AMSANT Response to the NT Climate Change Discussion Paper

December 2018

Contents

Introduction

Thank you for the opportunity to provide a submission in response to the NT Government *Economic and Environment Policy Climate Change Discussion Paper* (Discussion Paper) and the call for broader consultation to inform the development of the Northern Territory's Climate Change Strategy. The Aboriginal Medical Services Alliance NT (AMSANT) is the advisory body for Aboriginal Community Controlled Health Services (ACCHSs) in the NT. Our members are located right across the NT from Darwin to the most remote areas and the ACCHSs sector is the largest provider of primary health care to Aboriginal people in the NT. ACCHSs deliver comprehensive primary health care in an integrated, holistic, culturally secure framework which combines a population health approach with primary health care service delivery, and are also involved in diverse health research activities. AMSANT provides guidance and advocacy on a wide range of research, public health issues, education, workforce, continual quality improvement programs, social and emotional wellbeing, housing and other determinants of health that affect NT Aboriginal people. It has high level collaborations with the NT and Commonwealth Governments on these issues.

AMSANT recognises the significant impact that climate change will have on the future economy, biodiversity, industry, living conditions, health and well-being of the NT population if aggressive actions are not taken to minimise greenhouse gas (GHG) emissions in the short-term. There is renewed interest to limit global warming to 1.5^0C as climate-related risks to health, livelihoods,

food security, water supply, human security, and economic growth are projected to increase at this level and get progressively worse at higher temperatures (IPCC 2018). The financial and power usage demands of remote communities, as well as the burden on human and natural resources will test their viability in the future. Despite this, we note that Aboriginal people are inextricably tied to the land and cannot and will not move from country - our member organisations and their communities are therefore in it for the long haul.

Those who contribute least to climate change will be among the most affected and will potentially have the least capacity to mitigate and adapt to these changes. AMSANT is particularly concerned about the inequity of projected climate change impacts on vulnerable populations, principally on NT Aboriginal people with poor living conditions. The NT Government (in conjunction with the Australian Government) has an important responsibility of protecting the most vulnerable members of its community from the projected impacts of climate change through mitigation and adaptation strategies that significantly reduce GHG emissions into the future, and meet the ongoing demands to health and living conditions.

AMSANT's submission focuses on areas of interest to AMSANT member bodies and their communities. In particular it focuses on four key areas of climate change: planning, coordination and implementation of mitigation and adaptation plans; direct health impacts; housing; and industry and the economy.

Planning, Coordination and Implementation

Aboriginal people through traditional knowledges and practices have the capacity to help mitigate and adapt to climate change in the NT. This is acknowledged in question three of the Discussion Paper where additional opportunities to apply Aboriginal knowledges and practices to help mitigate and adapt to climate change were sought. In planning for the future in an environment of climate change we make the point that it will be critical that Aboriginal people are included as key partners at all levels in this process. It will also be important that where Aboriginal knowledges and understandings are used to mitigate against and adapt to climate change that Aboriginal people receive equitable benefits from this information and knowledge sharing.

Climate change is a complex issue and our understanding of this subject is still evolving and will continue to evolve. While Aboriginal people are already noticing changes to weather patterns and seasonal foods, including fishing and hunting opportunities, it will be important to engage with Aboriginal people to improve broader literacy around climate change in order to empower Aboriginal people so that they are prepared for and able to engage with this important issue. Unbiased scientific advice needs to be available not only to Traditional Owners but also to the broader Aboriginal community, with the availability of interpreters and cross cultural expertise to communicate the complex technical information.

In the NT there are significant regional variations in climate, exposure to types of climate risk and access to resources which all have an impact on regional access to and ability to engage with climate change. In developing an overarching NT Climate Change Policy document it will be necessary to balance planning for the NT as a whole with providing a regional focus.

While the Discussion Paper raises the issue of temperature and the increasing number of days over 35 degrees, we note that it does not explicitly focus on the issue of humidity. As articulated

by Opperman et al. in their 2017 paper, "*Heat, health and humidity in Australia's monsoon tropics: a critical review of the problematization of 'heat' in a changing climate,"* humidity is an important factor in our understanding of and consequent ability to mitigate against and adapt to increased temperatures.

The health impacts of climate change will be discussed in greater detail later in the submission, however, in planning for an increased number of hotter days it will be important to carefully consider how we understand and measure heat (including what constitutes a heat wave) for which populations and for what purpose. As noted by Opperman et al. how we understand and measure heat, excessive heat and what constitutes a heat wave - be it ambient temperature, apparent temperature, wet-bulb globe temperature and excess heat factor has an impact as to what, when and where are considered to be significant heat events. While AMSANT does not propose an answer to this question, it is suggested that a nuanced multi-modal understanding of heat and excessive heat may need to be developed to suit the NT.

In developing and implementing the model it will be important to ensure that the needs of NT people, and the subsequent strategic choices that are made, are appropriate for the full range of climatic zones in NT. That is, from the tropical North to the arid dry South and intermediate zones, it will be important that what the NT puts in place is not overwhelmed by strategies appropriate for other more populated climatic conditions that are promoted by a dominant national Australian discourse (Opperman et al. 2017, p 15). It is important that climate change is considered as an integral part of general business. It is therefore proposed that a "climate risk (including risk to human health) in all policies" approach be implemented.

AMSANT believes that the Northern Territory needs to plan for, coordinate and implement programs and activities, for a future of zero net GHG emissions (which is inconsistent with the exploitation of NT gas reserves) and supports an increased renewable energy target beyond the current NT target of 50% of grid electricity by 2030 to as close to 100% renewable electricity generation as possible. Such actions would require the coordination and implementation of a significant ongoing inter-sectoral approach between government, industry and the community.

In an environment where we are seeking to increase the use of renewable energy and pursue decreased carbon emissions it is critical that we also seek to reduce the use of electricity and any wastage of other resources such as water. Education, monitoring and enforceable targets will be important in efforts to promote the most efficient use of resources.

AMSANT suggests that the approach to planning, coordinating and implementing climate change mitigation and adaptation activities must be strengths based. It is just as important to build on existing strengths of individuals and communities to mitigate against and adapt to climate change, as it is to address potential vulnerabilities. AMSANT notes that adaptation will need to be both incremental and transformative.

In planning, coordinating and implementing activities that respond to climate change it will be important that there is engagement at all levels. It will be important that all sectors take action in areas of their responsibility and that reductions in carbon emissions, renewable energy uptake and reduction of resource wastage are enforceable. AMSANT would support a Climate Change Act that legislates for increased and binding action to combat climate change.

Recommendation 1: That planning, coordination and implementation of activities around climate change are conducted in partnership with Aboriginal people, communities and their representatives.

Recommendation 2: That planning, coordination and implementation activities related to climate change be conducted at the regional level as well as for the whole of the Northern Territory to ensure that they are appropriate and relevant to different areas.

Recommendation 3: Planning and policy be undertaken to limit developments in hazard prone areas.

Recommendation 4: That climate change be built into the way that the NT Government operates with consideration of a "Climate Risk (particularly with respect to health) in all Policies" approach in all major policy deliberations.

Recommendation 5: Development of a model of heat and dangerous heat situations specific to the NT climate and its population groups, particularly to Aboriginal people.

Recommendation 6: That the NT pursue an overall target of zero net carbon emissions and support national policy of zero net carbon emissions.

Recommendation 7: That there is reduction of power and resource wastage through education and monitoring programs.

Recommendation 8: That the NT seek to move beyond the current target of 50% of electricity by renewable sources by 2030 to 100% renewable energy generation.

Recommendation 9: That industry performance indicators against targets be monitored, evaluated and reported.

Recommendation 10: That a NT Climate Change Act that legislates for enforceable targets be developed in conjunction with key partners.

Health Impacts

Climate change will inevitably increase the risks to health, livelihoods, food security, water supply, human security, and economic growth on a global and local scale (IPCC 2018). Risks to health include: (1) death, injuries and post-displacement infectious disease outbreaks due to extreme weather events (e.g. fires, floods, cyclones and storm surges); (2) dehydration and exacerbation of chronic diseases, particularly renal and cardiovascular diseases, from heat stress and inactivity; (3) respiratory distress from air pollution, fires and relocation of pollen sources; (4) stunting, malnutrition and diabetes from unhealthy diets due to food insecurity; (5) diarrhoeal and gastrointestinal illness due to water pollution and shortages in potable water; (6) from vector distribution changes (mosquitoes, rodents and ticks) leading to introduction and/or spread of vector-borne communicable diseases such as malaria, dengue, leptospirosis and tick fevers; and (7) mental health impacts following extreme weather events, from displacement from non-habitable environments such as lost coastal land (climate-change refugees), and from loss of livelihood, employment prospects and future (Kjellstrom et al. 2009; DEA 2016).

Climate change will affect vulnerable groups disproportionately, particularly the young, the aged, pregnant women, the poor, homeless, linguistically and culturally diverse people, people with limited access to healthcare, those living remotely, those living in coastal areas and those suffering with chronic non-communicable diseases (DEA 2016). As cited in the NT Government Discussion Paper, NT Aboriginal people will be particularly hit hard because they also carry many of the other risk factors described. It is expected that climate change will increase the social health gradient meaning that the health outcomes of the most disadvantaged populations will get even worse relative to other socioeconomic levels (RACP 2016a).

To adequately address the future health needs of NT Aboriginal people due to climate change, we need to contextualise the current health situation in the NT, and extrapolate to where things are likely to progress to. The barriers and difficulties present in Aboriginal health today are likely to persist and grow into the future, but there is room for innovation and for health technologies to ease some of these demands.

Aboriginal people in the NT generally have worse health outcomes than Aboriginal people elsewhere in Australia (AIHW 2017). This is partly due to the fact that a larger proportion of Aboriginal people live remotely, where housing, access to health services and the social determinants of health are much worse. Similarly, a large number of Aboriginal people living in town camps or urban centres are homeless or have poor quality public housing. Socio-economic disadvantage is the major factor underlying the persisting life expectancy gap in the NT, contributing as much as half of the difference between Aboriginal and non-Aboriginal populations (Zhao et al. 2013). The impact to the NT health budget as a result of these discrepancies is significant.

If climate change was to progress unabated then there would be a considerable toll to NT Aboriginal people, both in the Top End and Central Australia. Aside from death, injury and displacement due to extreme weather events the impact from rising daily temperatures would be significant. It is expected that the frequency of extreme heat days (above 35^{o}C) would significantly increase in Darwin to 275 days per year by 2100 (The Australia Institute 2018) and would also increase in Central Australia. The impact of temperature rises will be made worse if there is high humidity and insufficient overnight cooling (Opperman et al. 2017). This would lead to heat stress in residents of many remote communities as many homes lack basic necessities such as running water, adequate plumbing and functional power sockets. Air conditioning is an intangible aspiration for many homes. Aboriginal people with inadequate or no housing in towns and urban centres will likewise be affected.

Heat stress can lead to dehydration, lethargy, inactivity, which can in turn exacerbate chronic diseases such as diabetes, cardiovascular disease and in particular renal disease, which is so rampant among Aboriginal people in the NT. During the heatwave that struck Europe in August 2003, 14,729 people died in France alone. The majority were elderly, dehydrated and with kidney failure (de Lorenzo & Liano 2017). Sweating combined with inadequate or excess water intake can cause electrolyte imbalances during periods of high temperatures and variable humidity, leading to electrolyte imbalances. Further, compensatory physiological mechanisms, such as circulatory adaptation and thermoregulation, may compromise kidney function and lead to renal failure (de Lorenzo & Liano 2017). The cost of the increased demand for dialysis services in NT Aboriginal people alone would be substantial.

The cascade of impacts from heat stress would extend into other areas. More people in remote communities would stay indoors to avoid the heat, leading to longer periods in overcrowded conditions, and subsequently higher risks of skin infections and other communicable diseases including rheumatic heart disease and meningitis. Inactivity would exacerbate and increase the prevalence of chronic conditions such as obesity, diabetes and cardiovascular diseases.

Fresh food storage and refrigeration would be compromised by power outages for those homes with electricity, and for homes without electricity the increased heat would lead to rapid spoilage, which would make processed unhealthy food a more viable option. Food security remotely would be further threatened by more frequent blockage of roads due to flooding and extreme weather events compromising food transport, and by changes in the availability of bush food.

Inability to undertake outdoor work due to the heat, and overcrowding and uncomfortable living conditions would impact on social and emotional wellbeing and lead to harmful behaviours. In other words, just one effect of climate change, an increase in the number of hot days, would have a cascading stream of consequences that will exacerbate current problems in Aboriginal health and increase the demands on health services.

There is definitely some capacity to adapt health services to meet this demand. Recent life expectancy improvements in older age groups have followed major investment in primary care, the establishment of Aboriginal community-controlled health services, and the implementation of chronic disease management strategies (Georges et al. 2017). Expanding core services of primary health care at the coal face of community health clinics and concurrently addressing the social determinants of health is essential to improving health in Aboriginal people now and to meet the challenges of climate change in the future (AMSANT 2016).

The added demand for services cannot be rectified by increasing funding alone, given problems of remote workforce supply and continuity of care (Russell et al. 2017). Innovation in health technologies can bridge some of these gaps particularly in areas of communication with specialist culturally-sensitive services. Enhanced care coordination and improved self-management and health literacy through educational innovations are also important.

Undoubtedly, the best method to address the effects of climate change in the future is to prevent it from occurring in the first place with effective mitigation policies, strategies and action on a global, national and local level. This would entail the NT Government incorporating all the recommendations summarised at the end of this submission, particularly those advocating for zero net carbon emissions by 2050 and 100% renewable energy use by 2050. In addition, as advocated for in the RACP position statement on environmentally sustainable healthcare (2016b), and as has been successfully implemented in the UK National Health Service (NHS), health infrastructure, procurement activities and transport should run sustainably as close to carbon neutral levels as possible. This could be accomplished with reduction of wastage and streamlining of healthcare processes and patient journeys, as well as through transition to renewable energy sources.

Adaptation strategies are far inferior to taking decisive climate change mitigation action now. They themselves may add to the greenhouse gas emission burden if not sourced by renewable energy. Cooling/ air-conditioning for all at-risk people (which includes most Aboriginal people in the NT)

should be considered as a basic human right. The NT Government should ensure that all Aboriginal people with chronic diseases, who are very young, elderly or pregnant have 24 hour access to cooling/ air-conditioning and potable water supplies.

For NT urban and remote Aboriginal communities, development, training and upskilling of the local Aboriginal Health Practitioner workforce and support and broadening of Aboriginal Community-controlled Health Services is the only viable means of meeting the increased demands of health in the NT Aboriginal population. The effects of climate change on the various aspects of health should be reinforced in staff education and training activities.

Recommendation 11: To intensify research on climate change impacts to health and appropriate adaptation strategies, with a focus on Aboriginal populations.

Recommendation 12: Education of the PHC workforce regarding the effects of climate change.

Recommendation 13: Health infrastructure, procurement activities and transport to run sustainably at carbon neutral capacity.

Recommendation 14: Innovation of health technologies to maximise healthcare delivery locally particularly in remote communities, to promote self-management and to enhance education and training at remote sites.

Recommendation 15: Development, training and upskilling of the Aboriginal Health Practitioner workforce.

Recommendation 16: Support and broadening of Aboriginal Community-controlled Health Services.

Recommendation 17: NT Government subsidisation of air-conditioning/ cooling of all homes with at-risk Aboriginal people.

Housing Effects

Sustainable, Culturally-responsive Housing Design

All public buildings and infrastructure should be designed in a climate responsive manner. The NT's existing knowledge in adapting infrastructure to our extreme climate makes us well positioned to become a leader in climate resilient design of housing. For example opportunities exist in passive cooling design that provide thermal comfort with limited energy consumption.

The benefits of climate-resilient buildings include:

- more comfortable and amenable buildings
- reduced energy costs for buildings
- cooler urban environments
- reduced frequency and cost of maintenance and replacement of assets, and
- increased health and wellbeing.

In the case of Aboriginal housing it is essential that consultation and participation with local communities occurs throughout the design, development and implementation stages. Greater participation in decision-making and employment in the supply of infrastructure has potential to improve the sustainability of services, reduce labour costs and raise living standards (Memmott et al. 2013). Greater participation in the early stages of the design process will also help to ensure that housing can respond to the social and cultural realities of community life.

Aboriginal Housing NT (AHNT) has been formed as an independent Peak Body for Aboriginal housing and all housing related issues, with representation from the majority of Aboriginal housing organisations across the NT. This body can and should play a key role in ensuring the participation of Aboriginal people in the design and delivery of housing across the Northern Territory.

It will also be necessary for all new-builds in public and private housing to be designed and built to respond to our changing climate. This can be achieved through revised planning schemes and building codes that incorporate and require compliance with climate resilience measures specific to the NT. Similarly, opportunities for adaptation of existing housing can be mandated in the public sector, and incentivised in the private sector through the provision of rebates and/or grants that encourage action to reduce a household's greenhouse gas emissions such as installing solar, or retrofitting and the like.

Cumulative factors including infrastructure, transport, energy and water management

Damage to infrastructure has been identified within Australia's National Climate Resilience and Adaptation Strategy as a major climate change risk, with expected increased damage to housing, roads and other essential infrastructure due to increased frequency and intensity of extreme rainfall, flooding and heat waves and increased risk of bushfires (Commonwealth of Australia 2015).

Impacts throughout the NT are likely to be more severe due to remoteness and poor condition of existing infrastructure and impacts are likely to be felt most greatly by those who have both contributed least to climate change, and are least equipped to deal with its impacts. It has been demonstrated that the political geography of affordable or insecure housing also often overlaps with the geography of exposure to climate risk (Greely et al 2018). This is particularly pertinent to the realities of Remote Communities, Town Camps and Homelands across the NT.

Mitigation and adaptation strategies must be developed as part of the NT's Climate Change Strategy to respond to the increased risk of damage to housing, water supply and sewerage, electricity supply, roads and telecommunications. Sustainable and cost-effective responses should include the upskilling of local organisations and their employees to deliver these services wherever possible.

The existence of Homelands and Outstations that developed through the Homelands Movement of the 1970s were hard fought for and remain an integral component of cultural maintenance for Aboriginal people in the NT. Water stress is an increasingly important issue to enable Aboriginal people to remain on and create sustainable livelihoods on their ancestral lands. The impact of climate change will only exacerbate these existing challenges, therefore planning to mitigate these impacts must begin now.

Repairs and maintenance

The primary cause of housing dysfunction is attributed to inadequate cyclical repair and maintenance provision. Some 73% of works completed by licenced tradespeople are shown to be required due to the absence of routine maintenance (Healthabitat 2018). This statistic has been consistently found in comprehensive housing data surveys undertaken by Healthabitat over a number of decades.

Furthermore, the recent review of the National Partnership Agreement on Remote Indigenous Housing (NPARIH) identified and recommended planned cyclical maintenance as the core priority for maintaining quality housing, with a focus on health related hardware and house functions (Commonwealth of Australia 2017, p 2).

The sustainable and ongoing provision of repairs and maintenance services are fundamental to improving the condition of health hardware, such as temperature regulation and control devices and other essential infrastructure. In the context of a warming environment that is increasingly prone to extreme weather events, the localised provision of these services will become even more vital than it already is. Local organisations must be supported to provide these essential services, including through education and the provision of training and skills development to a local workforce.

Recommendation 18: Integrate climate resilient design outcomes into planning policies and legislation to ensure that all new-builds in the public and private housing is built in a climate responsive manner.

Recommendation 19: Increase Aboriginal participation in decision-making about infrastructure provided to Aboriginal communities, including through the involvement of the recognised representative body, AHNT.

Recommendation 20: Increased compliance requirements for climate resilient design of private housing through amendments to planning schemes and building codes, and increased incentives to adapt existing housing in ways that will reduce emissions.

Recommendation 21: Planning must commence now to mitigate the impacts of water stress in very remote locations to ensure Aboriginal people can continue to reside on their ancestral lands.

Recommendation 22: Increase local capacity to manage and conduct repairs, maintenance and construction of housing and essential infrastructure. In many cases this will require dedicated funding for the provision of training and skills development.

Industry and Economy

AMSANT is concerned on seeing that the discussion paper characterises gas as a low carbon ‘transition’ fuel that can reduce emissions by replacing coal. Evidence from sources including the Climate Council of Australia indicate that replacement of coal with gas will not be adequate to garner the levels of carbon reductions that are required to reduce the impacts of global warming, and in some cases may actually lead to increased emissions (Climate Council Australia 2017).

AMSANT does not support the introduction of an onshore unconventional gas industry in the Northern Territory and made clear our concerns about the significant impacts that this industry will have on the health and wellbeing of Aboriginal Territorians in our submission to the *Scientific Inquiry into Hydraulic Fracturing in the NT* (AMSANT 2018).

In addition to the concerns expressed in this submission, we note that expanding gas usage is inconsistent with tackling climate change as it locks in emissions for decades into the future. The NT needs to be transitioning our economy away from fossil fuel extraction, including hydraulic fracturing, towards one that is driven by renewable technologies and builds on the strengths of Aboriginal environmental knowledge and practices.

Aboriginal Land Management and Emerging Industries

Climate change presents an opportunity to develop economies, jobs and business development opportunities that are supportive of Aboriginal cultural values and enable people to remain on country. The NT Government's climate change strategy must provide mechanisms for Aboriginal people to have strong decision-making roles in relation to the management of Aboriginal land, to allow for Aboriginal knowledge and practices to be harnessed in transitioning to a low carbon economy.

The Caring for Country and Ranger programs run by the Northern and Central Land Councils are an example of existing programs providing employment and training opportunities in natural and cultural resource management, which can be harnessed to meet the goals of an NT Climate Change Strategy. While funding from the Commonwealth Government has been committed to continue existing programs, we are concerned to note that Senator Scullion has ruled out any expansion to the program up to 2021. Long-term and increased government funding for these programs is essential to their sustainability and we would encourage the NT Government to support increased funding in recognition of the demonstrated opportunities that exist through these programs in carbon sequestration, biodiversity conservation, management of invasive species, and general management and protection of land (Refer to NLC and CLC submissions for more detail).

Further to these existing programs, AMSANT supports the development of Aboriginal-driven enterprises that support the NT's transition to a low carbon economy. Opportunities should be explored in consultation with Aboriginal communities and organisations relating to carbon farming and abatement, harvesting of native bush foods and medicines and opportunities in renewable technologies (discussed in more detail below).

Renewable Electricity

As highlighted in the Discussion Paper, the NT has access to abundant solar, tidal and geothermal renewable energy resources. As the cost of renewable energy generation continues to decline, and rapid advancements are made in low-carbon technology, transitioning to a low-carbon economy now makes economic sense. To remain on our current trajectory would result in not only harmful consequences to our health and wellbeing that have been outlined in this submission, but an increasing economic cost. We note that extreme weather events alone (excluding impacts of heatwaves or other climate change events) were estimated to have cost the NT $1.3 billion in 2017 and that this is expected to rise to $3.3 billion by 2050 (Discussion Paper, p 6).

AMSANT notes that there are already jurisdictions that make an economic argument for, and already use available technology, to harness renewable energy. In South Australia the giant Tesla Powerpack battery which cost around $91 million to build, has enhanced the electricity generating capacity of a 99 turbine wind farm at Hornsdale and is providing stability to the grid as well as the ability to provide electricity during peak requirements. The giant Tesla Powerpack made $13 – $23 million within its first six months of operation, according to an *Electrek* report and this is expected to increase to $27 million by the end of its first year.

When considering the economic viability of renewables it is important to note that a recent study conducted by the Victoria Energy Policy Centre found that wind and solar generation in South Australia has brought wholesale prices down — and by far more than what the subsidies paid for them.

As the price of renewable energy production and storage come down opportunities for the sale of renewable energy across state and international boundaries becomes more viable. We note with interest the presentation that is being made to the December 2018 UN Climate Change Conference regarding the potential for the development of an undersea high voltage direct current link to sell renewable electricity generated in the NT to Indonesia, and above ground transmission to the eastern Australia electricity grid (Wang et al. 2018). While not wanting to go into significant detail, AMSANT also notes discussions regarding coupling solar energy with hydrogen production and the potential future opportunities to export energy in this way. AMSANT notes that the NT is well placed geographically, and has large areas of land that have significant solar energy potential, to be able to take up these opportunities. This will require the NT Government to have the vision to position the NT to be a renewable energy hub and work collaboratively with the Australian and State Governments, industry and the university sector to make these type of opportunities a possibility.

A climate change strategy that sets out the long-term infrastructure changes required to move to an economy with renewables at its centre is essential to send a strong message to industry and ensure that the right conditions and incentives are in place for investors to fund projects that include low carbon and energy-efficient infrastructure. There must also be strong consideration of measures to ensure that Aboriginal enterprises and people are key participants in an emerging low-carbon market in the NT.

There is also significant potential for job creation and increased employment through investment in renewable industries, natural resource management, carbon farming and caring for country programs, which would have significant economic and social flow on effects for the Northern Territory. Programs and enterprises based around natural resource management, carbon farming and caring for country programs are particularly significant for regional and remote Aboriginal communities, providing both an economic base and improved health and wellbeing outcomes that will be crucial in enhancing their capacity to adapt and respond to the impacts of climate change.

Recommendation 23: Reverse the decision to exploit NT gas reserves and abandon positioning the NT as a ‘gas hub’.

Recommendation 24: Support Aboriginal people to have strong decision-making roles in relation to the management of Aboriginal land, including through advocating for long-term and increased funding for ranger programs.

Recommendation 25: Support development of Aboriginal-driven enterprises which make use of opportunities in carbon farming and abatement and harvesting of native bush foods and medicines.

Recommendation 26: Focus effort toward the NT becoming a renewable energy hub both for export and domestic use. Ensure policy settings support and enable renewable electricity generation both now and into the future.

Recommendation 27: Work closely with land councils and other stakeholders to ensure that Aboriginal enterprises and residents have a significant role in and benefit from renewable energy infrastructure.

Conclusion

The NT (and Australia more broadly) are vulnerable to the effects of climate change and the development of an NT Climate Change Strategy comes at an opportune time. In developing the NT's Climate Change Strategy it is important to note that the NT is already experiencing some of the early effects of climate change through increased temperatures and changed weather patterns and that globally the window of opportunity to mitigate against climate change is narrowing. We also note that those that have contributed least to climate change are among the most vulnerable and may be the least able to adapt to the changing environment.

In responding to climate change in the NT we note that Aboriginal people - who make up 30% of the NT's population - must be a key stakeholder. Aboriginal people as a group have some key potential vulnerabilities to the outcomes of climate change, however, the resilience of Aboriginal people and the ability of this group to offer solutions to climate change mitigation and adaptation should not be underestimated. We take this opportunity to reiterate the importance of working with Aboriginal people, communities and their representative groups with regards to climate change in the spirit of partnership.

AMSANT's submission has outlined what our organisation believes are some of the opportunities and challenges with regards to planning, coordinating and implementing activities with reference to climate change. As the peak organisation for Aboriginal Medical Services in the NT, the AMSANT submission also focuses on what we believe are some of the key health and public health risks with regards to climate change and makes recommendations as to how these may be ameliorated including through housing and other measures.

Climate change mitigation is a far preferable option than needing to implement adaptation measures. Noting this, it is deeply concerning that the NT Government continues to promote and pursue the development of the NT as a 'gas hub' potentially building in a future of high levels of GHG emissions. It is AMSANT's strong belief that the NT needs to be transitioning our economy away from fossil fuel extraction, including hydraulic fracturing, towards one that is driven by renewable technologies and builds on the strengths of Aboriginal environmental knowledge and practices.

Increasingly there are opportunities in using both existing technologies as well as emerging technologies to move the NT toward a low carbon economy and help mitigate against climate change. This submission offers AMSANT's views regarding some of these opportunities and on

how Aboriginal people and communities can engage through partnerships with the NT Government and industry to mitigate the effects of climate change and to adapt to its consequences. We look forward to working with the NT Government in the spirit of partnership on this critical issue.

List of Recommendations

Recommendation 1: That planning, coordination and implementation of activities around climate change are conducted in partnership with Aboriginal people, communities and their representatives.

Recommendation 2: That planning, coordination and implementation activities related to climate change be conducted at the regional level as well as for the whole of the Northern Territory to ensure that they are appropriate and relevant to different areas.

Recommendation 3: Planning and policy be undertaken to limit developments in hazard prone areas.

Recommendation 4: That climate change be built into the way that the NT Government operates with consideration of a "Climate Risk (particularly with respect to health) in all Policies" approach in all major policy deliberations.

Recommendation 5: Development of a model of heat and dangerous heat situations specific to the NT climate and its population groups, particularly to Aboriginal people.

Recommendation 6: That the NT pursue an overall target of zero net carbon emissions and support national policy of zero net carbon emissions.

Recommendation 7: That there is reduction of power and resource wastage through education and monitoring programs.

Recommendation 8: That the NT seek to move beyond the current target of 50% of electricity by renewable sources by 2030 to 100% renewable energy generation.

Recommendation 9: That industry performance indicators against targets be monitored, evaluated and reported.

Recommendation 10: That a NT Climate Change Act that legislates for enforceable targets be developed in conjunction with key partners.

Recommendation 11: To intensify research on climate change impacts to health and appropriate adaptation strategies, with a focus on Aboriginal populations.

Recommendation 12: Education of the PHC workforce regarding the effects of climate change.

Recommendation 13: Health infrastructure, procurement activities and transport to run sustainably at carbon neutral capacity.

Recommendation 14: Innovation of health technologies to maximise healthcare delivery locally particularly in remote communities, to promote self-management and to enhance education and training at remote sites.

Recommendation 15: Development, training and upskilling of the Aboriginal Health Practitioner workforce.

Recommendation 16: Support and broadening of Aboriginal Community-controlled Health Services.

Recommendation 17: NT Government subsidisation of air-conditioning/ cooling of all homes with at-risk Aboriginal people.

Recommendation 18: Integrate climate resilient design outcomes into planning policies and legislation to ensure that all new-builds in the public and private housing is built in a climate responsive manner.

Recommendation 19: Increase Aboriginal participation in decision-making about infrastructure provided to Aboriginal communities, including through the involvement of the recognised representative body, AHNT.

Recommendation 20: Increased compliance requirements for climate resilient design of private housing through amendments to planning schemes and building codes, and increased incentives to adapt existing housing in ways that will reduce emissions.

Recommendation 21: Planning must commence now to mitigate the impacts of water stress in very remote locations to ensure Aboriginal people can continue to reside on their ancestral lands.

Recommendation 22: Increase local capacity to manage and conduct repairs, maintenance and construction of housing and essential infrastructure. In many cases this will require dedicated funding for the provision of training and skills development.

Recommendation 23: Reverse the decision to exploit NT gas reserves and abandon positioning the NT as a 'gas hub'.

Recommendation 24: Support Aboriginal people to have strong decision-making roles in relation to the management of Aboriginal land, including through advocating for long-term and increased funding for ranger programs.

Recommendation 25: Support development of Aboriginal-driven enterprises which make use of opportunities in carbon farming and abatement and harvesting of native bush foods and medicines.

Recommendation 26: Focus effort toward the NT becoming a renewable energy hub both for export and domestic use. Ensure policy settings support and enable renewable electricity generation both now and into the future.

Recommendation 27: Work closely with land councils and other stakeholders to ensure that Aboriginal enterprises and residents have a significant role in and benefit from renewable energy infrastructure.

References

Aboriginal Medical Services Alliance NT (2018). *AMSANT submission on the draft Final Report of The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory*. Accessed 13 Dec from: https://frackinginquiry.nt.gov.au/?a=485025

Aboriginal Medical Services Alliance NT (2016). *Priorities for Aboriginal Primary Health Care in the Northern Territory*. Accessed on 10 Dec 2018 from: http://www.amsant.org.au/resources-2/publications/

Australian Institute of Health and Welfare (2017). *Aboriginal and Torres Strait Islander Health Performance Framework 2017 report: Northern Territory*. Cat. no. IHW 186. Canberra: AIHW. Accessed on 11 Dec 2018 from: https://www.aihw.gov.au/reports/indigenous-health-welfare/health-performance-framework-2017-nt/contents/table-of-contents

Climate Council Australia (2017). *Pollution and Price: The Cost of Investing in Gas*. Accessed on 10 Dec 2018 from: https://www.climatecouncil.org.au/uploads/eaa1181f00bc27b89d9c78e280ccc684.pdf

Commonwealth of Australia (2015). *National Climate Resilience and Adaptation Strategy.* Department of Environment and Energy, Canberra.

Commonwealth of Australia (2017). *Remote Housing Review: A review of the National Partnership Agreement on Remote Indigenous Housing and the Remote Housing Strategy (2008-2018)*. Department of the Prime Minister and Cabinet, Canberra.

de Lorenzo, A., & Liaño, F. (2017). High temperatures and nephrology: The climate change problem. *Nefrología (English Edition)*, *37*(5), 492-500. https://www.sciencedirect.com/science/article/pii/S2013251417301566

Doctors for the Environment Australia (2016). Climate change and health in Australia - Fact sheet. Accessed 1 Dec 2018 from: https://www.dea.org.au/climate-change-and-health-in-australia-fact-sheets/

Georges, N., Guthridge, S. L., Li, S. Q., Condon, J. R., Barnes, T., & Zhao, Y. (2017). Progress in closing the gap in life expectancy at birth for Aboriginal people in the Northern Territory, 1967–2012. *Medical Journal of Australia*, *207*(1), 25-30. Accessed 8 Dec 2018 from: https://onlinelibrary.wiley.com/doi/abs/10.5694/mja16.01138

Greely, L., Lea, T., and Cornell, C. (2018). *Housing Policy and Infrastructural Inequality in Indigenous Australia and Beyond*. Housing for Health Incubator Issues Paper.

Healthabitat (2018). “Why the Houses Need Fixing”. Housing for Health Incubator, Issues Paper. Accessed 4 Dec 2018 from: http://www.healthabitat.com/what-we-do/what-the-housing-data-reveals/why-the-houses-need-fixing

Intergovernmental Panel on Climate Change (2018). Summary for Policymakers. In: *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.* [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, et al. (eds.)]. World Meteorological Organization, Geneva, Switzerland.

Memmott, P., Reser, J., Head, B., Davidson, J., Nash, D., O’Rourke, T., Gamage, H., Suliman, S., Lowry, A., Marshall, K. (2013). *Aboriginal responses to climate change in arid zone Australia: Regional understandings and capacity building for adaptation*, National Climate Change Adaptation Research Facility, Gold Coast, pp. 287.

Mountain, B. R., Percy, S., Kars, A., Saddler, H., and Billimoria, F. (2018). *Does renewable electricity generation reduce electricity prices?* Victoria Energy Policy Centre, Victoria University, Melbourne, Australia.

Oppermann, E., Brearley, M., Law, L., Smith, J. A., Clough, A., & Zander, K. (2017). Heat, health, and humidity in Australia's monsoon tropics: a critical review of the problematization of ‘heat’ in a changing climate. *Wiley Interdisciplinary Reviews: Climate Change*, *8*(4), e468.

Royal Australasian College of Physicians (2016a). Climate Change and Health Position Statement. Accessed 10 Dec 2018 from: https://www.racp.edu.au/advocacy/policy-and-advocacy-priorities/climate-change-and-health

Royal Australasian College of Physicians (2016b). Environmentally Sustainable Healthcare Position Statement. Accessed 10 Dec 2018 from: https://www.racp.edu.au/advocacy/policy-and-advocacy-priorities/climate-change-and-health

Russell, D. J., Zhao, Y., Guthridge, S., Ramjan, M., Jones, M. P., Humphreys, J. S., et al. (2017). Patterns of resident health workforce turnover and retention in remote communities of the Northern Territory of Australia, 2013–2015. *Human resources for health*, *15*(1), 52.

The Australia Institute (2018). *Cooked with gas. Extreme heat in Darwin.* Accessed on 12 Dec 2018 from: http://www.tai.org.au/content/cooked-gas-extreme-heat-darwin

Wang, C., Dargaville, R., Jeppeson, M. (2018). Power system decarbonisation with Global Energy Interconnection - a case study on the economic viability of international transmission network in Australasia. *Global Energy Interconnection*.

Zhao, Y., Wright, J., Begg, S., Guthridge, S. (2013). Decomposing Indigenous life expectancy gap by risk factors: a life table analysis. *Popul Health Metr,* 11, 1.