence regularly release a climate adaptation strategy to complement a climate security white paper.¹⁴

4.9 Other participants similarly supported the development of a Defence-specific climate security strategy. For example, Dr Bergin and Ms Glasson advocated the release of a 'long-term strategy for developing ADF responses to climate change...based on an analysis of the political, strategic, financial, and capability risks and opportunities climate change presents to the ADF business'.¹⁵

4.10 The Centre for Policy Development (CPD) recommended the development of a broader national climate security strategy that would both 'provide the overarching direction for the DoD to ensure the ADF's effectiveness, readiness and resilience, as well as position Australia to be a strategic leader in climate security'.¹⁶ This should cover climate-related risks to Defence including increasing HADR and stabilisation responsibilities, potential geopolitical 'hotspots', and 'the overall effect of climate change on the defence estate including preparedness of the ADF across capacity, capability and resilience'.¹⁷ CPD envisaged this strategy would establish specific 'roles, responsibilities, actionable timeframes and internal reporting requirements', and suggested linking it to the Defence Corporate Plan cycle.¹⁸

11 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 21.

12 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 24.

13 *Submission 18*, p. 10.

14 *Submission 18*, p. 10.

15 *Submission 3*, p. 9.

16 *Submission 24*, [p. 9].

17 CPD, *Submission 24*, [p. 9].

18 *Submission 24 Attachment 1*, pp. 36–37.

Climate security leaders

4.11 Participants recommended the elevation of a senior Defence leader responsible for climate security. Defence appointed a Defence Climate and Security Adviser in mid-2016 to build climate change awareness.¹⁹ The Adviser is tasked with supporting the adoption of climate change consideration into business as usual activities, and ensuring guidance from the *2016 Defence White Paper* is 'integrated and synchronised into all relevant areas of Defence business'.²⁰ However, the committee heard the scope and seniority of this role should be expanded. Dr Thomas emphasised that climate security is:

...a big enough issue to warrant having someone who's the voice on behalf of the ADF that can act, both in a national domestic sense but also in a regional international sense, and speak with authority on the issues. I think it's really important....Whilst Defence has a climate adviser—and no disrespect to that position—I think elevating that to a more senior position, with more prominence in the organisation, would give some drive and some impetus within the ADF to pull those threads together so that it does act against the risks.²¹

4.12 Dr Bergin similarly stated:

What I had in mind was a senior leadership position that could look at the impacts of climate across defence procurement, strategic policy, operations, training and military health. I'm not at all critical of the fact that Defence have appointed someone to try and hoist in some of the impacts of climate. My suspicion is that it is mainly focused around, as I say, the environmental aspects...I'd also see energy security as being part of the responsibility of a senior climate adviser.²²

4.13 The Center for Climate and Security highlighted the importance of providing the senior Defence climate security leader with an 'appropriately staffed office', and suggested it could be positioned within the 'Head Force Design within Vice Chief of Defence Force Group, responsible amongst other things for ADF preparedness and future force design'.²³

4.14 Air Vice Marshal Hupfeld argued that while the Defence Climate and Security Adviser 'does the legwork', he is 'only one part of the machinery of considering all aspects of the security risks that we face'.²⁴ He explained Defence cooperates with Commonwealth agencies on climate risk and adaptation at all staff

19 *Submission 63*, p. 10.

20 *Submission 63*, p. 13.

21 *Committee Hansard*, 8 December 2017, p. 36.

22 *Committee Hansard*, 8 December 2017, p. 14.

23 The Center for Climate and Security, *Submission 22*, [pp. 6–7].

24 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, pp. 24–25.

levels 'the same as we do for any other activity that we perform'.²⁵ For example, he observed:

In terms of an accountability point, the Vice Chief of Defence takes a very strong look and is an accountable officer in the department. He includes the climate elements both as my boss and in preparing our work for the Chief of Defence Force. So the preparedness statements are the vice chief's responsibility—to prepare for the Chief of Defence.²⁶

4.15 The Vice Chief holds other climate-related responsibilities, including:

...a function that we call the Joint Force Authority. He has and takes the authority to prioritise the joint force integration and options that we might use as we operate the force and prepare it for operations prior to then passing them to the Chief of Joint Operations for the conduct of operations. The vice chief also sits on the Secretaries Group on Climate Risk, which is the group above the Disaster and Climate Resilience Reference Group....²⁷

4.16 The committee heard that the Deputy Secretary Strategic Policy and Intelligence 'is the policy lead within Defence who looks at the climate change aspects...[and] the policy settings by which we will contribute to and conform to the whole-of-government policy agenda'.²⁸ Air Vice Marshal Hupfeld reiterated:

...we structure for the key war-fighting activities that we need to perform, and then work out our capabilities to meet those. But there is no doubt that the senior leadership is focused on the climate change elements as one of the security threats we face, so that will continue to be our normal activity. As for whether we set up a deliberate office or some other structure, as I think you are suggesting, that is yet to be seen.²⁹

Estate management

4.17 As outlined in the US DoD report mentioned in the terms of reference, climate change responses are being implemented across American military planning, operations, training, testing, estate and acquisition and supply chains.³⁰ Ms Sherri Goodman explained American agencies including the US DoD have been required over the last decade to 'address the national security implications of climate change as they apply to both military planning and military bases'.³¹ She went on:

25 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 25.

26 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 24.

27 Air Vice Marshal Hupfeld, *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 24.

28 Air Vice Marshal Hupfeld, *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 24.

29 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 25.

30 US DoD, *National Security Implications of Climate-Related Risks and a Changing Climate*, July 2015; Climate Council, *Submission 18 Attachment 1*, p. 68.

31 *Committee Hansard*, 8 December 2017, p. 2.

...the Defense department is leading in assessing the impacts to its military infrastructure, particularly its coastal military bases. At Norfolk/Hampton Rhodes on the east coast of the United States, the US's largest complex of military facilities—that includes many bases—there is a combination of sea level rise, coastal erosion and storm surge that are affecting many of the military facilities down there. They already have extensive sunny-day flooding. The infrastructure there needs to be adjusted and made resilient. There are extensive efforts under way by all the military departments to address the climate impacts that are affecting the operation of that large complex of naval and other military facilities. That's being replicated across particularly the east coast of the United States.³²

4.18 Chapter 2 described how Australian Defence bases and equipment could also be damaged by the physical effects of climate change. However, the CPD suggested Australia 'has still not seen anything like the long-standing, on-the-ground action' the US DoD has undertaken to prepare for sea level rise and climate change.³³ Dr Bergin and Ms Glasson reiterated Defence needs to adapt its estate management in response to climate change, stating '[c]limate proofing the estate will become more important'.³⁴

4.19 Defence undertook 'preliminary investigations that identified the risks from climate change on Defence activities, personnel, and assets' between 2011 and 2015.³⁵ Retired American Rear Admiral Titley endorsed this preliminary work, and suggested there has been a recent re-emergence of attention of this topic.³⁶ Dr Thomas noted that, 'problematically', some relevant Defence studies remain classified.³⁷ Defence suggested these preliminary investigations inform the estate planning processes, and that it 'is already moving to adapt, plan and prepare for potential climate change impacts on its infrastructure'.³⁸ It further stated:

Defence has factored climate change risks into estate planning processes including conducting bushfire hazard reduction land management practices in accordance with approved bushfire management plans, noting requirements to meet other biodiversity, flora and fauna protection obligations. Defence has joined the Bushfire and Natural Hazards Cooperative Research Centre...³⁹

4.20 The *2016 Defence White Paper* noted:

32 *Committee Hansard*, 8 December 2017, p. 4.

33 *Submission 24*, p. 5.

34 Dr Bergin and Ms Glasson, *Submission 3*, p. 7.

35 *Submission 63*, p. 7; Climate Council, *Submission 18 Attachment 1*, p. 53.

36 *Committee Hansard*, 8 December 2017, p. 4.

37 Michael Thomas, *The Securitization of Climate Change Australian and United States' Military Responses (2003–2013)*, UNSW, Springer, Canberra, Australia, 2017, p. 142.

38 *Submission 63*, p. 13.

39 *Submission 63*, p. 13.

Beyond 2025, the Defence estate footprint will need to be further developed to accommodate our new high technology capabilities and ensure that Defence is appropriately postured for future strategic requirements and the implications of climate change. This will involve developing new bases, wharves, airfields and training and weapons testing ranges.⁴⁰

4.21 Defence confirmed it 'will continue to incorporate climate change into existing risk frameworks and processes as they develop across government for projects and planning'.⁴¹

Capabilities

4.22 In 2007, Mr Michael Pezullo, then Defence Deputy Secretary, Strategy, told the committee that climate change effects:

...will probably not affect the force that is being developed over the current 10-year period, which is our acquisition period of 2007-17. Beyond that, we do need to give consideration to those kinds of non-traditional security dynamics in relation to the force that we will develop...⁴²

4.23 The committee heard during the current inquiry that Defence should now consider climate change and the increasing demand for HADR:

A growing HA/DR burden will necessitate expanding the ADFs logistic support corps, including engineers, medical staff, supply and transport. Climate change will also influence the type and volume of equipment and capabilities required to move and land large volumes of supplies, a critical aspect of HA/DR.⁴³

4.24 Air Vice Marshal Hupfeld noted that versatile vehicles can be adapted to provide HADR.⁴⁴ Defence indicated it is investing in these capabilities, stating:

The Government will acquire enhanced aero-medical evacuation and search and rescue capabilities, commencing with upgrades to Chinook helicopters to improve their ability to conduct aero-medical evacuation. In the longer-term, the Government will investigate options to enable the ADF to undertake combat search and rescue tasks more speedily and at longer range....The 2016 Defence White Paper included new Defence capabilities which will enhance the ADF's amphibious, air and sea lift, and maritime surveillance and response warfighting capabilities. As with existing capabilities, these will be able to adapt to respond to future HADR operations both in our region or further afield. Defence is also reviewing the potential impact of additional responses to climate change related events

40 Defence, *2016 Defence White Paper*, February 2016, p. 102.

41 *Submission 61*, p. 13.

42 *Committee Estimates Hansard*, 31 May 2007, pp. 102-103.

43 Dr Bergin and Ms Glasson, *Submission 3*, p. 7.

44 *Proof Committee Hansard*, 20 March 2018, p. 14.

on concurrent tasks and training to sustain Defence preparedness for its warfighting and other response options.⁴⁵

4.25 Defence further noted the physical effects of climate change can negatively affect the maintenance and operational performance of its assets.⁴⁶ It asserted it 'will incorporate input from agencies monitoring changes in biophysical geography...into capability development planning and risk assessment processes'.⁴⁷

Emissions reductions

4.26 While all Commonwealth agencies contribute to Australia's total greenhouse gas emissions, submissions focused on how the major emitter, Defence, could reduce its emissions. Defence emissions are typically grouped into those resulting from estate/establishments (infrastructure, facilities and buildings) and operations (the use of military equipment such as aircraft, tanks, ships and submarines).⁴⁸ In 2011–12, Defence Operational Fuel accounted for 56 per cent of the total energy used within the Australian Government's operations, while Defence Establishments accounted for 15 per cent of the total Australian Government energy use.⁴⁹ Mr Steven Grzeskowiak, Deputy Secretary, Estate and Infrastructure Group, explained:

Within Defence, we track our fuel usage across the range of uses and types of fuel....My latest information for the 2016-17 financial year was that the net emissions from Australian Defence use of fuel was 1,705,000 tonnes of CO₂. That's actually a 10 per cent reduction from the previous year. What tends to drive that is Defence's operational posture. The bulk of that comes from what we refer to as operational fuel use for our warships, our fighter planes and our military vehicles. We also track what we call our stationary energy use, so that's electricity and gas mainly for our Defence bases, but that is a small fraction of the overall total.⁵⁰

4.27 Submissions were generally critical of Defence's emissions reductions efforts. Defence's *Combat Climate Change* program, launched in 2008 'to raise awareness about the issue across Defence and to restrict non-essential energy use', was described by Dr Thomas as 'more rhetoric than reality'.⁵¹ CPD noted the program 'sought to reduce the ADF's greenhouse gas emissions yet excluded large and significant parts of

45 *Submission 63*, p. 9.

46 *Submission 63*, p. 7.

47 *Submission 63*, p. 6.

48 Anthony Press, Anthony Bergin and Eliza Garnsey, *Heavy Weather: Climate and the Australian Defence Force*, ASPI, Special Report no. 49, March 2013, p. 24.

49 Department of Resources, Energy and Tourism, *Energy Use in the Australian Government's Operations 2011–12*, p. 30.

50 *Proof Committee Hansard*, 20 March 2018, p. 12.

51 Climate Council, *Submission 18 Attachment 1*, p. 53; Michael Thomas, *The Securitization of Climate Change Australian and United States' Military Responses (2003–2013)*, UNSW, Springer, Canberra, Australia, 2017, p. 137.

the organisation such as operational fuel use'.⁵² CPD also highlighted that 'the ADF's emissions actually increased over the life of the program'.⁵³

Estate

4.28 The *Defence Estate Energy Policy* committed Defence to exploring renewable energy generation options and reducing carbon emissions, among other objectives.⁵⁴ The *Defence Estate Energy Strategy 2014–2019* stated 'energy efficiency and harnessing energy from alternative sources will allow Defence to deliver value for money, reduce climate change impacts and minimise other environmental consequences arising from fossil fuel use'.⁵⁵ Defence also asserted the 'Defence Estate and Infrastructure Group is actively pursuing best practice in delivering energy to bases'.⁵⁶ As examples of renewable energy use, the Defence submission nominated the 'numerous solar sites operational across northern Australia and the Carnegie Wave Project undertaken at HMAS Stirling'.⁵⁷ This 'is the world's first commercial-scale wave energy array that is connected to the grid and has the ability to produce desalinated water'.⁵⁸ Defence is implementing a broader mitigation program including:

- a. An extensive energy sub metering program to understand consumption and identify opportunities.
- b. Consideration and installation of alternative renewable sources, with a current focus on remote sites.
- c. Investigation of large scale solar arrays.
- d. Integrating sustainability initiatives into the estate, through energy efficient designs, fittings and equipment, and the installation of solar systems on Defence bases, where appropriate.⁵⁹

4.29 Mr Grzeskowiak described the outcomes of Defence's mitigation efforts:

In the things where we have more control—for example, the stationary energy and the cost of running our bases in Australia—we are seeing a reasonably flat line in terms of usage. We're fractionally above our baseline of 2006-07. When you consider the number of more modern facilities we're building, every new capability that we've introduced in the last 10 years

52 *Submission 24 Attachment 1*, p. 33.

53 *Submission 24 Attachment 1*, p. 33.

54 Defence, *Defence Estate Energy Policy*. Defence's 2016 *Defence Environmental Policy* does not mention climate change or greenhouse gas emissions, and these issues are not a focus of the *Environmental Strategy 2016–2036*.⁵⁴ The 2016-2020 *Defence Environmental Plan* is yet to be endorsed at the time of writing.

55 Defence, *Defence Estate Energy Strategy 2014–2019*, 2014, p. 5.

56 *Submission 63*, p. 13.

57 *Submission 63*, p. 12.

58 Australian Renewable Energy Agency, *Perth Wave Energy Project*, <https://arena.gov.au/projects/perth-wave-energy-project/> (accessed 22 January 2018).

59 *Submission 63*, pp. 12–13.

comes with extensive use of simulators and the like, which are energy heavy, then the fact that we're only using a small amount more energy than 10 years ago is quite positive.⁶⁰

4.30 The Climate Council supported some of Defence's environmental initiatives, such as 'strategies to minimise its environmental footprint that include recent enhancements to energy monitoring, 'green' procurement, energy efficiency building codes (including 5-star rated buildings) and fuel efficient commercial vehicle fleets'.⁶¹ It also recommended Defence implement further initiatives, including specific targets for emissions reductions or renewable energy use on military bases.⁶² The US DoD implemented mandated renewable energy targets for military bases, and the US Army 'Net Zero' initiative aims to further reduce base energy emissions and produce as much renewable energy on military bases as it uses over the course of a year.⁶³ Dr Thomas described reducing base emissions and taking bases off the grid as 'almost low-hanging fruit', and identified the opportunity to create local industry jobs.⁶⁴

Operations

4.31 Defence has been considering further 'capability changes to incorporate changing energy options', including alternative fuel sources.⁶⁵ Mr Patrick Suckling, Ambassador for the Environment, suggested military vessels contribute a relatively small proportion of greenhouse gas emissions compared to civilian fleets.⁶⁶ Elsewhere, Dr Bergin noted 'Defence use of liquid fuels is a drop in the ocean of the nation's overall fuels consumption (industry and mining are much bigger users)'.⁶⁷ Nevertheless, Commonwealth agencies informed the committee that '[d]evelopments in alternative fuels and their certification for sea, land and air platforms have the potential to improve future interoperability, cost effectiveness and resilience'.⁶⁸

4.32 Elements of the US military services are implementing measures to reduce emissions relating to operations. The *US Navy Energy Program for Security and Independence* focuses on energy efficiency and security initiatives in the Navy and

60 *Proof Committee Hansard*, 20 March 2018, p. 12.

61 *Submission 18 Attachment 1*, p. 53; *Submission 18*, p. 13.

62 *Submission 18*, p. 12.

63 *Submission 18 Attachment 1*, pp. 66, 69. See, Michael Thomas, *The Securitization of Climate Change Australian and United States' Military Responses (2003–2013)*, UNSW, Springer, Canberra, Australia, 2017, p. 244; Office of the Assistant Secretary of Defense (Energy, Installations and Environment), *Department of Defense Guidance for Executive Order 13693: Planning for Federal Sustainability in the Next Decade*, March 2016.

64 *Committee Hansard*, 8 December 2017, p. 37.

65 *Submission 63*, p. 13.

66 DFAT, *Proof Committee Hansard*, 20 March 2018, p. 12.

67 Dr Bergin, 'Defence and liquid transport fuel resilience', *The Strategist*, ASPI, 30 August 2016.

68 Department of the Environment and Energy (DoEE) and Defence, joint answer to question on notice, 20 March 2018 (received 6 April 2018).

Marine Corps.⁶⁹ The US Navy has committed to drawing 50 per cent of its energy from alternative sources by 2020 through the Great Green Fleet energy initiative, and aims to ensure 50 per cent of shore installations will be carbon neutral.⁷⁰ Commonwealth agencies informed the committee that in 2016 'the Great Green Fleet sailed to Australia to participate in Exercise Pacific Rim on a 90 per cent regular ship diesel and 10 per cent biofuel blend'.⁷¹

4.33 Dr Bergin and Ms Glasson described how the Australian Navy has sought to ensure ongoing interoperability with the US Navy, stating it 'has made significant progress in ensuring our ships and aircraft are certified to use USN sourced [fuel] blends'.⁷² For example, Commonwealth agencies noted:

...in May 2017 the Australian Defence Standard (DEF(AUST)5213C AM1) for Navy Fuels was amended to include provision for alternative fuels obtained from blending conventional fuels with synthetic fuels manufactured by approved methods. The standard was endorsed by the Royal Australian Navy (RAN) and is available to suppliers, noting that current approved processes require blending of conventional fuel with up to 50 per cent synthetic fuels to meet the required physical and chemical properties for naval distillate.⁷³

4.34 However, unlike the US, Defence has not specified targets for alternative fuel use or emissions reductions.⁷⁴ Dr Bergin and Ms Glasson asserted 'there is no reason why Defence should not set an ambitious target in terms of moving towards alternative fuels by announcing its readiness to receive cost-competitive blended products'.⁷⁵ The Climate Council recommended Defence should:

Continue to promote the uptake of energy efficient military hardware and implement sustainable procurement practises. Promoting the uptake of energy efficient major military hardware platforms (e.g the use of biofuels and hybrids) will play a role in helping to mitigate the climate change threat. Sustainable procurement practises such as energy efficient civilian fleets, energy efficient lighting, heating and waste reduction strategies will also be key.⁷⁶

69 Climate Council, *Submission 18 Attachment 1*, p. 68.

70 Dr Bergin and Ms Glasson, *Submission 3*, p. 8; Climate Council, *Submission 18 Attachment 1*, p. 57.

71 DoEE and Defence, joint answer to question on notice, 20 March 2018 (received 6 April 2018), [p. 5].

72 *Submission 3*, p. 8.

73 DoEE and Defence, joint answer to question on notice, 20 March 2018 (received 6 April 2018), [p. 5].

74 See CPD, *Submission 24 Attachment 1*, p. 11.

75 *Submission 3*, p. 8.

76 *Submission 18*, p. 13.

4.35 The Defence Science and Technology Group is 'exploring the potential for new energy technologies for Defence'.⁷⁷ The Army is 'examining innovative energy approaches in the Deployable Force Infrastructure projects' and 'Airforce is also examining potential alternative sources for fuel'.⁷⁸ Commonwealth agencies also noted that, for example, the Defence Capability Technology Demonstrator program has funded research and development into hydrogen-based technologies, including 'portable light-weight fuel cells that can be recharged through solar energy, for use in forward operating bases and mobile units, peace-keeping and emergency relief'.⁷⁹ However, '[c]ost and availability through commercial suppliers is still considered a barrier and wholesale commercialisation of alternative fuel products is not expected in Australia for several years'.⁸⁰

Energy security

4.36 Defence described 'a secure electricity system' as 'one that continues to operate across the entire region despite disruptions'.⁸¹ Energy insecurity 'has potential to disrupt supply chains and immobilise military assets'.⁸² Defence stated:

Given Defence's reliance on energy sources provided and managed by external parties, it is critical that Defence's energy security and resilience requirements are reflected by Australian Government energy security legislation and regulation at both the state and national level.⁸³

4.37 Submissions suggested transitioning to renewable energy sources will improve Defence's energy security by ensuring it has access to diverse energy sources under Australian control.⁸⁴ ASPI stated that eliminating Defence's reliance on domestic power grids 'may assist operational autonomy and overall capacity'.⁸⁵ ASPI further noted using alternative fuel sources 'to decrease the ADF's reliance on external supplies in times of international crisis that may make supplies of crude difficult to obtain, or even unavailable, will increase operational resilience'.⁸⁶ The ANU Climate

77 *Submission 63*, p. 13.

78 *Submission 63*, p. 13.

79 DoEE and Defence, joint answer to question on notice, 20 March 2018 (received 6 April 2018), [p. 6].

80 DoEE and Defence, joint answer to question on notice, 20 March 2018 (received 6 April 2018).

81 *Submission 63*, p. 8.

82 *Submission 24*, [p. 6].

83 *Submission 63*, p. 8.

84 CPD, *Submission 24 Attachment 1*, p. 22; Climate Council, *Submission 18*, p. 12; AGL, *Submission 33*, p. 2; ANU Climate Change Institute, *Submission 50*, p. 22.

85 Anthony Press, Anthony Bergin and Eliza Garnsey, *Heavy Weather: Climate and the Australian Defence Force*, ASPI, Special Report no. 49, March 2013, p. 25.

86 *Heavy Weather: Climate and the Australian Defence Force*, p. 26.

Change Institute also identified the broader national security benefits of diversification and additional domestic energy availability.⁸⁷

Response to domestic disasters

4.38 As outlined in chapter 2, climate change is contributing to extreme weather events that endanger the health and wellbeing of Australian individuals and communities. The ADF is currently structured around its warfighting role, and adapts existing capabilities to assist lead agencies through the provision of HADR, rather than making HADR a central Defence priority.⁸⁸ As detailed below, the committee heard various suggestions about the appropriate Defence response to disasters.

Defence Assistance to the Civil Community

4.39 Defence emphasised that it is 'committed to supporting the interagency coordinating mechanisms...under the resilience and adaptation framework'.⁸⁹ Defence stated the 'continuation of whole of nation approach and engagement with international partners is essential as most of Defence's climate change and adaptation risks are shared with other Government agencies, business and communities'.⁹⁰ The Department of Home Affairs has primary responsibility for domestic resilience and emergency management within the Commonwealth through Emergency Management Australia (EMA). Defence collaborates with EMA to improve Australia's domestic disaster resilience, including through:

- a. Participation through the EMA in scenario planning and preparedness activities.
- b. Participation in EMA led pre-disaster briefings for state and territory governments and Emergency Services agencies.
- c. A review of regional humanitarian assistance/disaster response and national DACC response plans.
- d. Analysis of likely domestic support contingencies and likely response requirements to ensure ADF preparedness to respond.⁹¹

4.40 Admiral Barrie noted that Defence has good relationships with EMA and the various state and territory emergency services.⁹²

4.41 Defence provides support to the Australian community in emergencies under Defence Assistance to the Civil Community (DACC) arrangements:

State and territory governments have primary responsibility for the protection of life, property and the environment, and for coordinating and

87 *Submission 50*, p. 23.

88 *Submission 63*, p. 3.

89 *Submission 63*, p. 10.

90 Defence, *Submission 63*, p. 14.

91 Defence, *Submission 63*, pp. 12–13.

92 *Committee Hansard*, 8 December 2017, p. 32.

planning an emergency response or recovery within their jurisdictions. Where the scale of an emergency or disaster exceeds their response capacity or where resources cannot be mobilised in sufficient time, a state or territory may seek Commonwealth assistance, including from Defence.⁹³

4.42 Defence assistance can include the 'airlift of equipment and personnel; engineering support; search and support; temporary accommodation and general support; health and psychological support; aviation refuelling; and communications'.⁹⁴ The ANAO noted:

...Defence is often able to deploy Australian Defence Force (ADF) personnel (including Reserve personnel) with relevant expertise and skills (for example, engineers), as well as equipment (from transport aircraft to water purification units). Defence may also have the capacity to deploy its personnel and equipment at relatively short notice due to the geographical proximity of certain bases to incident areas and its access to transport assets. Further, Defence has developed approaches to the planning, coordination and conduct of operations, which may be readily adapted to emergency responses.⁹⁵

4.43 The ADF was deployed approximately 275 times to provide emergency assistance from 2005–06 to 2012–13.⁹⁶ Examples included:

Victoria Black Saturday bushfires, 2009: Defence support to the 2009 bushfires reached a peak operational strength of about 800 military personnel per day, with more than 1,250 Defence personnel providing assistance over the seven weeks of the operation.

NSW bushfires, 2011: The Army Engineer Remediation Force conducted over 200 demolition tasks, 338 tree felling tasks, 21 pool drainage tasks and over 200 site reconnaissance tasks.

Queensland floods, 2011: Defence deployed some 1,440 personnel with 26 aircraft flying 572 hours transporting about 1,000 people with more than one-half million kilograms of stores.

Queensland Tropical Cyclone Yasi, 2011: Operation Yasi Assist involved more than 1200 soldiers, sailors and aircrew deployed to assist with the recovery.⁹⁷

4.44 During the response to the Black Saturday bushfires Defence 'recorded supplier expenses totalling some \$6.7 million, for items such as travel, consumable

93 Defence, *Submission 63*, pp. 8–9.

94 The Auditor-General, *Emergency Defence Assistance to the Civil Community*, Australian National Audit Office (ANAO), Audit Report No. 24 2013–2014, April 2014, p. 12.

95 The Auditor-General, *Emergency Defence Assistance to the Civil Community*, ANAO, Audit Report No. 24 2013–2014, April 2014, pp. 11–12.

96 *Emergency Defence Assistance to the Civil Community*, p. 32.

97 Climate Council, *Submission 18 Attachment 1*, p. 55.

goods and garrison support'.⁹⁸ More recently, Defence responded to Tropical Cyclone Debbie in Queensland in 2017, at a cost to Defence of \$306,600.⁹⁹ At the time of writing, a Joint Task Force of over 400 Navy, Army and Air Force personnel had been established to assist the Northern Territory and local governments in recovery efforts following Tropical Cyclone Marcus in March 2018, alongside 50 US marines.¹⁰⁰

4.45 Defence does not currently have personnel solely responsible for responding to international HADR or domestic DACC policy, planning or coordination.¹⁰¹ Instead, extant personnel are tasked with managing Defence's response once it has committed to an operation.¹⁰² However, as Air Vice Marshal Hupfeld explained:

...in doing analysis around the high-risk weather season, Defence works with Home Affairs to examine what that risk analysis would be so that we can prepare in advance. We certainly pre-plan, we adjust and the Chief of the Defence Force will adjust the preparedness requirements if he thinks it's necessary based on those risks. So there are staff that are allocated to those functions and we perform those activities in planning and policy.¹⁰³

4.46 From October 2017 to April 2018 a range of capabilities were available to provide DACC and HADR, including:

...an amphibious ship (HMAS *Canberra*)...Operational Response Vessels, which are available to provide assistance for Search and Rescue (SAR) and civil emergencies. A helicopter response capability...a range of air mobility assets...surveillance, aero-medical evacuation, communications, logistics support and limited plant operators and tradespersons, depending on the emergency...The 3rd Brigade, based in Townsville, is the primary on-call Army unit over the high-risk weather period 2017-18. Army also maintains scalable Emergency Support Force units around Australia...¹⁰⁴

Capacity of Defence to continue responding to disasters

4.47 Many submissions questioned whether Defence will have the capacity to fulfil its military and HADR responsibilities in the future due to the additional commitments and climate-related threats outlined in chapter 2.¹⁰⁵ Submissions agreed

98 The Auditor-General, *Emergency Defence Assistance to the Civil Community*, ANAO, Audit Report No. 24 2013–2014, April 2014, p.15.

99 Department of Defence, *Annual Report 2016–17*, p. 39; Defence, answer to written question on notice, (received 27 February 2018).

100 Defence, 'Australian Defence Force stands up Joint Task Force to help cyclone recovery', *Defence News and Media*, 23 March 2018; Senator the Hon Marise Payne, Minister for Defence, *Senate Hansard*, 27 March 2018, p. 20.

101 Defence, answer to written question on notice, (received 27 February 2018).

102 Air Vice Marshal Hupfeld, *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 20.

103 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 20.

104 Defence, answer to written question on notice, (received 27 February 2018).

105 Dr Bergin and Ms Glasson, *Submission 3*; Dr Barnes, *Submission 46*; CPD, *Submission 24*.

'it is reasonable to expect increasing pressure on ADF resources to respond to such crises in terms of relocating affected populations and managing the clean-up'.¹⁰⁶

4.48 The committee heard Defence has not always been able to respond to domestic emergencies, such as when the Navy was 'unable to deploy HMAS *Manoora*, *Kanimbla* or *Tobruk*' following Cyclone Yasi.¹⁰⁷ Admiral Barrie suggested:

Tobruk's failure was certainly an issue with support arrangements inside Navy and, in my view, a failure to take preparedness seriously. I spent some time saying to the people who ran the Navy, 'You really dropped the ball on this.' There is a report, as well [as] other changes inside the organisation, and they have really tried to correct those omissions.¹⁰⁸

4.49 Admiral Barrie questioned whether Defence has 'sufficient personnel in the present force' to respond to the increasing HADR requirements.¹⁰⁹ ASPI predicted the ADF will not have the capacity to fulfil its range of military, HADR and other responsibilities in the changing operating environment without additional resources.¹¹⁰ Defence does not currently pre-allocate funding for HADR tasks 'due to the unpredictability of these events'.¹¹¹ Instead, 'costs are usually absorbed within the existing Defence budget'.¹¹² Air Vice Marshal Hupfeld noted once a certain threshold is reached the government may consider refunding Defence's costs.¹¹³

4.50 Modelling of Defence's future preparedness posture indicates a manageable increase in the frequency, scale and operational risk of climate commitments in the near term.¹¹⁴ However, Defence cautioned 'concurrency pressures' could become apparent from as early as the middle of the next decade.¹¹⁵ Also referred to as the risk of 'compound events' or 'simultaneity', concurrency refers to a combination of disasters or military missions requiring responses simultaneously.¹¹⁶ The CPD identified concurrency pressures as the 'key risk to the ADF', noting:

106 Associate Professor Matt McDonald, *Submission 23*, p. 3.

107 *Committee Hansard*, 8 December 2017, p. 17. See Hayden Cooper, 'Call for heads to roll over rust-bucket Navy', *ABC News*, 7 March 2011.

108 Admiral Barrie, *Committee Hansard*, 8 December 2017, p. 31. See Paul J Rizzo, *Plan to Reform Support Ship Repair and Management Practices*, July 2011.

109 *Submission 38*, p. 9.

110 Dr Bergin and Ms Glasson, *Submission 3*, p. 6; Dr Barnes, *Submission 46*, p. 2.

111 Defence, answer to written question on notice, (received 27 February 2018).

112 Defence, answer to written question on notice, (received 27 February 2018).

113 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, p. 20.

114 *Submission 61*, p. 14; *Submission 63*, p. 6.

115 *Submission 61*, p. 14; *Submission 63*, p. 6; Air Vice Marshal Hupfeld, *Proof Committee Hansard*, 20 March 2018, p. 3.

116 ARC Centres of Excellence for Climate System Science and Climate Extremes, *Submission 14*, [pp. 2–3]; The Center for Climate and Security, *Submission 22*, p. 4.

One scenario, for example, is the ADF needing to respond to a regional request for a large-scale HADR deployment in the aftermath of a severe tropical storm, whilst also responding to a natural disaster domestically.¹¹⁷

4.51 Ms Goodman related actual examples of such events:

In the western part of the United States, we have extensive wildfires. Temperatures are rising, and that's affecting training days. It's also diverting the military from its war missions to be able to perform Defense support to civil authorities, either to address wildfires in the west or to provide support for the hurricanes that came through Puerto Rico, Florida and Texas earlier this year...We even experienced a case where we had to slow the flow of forces into Afghanistan, because they were stretched in responding to the hurricanes in Texas, then Florida and then Puerto Rico.¹¹⁸

4.52 Dr Bergin suggested Australia needs to prepare for concurrency pressures, and 'test our military systems to see how we would go in the event that we did have to do what the Americans have just done'.¹¹⁹ The committee heard the potential long-term impacts of such concurrency pressures:

Greater demand on our agencies (including defence forces) domestically will potentially limit our security forces' ability to respond to disasters in our region. If our capability to provide assistance becomes increasingly constrained, the resilience of vulnerable states in our region will be further undermined and their infrastructure weakened as the result of a reduced Australian capacity to help protect and rebuilding. This will translate as greater potential for insecurity or state collapse, in turn further increasing demands on our military.¹²⁰

4.53 Air Vice Marshal Hupfeld agreed there is 'scope in the future for Defence to be reorientated more towards other threats to national security' if required.¹²¹ He elaborated:

The key point, from my perspective, is we identify that the risks and impacts from climate change are a threat multiplier—there's no doubt. Things like sea level rising, resulting in migration, arguably can lead to conflict as you get unsettled nations and displaced people...In our force design outcomes, we include these planning factors in our future operating environment assessments. We match that to our operating concepts both for the next 10 years and further out, under our future joint operating concept, to examine what we think those impacts may be. We are including that in

117 *Submission 24*, [p. 5].

118 *Committee Hansard*, 8 December 2017, pp. 4, 6.

119 *Proof Committee Hansard*, 8 December 2017, p. 16.

120 Griffith Climate Change Response Program and Griffith Policy Innovation Hub, *Submission 37*, p. 7.

121 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, pp. 5–6.

the design of our force to ensure that we can meet all nature of security threats that this nation may be forced to follow.¹²²

4.54 The Center for Climate and Security predicted the increasing demand for Defence to deliver HADR due to climate change:

...may impose downstream changes; from what type of equipment and capability the ADF uses and procures, to 'how' and for 'what' the ADF trains. Through time, these facets may alter the actual force structure of the ADF, or as a minimum, increase inter-operability requirements with domestic and regional emergency services.¹²³

Proposals for preparing Defence to respond to disasters

4.55 The committee heard various proposals for addressing this issue, including that Defence readjust its priorities, invest in versatile personnel and assets, or further support non-military forces to respond to climate-related events.

4.56 A number of submissions argued Defence should equally prioritise its warfighting and non-warfighting responsibilities, and adjust procurement and training policies accordingly. CPD recommended equally prioritising 'non-war functions alongside war functions', namely:

...responding effectively to demands for humanitarian and disaster relief from neighbouring countries; undertaking peace keeping and stabilisation missions to countries of direct relevance to Australia's national security; and protecting Australia's supply of, and access to, natural resources including food, water and energy.¹²⁴

4.57 As an example, the committee raised the example of whether Defence should own and operate a fleet of aircraft for firefighting purposes.¹²⁵ Mr Mark Crowweller, Director General of EMA, suggested there are good reasons for contracting rather than owning such aircraft:

We're able to contract the best and the brightest and the latest aircraft into Australia that suit Australian conditions...They're not required in Australia for 12 months of the year, so we bring the expertise in from overseas when we need it. It goes back when we don't need it. That's managed through the

122 *Proof Committee Hansard*, 20 March 2018, p. 3; Defence, *Submission 63*, pp. 5–6.

123 The Center for Climate and Security, *Submission 22*, p. 4 [original emphasis removed].

124 CPD, *Submission 24*, [p. 4].

125 *Proof Committee Hansard*, 20 March 2018, p. 16. The example of the US Marine Corps was raised, which can adapt existing helicopter and fixed-wing fleets for firefighting purposes using technology such as the Modular Airborne Fire Fighting System. See <http://www.maffs.com/> (accessed 4 April 2018). Some Canadian provincial governments operate purpose-built firefighting aircraft, and lease them to the US for limited, high fire risk periods each year. See, for example, Ontario Ministry of Natural Resources and Forestry, <https://www.ontario.ca/page/forest-fires> (accessed 4 April 2018).

National Aerial Firefighting Centre, which is a cooperative arrangement between the federal government and the states.¹²⁶

4.58 He further added:

...we are well-serviced by a volunteer firefighting force that is the envy of the world...We've often talked to Defence about supplementation of capabilities in that particular space. We don't believe that it's necessary to train soldiers to that level of firefighting capability, and I think Defence would agree with that.¹²⁷

4.59 A possible compromise may entail Defence investing in 'dual-use-styled forces' that could be available for HADR or war fighting.¹²⁸ Dr Bergin clarified his view regarding the use of Defence assets to respond to non-conflict emergencies:

...I'm certainly not suggesting we invest in specific capabilities designed for these missions. What I'm suggesting is that capabilities, obviously like the [amphibious] ships, should be deployed and used and so forth and be maintained for these sorts of purposes and that they should not be seen both domestically, for domestic disaster response, or regionally as add-ons, as it were. They should be seen as absolutely core missions of the ADF...There is an array of areas that Defence, as an institution with investments in things that fly and go into the water, can be of benefit in terms of pre-disaster preparation and information, adding to civil authorities.¹²⁹

4.60 Some submissions raised alternative structural changes to the ADF, such as the creation of a dedicated 'green helmet' force or separate 'wake force' focussed on responding to humanitarian needs in climate emergency scenarios.¹³⁰ Dr Bergin and Ms Glasson noted that it 'may be necessary for the ADF to assign part of its ready reserve or regular force to dedicated HA/DR tasks'.¹³¹ The committee is aware of other calls for the ADF to develop its reserve forces to provide HADR.¹³²

4.61 The committee also heard that, instead of positioning dedicated HADR forces within the ADF, the role of non-military forces could be expanded. Dr Bergin and Ms Glasson suggested:

126 *Proof Committee Hansard*, 20 March 2018, p. 16. The Department of Home Affairs provided additional information on the National Aerial Firefighting Centre. Department of Home Affairs, answers to questions on notice, 20 March 2018 (received 9 April 2018).

127 *Proof Committee Hansard*, 20 March 2018, pp. 16–17.

128 Dr Thomas, *Committee Hansard*, 8 December 2017, p. 38; Dr Bergin and Ms Glasson, *Submission 3*, p. 5.

129 *Committee Hansard*, 8 December 2017, p. 17.

130 Friends of the Earth Brisbane, *Submission 15*, [p. 1]; Ms Elizabeth Boulton, *Submission 47*, pp. 9–10.

131 *Submission 3*, p. 5.

132 For example, Mr Geoffrey Craggs, *Australian Defence Response to a Changing Climate*, Future Directions International, February 2018.

Because of demands on ADF resources for maritime border security, maritime enforcement and disaster relief, climate change may give greater currency to arguments in support of a coastguard and re-vamped civilian disaster agencies.¹³³

4.62 Rear Admiral Titley also addressed the idea of a dedicated HADR force:

Your question gets to what we sometimes refer to as a constabulary force. It's not maybe high-end military, high-end war fighting, but they are able to go into these uncertain security situations, disasters, and re-establish some sort of order, communications, intelligence, logistics and all that...it's a very good idea that needs to be kept on the table and really thought through, but at what level—how much of that do you need to do to really make it worthwhile? If it's below that level, then maybe it's more efficient to simply have the ADF, who is exceptionally good at this, to just simply achieve that mission.¹³⁴

4.63 Admiral Barrie responded:

I would say that members of the Australian Defence Force are the most expensive assets that the government funds to get jobs done, whatever they are. And I think if you can find someone else to do that work and you don't have to spend that amount of money, you should go and find it...I worry that we see the emergence of these paramilitary forces, and I would put Border Protection in one of those classes. Paramilitary forces are there to do jobs that essentially look very military to me, but I wouldn't go so far as to say that becomes 50 per cent of the defence function; I think that would be a total misuse of resources.¹³⁵

4.64 On the broad topic of how Defence responds to climate change, Air Vice Marshal Hupfeld reiterated it is being considered across Defence as part of its normal activity, and noted Defence continues 'to review our structures to see what is the most efficient and effective way of delivering the capabilities that are required'.¹³⁶

133 *Submission 3*, p. 7.

134 *Committee Hansard*, 8 December 2017, p. 7.

135 *Committee Hansard*, 8 December 2017, p. 32.

136 *Proof Committee Hansard*, 20 March 2018, p. 25.