AMSANT Response to the NT Climate Change Discussion Paper
December 2018

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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°C 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°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.

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

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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.


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Darwin 0801

27/11/2018

Response to the Climate Change Strategy Discussion Paper

Anglicare NT is one of the largest providers of government-funded welfare, social justice and community development services in the Northern Territory. The organisation employs more than 420 staff and delivers support services to over 15,000 Territorians each year. Our purpose is to promote the enrichment of people’s relationships, fullness of life and social justice for all in the Northern Territory.

Anglicare NT would like to congratulate the NT Government’s commitment to developing a Climate Change Strategy for the Northern Territory. This is a positive step forward. There is no doubt that the global scientific consensus is that greenhouse gas emissions must decline rapidly to net zero and that all Governments must provide leadership to achieve this.

Climate change is about people and the planet, it is an issue that affects everyone, but it’s impacts will be felt disproportionately by those with the least resources and capacity to adapt. Indigenous people, the sick, the frail, the very young and the disadvantaged. The consequences on the lives of these Territorians, your constituents, must be considered in any climate change policy developed.

We believe there is a need to accelerate climate change action and that the NT Government’s Climate Change Strategy is a significant opportunity to do this. This submission puts forward areas where we believe your policies can have impact.

Vulnerable people need to be protected

At the current trajectory, the predicted changes to the Northern Territory’s climate are severe, and the consequences, catastrophic.

The effect of extreme heat and humidity on vulnerable people is of enormous concern. These are people who can’t just turn on the air-conditioning or move to a more favourable climate. The CSIRO climate change modelling estimates that the number of days over 35 degrees in Darwin will increase from long term average of 11 days per year to around 44 days by 2030 and up to 227 days by 2070. An Australian Institute report found that the number of days over 35 degrees in Darwin has already increased from 5.6 days per year in the early 20th century to over 20 days per year in the last five years.
Extreme heat, when coupled with high humidity (over 70%) is considered ‘extremely dangerous’. Research indicates that such conditions represent “a serious threat to the wellbeing of Darwin’s population... even a short period of exposure, particularly in combination with physical exertion, can lead to serious heat disorders and even risk of death.”

Exposure to extreme heat is known to exacerbate mental health conditions, negatively impact on wellbeing, and increases levels of violence and suicide rates. As the temperature rises, it is predicted that the ‘heat, health burden’ is likely to significantly increase.

Other predicted impacts of climate change on Territorians include extreme rainfall and flooding, the inundation of freshwater wetlands with salty water due to sea level rise, higher bush fire intensity and less frequent but more powerful tropical cyclones.

The availability of bush tucker will be affected, it will be more difficult to fish, and natural and cultural tourism is likely to suffer. The Climate Change Discussion Paper 2018 acknowledges many of the predicted impacts of climate change. The social and financial costs of a changed climate in the Northern Territory are unfathomable.

**Adopt a robust target – net zero by 2050**

The potential for harm to eco-systems, communities and of course future generations should not be ignored. Anglicare NT implores the NT Government to take this opportunity to create climate change strategy that is far reaching and results in deep reductions in greenhouse gas emissions.

This requires significant government will, and government action. It means legislating a firm emissions reduction target of at least net zero by 2050, including interim targets and industry specific targets, to ensure the overarching target is met.

The Northern Territory is well behind the rest of Australia. Victoria has legislated a net zero emissions target by 2050, with five yearly interim targets; NSW has committed to net zero by 2050; Tasmania achieved net zero emissions in 2018; South Australia has a net zero emissions by 2050 target and a legislated climate change framework; Queensland has committed to net zero by 2050; and the ACT recently revised their net zero emissions target to 2045.

A climate change strategy is time-critical. The recent release of the *IPCC Special Report on Global Warming of 1.5°C* which warns of the potentially severe consequences of just a 1.5 degree temperature increase, makes the decision even more pertinent. Investment and policy decisions made now, will shape the Northern Territories emission trajectory for the next decade or more.

*Recommendation: Legislate an emission reduction target of at least net zero emissions by 2050 with interim targets and industry specific targets to ensure the overarching target is met.*

**Building capacity through rooftop solar**

Anglicare NT believe there are policies that can be put in place in the short term that will significantly contribute to emissions reduction and build the capacity of vulnerable citizens to cope with the increasing heat.

Already, low income households spend a greater proportion of their income on water and energy than wealthier households, on average, twice as much. They are also far less able to invest in measures to combat the heat like air-conditioning or home insulation.
The Climate Change Discussion Paper points to opportunities to improve the energy efficiency of NT Government buildings and housing stock through measures such as installing home insulation.\textsuperscript{xiii}

While this and other energy efficiency measures are worthy initiatives which should be pursued, rooftop solar, coupled with battery storage, for all public and social housing would have even greater benefits.

The benefits of this initiative include:

1) Significantly reducing the emissions footprint of more than 5000 households in the NT
2) Efficiently increasing the capacity of vulnerable people to deal with heat increases
3) Reducing the energy cost burden on low income households, freeing up money to purchase other essentials like food or medicine
4) Boosting economic opportunities for the burgeoning renewables industry in the NT
5) Creating jobs and training opportunities
6) Creating infrastructure that may support the longer term uptake of electric motorvehicles.

This initiative is in-line with the recently released Australian Labor energy policy ‘Neighbourhood Renewables’ which aims to increase the uptake of solar and battery storage solutions for social housing.\textsuperscript{xiii}

\textit{Recommendation: Invest in rooftop solar and battery storage on all NT Government-owned public and social housing.}

Early intervention and prevention has been a key theme for the current NT Government. A Climate Change strategy should be no different. There is no doubt that the cost of collective inaction will be far greater than the cost of collective action.

Regards,

\[Signature\]

Dave Pugh
Chief Executive Officer
Anglicare NT
Citations:


2 Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.


4 Hanna and Ogge, *Cooked with Gas: Extreme Heat in Darwin.*

5 Ibid

6 Ibid


8 Ibid

9 Ibid

10 Op. Cit. CSIRO, *Climate Change in Australia’s Top End*


14 Government of South Australia, “South Australian Climate Change Action.”


16 Burgess, “ACT Brings Forward Zero Net Emissions Deadline to 2045.”

17 Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.


Climate Change Discussion Paper: Arid Lands Environment Centre Submission

The Arid Lands Environment Centre (ALEC) is central Australia’s peak environmental organisation that has been advocating for the protection of nature and ecologically sustainable development of the arid lands since 1980.

Climate change is the biggest global challenge of our time. It presents an existential threat to our economic, political, social and cultural systems by disrupting the environments in which they exist. Responding to this level of change is testing the limits of our regulatory frameworks to protect the environment, human well-being and to provide economic stability.

ALEC welcomes the Northern Territory Government’s Climate Change Discussion Paper as a starting point for developing climate policy. Whilst this paper gives a broad overview of climate change and the associated risks, the discussion paper does not give due recognition to the severity of impacts already happening and the urgency of change required.

Key recommendations

1. Legislate a Climate Change Act that will develop an enforceable long-term plan to facilitate the transition to low carbon economies.
2. Adopt an initial emissions reduction target of net zero emissions by 2050 to deliver long term certainty across business, government and communities. This target should be implemented through sectoral and interim targets established by an independent expert authority. This target should be periodically reviewed to be consistent with global scientific evidence.
3. Climate change projections and resilience building should be integrated into long-term economic planning for the Northern Territory, such as the Economic Development Framework.
4. Review decisions to exploit NT gas reserves, which will significantly raise Australian emissions.
5. Abandon positioning the NT as a ‘gas hub’.
6. Review post 2030 renewable energy targets with the view to transitioning to 100% renewable energy.
7. Investigate opportunities in renewable energy export industries.
8. Explore opportunities for low carbon industries including carbon farming.
9. The NT Government releases the draft NT Climate Strategy for public consultation

Northern Territory – Climate change is already here

The lack of a climate policy for the Northern Territory means that we remain exposed and vulnerable to the worse impacts of these changes that are already well underway.

The Northern Territory is especially vulnerable to the impacts of climate change with a predicted increase in extreme heat days (over 35 degrees Celsius), an increase in the severity of extreme weather events, changes to water availability, and an increase in sea-level rise and extreme sea-
level events. The Northern Territory is already being impacted with increased temperatures, the loss of large swathes of mangroves across the Top End, increased weed spread and changing seasons.

The most marginalised and vulnerable members of our community, including Aboriginal and Torres Strait Islander people, are often the least responsible for ecological risks and threats but will be most affected by their emergence. Anecdotal evidence of the changing climate from some Indigenous communities include noticing changes to weather patterns, “crazy weather”, and bush tucker seasons.

Planning for climate change in the NT

- Climate change ultimately requires a transformational change in political, cultural, social and economic systems
- The legitimacy of NT Climate Policy will be undermined by continued investment in developing fossil fuel industries
- A key objective of the Northern Territory climate strategy must support and enable local and regional adaptation responses
- Opportunities exist for the NT to transition to resilient low carbon economies

Climate planning is critical to addressing the severe impacts projected for the NT. It is estimated that central Australia has already experienced a warming of 1.5°C. Communities and economies of central Australia are particularly vulnerable as a result of pre-existing issues associated with access to and quality of essential services, as well as localised environmental issues such as water scarcity.

While climate change is a direct threat, it is also largely an indirect cumulative risk factor that will exacerbate existing challenges in maintaining liveability and sustainability in the arid zone.

Conventional models of economic growth are driving climate change and will continue to render societies and economies vulnerable.

The legitimacy of meaningful climate action in the Northern Territory is undermined by permitting the development of industries that will cause an exponential growth in NT emissions at a time when we need to be drastically reducing our emissions.

Climate change ultimately requires a transformational change in political, cultural, social and economic systems. The scale of change necessary is not anticipated in the Climate Discussion Paper.

Flawed assumptions inherent in the Discussion Paper include:

- gas as a transition fuel
- the NT needing to grow emissions as a developing economy.

ALEC has raised these issues directly to representatives of the NT government. It became clear these were critical points of contention, which we believe highlight the key barriers to accepting the scale of the problem and committing to meaningful action.

In moving forward, the planning process should prioritise investigating the interactions and linkages between various sectors, industries and institutions. For example, the increase in extreme weather events will likely have an impact on the viability of already seasonal and marginal pastoral operations. Without facilitating a change in financial and logistical networks to manage this vulnerability, the diminished economic productivity of the pastoral estate is likely.
Climate planning should be guided by global developments in technology and information. A key objective of this framework must be to support and enable local and regional mitigation and adaptation responses.

Climate planning must acknowledge that communities and peoples that have contributed the least to climate change stand to be the most severely impacted. The allocation of services and resources to improve a community’s resilience should be prioritised according to those most in need. These communities should be enabled to manage the development of suitable responses.

Climate planning must embrace the significant economic and other co-benefits available through developing industries that reduce carbon emissions and improve adaptive capacity and climate resilience.

**Mitigation**

- Developing an onshore gas industry and growing LNG exports is incompatible with taking action on climate change.
- Allowing emissions to rise has undermined public confidence in the government’s commitment on climate action.
- There is significant economic opportunity in growing the renewable energy industry beyond 100%.
- Opportunities to diversify the economy through sustainable low carbon enterprises are rapidly developing.

**The Northern Territory Government must commit to a net zero emissions target by 2050 with interim sectoral targets.**

The global scientific literature is incontrovertible in the conclusion that emissions need to cease growing and ultimately reduce to net zero by 2050 at the latest.\(^1\) The Northern Territory thus has a political, ethical and economic imperative to commit to reducing emissions according to the principle of common but differentiated responsibilities.

The development of an onshore unconventional gas industry and ambitions to further develop LNG exports is incompatible with the Federal Government commitment to reduce greenhouse emissions to prevent a 1.5°C rise in global temperatures.

Our understanding of the contribution of methane emissions to climate change is still developing, with recent studies suggesting we are underestimating the role of anthropogenic sources of methane in driving climate change.\(^2\) The warming potential of LNG production and the process of hydraulic fracturing could be much greater than currently stated. ALEC continues to advocate that the decision to open up the NT to unconventional gas production must be reversed, and fracking must be banned as part of meaningful climate action.

ALEC also questions the emissions projections stated in the graph on page 12 of the Discussion paper, that shows that all sectors emissions plateau beyond 2016, when they are all on an upward trajectory from 2014. We have concerns that the emissions could be much higher than projected for in this graph across all sectors.

The NT Climate Strategy is unlikely to be accepted by the general public and businesses of the Territory without government demonstrating it will lead by accepting responsibility for reducing emissions. Increasing national focus will be directed to the Northern Territory as a climate laggard, effectively undermining climate action in other states and Territories by choosing to increase emissions.

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1. Intergovernmental Panel on Climate Change (IPCC). *IPCC Special Report on Global Warming of 1.5°C*.

Arid Lands Environment Centre
Developing renewable energy industries in the NT offers a unique opportunity to grow and diversify economies and improve energy security without increasing greenhouse emissions.

The current renewable target of 50% should be expanded to encourage the production of surplus energy. The Northern Territory is a primary candidate to explore the potential of renewable energy export industries, whether that be through hydrogen or undersea high voltage direct current lines to South East Asia.

The transition towards low and eventually zero carbon economics is technically feasible:
- We can no longer rely on traditional economic models of growth that are highly vulnerable to climatic extremes while entrenching environmental risk.
- Transitioning to sustainable industries could be supported by finance allocated by a fund that is contributed to by large polluters, in a similar way that mining companies contribute to legacy rehabilitation levy.
- The Territory should dedicate research and investment into low carbon enterprises not only in order to reduce global greenhouse emissions, but because continued reliance on unsustainable industries that are being impacted by climate change will undermine future economic and social stability.
- The strategy should develop a post 2030 renewable energy plan to facilitate ongoing growth in renewable energy beyond 50%. This target could exceed 100% to enable the development of renewable export enterprises.
- There is significant economic opportunity in the growth industry of education and training through the development of renewable energy expertise. Key to this could be developing institutional strength in tertiary and engineering capability to export expertise and products.
- Carbon farming has now been firmly established as a reliable economic enterprise that should be further expanded across the NT through committed and sustained funding to indigenous ranger groups. This will provide additional co-benefits as well as carbon sequestration.

Gas is not a transition fuel
- Australian’s total fugitive emissions are rising because of the expansion of the LNG export industry
- The premise that natural gas will reduce emissions by displacing more polluting energy sources overseas is unsubstantiated.
- Developing the NT as a gas a hub will jeaparidise Australian emission reduction efforts.

A central assumption in the discussion paper is that natural gas, including LNG and LPG is a transition fuel that will reduce global emissions by displacing coal. There is no substantive body of research to support this assumption. It is therefore misleading to continue to argue this in support of a gas industry for the NT. The development of natural gas export industries, manufacturing and processing in the NT will increase total global greenhouse emissions.

There are several components of this assumption that need to be corrected in order to clarify the current confusion within the energy debate in Australia.

- The most recent growth in total fugitive emissions in Australian inventories was greater than the decrease in electricity emissions from reduced coal consumption. This is a critical correction that should inform future energy policy: namely that increasing gas production, processing, transport and combustion has not and will not reduce Australia’s greenhouse emissions.
- There is no conclusive proof that the production and export of NT natural gas will displace coal as an energy source for international or domestic energy production.
Most Australian natural gas is exported (around 70%) and most of this is being used in Japan to displace the loss in nuclear power capacity, it is therefore dishonest to suggest the east coast will benefit from fracking.  

The proposals to build import gas terminals on the East Coast to sell Australian gas back to Australians highlights the inequities of an export driven gas market. 

A recent study into the climate change and the global gas market investigated the US LNG exports to Asia and demonstrated that LNG export would most likely increase global greenhouse gas emissions. The paper found no evidence that increasing LNG exports would displace enough coal to cause a net decrease in emissions. 

Offsetting the total increase in emissions from a fracking industry is not scientifically or economically feasible. 

Offsetting the emissions from shale gas development are projected to cost $143 billion from 2030-2040, completely dwarfing the economic benefits of any gas development. 

Global markets for gas will fall as the world implements the Paris agreement and incorporates the latest IPCC 1.5°C report: this will therefore lock in stranded assets for LNG and LPG production and export. 

Developing gas infrastructure will expose the NT Government to liability through litigation and financial action against stranded assets.

Gas will lock in infrastructure that promises continued increases in emissions for decades.

Diversifying the Territory Economy

Climate change is a significant financial risk through transitional and direct impacts, and early action will be more cost effective. 

The argument that developing economies need to increase emissions must be challenged as the global budget diminishes. 

Future economic planning for the NT should be informed by climate change projections and prioritise low carbon enterprises. 

There are economic opportunities in renewable technologies such as a hydrogen export industry. 

Carbon sequestration strategies have proven economically viable and provide sustained long-term co-benefits. 

ALEC acknowledges the importance of diversifying the NT economy to improve opportunity and wellbeing. 

Developing an economy that is dependent on gas production, manufacturing and transport will embed exposure to climate risk, stranded assets and government and corporate entities to the liability of litigation.

The unconventional petroleum industry in the US is proving increasingly non-profitable with a significant portion of companies recording negative cash flows across 2018. Climate change is now firmly recognised as both a direct and indirect transitional financial risk that corporate entities and regulators must consider. Transitional risks are those arising from the movement away from enterprises that are highly exposed to climate change impacts.

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6 Ibid.
There are multiple options to diversify the economy through sustainable industries that provide economic benefits as well as social and environmental co-benefits. Climate change planning should prioritise nature-based services that will appreciate value with time and improve adaptive capacity.

Globally, there are developing economies that are investing heavily in renewable energy and have committed to significant emissions reductions. Climate planning is a unique opportunity to diversify the economy away from extractive commodity driven growth.

Economic diversification should ultimately embed climate resilience through programs that restore environmental condition and promote industries that encourage environmental stewardship such as carbon sequestration, carbon farming and native plant food industries.

The assertion in the Climate Discussion Paper that “we all depend on economic development to sustain and improve our social and economic wellbeing, but increase economic activity generally leads to increased levels of GHG emissions” is not tenable.

Ultimately, the transition towards new economic models is necessary.

**Adaptation Planning**

- Adaptation planning will require collaboration and cooperation across many sectors.
- Climate planning should prioritise a comprehensive risk assessment for the NT, especially concerning the most vulnerable and exposed regions and communities.
- Improving adaptive capacity will require short term incremental changes and long-term transformational changes.
- Government should facilitate and support adaptation planning that is culturally appropriate and context specific.
- The government should support the development of a collaborative climate change research institution.

The Northern Territory government has a critical role to play in facilitating adaptive responses to climate change. Government is well placed to design the institutional, market and regulatory mechanisms that support and guide adaptation. Adaptation planning must involve a collaborative effort across multiple sectors, institutions and communities through an interdisciplinary approach to research and development.

Climate change adaptation is a constantly developing body of knowledge that should be informed by best practice, up to date localised data drawing from a range of resources and strategies.

The following figure illustrates how to the core principles of adaptation operate, namely: resilience, adaptive capacity, vulnerability and exposure.

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10 [https://www.nccarf.edu.au/](https://www.nccarf.edu.au/)
The following are some strategies to inform adaptation planning that is equitable, inclusive and culturally appropriate.

– Guidelines for increasing adaptive capacity and reducing vulnerability will take a comprehensive and holistic approach to research, monitoring and adaptive feedback processes.

– Establish the NT as a climate change adaptation innovator, demonstrating the possibilities of adaptation planning in arid and tropical zones which could have global significance.

– Each sector or community should be supported to build adaptive capacity on their own terms. The role of Government will be to facilitate the transition by providing capability to implement adaptive responses.

– Adaptation should be differentiated into incremental and transformational changes. For example: more cycling signage on roads to encourage cycling as compared to transforming the industrial relations system so that working hours change to reduce the health risks of extreme heat.

– Commit considerable financial support to developing climate change research capability across key sectors and institutions.

– Undertake a comprehensive assessment of the scale and magnitude of risk posed by climate change to the Northern Territory: in the absence of this knowledge it will be difficult for communities and organisations to adapt.

– Planning will need to be proactive in order to be effective in mitigating the worst impacts over the long term. This will require working beyond the normal short-term policy planning cycles.

There is not yet a significant body of research that has been conducted into the ways remote and very remote communities will be impacted by climate change. Adaptation for remote and very remote communities must be developed through proper engagement, ensuring these communities are able to determine the scope and direction of adaptation. A research priority should be investigating the ways in which people have responded to historical changes to understand inherent resilience.

There are several important considerations in developing appropriate adaptation policy:

– Pre-existing vulnerabilities that need to be understood in order to frame adaptation strategies over the coming decades.
- Acknowledge that while there are significant vulnerability issues and generally high exposure, remote communities may also be highly resilient to climatic extremes and environmental change because of adaptation to resource scarcity and variability.¹¹
- Remote inland communities are likely to experience a greater level of warming than coastal and regional centres.

Significant and long-term structural reforms will be necessary to maintain the economic viability of the Territory and continue to provide for livelihoods of all living in the NT.¹²

The total number of days over 35⁰C in Alice Springs are projected to rise significantly by 2070. This will require a radical redesigning of the urban zones to ensure it remains liveable.

One significant method of adapting to this warming that is already being employed to a degree is increasing total vegetation cover in urban areas. Tree plantings are a proven method of reducing temperatures in regional centres. The cooling effect of vegetation is most effective during extreme heat events and at the hottest temperatures in the day.

Legislatively mandated urban canopy targets could be introduced through the Planning Scheme, Planning Act or local government plans. Tree species selection should be informed by a consideration of cultural, political and legal factors. Vegetation targets could be achieved through a strategic approach to implementation that will require long term planning. This approach could also consider additional benefits such as bush food species and amenity while also minimising fire risk. Adaptation will therefore require planning reform to ensure an increase to total green cover in urban areas.¹³

Planning guidelines should be entirely reviewed so that they provide for energy efficient design and passive heating and cooling. Climate change suitable design should be incorporated into urban architectural guidelines.

**Land Management and caring for country**

- Supporting communities to stay on country and care for country is one of the most effective ways to improve adaptive capacity.
- Indigenous ranger programs should be expanded and supported with committed long-term funding through carbon farming and invasive weed management.
- The Pastoral estate is vulnerable to the impacts of climate change and needs to be supported to implement more sustainable land management techniques.
- Improving grazing methods and pastoral reform should become a research priority to improve carbon sequestration potential, improve land condition and reduce methane emissions.

The management, conservation and use of the land mass of the NT is fundamental to successful climate planning. Emissions from LULUCF are disproportionately significant compared to other Australian jurisdictions and should therefore be a focus of climate policy.

A key priority for climate planning should be on investigating ways to reduce emissions from LULUCF and pastoral activities as well as encouraging more sustainable methods of primary production. Caring for country and supporting Aboriginal people to stay on country is also fundamental to explore the carbon sequestration opportunity and improve adaptive capacity.

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¹³ Cooling remote Australian communities with vegetation; Findings from Alice Springs

_Arid Lands Environment Centre_
Indigenous ranger programs have proven highly successful in delivering environmental outcomes while also improving economic opportunity and enabling the maintenance of cultural responsibilities. Demand for these programs currently surpasses supply. They are also undermined by short term funding arrangements and no commitment beyond 2020. These programs have already demonstrated significant carbon sequestration opportunities, improved biodiversity outcomes and generally enabling caring for country across a vast area of land that requires ongoing management and protection.

This climate policy should outline a process for ensuring long term committed funding to expand ranger programs across the NT.

Strategies to improve adaptive capacity and resilience across Aboriginal owned land include:

- Keeping people on country to maintain Aboriginal systems of governance.
- Maintaining cultural practices of caring for country such as seasonal burning, biodiversity conservation and management of invasive species.
- Support Aboriginal driven enterprise development such as bush foods and bush medicine industries.
- Provide capacity support through finance and regulations for those enterprises and develop market opportunities.
- Expand the **Land Management Conservation Fund** and include the Central Land Council and other Aboriginal organisations in the advisory committee to ensure that those funds support Aboriginal land management priorities.
- Developing a carbon methodology for rangelands and areas receiving less than 600mm of rainfall should be a key research priority.

There are promising developments on the pastoral estate in alternative grazing methods that demonstrate positive biodiversity outcomes, carbon sequestration potential and generally improved land condition.

Coodardie and Woodgreen Stations are two examples of non-conventional forms of grazing that maintain dynamic environmental systems. These methods have greater capacity to preserve biodiversity and encourage carbon sequestration through soil protection. Holistic and rotational grazing methods have shown positive outcomes in higher rainfall zones but there is still a lot of research that needs to be done to verify these claims and demonstrate its potential in the arid zone. Maximum stocking rates should be revised according to the climate change projections for the rangelands. Climate change is projected to significantly impact productivity of the pastoral estate by as much as 20%, and this should be acknowledged as both an environmental and economic risk.

Pastoralists should be supported to diversify their activities through conservation covenants and sequestration activities as well as provided with information on how to adapt their operations. This will require a compete revision of the Pastoral regulatory framework including a review of the **Pastoral Land Act** to incorporate climate change planning. Planning for the pastoral estate under climate change is therefore not just good climate policy but responsible economic policy.

The cattle industry is now expected to be responsive to consumer demands of improving the sustainability of the industry through reducing total greenhouse emissions. Meat and Livestock Australia have committed to carbon neutral operations by 2030.

Government should provide scientific support to develop methane mitigation strategies for the pastoral industry and provide the monitoring and research capacity to verify claims of carbon neutrality.

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14 Factsheet 1: NT Pastoral Industry and Climate Change Overview: NTG 2008

Primary industries and fisheries

- Primary industries are highly exposed to climate change and should be supported to diversify with climate resilient crops.
- There is a wealth of research already undertaken that should be built upon to reform the pastoral estate with a view to becoming carbon neutral by 2030.

Previous NT Government studies identified a risk of reduced productivity of the pastoral estate by up to 20% because of climate change.16

An additional risk for pastoral activities is that in order to adapt to increasing temperatures, adding watering points will increase the total environmental pressures of grazing. It is widely acknowledged that land degradation on stations is greatest around watering points. This is an example of the need to identify those indirect impacts of adaptation that have flow on environmental risks.

Pastoral enterprises are being increasingly contested over issues such as animal welfare, attitudes to private land conservation and invasive plant species. These are all impacted by climate change and will need to be addressed in adaptation planning. Factsheets on the pastoral industry from the government in 2008 shows the importance of building on existing knowledge.17

The stress on primary industries from climate change offers an opportunity to improve economic stability through diversifying activities.

Pastoral enterprises should:
- Consider alternatives to large scale grazing using more sustainable and resilient protein sources such as kangaroo.
- Anticipate the very real possibility that already marginal land will become unproductive: some regions will no longer be appropriate for grazing.
- No strategies will be effective in isolation; industries will need to develop a systemic approach to managing land in a highly variable climate that will become more variable and extreme.
- Develop holistic reviews of processes for determining stocking rates that accommodate longer-term projections under climate change.18
- Support strengthened investment in small scale sustainable horticulture, especially if diversification of the pastoral estate or indigenous owned land is supported by local land owners. This will also improve food security which will be impacted by climate change.

Biodiversity and ecosystems

- Climate change will be a key driver of species extinction in the NT without improved management.
- Improving private land conservation and linking extended wildlife corridors is integral to improving biodiversity resilience.

In the Discussion Paper there are several additional impacts that weren’t acknowledged and need to be highlighted:
- Extinctions: several species are on the verge of extinction and climate is a threat multiplier. Climate change is projected to become one of the greatest drivers of extinction as it places additional stress on populations already vulnerable from pre-existing land use pressures.

- Tree die back: mangrove die back is well documented in the Top End and there is growing awareness of die back for other species in the tropics such as Melaleuca and estuarine Eucalypts.
- Homogenisation of landscapes as a result of changed fire regimes. This will reduce genetic diversity and increase threats to biodiversity.
- Reduced availability of native plant foods which add to the barriers of remaining on homelands.

Improving the adaptive capacity of landscapes to reduce total biodiversity stressors will require innovation in conservation strategies across land tenures and jurisdictions.

Private land conservation is an emerging area of interest that has a lot of potential to increase the total area of land under conservation agreements. Linking habitat corridors, conservation reserves and national parks is a key adaptation strategy.

Other strategies for improving resilience in landscapes to improve native plant and animal resilience are:
- Recommit to planning the Territory eco link in collaboration with the South Australian Government. This work is consistent with objectives of the SA and NT Strategic Partnership Agreement.
- Establish a legal process to facilitate cooperation across different land tenures to develop eco links and prevent habitat fragmentation.
- Initiate climate planning across all organisations and sectors with land use management responsibilities.
- Create incentives to encourage restoration of environmental condition across the NT through developing a land condition assessment for the various bioregions of the NT. This should inform land use planning with a focus on improving adaptive capacity.

Conservation activity and maintained habitat connectivity primarily occurs on Aboriginal land. The benefit of on country management to both carbon sequestration and biodiversity conservation are critical to addressing climate change. Aboriginal land must continue to be managed according to the interests and governance of the appropriate custodians, ensuring that those communities are in control of the terms of this management. Any benefit arising from indigenous ecological knowledge and management should be mutually beneficial.

**Wellbeing**

- Adaptation planning should develop comprehensive vulnerability assessments through engagement of the most vulnerable communities.
- Climate change will exacerbate ongoing issues of poor access to essential services, dispossession of land and health inequality.
- Climate justice should be a core objective of climate policy.

Indigenous communities are not more likely to be negatively impacted because of close relationship and dependence on the land, as suggested in the Discussion Paper, but because the changes will exacerbate pre-existing vulnerabilities.

However, it is important to not assume only vulnerabilities and overlook the resilience and strengths of these communities. Communities should be supported to determine vulnerability assessments according to local issues and perspectives.

Climate change is a cumulative risk factor for communities where there is already heightened exposure to risk and limited adaptive capacity. This is primarily because of poor access to essential services, poor infrastructure, barriers to staying on country, dispossession from land and generally lower standards of wellbeing.
Remote communities have higher proportions of young people whom are more vulnerable to the impacts of climate change. It is important to emphasise that climate justice should inform our response to mitigation and adaptation. Climate justice should be incorporated as a key principle of climate planning.

**Implementation**

- The NT Government must legislate a climate change act that creates an enforceable whole of government approach to mitigation and adaptation.
- Introduce a new set of policy objectives and an updated set of guiding principles to embed climate change in government decision making.
- Climate triggers should be implemented in environmental assessment decisions.

Climate planning will require a cultural shift to ensure commitment across the NT well into the future. Climate change planning will be most effective once it is legislated and incorporated across all aspects of government planning and decision-making.

**Climate planning should be implemented through an enforceable whole of government legislated framework.**

While there is a place for voluntary programs, emissions targets and adaptation actions should ultimately be enforced by legal mechanisms to ensure reform is effective and implemented in a timely manner. Economic plans, regional planning documents and policy visions should integrate the latest climate projections to ensure future planning is guided by climate considerations.

The framework should outline a mechanism for collaborating relevant information, data and research across the NT to inform adaptation planning. For example, climate data recorded by mining companies and methane emission investigations through GISERA should be constantly fed into decision making processes across government.

There is opportunity in invigorating the NT as a knowledge and innovation hub that promotes climate research as a core tertiary research priority. There is a legacy of robust and reliable research in the arid zone that should be built upon and revived through cooperative research centres.

A Northern Territory Climate Change Act should:
- Establish long-term emissions reduction targets of net zero by 2050 and include interim targets with periodic compliance reporting.
- Introduce a clear agenda of policy objectives and guiding principles to embed climate change across all levels of government decision making.
- Establish a process for reviewing climate action every five years including a process to meet targets.
- Develop adaptation action plans for key systems and communities most vulnerable to the impacts of climate change.
- Establish a system of regular reporting to ensure planning is transparent, accountable and that there is ample opportunity for public participation.
- Introduce a climate trigger for relevant decision making, especially regarding land clearing.

**Conclusion**

The release of the Northern Territory Government Climate Change Discussion Paper is an important step in the process of developing an effective and meaningful Climate Strategy.

It is crucial Territorians understand the risks posed by climate change and tailored strategies must be developed - with extensive stakeholder engagement - to reduce the risks and optimise the co-benefits.

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Arid Lands Environment Centre
It is also crucial that the NT Government leads action on climate change, adopts emission reduction targets and facilitates adaptation planning. Deep and rapid emissions reductions targets are required across all sectors and at all levels, and communities be supported to prepare for climate change impacts.

The NT Government must lead the necessary transition towards sustainable, low carbon and climate resilient futures. This will involve reframing the economic aspirations of the NT to develop sustainable low carbon enterprises and committing to community based, interdisciplinary approaches to adaptation that builds adaptive capacity and resilience over the long term as the climate changes.

ALEC continues to advocate against the development of an unconventional gas industry in the NT, which has the potential to increase Australian emissions significantly.
Submission to the Northern Territory Government on the Climate Change: Mitigation and Adaption Opportunities in the Northern Territory

ALFA (NT) Limited is an Indigenous-owned carbon business working in partnership with Traditional Landowners and Indigenous ranger groups over more than 80,000 km² of Aboriginal freehold land (under the *Aboriginal Land Rights Act (NT) 1976*) in Arnhem Land in the Northern Territory of Australia (Figure 1). ALFA is the registered project proponent for five projects which generate Australian Carbon Credit Units (ACCUs) through the Savanna Burning methodology and is currently the largest producer of Savanna Burning ACCUs. ALFA is a not for profit Company that derives its income from the sale of ACCUs. The proceeds from the sale of carbon credits are reinvested to fund the on-ground land management activities of the Indigenous ranger programs within the fire project areas in Arnhem Land. The engagement in savanna fire management through the CFI/ERF provides a critically important source of income and employment and is integral to the environmental, social and cultural fabric of Arnhem Land in which ALFA operates.

Figure 1: The location of registered ALFA fire projects in Arnhem Land
ALFA welcomes the chance to comment on the Northern Territory Governments Climate Change Discussion Paper. ALFA notes the critical role of both the Federal and State/Territory Governments in growing and maintaining a viable carbon industry in Australia. Since 2010, changes in Federal carbon law and policy have been frequent and have had significant impacts on the viability and growth of carbon projects, including savanna burning projects. As such, one of the biggest risks to this new industry is the lack of long term National and State/Territory climate change policies and associated frameworks to support the creation and sale of carbon credits and other offsets.

ALFA has been operating as a project proponent with the CFI/ERF since 2014 and address the relevant consultation questions as they relate to ALFAs experiences to date with respect to engagement with the Savanna Burning Methodology and the carbon industry in Australia.

CONSULTATION QUESTIONS

Q.1. What (if any) greenhouse gas emissions target should the Northern Territory adopt?

The Northern Territory, along with other States and Territories in Australia, needs to adopt a significant overall emissions reduction target and clear mechanisms by which to achieve it. A clear emissions reduction target will also drive innovation and opportunity in the developing carbon industry. Such opportunities should be brokered with projects within the Northern Territory driving demand and economic activity for Territory based offsets projects.

The Northern Territory Government has a recent history of enabling innovation and opportunity within the carbon industry. NTG played a vital role in brokering non-commercial aspects related to the development of the Darwin LNG plant with ConocoPhillips. Prior to the introduction of Federal carbon legislation, the NTG used existing regulatory frameworks to place include environmental conditions on the DLNG operating licence and broker a funded environmental offsets project. The resultant project, WALFA – West Arnhem Land Fire Abatement, was incredibly successful and became the landscape scale model on which the Savanna Burning methodology under the Carbon Credits (Carbon Farming Initiative) Act was based. This has enabled registered fire projects across northern Australia to earn Australian Carbon Credit Units through the management of fire. Today there are over 70 registered savanna burning projects and they have abated almost 6 million tonnes of greenhouse gas

Under current Federal legislation, the Northern Territory has developed a strong and viable carbon industry which has the potential for growth and will continue to play a significant role in meeting both the NT and Australia’s emissions reduction targets.

Q.2. What should businesses and governments be doing to reduce emissions?

Businesses and Government will need to play an instrumental role in reducing NT emissions.
Businesses need clear and long term policy direction from Government to both manage climate risk and capitalise on emerging opportunities in the transition to a lower carbon economy.

Q.3. How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

To date, one of the biggest contributors to emissions reduction in the Northern Territory and Australia has been through the Aboriginal carbon industry operating in the NT. The climate strategy does not adequately reference the existing contribution of Aboriginal knowledge and practise or use this as an example of the types of innovation that are possible in the NT. For example, the Indigenous savanna burning projects in the NT have been responsible for a significant proportion of the almost 6 million ACCUs that have been produced by the Savanna Burning Industry to date (Figure 2).

![Figure 2: Australian Carbon Credit Unit (ACCU) issuance from Savanna Burning.](image)

Q.4. What potential opportunities can you see emerging from climate change in the Territory?

Much of the focus of the discussion paper is around making existing industry more energy efficient and this is indeed important. However, there are significant opportunities for emissions reduction and other offsets which are currently not covered by approved methodologies or supported through climate policies. As such, the research and development of other offset methodologies is strongly encouraged.
Again, this is a precedent that has already been set by the Northern Territory Government through their role in the research and development of the savanna burning methodologies. Given the success of savanna burning methodologies in driving significant carbon reductions while promoting positive environmental outcomes, other similar opportunities (e.g. feral animal herd management) might also exist within the land and sea management sector in the NT.

Specifically, in relation to Savanna Burning, there are additional sequestration methodologies that would make a significant contribution to Australia’s emissions reduction.

The experience of ALFA in the application of the current Savanna Burning methodology in Arnhem Land demonstrates highly successful uptake and engagement by remote Indigenous Australians in the CFI/ERF. Engagement in the carbon industry is particularly important for these remote Indigenous communities as other industry and employment options are limited. As such, savanna fire management presents a rare and significant opportunity for Aboriginal people to work on and generate wealth from their country. The ability to engage with new methodologies represents an opportunity for Indigenous Savanna Burning projects to significantly increase not only the economic returns generated from the fire projects but also the environmental, cultural and social returns from investment in the fire project areas.

Q.5. How can the fossil fuel industry further reduce emissions from energy production?

The Northern Territory economy is currently characterised by emissions intensive export trade. The reintroduction of a market-based emissions trading mechanism, which puts a price on carbon, would provide a driver for both the development of offsets projects as well as a financial incentive for the fossil fuel industry to cut greenhouse gas emissions.

Q.6. What type of regulations do you think would assist industry in being accountable for their impact on climate change?

The re-introduction of a market based emissions trading mechanism would provide a financial incentive to ensure that industry is accountable for their impact on climate change.

The carbon industry in Australia was developed under a carbon price mechanism and it was ALFAs experience during this period that the higher and market driven price on carbon increased methodology innovation, the uptake of offsets projects as well as the demand for ACCUs and was successful in driving industry reductions in greenhouse gas emissions.

Q.7. What actions are you willing to take to mitigate or reduce the impact of climate change?
ALFA is currently responsible for the generation of 5% of Australia’s Australian Carbon Credit Unit (ACCU) issuance to date. Further development support of the current Aboriginal carbon industry and the development of other opportunities in the NT will enable companies such as ALFA to be able to further contribute to the reduce the impact of climate change.

**Q.8. What support do you need to help you to mitigate or adapt to climate change?**

ALFAs experience in Indigenous Savanna Burning projects has demonstrated a number of barriers to Indigenous participation. In particular, is recognition that it takes time and resources for Indigenous carbon projects (or other offsets projects) to be established and for Indigenous groups to develop their capacity to engage with industry. As such, the current and ongoing support provided by the NTG through the Aboriginal Carbon Strategy and the support of the Indigenous Carbon Industry Network (ICIN) is both welcome and necessary.

Whilst no longer available, the Indigenous Carbon Farming Fund (ICFF) filled an important role providing invaluable support for Indigenous projects to build both their operational project and business capacity. For the Arnhem Land fire projects, this capacity development support helped fund the creation of ALFA as an appropriate governance and business company to support the Indigenous ranger groups in their engagement with the CFI/ERF and the generation of ACCUs. Access to similar funding which is not tied to the provision of ACCUs would be greatly beneficial for establishing projects.

Finally, the current Federal carbon policy of least cost abatement purchasing principles has no way of recognising and valuing the co-benefits associated with Indigenous participation in the carbon industry. Savanna burning carbon credits produced by Aboriginal projects are highly valued and currently sell well in the voluntary market. The reintroduction of a market driven carbon pricing mechanism would further support the developing niche market for high priced Aboriginal carbon credits and co-benefits.
28 November 2018

Ms Jodie Ryan  
Chief Executive Officer  
Department of the Chief Minister  
DARWIN NT 2601

By email: DCM.EconomicEnvironmentPolicy@nt.gov.au

Dear Ms Ryan

Submission on the Climate Change Mitigation and Adaptation Opportunities in the Northern Territory Discussion Paper

Thank you for the opportunity to provide comment on the Climate Change Mitigation and Adaptation Opportunities in the Northern Territory Discussion Paper 2018 (the Discussion Paper).

The Association of Mining and Exploration Companies (AMEC) is the peak national industry body representing hundreds of mining and mineral exploration companies throughout Australia, all of whom are adapting their business to remain competitive while incorporating the costs of climate change.

AMEC supports climate change action through:

- an integrated, orderly, phased transition to a low carbon Australian economy in sync with global action;
- the development and deployment of low emissions technologies;
- Government policy that does not significantly disadvantage trade exposed industries in comparison to their international competitors.

It is important that the Northern Territory’s approach remains in lock-step with the global economy’s treatment of climate change. The mining and mineral exploration sector creates jobs, revenue and royalties, important social and economic contributions to national and local economies that must not be jeopardised.

The following are AMEC’s responses to the specific questions.
Question 1: What greenhouse gas emissions target should the Northern Territory adopt?

The mining and mineral exploration sector needs certainty and transparency of climate change policy. Companies operate in domestic and international capital markets with investors that are sensitive to any change in the public policy framework that may make the Northern Territory uncompetitive.

The mining and mineral exploration sector is crucial for the manufacture of emission reduction technologies. For example, a solar panel requires sixteen different minerals.¹ While the average utility-scale wind turbine contains roughly 8,000 parts², each sourced ultimately from the mining and mineral exploration sector. This is why a comprehensive business case that models the impact of implementing climate change policies must be shared with Industry during an open and transparent consultation process. Doing so will mean both Industry and Government are clear on how any proposed public policy settings will impact business, along with any opportunities or problems the policy approach may bring.

A unified policy response to Climate Change is a responsibility of the Federal Government. The Territory should ensure that the gas emissions target it chooses to adopt does not conflict with the Federal Government’s position. Care must be taken to ensure that the chosen target must also not conflict with any bilateral arrangements with the Environmental Protection and Biodiversity Conservation Act 1999.

Question 2: What should businesses and governments be doing to reduce emissions?

Government need to lead the way in reducing its own emissions and set up an appropriate regulatory environment which will makes it possible for Industry to reduce emissions while remaining competitive. The Northern Territory Government’s commitment to providing 50% of energy from renewables by 2050 will help with reducing emissions. This needs to be implemented in such a way that costs are not transferred to industry as this will hinder investment in the Territory.

The Federal Government’s climate change response currently in development will also act as a guide for the Territory Government’s response to climate change.

It should be noted that Australia is already successfully implementing world leading environmentally sensitive mining and mineral exploration practices. For example, the largest integrated off-grid solar and battery storage facility in Australia and, reportedly, the world has been built by Sandfire at the DeGrussa mine site. Further in the Northern Territory, the expansion of the Jemena Northern Gas Pipeline will provide a lower emission

alternatives and lower emissions. The mining and minerals industry are increasingly looking towards providing the minerals necessary to meet demand for future energy sources.

AMEC commissioned an independent report in February 2018 which found that the lithium value chain is set to grow from $160 billion in 2018 to $2 trillion in 2025. With batteries set to play a key role in the renewable energy space, support of governments is absolutely essential to ensure that projects develop and there are enough raw materials available to ensure that renewable energy and batteries are cost effective.

The outcome of this Discussion Paper must not drive mining and mineral exploration investment offshore, where standards may be lower, and ultimately would lead to detrimental environmental outcomes.

Other issues

It is noted under “Business and Industry” on page 19, one of the opportunities is to investigate into market-based carbon pricing options. The difficulty here lies in the administration of the carbon pricing regime. The Northern Territory needs to look to other jurisdictions who have had successes and failures in introducing a carbon price, and keep all stakeholders informed about the options the Government is looking at the implement. For example, the European Union Carbon Market failed for many years highlighting the amount of care the needs to be taken when implementing such a scheme. Further we request that the Territory Government prepare and release an Economic Impact Statement on the proposed policies prior to implementation.

It is also important to note that the Federal Department of Environment and Energy provides estimates of Australia’s State and Territory greenhouse gas emissions according to the United Nations Framework Convention on Climate Change and the Kyoto Protocol. AMEC seeks reassurance that the Northern Territory will use this data appropriately as a benchmark and guide for how the Territory’s climate change policies are performing.

Looking forward to the next steps of this process, AMEC reiterates the absolute vital importance of effective, transparent, ongoing and meaningful engagement with industry during the policy development phase.

We look forward to working with the Northern Territory Government on the next steps to come from this Discussion Paper.

Yours sincerely

[Signature]

Warren Pearce
Chief Executive Officer
ACF Submission
Northern Territory Climate Change Discussion Paper

KEY RECOMMENDATIONS

- LEGISLATE A CLIMATE CHANGE ACT TO SET A CLEAR CLIMATE CHANGE POLICY FRAMEWORK.
- SET A LONG-TERM TARGET TO ACHIEVE NET ZERO CLIMATE POLLUTION ACROSS THE NORTHERN TERRITORY ECONOMY BY 2050.
- SET INTERIM CLIMATE POLLUTION REDUCTION TARGETS FOR 2025 AND 2030, DEVELOPED BY AN INDEPENDENT EXPERT ADVISORY BODY.
- SET REVIEW PERIODS FOR THE TERRITORY’S RENEWABLE ENERGY TARGET WITH INTENTION TO INCREASE IT OVER TIME, SUPPORTING A TRANSITION TO 100% RENEWABLE ENERGY.
- REVIEW DECISIONS TO EXPLOIT THE TERRITORY’S GAS RESERVES, WHICH POSE SIGNIFICANT RISK TO THE CLIMATE, LAND, WATER, AND FUTURE ECONOMY.
- ADD A CLIMATE TRIGGER TO ENVIRONMENTAL ASSESSMENTS FOR NEW LAND CLEARING CLAIMS.
- SEIZE OPPORTUNITIES FOR A GREEN ECONOMY THAT OFFER JOBS AND INVESTMENT WITH A FUTURE.

Introduction

The Australian Conservation Foundation (ACF) welcomes the opportunity to provide a submission to the Northern Territory Government’s Climate Change Discussion Paper. The ACF is Australia’s peak national environmental organisation. We represent a community of more than 500,000 people from across the country who are committed to achieving a healthy environment for all Australians. For more than 50 years, ACF has been a strong advocate for the nation’s forests, rivers, people and wildlife. ACF is proudly independent, non-partisan and funded by donations from our community.
The Northern Territory is vulnerable to the impacts of climate change including extreme heat and weather events, sea level rise and other coastal impacts such as storm surges, increased bushfires and changes in rainfall. The Climate Change Discussion Paper makes it clear that these climate impacts will extend to the Territory’s health and well-being, business and industry, tourism sector, built environment and precious natural ecosystems.

Climate projections recently released by the IPCC in their 1.5-degree Special Report\textsuperscript{1} make clear that 1.5 degrees is a critical threshold and the implications of crossing it are extremely detrimental for life on earth. Even 1.5 degrees of warming will pose significant risk.

The Northern Territory cannot solve climate change on its own but all jurisdictions have a responsibility to set responsible climate pollution reduction targets, policies to meet them, and plans to phase out dangerous fossil fuels like coal, oil and gas. It is also extremely important to build resilience to climate change and help the Territory to adapt to the unavoidable changes from the greenhouse pollution that is already in the system.

**Climate Change Act**

A Climate Change Act is important for a range of reasons, including to set clear commitments and a clear policy framework for dealing with climate change. Several elements are proposed for inclusion in Territory climate change legislation including emissions reduction targets and a climate charter with specific principles and objectives.

Other elements to consider include mechanisms for encouraging voluntary actions from business and the community such as the Victorian Government’s ‘Take2 Pledge Program’. While a Climate Change Act is important it needs to work alongside a broader policy agenda for addressing climate change including a portfolio of measures to support renewable energy and energy efficiency, a transition away from fossil fuels, land sector policies including controls on land clearing and low and zero emissions transport.

\textsuperscript{1} https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf
Legislate short and long-term targets for climate pollution reduction

Strong territory-based climate pollution reduction targets are important to drive effective policy and send a clear signal to business, investors and the community.

The Territory’s climate change policy needs a commitment to both a long-term legislated carbon pollution reduction target and interim targets to ensure carbon pollution is reduced year on year.

There is significant precedence for such targets in jurisdictions across Australia. Victoria, New South Wales, Queensland, South Australia, Tasmania and the Australian Capital Territory (ACT) have all committed to net zero emissions by 2050. In the ACT and Victoria these targets have been set in legislation. Queensland and the ACT have also set interim targets: Queensland has set a target to reduce emissions 30% below 2005 levels by 2030, and the ACT has legislated a reduction of 40% below 1990 levels by 2020. Victoria has established an expert panel to provide advice on interim targets for 2021-25 and 2026-30.

Long-term and interim carbon pollution reduction targets should be legislated to send a strong signal about the Territory government’s intentions. Enshrining targets in legislation communicates that the government is genuinely committed to achieving emissions reduction and provides clear emissions reduction benchmarks for the community and certainty for businesses.

Regular review cycles should also be implemented to ensure the targets are increased when possible in line with updated science, new technology developments, reduced costs of climate solutions and other factors that allow for higher ambition.

There are good examples of Climate Change Legislation, including Victoria’s Climate Change Act, that should be considered by the Territory. See Box 1 below for a brief outline of the Act.

BOX 1: VICTORIA’S CLIMATE CHANGE ACT:

- LEGISLATES A LONG-TERM GREENHOUSE GAS EMISSIONS REDUCTION TARGET OF NET ZERO EMISSIONS BY 2050;
- REQUIRES THE PREMIER AND THE MINISTER TO SET FIVE-YEARLY INTERIM TARGETS FROM 2021, TO KEEP VICTORIA ON TRACK TO MEET THE LONG-TERM TARGET;
• REQUIRES THE MINISTER TO DEVELOP A CLIMATE CHANGE STRATEGY EVERY FIVE YEARS (WITH THE FIRST DUE BY 1 AUGUST 2020), SETTING OUT HOW VICTORIA WILL MEET ITS TARGETS AND ADAPT TO THE IMPACTS OF CLIMATE CHANGE;

• ESTABLISHES A PLEDGING MODEL TO REDUCE EMISSIONS FROM STATE AND LOCAL GOVERNMENTS’ OWN OPERATIONS AS WELL AS FROM KEY EMITTING SECTORS OF THE ECONOMY;

• INTRODUCES A NEW SET OF POLICY OBJECTIVES AND AN UPDATED SET OF GUIDING PRINCIPLES TO EMBED CLIMATE CHANGE INTO GOVERNMENT DECISION-MAKING;

• REQUIRES ADAPTATION ACTION PLANS BE PREPARED EVERY FIVE YEARS (FROM 2021) FOR KEY SYSTEMS SUCH AS WATER, FARMING AND HEALTH THAT ARE EITHER VULNERABLE TO THE INEVITABLE IMPACTS OF CLIMATE CHANGE, OR ARE ESSENTIAL TO ENSURE VICTORIA IS PREPARED FOR THE IMPACTS; AND

• ESTABLISHES A SYSTEM OF REGULAR REPORTING ON VICTORIA’S EMISSIONS AND ACTIONS TO PROVIDE TRANSPARENCY AND ACCOUNTABILITY.

VICTORIA’S CLIMATE CHANGE FRAMEWORK (THE FRAMEWORK) PROVIDES A DESCRIPTION OF HOW THE GOVERNMENT WILL DRIVE THE ECONOMIC TRANSITION TO A NET ZERO EMISSIONS ECONOMY THROUGH INCREASING ENERGY EFFICIENCY AND PRODUCTIVITY; MOVING TO A CLEANER ELECTRICITY SUPPLY; INCREASING ELECTRIFICATION OF TRANSPORT, BUILDINGS AND INDUSTRY; SWITCHING TO CLEANER FUELS; REDUCING NON-ENERGY EMISSIONS; AND STORING CARBON IN TREES, PLANTS AND SOIL.²

A Climate Charter that applies to all government decisions

Climate change principles and objectives should be considered in all plans, policies, programs and operations decision-making across government. An effective means of mainstreaming climate change mitigation and adaptation into policymaking and decisions across whole of government is to commit to a ‘Climate Charter’ as part of climate change legislation. A similar proposal was made to the Victorian State Government and taken up by the Climate Change Act Independent Review Panel. For more info on this recommendation, see the Review Panel’s Report which can be found here:

A Climate Charter should include a ‘climate test’. A climate test would provide that all public authorities, when making an administrative decision or financial decision, must assess whether that decision will enhance or reduce the Territory’s ability to achieve its greenhouse emissions reduction targets. If the effect of making the decision would be to reduce the territory’s ability to meet the targets, the subject of the decision would need to be modified until it did not reduce territory’s ability to achieve the short-term and long-term targets. This climate test would be an important tool in a Climate Change Act to ensure that climate change considerations and the achievement of the emissions reduction targets are embedded in government decision-making. The test provides a clear mechanism that links government decisions to emission reduction targets.

**Climate change adaptation strategy**

The ACF sees development of a Climate Change Adaptation Strategy as essential work and supports the government’s efforts to adapt to and manage the unavoidable risks that climate change poses to communities, the environment, infrastructure, and the economy. Adaptation planning should be integrated across all aspects of government.

Adaptation planning is a long-term process that involves government, business and community working together. It is important to ensure that climate change justice is embedded in climate change planning by focusing on building resilience in the most vulnerable communities and sectors. Adaptation strategies should be developed at the local level with input from local government and local communities.

**Support a transition to 100% renewable energy**

Generating 100 per cent of our electricity with renewable energy is both technically feasible and economically responsible for Australia as a whole and for all states and territories. Research and modelling by the University Technology Sydney Institute of Sustainable Futures, determined that by 2030 we can power all of Australia’s homes and businesses with 100 per cent renewable electricity and by 2035 Australia can also meet around 40 per cent of our transport needs with renewable energy. The modelling further found that by 2050, Australia’s entire energy system can be decarbonized and that getting to 100 per cent renewable electricity would result in electricity that is more reliable than it is
The ACF is calling on the Federal government, and state and territory governments, to set a target for clean renewable energy to power 100 per cent of Australia’s electricity as soon as possible, and to transition 100 per cent of Australia’s overall energy use (including electricity, transport and industrial processes) to clean energy before 2050.

The ACF acknowledges that the Territory has committed to 50% renewable energy by 2030. We recommend that this target be reviewed regularly with the aim of increasing it over time. The benefits of strong renewable energy commitments can be very significant. For example, under the Victorian Renewable Energy Target, delivering up to 650MW capacity was projected to drive up to $1.3 billion of additional renewable energy investment and create around 1,250 additional two-year construction jobs and 90 ongoing jobs in regional Victoria.  

Clean electricity is a prerequisite to mass electrification of our transport sector and industrial processes and is necessary to achieve the long-term target of net zero carbon pollution before 2050. The ACF recommends that the NT adopt a policy to transition electricity and the broader energy sector to net zero carbon pollution well before 2050.

**Phase out fossil fuel developments and ban fracking**

Digging up and burning coal, oil and gas are all responsible for fueling climate change and none of these fuels have a place in plans to mitigate climate damage. While burning gas generates less carbon emissions than coal, it is not a clean fuel. In addition to direct pollution caused by burning gas, fugitive emissions can be substantial. Across Australia, fugitive emissions from the production of coal, oil and gas accounted for about 35% of emissions growth (excluding Land Use, Land Use Change and Forestry) from 2005-2017. The largest source of fugitive emissions during this period came from the expansion of Liquified Natural Gas (LNG) and gas production.

The Territory’s emissions have risen 28% over the last 10 years and will continue to rise with the INPEX Ichthys project, opening up the Territory to gas fracking, new land clearing permits, and increased offshore gas processing. The Territory has only 1% of Australia’s population, yet produces 3% of Australian emissions. Exploiting the Territory’s unconventional gas reserves could increase Australia’s emissions.

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total greenhouse gas emissions by over 5%.

The Territory’s reversal on its two-year ban on fracking, which opens up more than half the region to onshore shale gas development, did not adequately consider the impact on greenhouse pollution and should be reconsidered in the context of the Territory’s efforts to mitigate and adapt to climate change.

According to The Australia Institute, shale oil and gas development could result in total emissions equivalent to 60 times the current national annual emissions. The “carbon bomb” from the new industry could dwarf other contentious projects, such as the plans to open up the Galilee Basin in Queensland for a new coal province.⁶

Although the Territory is considering options to offset these emissions, the full cost of offsets is likely to be very expensive. The Australia Institute estimates that it could cost up to $4.3 billion per year when the shale gas industry is at full production in 2030.⁷ It would be much more prudent to protect against damage to land, water and climate by avoiding fracking altogether.

Control Land Clearing with Climate Trigger

Land targeted for clearing in the Northern Territory has increased nearly tenfold in the past two years. Land clearing is a significant contributor to climate change while also destroying critical wildlife habitat and contributing to species extinction. To help address this, a climate trigger should be added to environmental assessments for new land clearing claims.

Seize the opportunities available by growing a green Territory economy

As the major economies of the world continue to decarbonise to meet Paris Agreement commitments and to protect against the growing risks of climate damage, demand is growing for clean energy, products that have low or zero carbon footprints, and carbon offsets. The Northern Territory has been a world leader in the carbon economy through Indigenous led savannah burning, which has provided

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⁷ Mark Ogge, “Offsetting NT fracking emissions identified by the Northern Territory Government’s Fracking Inquiry will cost up to $4.3 billion in 2030 alone, and $146 billion from 2030 to 2040” Australia Institute Discussion Paper, October 2028.
economic opportunities for reducing atmospheric carbon. There are growing opportunities for economic development related to carbon sequestration including native plant food industries, reforestation, hemp industries, sustainable agriculture and carbon neutral hydrogen production.
NT Climate Change Discussion Paper

Submission from Jason Fowler, 30/11/18
Australian Marine Conservation Society, Darwin.

The current climate change discussion paper released by the NT Government is primarily focused on the terrestrial impacts of climate change and only briefly mentions marine impacts (p 17), “Rising sea temperatures and sea levels can impact the fishing and prawn industries”. The only current action mentioned is “Building resilience in the fisheries sector by identifying new harvest targets for species impacted by climate change”

This is woefully inadequate as the marine and coastal ecosystems of the NT are valued at around $2 billion to the Territory economy¹ and are acutely exposed to the impacts of climate change. Therefore, this submission will focus on coastal and marine impacts and address the adaptation and mitigation strategies that should be employed by the NT government.

Current Impacts

Over the past 15 years the NT marine environment has seen increasing impacts from climate change related events mainly associated with increasing sea surface temperatures and changing weather patterns.

Coral bleaching. First recorded in 2003 at the Coburg Peninsula, bleaching impacts have increased since and continue to have a negative impact on the NTs various fisheries and tourism industries². Currently the NT coast is on bleaching warning and this is expected to be upgraded by January 2019 to “alert level 2” which indicates coral mortality is evident³.

Mangrove Dieback. A major mangrove dieback event occurred in 2015/16 that affected 1000km of coast in the Gulf of Carpentaria extending westwards to Limmen Bight. This event was caused by exceptionally high sea temperatures, a severe lack of monsoonal rainfall and lower sea levels. The Mangroves have not grown back thus far.⁴

Mudcrab Dieoff. After 3 years of little rain and the exceptionally hot summer of 2015/16 the mudcrab fishery in the gulf of Carpentaria almost collapsed⁵.

Turtle Hatchling Failure. Long term studies on Bare Sand Island in Bynoe Harbour have shown steadily increasing sand temperatures which have had a two fold affect. 1) Hatchlings

¹ https://www.researchgate.net/publication/325654133_Economic_Values_of_the_Northern_Territory_Marine_and_Coastal_Environments
³ https://coralreefwatch.noaa.gov/vs/timeseries/australia.php
⁵ https://www.abc.net.au/news/rural/2015-09-17/one-of-worst-seasons-on-record-for-roper-river-crabbers/6781136
born are becoming predominately female 2) the centre of the nests have exceeded maximum thermal thresholds and hatchlings die before hatching occurs\(^6\).

**Declining Coastal Dolphin Populations.** Recent studies show the decline in coastal dolphin species in Darwin Harbour, Bynoe Harbour and Shoal Bay. Researchers indicate climate change may be one of the factors causing this\(^7\).

**Rising Sea Surface Temperatures.** Reports from long term fishing guides in Bynoe Harbour have noted the increasing difficulty to catch fish in the shallow waters due to water temperatures exceeding optimal conditions for Barramundi\(^6\).

**Rising Sea Levels.** The NT coast is particularly exposed to rising sea levels with major impacts forecast for Kakadu National Park\(^8\)

**Recommendations**

To mitigate and adapt to the ongoing climate change impacts on the marine and coastal environment the NT climate change strategy should include the following actions;

**Ban Seabed mining.** While a current moratorium on seabed mining exists this should be permanently banned. Sediments on the sea floor act as a major carbon sink. Seabed mining will resuspend sediments and release stored carbon. Suspended sediments also block light penetration and lower photosynthetic potential which leads to lower oxygen availability and increasing ocean acidity\(^9\).

**Protect coastal wetlands.** Coastal wetlands include Mangroves, Seagrass meadows and saltmarshes and account for 50% of stored carbon in the ocean despite being only 0.02% of ocean area. The NT coast has extensive mangrove and seagrass communities that play a critical role in protection against storm damage\(^9\).

**Deliver an effective Coastal and Marine Management Strategy (CMMS).** The soon to be released CMMS must include marine spatial planning that delivers high level protection to areas of high biodiversity. Territory Labour’s election commitment stated that the CMMS would be science based. The scientific literature is very clear and states that Marine protected areas (MPAs) are widely accepted as being the most effective way of mitigating

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\(^7\) https://www.abc.net.au/news/2018-11-30/darwin-harbour-dolphin-population-decline-worries-scientist/10157960

\(^8\) https://events.csiro.au/Newsletters/ECOS/2018-11

\(^9\) Marine reserves can mitigate and promote adaptation to climate change Callum M. Roberts et al .2017, PNAS Early Edition.
and adapting to climate change impacts. MPAs build resilience in marine ecosystems in many ways including\(^\text{10,11}\).

**Increasing fish populations.** MPAs rebuild fish populations which increases resilience to major disturbance\(^\text{12}\).

**Lower ocean acidity.** Abundant fish populations can lower ocean acidity by increasing the levels of alkaline carbonate minerals in shallow waters which boosts photosynthetic activity, lowers CO2 concentrations and affects ocean acidity on a local scale\(^\text{9}\).

**Aid species distribution shifts.** MPAs provide stepping stones for species dispersal, safe landing zones for colonising species and refugia for those unable to move\(^\text{9}\).

**Coral reef recovery.** MPAs have been proven to help coral recover faster from bleaching events\(^\text{13}\) Coral reefs in MPAs also recover faster from major disturbances such as high flood events and large cyclones\(^\text{15}\).

**Coastal protection from storm damage.** The Territory coastline is particularly vulnerable to the increased risk of major cyclones. MPAs ensure the coastal ecosystems are kept in best possible health and are better able to withstand major storms. This includes inshore reefs, Mangroves and Seagrass meadows\(^\text{9,14,15}\).

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\(^\text{11}\) Synergistic effects of reserves and connectivity on ecological resilience 30 October 2012 *Journal of Applied Ecology* Andrew D. Olds, Kylie A. Pitt, Paul S. Maxwell, Rod M. Connolly

\(^\text{12}\) https://www.sciencedirect.com/science/article/pii/S0960982212003958#

\(^\text{13}\) https://dmc.umaine.edu/2018/05/10/study-finds-marine-protected-areas-help-coral-reefs/


7 December 2018

Mr Ian Satchwell
Executive Director – Economic and Environment Policy
Department of the Chief Minister
GPO Box 4396
DARWIN NT 0801

Dear Mr Satchwell

RE: NT CLIMATE CHANGE DISCUSSION PAPER

The Australian Petroleum Production & Exploration Association (APPEA) is the peak national body representing Australia’s oil and gas exploration and production industry. APPEA’s member companies account for an estimated 98 per cent of the nation’s petroleum production. APPEA also represents over 100 associate member companies that provide a wide range of goods and services to the upstream oil and gas industry.

APPEA welcomes the opportunity to provide comments on the Climate Change – Mitigation and adaptation opportunities for the Northern Territory – Discussion Paper released on 5 October 2018. APPEA’s comments should be read in conjunction with submissions provided by individual members.

Background

APPEA has been engaged in the greenhouse and climate change policy debate since the 1990s and has participated in every major consideration of national climate change policy approach in Australia since that time.

APPEA is also committed to working with governments as they develop policy responses to climate change. APPEA in February 2016 released a second edition of its Climate Change Policy Principles – a copy is at Attachment 1 – setting out the principles that APPEA considers should underpin Australia’s national policy response to climate change. These principles inform this submission in response to the Discussion Paper.

The key role natural gas plays in reducing domestic and global greenhouse gas emissions

As the Discussion Paper notes, greater use of Australian natural gas – in the domestic market, and in Asia – can significantly reduce greenhouse gas emissions.

Gas has an essential role to play in reducing emissions. In the home, natural gas is a cleaner fuel compared to the National Electricity Market (NEM) average. The high level (around 80 per cent in 2017) of gas-fired power generation has meant that the Northern Territory has one of the lowest emissions electricity generation fleets in Australia. Gas-fired generators can be rapidly started

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1 A copy of APPEA’s Climate Change Policy Principles can also be found at www.appea.com.au/2016/02/appea-updates-climate-change-policy-principles.
2 See page 11.
3 The average emissions intensity for the Territory is 0.64 kg CO2 e/kWh (or 0.56 kg CO2-e/kWh for the Darwin Katherine Interconnected System (DKIS)) compared to a NEM average of 0.82 kg CO2 e/kWh (or, for Victoria, an average of 1.07 kg CO2 e/kWh). See Department of...
making them complementary with intermittent renewable energy. Exporting gas as LNG allows our Asian trading partners to reduce the emissions from their economies.

Australia could generate significant additional national economic, environmental and social benefits through greater use of its substantial natural gas resources.

Using more natural gas in Australia’s power generation and resource processing would significantly enhance the nation’s ability to meet increasing energy needs and reduce emissions.

The potentially growing role of natural gas considered in these reports reflects the role gas could play as a lower-emissions and cost-effective generation technology, both in replacing coal-fired generation and in complementing the growth in renewable technologies.

In considering Australia’s climate change policy responses both in the period to 2030, and beyond, and Australia’s existing and future contribution to global emissions reduction efforts, it is important to acknowledge the positive contribution Australia’s LNG exports make now and will increasingly make to that global effort.

For example, the recent special report of the Intergovernmental Panel on Climate Change (SR15) provides a comprehensive analysis of the pathways to limiting global temperature increase to 1.5 degrees. Many of these pathways are consistent with a strong, and growing, role for natural gas.

Australia’s LNG industry is in a unique position to contribute substantially to the economic development of the nation and to reduce greenhouse gas emissions. Australia’s resources of natural gas and proximity to growing markets make us well-placed to meet the global climate change challenge while substantially contributing to Australia’s economic growth. While the demand for energy as part of the industrialisation of Asian economies is a key driver, the properties of natural gas as a lower emitting and cleaner burning fuel is also driving much of the international demand for LNG.

A 2008 study (updated in 2011) by WorleyParsons, for example, compares lifecycle greenhouse gas emissions of Australian LNG exports from the North West Shelf Project with Australian east coast black coal exports in terms of lifecycle greenhouse gas emissions: from extraction and processing in Australia through to an end use of combustion (using different power generation technologies) in China for power generation.

Figure 1 below is derived from data within the study, and shows that:

- For every tonne of carbon dioxide equivalent (CO₂-e) emitted in LNG production within Australia, between 5.5 and 9.5 tonnes of emissions from the coal alternative can be avoided globally.


Available at: www.ipcc.ch/sr15/

LNG has a substantially lower greenhouse footprint associated with it compared to coal – not just in combustion emissions, but throughout its lifecycle.

The lifecycle greenhouse intensity for LNG is about 50 per cent lower than that of coal.

Figure 1. Displacement of Coal by LNG (kg/MWh CO2-e by Fuel Source)

A similar 2011 study by WorleyParsons\(^7\) considered lifecycle greenhouse gas emissions of Australian coal seam gas (CSG) to LNG (CSG→LNG) exports from projects in Queensland with Australian east coast black coal exports in terms of lifecycle greenhouse gas emissions: from extraction and processing in Australia through to an end use of combustion (using different power generation technologies) in China for power generation.

The study found that, in the case of CSG→LNG exports:

- For every tonne of CO\(_2\)-e emitted in LNG production within Australia, between 2.5 and 4.3 tonnes of emissions from the coal alternative can be avoided globally.
- Considering savings from a 30 year 10 million tonnes per year (Mtpa) CSG→LNG project, if CSG→LNG is combusted in a combined cycle gas turbine (CCGT) plant instead of a subcritical coal plant, the life cycle emissions are 42.7 Mt CO\(_2\)-e per annum, the annual savings 37.2 Mt CO\(_2\)-e and the project life savings 1,114 Mt CO\(_2\)-e\(^{11}\). For CSG→LNG combustion in a CCGT plant instead of a supercritical coal plant the annual savings and project life savings are 21.7 Mt CO\(_2\)-e and 652 Mt CO\(_2\)-e respectively.

In addition, and as noted above, burning gas instead of coal improves urban air quality. This is particularly important in many Asian countries that are importing Australian LNG or considering imports.

Comments on the Discussion Paper

As indicated above, the Discussion paper recognises the important role that the NT’s natural gas industry has and will continue to play in meeting local and international emissions reduction. APPEA’s comments that follow respond to questions in the discussion paper relevant to the upstream oil and gas industry.

2: WHAT SHOULD BUSINESSES AND GOVERNMENTS BE DOING TO REDUCE EMISSIONS?

6: WHAT TYPE OF REGULATIONS DO YOU THINK WOULD ASSIST INDUSTRY IN BEING ACCOUNTABLE FOR THEIR IMPACT ON CLIMATE CHANGE?

Any actions undertaken by the Northern Territory Government must be consistent with and complementary to Australia’s commitments under the Paris Agreement. APPEA supports a national climate change policy that delivers greenhouse gas emissions reductions at least cost and facilitates broad-based investment decisions consistent with there being an international price on carbon.

Australia’s policy response, and therefore the NT’s response, should seek to:

• Deliver lowest cost greenhouse gas emissions abatement through an appropriately designed mechanism that provides an economy-wide transparent price signal to shape business and consumer plans and investments. The mechanism should be efficient, have low compliance costs, and support international trade that recognises different national circumstances.
• Recognise and allow the use of the widest range of credible domestic and international offsets.
• Provide a level playing field for new entrants.
• Avoid penalising early movers who have previously implemented abatement measures.
• Support research into low-emissions technologies, and development and deployment of such technologies.

In the event Australia takes action before comparable action is taken by the nations with which we compete, any Australian and NT policy response should maintain the competitiveness of Australian trade exposed industries, such as LNG, by minimising the costs the industry faces in the absence of a carbon price being imposed on energy sources in customer countries and competitors.

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8 As the Western Australian Government noted when announcing its intention to update its climate change policy approach that “…the Federal Government must lead the way at a national level to address the impacts of climate change”. See www.mediastatements.wa.gov.au/Pages/McGowan/2018/12/McGowan-Government-to-develop-new-climate-change-policy.aspx for more information.
9 Australia’s Nationally Determined Contribution (NDC) can be found at www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Australia/1/Australias%20Intended%20Nationally%20Determined%20Contribution%20to%20a%20new%20Climate%20Change%20Agreement%20-August%202015.pdf. See also www.dfat.gov.au/international-relations/themes/climate-change/Pages/climate-change.aspx for more information.
The oil and gas industry has a strong commitment to operating to the highest environmental outcomes with emissions reduction efforts a key focus. In terms of methane in particular, efforts to reduce methane emissions present continuous improvement opportunities and provide environmental and commercial benefits. Methane is, of course, a valuable commodity for our industry.

Industry actions to reduce greenhouse gas emissions encompass the entire oil and gas exploration and production life cycle, and encompass:

- Industry joint initiatives.
- What we do when we design our facilities.
- What we are doing in our facilities (both in Australia and globally).
- What we are doing around our facilities.
- Low emissions research & development.

Industry joint initiatives

The oil and gas industry, both internationally and in Australia, has come together around several industry initiatives to act collectively to reduce greenhouse gas emissions and play a positive role in climate change policy developments.

Oil and Gas Climate Initiative

The Oil and Gas Climate Initiative (OGCI) is a global EO-led initiative which aims to lead the industry response to climate change. Launched in 2014, OGCI comprises thirteen international oil and gas companies, seven of whom are APPEA members, that pool expert knowledge and collaborate on action to reduce greenhouse gas emissions.

OGCI aims to increase the ambition, speed and scale of the initiatives members undertake as individual companies to reduce the greenhouse gas footprint of their core oil and gas business – and to explore new businesses and technologies.

OGCI Climate Investments

In November 2016, OGCI launched a billion-dollar investment vehicle, OGCI Climate Investments. Climate Investments invests in technologies that have the potential to significantly reduce greenhouse gas emissions, and that are economically viable. OGCI Climate Investments focus is on innovative companies with promising technology and business models that are ready to be commercialised.

Zero Routine Flaring by 2030

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10 See [www.oilandgasclimateinitiative.com](http://www.oilandgasclimateinitiative.com). APPEA member companies BP, Chevron, Eni, Equinor, ExxonMobil, Shell and Total are OGCI members.

This World Bank initiative, brings together governments, oil companies (seven of whom are APPEA members), and development institutions who agree to cooperate to eliminate routine flaring no later than 2030.

Oil companies that endorse the Initiative will develop new oil fields they operate according to plans that incorporate sustainable utilisation or conservation of the field’s associated gas without routine flaring. Oil companies with routine flaring at existing oil fields they operate will seek to implement economically viable solutions to eliminate this legacy flaring as soon as possible, and no later than 2030.

**Climate & Clean Air Coalition Oil and Gas Methane Partnership and Methane Guiding Principles**

The Climate and Clean Air Coalition (CCAC) created a voluntary initiative to help companies reduce methane emissions in the oil and gas sector. The Oil and Gas Methane Partnership was launched in September 2014. The Oil and Gas Methane Partnership provides companies a mechanism to systematically and responsibly address their methane emissions, and to demonstrate this systematic approach and its results to stakeholders.

In 2017, eight companies, seven of whom are APPEA members, signed a set of *Guiding Principles on Reducing Methane Emissions across the Natural Gas Value Chain*. The Guiding Principles are to:

- Continually reduce methane emissions.
- Advance strong performance across gas value chains.
- Improve accuracy of methane emissions data.
- Advocate sound policies and regulations on methane emissions.
- Increase transparency.

The Guiding Principles are complementary to and mutually reinforcing of other initiatives, including the OGCI.

**Facility Design**

This section provides a series of case studies of actions taken by the industry in both the design and construction of its facilities to reduce emissions or to minimise the facility’s emissions profile.

Australia’s LNG projects, for example, include design features to maximise energy efficiency and minimise its greenhouse gas emissions footprint, throughout the design and operations planning phases of the project.

The use at the Ichthys LNG Project of an onshore combined cycle power plant, will have a significantly improved efficiency compared to an open cycle gas power plant.

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13 See [www.ccacoalition.org/en/activity/ccac-oil-gas-methane-partnership](http://www.ccacoalition.org/en/activity/ccac-oil-gas-methane-partnership) for more information. APPEA member companies BP, Eni, PTT, Shell, Equinor and Total are partner companies.

Projects are designed to minimise operational venting and flaring. For example, installing vent gas recovery systems, which recover otherwise unused vent gas to the fuel gas systems.

Waste heat recovery units are installed to reduce the need for fired heating down to essentially zero during normal operations. Fired heaters are provided for start-up only. In some projects, waste heat recovery units have also been installed offshore to reduce the requirement for fired heating significantly.

Acid Gas Removal Unit (AGRU) incinerators are designed with waste heat recovery systems. The exhaust gases will be used to pre-heat combustion air to minimise the need for gas firing to maintain sufficient combustion temperature.

At the Ichthys LNG Project, an innovative offshore power-sharing cable has been included in the design of the central processing facility and floating production, storage and off-taking facility. This feature will result in reduced fuel consumption and emissions on these facilities through rationalisation of power generation capacity offshore.

**Continuous Operational Improvement**

This section provides a case study to illustrate the activities and initiatives undertaken by APPEA member companies at facilities across the industry to reduce their greenhouse gas emissions.

**Methane Code of Practice for onshore gas facilities in the Northern Territory**

As part of the regulatory reforms stemming from the recent Independent Scientific Inquiry into Hydraulic Fracturing in the NT, a Code of Practice for Methane Emissions is being developed. This code will cover best practices for the ongoing monitoring, detection and reporting of methane emissions from any onshore shale gasfields and wells.

APPEA members operating onshore in the NT are working with local and interstate regulators and scientific experts to develop the Code of Practice. It is expected that the Code will be completed early in 2019.

**Emissions Reduction Outside of Facilities**

This section provides a series of case studies of activities and initiatives undertaken by APPEA member companies around their facilities to reduce greenhouse gas emissions. This includes a variety of activities across the industry.

**Darwin LNG and WALFA**

ConocoPhillips, as operator of the Darwin LNG (DLNG) facility, is a leader in emission abatement through their partnership with the West Arnhem Land Fire Abatement (WALFA) project, the pioneer of the Savannah-Burning abatement methodology.

Supported by DLNG since 2006, WALFA is now recognised globally as a world class program with success in both greenhouse gas abatement alongside social, cultural and economic co-benefits.

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With a cumulative total abatement since inception of over 2 million tonnes CO$_2$-e, WALFA is the largest greenhouse gas offset program in Australia and has been the catalyst for over 70 other similar projects across northern Australia.

The Project’s success is not limited to greenhouse gas emissions abatement alone – it has also resulted in the conservation of rainforest vegetation, protection of local wildlife and rock art sites, facilitated reinvigoration of cultural aspects of land management, while supporting more than 300 Indigenous jobs per year over the years the project has been operational.

This pioneering abatement methodology, initiated by the NT’s LNG industry, has created a new Savannah burning offset industry, dealing directly with the largest source of emissions in the NT – LULLCF by drawing on Aboriginal knowledge and practices.

Ichthys LNG Project Savanna Fire Management Program

The Ichthys LNG Project recently finalised agreements with the Indigenous Land Corporation (ILC) and Perpetual Trustees to deliver a savanna fire management program in the Northern Territory. This $34 million program will fund the development, establishment and operation of individual fire management projects on Aboriginal-held land. In addition to generating Australian Carbon Credit Units (ACCUs), it is aimed at providing positive social, economic, cultural and environmental outcomes.

Greenhouse Gas Storage (Carbon Capture and Storage or CCS)

Greenhouse gas storage is the process whereby large volumes of captured carbon dioxide are safely injected and stored deep underground rather than being released to the atmosphere. It is seen as one of the pathways enabling the continued use of fossil fuels in a low-carbon economy and may be vital in reducing emissions from industries such as steel and cement manufacture.

Since 1996 the global oil and gas industry has lead the world in the practical deployment of this technology. Equinor is operating large projects alongside their Sleipner and Snøhvit gas processing operations, and in Canada, Shell has developed the Quest CCS project.

In Australia, the oil and gas industry has been at the leading edge of researching and deploying greenhouse gas storage technologies. The industry instigated significant research efforts into greenhouse gas storage in the late 1990s through the Australian Petroleum Cooperative Research Centre which undertook the first assessments of possible storage sites across Australia. Several years later that work was taken over by CO2CRC Limited who continue to be one of the world’s leading collaborative research organisations focused on carbon capture and storage. The CO2CRC continues to receive significant backing from the oil and gas industry.

The Australian industry has privately funded several hundred million dollars undertaking detailed storage site and project scoping assessments in the Perth, Carnarvon, Browse, Bonaparte and Cooper Basins. The Gorgon Project on Barrow Island, operated by Chevron, includes the Gorgon Carbon Dioxide Injection Project, the safe underground injection and storage or between

3.4-4.0 million tonnes CO$_2$-e greenhouse gases per year$^{17}$, or around 100 million tonnes over the life of the project$^{18}$.

The Gorgon Carbon Dioxide Injection Project is the largest greenhouse gas mitigation project in Australia and the largest undertaken by industry globally. The Australian oil and gas industry has also assisted other organisations undertaking storage site assessments in the Gippsland and Perth Basins.

In addition to assessing potential storage sites the Australian oil and gas industry has played a pivotal role in the development of legislative and regulatory regimes required to enable the technology to be deployed. The legislation enabling the Gorgon Carbon Dioxide Injection Project is believed to be the world’s first storage specific legislation and the Project was the first large scale project to have its environmental impact assessed under State and Federal Environmental laws.

The experience at Gorgon was subsequently used to help develop the Australian *Offshore Petroleum and Greenhouse Gas Storage Act 2006* and continues to be a test case for regulatory developments in other areas such as the reporting of storage site emissions.

The Ichthys LNG facility has been designed as “CCS-ready”, meaning that provisions have been made in the design to be able to retrofit the facility with CCS capability in the future. INPEX has conducted investigations into capturing reservoir CO$_2$ from the AGRU and re-injecting this CO$_2$ in a suitable reservoir. This included a detailed site selection and characterisation assessment, which indicated that suitable storage reservoirs may exist but at a significant distance from the LNG facility. To date, in excess of $10 million has been spent on evaluating CCS as an abatement option for Project. These studies confirmed that, whilst there may be no technical barriers to implementation, implementation of CCS cannot be commercially justified for this project at this stage.

Research, Development and Demonstration

The Australian oil and gas Industry is a strong supporter of research, development and demonstration (R,D&D) in Australia.

Much of this R,D&D is undertaken through collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Australian universities under umbrellas such as the Western Australian Energy Research Alliance (WA:ERA) and in the sponsorship of numerous university research chairs.

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$^{17}$ This represents around 1 per cent of Australia’s annual greenhouse gas emissions.

$^{18}$ By comparison the emissions reductions from the installed solar PV capacity in Australia is estimated by Energetics to have reduced emissions by approximately 6 Mt CO$_2$-e per year.
Conclusion

APPEA’s members place the highest priority on operating safely and with minimal impact on the environment. As demonstrated above, the industry is an active participant in a vast range of initiatives at the global and local level all designed to reduce to greenhouse gas emissions to as low as reasonably practicable.

APPEA appreciates the opportunity to engage in the development of the NT’s Climate Change Strategy. Should you or your staff wish to discuss any aspects of APPEA’s submission, please contact Mr Damian Dwyer, Director – Economics on 02 6267 0900 or ddwyer@appea.com.au.

Regards,

Matthew Doman
Director – South Australia & Northern Territory
29 November 2018

Economic and Environment Policy Climate Change Discussion Paper
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To Whom It May Concern

NORTHERN TERRITORY GOVERNMENT CLIMATE CHANGE DISCUSSION PAPER

The Australian Sustainable Built Environment Council (ASBEC) welcomes the release of the Climate Change Discussion Paper - Mitigation and Adaptation Opportunities in the Northern Territory and commends the Northern Territory Government on their commitment to a low carbon future.

ASBEC is a body of peak organisations committed to a sustainable built environment in Australia. ASBEC’s membership consists of industry and professional associations, non-government organisations and government observers who are involved in the planning, design, delivery and operation of our built environment.

We have twenty-seven industry members, including the Property Council of Australia, Planning Institute of Australia, Australian Institute of Architects, Energy Efficiency Council, Consult Australia, Water Services Association of Australia, Australian Institute of Refrigeration Airconditioning and Heating, Green Building Council of Australia and Infrastructure Sustainability Council of Australia. Collectively, ASBEC’s membership has direct reach to more 300,000 professionals in the built environment and represents an industry worth more than $700 billion in value.

ASBEC’s members are committed to contributing significantly towards Australia’s obligations within the Paris Climate Change Agreement through a net zero emissions built environment by 2050 and we are pleased to provide this submission to inform the development of a Northern Territory Climate Change Strategy. Most Australian States and Territories have set an overall emissions target of net zero emissions by or before 2050, which provides for a level of certainty and consistency across the country.

We commend the Northern Territory Government on the 50% Renewable Energy Target by 2030. Energy efficiency will be a key enabler towards reaching this target.

Recommended built environment a key sector for carbon reduction opportunities

The built environment is a key sector for carbon reduction opportunities. Our Low Carbon, High Performance report, authored by ClimateWorks Australia, outlines the potential of the built environment to significantly and cost-effectively reduce Australia’s emissions.

Key findings of the report show:

- buildings account for 23% of Australia’s emissions so strong action in buildings is essential to meet Australia’s international obligations to transition to zero net emissions by around 2050
- buildings can achieve zero carbon by 2050 using existing technologies
- in addition to $20 billion in energy savings, buildings can deliver one quarter of the national emissions target and over half of the national energy productivity target by 2030
- leading property companies have demonstrated a rapid improvement in energy performance is possible, but a range of complex barriers limits progress across the sector
The role of business and government in reducing emissions

Industry is leading the way

Market leaders in Australia are demonstrating world-class commitment to sustainability in the built environment. Property companies and fund managers in Australia and New Zealand have been outperforming the rest of the world for the past seven years in commercial office sustainability, according to the Global Real Estate Sustainability Benchmark (which is based in part on measured and publicly disclosed energy performance).

Recent years have seen leaders commit to net zero emissions targets. For example:

- AMP Capital Wholesale Office Fund, one of the largest wholesale property fund managers in Australia and New Zealand, is targeting net zero emissions by 2030 across its $4.7 billion portfolio;
- Investa, one of Australia’s largest owners and managers of institutional grade office real estate, is pursuing a net zero emissions target by 2040 across its office portfolio and business operations;
- Dexus, a real estate investment trust with $26 billion worth of assets spanning commercial office, retail and healthcare, has committed to a net zero target across their business by 2030;
- Mirvac, a property group managing over $18 billion worth of assets across office, retail and industrial sectors, has committed to reaching net positive carbon emissions by 2030;
- The GPT Group is working to achieve a net zero emissions target across its $18 billion property portfolio before 2030;
- Lendlease’s wholesale commercial property trust, Australian Prime Property Fund Commercial, has set an ambitious target of net zero emissions by 2025.

In the residential sector, although the minimum requirement in most parts of Australia is for housing to be designed to the equivalent of a heating and cooling efficiency of 6 Stars under the Nationwide House Energy Rating Scheme (NatHERS), almost nine per cent of housing designs across Australia are at 7 Stars and above. The proportion of ratings at these levels are particularly high in the Northern Territory (20 per cent).

Government must play a role in addressing market barriers

A range of persistent barriers and market failures have prevented broader uptake of these better practices across the building sector. As a result, progress in improving energy performance in the built environment has been limited to a small segment of market leaders. For example, a 2013 ClimateWorks review of the progress being made in the building sector towards a low carbon economy, found that new commercial office buildings with a Green Star rating had, on average, half the emissions intensity of new office buildings built to minimum Code energy requirements.

While some gap between market leaders and the market average is expected, these barriers and market failures explain why most buildings are built to minimum standards despite the existence of feasible and cost-beneficial upgrades as demonstrated by the leaders.

Barriers can be categorised as follows:

- Capability: Home buyers, tenants and businesses often lack appropriate data, information and skills, which can undermine their ability to fully realise the benefits of low-energy buildings when making decisions to buy or rent a property; and
- Motivation: Internal and external factors can have a strong influence on the motivation of home buyers, tenants and businesses to consider investing in a high-performance building, regardless of financial attractiveness and capability. These include ‘split incentives’ between tenants and landlords, and a lack of awareness of the non-energy benefits of energy efficiency.

Low Carbon, High Performance outlines a suite of targeted policies to address barriers to net zero buildings. These policies include:

1. Strong **mandatory minimum standards** for energy performance of buildings and appliances
2. Targeted **incentives and programs**, starting with government leading the way in procurement practices
3. Enabling measures including **data, information, research and education**
Mandatory Minimum Standards – National Construction Code

Energy requirements in the National Construction Code have not shifted substantially in a decade, which is a contributing factor to these market failures that have seen a widening gap between industry leaders and minimum Code requirements. Increased energy requirements in the Code are essential to address such market failures in the delivery of higher performance buildings. A forward plan for introducing more ambitious Code energy requirements, implemented in a manner that provides consistency and certainty to industry and consumers, will help ensure that the full potential of the Code to drive improvements is realised and accelerates the adoption of new technologies and design and construction practices across the market as a whole.

The Commonwealth Department of Environment and Energy’s work on trajectories for residential and commercial buildings, on behalf of the COAG Energy Council, should constructively inform this modelling.

This year, ASBEC and ClimateWorks Australia released *Built to Perform: An Industry Led Pathway to a Zero Carbon Ready Building Code* and also an addendum report focussing on Northern Australia – *Built to Perform in Northern Australia* – which outline the findings of the Building Code Energy Performance Trajectory project, an industry-led effort to support long-term improvements to the energy requirements of the National Construction Code. This work was complementary to the Commonwealth Government’s ‘Trajectory for Low Energy Buildings’ work and has helped to inform the results.

A transition to a net zero emissions economy by 2050 will require a ‘Zero Carbon Ready Code’, which prepares buildings being built today for a zero net future. New buildings add up fast: over half of the buildings expected in 2050 will be built after the next Code update in 2019.

The *Climate Change Discussion Paper* noted the opportunity to “Enhance the passive cooling capabilities of the housing stock and installing insulation (to) help to mitigate higher demand for electricity”. We strongly encourage an improvement in building standards, delivered through the National Construction Code.

We have welcomed the proposed improvements to energy requirements for non-residential buildings in the draft 2019 National Construction Code. However, it is important that targets and a forward trajectory are set for future updates, with a clear and transparent process for implementation and adjustment over time.

Targets for Building Code energy requirements provide the certainty the industry needs to innovate and invest in higher performing buildings, and support a rapid and least cost national transition to net zero. Further significant gains could be achieved by incorporating renewable energy in the Code.

Our modelling shows that:

- Building Code improvements from 2022 onwards could **deliver 210 thousand tonnes of cumulative emissions reductions across the Northern Territory to 2030**, and **2.1 million tonnes to 2050**.
- Updating the Building Code could also **cut residential energy bills by $270 million across the Northern Territory**, and **non-residential energy bills by $160 million, between now and 2050**, while reducing electricity network investments across Australia by approximately $12.6 billion between now and 2050. These benefits more than offset the upfront costs, resulting in a net benefit to society.
- A three-year delay would **lock in $2.6 billion of wasted energy expenditure nationally**, plus 9 MtCO$_2$-e of emissions to 2030 and 22 MtCO$_2$-e to 2050.

In order to realise the above listed benefits, we strongly encourage the Northern Territory Government, along with all other States and Territories and the Commonwealth to:

- **Commit to a Zero Carbon Ready Building Code**, as part of a transition to net zero carbon new buildings by 2030. This would mean setting energy efficiency targets, and introducing net energy targets.
- **Deliver a step change in the energy requirements in the 2022 Code**, with a strong focus on residential, and a further incremental increase in non-residential requirements.
- **Continue to enable climate-responsive building design and construction practices**.
- **Expand the scope of the Code and progress complementary measures**, to prepare for future sustainability challenges and opportunities, including health, peak demand, maintainability, electric vehicles and embodied carbon.
Incentives and Programs

Government procurement

Government is a major presence in existing commercial buildings, particularly health and education, offices and other public buildings, and can leverage this considerable market power to directly fund improvements to its own property assets and influence improvements in buildings which it occupies or over which it can exercise some level of influence.

We note that the Climate Change Discussion Paper identified the opportunity for “Building design guidelines for Government buildings (which) could incorporate specific environmental efficiency strategies to mitigate higher average temperatures”. Ideally the Northern Territory Government would set clear targets and standards for government buildings.

The Commonwealth Government is currently reviewing the Energy Efficiency in Government Operations policy, with a view to increasing minimum standards for government-owned and tenanted buildings. There is also a consideration of commitment to tenancy ratings. Improving government buildings can:

- Provide leadership and demonstration: Improving government buildings can demonstrate to building owners more broadly the potential to improve energy performance and the benefits of doing so.
- Deliver major budget savings: For example, the reinstated Victorian Greener Government Buildings (GGB) program previously delivered 28 large-scale projects with average savings of over 37 per cent across water, energy and emissions, and a return of investment of at least 12 per cent for all projects.
- Reduce costs and build skills and capability: Government leadership helps to accelerate deployment of new technologies, reduce the cost for others, and build capability and scale amongst energy efficiency service providers by providing a large, stable and certain flow of work. This can support development of effective business models for delivery of project, which can be applied to other sections of the market.
- Improve public facilities such as schools and hospitals, with potential flow on benefits for health and educational outcomes.

The Climate Change Discussion Paper notes the potential for “energy efficiency audits of existing Government dwelling designs” to be conducted, “to assist with transitioning all government buildings to energy efficient lighting and support sound decisions on upgrading, demolishing or disposal”. We strongly encourage upgrades of existing government building stock. A number of government asset upgrade programs are already in place or in development. For example, the NSW Government Resource Efficiency Program requires:

- Energy efficiency projects to be undertaken on all government owned or leased sites
- Minimum 4.5 star NABERS Energy ratings to be achieved by June 2017 for offices and data centres
- Mandatory minimum standards for new electrical appliances and equipment
- Mandatory minimum standards for new buildings and fitouts
- Identification of opportunities for solar leasing

Other measures that could be considered for inclusion in Northern Territory Government programs include:

- Public reporting of environmental performance of government owned and leased buildings and government tenancies.
- Investing in onsite renewable energy.
- Establishing a mandate that government officers only use NABERS or Green Star accredited hotels that meet a best practice rating threshold.
- The establishment of a mandate that government construction contracts use Building Information Modelling.
- Requiring contractors on government construction projects to meet a minimum level of energy efficiency training or accreditation, for example through the Master Builders Association or Housing Industry Association. In addition, government could share its ‘green procurement’ templates, tools and resources with the private sector to help mainstream these approaches.
- Requiring all government building projects to achieve credible, third party energy certification.
Energy Efficiency Obligation schemes

Energy Efficiency Obligation schemes are in place in New South Wales, Victoria, South Australia and the ACT. These schemes reward energy consumers who reduce energy consumption (e.g. through replacement of light globes) by requiring energy retailers to fund a set amount of energy efficient improvements each year. Energy Efficiency Obligation schemes have successfully incentivised third party aggregators to seek out and implement energy efficiency improvements in households and businesses.

Improvements could be made to existing Energy Efficiency Obligation Schemes to increase their impact:

- Harmonise and integrate schemes: Schemes are reviewed regularly to consider the inclusion of new technologies, products and methods. Harmonisation or integration of these processes between the different state schemes would reduce transaction costs, reduce the cost of expanding to other states and territories, reduce administrative costs particularly for smaller jurisdictions and reduce the cost of reviews and updates. Harmonisation could extend to reporting to ensure consistent data on the energy, emissions and cost savings achieved.

- Include incentives for replacement of non-electric appliances: As discussed above, gas and other non-electric appliances will need to be phased out, and Energy Efficiency Obligation schemes can begin to incentivise this switch, and need to avoid incentivising the replacement of inefficient electric appliances with more efficient non-electric appliances (e.g. replacement of electric resistance water heaters with gas water heaters).

- Incentivise deeper retrofits: A widespread concern with Energy Efficiency Obligation schemes is their ability to deliver deep retrofits, and indeed the risk that they can remove all of the ‘low hanging fruit’ in existing buildings, undermining the business case for returning to capture the harder or higher cost measures. Introducing project-based methodologies could encourage deeper retrofits, for example the NSW scheme rewards projects that demonstrate an overall NABERS rating improvement.

The Northern Territory should introduce such a scheme.

- Enabling measures

Building energy performance disclosure

Disclosure of building energy performance should be improved and expanded.

The Commercial Building Disclosure (CBD) scheme requires commercial office buildings above 1,000m² to disclose their energy performance rating (NABERS) at the point of sale or lease. In combination with government and large corporate tenant leasing requirements, this scheme has been instrumental in driving improvements in the large office sector. The needs of other building types outside the office sector may be different; however the potential expansion of disclosure policies to other building types should be investigated.

Disclosure of energy efficiency is already required for homes at the point of sale or lease in the ACT, with good results. There is a strong case to extend residential disclosure to other jurisdictions. The National Energy Productivity Plan identifies the opportunity to implement a national approach to residential building energy ratings and disclosure and we are pleased that the members of the COAG Energy Council are working together to explore the potential of the recently released Victorian Residential Efficiency Scorecard. We encourage the Northern Territory Government to pilot the Scorecard.

We commend the Northern Territory Government on the funding of COOLmob to undertake community energy efficiency education and audits and encourage the continuation of this program.

Improving access to energy consumption data

For energy consumption data to be useful, it is essential that it is accessible at low effort, at low or zero cost and via cloud-based smart phone apps, particularly for households. While direct access to energy consumption data for energy consumers is important, far more important is the process for third parties to access this data (subject to privacy considerations), in order that they can package it into useful information
that is comprehensible and actionable by consumers, as part of an energy upgrade offering or as part of an energy management service such as a cloud-based energy management app.

Examples of these services are beginning to emerge, such as the Google Nest device, a smart thermostat which allows users to control their heating and cooling appliances remotely via their phone.

Energy consumption data is currently collected via electricity and gas metering. The quality and granularity of data collected varies significantly in different jurisdictions and across different building types. The most granular and real-time data is available via advanced meters – or ‘smart meters’ which do not need to be read manually and measure energy use at regular intervals (e.g. every 5 minutes).

We encourage the installation of “smart meters to assist residential and the commercial sectors to reduce energy consumption”, as highlighted in the Climate Change Discussion Paper.

Resilience and cities

Resilience

Urban resilience refers to the capacity of individuals, communities, institutions, business and systems within an urban environment to survive, adapt and grow no matter what kind of chronic stresses and acute shocks they may experience. Climate change is currently an unavoidable ‘stress’ that must be carefully managed through the implementation of an intergovernmental regulatory framework that, in addition to a clear focus on reducing carbon emissions, should prioritise adaptation and resilience.

ASBEC’s Built Environment Adaptation Framework aims to:

- Protect the wellbeing of communities through targeted policy initiatives and better urban and building design
- Ensure appropriate institutional arrangements to facilitate resilience and adaptation
- Realise economic benefits from early adaptation through effective strategic planning and risk minimisation
- Advance sustainability through better resource and risk management strategies
- Increase community education and awareness about climate change risks and adaptation

The Adaptation Framework outlines the ways that the Australian Government, state, territory and local governments, industry, academia and the community sector can deliver effective resilience and adaptation strategies through:

1. Cross-sector engagement
2. Leading by example
3. Sponsoring applied research
4. Providing better access to information and tools
5. Investing in education
6. Providing incentives
7. Reforming and improving regulation
8. Reviewing building codes and standards
9. Improving planning systems and outcomes
10. Improving insurance and financial services

Realising co-benefits across infrastructure and cities

ASBEC’s Investing in Cities platform outlines four priority recommendations:

- Fully leverage the unique roles and responsibilities afforded to every sphere of government, industry and the community in developing our best urban centres and cities;
- Measure and report progress and inform good policy through transparent and consistent indicators applied across all our major cities;
- Work collaboratively across governments and with the private-sector to ensure best practice infrastructure planning and new investment, based on independent, transparent advice supported by broad cost-benefit analysis that appropriately considers environment impact and sustainability co-benefits;
- Deliver best practice urban environments through a commitment by all spheres of government to adopt and champion creating places for people: an urban design protocol for Australian cities.
The Commonwealth’s prioritisation of a Smart Cities Plan provides a synergistic opportunity to deliver a more sustainable built environment, reduce emissions and build resilience through cities policy and planning.

It will be important to leverage sustainable outcomes through the City Deals program, which can be realised at a precinct and project level – particularly through the use of robust and well-informed indicators and third party verification of processes and outcomes.

**Stakeholder engagement**

ASBEC recommends establishing regular consultation for with key organisations to ensure policy reform reflects industry expertise and maximises opportunities early. ASBEC’s membership consists of twenty-seven industry and professional associations, along with government and academic observers, involved in planning, design, delivery and operation of our built environment. As such, we are uniquely placed to facilitate this type of consultation.

We look forward to working with your Government in the months ahead to advance climate action in the Northern Territory.

Yours Sincerely

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Beyond Zero Emissions at a glance

- BZE is a unique, engineering-led, climate solutions think tank that has a strong track record of delivering influential roadmaps to achieve zero emissions in 10 years. We show that a rapid transition is achievable and affordable, and will have many benefits in Australia.
- Awarded 2018 Best International Energy Think Tank by UK-based Prospect Magazine, and ranked 50th Best Global Independent Think Tank by the Lauder Institute.

Climate Policy Discussion Paper Response

What (if any) GHG emissions target should the Northern Territory adopt?

The science of climate change is clear that the world needs to reach zero net emissions by 2050 in order to avoid the worst effects of runaway climate change. Given the NT’s huge solar resource and small population, the NT has an opportunity to transform its economy to take advantage of the transition. By reaching zero-net emissions earlier than 2050, the NT could export renewable energy and have net-negative emissions by 2050 with a thriving economy. Beyond Zero Emissions suggest net-zero emissions by 2030 and net-negative emissions of 400% by 2050.

What should business and governments be doing to reduce their emissions?

Business have a large role to play in investing in building the infrastructure required to transition the NT to a zero-emissions economy. However, Government will need to set the policy signals that give business certainty to invest in the NT.
Business is supportive of this approach with a recent survey of Australian Business by The Carbon Market Institute\(^1\) showing that:

- 82% agree that Australia should set an economy-wide zero net emissions target for 2050.
- 82% believe that Safeguard Mechanism baselines should be set to reduce over time in line with the trajectory of Australia’s 2030 emissions reduction target.

Aggressive GHG emissions targets and supporting policies that provide certainty and incentives to invest in renewables will set the scene for a business investment boom in the NT. The NT Government can also save money and encourage investment by rapidly moving to supply all of its own energy requirements through renewables and electrifying its fleet of vehicles.

Beyond Zero Emissions has shown through its Electrifying Industry\(^2\) report that it is cheaper and more efficient to run manufacturing plants with electrical processes powered by renewables. The NT Gov could reduce emissions and create jobs by setting policy to incentivise business to invest in new electrified manufacturing and processing plant powered by distributed renewable energy around the NT.

Detailed policy recommendation policies can be found in Section 5A of *Electrifying Industry*.

How else can we apply Aboriginal knowledge and practices to help us to adapt to climate change?

The viability of Aboriginal communities is threatened by climate change. Climate change is causing changes to the seasons, flora and fauna around the NT. These conditions are new and different to how country has been in the past. Because of this, Aboriginal communities are generally supportive of strong action on climate change and ending fossil-fuel extraction in the NT.

What potential opportunities can you see emerging from climate change in the Territory?

The NT has a unique combination of:
- Vast solar resource
- Low population
- Remote communities

\(^1\) http://carbonmarketinstitute.org/australias-current-climate-change-policies-are-insufficient-to-meet-our-par is-targets/
- High cost of living

The presents a fantastic opportunity for the NT to create an economy with renewable energy at its centre. A strong climate policy would see an excess of cheap, clean renewable energy distributed around the NT that could be used to power:
- Electrified manufacturing and processing leading to higher value exports
- Hydrogen and Ammonia production and export industries
- Electrified transportation

This would lead to:
- Reduced cost of living as fuel costs drop significantly with electrification
- A jobs boom in the NT, providing meaningful employment opportunities for young people and aboriginal communities
- A sustainable and thriving economy that doesn’t have a strong boom/bust cycle
- Reduce the financial risk of carbon exposure for industries and investments
- Energy security for the NT
- Protecting and improving the health of our population
- NT becoming a renewables innovation centre
- NT becoming a more attractive place to live, attracting population

How can the fossil fuel industry further reduce emissions from energy production?

To avoid catastrophic climate change, fossil fuels must be rapidly phased out. Over this period, the fossil fuel industry should pay to fully offset any emissions that they produce. They should also ensure that all emissions are correctly monitored and extraction sites are fully remediated.

Industries currently investing and operating in fuels need to set ambitious plans to transition away from fossil fuels to clean energy and technology alternatives. The global shift to renewables has commenced, and major companies, international jurisdictions and investors are committing to science-based emission targets. Inaction puts the NT at risk of being left behind in the global market.

What type of regulations do you think would assist industry in being accountable for their impact on climate change?

Industry requires clear signals that investments in reducing their emissions are a wise business decision. This should be both a positive signal through incentives and signals that show that emissions are not acceptable such as carbon pricing and regulation. Time and again industry has shown that with policy certainty in place they can rapidly adapt to the new regulatory environment.
Are you prepared to pay higher prices for goods and services as businesses pass on the cost of mitigation?

As discussed above, a strong policy that encourages electrification through renewable will most likely reduce the cost of living for Territorians.

What support do you need to help you to mitigate or adapt to climate change?

It is crucial Territorians understand the risks posed by climate change. Without this knowledge, it is not possible to address climate risk. Then, tailored strategies must be developed - with extensive stakeholder engagement - to reduce the risks and optimise the co-benefits. These strategies should be people-centred and informed by best-practice in other regions in Australia and internationally. Territorians then need to be made aware of the best ways to mitigate and adapt to climate change. In addition, mechanisms need to be available to access finance and develop skills (and the required capacity) to implement climate solutions.
Submission to the Northern Territory Government on the development of a *Northern Territory Climate Change Strategy*
13 December 2018

**Executive Summary** [see text for details]

**Principles for action**
A. Action to mitigate the effects of climate change, or assist Aboriginal communities to adapt to it, must recognise the rights to self-determination of Aboriginal peoples as established under international agreements to which Australia is a signatory, including the *United Nations Declaration on the Rights of Indigenous Peoples*.

**Climate change in Central Australia**
B. The effects of climate change in Central Australia are likely to include: increased temperatures; more hot days; more variable rainfall; and an increased risk of extreme weather events. Aboriginal community members are already recognising the effects of climate change on local ecosystems.

**Aboriginal communities at risk from climate change**
C. While climate change affects everyone’s health in the Northern Territory, Aboriginal communities are disproportionately at risk due to the higher proportions of Aboriginal Territorians living in poverty; having pre-existing low levels of health; living in remote areas; having poor quality drinking water; and living in poor housing often without functional air-conditioning.

**Health effects of climate change**
D. The Aboriginal conception of health includes the social, emotional and cultural well-being of the whole community and the relationships between families, communities, land, sea and spirit. It is a spiritual system in which the physical environment is sacred. The disruption of the living world that climate change creates is therefore in itself a harm to the health of Aboriginal communities.

E. There are a range of other direct effects on population health that climate change is creating. These include increased sickness and mortality due to heat stress; increased food insecurity and malnutrition; increased risk from infectious disease; poorer social and emotional wellbeing / mental health; poorer respiratory health; reduced fresh water supply; and an increased
potential for social conflict.

F. Climate change will reduce the capacity of the health system to respond to the health needs of communities in the Northern Territory because of increased difficulty in recruiting and retaining health staff; increased health facility infrastructure costs; and reduced productivity of health staff.

Limiting the amount the climate changes (mitigation)

G. In order to limit the amount or rate of climate change and avoid the most serious effects on the health of Aboriginal and other Territorians, the Northern Territory Climate Change Strategy should include a commitment to a target of net zero emissions in the Northern Territory by 2050.

H. In order for this target to be met, the following actions should be included in the Northern Territory Climate Change Strategy:
   - reimposing a ban on Hydraulic Fracturing (‘fracking’)
   - investing in sustainable renewable power
   - recognising and investing in Aboriginal traditional ecological knowledge
   - adopting and advocating for an economic paradigm that is focused on public health and the reduction of inequality.

Reducing the negative effects of climate change (adaptation)

I. The Northern Territory Climate Change Strategy should commit to the following investments to minimise the adverse health effects of climate change:
   - addressing the social and economic determinants of health
   - increasing the resources for comprehensive primary health care under Aboriginal community control
   - increasing investment in health infrastructure
   - substantially improving community housing
   - advocating for and establishing appropriate regulatory and taxation regimes
Background

1. Central Australian Aboriginal Congress (Congress) is a large Aboriginal community controlled health service based in Alice Springs. We are one of the most experienced organisations in the country in Aboriginal health, a national leader in primary health care, and a strong advocate for the health of our people. Since the 1970s, we have developed a comprehensive model of primary health care that includes:
   - multidisciplinary clinical care;
   - health promotion and disease prevention programs; and
   - action on the social, cultural, economic and political determinants of health and wellbeing.

2. In making this submission to the Northern Territory Government on the development of a Northern Territory Climate Change Strategy, we speak from the perspective of the Aboriginal communities of Central Australia. However, much of what is included in this submission is applicable across the Northern Territory and beyond.

Principles for action

3. Through our diverse cultures, Aboriginal peoples have cared for and sustainably regulated the natural ecosystems of this continent for tens of thousands of years. However, the process of colonisation in Australia has profoundly undermined our ability to care for Country.

4. The deregulated non-Aboriginal economic system and its unrestrained pursuit of profit is now causing irreparable damage to the living systems that sustain life in the Northern Territory, across Australia, and around the world.

5. Climate change is a fundamental threat to the planet’s living systems and to all human societies. It poses particular threats to the health and wellbeing of vulnerable peoples, including the Aboriginal nations of the Northern Territory.

6. These threats are not in the future – they are happening now. If they are not to become ever more serious, climate change must be tackled immediately. This means all governments – including the Northern Territory Government – taking immediate and effective action to:
   - mitigate the effects of climate change in particular by reducing greenhouse gas emissions, and
   - assist communities, especially vulnerable communities such as Aboriginal nations – to adapt to the effects of climate change.
7. Aboriginal people did not create climate change, but our peoples are amongst those who are most affected by it. Accordingly, action to mitigate the effects of climate change, or assist Aboriginal communities to adapt to it, must recognise the rights to self-determination of Aboriginal peoples as established under international agreements to which Australia is a signatory, including the United Nations Declaration on the Rights of Indigenous Peoples [1], which states:

Article 23: Indigenous peoples ... have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions;

Article 29: Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.

Climate change in Central Australia
8. Climate change is an established scientific fact supported by the overwhelming majority of scientists working in the field. However, while the effects are already being felt, its local effects over the coming decades are still uncertain. In Central Australia they are likely to include [2-4]:

- increased temperatures;
- more hot days, with the number of days per year over 35°C estimated to increase from around 90 currently to an estimated 118 by 2030 and 180 by 2070);
- more variable rainfall (for example, more average rainfall but greater variation of wet and dry periods and continuing droughts); and
- more extreme weather events such as storms, bushfires, cold snaps, and heatwaves.

9. While the science to show regional-level changes is still developing, Aboriginal people already recognise climate change and its effects on the ecosystem in Central Australia [2]:

I think it is changing, sometimes hotter, sometimes colder. Weather more mixed up. Not hot all the time in summer, cold in winter. People talking about this now, now everything’s changing, one day hot, one day cold. (Ltyentye Apurte ranger)
Blossom flowers come on at different times. Atwakeye (Wild Orange) should be flowering at Christmas time, but they are coming early. Other things come late or early, but are all mixed up. (Longterm resident of Ltyentye Apurte)

In the old days, the stars and the weather lined up. (Eastern Arrernte elder)

Aboriginal communities at risk from climate change

10. Climate change is affecting everyone. However, just as ill-health is not distributed evenly across society, the negative effects of climate change is posing greater risks to some populations than others. Populations at particular health risk include those living in poverty; those with pre-existing poor health; those in remote areas; and those living in poor housing. The following table shows how Aboriginal people in the Northern Territory are particularly vulnerable on these factors.

<table>
<thead>
<tr>
<th>Vulnerable Population [5-7]</th>
<th>Aboriginal population in the Northern Territory</th>
</tr>
</thead>
</table>
| Living in poverty           | Median total personal income for Aboriginal people in the Northern Territory is a quarter of that for non-Aboriginal people ($281 compared to $1,072 per week) [8]  
In very remote areas, Aboriginal incomes are falling, and the income gap to non-Aboriginal people rapidly widening [9] |
| Pre-existing low levels of health (especially respiratory / cardio-vascular disease, alcohol/drug issues or other mental health issues) | In 2014–15, a fifth (18%) of Aboriginal people in the Northern Territory self-assessed their health as only as fair or poor [10]  
Aboriginal Territorians die from respiratory disease at 2.7 times the rate for non-Indigenous Australians and at higher rates than Aboriginal people elsewhere in Australia [10]  
More than one in five (22%) of Aboriginal Territorians report high or very high levels of psychological distress compared with 8% for non-Indigenous Australians [10]  
The life expectancy gap is still 13.5 years for Aboriginal Territorians compared to non-Indigenous Australians [11] |
| Living in remote areas      | In 2011 in the Northern Territory, almost four out of five Aboriginal people lived in Remote (21%) and Very remote areas (58%) [10]  
Three quarters (75%) of those living in very remote areas are Aboriginal [10] |
| Living in poor housing      | A third (33%) of Aboriginal Territorians live in houses that need 1 or more extra bedrooms, six times the rate (5%) for non-Aboriginal people [8] |
11. Therefore, while climate change affects everyone’s health in the Northern Territory, Aboriginal people are disproportionately at risk due to the burden of disadvantage and poor health that they already carry as a result of colonisation.

**Health effects of climate change in Central Australia**

12. For Aboriginal people health is *not just the physical well-being of an individual but includes the social, emotional and cultural well-being of the whole community* [12]. This definition:

   ... *recognises the importance of connection to land, culture, spirituality, ancestry, family and community, how these connections have been shaped across generations, and the processes by which they affect individual wellbeing. It is a whole-of-life view, and it includes the interdependent relationships between families, communities, land, sea and spirit and the cyclical concept of life–death–life.* [13]

13. Accordingly, the disruption and damage to the living world that climate change creates is in itself a harm to the health of Aboriginal people as it undermines the relationships to land and sea that are at the heart of Aboriginal wellbeing. In Aboriginal culture the human spirit is one with the physical environment from which it was formed. An insult to the physical environment creates human illness in and of itself. This relationship and the responsibility for maintaining it has recently been beautifully expressed by Warlpiri leader Ned Hargraves Jampijimpa [14].

14. There are also a range of direct effects on population health that climate change is creating. These include the following [5, 6, 15-18]

   a. *Increased sickness and mortality* due to heat stress with Aboriginal people particularly vulnerable due to poorer underlying health in general and higher rates of cardio-respiratory disease in particular.

   b. *Increased food insecurity and malnutrition* with remote Aboriginal communities particularly vulnerable due to pre-existing poverty and poor access to healthy food, and expected increases in prices of food and damage to ecosystems that disrupts access to traditional foods.

   c. *Increased risk from infectious disease* and increased range of some vector-borne diseases. Remote Aboriginal communities are particularly vulnerable to food- and water-borne disease – in Central Australia there is already a high incidence of Aboriginal children being admitted to care with diarrhoea, and nationally such admissions are predicted to rise by up to 18% by 2015.
d. **Poorer social and emotional wellbeing / mental health**, with increasing temperatures contributing to greater stress and higher rates of suicide. For Aboriginal people, social and emotional wellbeing is also undermined by damage to Country and disruption of cultural practices.

e. **Poorer respiratory health** due to increased smoke from bushfires and/or dust.

f. **Reduced fresh water supply** (both quantity and quality) due to changed rainfall and increased evaporation rates as well as potential contamination from mining and other extraction industries.

g. **Increased potential for social conflict** due to displacement of populations (climate refugees) for example due to changing temperatures or sea level rise elsewhere.

15. In addition, climate change will increasingly reduce the capacity of the health system to respond to the health needs of communities in the Northern Territory because of [5, 6, 15]:

a. increased **difficulty in recruiting and retaining health staff**, especially to remote areas affected by increased temperatures and more extreme weather events;

b. increased **health facility infrastructure costs** to ensure health buildings and staff accommodation are appropriately insulated and cooled;

c. **reduced productivity of health staff** due to heat stress and sickness.

**Limiting the amount the climate changes (mitigation)**

16. Limiting the amount or rate of climate change involves reducing the levels of heat-trapping greenhouse gases in the atmosphere: continuing current emissions rates is likely to lead to a 4°C of warming by 2100 [17]. All governments will need to implement substantial cuts in greenhouse gas emissions if catastrophic effects on human health are to be avoided.

17. The **Northern Territory Climate Change Strategy** should therefore commit the Northern Territory Government to put in place a target of net zero emissions by 2050.

18. In order for this target to be met, the following actions should be included in the Strategy:

a. **reimposing a ban on Hydraulic Fracturing (‘fracking’) in the Northern Territory** as it is incompatible with reducing greenhouse gas emissions and poses a range of other environmental threats to the health;
b. investing in sustainable renewable power (e.g. solar) especially in remote communities, including well-resourced systems for maintenance and back up; and

c. recognising and investing in Aboriginal traditional ecological knowledge to manage Country and reduce the release of greenhouse gases for example through Ranger programs to manage fire regimes, feral animals etc.

d. adopting and advocating for an economic paradigm that is focused on public health and the reduction of inequality, rather than the unrestrained pursuit of private profit and the exploitation of the natural world.

Reducing the negative effects of climate change (adaptation)

19. The effects of climate change are unpredictable and may change over time. However, the Northern Territory Climate Change Strategy should commit to the following investments which can be expected to help minimise the adverse health effects outlined above:

a. addressing the social and economic determinants of health that increase the vulnerability of Aboriginal communities to the health effects of climate change. This includes action on poverty, lack of appropriate education, employment, and housing (see next point) and action to reduce inequality;

b. increasing the resources for comprehensive primary health care under Aboriginal community control, including social and emotional wellbeing services, to respond at the grassroots level to increased health risks posed by climate change and provide a centre for coordinated action and advocacy on health needs;

c. increasing investment in health infrastructure to ensure that all clinics and staff housing are fit for purpose in the context of increasing temperatures and more extreme weather;

d. substantially improving community housing, to ensure that public housing and houses in Aboriginal communities meet the needs of Aboriginal families facing increasing temperatures (improved insulation, air-conditioning, and water) supply; that construction specifications are updated and enforced; and that increased maintenance is provided;

e. advocating for and establishing appropriate regulatory and taxation regimes to ensure that government both address inequality and has the revenue to invest in transitioning to a low carbon economy and which ensure that the effects of climate change are not felt disproportionately by poor and marginalised communities.
References


Submission

NT Government Climate Change Discussion Paper

Dec 2018
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Introduction
About the Central Land Council

The CLC is a Commonwealth statutory authority established under the *Aboriginal Land Rights (Northern Territory) Act 1976* (‘ALRA’). It is led by a representative body of 90 Aboriginal people elected from communities in the southern half of the Northern Territory, which covers almost 777,000 square kilometres and has an Aboriginal population of more than 24,000.

The CLC has statutory responsibilities to ascertain, represent and protect the rights and interests of Aboriginal people living in the CLC region. One of the CLC’s central roles is to protect the interests of Aboriginal people with an interest in Aboriginal land, by assisting constituents to make land claims, negotiate agreements with third parties, protect sacred sites, and utilise land and other financial resources for the benefit of their communities.

In addition to these functions, the CLC administers a range of programs for the benefit of constituents in relation to environmental management, community development, governance, cultural heritage, and customary practices. The CLC also plays a strong role in advocating for the interests of our constituents, the majority of which reside in remote communities.
Executive Summary

Remote Aboriginal communities face significant challenges arising from climate change - much greater than those faced by cities and regional centres.

Higher temperatures and more frequent extreme weather events will put increasing pressure on strained community infrastructure, limited water resources, fragile natural ecosystems, and will pose severe risks to the already poor health of communities due to heat exposure.

These impacts will be compounded by existing vulnerabilities - poverty and disadvantage, poor quality housing and infrastructure, inadequate access to education and health services, and limited access to country.

Connection to country is core to Aboriginal peoples’ identity and culture. It is critical that adaptation approaches adopted in the NT recognise the unique vulnerabilities of remote residents.

There is a need for a stronger focus on how remote communities will adapt to climate change - building a robust evidence base, relying on mainstream and traditional knowledge, and empowering communities to identify and implement their own responses to climate change.

A key priority for CLC and its constituents is ensuring that people are able to continue to live on and maintain connection to country, primarily in remote communities and outstations. Where Aboriginal people remain on country, cultural and natural values are maintained and enhanced. For people to continue to live on country under increasingly extreme conditions, it is critical that government urgently support improvements in housing design, water and power security, access to health services, and emergency management.

Sustainable remote living requires both sustainable, resilient infrastructure and economic development. To that end, the CLC views this policy as a key opportunity to promote Aboriginal leadership of and participation in sustainable industries, including carbon farming, bush food harvesting, as well as in the supply of new infrastructure such as renewable energy.

While planning for climate change adaptation in Central Australia poses challenges, it also provides an opportunity to recognise and draw on the knowledge which has enabled Aboriginal people to adapt to changing climatic conditions over millennia. Aboriginal knowledge is increasingly being recognised as essential to addressing complex environmental problems and this policy provides an opportunity to engage meaningfully with remote communities about climate change impacts.

The CLC urges the NT Government to adopt an adaptation approach which responds to the unique physical, socio-cultural, historical, and geographic characteristics of remote Aboriginal communities. Development of this approach must start with further research of climate change impacts on this region, supported by meaningful engagement with Aboriginal people about their knowledge and experiences.
Recommendations

**Health**

(i) Ensure that houses are modified and/or constructed in order to reduce exposure of residents to extreme weather events, and to be resilient to climate change impacts.

(ii) Support improvements in emergency management to ensure that service delivery is not over-compromised by the challenges of remoteness and is culturally sensitive. Training local people to undertake these services is essential.

(iii) Support improvements in nutrition, health and educational attainment in Aboriginal communities by ensuring access to good quality food, schools, hospitals and health care.

**Housing/Infrastructure**

(i) Introduce and fund integrated approaches to planning of communities and the design of houses that consider the socio-cultural, historical, geographic and economic factors.

(ii) Prioritise research to identify and develop responses to predicted waters shortages in remote communities in Central Australia.

(iii) Prioritise strategies to provide reliable and more affordable power in remote communities, including the installation of renewable energy infrastructure in communities.

(iv) Increase Aboriginal participation in decision-making and employment in the supply side of infrastructure.

**Water security**

(i) Support additional research into water security in Central Australia, focusing on the sustainability of groundwater sources.

(ii) Support the installation of appropriate technology and water efficiency hardware suited to the highly mineralized bore water.

(iii) Continue to support demand management programs in close engagement with communities.

(iv) Ensure that drinking water testing regimes aligned with changing health risks.

**Aboriginal Land management**

**Ranger Program**

(i) Support stable, long-term funding for CLC’s Ranger Program to enable Aboriginal people to continue to care for country, as a key adaptation response to climate change impacts.

(ii) Support additional funding for CLC’s ranger program to support more comprehensive collection of data on climate change impacts in the region.

(iii) Support an updated social and economic analysis of the net benefit of ranger employment.

**Joint Management**

(i) Support traditional owners to have more opportunities to access country and play a greater role in decision-making for jointly managed parks- in relation to land management planning and, in the future, adaptation responses.
Economic development opportunities

Local Employment

(i) Increase local employment in the delivery of infrastructure and services in communities related to adaptation.

Carbon abatement

(i) Support initiatives to improve opportunities for carbon abatement activities on Aboriginal land, including through the Aboriginal Carbon Unit and funding for research and development on carbon abatement opportunities in Central Australia (including a methodology for areas below the 600mm isohyet).

Bushfoods and bush medicine

(i) Continue to support research and community engagement on the viability of bush foods and bush medicine industries in the Central Australian region.
(ii) Support the CLC to and other Aboriginal organisations to provide capacity-building support to Aboriginal enterprises, to engage in these industries.

Renewable technology in remote communities

(i) Work closely with land councils and other Aboriginal stakeholders to ensure that Aboriginal enterprises and local residents have a significant role in and benefit from the roll-out of pilot or large-scale renewable energy infrastructure in remote communities in Central Australia.

Offsets

(i) Support enactment of legislation to establish an NT offsets policy, which recognises offsets for social co-benefits such as local Aboriginal employment.
(ii) Support research into biodiversity offset opportunities in the Central Australian region.

Research - Incorporating Aboriginal knowledge and experiences

(i) Support independent experts to conduct research on impacts of climate change in Central Australia, including on natural, social, cultural and built environments, and informed by the National Climate Change Adaptation Research Plan for Indigenous Communities (2012).
(ii) Ensure that this research includes significant engagement with CLC ranger groups and traditional owners, recognising the importance of existing Aboriginal knowledge, personal experiences and local contexts, and drawing on methodologies adopted in previous projects working with Aboriginal communities to assess responses to climate change [as noted in submission].
(iii) Based on this research and engagement with ranger groups, develop options for engaging with remote communities in Central Australia to identify and respond to impacts of climate change.
Submission

1. Impacts of climate change in Central Australia

The Central Australian climate is characterised by water scarcity, highly variable annual precipitation and high rates of potential evapotranspiration (Healy M-A 2015, p.170).

Research undertaken jointly by CSIRO, University of Canberra and Ninti One, between 2013 and 2015 identified key climate change impacts on Central Australian Rangelands (Rangelands Report):

- Substantial increases in mean, maximum and minimum temperatures
- Substantial increases in extreme temperatures, including increases in the frequency of hot, temperatures reached on hot days, and duration of warm spells
- Decline in winter rainfall
- Increase in the intensity of extreme rainfall events
- Increase in time spent in drought
- Increase in evapotranspiration in all seasons

These findings are consistent with national studies, including a report released this year by the Climate Council, which notes that increases in average global temperatures will lead to substantial increases in extreme heat, heavy precipitation events, drought and negative impacts on land-based biodiversity and ecosystems (Climate Council 2018 (Oct)).

2. Impacts of climate change on regional and remote communities and outstations

Aboriginal people living in remote areas face some of the greatest climate change risks in the country (Memmott et al. 2013, p. 25). Climate change has and will continue to impact not only ecosystems, species, landscapes, livelihoods and health but also fundamental relationships that are interrelated with cultural landscapes.

Aboriginal communities face specific risks and vulnerabilities due to remoteness and systemic poverty and disadvantage. These include:

- Loss of access to traditional lands, waters and natural resources as well as a loss of ancestral, spiritual, totemic and language connections to land
- Extreme poverty and disadvantage
- Inadequate access to education and health services
- Poor quality housing and infrastructure
- Costs of transport and supply monopolies giving rise to high prices
- Inaccessibility by road limiting mobility and access to fresh food and essential goods

In this context, an awareness of vulnerabilities must be balanced against an acknowledgement of the extreme resilience of Aboriginal people.

Aboriginal peoples’ traditional knowledge, connection to country and understanding of how landscapes work and respond to change represent have enabled people to adapt to changing climatic and meteorological conditions over millennia (Tran et al. 2013, p. 3).
Noting this, frameworks for climate change adaptation in Central Australia must:

- adopt a multi-dimensional and community-based approach to vulnerability, which acknowledges the adaptive capacity of Aboriginal people, as well as unique determinants of vulnerability such as historical disadvantage and political and economic exclusion (Memmott et al. 2013, p. 30; Tran et al. 2013, p. 49).
- recognise that actions that build community capacity, well-being and prosperity also contribute to adaptive capacity - the capacity for remote communities to meet the challenges of climate change (NCCARF 2012, p. 4), and
- recognise the complex links between health, well-being and impacts on country arising from climate change.

Noting this approach, the remainder of the submission addresses the critical climate change challenges that remote communities are likely to face, and how these can be addressed, including:

- impacts on **health and wellbeing** due to frequency and intensity of heat waves and the loss of cultural sites and compromised ability to manage changing environmental conditions consistent with customary practices.
- increased damage to **housing, roads and other infrastructure** due to frequency and intensity of floods and heatwaves,
- **constraints on water resources** due to changes in temperature and rainfall patterns, and
- impacts on **natural ecosystems** due to changes in temperature, rainfall and bushfires.

### Impacts on health and wellbeing

The impacts of climate change on health and wellbeing are well-recognised. For the general population, human health is intimately linked with the environment, and environmental factors such as temperature and air and water quality are important determinants of health.

For Aboriginal people, connection to land and sensitivity to environment is particularly acute. Connection to country is important to the physical and mental health of its people, as well as the health of country. Physical and mental health is closely linked to the health of country.

A number of reports identify key health impacts in Australia more broadly and the NT: elevated risks of heat stress and dehydration; flood-related injuries; risks of skin and gastrointestinal infections; increases in respiratory illnesses such as asthma and increased risks of vector-borne diseases (Green et al. 2009, p. 42; Hennessy et al. 2004, p. 10).

These reports also conclude that these impacts will have a significantly greater impact on Aboriginal people in remote communities, especially the elderly, sick and those without access to good housing and adequate fresh water supply (Hennessy et al. 2004, p. 10).

Aboriginal people in remote communities of Central Australia suffer some of the lowest incomes, poorest health outcomes, worst housing conditions, and highest energy costs in Australia. These communities are also highly vulnerable to water scarcity and have limited access to health and aged care services. Factors of remoteness, poor roads, and transport limitations also means that residents are increasingly at a higher risk travelling in remote areas.
Given these high risk factors, the CLC urges the NTG to work with the Commonwealth government to address **urgent adaptation needs**.

**Recommendations**

(i) Ensure that houses are modified and/or constructed in order to reduce exposure of residents to extreme weather events, and to be resilient to climate change impacts.

(ii) Support improvements in emergency management to ensure that service delivery is not over-compromised by the challenges of remoteness and is culturally sensitive. Training local people to undertake these services is essential.

(iii) Support improvements in nutrition, health and educational attainment in remote communities by ensuring access to good quality food, schools, hospitals and health care.

**Impacts on infrastructure**

Damage to infrastructure has been identified by the International Panel on Climate Change is one of the major climate change risk areas for Australia, and is identified as a key risk in national and state and territory adaptation frameworks.

Nationwide risks include damage to housing, roads and other infrastructure due to increased frequency and intensity of extreme rainfall and flooding, increased intensity and frequency of heat waves and increased risk of bushfires (Australian Government 2015, p.23; Senate Committee 2018, pp. 9-22).

In remote communities in Central Australia, the impacts are likely to be more severe and have more severe consequences due to remoteness and poor condition of existing infrastructure. Increased risk of damage to housing, water supply and sewerage, electricity supply, roads and telecommunications will have serious impacts on the health, financial position, and traditional culture of communities (Senate Committee 2018, p. 108).

To date, no research has been conducted on the impact on infrastructure in Aboriginal communities in Central Australia. However, climate change research conducted in tropical Northern Australia and the arid zone of the Upper Georgina River Basin on the border of the NT and Queensland has identified a number of risks to the built environment in remote communities, including:

- Increased temperatures, bushfires, flooding events, wind gusts and dust storms will affect the performance of building fabric and infrastructure and compromise the safety and sustainability of remote communities,
- Increased evaporation and variable rainfall has implications for drinking water supply,
- Ecological change vary risks of vector-borne disease, which has implications for housing construction and maintenance,
- Increased risks from food and water-borne disease related to food storage and preparation, and
- Heat, evaporation and less predictable rainfall affecting the conditions for domestic production of fresh food (Memmott et al. 2013, p. 139; Green et al. 2009, pp. 50-56).

The latter report also reported feedback from workshops with communities on the impacts of weather and climate change, including residents from Central Australian remote community Alpurrurulam. Participants identified the following concerns regarding housing and towns:
- Housing is uncomfortable in both hot and cold weather,
- Yards are used extensively and could benefit from shade structures,
- More repairs and maintenance services are required for community housing,
- Costs associated with air-conditioning, refrigeration and heating causes financial stress and can contribute to eviction from housing,
- Secure supplies of potable drinking water is a key concern, and
- Emergency accommodation and upgraded community buildings are required (Memmott et al. 2013, p. 146).

In responding to these risk and challenges, this report make a number of recommendations, including for improved approaches to planning of settlements and the design of houses that consider socio-cultural, historical, geographic and economic factors and more Aboriginal participation in decision-making and employment in the supply side of infrastructure.

Based on the recommendations of these and similar research considering impacts on Aboriginal communities, the CLC makes the following recommendations:

**Recommendations:**

(i) Introduce and fund integrated approaches to planning of communities and the design of houses that consider the socio-cultural, historical, geographic and economic factors.

(ii) Prioritise research to identify and develop responses to predicted waters shortages in remote communities in Central Australia.

(iii) Prioritise strategies to provide reliable and more affordable power in remote communities, including the installation of renewable energy infrastructure in communities.

(iv) Increase Aboriginal participation in decision-making and employment in the supply side of infrastructure.

**Impacts on water security**

Central Australia is one of the driest regions in Australia. The majority of the CLC region receives between 200 and 600 mm average rainfall per year (BOM 2010). Ninety per cent of the water supply in the NT and comes from groundwater (NT Government 2017) and the majority of supplied to remote communities comes from groundwater sources pumped to the surface by production bores.

In the context of projected climate change, water supply is one of the most vulnerable sectors. Australia is already experiencing water supply problems due to climate change and longstanding allocation issues (Climate Council 2018 (Nov)). In Aboriginal communities, infrastructure and economic constraints often mean that people are only supplied with untreated water or that treatment is limited in extent and monitoring may be infrequent or absent (Green et al. 2009, p.51).

Water access and supply has been a significant concern for remote communities in Central Australia for many years. The Power and Water Corporation responsible for supplying water services to communities has itself noted that “natural water sources vary significantly in quantity and quality presenting challenges to ensure residents receive adequate safe water through their taps” (PWC, p.1).

A number of NT-based studies have identified water access and supply as key areas of concern. As Ms Wright notes in her report on sustainable water management in remote communities,
“Survival in these regions depends first and foremost on the supply of water and hence, the need to conserve and protect the groundwater resources is essential to permit the natural growth and development within each remote Indigenous community” (Wright 2002, p.8).

Further, the report conducted in the Upper Georgina River Basin notes:

“Predicted increases in evaporation, coupled with the likelihood of increased in variability in rainfall, have consequences for potable water supplies and the sustainability of landscapes”(Memmott et al. 2013, p. 149).

While studies have looked at the sustainability and management of water supplies in remote communities, no studies have yet determined the potential impact of climate change on water infrastructure in Aboriginal communities in Central Australia.

Water security must form a core element of any adaptation approach in remote Aboriginal communities. On this basis, the CLC makes the following recommendations:

**Recommendations:**

(i) Support additional research into water security in Central Australia, focusing on the sustainability of groundwater sources and benefits and risks associated with domestic and communal rainwater tank.

(ii) Support the installation of appropriate technology and water efficiency hardware suited to the highly mineralized bore water.

(iii) Continue to support demand management programs in close engagement with communities.

(iv) Ensure that drinking water testing regimes aligned with changing health risks.

**Impacts on natural ecosystems**

Climate change is predicted to have a significant impact on natural ecosystems in Central Australia. This will have significant consequences for the natural environment and the capacity of Aboriginal people to maintain their connection to country and practice traditional law and culture.

Relationships with country are an essential element of Aboriginal peoples’ identity and culture. Dominant approaches to climate change risk assessment often ignore cultural losses and issues of identity. The relationships that Aboriginal people have to their traditional land and waters is placed at risk especially where they are unable to negotiate their land management priorities.

The Rangelands Report provides some guidance as to predicted impacts on the region:

- Predicted spread and thickening of buffel grass,
- Decline and potential extinction of native species,
- Erosion due to extreme weather events,
- Predicted increase in populations of some non-native animals, including foxes,
- Increased periods of very high fire danger, and
- Impacts on aquatic refugia and organisms reliant on these refugia, such as natural springs and riverine waterholes (Healy M-A 2015, pp.2-12).

This report emphasises that impacts will vary considerably across these regions and will require careful assessment to develop local adaptation responses.
Impacts on ecosystems and weather patterns have also been identified by traditional owners and residents in remote communities. As part of a research project on weather and climate change in the Central Australian community of Ltyentye Apurte (Santa Teresa), Arrernte elders reported noticeable changes in weather patterns, leading to changes in the type and timing of plant growth, different burning patterns, and unpredictable seasons:

“The beginnings of the seasons are confused. The season doesn’t come in like it used to.”

“The rains are at different times now. So plants, lie mistletoe berries, are coming at different times.”

“Trees are getting burnt by a different kind of wind. After bushfires, the sun burns the little plants down so they don’t come up” (Mooney et al. 2014)

Participants in the study conducted in the Upper Georgina River Basin also reported a range of changes in weather patterns and impacts on hunting and gathering areas:

“Weather pattern now: always cold/hot/cold/hot ‘snaps’, changing all the time. Not predictable.”

“Bush tucker from trees is not coming in right seasons; not many bush bananas – not coming at the time we need them, after the wet. Wet was late bush tucker missed time to come out. Bush potato comes in winter-time... No bush tucker – bush orange, bush banana” (Memmott 2013, p. 119)

These impacts have significant flow-on impacts on communities and maintenance of culture. Changes in temperature and the environment are forcing people in remote communities to adjust strategies of hunting, gathering and travel, causing interference with residence and lifestyle, and food security. Natural waterholes, which are highly culturally significant to Aboriginal people in the region, are being affected. These changes are also likely to pressure migration trends and, in some instances, cause people to be displaced from their country (Memmott 2013, pp. 89-91).

Recommendations:

Noting the lack of research on interaction between climate change impacts on natural ecosystems and Aboriginal peoples’ connection to country, the CLC recommends that the NTG:

(i) Provide additional funding to CLC’s ranger program to support more comprehensive monitoring, reporting and management of climate change impacts in the region.
Impacts on agriculture

Drought frequency and severity, and consequent stresses on agriculture, are likely to increase in many agricultural regions in Australia. Agriculture, including pastoralism, is highly sensitive to changes in climate and impacts on water availability, carbon dioxide fertilisation, pests and diseases. These activities are vulnerable to projected reductions in rainfall and are especially threatened by general warming that will increase evaporation and water demand (Hennessy et al. 2004, p. 50).

In Central Australia, there are unique barriers to agricultural activities, including highly variable rainfall patterns, poor infrastructure and remoteness leading to distance from markets and high cost burdens. Aboriginal people face even more significant barriers to participation in these activities.

Climate change will exacerbate these barriers. Longer periods of hotter weather will require increased robustness in water supply. Increased rainfall intensity has the potential to damage station infrastructure and increase erosion. Further, higher temperatures are likely to negatively affect pasture growth and some horticultural crops (Healy M-A 2015, pp.3, 10).

Noting these challenges, the CLC makes the following recommendations.

Recommendations

(i) Ensure the research considering climate change impacts on Central Australia considers impacts on agriculture, including pastoral activities.

(ii) Support the CLC and ALSEDA to conduct pilot projects relating to agriculture and pastoralism, to develop models which address the unique Central Australian context.
3. Opportunities adapting and responding to climate change

While climate change poses challenges to the region, the CLC also recognises key opportunities to draw on the strengths and knowledge of Aboriginal people. It is well-recognised, domestically and internationally, that Indigenous knowledge is essential to addressing complex environmental problems. Any approach to climate change adaptation in the NT must recognise the significant lessons that can be learned from Aboriginal people and traditional land management practices.

Climate change responses present the potential to support sustainable industries and activities that support Aboriginal people to remain on country and practice and maintain culture.

Research and engagement with Aboriginal people

Increasingly, Aboriginal knowledge is being recognised as a valuable resource in responding to complex environmental problems such as climate change.

The risks associated with climate change create new impetus to investigate the ways in which Aboriginal communities respond to climatic change on their traditional lands. With improved understanding of vulnerability and the interdependence of humans and the landscapes, Aboriginal knowledge offers valuable insight into how to adapt to the changes we face.

While some efforts have been made to integrate Aboriginal and conventional knowledge for improved climate change adaptation outcomes, much of this work has been undertaken in the Northern half of the Territory.

The most significant project undertaken in Central Australia was conducted in 2014 by CSIRO in partnership with local research institute Ninti One Limited. The project involved close engagement with Ltyentye Apurte (Santa Teresa) rangers and elders, which enabled the two-way sharing of knowledge.

CSIRO scientists shared information about what scientists think is happening with the weather and what they think is causing these changes- rangers and elders shared their knowledge of the weather and the changes they have seen. The project led to the production of a book, which includes an Arrernte ‘weather calendar’, which captures local Arrernte concepts and terms to describe the weather. The aim of this publication is to help Aboriginal communities and others to learn and talk more about climate change, and to help communities deal with changes in the weather (publication available here).

Projects such as these offer valuable lessons for how government and others should engage with Aboriginal people on the issue of climate change. One study conducted in partnership with the Yorta Yorta people of the Murray River in Northern Australia notes:

“Meaningful engagement by government, academia and others with First Nations is the key to supporting them implement effective climate change adaptation solutions. Meaningful engagement is founded on trust, respect, and..robust interpersonal relationships and durable frameworks of engagement that take time and mutual effort to develop” (Griggs et al. 2013, p. 36).
Similar research involving work with communities on impacts and adaptation to climate change have noted the importance of taking time to establish trust and relationships with research participants and recognising the damage that can be caused as a result of poor engagement.

As the Yorta Yorta study notes,

> “While First Nations communities are keen to have their knowledge taken on board, they have also experienced (and still do) a troubling history where their information has been taken without proper permission or inappropriately transmitted, and of economic benefits from the information not flowing on to communities. This can only be remedied through the establishment of meaningful engagement and appropriate legal ways to protect the information” (Griggs et al. 2013, p. 38).

Several communities in Central Australia have already experienced the negative impacts described above as a result of interactions with government and academia in relation to climate change.

In order to ensure that people are engaged in a meaningful and appropriate manner on questions of climate change impacts, mitigation and adaptation, the CLC urges the government to consider methods adopted and lessons learned from previous work with Aboriginal communities.

**Recommendations**

(i) Support independent experts to undertake research on the impacts of climate change in Central Australia, including on natural, social, cultural and built environments, and guided by the recommendations of the National Climate Change Adaptation Research Plan for Indigenous Communities (2012).

(ii) Ensure that this research includes significant engagement with CLC ranger groups and traditional owners, recognising the importance of existing Aboriginal knowledge, personal experiences and local contexts, and drawing on methodologies adopted in previous projects working with Aboriginal communities to assess responses to climate change [as noted in submission].

(iii) Based on this research and engagement with ranger groups, develop options for engaging with remote communities in Central Australia to identify and respond to impacts of climate change.

(iv) Ensure that any processes involving engagement with Aboriginal people include protocols to ensure the protection of traditional knowledge.

**Aboriginal land management**

Many of the critical tasks in climate change monitoring, abatement and adaptation are consistent with existing Aboriginal land management practices.

In Central Australia, Aboriginal people already actively manage land using traditional knowledge systems. Through mechanisms such as Indigenous protected Areas (IPAs) and joint management arrangements, Aboriginal people identify priorities to maintain country based on traditional knowledge developed over millennia, and implement actions including fire, feral animal and weed management and protection of sacred sites and vital water sources.
A new climate change strategy provides a key opportunity to recognise and support the valuable role of Aboriginal traditional knowledge in monitoring and evaluating changes in climate, and determining effective methods of adaptation and abatement (Tran et al. 2013, p. 41).

A key example in the CLC region is the Karlantijpa North Savanna Burning Project, which has enabled traditional owners to access and work on their country during the burning season and improve regional bushfire management.

The CLC urges the NT and Commonwealth governments to support the CLC’s ranger program and support traditional owners’ decision-making roles in relation to management of Aboriginal land- to ensure that Aboriginal knowledge and practices can be used to respond to climate challenges.

**Recommendations**

**CLC Ranger Program**

(i) Support stable, long-term funding for CLC’s Ranger Program to enable Aboriginal people to continue to care for country, as a key adaptation response to climate change impacts.

(ii) Support additional funding for CLC’s ranger program to support more comprehensive collection of data on climate change impacts in the region.

**Joint Management**

(i) Support traditional owners to have more opportunities to access country and play a greater role in decision-making for jointly managed parks- in relation to land management planning and, in the future, adaptation responses.

**Aboriginal participation in emerging industries**

In remote communities, the non-market customary sector plays a significant role. These customary activities include hunting, gathering and a variety of natural resource management practices. These hybrid economies in remote communities are highly reliant on natural resources and will therefore be profoundly affected by climate change.

While posing new challenges, climate change may also generate significant opportunities for hybrid economies in Aboriginal communities, including in carbon farming, bush foods, and delivery of renewable technology. Aboriginal people are well positioned to engage in projects that seek to minimise the adverse environmental consequences of climate change.

**Carbon Farming**

Aboriginal people can make a significant contribution to carbon abatement through land management activities- particularly through fire management.

Currently, the *Karlantijpa North Savanna Burning Project* is CLC region’s only savanna burning project. It has enabled Mudbarra traditional owners to access and work on their country during the burning season and improve regional bushfire management. The sale of the project’s carbon credits through the Emissions Reduction Fund enables it to be self-sustaining. In its first two years, the project has generated over 17,000 carbon credits and secured a 5-year contract with the Emissions Reduction Fund to sell a portion of these.
To assist Aboriginal people in Central Australia to participate in this emerging market, the CLC recommends supporting additional research for a carbon methodology as well as the feasibility of biodiversity offsets in the region.

**Bushfood Industry**

Aboriginal people of Australia have a long and well documented history of using native plants as an essential component of their customary economy. Bush products provide one opportunity for new or expanded natural resource-based enterprise activities.

The bush food and bush medicine industries provide important opportunities for Aboriginal people to maintain connection and look after country, share knowledge and promote intergenerational learning, and engage in work which aligns with cultural practices and traditions. Increased variability in weather as a result of climate change is already having an impact on viability of these industries—affecting peoples’ ability to predict when food sources will be available for sale.\(^1\)

Given the importance of these customary activities to cultural maintenance and the potential for income generation, the CLC recommends that the government’s policy facilitate research, monitoring and management of native species in the region.

**Renewable technology**

For many years, CLC constituents have expressed concern regarding the cost and reliability of power in remote communities and the need to explore more reliable, sustainable options. Given these pressures, the CLC views this as a vital opportunity to promote the participation of Aboriginal enterprises and people in the renewable technology industry and installation of renewable technology in remote communities.

The CLC strongly urges the government to work closely with land councils and other Aboriginal stakeholders to ensure that Aboriginal enterprises and local residents have a significant role in and benefit from the roll-out of pilot or large-scale renewable energy infrastructure in remote communities in Central Australia.

**Recommendations:**

**Carbon abatement**

(i) Support initiatives to improve opportunities for carbon abatement activities on Aboriginal land, including through the establishment of Aboriginal Carbon Unit and funding for research and development on carbon abatement opportunities in Central Australia (including a methodology for areas below the 600mm isohyet).

**Bushfoods and bush medicine**

(i) Continue to support research and community engagement on the viability of bush foods and bush medicine industries in the Central Australian region.

(ii) Support the CLC to and other Aboriginal organisations to provide capacity-building support to Aboriginal enterprises, to engage in these industries.

\(^1\) Top End Report, p. 72
Renewable technology in remote communities

(i)  Work closely with land councils and other Aboriginal stakeholders to ensure that Aboriginal enterprises and local residents have a significant role in and benefit from the roll-out of pilot or large-scale renewable energy infrastructure in remote communities in Central Australia.

Aboriginal employment

As this submission has outlined, living conditions in remote communities will become increasingly challenging as a result of climate change and other impacts. The CLC views this an opportunity for government to support and leverage community strengths to respond to these challenges.

The CLC urges the NTG’s climate change policy to align closely with legislative and policy frameworks aimed at supporting the economic participation of Aboriginal people and enterprises, including the local decision making policy and Aboriginal Contracting Framework.

Together, these policies have the potential to drive local employment by ensuring that planning and funding decisions guarantee upskilling and employment of local community residents.

Increasing local employment in areas such as the delivery of housing, power, water and road infrastructure will both raise standards of living and improve adaptation capacity of communities.

Recommendation:

(i)  Increase local employment in the delivery of infrastructure, services and housing construction.
References


Senate Environment and Communications References Committee (Senate Committee), Parliament of Australia, Current and future impacts of climate change on housing, buildings and infrastructure (2018).


28 November 2018

Mr Ian Satchwell
Executive Director
Economic and Environment Policy
Department of the Chief Minister
GPO Box 4396
Darwin NT 0801

DCM.EconomicEnvironmentPolicy@nt.gov.au

Dear Mr Satchwell

City of Darwin commends the initiative to develop a Territory-wide Climate Change Strategy. Feedback on the Discussion Paper is provided in the attachment to this letter.

City of Darwin recognises that meeting the challenges of climate change requires a partnership between government, business and the community as a whole. Council is committed to delivering a range of mitigation and adaptation measures to meet the adverse impacts of climate change for the organisation, for the community and for environment sustainability. Council has demonstrated leadership on climate change by:

- City of Darwin Climate Change Action Plan – under which Council has achieved a reduction in emissions of 15% based on 2009 emissions.
- Cities Power Partnership – a national initiative under which Council has committed to a number of climate change actions
- City of Darwin Coastal Erosion Management Plan - for which $679K was allowed in the 2018/19 financial year
- City of Darwin Energy Strategy – includes a commitment to net zero emissions by 2030
- The development of a Waste Management Strategy to reduce emissions from waste for the whole of the Greater Darwin Region

Council acknowledges and respects the importance of addressing climate change and environmental priorities within its sphere of influence in a way that is beneficial to the organisation, the Darwin community, the biodiversity of the region and Australia.

Council recognises that this approach to climate change should be flexible and able to adapt to the changing political and legislative environment. Detailed comment against the Discussion Paper is provided as an attachment to this letter. Should you require any further information please don’t hesitate to contact me on the details below.

Yours sincerely

[Signature]

SHENAGH GAMBLE
EXECUTIVE MANAGER ENVIRONMENT AND COMMUNITY
City of Darwin

Submission on Northern Territory Government Climate Change Discussion Paper

City of Darwin (CoD) welcomes the opportunity to provide a response to the Northern Territory Climate Change Discussion Paper. The following response was prepared by officers and was endorsed by Council at its 2nd Ordinary Council meeting on Tuesday 27 November 2018.

The vision of Council is for Darwin to be a tropical liveable city. We value our natural environment, our history and culture, our outdoor lifestyle and close relationship with the ocean and coast. Our strategic vision and a number of Council policies directly align with the goals and objectives of the Climate Change Discussion Paper.

City of Darwin is committed to lead and advocate for sustainability and the protection of our environment. Council values biodiversity, the natural environment and the green open spaces that all contribute to the tropical lifestyle of this capital city. Council will strive to continually improve on its environmental performance and to foster a culture of environmental awareness and sustainability among its staff and the community. As a demonstration of this City of Darwin has committed to increasing its urban forest and strongly recommends others to contribute in similar ways.

City of Darwin recognises the need for clear identification of the risks associated with climate change. Without mitigation of risks the Darwin community both financially and physically will be significantly impacted. Planning for appropriate and effective mitigation measures should be a priority.

City of Darwin is committed to supporting the health and wellbeing of residents through the provision of community spaces, facilities, programs and healthy food choices that encourage healthy lifestyle behaviour, connect the community, and celebrate Darwin’s unique tropical outdoor lifestyle.

Comments contained below address the discussion questions posed in the paper and how these impact on the community, local government in general and CoD in particular.

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1 City of Darwin Policy No. 006 - Environment
2 City of Darwin Policy No. 045 – Recreation and Healthy Lifestyles
1: What (if any) greenhouse gas emissions target should the Northern Territory adopt?

Early in 2018 City of Darwin has adopted a position of net zero emissions from energy by 2030. City of Darwin recommends The Northern Territory Government adopt a science-based emissions reduction target of net zero by 2050. The target should comprise interim targets to ensure the overarching target is achieved and integrate sector-specific targets (with the recognition that some sectors are more difficult to decarbonise than others).

The NTG previously had adopted a Climate Action Policy in 2009. This policy had an aspirational goal of 60% carbon emissions reduction by 2050, compared to 2007 emissions.

2: What should businesses and governments be doing to reduce emissions?

Meaningful emissions reductions targets should be embedded across all sectors and at all levels. In short, businesses and governments need to make emissions reductions part of everyday business to decarbonise and transition to a low-carbon economy.

Setting an emission reduction target for the Northern Territory will provide investor certainty, drive innovation and signal to the business and broader community that the NT is open for clean and sustainable investment.

Strengthening emission targets through participating in mitigation activities such as developing the Darwin urban forest, increasing canopy cover and other initiatives will increase community support of aspirational emissions targets.

3: How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

City of Darwin has no direct response to this question.

4: What potential opportunities can you see emerging from climate change in the Territory?

Great opportunities exist when the Government provides clear commitment to emission reduction. This includes:
- Significant cost savings could be realised (e.g. savings realised through energy efficiency; savings realised from maximising renewable energy generation)\(^3\)
- Stimulate new investment in low-carbon sectors and encourage technological innovation\(^4\)
- Increase in energy security\(^5\) and water security\(^6\)
- New jobs and industries created (e.g. the NT could be a net renewable energy exporter)\(^7\)
- The NT could be established as a leading international solar/renewable energy research hub\(^8\)

Further, taking action to reduce the impacts of climate change provides opportunity to improve the lives of our community by:

- Protecting and improving the health of Territorians\(^9\)
- Protecting the ecosystems we rely on (e.g. the NT’s marine and coastal ecosystem contribute AUS$1 billion per year to the economy\(^10\). Marine ecosystems are at high risk with rising temperatures\(^11\))
- Cost savings for Territorians (e.g. if renewable energy generation is maximised)\(^12\)
- Safer and climate smart infrastructure could be established\(^13\)
- Making communities more sustainable\(^14\)
- The UN’s Sustainable Development Goals could be simultaneously achieved if carefully integrated into climate action planning and implementation\(^15\)

5: How can the fossil fuel industry further reduce emissions from energy production?

City of Darwin has no direct response on this question

\(^6\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C.*
\(^8\) Langworthy et al., *Roadmap to Renewables: Fifty per Cent by 2030.*
\(^9\) Hanna and Ogge, *Cooked with Gas: Extreme Heat in Darwin.*
\(^10\) Crossman et al., *Economic Values of the Northern Territory Marine and Coastal Environments.*
\(^11\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C.*
\(^12\) CSIRO and Energy Networks Australia, *Electricity Network Transformation Roadmap: Final Report.*
\(^14\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C.*
\(^15\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C.*
6: What type of regulations do you think would assist industry in being accountable for their impact on climate change?

City of Darwin supports the setting of emissions reduction targets across all sectors. Regulations that support and enhance such measures are encouraged.

7: What actions are you willing to take to mitigate or reduce the impact of climate change?

City of Darwin has a range of adopted strategies detailing a commitment to mitigate and adapt to the impacts of climate change. These include:

- City of Darwin Climate Change Action Plan – under which Council has achieved a reduction in emissions of 15% based on 2009 emissions.
- City of Darwin Energy Strategy – includes a commitment to net zero emissions by 2030
- Cities Power Partnership – a national initiative under which Council has committed to a number of climate change actions
- City of Darwin Coastal Erosion Management Plan - for which $679K was allowed in the 2018/19 financial year

8: What support do you need to help you to mitigate or adapt to climate change?

Council requires an emissions reduction commitment from the Northern Territory Government. Decarbonising the electricity network through investment in renewables will facilitate City of Darwin’s commitment to net zero emissions.

In conclusion

City of Darwin welcomes the development of a Climate Change Strategy and urges the Government to be set ambitious and meaningful emissions reductions targets for the Northern Territory. Recognition of climate impacts across all Northern Territory legislation and government operations is crucial. For example, stronger criteria for addressing climate change within planning processes in the NT should be considered through the current Planning Reform process. This would include embedding a range of criteria within the Planning Act and NT Planning Scheme, so that greater consideration is given to the impacts of climate change within strategic planning and development assessment processes.
Submission to the Northern Territory Government Climate Change Strategy Discussion Paper 2018:

Climate Action Darwin

Climate Change Mitigation and Adaptation Opportunities in the Northern Territory
SUMMARY:

Climate Action Darwin (CAD) are a volunteer community group with 500-strong registered supporters. The group is focused on awareness-raising and advocacy on climate change in Darwin and the Northern Territory. Climate Action Darwin's submission to the Northern Territory Government's “Have Your Say” Discussion on its prospective climate strategy gives credit to the government for initiating this discussion, but calls for significant and binding action. Climate Action Darwin’s recommendations have been informed by the 157 participant open survey it conducted in November 2018. Climate Action Darwin is calling on the NT Government to:

- legislate an emissions reduction target of net zero emissions by 2050 (or earlier) including interim and industry targets to ensure the overall target is met;
- support the development of a renewable energy export industry with energy-rich manufacture opportunities;
- support the development of an ecologically-based tourism industry, with commensurate approaches to land management and clearing;
- leading and incentivising a strong carbon-neutral program for business, government and community;
- provide a strong model of climate leadership, maximising the opportunities of climate change for Territorians in a sustainable, liveable, low-carbon future.
1: Introduction

Climate Action Darwin is a volunteer community group with over 500 registered supporters in the Northern Territory. The group is made up of everyday Territorians who are deeply concerned about climate change. Representing the interests of our members, Climate Action Darwin provide advice and advocacy on NT-focused climate change mitigation and adaptation strategies. Climate Action Darwin also facilitate community education and awareness raising events in Darwin. In 2018 this included the “Some Like it Hot” film night with over 100 attendees and the “Rise for Climate March” which brought together around 200 Darwin residents.

In acting to develop a climate policy for the Northern Territory, the NT Government has taken a step in the right direction. Climate Action Darwin congratulates the government for this initiative. However, as this submission demonstrates, there is no time to spare, and the public are expecting the Government to take a leadership role in quickly creating deep cuts to carbon emissions.

**Climate Action Darwin is calling on the NT Government to legislate an emissions reduction target of net zero emissions by 2050 (or earlier) including interim and industry targets to ensure the overall target is met.**

Climate Action Darwin notes that then Labor NT Government developed and adopted a strong and comprehensive Climate Change Policy in 2009, which was subsequently abandoned with a change of government. Climate Action Darwin participates and supports this current strategy development in the understanding that rigorous processes will be put in place that would support this climate strategy’s longevity.

In November 2018 Climate Action Darwin conducted an open community survey to gather feedback from the public on what they would like to see in any climate change strategy. The results were clear. A total of 157 people responded with remarkably similar views - requesting a robust GHG emissions reduction target that is at least net zero emissions by 2050. The great majority of respondents requested that the Territory move away from fossil fuels, including natural gas, by 2050. Territorians are worried that climate change will make the Northern Territory ’unliveable’ and to them the answer is clear – move away from fossil fuels and build an economy based on renewable energy.

*“Future risks from climate change depend primarily on decisions made today.”*  
(USGCRP 2018)

Immediate government action is required and what we do now will set the course for the future. The crucial role of government in addressing climate change is illustrated by the the International Energy Agency report “World Energy Outlook 2018”:
“Over 70% of global energy investments will be government-driven and as such the message is clear – the world’s energy destiny lies with decisions and policies made by governments.” Dr Fatih Birol, Executive Director, IEA

The Overview of the 2018 World Energy Outlook provides the following:

“In all cases, governments will have a critical influence in the direction of the future energy system. Under current and planned policies, modeled in the New Policies Scenario, energy demand is set to grow by more than 25% to 2040, requiring more than $2 trillion a year of investment in new energy supply. …

In power markets, renewables have become the technology of choice, making up almost two-thirds of global capacity additions to 2040, thanks to falling costs and supportive government policies. This is transforming the global power mix, with the share of renewables in generation rising to over 40% by 2040, from 25% today, even though coal remains the largest source and gas remains the second-largest.

This expansion brings major environmental benefits but also a new set of challenges that policy makers need to address quickly. With higher variability in supplies, power systems will need to make flexibility the cornerstone of future electricity markets in order to keep the lights on. The issue is of growing urgency as countries around the world are quickly ramping up their share of solar PV and wind, and will require market reforms, grid investments, as well as improving demand-response technologies, such as smart meters and battery storage technologies.

Electricity markets are also undergoing a unique transformation with higher demand brought by the digital economy, electric vehicles and other technological change. As part of its deep-dive into the electricity sector this year, WEO 2018 also examines what impact of higher electrification in transportation, buildings and industry. The analysis finds that higher electrification would lead to a peak in oil demand by 2030, and reduce harmful local air pollutants. But it would have a negligible impact on carbon emissions without stronger efforts to increase the share of renewables and low-carbon sources of power.”

As the IEA also states, renewables have become the technology of choice; there are a new set of challenges that need to be addressed quickly; and to have an impact on carbon emissions, stronger efforts are required to increase the share of renewables and low-carbon sources of power.

The threat of climate change provides a remarkable opportunity for the Territory to generate our own economic independence. An abundant cheap supply of electricity from renewables can both provide a product to export and provide the basis to attract further industry. The Territory is ideally positioned to seize this opportunity.
To do so requires leadership with the vision to take us forward and a populace keen to escape from “business as usual”. The community survey conducted by Climate Action Darwin in November 2018 demonstrates widespread community concern and a willingness to embrace a different future based upon renewable energy. Climate Action Darwin believe there is a great opportunity at hand for the Northern Territory Government to show strong leadership and build a strong economic and positive environmental future for the Territory.

Key aspects of this future include:

- a strong economy based upon renewable energy;
- a strong community supported by jobs in the renewable energy and downstream industries;
- improved outcomes for Aboriginal Territorians through management of carbon in the landscape, improvements in remote power generation and opportunities for communities to develop businesses though the availability of cheap power;
- a strong balance of trade, with the export of energy either directly into the national or international grids and/or export of energy rich products manufactured in the Territory;
- strengthening the future of other industries, such as tourism, based upon the remarkable natural features of the Territory, including: a significant proportion of the largest areas of remaining intact savanna ecosystems on the globe; iconic world heritage area such as Kakadu and Uluru National Parks; and internationally significant wetlands and marine environments;
- adapting to climate change so that the Territory remains a comfortable place to live and an environment that is attractive to visitors; and
- building a society that is characterised by strong leadership and is focused on the best long-term outcomes for residents of the Territory.

In the body of this submission, Climate Action Darwin will present the details and summary of results from the Climate Action Darwin open community survey (Section 2); present key points about building a robust future for Territorians (Section 3); respond to the NTG’s “Have Your Say” questions on a prospective Northern Territory Climate Change Strategy (Section 4), local implications are explored (Section 5); and verbatim responses to the Climate Action Darwin community survey are provided as an Appendix.
2. Climate Action Darwin Community Survey

To assist the NT Government to gather community feedback for the Climate Change Strategy, Climate Action Darwin conducted an open survey. We sought the opinions of the general population living in the Top End: those who are unlikely to ‘have their say’ through the standard government mechanisms but whose views the NT Government is elected to represent. The 157 respondents are not industry. They are not vested interests. They are simply constituents who care enough to take the time to complete a short survey.

2.1 The Climate Action Darwin Survey Method

The climate change survey was posted as a public survey on the Climate Action Darwin Facebook page and emailed to our supporters. It was also ‘pushed’ to those outside of our supporter base thorough advertising on social media and through “share” promotion. It was made clear that answers would be provided to the NT Government as part of the Climate Change Strategy consultation process.

The survey received 157 responses in an 12 day period between 14 November and 25 November 2018. The survey asked four questions, which aimed to go to the heart of the climate strategy discussion. The survey questions were:

1. Should your local member (MLA) support a target of net zero emissions by 2050? If yes, why?
2. Would you support action by the NT Government to phase out fossil-fuels, including natural gas, by 2050?
3. What do you love about the Territory that will be affected by climate change?
4. What do you think the NT Government should do about climate change?

2.2 Climate Action Darwin Community Survey Results

**Summary:** Territorians want strong action on climate change. They don’t want to see a climate strategy that achieves nothing. They want a strong emissions reduction target of at least net zero emissions by 2050. They want to move away from fossil fuels, including natural gas, by 2050. They are very worried that climate change will make the Northern Territory ‘unliveable’ and they think the answer is clear – set targets, move away from fossil fuels and build a new economy based on renewable energy. Better yet, become a leader in renewables.

2.3 Survey Questions

**CAD Survey Q 1.** Should your local member (MLA) support a target of net zero emissions by 2050? If yes, why?

Over 82% of respondents said that their local member should support a target of net zero emissions by 2050. Only 10% said no and 7% were unsure.
When asked why their MLA should support a target of net zero net emissions 2050, one of the most common answers was that a target of 2050 is not soon enough. Common themes included that the decision is responsible and logical, and that the survival of future generations and wildlife depends on it. To read all the verbatim answers from the Survey, see the Appendix.

“Because it is possible and responsible. Surely we can aim for earlier - 2040? 2030?”

“Really they should work towards net negative emissions by 2040 as the NT is suffering from the 1 degree of warming we have had and we need to recognize that we Territorians are amongst the highest climate polluters per capita on the planet. MLAs should be leaders with a long term protective vision.”

“This would be easy to achieve in the NT, in fact there is no reason it should not be done sooner.”

“The target should be zero emissions by 2030”

“Yes because if we don’t have zero emissions our whole planet will be unlivable. Darwin will be unlivable earlier than many other parts of Australia. I think 2050 is too far away. We need to cut to zero earlier than that. This is an emergency.”

“We should actually aim for a target of net zero emissions much sooner, say 2025 or 2030. The time for action was 10 years ago, we need to act more urgently. We need to take bold, brave action now.”

CAD Survey Q 2. Would you support action by the NT Government to phase out fossil-fuels, including natural gas, by 2050?

In excess of 81% of respondents said that yes, they would support action by the NT Government to phase out fossil fuels, including natural gas, by 2050. Only 13% said no and 5% were unsure.

This response is profound given the commonly held view that the Northern Territory economy relies on natural gas and the misconception that gas can be a so-called ‘transition’ fuel. This shows a willingness by NT residents to change the direction of our economy. It shows that people are not scared. Quite the opposite, they are optimistic about a change.

CAD Survey Q 3. What do you love about the Territory that will be affected by climate change?

This was a free form text question. We urge the NT Government to read the answers verbatim from Territorians found in the Appendix.

There were clear commonalities amongst the answers. Topics covered include: that the Northern Territory will be unliveable, it will be too hot, that people’s beloved lifestyle will suffer, that population will decrease and work will be harder to find. People are also greatly concerned for our ecosystems and wildlife, in particular turtles.
Territorians want action on climate change because they understand it is a real threat to the very things they hold dear. Inaction or ineffective action on climate change by government will be seen as an unwillingness to protect these precious things. Responses included:

“Everything! if it gets too hot to live here, all the things we love about the Territory lifestyle will be gone!”

“I live in Darwin. I believe it will become an unlivable city.”

“I love our climate... but any increases to global temperatures would make living in the Top End intolerable…”

“The climate. I like the heat and humidity. But any hotter is a bad idea. If the temperature keeps increasing, everyone will leave and there’ll be no workers to make any profit from anything.”

“The climate, the lifestyle and work opportunities.”

“The lifestyle, it will become so hot it will be unliveable. The eco-systems including wildlife. The industries e.g mangoes, prawns, fishing.”

“The environment, the temperature, outdoor lifestyle, in fact virtually everything!”

“The lifestyle. If we keep going the way we are, the lifestyle will disappear and then so will the population.”

**CAD Survey Q 4.** What do you think the NT Government should do about climate change?

This final question was a free form question. When considering the Climate Change Strategy, the NT Government should take seriously the ideas and aspirations contained in respondents’ answers, found in full in the Appendix. They outline Territorians’ vision of how we can tackle climate change and they are remarkably similar.

Among respondents, there is virtual consensus in the call for the NT to transition away from a fossil fuel-based economy, to one based on renewable energy sources. They want better-designed, low and no-emission buildings and more trees. They want the Government to reconsider its green light on fracking, given the huge emissions the unconventional gas industry will release here and the lack of any realistic plan to offset these emissions. Responses include:

“Convert to renewable energy. Ban gas and oil exploration. Plant trees everywhere. Put timers on all buildings so aircon and lights switch off when people leave. Research and support SUSTAINABLE development. Lobby the federal government. Educate the public.”

“Determine that there will be no new sources of fossil fuels. Get serious about practical measures to transition to 100% renewables a la the former SA Labour government.”

“Phase out fossil fuels, phase in solar, tidal, wind power.”
“Ban fracking, commit to net zero emissions by 2030, become a leader in renewables.”


2.4 CAD Community Survey Conclusion

Over 157 Territorians responded to our online survey about what type of climate change policy they would like the NT Government to adopt. Their answers map a clear direction: adopt a strong emissions target of at least zero net emissions by 2050; move away from the anachronistic fossil fuel-based economy, including natural gas; and move our economy to one based on renewables, because climate change is a real threat to our Territory lifestyle.

3. Building a Robust Future for the Territory

Climate Action Darwin submits that climate change and agenda setting climate change policy provides a unique opportunity for the NT Government to build a robust future for the Territory.

3.1 A strong economy based upon renewable energy

There is a rapidly mounting case for the economic advantage of renewable energy sources. Doubling the share of renewables in the global energy mix by 2030 would increase global GDP by up to 1.1% (IRENA 2016). Furthermore, the cost of electricity generation from renewable resources has declined in recent years and is still on a downward trajectory (IRENA 2017). Globally, in 2018 renewables have become the technology of choice (IEA 2018).

Given high local levels of solar radiation (BOM 2018), the Territory is well placed for the large-scale rollout of solar PV. The projected capital costs of solar photovoltaic electricity is below that of various coal, gas and solar thermal alternatives (CO2CRC 2015: page 252). The provision of relatively cheap locally produced electricity opens the door for downstream industries such as the production of hydrogen which in itself can be exported.

The global trend of the declining costs of renewable energy compared with fossil fuel sources is clear. Furthermore, the economic certainty of an alternative future based upon hydraulic fracturing is increasingly doubtful. The Institute for Energy Economics and Financial Analysis provides a red flag assessment from north America.

“Yet in financial terms, America’s fracking boom has been a world-class bust. Despite significant technological advances—and, more important, an influx of hundreds of billions of dollars of capital—fracking has yet to produce positive cash flows. To the contrary, frackers have consistently spent more on drilling than they have generated from selling oil and gas.” (IEEFA 2018)
Prices for gas will vary, however increased gas and/or oil prices would make the economics of renewables even more attractive.

3.2 **A strong community supported by jobs in the renewable energy and downstream industries**

Employment is a key issue for Territorians. In the United States, an analysis of the economic benefits of a 25% renewable energy supply by 2025 found that this would create more than three times as many jobs as producing an equivalent amount of electricity from fossil fuels (UCSUSA, 2009). While recognising this data is from overseas, it illustrates the potential for the growth of renewable energy sources to have a positive impact on employment.

Further to direct employment in generation of electricity from renewable sources, there is the potential for the establishment of downstream industries with associated gains in employment.

3.3 **Improving outcomes for Aboriginal Territorians**

There is significant potential in the Northern Territory to optimise carbon storage through management of Aboriginal land in the Territory. Preliminary estimates suggest that savings of four million tonnes per year can be achieved by improving land management and harnessing emerging carbon markets. A well-designed carbon offset program has the potential to deliver substantial social, economic and environmental benefits, especially for remote and Indigenous communities.

3.4 **A strong balance of trade with the export of energy**

Climate Action Darwin submits that climate change provides the potential for strong trade development on the basis of large-scale renewable energy generation and export. Energy demands are set to increase globally with major growth in the Asian region (IEA 2018). There is potential for the Territory to tap into this market by either direct export of electricity or the export of energy-intensive Territory-manufactured products. The proposed Asia Renewable Energy Hub linking the East Pilbara of Western Australia with Indonesia via subsea high voltage transmission cables is an illustration of future export of electricity from Australia. Products manufactured here that incorporate relatively cheap renewable energy could be targeted towards Asia, however, potential exists for export to anywhere around the globe.

3.5 **Strengthening the status of other industries such as tourism**

The Territory is noted for its world class environmental values. Northern Australia’s extensive savanna is a rarity: globally almost 70% of global savanna woodlands have been lost, and this was reported a decade ago (Woinarski et al. 2007). Within the Territory this savanna country includes the World Heritage-listed Kakadu National Park. Along with Uluru National Park in the arid zone these hotspots are targets for international tourists. While the low
population of the Territory is sometimes viewed as an impediment to economic growth, the sparsely settled nature of the Territory provides opportunities to maintain natural landscapes that will become increasingly rare around the globe as human population rises. Wise management of these resources to maintain their ecological integrity will lead to their increasing value. Tourism is already a major industry and directly supports around 6.4% of Territory employment (DTBI 2017). With wise management, the opportunity exists to continue to build nature-based tourism.

Combined with its strong Aboriginal culture, the Territory is well placed to reap benefits in the future. However, such a future is under threat from predicted climate change impacts such as severe bushfires, sea level rise and freshwater inundation. Without deep cuts to emissions this precious industry is under serious threat. A successful tourism industry is underpinned by looking after the basic resource, maintaining a reputation as an unspoilt part of the globe and ensuring the Territory is an attractive place to visit.

3.6 Keeping the Territory a comfortable place to live or visit

“The number of days over 35°C in Darwin has increased from 5.6 per year to 22.2 per year. CSIRO modelling estimates that without climate action this could rise to 132 days per year in 2030 and 275 days per year in 2070. Such extreme heat would have profound effects on human health, industries and ecosystems. Given the NT’s vulnerability to climate change, development of emission-intensive oil and gas reserves are not in the Territory’s interests.” (Hanna and Ogge, 2018)

This statement provides a dire warning that lifestyle in Darwin is on a trajectory of adverse change. If comfortable human habitation is to continue in Darwin, it depends on substantially reduced emissions of greenhouse gasses (Hanna and Ogge, 2018). The NT Government must reduce emissions to minimise the adverse effects of increased temperature on lifestyle and to maintain a destination that is attractive to tourists.

3.7 Building a society characterised by strong leadership and best long-term outcomes for residents

There is near universal consensus among scientists that human society is facing a crisis from climate change (IPCC, 2018). There is a risk that the changes that are occurring as a result of greenhouse gas emissions show up over a period of years and decades, creating a false sense of security. There is strong evidence that the increased costs to society will be enormous and these costs will continue to grow, the longer that it takes to implement decisive action (USGCRP 2018).

Often a crisis brings out positives in human nature and gives rise to great leadership. Today we are in great need of forward thinking leaders who will set the direction for Territorians and Territory landscapes in the future. Leaders who are prepared to make decisions that maximise the chance of positive long-term outcomes for Territorians. Leadership that has a vision for where the Territory will be placed in decades to come.
The results of the Climate Action Darwin community survey in November 2018 demonstrate a high level of concern from Territorians about carbon emissions and climate change. Recent elections elsewhere in Australia such as the Wentworth by-election and Victorian state election saw climate change as a top issue for constituents. There is a groundswell community sentiment both in the Territory and elsewhere in Australia. People are clearly saying enough is enough, they want to be part of a society that values their long-term welfare and they want decisive and forward thinking leadership with regard to climate change.

4. NTG Climate Strategy Discussion: “Have Your Say”.

In this Section, on behalf of its 500 supporters, Climate Action Darwin provides responses to the questions posed by the Chief Minister’s Office in its Climate Strategy Discussion paper.

4.1 What (if any) Greenhouse gas emissions target should the Northern Territory adopt? (choose one)

Answer: An overall emissions target of net zero emissions by at least 2050, if not sooner, with interim targets and industry targets to ensure that the overarching target is met.

Comment: A target of net zero by 2050 (at least) should be legislated, however, the timing and implementation schedule to achieve net zero emissions is important. The capacity to achieve net zero will vary across sectors and thus the targets adopted may vary between sectors. Similarly the schedule of implementation may vary between sectors. A progressive series of targets to be met by certain times will provide a useful guide against which to assess progress towards net zero emissions.

It is important to develop a precise and responsible approach when measuring emission reductions. Extracting gas in the Territory and then claiming an offset against carbon emissions released through production of a similar amount of electricity produced via coal elsewhere is not a valid offset. This is especially the case when renewable energy sources such as solar PV are available.

4.2 What should businesses and governments be doing to reduce emissions?

One of the most important things for government to do is to take a comprehensive, multifaceted approach to climate change. This includes:

- **developing and communicating a vision** for the Territory in 10 years, 30 years, and 50 years;
- **providing clear and consistent policy direction**;
- **incorporating carbon costing into all decision making** including economic decisions;
- **educating** staff, clients and the general public about risks and opportunities;
- **providing legal and legislative support** to address climate change; and
setting an example by maximising efficiencies while minimising emissions, with net zero emissions for government activities.

There are many ways to incorporate a more sustainable and lower emission future. Examples include:

- migrating the government fleet to electric cars;
- minimising air travel;
- using video conferencing to reduce travel;
- adopting energy efficient building designs that allow natural ventilation and make use of breezeways and the surrounding environment such as trees to reduce cooling costs;
- use local suppliers to reduce supply chain emissions including transportation and storage;
- reduce the use of plastic;
- use energy efficiency practices (appliances, lighting); and
- source more energy from renewable sources.

4.3 How else can we apply Aboriginal knowledge and practices to help us to adapt to climate change?

Comprehensive consultation by the NT Government with Indigenous residents is required to develop principles and programs harnessing Aboriginal knowledge and practices to adapt and mitigate the Territory’s response to climate change. Aboriginal people are known for their connection to country and attitudes towards stewardship of the land. Aboriginal culture is widely recognised as the most ancient living culture persisting on the planet today. There is arguably a connection here between stewardship and deep concern for the land in making decisions that have an impact on natural resources.

4.4 What potential opportunities can you see emerging from climate change in the Territory?

The opportunity exists to redesign the Territory’s supply chains, for instance significantly increasing our rail freight and subsidising road trains using hydrogen fuel cell or biodiesel technology. The promotion of carbon-neutral building design for the tropics/desert. A Carbon Neutral Territory will generate demand for advisory services, eco-tourism, professional expertise, policy advice and significant employment in the energy sector. Climate change also provides the opportunity to implement energy efficiency practices (alliances, lighting, solar energy systems) and vocational and educational employment opportunities.

See section 3.1(on page 9); other opportunities include the development of a robust economic future based upon renewable energy; for example production of relatively cheap electricity via solar PV and then either direct export of the electricity or export of products that have the energy embedded within. For example, using electricity from solar PV to produce hydrogen that can be used in the Territory or exported.
4.5 How can the fossil fuel industry further reduce emissions from energy production?

With regard to Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (2018), Recommendation 9.8 seeks “... to ensure that there is no net increase in the life cycle GHG emissions emitted in Australia from any onshore shale gas produced in the NT”. This raises the concept of offsetting emissions, however, the financial cost of providing a true offset to hydraulic fracturing is prohibitive (Ogge 2018).

More generally, the fossil fuel industry must view their work as “energy production” rather than “fossil fuels” and thus embrace renewables as the “technology of choice”. In line with our Paris commitments and the scientific consensus to keep warming below 2 degrees, we must phase out fossil fuels by 2050.

There must be no new fossil fuel basins opened and those currently extracting must be phased out, and fast.

4.6 What type of regulations do you think would assist industry in being accountable for their impact on climate change?

Setting a strong emissions reduction target with clear interim targets will send a clear signal to industry to invest in innovative business practices. Regulation will actually help transform our economy to become more sustainable but also more future-focused.

4.7 Are you prepared to pay higher prices for goods and services as business passes on the cost of mitigation?

Without a carbon tax, the carbon cost of goods and services in our economy are omitted. Climate change is therefore an overriding negative production externality that has the potential to destroy the economy. The sooner carbon costs are factored in to the price of goods and services, the faster the Territory and other jurisdictions will be able to decarbonise. It would be erroneous however to assume that higher prices would be the universal result of pricing carbon. As indicated by the Climate Action Darwin survey, Territory residents care about more than just the cost of living. Many Territorians will adapt to different pricing for goods and services if the rationale and method is adequately explained.

4.8 What support do you need to help you to mitigate or adapt to climate change?

At the time of writing, extreme weather is being experienced in Northern Australia. In the last week, many temperature records have been set in Queensland. Native fauna are dying, farmers are unable to harvest their crops, and those crops are being heat-damaged. Industries involving outdoor labour are working reduced hours and losing productivity. Following long term predictions, Climate Action Darwin recognises that increasingly extreme weather will continue in the Northern Territory. As the Climate Action Darwin open
Community Survey clearly showed, our members are concerned that the Territory will soon become uninhabitable. The role government needs to play in this new reality is crucial.

A comprehensive program of incentives and measures encouraging homes, businesses and industries to move towards carbon neutrality must be developed and adopted immediately. A campaign of universal public education on energy efficiency (i.e. saving power and water) is required. There is also a vital role for government to install renewable energy and implement energy efficiency solutions for public and community housing.

An ongoing program of climate change awareness events, including information about government regulations and incentives surrounding carbon emissions must be rolled out.

Improved self and public transport services should support users, rather than punishing them for their climate-friendly choices. A growing number of automotive companies have or will soon move to only electric vehicle production. Many more public charging stations for electric vehicles must be built in the Territory.

5. Local implications

5.1 Sea Level Rise
The Top End coast is already experiencing a sea level rise of about 7mm each year (BOM 2016). As the rate of sea level rise is also increasing, Darwin can expect to experience significant impacts as a result of sea level rise, including damage to infrastructure, damage to houses, loss of beaches, flooding and loss of nearby freshwater wetlands to saltwater intrusion.

Response
That NT Government work with local councils, planning authorities, community groups, landholders, Traditional Owners and scientists to create detailed maps informed by the latest science and planning tools to project impacts from a rapid sea level rise and work with these groups to develop a detailed climate resilience plan.

That NT Government commit to protect the Top End’s mangroves which provide free protection and maintenance of coastal areas by banning the clearing of, or damage to, mangroves.

5.2 Extreme Heat
Darwin is already experiencing an increase in average number of hot days each year (over 35°C) from 5.6 per year at the beginning of the century to 22.2 per year now. Without rapid cuts to greenhouse gas pollution Darwin is set to experience an average of up to 132 days per year in 2030 and 275 days per year in 2070 (Hanna and Ogge, 2018).

Response
That the NT Government work with householders, developers, COOLmob, architects, local councils and planning authorities to review building codes and legislate appropriate changes in response to climate change including: mandatory solar hot water and solar PV for new
houses, use of passive cooling design which minimizes the need for artificial air-conditioning and improve natural shading of outdoor areas.

That the NT Government identify groups particularly vulnerable to heat stress such as the elderly, young children, those with chronic disease and those who don’t have the resources to access and maintain air-conditioned or well-ventilated houses. Work with advocates of these groups and health experts to develop a plan for protecting people from heat stress.

That the NT Government work with tour operators, hotels and other tourism businesses to improve the climate resilience of their businesses and protect tourists from the impacts of heat stress.

5.3 Health
Along with heat stress, Darwin is likely to be more at risk to the spread of mosquito borne diseases such as malaria, dengue fever and Ross River virus due to increased temperatures and more extreme rainfall.

Response
Work with health experts to develop a climate change response hub to better understand the impacts that climate change has on people’s health and how to best manage these.

5.4 Land management
Increased intensity of extreme weather events such as fire, storms and cyclones increases the risks associated with land management activities. Indigenous rangers provide an invaluable service to the local and global communities by conducting fire management, weed management and ecological studies on their country. The spread of gamba grass exacerbates the impact of more intense, hotter fires which destroy trees, can damage infrastructure, put lives at risk and change entire ecosystems.

Response
Increase support for Indigenous ranger groups to manage the impacts of climate change and mitigate greenhouse gas emissions through fire management. Provide training opportunities in response to increased risk from more intense fires.

Ban the deliberate spread and planting of gamba grass and put in place strict hygiene procedures to prevent accidental spread.

Work with fire managers and Bushfires NT to develop fire management safety procedures in response to an increased risk of hotter fires due to climate change.

Support landholders to eradicate gamba grass from their properties in a planned and staged intervention.

5.5 Transport
Transport currently contributes 8% to the NT’s total emissions (NT Government, 2018).
**Response**

Conduct a review of public transport services in the NT to investigate how advances in technology could vastly improve the NT’s public transport system. The NT Government must ensure public transport is properly provisioned; expand the bicycle network; and establish better facilities for pedestrian foot traffic. All these services require enhancement, expansion, connectivity, comprehensive shading and drinking water-fountains.

5.6 Food

Increased drought and fires in the eastern states is likely to interrupt food supply. Supporting householders and local market gardeners to grow food is the best way to help improve food security. Educating residents about how to cook grow and cook tropical foods would also be beneficial.

The meat and dairy industries are significant contributors to greenhouse gases. Educating householders about the environmental impacts of common foods whilst supporting people to make informed and healthy dietary choices is great way to help householders to reduce their climate footprint.

Food miles are also an important factor in the climate footprint of a product. Working with supermarkets and suppliers to display the food miles of products will help consumers make informed choices. Supporting local markets and growers reduces food miles.

**Response**

The NT Government should work with the pastoral industry to support it to reduce its greenhouse gas emissions and to develop premium products with a low environmental impact.

The NT Government should work with health experts to support people who wish to decrease their meat intake and provide balanced information about dietary needs.

That the NT Government work with suppliers and supermarkets to display the food miles of products on the shelves.

5.7 Migration and Climate Refugees

As islands in the Pacific, Indonesia and remote coastal communities are inundated, it is highly likely that there will be more and more people left with nothing and nowhere to go. North Australia is likely to experience a sudden wave of refugees stranded by the impacts of sea level rise and extreme weather events.

**Response**

That the NT Government work with other jurisdictions and refugee support organisations to develop a plan for assisting climate refugees, particularly remote Top End coastal communities.
5.8 Community

Climate change presents an opportunity for the community to work together to develop creative responses to climate change. Examples include events organized and supported by Climate Action Darwin, such as the “People’s March for Climate”, presentations by climate experts and forums to support community discussion and improve understanding of how climate change impacts our day to day lives and what we can do about it.

Response
That the NT Government support NGOs and community groups to engage the community in developing responses to climate change.

6. Conclusion

The NT Government Climate Policy of 2009 included a thorough and comprehensive agenda for place-appropriate, responsible climate change adaptation and mitigation. Since then, ten years have been lost while temperatures continue to rise.

Climate Action Darwin submits that the NT Government has the capacity to capitalise on the opportunities that are described in this document and must adopt an effective emissions reduction target. We also implore the Government to ensure that the target is legislated, to prevent another ‘policy of inaction’. A climate change strategy, without a target is likely to lead to an increase in emissions, and exacerbation of impacts.

7. References

BOM (2016), State of the Climate Report, p.15


NT Government (2018) Hydraulic Fracturing in the NT: Greenhouse Gases, 


Q1 Should your local member (MLA) support a target of net zero emissions by 2050?

Answered: 157  Skipped: 0

<table>
<thead>
<tr>
<th>Answer Choices</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>82.80%</td>
</tr>
<tr>
<td>No</td>
<td>10.19%</td>
</tr>
<tr>
<td>Unsure</td>
<td>7.01%</td>
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<tr>
<td>TOTAL</td>
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</table>
Q2 Would you support action by the NT Government to phase out fossil-fuels, including natural gas, by 2050?

Answered: 156  Skipped: 1

- **Yes**: 81.41% (127 responses)
- **No**: 13.46% (21 responses)
- **Unsure**: 5.13% (8 responses)

**TOTAL**: 156
<table>
<thead>
<tr>
<th>Date</th>
<th>Support MLA</th>
<th>Support Action</th>
<th>What Do You Love About the Territory</th>
<th>What Do You Think the NT Government Should Do About Climate Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-11-14</td>
<td>Yes</td>
<td>Yes</td>
<td>The lifestyle, it will become so hot it will be unlivable. The eco-systems including wildlife. The industries e.g. mangos, prawns, fishing.</td>
<td>Implement stringent targets. Move away from a mining and fossil fuel based economy. This change is happening anyway and we are going to miss out on the new economy.</td>
</tr>
<tr>
<td>2018-11-14</td>
<td>Yes</td>
<td>Yes</td>
<td>All round liveability. The same as anywhere else.</td>
<td>Determine that there will be no new sources of fossil fuels. Get serious about practical measures to transition to 100% renewables a la the former SA Labour government.</td>
</tr>
<tr>
<td>2018-11-14</td>
<td>Yes</td>
<td>Yes</td>
<td>Nature</td>
<td>stop the fracking!!!</td>
</tr>
<tr>
<td>2018-11-14</td>
<td>Yes</td>
<td>Yes</td>
<td>I like going outside on my skateboard and I can’t do that sometimes because my skin melts, but members sit in an air con all day and go on fancy holidays because they’re richer than the people who actually live IN Darwin and GO OUTDOORS.</td>
<td>They can’t while you have people like Scott Morrison. However it would create a lot of jobs for territorians if we exported solar generated power to other states.</td>
</tr>
<tr>
<td>2018-11-14</td>
<td>Yes</td>
<td>Yes</td>
<td>The ocean, I like to see levels where they are. The build up, it’s not pleasant and it's not good if it gets any worse. The ecology, cyclones and hot fires will destroy a lot of what we have up here.</td>
<td>Deploy all available resources in a similar way to The Manhattan Project and the moon mission reducing fossil fuel use converting stationary energy to renewable resources and creating policy that will convert land use to async instead of a source.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
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<td>What do you think the NT Government should do about climate change?</td>
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<tr>
<td>2018-11-14 11:33:41</td>
<td>Yes</td>
<td>Yes</td>
<td>Turtle breeding</td>
<td>I would like to see a clear plan on what they propose in the future and why haven't they committed to support net zero emissions?</td>
</tr>
<tr>
<td>2018-11-14 11:36:49</td>
<td>Yes</td>
<td>Yes</td>
<td>The climate, the lifestyle and work opportunities.</td>
<td>Ban fracking, build solar thermal and build an electrical trunk line to Asia so we can export green power.</td>
</tr>
<tr>
<td>2018-11-14 11:44:04</td>
<td>Yes</td>
<td>Yes</td>
<td>Everything! The outdoor lifestyle (having to spend more time in aircon), the ecology, the wildlife, flora, more adverse weather events.</td>
<td>Be a leading state on the issue. PowerWater should be reconfigured to adapt to solar/wind generation in as many areas as possible. Incentives to switch should be on offer again. Targets need to be set and regulations passed that ensure that every industry, development, contract, event considers climate change impact and acts according to the guidelines. That independent assessment and monitoring unit is staffed properly to do their job. The public is better educated about what can and cannot be recycled in the NT.</td>
</tr>
<tr>
<td>2018-11-14 12:11:37</td>
<td>Unsure</td>
<td></td>
<td></td>
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<tr>
<td>Completed</td>
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<tr>
<td>2018-11-14 12:34:10</td>
<td>Yes</td>
<td>Yes</td>
<td>The harsh summers (Alice) and build up (Top End) are already noticeably more uncomfortable than when I moved here 20 years ago due to climate change; the rapid loss of native animals and plants; more extreme weather events will have big impacts on some of the most vulnerable communities in the country.</td>
<td>Invest more in solar  Hold high emitting companies to account  Not allow fracking anywhere  Step up and show a hint of leadership  Invest more in protecting threatened species</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td></td>
<td>The climate. I like the heat and humidity. But any hotter is a bad idea. If the temperature keeps increasing, everyone will leave and there'll be no workers to make any profit from anything.</td>
<td>Net zero emissions. Stringent environmental protection legislation and policy. Right of appeal against development applications, decisions and acts for all stakeholders. Real community lead democratic decision making.</td>
</tr>
<tr>
<td>2018-11-14 12:50:37</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT Government to reduce emissions?</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>What do you think the NT Government should do about climate change?</td>
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<tr>
<td>2018-11-14 12:57:04</td>
<td>Yes</td>
<td>Yes</td>
<td>The liveability. I could not live here if in ten years, as predicted one third of our days were like our worst build up day (35 degrees and over with 40% + humidity). I would not wish to go outside for work or recreation. We are risking our coastal eco system with rising temperatures; mangroves, turtles, barramundi.</td>
<td>No fracking is first. Invest in solar. Focus on cooling the cities and towns including tree planting and other new tech strategies if applicable. Focus on public transport rather than road building and individual cars. Encourage local agriculture to reduce food miles and create food security. Support the coastal mangrove systems rather than removing them. They are a critical buffer against natural disasters and fish breeding zone. Invest in research regarding impacts to NT specifically re climate change so that we can be informed and prepare for the impacts. Reduce food waste, improve soil and reduce methane emissions with an industrial scale composting facility. Stop land clearing our native habitat for cattle and development. There are probably policies and initiatives that could help achieve these things but I would need to research them.</td>
</tr>
<tr>
<td>2018-11-14 13:03:11</td>
<td>Yes</td>
<td>Yes</td>
<td>Water quality &amp; quantity. Fishing &amp; our lifestyle.</td>
<td>Stop Fracking- it will add to climate change.</td>
</tr>
<tr>
<td>2018-11-14 13:08:55</td>
<td>Yes</td>
<td>Unsure</td>
<td>It’s hard to say what will be affected by climate change, but I’d suggest a threat to our natural environment and national parks is concerning.</td>
<td>Commit to meaningful change.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-14 13:44:47 Yes</td>
<td>Yes</td>
<td>The &quot;livability&quot; of our home and ongoing survival of many plants and animals native to the Northern Territory is dependent upon minimizing the effect of human exacerbated climate change.</td>
<td>Yes</td>
<td>Special plants and animals.</td>
</tr>
<tr>
<td>2018-11-14 13:44:54 Yes</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td>Everything!</td>
</tr>
<tr>
<td>2018-11-14 13:49:37 Yes</td>
<td>Yes</td>
<td>The science tells us we need to accelerate action no more indecision or fobbing off actions</td>
<td>Yes</td>
<td>Inundation of the Kakadu wetlands would be a loss to the whole planet</td>
</tr>
<tr>
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<tr>
<td>2018-11-14 13:50:19 Yes</td>
<td>Bare minimum and what the science demands</td>
<td>Yes</td>
<td>Dry season. Wildlife. Coasts</td>
<td>Make cities and towns resilient to heat by investing heavily in cooling strategies and smarter urban design. Make more resilient communities and address emissions from all sectors</td>
</tr>
<tr>
<td>2018-11-14 14:04:26 Yes</td>
<td>because over 6000 climate scientists have urged us to and they know what they are talking about</td>
<td>Yes</td>
<td>everything if we have more catastrophic cyclones, Aboriginal communities specifically will bear the brunt and that's not ok</td>
<td>don't frack!! reduce emissions phase out non-renewables ASAP listen to Aboriginal people</td>
</tr>
<tr>
<td>2018-11-14 14:34:57 Yes</td>
<td>We are very able to achieve this target - at an even earlier date</td>
<td>Yes</td>
<td>the heat will get hotter - it is just right now</td>
<td>aim to be an exporter of solar generated power; aim to be on the cutting edge of research into tropical climate solar/renewables generated power; research into tropical agriculture carbon emission reduction; aim to have net zero native vegetation clearing to retain natural environments</td>
</tr>
<tr>
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<td></td>
<td>Yes</td>
<td>The Dry Season. magpie geese. turtles.</td>
<td>Ban fracking. make the offset penalties and other taxes and royalties for current fossil fuel miners so prohibitive they pack up and leave. Swiftly transition to 100% renewable energy for both stationery and transport needs. Then ramp it up so we can export clean energy. Ban new concrete aircon box houses. Roll out shaded and connected bike paths and add pedestrian crossings frequently on all roads. Roll out frequent and well provisioned public transport to all Territorians. Roll out local food and fibre farms complete with processing facilities and produce building materials locally too. Plant trees, eradicate gamba and mission grass and stop bush fires being so common and so rampant. Teach people how and why to vote.</td>
</tr>
<tr>
<td>2018-11-14 16:01:49</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-14 16:09:05</td>
<td>Yes</td>
<td>Yes</td>
<td>Biodiversity</td>
<td>Stop fracking. It is irresponsible.</td>
</tr>
<tr>
<td>Completed</td>
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<td>Would you support action by the NT</td>
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<tr>
<td>2018-11-14 17:05:54 Yes</td>
<td>Net zero emissions preferably reached earlier. This is the most urgent issue to affect us all and we are doing so little, it's not good enough.</td>
<td>Yes</td>
<td>Outdoor lifestyle</td>
<td>As much as they possibly can. Stop mass clearing of bush land habitat for development. Ban fracking. Plant more trees.</td>
</tr>
<tr>
<td>2018-11-14 17:06:33 Yes</td>
<td>It is urgent that government act to avoid the dangerous effects of climate change.</td>
<td>Yes</td>
<td>Our mild and beautiful dry season.</td>
<td>Adopt policies that limit our carbon footprint including embracing renewable energy.</td>
</tr>
<tr>
<td>2018-11-14 17:19:49 Yes</td>
<td>We are the boiling frogs here. If no one is prepared to get real about reducing emissions soon we will not survive in this region.</td>
<td>Yes</td>
<td>Our wilderness will carry on long after humans have dashed their chances of living on this extraordinary planet. Being in close contact with the oldest surviving culture on earth is my favourite thing about the NT.</td>
<td>STOP. REASSESS. PLAN FOR ADAPTATION. CEASE EMISSIONS.</td>
</tr>
<tr>
<td>2018-11-14 17:33:46 Yes</td>
<td></td>
<td>Yes</td>
<td>Everything! if it gets too hot to live here, all the things we love about the Territory life style will not be gone!</td>
<td>Act now!</td>
</tr>
<tr>
<td>2018-11-14 18:02:56 Yes</td>
<td>The NT Government has a responsibility to put policies in place that limit our emissions. We have bountiful solar energy, let's use it.</td>
<td>Yes</td>
<td>Being outside in our wonderful natural environment.</td>
<td>Put strong policies in place and make sure government and private business and individuals follow them.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
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</tr>
<tr>
<td>2018-11-14 19:20:23</td>
<td>No</td>
<td>Yes</td>
<td>Coastlines, biodiversity, wetlands</td>
<td>Fund people on country and ranger programs to reduce fire in the landscape, ban fracking, invest in renewables</td>
</tr>
<tr>
<td>2018-11-14 20:30:26</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-14 21:27:38</td>
<td>Yes</td>
<td>Yes</td>
<td>Natural environment</td>
<td>Change everything.... Promote different values and ways of living, lead by example, stop pandering to business</td>
</tr>
<tr>
<td>2018-11-14 21:35:42</td>
<td>Yes</td>
<td>Yes</td>
<td>I love everything about the Territory ! PLEASE stop fracking it is too risky and could destroy all the beautiful water ways we love so much. If the earth warms another two degrees then the territory will be too hot to live in, our wildlife will suffer and we will risk losing certain species. There will also be more natural disasters .</td>
<td>STOP FRACKING! You are making us one of the biggest carbon emitters in the world it’s shameful! Also subsidise solar and make us the solar state!</td>
</tr>
<tr>
<td>2018-11-14 21:50:59</td>
<td>Yes</td>
<td>Yes</td>
<td>Outdoor lifestyle - it’s already becoming unbearable to be outside during the day</td>
<td>Make it a priority in future planning</td>
</tr>
<tr>
<td>2018-11-14 22:34:05</td>
<td>Yes</td>
<td>Yes</td>
<td>Cattle industry, remote communities, unique wildlife and ecology, cyclone safety, marine life, clean safe water (no fracking )</td>
<td>listen to scientific evidence! Transform the economy to renewable energy and not get left behind. Make polluters pay</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td></td>
<td>Unsure</td>
<td>Unsure</td>
<td>It's difficult to predict the many ways climate change will affect the Territory - for example, biodiversity, immigration, coastal populations. My main angst related to climate change is more global and the fact that billions of vulnerable, low-resource peoples will suffer and be displaced. It doesn't relate to the NT as much.</td>
<td>If there is a leader on the issue with larger aspirations who wants to hone his or her message and skill set in a smaller platform and test any innovative approaches that they can scale or transfer elsewhere, they should go for it. I don't otherwise want the NT Gov spending its time and resources on climate change in a broad sense as opposed to environmental regulations that matter here, say, like, in respect to fracking gas. Larger issues of climate change need to be solved at the international level, particularly in China and US.</td>
</tr>
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2018-11-15 4:28:43
<table>
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<tr>
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<th>Should your local member (MLA) support a target of net zero emissions by 2050?</th>
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<th>What do you think the NT Government should do about climate change?</th>
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<tbody>
<tr>
<td>Yes</td>
<td>Whether or not climate change is real (and I believe it is) zero emissions living is likely to make for a better quality of life for all of us with lower pollution, more responsible use of resources etc. If climate change IS real then, seriously, what do you want me to say?! 2050 is too far away though. We can adapt more quickly. And there are many fabulous industries for NT that could come from innovative approaches to this challenge.</td>
<td>Yes</td>
<td>I live in Darwin. I believe it will become an unliveable city.</td>
<td>It needs to implement rigorous building standards that are environmentally friendly and smart for this environment. I drive past the new housing projects and I don’t see tropical housing - I see homes utterly dependent on large power use to be liveable. It needs to pull away from carbon fuel industry like fracking - I have been told the government was hamstrung by the federal government on this one - then call them out NT, name and shame the feds, get the nation on board to back you. Support community action groups - there is some major expertise floating around who would certainly volunteer their vision, energy and time if they knew the government would back not block their ideas. Solar, wind etc projects in remote communities reliant on diesel generators, same for Darwin. Community education around buying local rather than trucked foods. Support the local growers and markets. There is a million little things. I think the main thing is to intensively consult and develop a detailed plan for it all with the community - if proper consultation and collaboration is done, then you will have thousands of community members who have a sense of ownership of get with the program</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>The climate</td>
<td></td>
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<tr>
<td>2018-11-15 6:34:14 Yes</td>
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<tr>
<td>2018-11-15 6:43:29 Yes</td>
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<tr>
<td>2018-11-15 6:58:58</td>
<td>Yes</td>
<td>Yes</td>
<td>Temperature rising! I've lived in the top end 12 years and it's noticeable already; with that comes more water and power (air-con, fan) use. A vicious cycle.</td>
<td>Ensure only tropical sytle houses built in remote communities. At present the hot-boxes built require air-con use that no one can afford. This is really important. I also think power and water need further regulation. They are inconsiderate in how they deal with the community - and are routinely in the business of destroying home gardens (which of course cool the house with shape / keep power costs down) under the thinly held excuse of 'maintenance'. Lastly please say no to fracking. We love the NT and don’t want the gamble.</td>
</tr>
<tr>
<td>2018-11-15 9:53:03</td>
<td>Yes</td>
<td>Yes</td>
<td>The culture and lore of First Nations people. Biodiversity from basic plant species up to the diversity of native fauna.</td>
<td>The NT Government should be adopting a long term strategy to end carbon emissions and investing in the skill and technical development required to both be carbon neutral locally, and not be economically reliant on the rents from fossil fuel extraction.</td>
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<tr>
<td>Completed</td>
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<tr>
<td>2018-11-15 11:10:45</td>
<td>Yes</td>
<td>Yes</td>
<td>We are on track to a much hotter climate thereby losing most of our small native mammals and many reptiles in the process. The diminishing natural landscape would be largely dry sclerophyll forest losing all our pockets of biodiversity.</td>
<td>Stop approving every bloody development application and mining exploration application would be a start. Develop our 'boundless possible' potential for solar and wind power, create more marine protection areas, restore funding to bodies such as the NT environment centre, instigate a single use plastics ban territory wide, have intensive education about environment and climate added to the Territory curriculum, stop pandering to big business.</td>
</tr>
<tr>
<td>2018-11-15 11:39:19</td>
<td>Yes</td>
<td>Yes</td>
<td>I love the tropics but if Darwin gets hotter so might move south. Plus there are lots of low lying areas that could be very affected by sea levels rising</td>
<td>Try not to contribute. Use solar, tide, wind. Invest in better urban design to reduce city heat sink effects. More good shade trees. Make sure building standards are appropriate.</td>
</tr>
<tr>
<td>2018-11-15 12:12:14</td>
<td>Yes</td>
<td>Yes</td>
<td>I love our climate... but any increases to global temperatures would make living in the Top End intolerable...</td>
<td>Immediately ban fracking!... plus work to attract serious investment and research into solar technology and other renewable sources.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-15 12:36:40 Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>The effects of climate change are hard to predict yet they are obvious. Imagine the average temperature rising by 1 or 2 degrees, this place will will quickly become uninhabitable, unless you sit in your car with the engine running so you can have your aircon on, which in turn will then further climate change again. Australia is one of the biggest per capita polluters in the world when it has almost boundless sun and wind energy at its disposal. It is a disgrace</td>
<td>Abandon fossil fuels sooner rather than later. Educate the public, compared to Europe this is like living in the stone age when it comes to awareness and measures taken. How can a country as advanced and prosperous as Australia be so far behind in awareness, education and measures taken to help protect future generations? It is nothing short of shameful. The territory and Australia in general have a major resource: natural beauty, yet it seems we are hell bent on destroying it as quickly as we can. It is sad and infuriating to watch it happen before our very eyes.</td>
</tr>
<tr>
<td>2018-11-15 13:00:16 Unsure</td>
<td>Unsure</td>
<td>Unsure</td>
<td>It's pretty hot already</td>
<td></td>
</tr>
<tr>
<td>2018-11-15 13:10:58 Yes</td>
<td>Yes</td>
<td></td>
<td>Rising sea levels which will destroy flood plain ecosystems</td>
<td>Incentive for solar and eco house</td>
</tr>
</tbody>
</table>

*2018-11-15 12:36:40 Yes* | Because it is necessary. Start with making it illegal to have your engine running while sitting in the car with aircon on! It is illegal in many countries (for example in Europe where the issue of running engines does not relate to having the aircon on but the heater instead. In any case, there are plenty of airconditioned spaces available, it is not necessary for people to sit in their cars with the engine on. I witness it a hell of a lot and it is insidious behaviour |
<table>
<thead>
<tr>
<th>Completed</th>
<th>Should your local member (MLA) support a target of net zero emissions by 2050?</th>
<th>Would you support action by the NT Government to make it the priority core issue around which all decisions and planning are made, not just 'another' factor or peripheral ambiguous concern?</th>
<th>What do you love about the Territory that will be affected by climate change?</th>
<th>What do you think the NT Government should do about climate change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-11-15 13:24:18 Yes</td>
<td>Yes</td>
<td>pretty much everything, except the backwards policies that promote capitalism over community and mythical progress over sustainability, and a deeply ingrained lack of respect for our Indigenous owners</td>
<td>Climate change is a serious problem and needs to be addressed, or we may not even be here in 2050!</td>
<td>make it the priority core issue around which all decisions and planning are made, not just 'another' factor or peripheral ambiguous concern</td>
</tr>
<tr>
<td>2018-11-15 13:58:15 Yes</td>
<td>Yes</td>
<td>Everything!</td>
<td>The environment, the temperature, outdoor lifestyle, in fact virtually everything!</td>
<td>They should act responsibly, take it seriously and do everything in their power to reduce it!</td>
</tr>
<tr>
<td>2018-11-15 14:19:36 Yes</td>
<td>Yes</td>
<td>To prevent: Economic collapse Environmental destruction Unlivable environment Unliveable climate International sanctions Death To create: A sustainable future To be a positive influence on word climate Economic prosperity To be at the forefront of sustainable technology</td>
<td>Way of life Environment Wildlife Climate Livability Economic prospects The ability to survive</td>
<td>Create an economy that drives renewable resources. Fund and create industry that can sustain the environment and the population Stop looking for quick fix mining money that does not create a sustainable future for the population Promote operation to the current Australian governments push for further fossil fuel projects Oppose threats of federal funding cuts for states/territories not furthering unsustainable mining practices Promote a future that is not just sustainable for human life but also economically viable</td>
</tr>
<tr>
<td>2018-11-15 15:09:09 Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-15 15:45:11 Yes</td>
<td>Yes! We should be striving to lead the way in climate change action, instead we fall behind every time and for what...money? money won't matter if we don't have a habitable planet to live on.</td>
<td>Yes</td>
<td>Our beaches, swimming spots, fresh water, fresh air, our diverse range of native wildlife and fauna and much more</td>
<td>Phase out fossil files and all other non-rentable energy sources. Put funding into solar, wind energy and researching new forms of renewable energy, phase out animal agriculture and pesticides, promote reusable or compostable bags/cutlery etc. and ban all single use plastics</td>
</tr>
<tr>
<td>2018-11-15 15:51:42 Yes</td>
<td>We needs to cut down on emission and look after the environment</td>
<td>Yes</td>
<td>Nature environment</td>
<td>cut down on fossil fuel and introduce more solar.</td>
</tr>
<tr>
<td>2018-11-15 15:52:12 Yes</td>
<td>because it's the most effective way of combating Climate Change and guaranteeing a future for our children and grandchildren</td>
<td>Yes</td>
<td>the lifestyle, which will be destroyed by climate change</td>
<td>introduce a plan to have the Territory powered by renewable energy, make the Territory a leader in this area, and supply the country and the world with renewable energy and effective renewable applications</td>
</tr>
<tr>
<td>2018-11-15 15:55:56 Yes</td>
<td></td>
<td>Yes</td>
<td>The weather will get hotter, natural disasters will become more frequent</td>
<td>Reduce reliance on fossil fuels, particularly by industry.</td>
</tr>
<tr>
<td>2018-11-15 19:03:39 Yes</td>
<td>No brainer</td>
<td>Yes</td>
<td>The air, the water, the sea level, our native flora and fauna.</td>
<td>Take action NOW!</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-15 19:09:26 Yes</td>
<td>Yes</td>
<td>The territory has some of the most amazing landscapes and wildlife in the world - all of this will be affected by climate change</td>
<td>Make it possible for massive changes to our lifestyles so that we can reverse the level of warming that has already happened. It’s not good enough to try to adjust to an altered climate and certainly not ok to completely ignore the whole issue</td>
<td></td>
</tr>
<tr>
<td>2018-11-15 21:07:30 Yes</td>
<td>Yes</td>
<td>The lifestyle. If we keep going the way we are, the lifestyle will disappear and then so will the population</td>
<td>Commit to a reduction target. Back renewable energy sources and create jobs for people in the renewable sector. Be leaders. We have so much sun here. Use it!</td>
<td></td>
</tr>
<tr>
<td>2018-11-15 22:26:57 Yes</td>
<td>Yes</td>
<td>Large areas of the territory will become unlivable under the 'business as usual' pollution strategy</td>
<td>Defensively: we can make a big contribution to the global imperative to minimise the impact of climate chaos by leaving our fossil fuel resources untapped. Proactively: our unique wealth of solar resource gives us an opportunity to stake out a leadership role in a renewable energy economy. We could be harvesting and distributing solar energy from the NT to the states, and our regional neighbours</td>
<td></td>
</tr>
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<tr>
<td>2018-11-15 23:34:22</td>
<td>Yes</td>
<td>Yes</td>
<td>Oh my goodness. Everything! Kakadu will be lost after only 50cm sea level rise. Turtles are having all female clutches. Barramundi are being affected. Mangroves have had mass die off. This year I've hardly been able to go outside. I've never lived with aircon - this year I cracked. Food is harder to grow. The list goes on and on.</td>
<td>Cut to zero emissions but promoting and switching to renewables, public transport, insulation. Obviously don't frack - leave it in the ground. Re-vegetate degraded land. Stop clearing land. Increase tree coverage of our streets to more than 50%. Look at our food and water security.</td>
</tr>
<tr>
<td>2018-11-16 6:11:49</td>
<td>Yes</td>
<td>Yes</td>
<td>We moved from Coconut Grove because we believe sea levels will rise. We love our outdoor life.</td>
<td>As much as possible- I can understand developing countries selling their resources but we need to be smarter.</td>
</tr>
<tr>
<td>2018-11-16 7:14:51</td>
<td>Yes</td>
<td>Yes</td>
<td>The places</td>
<td>More.</td>
</tr>
<tr>
<td>2018-11-16 9:21:05</td>
<td>Yes</td>
<td>Yes</td>
<td>The beautiful dry season. The wildlife, including fish stocks for recreational fishing.</td>
<td>Everything possible! Use more renewable energy and phase out fossil fuels. They should also do more to educate the community</td>
</tr>
<tr>
<td>2018-11-16 10:01:25</td>
<td>Yes</td>
<td>Yes</td>
<td>One reason why I love the Territory is because our environment is wild, harsh and natural. Climate change will impact tourist numbers, jobs and all other kinds if benefits.</td>
<td>Commit to 2050 as zero emissions target. Like other governments are doing. If we are going to frack offset the carbon emissions! This will help us determine fracking cost:benefit to limit and phase out.</td>
</tr>
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<tr>
<td>2018-11-16 12:44:33 Yes</td>
<td>If you don't have a target, you have nothing to aim for.</td>
<td>Yes</td>
<td>Everything.</td>
<td>Swich to renewables</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-16 13:21:22 Yes</td>
<td>It is a no brainer to expect that in 30 years we can’t achieve this. We NEED to achieve this.</td>
<td>Yes</td>
<td>I love the weather and the wildlife. Climate change negatively impacts both.</td>
<td>Invest in renewables both at a utility level and an industry level. There is no reason why reliable power and sustainable businesses can’t be created through renewables. Stop letting multinationals drain the land and sea of natural resources. Encourage eco friendly tourism enterprises. Invest in public transport and better public infrastructure to reduce the number of cars on the roads.</td>
</tr>
<tr>
<td>2018-11-16 15:22:10 No</td>
<td></td>
<td>No</td>
<td>Nothing will be affected. I can’t believe the population of Australia can be so naive as to be sucked in by fake education and total lies.</td>
<td>Assist the Federal Government in abolishing any further support to the UN and it’s fake agenda</td>
</tr>
<tr>
<td>2018-11-16 16:00:58 Yes</td>
<td></td>
<td>Yes</td>
<td>Everything</td>
<td>Ban coal. Invest in solar and batteries.</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-16 16:24:48</td>
<td>Yes</td>
<td>Yes</td>
<td>Absolutely climate change needs to be a top priority, without making drastic changes Darwin will not be a liveable city. We need to make changes NOW</td>
<td>This needs to be at the forefront of the NT governments planning. The government should give generous incentives for families to install solar power systems. All new home builds should receive a grant to install a water tank. The NT Gov needs to stop allowing developers to clear established trees in new suburbs. Town planning should be planned in cohesion with the natural environment. The NT gov needs to lead by example. Drastic improvements and change should start 2019</td>
</tr>
<tr>
<td>2018-11-16 17:40:13</td>
<td>Yes</td>
<td>Yes</td>
<td>Wildlife, beaches, nature reserves, human life</td>
<td>Switch to renewable energy, ban single use plastics, invest in more recycling/reusing, develop more compulsory programs for schools regarding how we can all help.</td>
</tr>
<tr>
<td>2018-11-16 19:08:46</td>
<td>Yes</td>
<td>Yes</td>
<td>Because we will all start cooking properly soon!! And what kind of future are we leaving for our kids!?</td>
<td>Whatever they need to do to phase out fossil fuels and take action to help lower emissions.</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-16 19:10:24</td>
<td>Yes</td>
<td>Yes</td>
<td>The weather apart from short periods of intense buildup is fantastic. It will get hotter, with more destructive storms, making it harder to live an outdoor lifestyle including being in the bush</td>
<td>Commit to serious reductions in fossil fuel</td>
</tr>
<tr>
<td>2018-11-17 6:39:01</td>
<td>Yes</td>
<td>Yes</td>
<td>Our wildlife, our fishing, our weather and our lifestyle are all threatened by climate change</td>
<td>The NT government should do EVERYTHING within its powers to reduce carbon emissions and support climate positive projects whenever possible. We need long term vision, not short term goals</td>
</tr>
<tr>
<td>2018-11-16 20:12:22</td>
<td>No</td>
<td>No</td>
<td>Nothing, as AGW is a scam</td>
<td>Nothing, it should focus on real issues</td>
</tr>
<tr>
<td>2018-11-17 11:43:57</td>
<td>Yes</td>
<td>Yes</td>
<td>Too hot</td>
<td>Fix it</td>
</tr>
<tr>
<td>2018-11-17 11:49:54</td>
<td>No</td>
<td>No</td>
<td>Nothing, as AGW is a scam</td>
<td>Nothing, it should focus on real issues</td>
</tr>
<tr>
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<tr>
<td>2018-11-17 13:00:23</td>
<td>Yes</td>
<td>Yes</td>
<td>Because as global citizens we have a responsibility to do our utmost to ensure a sustainable future for this planet and it’s inhabitants. Science shows we must take urgent action to reduce emissions</td>
<td>Not invest in fossil fuels and industry that will increase emissions...surprise surprise that means no fracking. Also improve planning to ensure that the expanding urban sprawl can be services by good no/low emissions public transport as well as better building design to work with the environment instead of energy hungry plastic boxes dependent on aircon. Invest in renewable energy...we have fantastic sustainable energy resources right here, so get smart and use them instead of bowing to the federal governments continued blackmail for increasing the fossil fuel industry. Take the lead NTG, make us Territory proud!</td>
</tr>
</tbody>
</table>

2018-11-17 13:00:23 | Yes | Yes | Just the fact that it's climatically possible to live here and love it... That's a pretty big reason |
<table>
<thead>
<tr>
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<tr>
<td>2018-11-17 19:29:57</td>
<td>Yes</td>
<td>Because the planet is in a very critical stage and we have to act now! A lot of the countries around the world have a plan for renewable energy and some countries have already achieved it! We desperately need to catch up to them if we want to see a brighter future :)</td>
<td>clean water, native animals, the botanical gardens and all the wonderful people that live in the NT</td>
<td>Come up with a solid, just and fair plan to help Australia transition from being dependent on fossil fuels to clean renewable energy</td>
</tr>
<tr>
<td>2018-11-17 20:45:20</td>
<td>Yes</td>
<td>It’s where the whole world is heading and we have a responsibility to help ensure it happens globally. With this goal in our sights, we will be inspired and motivated to be more innovative and creative in achieving it.</td>
<td>The weather! I love the heat but it was hot enough. For at least 4 years now, the average monthly maximum temperature has been around 1 degree higher than the long-term average. The increasing frequency of 34 and 35 degree maximums is very concerning to me.</td>
<td>Ban fracking; Green up; Promote and support development of and investment in renewable, sustainable energy resources; work closely with indigenous communities to develop sustainable industries with long-term vision and care for future generations rather than the self-interests of a few; get innovative and creative</td>
</tr>
<tr>
<td>2018-11-17 21:38:51</td>
<td>Yes</td>
<td>Just about everything, fishing, hiking, shopping in the cbd, hunting and bird watching on the floodplains</td>
<td></td>
<td>Set targets and stick to them</td>
</tr>
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<tr>
<td>2018-11-17 22:22:58 Yes</td>
<td>Yes, if not for the love of humanity and the planet then at least for preservation of a population who want to live in the NT.</td>
<td>Yes</td>
<td>Preserved remote areas, unchanged by human developments. Biodiversity - our unique tropical and arid land flora and fauna. A coast line with islands that are still above sea level.</td>
<td>Make strong targets for renewable energy and emission reduction. Plant out (native trees) any cleared land to sequester carbon. Provide subsidies to residents who use renewable energy. Better public transport in town areas. (Bus stops can be so hot when not in shade and the buses slow and smelly). Put into place better waste management. Develop a policy that focuses on compost, recycling and a massive reduction in landfill waste. Fully develop, educate and facilitate compost systems in urban and remote areas. Recycle as much as we can locally. Regulate the building sector - Build energy efficient homes designed for the tropics. Not the current massive concrete block air-conditioning reliant subdivisions.</td>
</tr>
<tr>
<td>2018-11-18 5:33:43 Yes</td>
<td>Because everyone should be doing what they can to reduce emissions.</td>
<td>Yes</td>
<td>Beaches, wildlife.</td>
<td>Have more solar panels in public places. Insist that private companies have solar panels, imagine how much energy a shopping centre could generate if it had solar panels on it’s roof and above the carpark shade covers. Offer business incentives to go green, invest in renewable energies. It’s time we started putting the future of humanity before profit and greed.</td>
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<tr>
<td>2018-11-18 8:00:51</td>
<td>Yes</td>
<td>Yes</td>
<td>The ocean when it's not full of jellyfish</td>
<td>Commit to providing better public transport and harnessing the abundant heat and sunshine to provide all of our power.</td>
</tr>
<tr>
<td>2018-11-18 8:40:38</td>
<td>Yes</td>
<td>Yes</td>
<td>Livability - more extreme weather events (cyclones, longer build ups) would make the north an undesirable place to live.</td>
<td>Enforce new builds to have solar, watertanks and deduct cost of batteries for homeowners.</td>
</tr>
<tr>
<td>2018-11-18 12:32:58</td>
<td>We're living in the Dark Ages, 2050 is just pushing the deadline further away, but it's better than NOT targeting zero emissions at all. MLP should pull his finger out of his rectum and get with a committed environmental agenda.</td>
<td>Yes</td>
<td>Marine life, The Dry, potable water, neighbours who are committed to living in the NT, and not just here to opportunistically rape and run.</td>
<td>Stop crawling into bed with big business. Stop giving each other hand jobs. Stop viewing their positions in public service as opportunities to satisfy their own greed and line their own bank accounts.</td>
</tr>
<tr>
<td>2018-11-18 16:36:47</td>
<td>Yes</td>
<td>Yes</td>
<td>Weather, community, available water</td>
<td>Limit new mines  Protect water supplies  Put plans into places to have 100% renewable energy in next 30 years</td>
</tr>
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</tr>
<tr>
<td>2018-11-18 17:24:39 Yes</td>
<td></td>
<td></td>
<td>The dry season may disappear and heat/humidity will intensify, significantly affecting the NT’s outdoor lifestyle and reducing the population which is attracted here to enjoy the outdoors. Working outside will become harder in the heat, not to mention adversely affecting human health. Sea level rises will radically change the coastal environment and impact ecosystems and the tourism industry (eg Kakadu). Infrastructure will fail more frequently, possibly leading to increased mortality. Without huge changes in planning and construction, Darwin will become hotter and a potentially unviable place to live.</td>
<td>Urgently develop climate change adaptation strategies (planning, infrastructure, health care, building codes, tree planting). The NT will be significantly affected by climate change. Make cities and towns/communities cooler by planning a mass tree planting/landscaping repurpose - rip out concrete in the city to do this if necessary. The Cavanagh Street Green ‘pergola’ is an unnecessary waste of money - find hot spots in the city and plant trees instead. All planning, infrastructure and construction should be subject to a climate change and energy analysis as part of the approval. The building code should be redesigned with an NT climate in mind. Invest in solar energy and make the NT a solar energy hub. Support and foster community initiatives for solar power plants in the NT (not big business-owned). Stop further fossil fuel development. Stop land clearing on pastoral leases. Focus on preserving the NT’s unique natural environment.</td>
</tr>
<tr>
<td>Date</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
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<tr>
<td>2018-11-18 17:47:17</td>
<td>Yes</td>
<td>Yes</td>
<td>Increased heat and unstable weather. fracking with all that connected water polluted when water will be one of our most precious resources and will become more so in the future. why aren't we protecting that for a future gain?</td>
<td>1. no fracking  2. invest in sustainable technology  3. ban plastic bags in NT</td>
</tr>
<tr>
<td>2018-11-18 19:58:44</td>
<td>Yes</td>
<td>Yes</td>
<td>Ability to live an outdoors life will be threatened with temperature rise. Currently don’t use aircon on principle but it will get harder to exist without this. I would move down South if forced to use aircon to be comfortable. Camping</td>
<td>Swift, strong changes: - incentives for renewable energy eg rooftop solar - reduce fossil fuel reliance - city cooling strategies to reduce aircon need</td>
</tr>
<tr>
<td>2018-11-18 20:08:58</td>
<td>No</td>
<td>No</td>
<td>Possibility of an ice age.</td>
<td>Use tidal power if there was a skerrick of intelligence in your tree hugging hordes.</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-18 20:18:12</td>
<td>Yes</td>
<td>Yes</td>
<td>Sea level rise, extreme heat, extreme fires, mangrove die-back, disease, extreme weather event will all wreak havoc on the NT and cause it to be unliveable.</td>
<td>Stop supporting fossil fuel extraction projects and especially ban fracking. Then pivot to an approach to building our economy focussed around renewables, electrified industry and electrified transport. NT has a huge renewable resource, one of the best in the world. We could easily power ourselves and then use excess renewable energy to power an export industry that is world-competitive.</td>
</tr>
<tr>
<td>2018-11-18 20:42:15</td>
<td>Yes</td>
<td>Yes</td>
<td>The ability to live with the climate as it gets worse.</td>
<td>Support reduced emissions and not support fracking anywhere in the NT.</td>
</tr>
<tr>
<td>2018-11-18 20:47:40</td>
<td>Yes</td>
<td>Yes</td>
<td>The coastline, the flora and fauna, the people, places and wet/ dry seasons. Everything!</td>
<td>Listen, research, action and promote renewable energies, energy efficient buildings, green spaces, cool burns of the bush and encourage sustainable environmental education in schools and workplaces.</td>
</tr>
<tr>
<td>2018-11-18 21:09:33</td>
<td>Yes</td>
<td>Yes</td>
<td>Maximum temperatures rising</td>
<td>Renewables</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-18 22:00:51</td>
<td>Yes</td>
<td>Yes</td>
<td>Climate itself, as well as natural, pristine environments which will be irreplaceable once affected.</td>
<td>Ban coal seam fracking!!! Encourage research and development of appropriate housing, infrastructure and industry for our tropical climate, rather than pander to get rich quick schemes! Support international zero emission targets. Stand up against Federal bullying.</td>
</tr>
<tr>
<td>2018-11-18 23:05:57</td>
<td>Yes</td>
<td>Yes</td>
<td>The environment, the weather, the livability of the Territory</td>
<td>As much as it can - with sensible consultation with scientific expertise</td>
</tr>
<tr>
<td>2018-11-19 5:42:10</td>
<td>Yes</td>
<td>Yes</td>
<td>Flood plains could be ruined, species lost.</td>
<td>Support moves away from fossil fuels. Look for industry that moves towards renewables.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-19 6:45:53 Yes</td>
<td>Yes</td>
<td>Net zero emissions are the most important aim we must have. It must be the policy framework for all government's actions.</td>
<td>Loss of our diversity, no flora and fauna</td>
<td>Declare it to be the biggest moral challenge of our times. Rescind their current policy on enabling fracking in NT. Seek and make public the length of time contracts signed with ConocoPhillips and Inpex will expire and advise an end of these contracts and put a price and tax on greenhouse gas emissions incurred by these companies. Negotiate another contract on water allocation to these companies, publicly declare this and set a tax on this use. Report to public at least annually on this emissions' report: quantify cattle industry's greenhouse gas emissions and transport industry, and tax accrued from these sectors to reduce emissions by setting rigorous targets.</td>
</tr>
<tr>
<td>2018-11-19 6:55:54 Yes</td>
<td>Yes</td>
<td>Climate change is real</td>
<td>Natural environment</td>
<td>Set targets and promote policy improvements</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-19 7:54:58 Yes</td>
<td>2050 is too far away. What about 2030</td>
<td>Yes</td>
<td>once it becomes a few degree hotter it will be much harder for white fellars to live here and for those that stay they will live in air con, drive in air con, work in air con and more and more resources will be eaten up. Then there are the mammals, the fish, the birds who are all affected by extreme heat as well.</td>
<td>a lot more than what they are doing! Stop fracking to begin with. more education about reduce, reuse, recycle in all schools and work places. totally ban single use plastic bags, improve public transport and promote car share so that there are less cars on the road, have fines for dumping rubbish in the sea etc etc</td>
</tr>
<tr>
<td>2018-11-19 7:57:05 Yes</td>
<td>Climate action is needed yesterday!</td>
<td>Yes</td>
<td>Most everything, the wet season and build up storms, the biodiversity and the warm weather that if warmer might become undesirable</td>
<td>Take immediate steps now, green up the city to cool it down, make the solar systems at schools actually function</td>
</tr>
<tr>
<td>2018-11-19 8:11:47 Yes</td>
<td>Climate change is the world’s greatest challenge. We are lucky in the NT to have the capability and capacity to do something about it.</td>
<td>Yes</td>
<td>The coastline and rivers. And it gets pretty damn hot here already. If the the government wants people to move up here from down south, inaction on climate change will hardly encourage them.</td>
<td>Create jobs by funding large scale, innovative, renewable energy projects.</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-19 8:13:29</td>
<td>Unsure</td>
<td>No</td>
<td>Liveability. Depending on the season the temperatures in the Top End can be unbearable. With increased temperatures potentially much of the year will be too hot to live comfortably</td>
<td>Achieve emission reduction and clean energy targets to contribute to a (hopefully) national drive to reduce overall emissions. Begin to heavily invest in developing the NT as the renewables R&amp;D hub of Australia in particular PV. Invest in widely implemented cooling techniques in the CBD that do not use potable water. Currently we use more water than can be sustainably supplied in the Darwin region and cooling measures using water will unnecessarily place supply at risk.</td>
</tr>
<tr>
<td>2018-11-19 8:22:44</td>
<td>Unsure</td>
<td>No</td>
<td>Climate change is affected by many things including the removal of native bush areas. Thereby reducing the number of wildlife in the territory. The development of small housing lots making the daily use of aircon necessary and putting more heat into the atmosphere</td>
<td>Mandatory building rules for appropriate housing and commercial building to enable cross ventilation reducing aircon use. Increase solar use and look at wind turbines Reduce emissions from the power stations ensure there are green corridors throughout urban development and also on agriculture properties</td>
</tr>
<tr>
<td>2018-11-19 8:50:33</td>
<td>Yes</td>
<td>No</td>
<td>To save the planet, for the kids</td>
<td>Marine life will find cooler waters to swim and fish in</td>
</tr>
<tr>
<td>2018-11-19 9:02:44</td>
<td>No</td>
<td>No</td>
<td>It is unrealistic.</td>
<td>I love the tropic and it will get hotter.</td>
</tr>
<tr>
<td>2018-11-19 9:35:46</td>
<td>Unsure</td>
<td>No</td>
<td>Don’t know</td>
<td>Nil</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-19 9:52:53 Yes</td>
<td>It’s a huge deadline</td>
<td>Yes</td>
<td>Freshwater turtles that live on billabongs. Dryer years are affecting their survival</td>
<td>Improve public transport and bike ways</td>
</tr>
<tr>
<td>2018-11-19 10:09:39 Yes</td>
<td>We can’t compromise and wait around any more, bold targets must be set</td>
<td>Yes</td>
<td>Our seas and our bush land and it’s wildlife</td>
<td>No fracking! Encourage and subsidise if necessary renewable energy</td>
</tr>
<tr>
<td>2018-11-19 11:01:42 Yes</td>
<td>Because the accelerating global warming is a consequence of our failure to take adequate measures to reduce emissions.</td>
<td>Yes</td>
<td>The beautiful coastline and all the natural areas where I go bird watching</td>
<td>Change with the times and move on to sustainable alternatives to fossil fuels</td>
</tr>
<tr>
<td>2018-11-19 11:38:08 Yes</td>
<td></td>
<td>Yes</td>
<td>It will get hotter and storms will become more violent.</td>
<td>Build solar farms and also deal more efficiently with waste.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The weather</td>
<td>Make it mandatory that high rises and density housing has individual water meters so all are responsible for paying for their water use and thus will encourage them to use it sparingly. Build dams. Use available water e.g. from cliffs to water golf course, instead of sending it down the drains. Landscape with water hardy natives. Forget green median strips and verges. Kalgoolie is a good example of landscaping with the environs you have.</td>
</tr>
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<td>Completed</td>
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</tr>
<tr>
<td>2018-11-19 12:02:24</td>
<td>Unsure</td>
<td>Yes</td>
<td>Cool evenings in the Wet.</td>
<td>Phase out fossil fuels, phase in solar, tidal, wind power.</td>
</tr>
<tr>
<td>2018-11-19 12:03:31</td>
<td>Yes</td>
<td>Yes</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>Support renewables and the removal of gamba grass.</td>
</tr>
<tr>
<td>2018-11-19 13:13:58</td>
<td>Yes</td>
<td>Yes</td>
<td>The climate, weather and seasons, the incredibly diverse endemic biodiversity</td>
<td>Transition to renewables as fast as possible, not allow any fracking or offshore gas extraction, make it possible for locals and businesses to transition to hybrid or solar vehicles/fleets, create/invest in carbon sinks</td>
</tr>
<tr>
<td>2018-11-19 13:16:41</td>
<td>Unsure</td>
<td>Unsure</td>
<td>Its seems to be getting hotter and dryer</td>
<td>Be part of a national program.</td>
</tr>
<tr>
<td>2018-11-19 15:19:41</td>
<td>Yes</td>
<td>Yes</td>
<td>Outdoor lifestyle</td>
<td>Promote solar power installations on public buildings</td>
</tr>
<tr>
<td>2018-11-19 15:35:07</td>
<td>Yes</td>
<td>Yes</td>
<td>Well it doesn't need to be hotter but nature reserves and outdoor activities are fantastic in the territory.</td>
<td>Combat emissions, make it easier for the population to acess info and ways of tackling climate change ie incentive programs, better cycle ways etc</td>
</tr>
<tr>
<td>2018-11-19 15:48:28</td>
<td>Yes</td>
<td>Yes</td>
<td>The wild life - so many species are in danger. I also feel that the livability of the NT will decrease if the temp gets much higher - it's already hot enough!</td>
<td>Ban fracking! PLEASE!!! Invest in renewable energy. Stop allowing major fossil fuel contributors to shirk tax.</td>
</tr>
<tr>
<td>2018-11-20 2:45:15</td>
<td>Yes</td>
<td>Yes</td>
<td>Mangroves and wetlands</td>
<td>Invest in renewables</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-20 7:06:21</td>
<td>No</td>
<td>No</td>
<td>What affect?</td>
<td>Enhance waste management and pollution control</td>
</tr>
<tr>
<td>2018-11-20 7:30:25</td>
<td>Yes</td>
<td>Yes</td>
<td>Biodiversity</td>
<td>Act sooner and actually become real leaders by standing up for what’s right.</td>
</tr>
<tr>
<td>2018-11-20 7:39:12</td>
<td>Yes</td>
<td>Yes</td>
<td>The wilderness, the foliage and the diversity of the community. Already lots of my friends are moving as they are worried about land values when fracking starts</td>
<td>Stop building unnecessary roads that only heat up the city and stop bulldozing parks and areas that help to cool the cities</td>
</tr>
<tr>
<td>2018-11-20 9:24:09</td>
<td>Yes</td>
<td>No</td>
<td>Sea level rise, more frequent cyclones and an increasingly unpleasant build up.</td>
<td>In itself it can do little. This issue is global and the NT Government can only reduce our own emissions and keep pace with new technologies that make this possible. It must be seen as a willing partner in this venture and cooperate with the best wisdom available.</td>
</tr>
<tr>
<td>Completed</td>
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<td></td>
<td>The Government have completely loss control over climate change issues cause they didn't believed it or have no leadership action plan that will effectively prevent the dangers, they based everything on technology which has nothing to do about climate change, they have misused the resources which protect environments and keep life save, is my recommendation to the Government to someone like me to well explain the precautions which must be taken earlier before the situation become worst. The world was not built by technology, many dams, deforestation, mining, space craft, industry toxic and pollution are major causes that creating climate change but unfortunately Government became arrogant and they don't listen to the right people advice. We need strong climate team that is traditionally/culturally well build not the technology expects at this urgent time.</td>
<td>They should provide grants for the right climate team across the states, and we will base our action on traditional/ culture contemporary knowledge as every evolved from both culture /tradition and I should be one of strong leader to monitoring and explain how air, water, fire and ground ( earth ) normally work in connection with the seasons. Thanks</td>
</tr>
<tr>
<td>2018-11-20 12:16:49</td>
<td>Unsure</td>
<td>Unsure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-20 14:16:19</td>
<td>Yes</td>
<td>Yes</td>
<td>Everything</td>
<td>100% renewable energy target, develop a renewable energy market as highest priority.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
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<tr>
<td>2018-11-20 15:15:42</td>
<td>Yes</td>
<td>Yes</td>
<td>Intertidal zone - soft corals and sponge gardens and the animals that live with them; mangrove forests and nursery habitats for fishes and prawns. Climate change heats up the shallow water. Changes the sand temp for nesting turtles. And it will be too hot for people like me to enjoy living here anymore :-(</td>
<td>Stop talking and do things. Have a plan. Have little actions and big actions. Celebrate the successes. Provide hope. Positive messages that together we can do something to make a difference. Don’t make the problem insurmountable - that will depress people, especially our younger generation. Embrace renewable energy. Embrace and support innovation that creates new opportunities for renewable energy. More positive messages of how to make a difference taught in schools.</td>
</tr>
<tr>
<td>2018-11-20 16:15:18</td>
<td>Unsure</td>
<td>Yes</td>
<td>turtles, coral, sea level rise, my grandchildren, wetlands inundated by salt water</td>
<td></td>
</tr>
<tr>
<td>2018-11-20 22:31:50</td>
<td>Yes</td>
<td>Yes</td>
<td>Nature</td>
<td>Stop fracking</td>
</tr>
<tr>
<td>2018-11-21 8:59:36</td>
<td>Yes</td>
<td>Yes</td>
<td>Environment, land and sea, lovable conditions</td>
<td>Educate people about the need for action. Create and transition existing infrastructure and jobs to sustainable energy - e.g. solar, wind - the NT government could liaise with traditional owners to utilise the vast land available to boost the ailing NT economy and create sustainable jobs in remote areas</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT Government to stop all fracking, to stop emissions generated by the process, restrict land clearance to save the carbon capture of trees.</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>What do you think the NT Government should do about climate change?</td>
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</tr>
<tr>
<td>2018-11-21 10:59:02 Yes</td>
<td>we need agreement if reductions are to be achieved.</td>
<td>Yes</td>
<td>the environment, such as turtle nesting, crocodile sex, over a certain temperature crocs eggs develop as only one sex.</td>
<td>stop all fracking, to stop emissions generated by the process, restrict land clearance to save the carbon capture of trees.</td>
</tr>
<tr>
<td>2018-11-21 12:03:49 Yes</td>
<td>By 2025 it will be clear that Federal Inaction is hitting home and cities, states (like SA) and Territories need to take the country into a hotter but controlled future.</td>
<td>Yes</td>
<td>Kakadu, coastal suburbs, tropical woodland, a tolerable climate, Darwin people and population</td>
<td>Adopt more climate friendly policies more quickly</td>
</tr>
<tr>
<td>2018-11-21 12:27:57 Yes</td>
<td>The future is approaching very rapidly. We need to protect the planet for our children and grandchildren</td>
<td>Yes</td>
<td>Nothing.... But if it does happen that will be a good thing because all of the Victorians will go back home.</td>
<td>Stop wasting money on it.</td>
</tr>
<tr>
<td>2018-11-21 13:37:19 No</td>
<td>The climate</td>
<td>No</td>
<td>What won’t be affected - coastlines, barramundi, fish stocks, over all temperatures, quality of life</td>
<td>Act as though it is real and pressing not as if they are listening to climate deniers</td>
</tr>
<tr>
<td>2018-11-21 14:35:55 No</td>
<td>Freedom of choice</td>
<td>F all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-21 14:45:19 Yes</td>
<td>Transition to renewable energy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018-11-21 17:09:28 Yes</td>
<td>The climate</td>
<td>Yes</td>
<td>Fishing. Weather will become unpredictable and cyclones more frequent. Agriculture likely to be affected. Health could deteriorate.</td>
<td>Switch to solar and other renewables. Assist economy to transition. Offer environment grants and research at cdu and to business.</td>
</tr>
<tr>
<td>Completed</td>
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<tr>
<td>2018-11-21 19:25:02</td>
<td>No</td>
<td>No</td>
<td>Nothing, if it brings more rain I'm all for it.</td>
<td>Nothing it is a natural phenomenon and to attempt to disrupt the natural cycles of our planet is arrogant and short sighted in the extreme</td>
</tr>
<tr>
<td>2018-11-21 20:05:40</td>
<td>Yes</td>
<td>No</td>
<td>Dry season</td>
<td>Get more federal funds</td>
</tr>
<tr>
<td>2018-11-22 0:26:14</td>
<td>Yes</td>
<td>Yes</td>
<td>Will get hotter and more unbearable</td>
<td>No fracking  More solar and other renewables</td>
</tr>
<tr>
<td>2018-11-22 0:34:18</td>
<td>No</td>
<td>No</td>
<td>Lolz you guys think it can be stopped, silly silly children</td>
<td>Remove the profit based economy, anything short of that is a complete waste of time</td>
</tr>
<tr>
<td>2018-11-22 5:48:16</td>
<td>Yes</td>
<td>Yes</td>
<td>Everything will be affected by climate change. It will be too hot to live here. Flora and fauna will disappear. Weather will be extreme.</td>
<td>Convert to renewable energy. Ban gas and oil exploration. Plant trees everywhere. Put timers on all buildings so aircon and lights switch off when people leave. Research and support SUSTAINABLE development. Lobby the federal government. Educate the public.</td>
</tr>
<tr>
<td>2018-11-22 6:04:21</td>
<td>No</td>
<td>Yes</td>
<td>Fishing, Rain WetSeason.</td>
<td>Stop fracking for a start. Listen to the people.. Stop the damage...</td>
</tr>
<tr>
<td>2018-11-22 6:12:41</td>
<td>No</td>
<td>No</td>
<td>Intelligent people</td>
<td>Nothing</td>
</tr>
<tr>
<td>2018-11-22 7:04:52</td>
<td>Yes</td>
<td>Yes</td>
<td>Loss of flood plains and extinction of our animals.</td>
<td>Look at industry that supports climate change mitigation.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>What do you think the NT Government should do about climate change?</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------</td>
</tr>
<tr>
<td>2018-11-22 7:42:01</td>
<td>Yes</td>
<td>Yes</td>
<td>The Wildlife.</td>
<td>Think about road materials, shade and action to stop private buyers taking down all trees in gardens. Solar on every new build and subsidies increased for installation.</td>
</tr>
<tr>
<td>2018-11-22 9:07:43</td>
<td>No</td>
<td>No</td>
<td>Climate change is bullshit</td>
<td>Nothing</td>
</tr>
<tr>
<td>2018-11-22 9:19:29</td>
<td>No</td>
<td>No</td>
<td>aboriginals bigger problem</td>
<td>invest in renewables</td>
</tr>
<tr>
<td>2018-11-22 9:31:27</td>
<td>No</td>
<td>No</td>
<td>Climate has always changed, nothing is static, however, I do believe we should conserve what we have and look after it.</td>
<td>Stop bulldozing trees down to build a road that will bring yet more cars onto the road. Build a life gut rail to Mae public transport a viable travel option.</td>
</tr>
<tr>
<td>2018-11-22 14:32:42</td>
<td>Yes</td>
<td>Yes</td>
<td>Climate - days over 40 degrees will make a big difference to cost of living and liveability in general. Indigenous communities that have been living on their land for 50 000 + years will be threatened by natural disasters. Native species may not be able to cope with climate change.</td>
<td>Need to take drastic action to move away from fossil fuels immediately, and have a target for zero emissions by 2030. Please, I beg you, I have grown up with this threat and I can't believe the inaction over the past decades. Put your political careers and personal motivations behind and think of the good of our people, and the environment. We need to move away from fossil fuels now. If this move is unpopular it’s only because people don’t understand the threat.</td>
</tr>
<tr>
<td>Completed</td>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>What do you think the NT Government should do about climate change?</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2018-11-22 17:43:28</td>
<td>No</td>
<td>No</td>
<td>It will get warmer with, probably, more extremes in both wet and dry seasons.</td>
<td>Not much than can be done about the Tropics each advancing on the equator by (circa) 15m annually, having an impact on climate globally. Then there's the other two very naturally occurring cycles which also influence climate.</td>
</tr>
<tr>
<td>2018-11-22 19:30:57</td>
<td>Yes</td>
<td>Yes</td>
<td>Climate, vegetation, seasons</td>
<td>Stop ignoring it and take action</td>
</tr>
<tr>
<td>2018-11-22 21:52:16</td>
<td>Unsure</td>
<td>Yes</td>
<td>My health</td>
<td>Follow the guidelines outlined by international bodies who work together to reduce climate change</td>
</tr>
<tr>
<td>2018-11-23 7:16:10</td>
<td>Yes</td>
<td>Yes</td>
<td>Every thing I love about the Territory will be affected including the lovely relaxed outdoor lifestyle which will be impacted by hotter temperatures, the coastal and urban environment will be impacted by more frequent and more intense storms</td>
<td>Ban fracking, commit to net zero emissions by 2030, become a leader in renewables</td>
</tr>
<tr>
<td>2018-11-23 21:08:56</td>
<td>Yes</td>
<td>Yes</td>
<td>Our weather temperatures, more extreme weather, less opportunities to go camping and do outdoor activities in the dry season due to hotter temperatures.</td>
<td>Invest in renewable energy, ban fracking and continue to invest in projects that will either not harm or better yet improve the NT environment and thus lessen contribution of our territory to climate change.</td>
</tr>
<tr>
<td>2018-11-23 21:54:34</td>
<td>Yes</td>
<td>Yes</td>
<td>Outdoor lifestyle</td>
<td>Create policies that define, educate and action change to allow us to reach zero</td>
</tr>
<tr>
<td>2018-11-23 21:54:34</td>
<td>Yes</td>
<td>Yes</td>
<td>For our and future generation’s future and comfort of living in the tropics</td>
<td></td>
</tr>
<tr>
<td>Should your local member (MLA) support a target of net zero emissions by 2050?</td>
<td>Would you support action by the NT</td>
<td>What do you love about the Territory that will be affected by climate change?</td>
<td>What do you think the NT Government should do about climate change?</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Wildlife, fishing, wetlands, great rivers, coral reefs. All of these are threatened by climate change and increasing temperatures. Look at the current threat to the flat back turtles where temp affects the sex of the young causing all young to be of the same sex which will lead to extinction. And when it's too hot all the eggs die. Same outcome. Do we really want this?</td>
<td>Decrease emissions, plant trees, BAN FRACKING!!</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>My children</td>
<td>Ban plastic bags and ban fracking would be a good start</td>
<td></td>
</tr>
</tbody>
</table>
Climate Change Discussion Paper
NT Government Department of the Chief Minister
GPO Box 4396
Darwin NT 0801
DCM.economicenvironmentpolicy@nt.gov.au

*RESTRICTED CONFIDENTIAL*

11 December 2018

To whom it may concern,

Re: Climate Change Policy Discussion Paper

ConocoPhillips Australia West (COPA-W) welcomes the NT Government’s development of a Climate Change Policy and appreciates the opportunity to contribute.

COPA-W has been in Northern Australia for nearly three decades, operating the Darwin Liquefied Natural Gas (‘DLNG’) facility and associated offshore Bayu-Undan field; and with exploration and appraisal projects, including the Barossa and Greater Poseidon projects.

DLNG has been a key asset in the COP global portfolio since 2006, delivering over 660 cargoes with the highest standards of safety, environmental and operational excellence. As the DLNG Operator, we are in discussion with several projects in Northern Australia to extend the life of DLNG following the end of field life for Bayu-Undan, post 2022.

Introduction

ConocoPhillips supports sustainable, practical climate change solutions, and believes that effective climate change policy must recognise that climate change is a global issue which requires both national and global solutions. The NT has a role to play in reducing global emissions, and its LNG industry is key long-term contributor in this effort. As well as the broader impacts of natural gas in reducing global GHG emissions, COPA-W is proud to be an industry-leader in emission abatement through our pioneering of the Savannah-Burning abatement methodology and implementation of the West Arnhem Land Fire Abatement (WALFA) project, in partnership with the Northern Territory Government and Warddeken, Adjumarllal, Djelk, Mimal and Jawoyn ranger groups.

Since 2006 WALFA has abated in excess of 2 million tonnes of CO2e, providing employment for more than 300 Indigenous rangers per year, conserving sensitive rainforest vegetation, protecting local wildlife and rock art sites and enabling cultural aspects of land management to be shared across generations.

WALFA’s success has led to the creation of the Savannah-Burning offset industry, with more than 80 projects now in operation across Northern Australia contributing more than 11% of total Australian Carbon Credit Units (ACCUS) and pilot programs in Africa and Latin America.
Response to Relevant Discussion Paper Questions

1. What (if any) GHG emissions target should the NT adopt?

Background – Australian GHG Regulation

In addressing climate change considerations, ConocoPhillips supports the use of market-based mechanisms co-ordinated with energy policy to provide long-term certainty for investment decisions. In our view, existing Federal policies of the Emissions Reduction Fund, Safeguard Mechanism and National Carbon Offset Standard provide a broadly appropriate framework in meeting Australia’s climate change commitments consistent with these principles.

However, this policy implementation must be carefully managed to balance climate change with energy supply security and economic impacts and avoid outcomes counter-productive to the overall objective of reducing global emissions.

Australia is a high cost jurisdiction and investment is far from assured; policies penalising future projects have the potential to make these multi-billion dollar investments uncompetitive in a global capital portfolio costing thousands of jobs and billions in tax revenue, while pushing energy projects to jurisdictions with lower energy regulatory standards and potentially displacing natural gas with more carbon intensive fuels.

Furthermore, it may have adverse impacts on the offset industries which have developed in unison with the LNG sector. Projects such as WALFA have provided benefits far beyond carbon abatement including remote area indigenous employment, biodiversity protection and cultural heritage renewal.

i. Acknowledge Global Emissions Benefits of Natural Gas

Climate Change is a global issue and policy settings should be set with consideration for domestic action and balanced against global outcomes. The positive role of natural gas in reducing global GHG emissions should be recognised in this process.

Increasing use of natural gas for power generation is acknowledged by the IPCC as a key pillar of the world’s progression to a lower carbon future, and Australia is at the forefront of this movement, with our LNG industry one of the most efficient, well-located and largest in the world.

Natural gas is fundamental to a shift towards a lower carbon and more efficient energy system. Progressive displacement of more carbon-intensive energy sources such as coal i.e. switching from coal to natural gas can reduce GHG emissions by 40-50% and by as much as 75% in some circumstances.

________________________
On a lifecycle comparison basis, this impact is profound; independent analysis suggests that for every tonne of CO2e emissions associated with natural gas use, including LNG production, up to 4.3 tonnes are avoided when used instead of coal by Chinese power generators.

This equates to a single train LNG project resulting in the avoidance of around 10 million tonnes of CO2e emissions each year.

Additionally, gas production is recognised as the logical partner for increasing renewable generation, where it can supplement renewables during falls in output or spikes in demand.

Any development of an NT GHG policies should therefore consider that while LNG has a high local GHG footprint it has significant global emissions reduction benefits, and that a NT GHG target would not result in a positive environmental outcome if it imposes further costs on, and therefore discourages further investment in LNG.

   ii.  Avoid Duplication

   In the NT context, any consideration of NT-based GHG policies should take as a primary consideration the avoidance of duplication with Federal GHG regulation.

   As well as avoiding inequitable and inefficient regulatory burden, this will avoid negative impacts on the NT’s domestic offsets industry.

   By way of example, the WALFA project was in effect created by DLNG’s need to fulfil a requirement of its operating license to offset a proportion of its emissions, in the absence of Federal carbon legislation.

   Once federal carbon legislation was established in 2012, the license requirement was removed. The removal of this duplicate regulation supported the ranger groups in developing a sustainable commercial model for their activities and allowed DLNG to use WALFA generated abatement to manage its carbon liability under the new legislation. This has been a critical step in the birth of the Savannah Burning offset industry, now valued at around $100M supporting both Indigenous and Pastoral Landholders.

   iii. Recognise Existing Emission Abatement Programs

   Darwin LNG is recognised globally as an industry leader in emission management through the WALFA project, delivering GHG and co-benefits for over 12 years. Any policy should recognise existing long-term commitments to emissions reductions.

   iv. Recommendation: Specific Sectoral Targets

   If a target is adopted, it should be on a sectoral basis to ensure a balanced approach customised according to the opportunities/constraints of individual sectors.

   Achieving emission reduction efficiently is an economy-wide undertaking. Just as business should look at emission reduction opportunities across its operations on a lowest-marginal cost basis, Government policy should find the least cost pathway in driving reductions across the economy.
This requires a sectoral approach to ensure that reductions are not pushed onto sectors with higher marginal abatement costs, unnecessarily reducing their competitiveness where cheaper opportunities exist in other sectors.

For example, opportunities exist in the electricity sector; where mature, commercial technologies and a demand for investment in new generation plants offers a lower cost option for affordable, lower-emission technologies to bring down the average intensity.

However, in contrast, the LNG sector has sunk investment in infrastructure that is already world’s best practice in controllable CO2 emissions, such as those seen in Darwin LNG; further reductions require retro-fitting solutions adding significant costs and eroding competitiveness.

2. What should business and governments be doing to reduce emissions

As discussed above, the private and public sector need to assess opportunities to reduce emissions on a least cost basis. From an LNG perspective, emissions come in two broad categories, venting and process.

Vented emissions involve stripping and release of ‘native’ CO2 contained in the feed gas as part of the liquefaction process. The only way to reduce these emissions is to capture and store the CO2, a technology not yet commercially mature. Significant barriers still exist to making this technology a viable option for the vast majority of projects, most notably cost, complexity along the value chain, and long-term liability issues.

Process emissions make up the majority of the carbon footprint and involve primarily combustion of gas to power the liquefaction process. Modification to plant design or operational practice resulting in more efficient fuel gas use will therefore result in lower GHG emissions.

Unlike vented emissions, commercial opportunities to reduce emissions through increased process efficiency exist, and in line with our global Corporate commitments to emission reduction, COPA-W is examining significant projects in this space.

3. How else can we apply Aboriginal knowledge and practices to help us mitigate and adapt to climate change

COPA-W are proud to be a pioneer in the harnessing of Indigenous knowledge to mitigate climate change through our support for the WALFA project. WALFA created the Savannah Burning Industry, now a major contributor to Australia’s emission reduction efforts with more than 80 projects across Northern Australia accounting for over 11% of all Australian Carbon Credit Units issued.

Indigenous land management practices have additional emission benefits not yet recognised; the NT Government can assist in the uptake of these new methodologies by playing an active role in facilitating interactions between NT project proponents and research organisations and the relevant Federal government regulatory agencies.
4. What potential opportunities can you see emerging from climate change in the Territory

As discussed above, Climate Change has created opportunities for the Territory through the creation of WALFA and the domestic offsets industry. Appropriate policymaking can continue the growth and success of fire management carbon offset projects.

More broadly, climate change provides a key driver to commercialise the Northern Territory’s vast, well-appraised offshore gas resources, currently stranded without route to markets.

Gas is critical to decarbonising Australia’s major emitter, the east coast electricity sector. Gas is key to lower-carbon power generation, and investment in high capacity pipeline infrastructure between the NT and East coast would provide the aggregated demand required to commercialise these upstream projects domestically.

This also avoids the additional processing emissions involved in importing LNG.

5. How can the fossil fuel industry further reduce emissions from energy production?

See 2

6. What type of regulations do you think would assist industry in being accountable for their impact on climate change

As discussed in (1), we believe the Federal legislative framework established under the safeguard mechanism is broadly appropriate.

7. What actions are you willing to take to mitigate or reduce the impact of climate change

Globally, ConocoPhillips has committed to reduce emissions by 5-15% on 2017 levels by 2030. At DLNG, we are focused on reducing our carbon intensity through operational and design excellence and continue to support the WALFA program.

8. What support do you need to help you to mitigate or adapt to climate change

While key contributors to lowering global emissions, major facilities like DLNG are a significant contributor to the Territory’s overall emissions profile. Large-scale opportunities exist to reduce power use and make our operations more efficient potentially significantly reducing this GHG footprint.
Government incentives to pursue these emission reduction opportunities through funding, in-kind support or facilitating federal investment may be an effective approach to reducing further emissions.

This support could also consider initiatives into alternative fuels for the transport industry, marine and road, that would assist with the transition away from conventional fuels (bunker fuel and diesel) to less carbon-intensive fuels like LNG and batteries.

Additionally, studies into Northern Territory-specific impacts of extreme weather would enable both industry and government to better plan and adapt to changes in climate.

We welcome the opportunity to further engage with Government on these collaboration opportunities.

Yours sincerely,

Kayleen Ewin
Vice President Sustainable Development, Communication & External Affairs
ConocoPhillips Australia Pty Ltd
ANNEX A: About ConocoPhillips

ConocoPhillips is the world’s largest independent exploration and production company based on proved reserves and production of liquids and natural gas. Headquartered in Houston, Texas, and listed on the New York Stock Exchange, the company has operations and activities in 17 countries and employs approximately 11,000 employees worldwide.

In Australia, ConocoPhillips’ key activities comprise of the following:

(a) ConocoPhillips is the largest joint venture owner and operator of the Bayu-Undan gas condensate field and world-class Darwin Liquefied Natural Gas (Darwin LNG) project, directly supporting more than 1300 jobs across WA, the NT and Timor-Leste and many more indirectly.

(b) In 2008, ConocoPhillips entered into a joint venture with Origin Energy Limited (Origin) to develop the Australia Pacific coal seam gas (CSG)-to-LNG project which comprises approximately 8.1 million acres of coal bed methane resource spanning across the Surat and Bowen Basins in Queensland. The joint venture vehicle for this project is Australia Pacific LNG Pty Ltd (APLNG), which is now held by ConocoPhillips, Origin and Sinopec. APLNG directly employs more than 1,400 staff excluding a significant contractor workforce.

(c) ConocoPhillips also has interests in other exploration and development projects located offshore Northern Territory and Western Australia, including the Greater Sunrise, Athena, Greater Poseidon and Caldita and Barossa discoveries.

(d) Darwin LNG will require a new gas field to be developed to backfill the Bayu-Undan gas as it declines, to remain operating post-2022. The lead candidate is Barossa, a ~A$10 billion project currently one of the only potential Australian LNG investments on the horizon, and currently in FEED (Front End Engineering and Design). A decision to proceed to FID (Final Investment Decision) on Barossa will be made in 2019-20.
COOLmob Submission: NT Government Climate Change Discussion Paper 2018

COOLmob began in 2002 as part of the national Cool Communities project, which was a partnership between community groups, environmental organisations and the Australian Government. COOLmob is the sustainable living initiative of the Environment Centre NT (ECNT) with a mission “to help and inspire our community to live sustainably and reduce their greenhouse gas emissions.” COOLmob’s role is to engage and keep the community interested in positive action. This in the past has been achieved by developing behaviour change strategies, conducting home energy audits, partnering with governments, industry bodies, community groups, businesses, schools and experts to advocate for the removal of sustainable living barriers in the Top End and provide accurate information to the community.

COOLmob has previously been funded by Territory and Federal government as well as Power and Water and the NT EPA. Committed ongoing funding is required for COOLmob to continue its role in the community. Through the Federally funded $2.4 million Smart Cooling in the Tropics Project, COOLmob were able collect valuable data and cement their role as a trusted community organisation providing free audits and retrofits to increase energy efficiency for low income earners. COOLmob has become a well-known advocate in areas such as solar, tropical design, energy pricing, metering and billing and has been successful in the local media.

COOLmob welcomes this opportunity to contribute to the development of the NT Government Climate Change Strategy. The development of a wide-reaching strategy that is strong and serious about reducing the NT’s greenhouse gas emission production, mitigating the climate change effects which are already being experienced in the Territory and preparing the people, economy and the environment for the future is desperately needed and well overdue.

The NT is one of the few First World economies in the tropical band. Forty percent (University, 2017) of the world’s population lives within these latitudes, many in low socioeconomic circumstances, but with developing economies, and a rising middle class, they are set to consume more energy. This will be compounded by climate change (King & Harrington, 2018). In the Top End we have an opportunity to apply our skills and capacity to research renewables in tropical conditions, energy efficiency, behaviour change and climate change adaptation. There is also a similar opportunity in Alice Springs and the southern NT.

If unconventional gas (fracking) goes ahead to the extent proposed, the Northern Territory will have the highest per capita carbon footprint in the world (The Australia Institute, 2018), contributing to the Territory’s susceptibility to increased temperatures and extreme weather.

Reducing consumption across all sectors is an essential, but often underrepresented factor in the Climate Change arena. Much emphasis is put on renewable energy, which we endorse, but reducing personal and commercial consumption through behaviour change and education is effective, and more importantly immediate. Below are recommendations that are essential for the NT to effectively meet the 2015 Paris Agreement goal of limiting global warming to less than 2°C. These recommendations have been sorted into mitigation, adaptation and opportunities and detail the ways COOLmob can contribute to their successful development and delivery.
Mitigation:

Education
It is vital that Territorians understand the risks associated with climate change. COOLmob has the potential to educate the community around their energy use and carbon footprint impacts on the environment and living costs. An educated and aware community will increase the capacity of Territorians to take actions that will decrease their carbon footprint. Currently as part of the Energy Efficiency Education Project, COOLmob provides a year 5 and 6 curriculum-based unit on energy efficiency to a wide range of schools. This could be expanded on a long-term basis and to a wider range of schools and students. This is a key opportunity to influence young minds and is a proven mechanism to impacting behaviour in the family home. In the current 2018/19 Project, COOLmob is running the program in a total of 12 schools across greater Darwin and Alice Springs, and there is the interest from additional schools if funding were allocated. COOLmob could also develop and deliver a Top End specific climate change / sustainable living curriculum unit to schools. Finally, COOLmob would also be in a position to deliver public education more broadly including public lectures, host informative talks and idea sharing events, business engagement, behaviour change and capacity building workshops as well as a robust social media and website campaign.

Home Audits and Behaviour Change program
COOLmob home energy audits and direct education programs can help Territorians to save both time and carbon emissions by directly educating home occupants about reducing their energy consumption. Currently COOLmob is only mandated to service low income households. However, as published in the Smart Cooling in the Tropics report, a previous COOLmob project working with low income households, low income people are already quite good at saving electricity as they are frugal with all their resources (Steinborner, et al., 2016). To realise significant gains in reduced CO2 via reduction in energy consumption, the mandate must shift to higher consumption households. This could be done via a subsidised system, where users pay for part of the service. Ongoing core funding is required to realise these relatively easy gains.

Adaption

Climate justice for low income earners
- COOLmob can assist in ensuring the Government is achieving climate change justice for all sectors of the community, including preparing those most vulnerable to climate change impacts like low income households who are often renters or living in Territory housing. Valuable data collected through COOLmob auditing projects demonstrates that low income earners generally behave in a way that consumes less energy than non-low income earners as they are more sensitive to the cost of power. These Projects’ found that it is the type of unsuitably designed housing that low income earners tend to live in which prevents them from lowering their power bills as they are essentially forced to use mechanical cooling to maintain a comfortable temperature.

Some of the relevant recommendations from the COOLmob Smart Cooling in the Tropics Project (Steinborner, et al., 2016) to increase climate change resilience for low income earners include:
- Retrofit programs for low income earners for heatwave resilience - such as a shade rebate to ensure health impacts are mitigated.
- Refugee energy consumption study would be beneficial as the Smart Cooling in the Tropics Project and current project are showing a decent proportion of participants are refugees, and peer to peer learning is high in these communities – train the trainer model could be cost effective and beneficial. These communities also have language barriers and low energy literacy – being able to access trusted information in their language is difficult.
- NT Housing improvement program could use findings from Smart Cooling in the Tropics Project to upgrade existing stock for energy and comfort gains. A collaboration with NT Housing’s maintenance program could be innovative as it could look at an ‘at cost scale’ – the Smart Cooling in the Tropics Project found that fixing security screens and ceiling fans was very cost and comfort efficient.
- COOLmob could assist with pathway development, program development and consultation to ensure the NT Government includes low income households in the clean energy transition through providing robust and wide-reaching rebate schemes to enable solar PV installation and energy efficiency appliance upgrades. The NT Government could draw on current Victoria and New South Wales Government schemes for development.
Commercial auditing and business/industry engagement

Through a commercial energy auditing program, COOLmob can assist large and small businesses in the NT including schools, hospitals, NT Government buildings, commercial buildings and retail stores with understanding their current energy consumption and provide detailed strategies to move to more efficient operations. This will increase efficiency, decrease running costs, decrease GHG emissions and increase community awareness and education. This is directly aligned with the “Conduct energy efficiency audits of existing Government dwelling designs to assist with transitioning all government buildings to energy efficient lighting and support sound decisions on upgrading, demolishing or disposal” opportunity identified in the Climate Discussion Paper.

COOLmob could partner with the Government and Local Councils to develop a business engagement strategy that educates and incentivises businesses to incorporate emission reduction pathways into their corporate strategies. Local Councils and Territory Governments could fund rebates or no interest loans to create further opportunity. Similar programs have proven very successful in Australia such as the Sustainable Melbourne Fund.

Build Environment/Infrastructure

COOLmob could create a partnership with Local Councils focusing on the emissions generated from multi-unit dwellings (MUDs), and through providing rebates and or grants, such a program could encourage MUDs to take action such as installing solar, or retrofitting, to reduce their greenhouse gas emissions.

COOLmob could assist the NT Government in developing a tropical climate specific energy efficiency rating tool for commercial and domestic buildings that aimed at mandating net zero carbon designs by a particular date, i.e. 2030. Through the introduction of tropical climate specific building and planning regulation changes that support development in an environment where sea levels and temperatures are increasing, Territorians will have access to cheaper power bills, increased home energy efficiency, and will be able to decrease their greenhouse gas emissions.

COOLmob could assist the NT Government in creating a mandatory scorecard for all properties, including rented properties. This scorecard could be similar to that which is being created in Victoria, which requires landlords to ensure properties meet appropriate standards to increase energy efficiency and reduce climate pollution.

COOLmob advocates, in line with Australian Sustainable Built Environment Council ((ASBEC), 2018) for better building codes and policy on housing stock for both residential, commercial and government facilities and housing. We would recommend improved shading and insulation standards, promotion of options for passive cooling where possible (temporally and spatially) and the incorporation of outdoor recreation spaces into building codes and policies.

Opportunities:

COOLmob have a unique position within the community and are proficient in the following skills, all of which are a vital component to successfully delivering a Climate Change Strategy:

- Education – schools
- Education – public
- Education - Household/individuals
- Audits – Domestic
- Audits – Commercial
- Data collection and Analysis
- Policy advice and Advocacy

With increased funding, COOLmob would be able to build its capacity in all the areas outlined above as well as expanding their reach. An example of this could include extending domestic audits beyond low income households to high energy using households. Further exciting opportunities COOLmob can see include working with Government using existing data and knowledge to improve on housing stock and regulations, energy policy and behaviour change projects.
Furthermore, with funding and support COOLmob has identified ways below which demonstrate how we could support identified opportunities in the Discussion Paper;

- “Establish new businesses in clean energy technology and related areas (e.g. renewable energy storage)” as we have always advocated for renewable technologies
- “Employ innovative energy saving practices to increase productivity and reduce costs”. This is our core business, and we have expertise, data, statistics and proven experience to deliver this successfully.
- “Building design guidelines for Government buildings could incorporate specific environmental efficiency strategies to mitigate higher average temperatures”. COOLmob would be able to audit Government Housing, and work alongside industry experts to develop tropical climate specific principles to ensure buildings were increasing in energy efficiency and able to withstand rising temperatures in an efficient manner.
- “Enhance the passive cooling capabilities of the housing stock and installing insulation will help to mitigate higher demand for electricity”. COOLmob argues that for this to be achieved there needs to be a new, climate specific building code and regulations introduced to ensure new buildings and alterations to existing houses are required or at very least strongly encouraged to incorporate passive design principles. COOLmob could work alongside the Government to introduce a program that addressed poor passive cooling principles in existing housing stock.
- “Develop an Electric Vehicle Implementation Plan and assess demand for provision of electric vehicle charging in new Northern Territory Government infrastructure”. COOLmob would support, investigate distributed car battery storage, hydrogen vehicles (from EL report)
- “Install smart meters to assist residential and the commercial sectors to reduce energy consumption”. Smart Grids are an essential step in hardware for both mitigation and adaption.
- “Conduct energy efficiency audits of existing Government dwelling designs to assist with transitioning all government buildings to energy efficient lighting and support sound decisions on upgrading, demolishing or disposal”. As mentioned above, COOLmob could provide advice generally, conduct commercial audits, and assist with the policy development around this project. This could then be used as a case study to encourage the private sector to increase energy efficiency.
- COOLmob could support development of an NT Centre of Climate Change to test innovative applied research and technology as we are well positioned to be an intermediary between experts, governments, local councils and business
- COOLmob can support development of educational programs in schools, training programs in businesses and general awareness raising programs to increase awareness about the environment and what everyone can do to contribute as we are already doing this.

References


Submission to the Northern Territory Government Climate Change Strategy Discussion 2018:

Dr Charlie Ward

Climate Change Mitigation and Adaptation Opportunities in the Northern Territory

Introduction:
I am a research consultant based in the Northern Territory for the last 18 years. I have been researching the science of climate change and the implications of effective mitigation and adaptation since 2016. Based on my reading of the literature, it is my firm opinion that regardless of potential NTG climate mitigation strategies, the Territory will continue to see observable population decline during the coming decades as temperatures continue to rise. This decline is already observable anecdotally and is a relatively inconsequential and foreseeable effect of anthropogenic climate change which may, on present trends, be regarded as an existential threat to humanity.¹ Yet population decline and the rate and amount at which NT temperatures rise will be determined partially by the future rate of global GHG emissions. It is because each jurisdiction is affected by emissions from all jurisdictions globally, yet can only exert influence within its own borders, that the only conscionable course of action before the NTG is pre-emptive and collective: a legislated net zero emissions target enforced in the most rapid timeframe possible. A negative target (less than zero) would be appropriate for any jurisdiction aiming for status as ‘good global citizens’.

Because the effects of the climate change crisis are ubiquitous (affecting every aspect of the lives of Territorians), this submission will argue that radical action be taken by the NT Government in its climate strategy. As the NTG’s Climate Strategy Discussion Paper states, the challenge is to maximise the benefits to Territorians that climate change presents. This submission has been written with a view to meeting that challenge.

What (if any) GHG emissions target should the Northern Territory adopt?

On the question of an Emissions Reduction Target (ERT), a Climate Change Strategy is meaningless unless it contains a legally-enforceable target. The opportunity exists for the Territory to distinguish itself as a leader in this regard. With its small population and “developing economy” as the NTG terms it, meeting an ERT in a short time-frame will be easier to operationalise than in larger jurisdictions. The only conscionable option for government bodies at this point in the climate catastrophe is a net zero ERT. Evidently, the development of both onshore and offshore gas industries by the NT government has and will (if the CSG industry is developed) make meeting such a target (and Australia’s

commitments to limit global warming to 2 degrees under the Paris Agreement) immeasurably harder.

**What should business and governments be doing to reduce their emissions?**

The NT Government employs 18% of Territory workers and uses 20% of all the electricity in the NT. A profound opportunity for leadership, education, resilience-building and emission reduction therefore exists, by adopting a zero emissions target for all NTG fleet, buildings, infrastructure, enterprises and government-supported activities. This process requires a whole-of-government approach to rapid baseline auditing of NTG emissions and the adoption of scalable, incremental reduction targets across all of the above.

Business: The NTG needs to provide tax concessions and other incentives for all businesses reducing their emissions. By taking action in the following areas, businesses large and small can help the Territory towards carbon neutrality: energy efficient buildings; zero emission transportation; renewable energy; waste reduction and water efficiency; carbon accounting and carbon offsetting. The Carbon Neutral Adelaide Business program provides a useful model to inspire the mitigation activity in the NT’s non-Land Use, Land Use Change and Forestry (LULUCF) sectors.

A flaw in the Climate Strategy Discussion paper is its failure to convey that the activities of the Land Use, Land Use Change and Forestry (LULUCF) sector are amenable to favourable intervention regarding emissions. The time is ripe for the NTG to establish new carbon fund arrangements to provide financing for investment in land management, renewable energy technology and other sustainability programs in the Territory; to ensure Territory land managers are at the forefront of sustainable land management, running economically and environmentally sustainable businesses; to research emissions reduction opportunities for Northern Territory agriculture and forestry; and to support landholders to use carbon offset markets to reduce the emissions from savanna burning by 500,000 tonnes per year by 2030.

**How can the fossil fuel industry further reduce emissions from energy production?**

To avert mass social, environmental and economic catastrophe, the fossil fuel industry must repurpose itself to renewable energy as rapidly as possible. The Climate Strategy Discussion Paper is commendable for its admission that the development of offshore and onshore gas industries is and will affect the Territory’s carbon emissions enormously. If the aim of the NTG’s Climate Strategy is to reduce emissions in the Territory, such a strategy would run directly counter to the NTG’s ongoing efforts (as of November 2018) to position the Northern Territory as hub for gas extraction and processing.

The Climate Discussion paper advances the discredited claim that gas is a relatively cleaner fuel (presumably than coal). This argument was advanced by the International Energy

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Agency in 2011 and fossil fuel interests since, but has been widely discredited, based spuriously on predictions of ideal conditions for the gas industry, the stagnation of renewable energy prices, a limited portion of the LNG life cycle and the omission of fugitive emissions.³

LNG is not a transition fuel. To reduce its emissions from energy production, the Gas industry in the Territory must transition as rapidly as possible to solar. Recommendation 9.8 of the NTG’s Fracking Inquiry, that the industry offset all emissions from unconventional gas extraction in the Territory, is now commonly recognised as a severely impractical, prohibitively expensive and beyond the capacity of an NT government.⁴ Given that renewable energy is now an increasingly cost competitive alternative to gas, and can drive down GHG emissions rather than increase them, with comparatively minimal environmental risk, it is obvious that the only ‘advantage’ of an active fossil fuel industry in the Territory is one of self-benefit: the profit it can generate for its commercial proponents.

**What type of regulations do you think would assist industry in being accountable for their impact on climate change?**

I do not have expertise in statute law, regulatory frameworks, legislation and governance. I would suggest though that a carbon tax which invokes significant costs on the basis of companies’ emissions is fundamental. Political donations from the mining industry should be banned, and every donation over $1000 must be disclosed publicly in real time.

**What support do you need to help you mitigate or adapt to climate change?**

Firstly, access to thoroughly-researched, honest, accurate research laying out the projected effects of climate change in the NT and each suburb/area of residence under various degrees-of-warming and GHG emission scenarios. This requires the NTG to fund this research, preferably locally via the creation of a dedicated research centre at Charles Darwin University, as a matter of priority.

Rebates and support for domestic solar uptake should be a priority, as should the development of an expanded hydrogen fuel cell-powered bus network. In combination with a shift from road to rail, subsidised local agricultural industries—NT ‘protectionism’ will foster the production of more food locally, reducing the large ‘food mile’ carbon footprint of foods currently available. Research and development funding for a Top End engineered bamboo industry—a low carbon local and interstate building material—for use reducing the energy footprint of new and existing housing.

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How else can we better apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

I am not Indigenous so cannot answer this question.

**What potential opportunities do you see emerging from climate change in the Territory?**

Largescale investment in solar energy, energy independence, exporting that energy interstate. With government vision and support, Darwin and Alice Springs can be re-visioned and re-branded. Darwin has the potential to position itself as a model and visitor destination of twenty-fist century Tropical Living, climate resilience, mitigation and adaptation. Similarly, Alice Springs could become a model of sustainable Arid Lands living along the same lines. These can be achieved via the retrofitting and redesign of buildings, hydrogen fuel cell–powered public transport, rescheduling of outdoor physical labour and sport, greatly expanded tree-planting, and de-carbonisation across all sectors. This transition will require government support for research and development. Capacity for this to occur exists at the Desert Knowledge Precinct in Alice Springs and can be created at Charles Darwin University Casuarina Campus once the new ‘City Deal’ campus is developed.

Because temperatures increasing in northern Australia ahead of more southern latitudes, the Territory is and will continue to be ideally positioned to provide greater employment and heat illness-related specialised training for health professionals. Similarly, with government leadership, the provision of high-level research and expertise in all aspects of climate adaptation, including product development, will be a growth industry in Northern Australia before the southern states.

**Conclusion:**

Recent independent analysis by The Australia Institute shows that offsetting GHG emissions from the fracking industry in the NT is impossible, and that NT-generated emissions alone will render Australia unable to meet our commitments to limit global warming to less than two degrees under the 2017 Paris Agreement. In light of significant resentment in the electorate over this matter if nothing else, the NTG needs to take radical, far-reaching action on climate change immediately. The NTG’s 2009 Climate Policy promised much and was largely abandoned. In terms of creating a viable future in the Northern Territory, we simply do not have the luxury of allowing this to occur again.

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INCREASING CLIMATE RESILIENCE IN THE NORTHERN TERRITORY: HARNESSING OPPORTUNITIES AND MITIGATING CLIMATE RISK

A RESPONSE TO THE NORTHERN TERRITORY GOVERNMENT'S CLIMATE CHANGE DISCUSSION PAPER

DR ELLIN LEDE
OVERVIEW

In October, 2018, the Northern Territory Government (NTG) released the Climate Change Discussion Paper. The Discussion Paper details the Northern Territory’s (NT) greenhouse gas (GHG) emission trajectory; outlines the projected climate change impacts; and highlights action already being undertaken in the NT to mitigate and adapt to climate change. In addition, potential opportunities associated with climate action are advanced.

The NTG has requested feedback, to inform the development of a climate change strategy and action plan. This report aims to respond to the Climate Change Discussion Paper.

This research was conducted throughout a three-month fellowship funded by the German Federal Ministry of Education and Research (Green Talent Award for High Potentials in Sustainable Development, 2017). The fellowship was undertaken at the NewClimate Institute for Climate Policy and Global Sustainability in Germany; a leading not-for-profit climate change research institute.

All views expressed in this report are the authors own.

Thank you to all of the experts, both in Australia and in Europe, who provided valuable advice and feedback to inform the development of this report.

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Ellin has advised governments; the private sector; and not-for-profits – including the National Government of Vietnam; the City of Paris; and the UK water sector – on increasing climate resilience.

1 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.
SUMMARY

The NTG’s response to climate change must reflect the level of risk. Climate change poses severe risks to all Territorians – loss of life; irreparable damage to human and natural systems; and significant economic costs. The response required is unprecedented.

It will require far-reaching and rapid changes within all sectors. Economic growth can no longer be coupled with an increase in GHG emissions. To remain within a ‘safe’ climate system boundary, a deep reduction in global net human-caused GHG emissions must be realised.

For the NTG to mitigate dangerous climate risk, a comprehensive evidence-based climate change policy must be implemented along with an emissions reduction target of net zero emissions by 2050.

The NT is being left behind the curve - Queensland; New South Wales; Victoria; the Australian Capital Territory; South Australia; and Tasmania have net zero emission targets and are realising the opportunities associated with a low-carbon transition. Compared to a business as usual pathway, bold climate action at a global scale could yield a direct economic gain of USD26 trillion by 2030 – and this is a conservative estimate².

If strategically designed and implemented – with a people-centred focus – a low-carbon transition will deliver clear benefits to people; ecosystems; and economies. Importantly; the technology and expertise required for this transition are available today.

When compared to the costs posed by not taking action, there is no other avenue but to implement wide-reaching climate change mitigation and adaptation measures within the NT.

The NTG must engage all sectors across the Territory to achieve the scale of change required. There is a considerable level of expertise within the NT to meet this challenge.

This report serves to highlight examples of how the NTG can respond to climate risk and simultaneously realise the significant benefits in doing so. It is divided into examples of mitigation opportunities; risks not yet considered; and adaptation. The report offers recommendations, summarised below.

It must be noted, this report does not provide a comprehensive overview of the mitigation opportunities available. It instead aims to highlight examples of potential avenues the NTG can pursue. Mitigation of GHG emissions must be realised across all sectors.

There is a short window of time to act. It is crucial pragmatic and evidence-based political decisions are made now to ensure the best outcomes for Territorians.

REPORT OUTLINE

SECTION 1: STATE OF THE EVIDENCE

CLIMATE CHANGE SCIENCE OVERVIEW (Page 4)

1. The risks posed to Territorians are severe and need to be mitigated, as a matter of urgency

SECTION 2: IMPLEMENTING AN EVIDENCE-BASED POLICY

TRANSITION TO A LOW-CARBON ECONOMY (Page 5)

1. Develop a comprehensive climate change policy to mitigate climate risk

2. Establish an independent Climate Resilience Advisory Committee – comprised of experts and relevant stakeholders – to inform the low-carbon transition process

EMISSIONS REDUCTION TARGET (Page 6)

1. Legislate a science-based emissions reduction target of net zero by 2050. Include interim targets and sector-specific targets

SECTION 3: MITIGATION OPPORTUNITIES FOR THE NORTHERN TERRITORY

MAXIMISE RENEWABLE ENERGY GENERATION (Pages 7-8)

1. Set the post-2030 (maximising) renewable energy target, including interim targets, and begin the transition process

2. Determine the potential for different renewable energy technologies to contribute to the NT’s future energy mix

HARNESS NEW ECONOMIC OPPORTUNITIES (RENEWABLE ENERGY) (Pages 9-11)

1. Investigate potential pathways for the NT to become a net energy exporter

2. Determine the feasibility of attracting new industries to the NT with the incentive of inexpensive, clean, electricity

3. Explore the potential for the NT to become a world-leading research hub for renewable energy technology

4. Investigate the feasibility of establishing a renewable hydrogen industry in the NT
NATURAL GAS: NOT A BRIDGING FUEL FOR THE TRANSITION TO RENEWABLES (Pages 12-13)

1. Natural gas should not be advanced as a low-carbon bridging fuel for the transition to renewables

2. Economic modelling; decarbonisation; and climate risk must be integrated into the decision-making process when determining the NT’s development pathway

ENERGY EFFICIENCY IN BUILDINGS (Page 14)

1. Undertake energy retrofits across the Territory’s building stock to optimise energy savings. Investigate complementary strategies to increase energy efficiency (e.g. demand management).

2. Mandate energy efficiency building codes to maximise emission reductions and cost savings. Ensure these are consistently updated to reflect technological advancements

3. Establish the NT as a hub for climate resilient and sustainable design

SECTION 4: RISKS NOT TAKEN INTO CONSIDERATION

STRANDED FOSSIL FUEL ASSETS (Page 15)

1. The NTG needs to factor the global low-carbon transition - and the subsequent risk of stranded fossil fuel assets - into government decision-making processes

RISK OF LITIGATION (Page 16)

1. Take legal duty of care (tort law) and human rights into consideration when developing the NTG’s response to climate change

SECTION 5: ADAPTATION

CLIMATE RISK ASSESSMENT AND ADAPTATION STRATEGY (Pages 17-18)

1. As a matter of urgency, climate change risks for the Northern Territory need to be comprehensively investigated and determined (climate risk assessment)

2. An adaptation strategy then needs to be developed, taking into account both short- and long-term climate risks and differentiated impacts

CROSS-SECTORAL ENGAGEMENT (Page 19)

1. Implement evidence-based mechanisms to engage all Territorians in building climate resilience
SECTION 1: STATE OF THE EVIDENCE

To increase climate resilience, rapid, far-reaching, and deep reductions in greenhouse gas (GHG) emissions are required (net zero carbon emissions by 2050)

There is scientific consensus: greenhouse gas emissions need to decline rapidly to net zero. Net zero is achieved when more GHG emissions are stored or sequestered than are released to the atmosphere.

This is consistent with the Paris Agreement science-based target; ratified by 197 countries, including Australia: Limit global warming to less than 2°C and pursue efforts to limit warming to 1.5 °C (above pre-industrial levels). This target was selected as within this threshold, the climate system is likely to remain in a habitable and stable state.

Warming at 1.5 °C is not considered ‘safe’ for most nations; communities; ecosystems; and sectors and poses significant risks to natural and human systems (compared to current warming of 1°C).

The IPCC Special Report on Global Warming of 1.5 °C, released on 8 October, 2018 (3 days after the NTG Climate Change Discussion Paper) determined the feasibility of limiting warming to 1.5 °C. The report synthesised the best available scientific evidence; citing more than 6,000 scientific references. Thousands of expert and government reviewers contributed to the process.

The IPCC Special Report determined limiting global warming to 1.5 °C would require rapid and far-reaching transitions in land; energy; industry; buildings; transport and cities. All sectors need to decarbonise.

Global net human-caused emissions of the carbon dioxide need to fall by approximately 45% from 2010 levels by 2030, reaching net zero by around 2050. This would require wide-sweeping and unprecedented changes in all aspects of society, with clear benefits to people and ecosystems.

While unprecedented in scale, this transition is possible. The technology and expertise to achieve this transition are available today. If this transition is strategically executed, significant co-benefits can be realised. However, the longer deep cuts in emissions are delayed, the more costly and difficult it will become, and the higher the subsequent climate risks. Unless rapid and deep emissions reductions are realised, the 1.5 °C carbon budget threshold could be passed in as little as 15 years.

RECOMMENDATION

1. The risks posed to Territorians are severe and need to be mitigated, as a matter of urgency

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5 UNFCCC, Paris Agreement Article 2(1)(A).


7 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.

8 Ibid.

9 Intergovernmental Panel on Climate Change (IPCC), “IPCC Press Release: Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C Approved by Governments.”

10 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.

11 Ibid.
SECTION 2: IMPLEMENTING AN EVIDENCE-BASED POLICY

TRANSITION TO A LOW-CARBON ECONOMY (DECARBONISATION)

The Northern Territory must transition to a low-carbon economy (and rapidly). Significant opportunities can be realised if the transition is effectively managed.

The Discussion Paper states the Territory needs to play its role in international and national efforts to reduce emissions and adapt to the impacts of our changing climate. Australia is a developed nation, and as a developed nation, we have the capacity to commit to deep emissions reductions. To stay within a ‘safe operating space for humanity’, economic growth needs to be decoupled from carbon emissions. Economic growth is achievable without high greenhouse emissions. If effectively planned and implemented, climate solutions can deliver significant economic opportunities. Bold climate action could yield a direct economic gain of USD26 trillion through to 2030 compared with business as usual. This is likely to be a conservative estimate.

Lower risk. The lower the cumulative greenhouse gas emissions, the lower the risks and the associated costs – in terms of lives; social disruption; infrastructural damage; economic costs; and damage to the natural systems Territorians rely on. The current costs of weather-related risks are already significant. In 2017, the economic costs of extreme weather events in the NT was $1.3 billion. This figure does not incorporate the economic costs of heat waves or other climate-related hazards. Extreme weather events are projected to intensify in the NT as global warming increases.

Economic risks of not decarbonising. There are significant risks posed for emissions-intensive resource-based economies as the world decarbonises (by 2050, all fossil fuels – including natural gas – must be phased out or compensated for). Risks include stranded assets and the implementation of mandatory stringent targets to lower emissions. In October, 2018, New York’s Attorney General sued Exxon Mobil, following three years of extensive investigation. It claimed that Exxon Mobil defrauded shareholders by downplaying the risks of climate change to its business, namely, that stringent regulations to reduce greenhouse gas emissions would inevitably be required.

RECOMMENDATIONS

1. Develop a comprehensive climate change policy to mitigate climate risk
2. Establish an independent Climate Resilience Advisory Committee – comprised of experts and relevant stakeholders – to inform the low-carbon transition process

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12 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.
17 Ibid.
18 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.
19 Earth Systems and Climate Change Hub, Climate Change Science for Northern Australia.
20 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
21 Gillis and Krauss, “Exxon Mobil Investigated for Possible Climate Change Lies by New York Attorney General Image”; Schwartz, “New York Sues Exxon Mobil, Saying It Deceived Shareholders on Climate Change.”
EMISSIONS REDUCTION TARGET (NET ZERO BY 2050)

Without an emissions reductions target, the Northern Territory is forfeiting the opportunities associated with decarbonisation that other governments and organisations are seizing.

Falling behind the curve. Victoria has legislated a net zero emissions target by 2050 (with five yearly interim targets to meet the long-term target)\(^{22}\); NSW has committed to net zero by 2050\(^ {23}\); Tasmania achieved net zero emissions in 2018\(^ {24}\); South Australia has a net zero emissions by 2050 target and a legislated climate change framework\(^ {25}\); Queensland has committed to net zero by 2050\(^ {26}\); and the ACT recently revised their net zero emissions target from 2050 to 2045\(^ {27}\).

Over 9000 cities – representing over 780 million people - have joined the Global Covenant of Mayors for Climate Change & Energy; an international alliance of cities and local governments who are committed to transitioning to a low emission, resilient society\(^ {28}\).

Companies are also establishing science-based emissions reduction targets; enabling decarbonisation to be integrated into long-term decision-making and boosting competitive advantage. They include: McDonalds; NIKE; Nestle; Ericsson; Origin Energy; Westpac; and Teachers Mutual Bank\(^ {29}\). Australia’s red meat industry is investigating the potential to become carbon neutral by 2030, in collaboration with the CSIRO\(^ {30}\).

Investor confidence. The Corporate Leaders Group - bringing together business leaders to accelerate progress - has called for governments to adopt a net zero emissions target by 2050\(^ {31}\). They argue this target will send a strong signal and galvanise business action; unlocking the innovation and creativity required to transition to a low-carbon economy. Members include: Unilever; Coca Cola; GlaxoSmithKline; and Lloyds Banking Group.

Enabling new insights and stimulating innovation. Mandating a target will also facilitate the integration of new – and advanced – approaches to inform long-term decision-making in the NT. For example, Google and the Global Covenant of Mayors have developed the Environmental Insights Explorer\(^ {32}\); an online tool enabling cities instant access to emissions and climate projections data; as well as recommendations and resources to mitigate emissions and deliver substantial co-benefits.

RECOMMENDATION

1. Legislate a science-based emissions reduction target of net zero by 2050. Include interim targets and sector-specific targets.

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\(^{22}\) Victoria State Government, “Emissions Reduction Targets.”


\(^{25}\) Government of South Australia, “South Australian Climate Change Action.”

\(^{26}\) Department of Environment and Heritage Protection, Pathways to a Clean Growth Economy: Queensland Climate Transition Strategy.

\(^{27}\) Burgess, “ACT Brings Forward Zero Net Emissions Deadline to 2045.”

\(^{28}\) Global Covenant of Mayors for Climate & Energy, “Global Covenant of Mayors for Climate & Energy.”

\(^{29}\) Science Based Targets, “Companies Taking Action.”

\(^{30}\) CSIRO, “The Australian Red Meat Sector Could Be Carbon Neutral by 2030.”


\(^{32}\) Google and Global Covenant of Mayors for Climate & Energy, “Environmental Insights Explorer.”
SECTION 3: MITIGATION OPPORTUNITIES FOR THE NT

There are significant opportunities inherent in decarbonising that need to be fully considered. Two of these are detailed here: maximising renewable energy generation and optimising energy efficiency in buildings.

These mitigative actions would meet the NTG’s key priorities: increasing local jobs; growing research, innovation and training capacity; and contributing to energy security.33

MAXIMISING RENEWABLE ENERGY GENERATION IN THE NORTHERN TERRITORY

Maximising renewable energy generation makes economic sense.34 To achieve the Paris Agreement target, the power sector needs to be completely decarbonised by around 2050 (at the latest).35

This is now economically feasible, given the steep decline in the cost of renewable energy generation and storage and low-carbon technological advancements. The rapid decline in costs surpassed all expert projections in recent years and continued reductions are anticipated.36 The International Renewable Energy Agency (IRENA) project that within two years all renewable energy generation technologies that are now in commercial use will either be cost comparable with fossil fuels or cheaper.37

57 nations now have 100% renewable electricity targets and in 2017, global investments in solar energy surpassed investments in gas, coal, and nuclear combined.38 Investing in solar PV is now cheaper than developing new gas and coal power stations and in many circumstances is even cheaper than running existing coal power stations.39

The Australian Renewable Energy Agency (ARENA) report that in 2016-2017, there was a total of AUD1.2 billion in new renewable energy investment nation-wide.40 Record levels of renewable energy generation are being consistently set in Australia.41 Grid renewables and rooftop solar supplied 25.6% of total electricity supply in August, 2018.42 100% of Canberra’s electricity will be delivered by renewable energy by 2020 and this transition delivers significant benefits; ACT’s renewable energy program has directly contributed over $500 million in local economic benefits.43

33 Gunner, “Creating Local Jobs - NT Gas Strategy Revealed.”
35 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
38 REN21, Renewables 2018 Global Status Report.
41 Crooks, “New Wind and Solar Generation Costs Fall below Existing Coal Plants.”
42 Australian Renewable Energy Agency (ARENA), ARENA Annual Report 16/17.
44 Saddler, National Energy Emissions Audit.
45 ACT Government, “100% Renewable Energy for Canberra by 2020.”
46 ACT Government, Canberra 100% Renewable.
Businesses – large and small – have also realised the economic benefits of investing in renewable energy. Companies including Telstra, Sun Metals, and GFG Alliance are making significant investments in renewables. Internationally, seven of the world’s largest companies have made a commitment to 100% renewable energy generation, including: Microsoft; Apple; Google; IKEA; Johnson & Johnson; and Amazon.

According to extensive analysis (Electricity Network Transformation Roadmap Report; 2017) by the CSIRO and Energy Works Australia – the peak national body representing gas distribution and electricity transmission and distribution businesses— a transition to zero emissions electricity sector by 2050 is viable and can deliver a positive energy future for Australians: enabling choice; lower emissions; lower costs; and high security and reliability. However, this pathway needs to be comprehensively planned for as soon as possible. Without an adequate transition strategy – including significant market reform and long term climate policy – the transition will be uncontrolled and highly inefficient.

**Maximising renewable energy.** Australia has the highest level of average solar radiation (per square metre) in the world; the annual solar radiation is approximately 10,000 times Australia’s annual energy consumption. Solar energy resources are greatest in the northwest and centre of Australia.

In 2017, the NTG announced the Roadmap to Renewables target: an increase in renewable energy generation from 4% to 50% within the electricity sector by 2030.

This target aligns with a decarbonisation trajectory in the electricity sector, but it is crucial to consider: we only have 12 years until 2030, yet, energy infrastructure has a lifetime of approximately 40 years. As such, infrastructural investments made now will have a life-time beyond 2050. To achieve decarbonisation in the electricity sector, a beyond-2030 target needs to be determined as soon as possible to ensure an optimal and cost-effective transition is achieved.

**The target.** A beyond-2030 target should aim to maximise renewable energy generation as much as is technologically feasible (up to 100%).

**RECOMMENDATIONS - MAXIMISE RENEWABLE ENERGY GENERATION**

1. **Set the post-2030 (maximising) renewable energy target, including interim targets, and begin the transition process**

2. **Determine the potential for different renewable energy technologies to contribute to the NT’s future energy mix**

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47 The Climate Council, ** Renewables & Business: Cutting Prices and Pollution.**
48 ARENA, **The Business of Renewables.**
49 CSIRO and Energy Networks Australia, **Electricity Network Transformation Roadmap: Final Report.**
50 Parkinson, “Households Will Be at Centre of Australia’s Transition to 100% Renewables”; CSIRO and Energy Networks Australia, **Electricity Network Transformation Roadmap: Final Report.**
51 Australian Renewable Energy Agency (ARENA), **Australian Energy Resource Assessment (Chapter 10; Solar Energy).**
52 Langworthy et al., **Roadmap to Renewables: Fifty per Cent by 2030.**
53 Union of Concerned Scientists, “Average Life Expectancy of Select Infrastructure Types and Potential Climate-Related Vulnerabilities.”
There are significant co-benefits associated with decarbonisation of the power sector. These include (but are not limited to):

**New job creation.** Globally, there were 9.8 million jobs in the renewable energy sector in 2016 and this is projected to rise to 24 million by 2030\(^54\). In Australia, there are 13,900 jobs within the renewables sector, with 6,100 in solar photovoltaic\(^55\).

Scenario modelling (Ernst & Young’s Australian electricity forecast model) projects that if renewable energy generation growth increased from 34% of total electricity in 2030 (business as usual scenario), to 50% by 2030, over 28,000 new (additional) jobs would be created. These jobs would be created in: construction; operation; maintenance of renewable energy installations and related industries\(^56\).

This needs to be compared to job growth rates under alternative energy pathways. As outlined by The Australia Institute (Economies of Shale; January, 2018), unconventional gas extraction in the NT is unlikely to provide significant economic benefit and has a high level of associated risk\(^57\). Independent economic analysis provided by ACIL Allen – commissioned by the Hydraulic Fracturing Scientific Inquiry – found there is a ‘very high probability’ that an unconventional gas industry would ‘fail to commercialise’ in the NT (‘Shale Calm’ scenario). In the highest production scenario (‘Shale Gale’ scenario) – deemed to have a ‘very low’ or ‘low’ level of probability of occurring – ACIL Allen estimate direct and indirect employment in the NT would translate to 524 full time equivalent jobs (compared to baseline case)\(^58\). This represents 0.5% of employment in the NT\(^59\).

**Attracting investment in the Territory.** Chile’s solar industry expanded so rapidly, electricity is being given for free\(^60\). While this can in part be attributed to inadequate infrastructural decision-making, it does provide an example of what is possible. If low-carbon electricity can be delivered at extremely low-cost – or under certain circumstances for free – to consumers, the Northern Territory could be in a strong position to attract new low-carbon industries and investment into the Territory\(^61\).

**Becoming a net energy exporter.** South Australia (SA), previously a net energy importer – when it had only gas and local coal – are now a net exporter of electricity, in net annualised terms. This is attributed to SA harnessing the abundant renewable energy sources to generate electricity\(^62\).

The Western Australian (WA) Government recently commissioned a renewable energy export feasibility study, finding it would be feasible to export solar energy from northern Australia to Indonesia via a high voltage direct current (HVDC) cable, under the ocean. This project would capitalise on the significant – and continued - increase in renewable energy demand in ASEAN nations. The pilot project could potentially generate up to 2,000 permanent jobs in the Pilbara region in WA and more than 12,000 jobs across the state\(^63\).

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\(^{54}\) International Renewable Energy Agency (IRENA), “Job Creation.”


\(^{56}\) The Climate Council, Renewable Energy Jobs: Future Growth in Australia.


\(^{58}\) Consulting, The Economic Impacts of a Potential Shale Gas Development in the Northern Territory.


\(^{60}\) Dezem and Quiroga, “Chile Is Producing so Much Solar Power It Has to Give It Away.”


\(^{62}\) Saddler, National Energy Emissions Audit.

\(^{63}\) Fitzgerald, “Solar Energy Exports from the Pilbara to Indonesia the Focus of New WA Government-Backed Study”; Pilbara Development Commission and Government of Western Australia, Pilbara Solar Export Pre-Feasibility Study.
Economic viability. Even at today’s costs, the Expert Panel for the Territory’s Roadmap to Renewables Report determined that as a consequence of the rapid decline in the cost of producing renewable energy, the economic viability of renewable energy projects is largely guaranteed provided the appropriate financial mechanisms are in place.64

Strong community support and engagement. A finding from the community consultations conducted during the development of the Roadmap to Renewables Report was a call from the community for the NTG to be more aggressive with regards to implementing renewables and for there to be greater support for businesses and households wanting to implement renewable energy technology.65

Energy security in remote communities. Optimising renewable energy generation in remote communities – and phasing out diesel generation – would enable greater levels of energy security; lower risks to human health and the environment; and deliver substantial cost savings.66

Decarbonising the transport sector. Maximising renewable energy generation is essential if the transport sector is to be decarbonised. A rapid and extensive deployment of electric vehicles - that are powered by clean electricity - is required if the transport sector is to decarbonise in line with the 1.5°C target.67

Establishing the NT as an international research hub. Alice Springs and Central Australia already have the initial infrastructure and research networks to become a world-leading solar research hub.68 The NT’s climatic diversity could be harnessed to understand how commercially viable renewable energy technologies respond to climatic variability. Results from solar energy research in the NT could be transferred to larger systems, both domestically and internationally. There is significant potential to establish the region as a leading research centre.69

Development of new industries. In August, 2018, Australia’s Chief Scientist chaired a Hydrogen Strategy Group briefing paper for the Australian Federal Government. It was determined with production costs declining; technological advancements; and momentum building for decarbonisation, Australia is in a promising position to develop a hydrogen economy for national consumption and export. A blueprint for the development of a hydrogen industry in Australia is outlined in CSIRO’s National Hydrogen Roadmap (August, 2018). Domestically, it is estimated exports alone could contribute AU$1.7 billion and provide 2,800 jobs by 2030.70

Renewable hydrogen. Renewable, or clean, hydrogen is an energy carrier – rather than a source- and is produced by splitting a water molecule into hydrogen and oxygen (electrolysis process utilising renewable energy). In comparison to fossil fuels - including natural gas - there are no carbon emissions released when it is burned; the only by-products are water vapour and heat (see: Annex I for overview of hydrogen applications). Extensive energy is required for the electrolysis process.

64 Langworthy et al., Roadmap to Renewables: Fifty per Cent by 2030.
65 Ibid.
67 Climate Action Tracker, “The Road Ahead : How Do We Move to Cleaner Car Fleets?”
68 Langworthy et al., Roadmap to Renewables: Fifty per Cent by 2030.
71 CSIRO, National Hydrogen Roadmap: Pathways to an Economically Sustainable Hydrogen Industry in Australia.
73 CSIRO, National Hydrogen Roadmap: Pathways to an Economically Sustainable Hydrogen Industry in Australia.
however, with the rapid decline in the cost of solar energy, renewable hydrogen is becoming increasingly economically feasible\textsuperscript{74}.

The idea to utilise hydrogen as an energy source is not new, however strategic investments (private and public) across the hydrogen supply chain and technological developments – demonstrated across pilot projects globally – have led to a renewed focus on renewable hydrogen\textsuperscript{75}. These technological advancements include a membrane technology – developed by the CSIRO - that will enable hydrogen to be safely transported and used as a mass production energy source\textsuperscript{76}. The global hydrogen market is projected to reach over USD154 billion by 2022\textsuperscript{77} and could potentially meet 18\% of global final energy demand by 2050\textsuperscript{78}.

\textbf{A local renewable hydrogen industry.} The NT is in an optimal position to develop a renewable hydrogen industry for domestic and international consumption, with: high solar radiation; existing LNG infrastructure, which can be utilised to transport and store hydrogen; and geographical proximity to potential export markets\textsuperscript{79}.

\textbf{International demand for hydrogen.} Internationally, Japan, the world’s third-largest economy (GDP), has developed a multi-decade plan to transition to a hydrogen-based society in a bid to decarbonise and achieve energy security\textsuperscript{80}. Additionally, South Korea has signalled a strong commitment; Korea’s hydrogen economy act will likely be passed in 2018\textsuperscript{81}. Both nations are net energy importers (94\% and 81\% of total energy, respectively)\textsuperscript{82}. Across Japan, South Korea, Singapore, and China, potential demand for imported hydrogen is projected to reach AU$9.5 billion by 2030\textsuperscript{83}. Currently, there are no large-scale exporters.

\section*{RECOMMENDATIONS}

\textbf{HARNESS NEW ECONOMIC OPPORTUNITIES (RENEWABLE ENERGY)}

\begin{enumerate}
\item Investigate potential pathways for the NT to become a net energy exporter
\item Determine the feasibility of attracting new industries to the NT with the incentive of inexpensive, clean, electricity
\item Explore the potential for the NT to become a world-leading research hub for renewable energy technology
\item Investigate the feasibility of establishing a renewable hydrogen industry in the NT
\end{enumerate}

\textsuperscript{74} IRENA, \textit{Hydrogen from Renewable Power: Technology Outlook for the Energy Transition}; International Renewable Energy Agency (IRENA), Technology Roadmap.
\textsuperscript{76} CSIRO, “CSIRO Tech Accelerates Hydrogen Vehicle Future.”
\textsuperscript{77} MarketsandMarkets, “Hydrogen Generation Market Worth 154.74 Billion USD by 2022.”
\textsuperscript{78} Hydrogen Council, \textit{Hydrogen Scaling up: A Sustainable Pathway for the Global Energy Transition}.
\textsuperscript{80} Agency for Natural Resources and Energy, \textit{Basic Hydrogen Strategy Determined}.
\textsuperscript{81} Jihye, “[Hydrogen Korea] ‘Hydrogen Economy Act Will Be Passed This Year.’”
\textsuperscript{83} CSIRO, \textit{National Hydrogen Roadmap: Pathways to an Economically Sustainable Hydrogen Industry in Australia}; ACIL Allen Consulting for ARENA, \textit{Opportunities for Australia from Hydrogen Exports}.
NATURAL GAS: NOT A BRIDGING FUEL FOR THE TRANSITION TO RENEWABLES

In the Climate Change Discussion Paper, natural gas is advanced as an important energy source in the transition to a low-carbon future. This assumption is not supported by evidence. The GHG emissions of natural gas from hydraulic fracturing is greater than that of other fossil fuels on time scales of up to 100 years. The GHG emissions of natural gas from hydraulic fracturing is at least 20% greater than that of coal over a 20-year time scale. Over a 100-year time scale, it is comparable to coal\(^\text{84}\).

Fugitive methane emissions. Unconventional natural gas extraction – hydraulic fracturing – is irreconcilable with mitigating climate risk and limiting global warming to 1.5 °C\(^\text{85}\). During the hydraulic fracturing process, methane emissions are released (fugitive emissions; unintended emissions released during extraction). Methane captures 28 times more heat in the atmosphere than carbon dioxide over a 100-year time-frame\(^\text{86}\).

The feasibility of offsetting emissions. The Scientific Inquiry into Hydraulic Fracturing in the NT found that even after the mitigation of fugitive emissions, the life-cycle greenhouse gas emissions risk level was unacceptable\(^\text{87}\). In response, the Inquiry recommended all emission be offset. Recent analysis by The Australia Institute suggests the (annual) offsetting cost could reach AUD4.3 billion in 2030 and the cumulative cost of offsets from 2030-2040 (likely operational life of gas fields) could reach AUD146 billion\(^\text{88}\). Renewable energy is (already) cheaper than fossil fuels\(^\text{89}\). AGL Energy – Australia’s largest integrated energy company – projects Australia’s transition away from coal will bypass gas and shift straight to solar\(^\text{90}\).

Economic considerations. When available, the operating costs of solar generators are close to zero\(^\text{91}\). The pay-back time for battery storage can be rapid, as demonstrated with the example of Tesla’s lithium-ion battery in South Australia, which is on track to make back a third of its total construction cost (AUD 90.6 million) in its first year of operation\(^\text{92}\). Combined cycle gas with open cycle gas turbine generators – run to provide grid resilience – are the most expensive form of electricity generation, behind brown coal generators and black coal generators\(^\text{93}\).

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\(^{85}\) Tyndall Centre for Climate Change Research Manchester et al., Natural Gas and Climate Change; The Australia Institute, “Open Letter to The Scientific Inquiry into Hydraulic Fracturing in the Northern Territory and the Northern Territory Government.”


\(^{88}\) Ogge, Options for the Implementation of Recommendation 9.8 of NT Fracking Inquiry.


\(^{91}\) Saddler, National Energy Emissions Audit.

\(^{92}\) Wahlquist, “South Australia’s Tesla Battery on Track to Make Back a Third of Cost in a Year.”

\(^{93}\) Saddler, National Energy Emissions Audit.
The Discussion Paper states natural gas exports will play an important role displacing coal – an energy source with higher embodied carbon – to gas. However, with the continued sharp decline in renewable energy costs, economies are bypassing gas and transitioning straight to renewables.94 For example, in India; a country advanced as a potential export market for the Territory’s natural gas reserves95, renewable energy is already displacing coal.96 Approximately 25% of India’s coal-fired pre-construction projects were cancelled from February to August 2018 (24 GW; an amount equal to 55% of Australia’s existing total operating capacity).97 In June 2018, Bloomberg New Energy Finance estimated the cost of solar and wind in India is now 50% cheaper than coal.98 The same month, the Indian Government announced an intent to launch a tender for 100 gigawatts of solar power – ten times the size of the world’s largest current solar tender.99

In the United States, the transition away from natural gas is already observable. Regulators in Arizona – a politically conservative state with no renewable energy mandate – rejected the integrated resource plans of Arizona’s major utilities, citing too much reliance on natural gas and the risk of stranded assets.100 The utilities are now soliciting battery storage, for what will become one of the largest projects in the U.S.101 In January 2018, Californian regulators rejected a bid from Pacific Gas & Electric to continue payments to three natural gas plants. Instead, they were required to solicit bids for energy storage.102 In the United States, gas consumption declined in 2017, for the first time in seven years. This was attributed to lower electricity demand and competition from renewable energy.103

Mitigating climate risk. The role of gas looks to be further displaced in Australia, as Governments take climate risk into consideration. In Canberra, Ginninderry – a new 11,500-home suburb set for development in 2020 - will become the first gas-free suburb. It will be completely powered by renewable energy. The ACT’s Climate Change Minister, Shane Rattenbury, stated, ‘Gas is going to be a significant source of emissions we’re going to need to tackle here in the ACT’.

RECOMMENDATIONS

1. Natural gas should not be advanced as a low-carbon bridging fuel for the transition to renewables

2. Economic modelling; decarbonisation; and climate risk must be integrated into the decision-making process when determining the NT’s development pathway

95 Reuters, “Australia’s Darwin Seeks to Shed Frontier Image to Become World-Class LNG Export Hub.”
97 Buckley and Shah, “India Coal Project Cancellations Snowballing”; Buckle, IEEFA Asia: India’s Electricity-Sector Transformation Is Happening Now.
99 Michael Safi, “India’s Huge Solar Ambitions Could Push Coal Further into Shade.”
100 Roberts, “Clean Energy Is Catching up to Natural Gas.”
102 Roseland, “California Regulators Choose Clean Energy and Storage over Existing Gas Plants.”
103 Enerdata, “Natural Gas.”
104 Burgess, “Ginninderry to Be First Canberra Suburb without Natural Gas.”
ENERGY EFFICIENCY IN BUILDINGS

Energy efficiency is the process of reducing energy demand without compromising end-use services. Buildings – and activity within them – account for approximately 31% of global final energy demand\textsuperscript{105}. Indirect emissions in the building sector – emissions from heat and electricity – will need to rapidly decline by 65-70% by 2030 and be completely phased out by 2050 to stay well below 2°C\textsuperscript{106}. Energy efficiency is one of the most cost-effective mitigation strategies to pursue.

The approaches detailed below can be undertaken with today’s technologies. In addition to stimulating economic growth, energy efficiency leads to improved health outcomes for building occupants (monetised value equal to approximately 8-22% of the realised cost savings)\textsuperscript{107}. Three approaches are detailed below. Additional approaches will need to be considered, for example, evidence-based demand management strategies.

**Retrofitting.** An energy retrofit entails modifying existing buildings to reduce energy demand. Retrofits range from minor retrofits (e.g. upgrading lighting systems and appliances; together, they represent 55% of total emissions in the building sector)\textsuperscript{108} to deep retrofits, where extensive measures are implemented in unison. Average retrofit payback time is five to seven years\textsuperscript{109}. Financing mechanisms need to be operationalised to enable wide-scale energy retrofits\textsuperscript{110}.

**New builds and building standards.** Building codes optimising energy efficiency in new developments must be mandated\textsuperscript{111}. Codes can be adapted from other jurisdictions. For example, in 2018, California mandated all new residential construction will achieve net zero emissions by 2020. This will be achieved by ensuring energy efficiency potential is maximised and any remaining energy demand is offset with rooftop solar PV. Benefits include negligible energy costs for residents\textsuperscript{112}.

**Climate resilient design.** The NT could establish itself as a climate resilient design leader (e.g. passive cooling designs that provide thermal comfort with limited (or no) energy consumption)\textsuperscript{113}.

**RECOMMENDATIONS**

1. Undertake energy retrofits across the Territory’s building stock to optimise energy savings. Investigate complementary strategies to increase energy efficiency (e.g. demand management).

2. Mandate energy efficiency building codes to maximise emission reductions and cost savings. Ensure these are consistently updated to reflect technological advancements.

3. Establish the NT as a hub for climate resilient and sustainable design

\textsuperscript{105} International Energy Agency (IEA), *Meeting Climate Change Goals through Energy Efficiency*.


\textsuperscript{108} Climate Action Tracker, “A Policy Spotlight on Energy Efficiency in Appliances & Lights Could See Big Climate Gains.”

\textsuperscript{109} Hawken, *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*.


\textsuperscript{111} Climate Action Tracker, “A Policy Spotlight on Energy Efficiency in Appliances & Lights Could See Big Climate Gains.”


SECTION 4: RISKS NOT TAKEN INTO CONSIDERATION

There are risks that are not accounted for in the Discussion Paper. Two are detailed here: 1) Economic risk of stranded fossil fuel assets; 2) Risk of litigative action

STRANDED ASSETS

As economies transition to a low-carbon growth trajectory, there is a risk of fossil fuel assets being stranded\textsuperscript{114}. This is not accounted for in the Climate Change Discussion Paper, yet this poses significant risks to the Territory’s economic growth.

Low-carbon technological advancements; energy efficiency; and decarbonisation strategies are reducing the demand for fossil fuels\textsuperscript{115}. This increases the risk of fossil fuel assets becoming \textit{stranded} by an unanticipated write-down; devaluation; or conversion to a liability\textsuperscript{116}.

A 2018 study published in \textit{Nature Climate Change} – a leading scientific journal - found even without strict mandated emissions reductions targets or any additional climate change policies, the magnitude of loss from stranded fossil fuel assets could amount to a discounted global wealth loss of USD1-4 trillion. There would be distributional effects; emissions-intensive resource-based economies will be most impacted, for example, Russia; the United States; and Canada could see their fossil fuel industries nearly shut down\textsuperscript{117}.

To put this global wealth loss of USD1-4 trillion in perspective, the subprime mortgage market value loss realised after the 2008 financial crisis was approximately USD0.25 trillion. This market value loss led to a global stock market capitalisation decline of approximately USD25 trillion\textsuperscript{118}.

The economics of renewable energy generation - and the consistently declining prices – means that (already) renewables are cheaper than fossil fuels\textsuperscript{119}.

The next 2-3 years is a critical window: when investment and policy decisions will be made that will shape the upcoming decades\textsuperscript{120}, especially given the lifetime of energy infrastructure (up to 40 years)\textsuperscript{121}.

RECOMMENDATION

1. The NTG needs to factor the global low-carbon transition - and the subsequent risk of stranded fossil fuel assets - into government decision-making processes


\textsuperscript{116} International Renewable Energy Agency (IRENA), \textit{Stranded Assets and Renewables}.

\textsuperscript{117} Mercure et al., “Macroeconomic Impact of Stranded Fossil Fuel Assets.”

\textsuperscript{118} Ibid.


\textsuperscript{120} Global Commission on the Economy and Climate, “Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action In Urgent Times”; Intergovernmental Panel on Climate Change (IPCC), \textit{IPCC Special Report on Global Warming of 1.5°C}.

\textsuperscript{121} Union of Concerned Scientists, “Average Life Expectancy of Select Infrastructure Types and Potential Climate-Related Vulnerabilities.”
DUTY OF CARE AND HUMAN RIGHTS (RISK OF LITIGATIVE ACTION)

NT’s emission profile. According to the Climate Change Discussion Paper, natural gas extraction may cause the NT’s carbon emissions to more than double in the next 8 years. These projections do not include an increase in GHG emissions associated with industry growth in offshore gas.\(^{122}\)

These emissions are significant. Analysis by The Australia Institute found if all shale gas in the NT was exploited, resulting emissions could be equivalent to sixty times Australia’s current annual emissions or building 130 coal power plants and operating these plants for forty years\(^{123}\).

Insufficient action given the threat. If the NTG does not transition to a low-carbon pathway, this may expose to the NTG to a risk of litigative action. There is legal precedent for this. On 9 October, 2018, the Dutch appeals court upheld a legal order on the Dutch Government to accelerate emissions cuts. The case was brought on behalf of 886 Dutch citizens\(^{124}\). The Court ruled that the severity and the scope of the climate crisis demanded GHG emissions reductions of at least 25% by 2020 (from a 1990 baseline). This is higher than the Dutch Government’s 17% reduction target (by 2020)\(^{125}\); deemed to be insufficient to limit global warming to below 2 °C\(^{126}\).

Serious risk. The judges ruled the current emissions reduction target was unlawful, given the scale of the threat posed by climate change. The Court stated (October, 2018): ‘It is appropriate to speak of a real threat of dangerous climate change, resulting in the serious risk that the current generation of citizens will be confronted with loss of life and/or a disruption of family life … [T]he State has a duty to protect against this real threat’ (Para. 45)\(^{127}\). The case was brought under human rights and tort law\(^{128}\).

In addressing the Dutch contribution to global climate emission of 0.5%, the Court stated (June, 2015): ‘[I]t has been established that any anthropogenic greenhouse gas emission, no matter how minor, contributes to an increase in carbon dioxide levels in the atmosphere and are therefore hazardous to climate change’ (Para. 4.79)\(^{129}\). The Court found a sufficient causal link could be established between Dutch emissions, global climate change, and the impacts\(^{130}\).

The Court noted that as a developed country, the Netherlands was in a position to reduce emissions and that adaptation measures could not compensate for the Government’s duty of care to mitigate GHG emissions\(^{131}\).

RECOMMENDATION

1. Take legal duty of care (tort law) and human rights into consideration when developing the NTG’s response to climate change

\(^{122}\) Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.


\(^{124}\) Urgenda, “The Urgenda Climate Case against the Dutch Government.”

\(^{125}\) Nelsen, “Dutch Appeals Court Upholds Landmark Climate Change Ruling.”


\(^{129}\) ELAW, “Urgenda Foundation v. The State of the Netherlands.”

\(^{130}\) Ibid.

SECTION 5: ADAPTATION

CLIMATE RISK ASSESSMENT AND ADAPTATION STRATEGY

No comprehensive climate risk assessment has been undertaken for the NT. It is not possible to mitigate climate risk and adapt when the extent of the risks are not established.

Risks from climate change arise from the interaction between a hazard (triggered by an event or trend related to climate change), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk).\(^{132}\)

The extent of the risks for the NT are not established. A climate risk assessment is required as a matter of urgency.

In addition to the requirement for a comprehensive risk assessment, the following should be considered:

**Impacts.** The projected impacts for the Territory will be severe. This is not extensively considered in the Discussion Paper. For example, the Paper states (global average) temperature is projected to increase by 2.7°C – 4.9°C by 2100\(^{133}\). However, this range far exceeds the Paris Agreement Target and what is considered ‘safe’ for most nations; communities; ecosystems; and sectors and poses significant risks to natural and human systems (when compared to current global warming of 1°C)\(^{134}\).

It is critical to note, even within the Paris Agreement range, climate risks are high. For example:

- Coral reefs would decline by 70-90 percent with global warming of 1.5°C, whereas virtually all (> 99 percent) would be lost with 2°C. at 1.5°C\(^{135}\); and
- The frequency of warm extreme temperatures over land will increase by 149% over Northern Australia at 1.5°C, at 2°C, this increases to 406%\(^{136}\)

**Short-term and mid-term projections are required.** The Discussion Paper outlines projected impacts in 2100\(^{137}\), yet impacts are already observable. For example, a 2018 report from independent research think tank, The Australia Institute, found that the number of days over 35°C per year in Darwin had increased from 5.6 days per year in the early 20th century to over 20 days per year in the last five years (days over 35°C and with > 70% humidity are considered extremely dangerous)\(^{138}\).

CSIRO climate models predict that without drastic reductions in GHG emissions, the number of days over 35°C would increase to 132 over the next 12 years\(^{139}\). This would have severe implications on health; productivity; agriculture; construction; and tourism. Ecosystems would be severely affected and the standard of living would greatly decline.\(^{140}\) These observed or projected impacts have not been considered to the extent that is warranted in the Discussion Paper.

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\(^{133}\) Northern Territory Government, *Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.*

\(^{134}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C.*

\(^{135}\) Ibid.

\(^{136}\) Carbon Brief, “The Impacts of Climate Change at 1.5C, 2C and Beyond.”

\(^{137}\) Northern Territory Government, *Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.*

\(^{138}\) Hanna and Ogge, *Cooked with Gas: Extreme Heat in Darwin.*

\(^{139}\) Ibid.

\(^{140}\) Ibid.
Severity of the impacts. Projected impacts in the NT include (but are not limited to):

- Increase in the number of extreme heat days. CSIRO modelling estimates the average number of extreme heat days (days over 35°C; > 70% relative humidity) – classified as extremely dangerous - could increase from 22.2 per year to 132 per year in 12 years (2030). 141
- Human health: Increased risk of exposure to extreme weather events projected to increase: heat-related mortality and morbidity; greater frequency of infectious disease epidemics. 142 Increased intensity of extreme rainfall events 143 projected to increase risk of Murry Valley encephalitis; Ross River virus; melioidosis; and infectious enteric diseases. 144
- Higher temperatures (and increase in threats, e.g. pests and spread of disease) projected to adversely affect primary industries (e.g. lower yields; risks to livestock; risks to fisheries) 145
- Increase in the intensity (and related damage) of tropical cyclones 146 and more extreme fire behaviour 147. Intensity and frequency of droughts projected to increase. 148
- Increase in mean sea level rise; increased risk of extreme sea-level events; and erosion 149
- Natural ecosystems placed at high risk (e.g. extensive mangrove dieback) 150; species loss and extinction (the sixth mass extinction is already under way) 151
- High risk of saltwater intrusion in Kakadu. Temperature increase of 2-3°C projected to lead to the loss of 80% of freshwater wetlands in Kakadu 152

It must be noted, certain sectors of society will be disproportionately affected. The worst impacts are expected amongst those with the least capacity to adapt; indigenous people; those working outdoors; children and the elderly; and those with agricultural or coastal dependent livelihoods. 153

RECOMMENDATIONS

1. As a matter of urgency, climate change risks for the Northern Territory need to be comprehensively investigated and determined (climate risk assessment)

2. An adaptation strategy then needs to be developed, taking into account both short- and long-term climate risks and differentiated impacts

141 Ibid.
142 Nikolakis, Nygaard, and Grafton, Adapting to Change for Water Resource Management: Issues for Northern Australia; Green, Climate Change and Health: Impacts on Remote Indigenous Communities in Northern Australia; World Health Organisation, “Climate Change and Human Health - Risks and Responses: Summary.”
143 Climate Change in Australia et al., “Climate Change in Australia.”
144 Whelan et al., “Rainfall and Vector Mosquito Numbers as Risk Indicators for Mosquito-Borne Disease in Central Australia”; Green, Climate Change and Health: Impacts on Remote Indigenous Communities in Northern Australia.
146 Earth Systems and Climate Change Hub, Climate Change Science for Northern Australia; Climate Change in Australia et al., “Climate Change in Australia.”
147 Climate Change in Australia et al., “Climate Change in Australia.”
148 Green, Climate Change and Health: Impacts on Remote Indigenous Communities in Northern Australia; Nikolakis, Nygaard, and Grafton, Adapting to Climate Change for Water Resource Management: Issues for Northern Australia.
149 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C; Hennessy et al., Climate Change in the Northern Territory; Nikolakis, Nygaard, and Grafton, Adapting to Climate Change for Water Resource Management: Issues for Northern Australia.
150 Duke et al., “Large-Scale Dieback of Mangroves in Australia’s Gulf of Carpentaria: A Severe Ecosystem Response, Coincidental with an Unusually Extreme Weather Event”; Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
151 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C; Barnosky et al., “Has the Earth’s Sixth Mass Extinction Already Arrived?”; Ceballos et al., “Accelerated Modern Human-Induced Species Losses: Entering the Sixth Mass Extinction.”
153 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
SECTION 6: CROSS-SECTORAL ENGAGEMENT

Climate change considerations need to be integrated into all decision-making – across the board. The risks are severe, and need to be addressed appropriately. Effectively mitigating climate risk will enable unprecedented transitions across the Territory. The IPCC Special Report outlined the vital importance of effectively engaging all community members in this transition process154.

Engaging all Territorians. To effectively engage Territorians, the NTG must clearly communicate the risks inherent in climate change and the avenues to mitigate emissions and adapt. In addition, the NTG must ensure Territorians have the skills and resources required to enhance climate resilience.

Communicating climate change. There are extensive resources available to inform governments and organisations on the best avenues to communicate climate change. They include *A guide to the science of climate change communication*; developed by the Tyndall Centre for Climate Change Research and Climate Outreach. Topics include: knowing your audience; communicating uncertainty; and bringing climate change into the here and now155.

Enabling capacity. The NTG and local governments must develop innovative mechanisms to encourage engagement across the Territory. Examples of successful approaches – implemented both domestically and internationally - can be adapted to the Northern Territory context.

The Sustainable Melbourne Fund (SMF) offers an avenue to overcome a key barrier to increasing climate resilience: financing. The SMF was established by the City of Melbourne Council – in collaboration with councils - to provide low cost and accessible finance to engage sustainability projects, such as providing upfront capital to fund investments in renewable energy. The fund administers loans through Environmental Upgrade Agreements and these are repaid quarterly through council rates. As of August, 2017, the SMF had saved small and medium businesses $1.5 million every year and reduced GHG emissions by over 5000 tonnes156.

The NTG’s 2009 Climate Change Policy also highlights examples of avenues to increase capacity and community climate resilience. For example, providing funding directly to Territory community groups to develop and implement climate solutions157.

Connecting to the climate change networks. Both nationally and internationally, Governments are transitioning to a low-carbon economy. There are networks the NTG can join to ensure the NT’s transition is informed by evidence and best-practice. These include the *Adaptation Research Network*, facilitated by the National Climate Adaptation Research Facility, within which scientists and practitioners work together to advance climate change adaptation158.

RECOMMENDATION

1. Implement evidence-based mechanisms to engage all Territorians in building climate resilience

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154 Ibid.
158 National Climate Adaptation Research Facility, “Adaptation Networks.”
REFERENCES


———. *Canberra 100% Renewable*. Canberra, 2016.


Pilbara Development Commission, and Government of Western Australia. *Pilbara Solar Export Pre-


Energy of the future: Renewable hydrogen

What could renewable hydrogen be used for?

• **Grid resilience:** Promisingly, hydrogen could play an integral role in developing resilience in the energy grid; it provides a fast responding load for variable renewable energy generation, thereby addressing energy intermittency challenges associated with renewable energy generation\(^\text{159}\).

• **Domestic cooking and heating/manufacturing:** With modifications to the existing gas networks and appliances, hydrogen can replace natural gas for domestic cooking and heating\(^\text{160}\).

• **Energy security in remote areas:** With the cost of energy from hydrogen and fuel cells projected to become commercially competitive with diesel equivalents before 2025\(^\text{161}\), there is potential to displace diesel as a primary fuel source in remote locations.

Renewable hydrogen could also play a role in reducing carbon emissions in sectors that have been traditionally difficult to decarbonise\(^\text{162}\), including:

• **Manufacturing:** Renewable hydrogen can replace fossil fuels in carbon intensive manufacturing processes including steel, fertiliser, and cement\(^\text{163}\).

• **Transport:** Hydrogen fuel cells are an alternative to batteries for electric motors. The Japanese Government aims to have 40,000 hydrogen fuel cell cars on the road by 2020\(^\text{164}\) and there is anticipated future domestic demand for hydrogen-powered long-haul transport (buses; trucks; trains; ships)\(^\text{165}\). In 2020, the first hydrogen road train is being released in the US; it can travel up to 1900 km on a single hydrogen fuel cell\(^\text{166}\).

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\(^{160}\) Jones, Al-Masry, and Dunnill, “Hydrogen-Enriched Natural Gas as a Domestic Fuel: An Analysis Based on Flash-Back and Blow-off Limits for Domestic Natural Gas Appliances within the UK”; CSIRO, *National Hydrogen Roadmap: Pathways to an Economically Sustainable Hydrogen Industry in Australia*.

\(^{161}\) CSIRO, *National Hydrogen Roadmap: Pathways to an Economically Sustainable Hydrogen Industry in Australia*.

\(^{162}\) IRENA, *Hydrogen from Renewable Power: Technology Outlook for the Energy Transition*.


\(^{164}\) Agency for Natural Resources and Energy (Japan), “Compilation of the Revised Version of the Strategic Roadmap for Hydrogen and Fuel Cells.”


\(^{166}\) Nikola, “Nikola One.”
The Environment Centre NT (ECNT) is the peak community sector environment organisation in the Northern Territory, Australia raising awareness amongst community, government, business and industry about environmental issues. We also assist people to reduce their environmental impact and support community members to participate in decision making processes and action.

The ECNT welcomes the opportunity to provide comments on the Northern Territory (NT) Government’s Climate Change Discussion Paper but we must stress that we feel the ‘Discussion Paper’ does not adequately identify the climate damage impacts to the NT, nor address the inherit risks. The report does not go deep enough to successfully mitigate and adapt to the expected risks from climate change in the Northern Territory.

As we write this report, California is recovering from late season bushfires fuelled by record combustible dry vegetation. Cairns, Australia has experienced its hottest day on record and Queensland is in the grip of unprecedented catastrophic fire danger warning. The impacts of climate change are clearly being felt already. As temperatures continue to rise with the release of greenhouse gases into our atmosphere, we can expect worsening extreme weather impacts in Australia, including more frequent and severe bushfires, droughts, heatwaves, coastal flooding and increased intensity of cyclones.

Our submission has been prepared in consultation with climate scientist Dr Ellin Lede and we support the findings in her research\(^1\). The recommendations provided below are also in line with the Paris Agreement, ratified by Australia along with 196 other countries, agreeing to actively work towards limiting global warming to less than 2 degrees Celsius and pursuing efforts to limit warming to 1.5 degrees Celsius.

**Scientific evidence to inform the NT Climate Strategy**
We urge the NT Government to create a climate strategy that is informed by the *IPCC Special Report on Global Warming of 1.5 °C*\(^2\). This report synthesised the best available scientific evidence; citing more than 6,000 scientific references. Thousands of expert and government reviewers contributed to the process of writing this report to determine the feasibility of limiting warming to 1.5 °C.

**Net-Zero Emissions by 2050**
There is scientific consensus that greenhouse gas emissions need to decline rapidly to net zero by 2050 to ensure climate resilience.\(^3\) Rapid, far-reaching, and deep reductions in greenhouse gas emissions are required with a global target of reducing emissions by at least 45% from 2010 levels by

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\(^2\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.

2030. This would require wide-sweeping and unprecedented changes in all aspects of society including land; energy; industry; buildings; transport and cities. While extremely challenging and unprecedented in scale, this transition is possible. The technology and expertise to achieve this are available today. However, the longer deep cuts in emissions are delayed, the costlier and more difficult it will become, and the higher the subsequent climate risks. Unless rapid and deep emissions reductions are realised, the 1.5 °C carbon budget threshold could be passed in as little as 15 years. Warming at 1.5 °C is not considered ‘safe’ for most nations; communities; ecosystems; and sectors and poses significant risks to natural and human systems (when compared to current global warming of 1 °C).

Recommendation: Legislate under a ‘Climate Change Act’ a science-based emissions reduction target of net zero by 2050. Include yearly ministerial reporting with sector-specific interim targets within political election cycles. In the interim, there should be GHG emission triggers within the NT Environment Protection Bill and Planning Act.

Recommendation: Provide yearly comprehensive GHG emissions inventories for the NT, which account for the GHGs from sources within a defined space and time and have these inventories externally verified.

Report Assumptions
We challenge the following assumptions made in the ‘Climate Change Discussion Paper’ and provide information to the contrary:

1. Expected Climate Change Impacts (page 6). These impacts are unreferenced, and we also challenge their accuracy.
   - # Days over 35 – Analysis of CSIRO data by the Australia Institute\(^4\) shows CSIRO climate models project that without drastic reductions in greenhouse gas emissions, the number of days over 35 degrees each year in Darwin will increase dramatically to 132 days per year by 2030, 187 days per year by 2050 and 275 days per year by 2070. This impact is greater than the figure quoted in the ‘NT Climate Discussion Paper’.

   Recommendation: Reference any future reports and seek impact information from wider sources. Refer also to recommendation below regarding more research needed about the future impacts of climate damage for the NT.

2. Asserting that Australia is on track to meet the National GHG emission target of 26-28% below 2005 levels by 2030 (page 10). Despite the Federal Governments reassurance that this target will be met, the following evidence suggests otherwise:
   - Latest Greenhouse Gas accounts\(^5\) show Australia’s emissions have continued to rise in the June quarter, ending the financial year at their highest level since mid-2011.

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• The UN Emissions Gap report\(^6\) identified that global CO2 emissions increased in 2017 and if emission reduction ambitions are not increased before 2030, exceeding the 1.5°C goal can no longer be avoided. The report stated that ‘now more than ever, unprecedented and urgent action is required by all nations’. In respect to Australia, their assessment is that ‘there has been no improvement in Australia’s climate policy since 2017 and emission levels for 2030 are projected to be well above the NDC target. The latest projection published by the government shows that emissions would remain at high levels rather than reducing in line with the 2030 target’.\(^7\)

• The Climate Action Tracker is an independent scientific analysis produced by three research organisations tracking climate action since 2009. They track progress towards the globally agreed aim of holding warming well below 2°C, and pursuing efforts to limit warming to 1.5°C. In their update of 30\(^{th}\) April 2018, they assess Australia’s emissions as follows: ‘we rate the NDC target itself “Insufficient”, with a level of ambition that—if followed by all other countries—would lead to global warming of over 2°C and up to 3°C. In addition, if all other countries were to follow Australia’s current policy settings, warming could reach over 3°C and up to 4°C (“highly insufficient”)”\(^8\)

Recommendation: Seek information beyond the Federal Government to assess Australia’s emissions reduction performance and adequacy of current National GHG emission reduction targets.

3. Gas as a low carbon fuel to contribute to reducing emissions in other jurisdictions (page 4). We strongly refute that gas is a transition fuel that can reduce emissions by replacing coal providing the following evidence:

• The Climate Council in their report Pollution and Price: The Cost of Investing In Gas\(^9\) determined that ‘gas is not sufficiently less polluting than coal to garner any climate benefit’. This is because:
  i. New gas power plants are less polluting than coal, however, when the entire supply chain of gas production is considered, gas is not significantly less polluting than coal;
  ii. Expanding gas usage is inconsistent with tackling climate change as it locks in emissions for decades into the future;
  iii. Natural gas is primarily composed of methane, a greenhouse gas with 86 times the global warming effect of CO2 over a 20- year period

\(^7\) Ibid page 12
\(^8\) Accessed from: https://climateactiontracker.org/countries/australia/
The report ‘Debunked the G20 Gas Myth’\textsuperscript{10} concludes:

i. If all the International Energy Agency’s (IEA’s) projected coal-fired generation in 2040 is replaced with fossil gas-fired generation, emissions from the power sector would still be more than five times the median of IPCC scenarios for a likely chance of keeping warming below 2 degrees Celsius. Their analysis shows that emissions from oil and gas power alone are too great, meaning that none of the coal can be replaced with fossil gas; it must all be replaced with zero-carbon energy sources;

The following graph clearly demonstrates that coal-fired generation needs to be replaced with no carbon generation\textsuperscript{11}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{Global Power Sector Emissions - 2014 and Projected 2040 - Compared with Median IPCC 2040 Power Sector Emissions for 2°C (assuming all coal is displaced by gas)}
\end{figure}

\begin{itemize}
\item Displaced Coal Emissions
\item Emissions from gas replacing coal
\item Need to replace coal with zero-carbon
\item Need less gas, not more
\end{itemize}

\item Source: Oil Change International analysis, using data and projections from IEA\textsuperscript{12} and IPCC\textsuperscript{12}

ii. The Oil Change International report also highlighted research\textsuperscript{12} that showed when examining scenarios in which U.S. LNG is exported to Asia, the displacement of coal by LNG exports is far from a given, and that, as a result of U.S. exports of LNG, GHG emissions are not likely to decrease and may significantly increase due to greater global energy consumption, higher emissions in the United States, and methane leakage.

\begin{itemize}
\item\textsuperscript{11} Ibid page 13
\end{itemize}
Recommendation: Natural gas should not be considered as a low-carbon bridging fuel to reduce emissions by replacing coal.

Actions by business and governments reduce emissions
The Northern Territory must transition to a low-carbon economy (and quickly). The Northern Territory has benefited from the Ichthys LNG project with record levels of private business investment, unprecedented in in the Northern Territory's history. Continued investment in new fossil fuel projects, including hydraulic fracturing, poses a risk to jurisdictions not making the transition to low carbon economies, including the Northern Territory. There are significant risks posed for emissions-intensive resource-based economies as the global economy decarbonises (by 2050, all fossil fuels – including natural gas – must be phased out). It is suggested that developing economies explore the potential for technological 'leapfrogging', bypassing emissions-intensive intermediate technology and jump straight to cleaner technologies. The NTG Discussion Paper states the NT needs to play its role in international and national efforts to reduce emissions and adapt to the impacts of our changing climate. Australia is a developed nation, and as a developed nation, we have the capacity to commit to deep emissions reductions and realise the economic benefits.

With a continued sharp decline in the cost of renewable energy generation and rapid advancements in low-carbon technology, transitioning to a low-carbon economy now makes economic sense. The economic costs of not acting are extremely high. For example, climate change will lead to more extreme weather events. The estimated cost of extreme weather events in the NT was $1.3 billion in 2017 (not including heat waves or other climate events).

The next 2-3 years is a critical window: when investment and policy decisions will be made that will shape the next 10-15 years and potentially lock-in high emissions trajectories. In 2018, the Global Commission on the Economy and Climate found that bold climate action could yield a direct economic gain of USD26 trillion through to 2030 compared with business as usual. This is likely to be a conservative estimate. The European Union recently released their 'Vision for a Clean Planet for all' stating that 'immediate and decisive climate action is essential' with a plan to be carbon neutral by 2050. Their action includes phasing out of fossil fuels and providing a just transition for people in those industries. Their plan details action in seven strategic areas including 'energy efficiency; deployment of renewables; clean, safe and connected mobility; competitive industry and circular

14 Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
15 Ibid
16 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.
19 Earth Systems and Climate Change Hub, Climate Change Science for Northern Australia; Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
20 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.
21 Global Commission on the Economy and Climate, Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action In Urgent Times; Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
economy; infrastructure and interconnections; bio-economy and natural carbon sinks; carbon capture and storage to address remaining emissions’. The Northern Territory is perfectly placed to prioritise development in the applicable strategic areas identified. This is the opportunity for the NT to be at the forefront of the decarbonisation transition, capitalising on first-mover benefits in the Asian region, in a world that will inevitably become increasingly carbon-constrained. The Environment Centre NT is working with Beyond Zero Emissions to develop an evidence-based plan which provides the details and data necessary for the NTG to commit to this transition. The report will explore the NT’s potential to use renewables to power local manufacturing and drive energy-intensive export industries, boosting the economy and creating jobs.

We need to transition the NT economy away from fossil fuel extraction, including hydraulic fracturing, towards one that is driven by renewable technologies. It is essential to avoid the ‘lock-in’ of fossil fuels infrastructure and carbon intensive assets that risk being stranded. Having a climate change strategy that is based on an economy driven by fossil fuel extraction is a dichotomy. The NT Government needs to strategically and quickly consider the long-term infrastructure changes that will be required to move to an economy that has renewables at its centre and put in place a climate strategy that supports this transition. This will also send a strong message to industry and create confidence that the NT is safe place to invest in the low carbon economy. As the world is embracing carbon neutral economies, the NT prioritising the development of the oil and gas industry is heading in the wrong direction. Instead the NT Government needs to put in place the right conditions and incentives for investors to fund projects that include low-carbon and energy-efficient infrastructure.

Recommendations:

Commit to decarbonising the economy, so climate risk can be mitigated and the co-benefits and financial opportunities associated with a low-carbon transition can be realised.

The NTG needs to factor the global low-carbon transition - and the subsequent risk of stranded fossil fuel assets - into government decision-making processes

Establish an independent Climate Resilience Advisory Committee – comprised of experts and relevant stakeholders – to inform the low-carbon transition process

Support and prepare for the removal of fossil fuel subsidies (fuel tax credits), as pledged by the European Union by 2020.

Develop a carbon neutral economic plan, establishing the NT as a first-mover in the decarbonisation transition, leading the Asian region in energy efficiency, renewables, circular economy and a renewable hydrogen industry.
Adaptation

To adapt to climate change, it is crucial climate change risks are determined (Northern Territory-specific) and a comprehensive vulnerability assessment and adaptation plan is developed. Risks from climate change arise from the interaction between a hazard (triggered by an event or trend related to climate change), vulnerability (susceptibility to harm) and exposure (people, assets or ecosystems at risk).\(^{24}\) Climate risks have not been extensively determined for the NT. The severity of the climate change risks posed to Territorians are not properly considered. For example, the Discussion Paper states temperature is expected to rise by 2.7 °C – 4.9 °C by 2100\(^{25}\). This exceeds the Paris Agreement target. Even warming of 1.5 °C is not considered ‘safe’ for most nations; communities; ecosystems; and sectors and poses significant risks to natural and human systems (when compared to current global warming of 1 °C)\(^{26}\).

Several climate change impacts could be avoided by limiting global warming to 1.5 °C compared to 2 °C, or more. For instance, coral reefs would decline by 70-90 percent with global warming of 1.5 °C, whereas virtually all (> 99 percent) would be lost with 2 °C; at 1.5 °C\(^{27}\), the frequency of warm extreme temperatures over land will increase by 149% over Northern Australia, at 2 °C, this increases to 406%\(^{28}\). The impacts include outlooks to 2100, yet climate change impacts are already affecting Territorians. For example, globally, 18 of the last 19 years were the warmest on record\(^{29}\). A 2018 report from the Australia Institute found that in the Territory, the number of days over 35 °C per year in Darwin has increased from 5.6 days per year in the early 20\(^{th}\) century to over 20 days per year in the last five years (days over 35 °C and with > 70% humidity are considered extremely dangerous). CSIRO climate models predict that without drastic reductions in greenhouse gas emissions, the number of days over 35 °C would increase to 132 over the next 12 years. This would have severe implications on health; productivity; agriculture; construction; and tourism. Ecosystems would be severely affected and the standard of living would greatly decline\(^{30}\). It must be noted, impacts will be felt disproportionately. The worst impacts are expected amongst those with the least resources or capacity to adapt; indigenous people; those working outdoors; children and the elderly; and those with agricultural or coastal dependent livelihoods\(^{31}\).

The Fourth National Climate Assessment\(^ {32}\) for the US provides an exemplary example of assessing the climate change affects on the physical earth, the impacts and mitigation/adaptation responses.

**Recommendation:** As a matter of urgency, climate change risks for the Northern Territory need to be comprehensively investigated and determined. A climate change vulnerability assessment and adaptation strategy then needs to be developed, taking into account both short- and long-term climate risks.


\(^{25}\) Northern Territory Government, *Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory.*

\(^{26}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5 °C.*

\(^{27}\) Ibid.

\(^{28}\) Carbon Brief, “The Impacts of Climate Change at 1.5°C, 2°C and Beyond.”

\(^{29}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5 °C.*

\(^{30}\) Hanna and Ogge, *Cooked with Gas: Extreme Heat in Darwin.*

\(^{31}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5 °C.*

Key Sectors and Systems

Marine Environment and Fisheries
(In consultation with the Australian Marine Conservation Society)
An NT Climate Strategy needs to consider impacts to the marine environment beyond ‘building resilience in the fisheries sector by identifying new harvest targets for species impacted by climate change’. The NT marine and coastal ecosystems are valued at around $2 billion to the Territory economy\(^{33}\) and are acutely exposed to the impacts of climate change.

Over the past 15 years the NT marine environment has seen increasing impacts from climate change related events mainly associated with increasing sea surface temperatures and changing weather patterns and sea-levels. This includes coral bleaching, mangrove die back, mud-crab die off, turtle hatchling failure and declining populations of dolphins.

To mitigate and adapt to the ongoing climate change impacts on the marine and coastal environment the NT climate change strategy should include the following actions:

- Ban Seabed mining
- Protect coastal wetlands including mangroves, seagrass meadows and saltmarshes, which play a critical role in storing carbon and protecting against storm damage.
- Support the delivering of an effective Coastal and Marine Management Strategy that considers marine protected areas (MPAs) to mitigate and adapt to climate change impacts and build resilience in marine ecosystems.

Biodiversity and Ecosystems

We endorse the submission of Dr Ellin Lede regarding ‘Land Management’ in the NT and support the following recommendations:

Implement net zero carbon emissions targets and associated carbon offset policies to support emerging carbon farming industries.

Continue to support Indigenous ranger groups to undertake mitigating land management activities such as fire management and maintenance of sea country.

Stop the spread of gamba grass by better resourcing gamba grass control and banning the deliberate spread of gamba grass.

Support the pastoral industry to reduce emissions from raising cattle and to undertake mitigating land management activities by implementing emissions reduction targets.

Develop legislation to support protection of native vegetation in order to minimise future land clearing where possible.

Where avoidance of land clearing is not possible, the project proponent must be required to offset this clearing through revegetation of the equivalent vegetation type.

Support research toward the development of methodologies for assessing the carbon stored by different vegetation types, as well as fire management and management of sea country.

Undertake detailed mapping and engage with landholders and scientists to identify impacts of climate change upon land management activities and remote communities.

Ban the clearing of mangroves since they provide essential coastal protection services and store vast amounts of carbon.

Where emissions cannot be mitigated by an activity, the polluter should be required to offset emissions, giving priority to locally produced high quality carbon credits.

Built environment and Infrastructure
Please refer to our recommendations made in our COOLmob submission.

NT Climate Response Statement
During August and September 2018, 36 organisations and scientists signed on to the NT Climate Response Statement, urging the Northern Territory Government adopt a climate policy of net zero emissions by 2050.

The NT Climate Response Statement was presented to the Northern Territory Government, by Environment Centre NT and the Arid Lands Environment Centre on the 25th September 2018 in Darwin.

The statement highlighted that all other Australian states and territories have climate policies/legislation and have committed to net zero emissions by 2050, except for Western Australia and the Northern Territory. Victoria has legislated a net zero emissions target by 2050 (with five yearly interim targets to meet the long-term target)\(^{34}\); NSW has committed to net zero by 2050\(^{35}\); Tasmania achieved net zero emissions in 2018\(^{36}\); South Australia has a net zero emissions by 2050 target and a legislated climate change framework\(^{37}\); Queensland has committed to net zero by 2050\(^{38}\); and the ACT recently revised their net zero emissions target from 2050 to 2045\(^{39}\).

The full NT Climate Response Statement is presented here, with a list of the signatories.

\(^{34}\) Victoria State Government, "Emissions Reduction Targets."
\(^{36}\) Tasmanian Government, "Tasmania Achieves Zero Net Emissions for the First Time."
\(^{37}\) Government of South Australia, "South Australian Climate Change Action."
\(^{38}\) Department of Environment and Heritage Protection, *Pathways to a Clean Growth Economy: Queensland Climate Transition Strategy.*
\(^{39}\) Burgess, "ACT Brings Forward Zero Net Emissions Deadline to 2045."
Response to Climate Impacts in the Northern Territory

Dear Chief Minister and Members of the Northern Territory Parliament,

We are calling on you to develop a comprehensive climate policy to:

1. Achieve net zero emissions by 2050 (mitigation)
2. Develop climate resilient communities (adaptation)

Anthropogenic climate change – climate change directly attributable to human activity – poses a severe risk to the Northern Territory.

Impacts. The impacts of climate change on the NT include: increase in extreme heat days (over 35 degrees Celsius)\(^{40}\); increase in severity of extreme weather events; changes to water availability; and an increase in sea-level rise and extreme sea-level events\(^{41,42}\).

Climate change threatens Territorians: it will impact our food and water security; our health; and the ecosystems we depend on.\(^{2,3}\) This will have adverse long-term economic consequences. We note that the most marginalised and vulnerable members of our community are often the least responsible for ecological risks and threats but are the most affected by their emergence.

Net zero emissions. Consistent with our ratification of the Paris Climate Agreement, we must reduce our GHG emissions to net zero. All other Australian States and Territories (except for Western Australia), have committed to reduce emissions to net zero by 2050.

The Northern Territory Government has already shown a commitment to reducing our emissions (Northern Territory Roadmap to Renewables). There is substantial potential to further reduce emissions and reduce climate change-related risks posed to Territorians.

Opportunity. We need to manage future risk, make robust decisions, and take advantage of opportunities including: stimulating long-term investment and economic growth; ensuring healthier communities; and protecting our environment and existing infrastructure.

An enforceable whole of government approach needs to be implemented that protects people and country and ensures the ongoing liveability of NT communities.

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We urge the Northern Territory Government to develop a comprehensive climate policy that has emission reduction targets and a plan for a just transition to a low carbon economy.

Signatories:

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Role</th>
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The Environment Centre NT appreciates the opportunity to provide comments on the NT Climate Change Discussion Paper and we look forward to contributing to the draft of the Northern Territory Climate Change Strategy.
30 November 2018

Economic and Environment Policy Team
Department of Chief Minister
GPO Box 4396
Darwin NT 0801

By email: DCM.EconomicEnvironmentPolicy@nt.gov.au

Dear Policy Team,

Submission – Climate Change Discussion Paper

The Environmental Defenders Office (NT) Inc (EDONT) welcomes the opportunity to make this submission on the Northern Territory Government’s NT Climate Change Mitigation and Adaptation Opportunities in the Northern Territory - Discussion Paper (Discussion Paper).

EDONT is a community legal centre specialising in public interest environmental law. We regularly advise and represent clients on legal and policy issues relating to climate change in the Northern Territory. For example, we are currently representing the Environment Centre Northern Territory in judicial review proceedings in the Supreme Court, challenging the decisions to permit the clearing of over 20,000ha of land at Maryfield Station. Our case focuses on the lawfulness of how climate change was considered in this decision-making process. We are widely respected for our expertise in environmental law and policy and are regularly invited to participate in policy and law reform processes as a key stakeholder.

This submission focuses on legal issues related to climate change mitigation and adaptation in the Northern Territory. While the Discussion Paper includes the ‘Have your Say’ question to seek feedback on ‘What type of regulations do you think would assist industry in being accountable for their impact on climate change?’, we have focused our comments at a broader scale - on ‘framework’ climate change legislation for the Northern Territory. This kind of legislation would guide any future industry regulation around climate change, by setting binding objectives and principles, emissions reduction targets, and whole-of-government strategic planning processes.

Our submission:

1. Provides some general observations about the role of the Northern Territory Government (NTG) in taking action on climate change;
2. Sets out our vision for a Climate Change Act for the Northern Territory and what key elements this Act should contain; and
3. Identifies how, in addition to a Climate Change Act, climate change must be integrated into sectoral legislation and policy, noting important opportunities to do so given various law reform activities currently underway across government.

1. The Northern Territory Government must take leadership on climate change

The Northern Territory is particularly vulnerable to the impacts of climate change. As the Discussion Paper notes, anticipated impacts include variable rainfall, increased intensity of extreme weather events, increased bushfire intensity, droughts, extreme temperatures, sea level
rise, and economic costs. Climate change will clearly have far-reaching consequences across the economy and society, impacting on primary industries and fisheries, biodiversity and ecosystems, business and industry, tourism and built environment and infrastructure.

The Northern Territory’s emissions profile clearly identifies that greenhouse gas (GHG) emissions are set to rise rapidly in coming years, due to offshore gas production, the lifting of the moratorium on hydraulic fracturing, and other economic development activities leading to land clearing / land use change. While we recognise the challenges faced by the NTG in balancing its economic aspirations and environmental protection, failing to rapidly and effectively respond to climate change (including by limiting GHG emissions, and through adaptation) will have serious, far-reaching long-term impacts on Territorians and the environment. Our position is that given the challenges associated with effective action on mitigation and adaptation, whole-of-government obligations must be entrenched in legislation.

We also emphasise that although a critical role remains for the Commonwealth Government with respect to emissions reductions, Commonwealth legislative and policy inertia should not be a reason for the NTG to postpone its own action on climate change. Indeed, the Northern Territory is well behind other Australian jurisdictions which have had climate change legislation (including legislated emissions reduction targets) and policy in place for well over a decade.

2. The Northern Territory should introduce comprehensive climate change legislation

EDONT submits that a strong legislative framework for climate change is required to deliver robust, accountable decision-making and policy framework for action. A core way the NTG can lead and deliver action on climate change is by introducing a standalone Climate Change Act. This legislation would establish mandatory targets, strategies and policies, and ensure climate change is integrated into all levels of government decision-making. Without a clear legal framework (including binding emissions reductions targets), our view is that any commitment by the NTG to address climate change will be incapable of delivering lasting positive change.

A Climate Change Act would not be the ‘end point’ for climate change regulation. An Act would instead be a vital starting point, operating as a guiding framework to deliver policy coherence for this far-reaching issue that cuts across society and the economy. We consider there would likely need to be a range of new or amended laws and regulations to drive the behavioural change and deliver action. Exploring in detail what these options are is not within the scope of this submission and is a more appropriate task of a strategic planning process (see (e) below). However, future regulations to ensure industry is accountable for their climate change impacts will be most effective if guided by, and implemented in accordance with, overarching legislation.

Climate legislation has been enacted in multiple Australian states and territories, in addition to many jurisdictions worldwide. The Attachment to this submission provides a high-level overview of the legislation currently in place in Australia. Building on the experience of other jurisdictions, in particular the best practice approach established by Victoria’s Climate Change Act 2017, EDONT makes the following recommendations for key elements to include a new Climate Change Act for the Northern Territory.

a. Legislated greenhouse gas emissions reduction targets

Legislated targets are essential to ensure the Northern Territory makes a fair and equitable contribution to reducing GHG emissions, in line with Australia’s emissions reductions commitments under the Paris Agreement and in light of the IPCC’s 2018 Special Report on Global

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1 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory, Discussion Paper, 11.
3 Our colleagues at EDONSW have also prepared a detailed discussion paper entitled ‘Planning for Climate Change’ which, while focusing on the role of climate change in the NSW planning system, contains information and analysis that can be equally applied in the Northern Territory. See: https://d3n8a8pro7vhmx.cloudfront.net/edonsw/pages/3015/attachments/original/1470696446/Planning_for_climate_change_EDO_NSW_discussion_paper_july_2016.pdf?1470696446
Discussion Paper, 5.

Warming, which stressed that ambitious mitigation action is necessary to limit warming to less than 1.5°C. State and territory governments around Australia have, over many years, demonstrated strong leadership on climate change action, adopting emissions reductions targets ranging from 20% reduction to net-zero-emissions. It is incumbent on the Northern Territory to similarly adopt robust emissions reductions targets. These targets must be based on the best available independent advice and scientific evidence, that is, in accordance with the most recent recommendations of the IPCC.

Including targets in legislation is an important way to ensure they are taken seriously, and are enforceable. A binding, long term GHG emissions reduction target must therefore be a key element of a Climate Change Act. It would establish a clear, whole-of-government position to guide policy and decision-making.

With the NTG decision to lift the moratorium on hydraulic fracturing and emissions set to rise due to offshore and onshore gas (and other land use changes), EDONT considers legislating an emissions reduction target is essential to ensure climate change considerations are at the forefront of future decision-making, and there is a framework in place to measure emissions reductions against a ‘target’ or within a ‘budget’. An offset scheme should also form part of the mix to support achieving targets.

To ensure the government can respond appropriately to the best available science as it becomes available in the future, the Act should also include interim (or tiered) emissions reduction targets to support achieving its long-term target. Targets may also be adjustable over time, and the mechanism to achieve this must prohibit any regression (weakening).

We consider that it may also be appropriate to include specific targets for different sectors. This could include, for example, specific targets for renewable energy. We note that the NTG, through the Discussion Paper, has expressed a commitment to achieving 50% renewable energy by 2030. Legislating this target would serve to ensure accountability and drive the Northern Territory towards this goal. This has been demonstrated by the ACT’s experience where that jurisdiction, consistent with a target set under its Climate Change and Emissions Reduction Act, will deliver 100% renewable energy by 2020. The legislation should also specifically reflect, through its legislated targets, the Fracking Inquiry’s recommendation that there should be no net increase in life cycle GHG emissions from NT onshore shale gas.

b. Clear obligations on decision-makers (e.g. Ministers) to achieve targets

A Climate Change Act should include clear obligations and duties on government decision-makers to ensure emissions reduction targets are met. Again, the inclusion of this duty in legislation is critical to deliver genuine accountability to meet the legislated targets.

For example, the Victorian Climate Change Act includes a requirement for whole-of-government and sector-based emissions reduction ‘pledges’ to be made. Similarly, the Climate Change (Scotland) Act 2009 imposes a broad obligation on Ministers ‘to ensure net Scottish emissions account for the year 2050 is at least 80% lower than the [1990] baseline.’

c. Climate change as a mandatory consideration in decision-making

In addition to targets, a Climate Change Act should establish, and be framed by, clear climate change objectives for the Northern Territory, with principles to guide the delivery of these objectives. For example, the Act’s objects should be drafted to ensure the legislation is

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4 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory, Discussion Paper, 11
5 For example, Climate Change Act 2017 (Vic), s 9
6 Climate Change Act 2017 (Vic), s 10
7 Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory, Discussion Paper, 5.
8 Climate Change and Emissions Reduction Act, s 9
9 Climate Change (Scotland) Act 2009, Part 1, Section 1
implemented and administered consistent with the principles of ecologically sustainable development and best available science.

In taking steps to operationalise these objects, the NTG should adopt an integrated, cross-sectoral approach to mitigation, whereby decision-makers are required to consider climate change, including emissions reduction targets, impacts and adaptation.

Our view is that the Northern Territory Government should specifically identify a broad range of decisions made or actions taken under various Acts that require consideration of climate change. Sector legislation should also integrate climate change in decision-making (see the discussion in section 3 below). Making climate change a mandatory relevant consideration for decision-makers will be a critical way to ensure an emissions reduction target is met. The Victorian Act has very strong provisions implementing this approach. For example, amongst other things, that Act provides that a person making a decision or authorising action under an Act specified in a schedule must have regard to the “potential impacts of climate change” (s 17(3)) and “potential contribution to the State’s greenhouse gas emissions” (s 17(4)).

We consider that in the Northern Territory, this approach should be applied so that in the course of considering whether to approve a new project, the relevant approval body would be required to consider how the GHG emissions generated will contribute to meeting emissions reductions targets and be able to refuse an approval on the basis that the GHG emissions contribution is unacceptable. Decision-makers should also be required to ensure future climate change impacts and associated adaptation requirements are taken into account.

To assist decision-makers, a Climate Change Act should require the development and publication of guidelines to provide support for how climate change is to be considered in relevant decision-making processes.

d. A framework for monitoring, reporting and verification procedures

To ensure public accountability and transparency, a Climate Change Act should establish appropriate monitoring, reporting and verification requirements. These provisions would require the NTG to periodically and publicly report on progress to the Act’s goals, including the legislated targets. Transparency of information is a critical accountability mechanism, by ensuring the public is aware of progress towards goals. It also would provide critical momentum towards achieving emissions reductions targets. Independent verification of this reporting would provide greater transparency and accountability. An independent audit and analysis of the reporting period should therefore be required.

For example, under the ACT’s Climate Change Act, for each financial year the Minister must request an independent entity to prepare a report about greenhouse gas emissions and the targets mentioned. If a target mentioned for a financial year is not met, the Minister, within 6 days of receiving a report from an independent entity, must present a statement to the Legislative Assembly setting out: (a) why the target was not met and (b) what action will be taken to meet any subsequent target and how it will differ from previous action taken.

The ACT Act also imposes annual reporting requirements for each financial year on the Minister. Government agencies are required give information requested by the Minister about any policies developed or programs implemented during the year to address climate change. In Victoria, a

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11 Relevant considerations under section 17(3) of Victoria’s Act include: (a) potential biophysical impacts; (b) long and short term economic, environmental, health and other social impacts; (c) beneficial and detrimental impacts; (d) direct and indirect impacts; and (e) potential cumulative impacts.
12 Relevant considerations under section 17(4) include: (a) potential short-term and long-term greenhouse gas emissions; (b) potential direct and indirect greenhouse gas emissions; (c) potential increases and decreases in greenhouse gas emissions; and (d) potential cumulative impacts of greenhouse gas emissions.
13 Climate Change and Emissions Reduction Act, s 12
14 Ibid, s 13.
15 Ibid, s 15(1)
similar duty also exists, whereby the Minister must prepare an annual report on the state’s greenhouse gas emissions that (a) collates best practically available information and (b) sets out the extent to which the State’s greenhouse gas emissions have been reduced.\(^\text{16}\)

EDONT also recommends establishing an independent expert advisory body to provide objective oversight and expert advice to the NTG. An independent body ensures objective, evidence-based and transparent information and advice can be provided to government, in an accountable manner. For example, the Climate Change Council was established under the ACT Climate Change Act, for the purpose of advising the Minister on matters relating to emissions reductions and climate change. The 2015 Independent Review of the Climate Change Act 2010 (Vic) advocated for the establishment of an independent advisory body on climate change.\(^\text{17}\)

e. An integrated, strategic approach via a legislated Northern Territory Climate Change Strategy and sector specific adaptation ‘action plans’

Climate change will have far reaching environmental, social, cultural and economic consequences for the Northern Territory, which, given the already extreme climate, is highly vulnerable to climate change. Evidently, all sectors of the economy and society will need to take strong action to both reduce GHG emissions and prepare for the impacts of climate change.

A whole-of-government strategic framework for action on climate change will be critical to provide a platform for integrating climate change considerations into the wider policy framework of the Territory. This would define the risk posed by climate change and provide a framework for action, focusing on both mitigation and adaption strategies across different sectors. While we understand the NTG is intending to prepare a Climate Change Strategy based on feedback received through this consultation, EDONT considers this Strategy should be included as a mandatory requirement in a new Act, together with sector-specific action plans.

For example, the Victorian Climate Change Act provides a useful model, requiring:

(a) a statement of priorities (which must include a description of the Government of Victoria’s priorities);

(b) an adaptation component (providing summary of information and short and long term objectives); and

(c) an emissions reduction component (relating to interim-targets and whole-of-government pledges, sectoral ledges and Council pledges) which must be prepared by the Minister.\(^\text{18}\)

In the Northern Territory’s case, the Discussion Paper identifies key growth and development sectors that are being impacted by climate change.\(^\text{19}\) These include primary industries and fisheries, biodiversity and ecosystems, business and industry, tourism and built environment and infrastructure.

Provisions in a Climate Change Act requiring a Strategy and Action Plans to be established would place binding obligations on the Northern Territory to implement, and regularly review and update (e.g. every 5 years), plans to progress strategies and actions in these areas. Adopting a legislative basis for a strategy and action plans would signify the importance the NTG places on responding to climate change, will elevate these planning documents to the highest level, ensuring climate change remains in the forefront of decision-makers (both current and future), and will be another important accountability mechanism.

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\(^{16}\) Climate Change Act 2017 (Vic), s 52


\(^{18}\) Climate Change Act 2017 (Vic), ss 29, 30

\(^{19}\) See Northern Territory Government, Climate Change: Mitigation and Adaptation Opportunities in the Northern Territory, Discussion Paper 16-26.
3. Integrating climate change in sectoral legislation

As discussed above, our view is that a Territory-wide, integrated approach to both mitigation and adaptation will be essential to ensure robust and effective action on climate change.

However, we are highly concerned that climate change is currently absent from existing legislation on the environment and development in the Northern Territory. Moreover, while there are number of significant law reform processes underway, none of these processes include consideration of climate change. This is highly surprising, given the clear commitments on the part of the Northern Territory to develop climate change strategy. We are concerned by the lack of coordination between departments about climate change.

Given these various law reform processes underway, there is a clear and important opportunity to appropriately integrate climate change across various sector laws. Although we consider that a Climate Change Act would be the best approach to holistically integrate climate change across government decision-making, it is of course also important to identify how climate change could be integrated into existing laws, particularly as an interim measure until such time as a Climate Change Act is developed.

In the following sections, we identify key policy processes that are currently underway and provide brief examples of how climate change could be integrated within them (noting there would, of course, be other sectors where similar amendments are required).

a. Environmental regulatory reforms

A draft Environment Protection Bill is currently on public exhibition. This legislation has the potential to fundamentally transform the framework for the environmental assessment and approval of the impacts of development in the Northern Territory. While EDONT generally supports the draft Environmental Protection Bill, it does not refer to climate change at all (although it does define ‘environment’ broadly).

We consider the Bill, and in particular the objects clause (cl 3), should specifically include reference to climate change, to emphasise the importance of considering climate change in decision-making under this new legislation. Recent reforms in Queensland could offer a guide, with the amended Planning Act incorporating specific references to resilience, climate change and ethical decision making. New Zealand’s Resource Management Act also provides further guidance.

Climate change should also be explicitly included in key supporting tools that sit under this legislation - for example, through the inclusion of a GHG trigger that would automatically require an EIS and approval under the Act it meets a specified threshold of GHG emissions.

b. Reforms to the Planning Act

Climate change is inherently connected with land use planning and development. Planning frameworks developed now will have long-lasting effects for regional and urban planning, transport, resource extraction, building standards and vegetation management. They must be designed to ensure resilience for extreme weather events such as cyclones and bushfires, and sea level rise.

The Department of Infrastructure, Planning and Logistics is currently undertaking a wholesale review of the planning system, with a view to amending the Planning Act. However, despite the interrelatedness between climate change and planning, there are no references to climate change in any of the reform documentation (nor was the fundamental concept of ‘ecologically sustainable

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22 In seeking to give effect to the purposes of the act, decision-makers must have regard to climate change (s 7(i)) and the use and benefits to be derived from renewables (s 7(j)).
development' proposed for inclusion). This is highly concerning given the critical role that planning will need to play in adapting to climate change impacts in the Northern Territory and ensuring future development is appropriately resilient.

To ensure the Territory makes land use decisions appropriately in a changing climate, the reforms to the *Planning Act* should similarly include explicit requirements to consider and integrate climate change into planning and development assessment decision-making, at a minimum, by including reference in the Act’s objects clause and as a mandatory consideration in decision-making.

c. **Review of land clearing guidelines and forthcoming regulatory reform**

Land clearing poses significant risks to the Northern Territory environment, including by generating significant amounts of GHG pollution. The impacts of land clearing on biodiversity are also likely to be exacerbated by climate change (e.g. through changes to water; impacts on species through varied climatic conditions). Land clearing is increasing in the Northern Territory, and the current regulatory framework is highly inadequate to ensure these matters are appropriately considered by decision-makers.

The Department of Environment and Natural Resources is proposing reform of the regulation of land clearing in stage 2 of its environmental regulatory reforms. In the meantime, DENR has proposed an update to existing *Land Clearing Guidelines (draft Guidelines)*. In engaging in this process, we were concerned that no proper consideration was given to climate change (on the grounds that a climate change policy is under development). However, regardless of the status of any climate change policy, it is essential that the draft Guidelines include information about how decision-makers are to assess the impacts of land clearing on climate change, for example on GHG emissions, water quality and biodiversity.

Moreover, we consider that due to the overarching inadequacy of the land clearing framework, a complete overhaul of how land clearing is regulated is urgently required (including, potentially, the development of standalone legislation). Understanding that comprehensive reform will take time, it is essential that the draft Guidelines be updated in the meantime to incorporate climate change considerations. This should include, amongst other things, consideration of the emissions generated by clearing and associated land use, and the influence of climate change on the impacts of clearing on the environment.

d. **Reform of water regulation**

The impacts of climate change will be ‘felt particularly through water’.24 The IPCC has predicted that by the 2050s, the area of land subject to increasing water stress due to climate change is projected to be more than double that with decreasing water stress.25 Given the Northern Territory is particularly vulnerable in this regard, and given how essential water is for livelihoods, culture and industry in the Territory, the legislative and policy framework for water must better address the complex relationship with climate change.26

There are a range of reforms to the *Water Act* and associated policy currently underway (including in response to the Fracking Inquiry). In a recent submission on proposed amendments to the *Water Act*, we identified a range of deficiencies with that Act, including that it does not have a guiding objects clause, and contains no explicit mention of climate change (amongst other things).

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26 The core elements of a regulatory framework should emphasise: (i) sustainable water use and/ or water quality; (ii) the importance of management plans that regulate surface and groundwater levels, protect from contamination and minimise impacts on overall water quality; and (iii) consultation processes and conflict resolution between key stakeholders (explicit reference should be made to Aboriginal communities). See Dr Emma Carmody (EDONSW), “Climate Change is water change: integrating water management, mitigation and adaptation laws and policies,” Australian Environment Review: https://d3n8a8pro7vhmx.cloudfront.net/edonsw/pages/3542/attachments/original/1485817872/AER_31.10.pdf?1485817872.
Since that time, the *Northern Territory Water Regulatory Reform Directions Paper* (October 2018) has been released for stakeholder comment. This paper does not include any genuine consideration of climate change – again, this is highly concerning. We strongly recommend that climate change must be at the core of future water legislative and policy reform. Ways to achieve this will need to be explored in detail and integrated in the forthcoming stage of reforms.

4. Concluding comments

The NTG must take strong leadership on climate change. While EDONT welcomes the government’s proposal to introduce a Climate Change Strategy, in our view, this does not go far enough. A new *Climate Change Act* must be implemented in order to set the required standards of accountability for government action. This Act must:

- Set binding targets (interim and long term);
- Place obligations on decision-makers to meet targets;
- Establish clear objectives and guiding principles in relation to climate change;
- Integrate climate change in government decision-making across sectors;
- Establish an independent climate advisory body/council;
- Provide a framework for monitoring, reporting and verification progress on action (particularly relating to targets); and
- Create a framework for strategic planning and action planning.

Further, and particularly in the interim while a *Climate Change Act* is developed, climate change considerations must be incorporated in legislation in all affected sectors. Considering the multitude of law reform processes currently being progressed by the NTG (including across environmental assessment, planning, land clearing and water), we consider it an opportune time to achieve the required integration of climate change.

We look forward to further engagement with the NTG as it develops its climate change policy. We also welcome the opportunity to discuss our comments at any time.

Yours sincerely

**Environmental Defenders Office (NT) Inc**

[Signature]

Gillian Duggin

Principal Lawyer
Attachment: Overview of climate change legislation in Australian states and territories

Climate legislation has been enacted in several Australian states and territories. A high-level overview of existing legislation is set out below.

a. Victoria

The Climate Change Act 2017 (Vic),¹ which replaced the Climate Change Act 2010 (Vic), has been widely applauded for its progressive approach. It provides for a long-term emissions reduction target of net zero greenhouse gas emissions by 2050 and a duty on the Premier and relevant Minister to ensure it is met. This is supported by interim targets and a codified ‘Climate Change Strategy’ which, renewed every five years, sets out how Victoria will meet targets.

The Act also includes ‘Policy Objectives and Guiding Principles’ to help embed climate change into government decision–making whilst ‘Adaptation Actions Plans’ require nominated Ministers to prepare adaptation system-based action plans (for example, plans concerning transport, water etc.).

Importantly, the Act also requires a periodic reporting scheme to provide transparency and accountability for the community (for example, standalone reports on the science and data relevant to climate change in Victoria).


The Act sits alongside other key Victorian energy and climate change policy initiatives, including Victoria’s Climate Change Framework,³ Victoria’s Climate Change Adaptation Plan 2017-2020⁴ and Victoria’s Renewable Energy Action Plan.⁵

b. ACT

The Climate Change and Greenhouse Gas Reduction Act 2010 (ACT)⁶ contains some of the most ambitious greenhouse gas reductions targets in Australia including, 100% renewable energy by 2020 and zero net emissions by 2045 (previously 2050).

In 2016 a review of the Act was conducted by the ACT Environment and Planning Directorate, which considers all sections of the current Act.⁷ This review was informed by the 21st United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP 21).

Regard should also be had to the ACT Government’s Climate Change Strategy and Action Plan⁸ (Known as AP2) and Climate Change Adaptation Strategy⁹, which are the relevant policy instruments addressing the Government’s response to the targets.

c. South Australia

South Australia was the first state to codify targets to reduce greenhouse gas emissions with the Climate Change and Greenhouse Emissions Reduction Act 2007 (SA). The Act sets out proportional targets covering both the reduction of greenhouse gas emissions, and renewable energy generation. It obliges the Minister for Environment and Water to prepare regular progress reports and reviews.

The Act also allows the South Australian Government to enter into voluntary agreements between specific business entities, industries, community groups and regions to tackle climate change by, for example, improving energy efficiency, or research and development in technology. Currently sector agreements exist between the South Australian Government and Adelaide City Council, SA Water and others.

d. Tasmania

The Climate Change (State Action) Act 2008 (Tas) similarly enshrines a greenhouse gas emissions reduction target into legislation. It also allows regulations to be made to achieve development of this target. The Act is currently under review. Recommendations currently being considered are:

- a new aspirational long-term emissions reduction target of zero net emissions by 2050;
- objects of the Act to be consolidated to target: reporting; actions to reduce emissions; adaptation to projected climate change; and complementarity with other jurisdictions;
- embedding climate change targets and principles into State agencies and Departments’ decision-making; and
- a set of principles to better implement the target and objects of the Act.

e. Further information

The following sources also offer some insights that are likely to be useful when designing climate change legislation:

- EDONSW's discussion paper on Planning for Climate Change, which provides a summary of state and federal climate change law, and make various recommendations, many of which would be transferrable to the Northern Territory.
- The Australian Panel of Experts on Environmental Law (APEEL)'s recent publication, Blue Print for the Next Generation of Environmental Law (2017), which outlines key principles to be incorporated within climate legislation and policy.
- For international examples of a climate legislation and policy framework, the Climate Change Laws of the World database is a comprehensive resource. We also refer to the specific examples of:

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16https://static1.squarespace.com/static/56401dfde4b090fd5510d622/t/59bb6fe3f43b55b154728d29/1505456149104/APEEL+Blueprint+for+Environmental+Laws.pdf
The Climate Change (Scotland) Act 2009 and the proposed amendments Bill (2018).\textsuperscript{17}

UK Climate Change Act (2008) and the 2018 review of that Act.\textsuperscript{18}

\textsuperscript{17}Proposed Amendments to the Climate Change (Scotland Act) at http://www.parliament.scot/S5_Bills/Climate%20Change%20(Emissions%20Reduction%20Targets)%20(Scotland)%20Bill/SPBill30PMS052018.pdf

The Paris Agreement also requires signatories to strengthen their abatement efforts over time with the overarching goal of limiting the increase in global average temperature to well below 2°C above pre-industrial levels, with efforts to limit the temperature increase to 1.5°C. The Paris Agreement also recognises that the world will need to achieve zero net emissions in the second half of the century. To achieve this level of decarbonisation, Australia will need to adopt a multi-faceted approach, primarily targeting emissions reduction in the land and energy sectors. The energy sector, which is the focus of this roadmap, will play a key role given it accounts for 79% of Australia’s emissions. (Ref 1)

The extract above is from the CSIRO report of June 2017. It reminds us that the task facing homo sapiens is the decarbonisation of the atmosphere we all share. Climate Change in excess of that naturally occurring, is an unintended consequence of the use of carbon based fuels as the major source of energy for the Industrial Revolution. Successful decarbonisation by mid 21st century will prove if the descriptor, sapiens is indeed justified. Failure will demonstrate that collectively we have lost our way. The comments that follow will focus on decarbonisation of the atmosphere deliberately to emphasise that climate change is a consequence of humankind actions. The primary task is decarbonisation.

Since June 2017 there have been two significant developments which have the effect of qualifying the above extract from the CSIRO Report. They are:

1. The latest IPCC report indicates with some urgency that to limit atmospheric temperature rise to 1.5 degrees by 2050 fossil fuel as a source of energy ideally, should cease.
2. As a consequence of the recent falls in the cost of renewables plus batteries, the economic argument for gas as a transition fuel between coal and renewables is no longer valid

Additional factors taken into account in the following comments include:

- Where fossil fuel continues to be used, driven by social or economic factors, generation of carbon offsets presents an opportunity.
- Nuclear power is not politically acceptable in Australia, has long lead times and is not cost competitive with renewables plus storage either hydro or batteries.\(^1\)
- Should carbon capture and storage (CSS) be proven at scale, sequestration in the NT of carbon dioxide produced by coal fired power stations in the eastern states does not seem practical given the investment in pipes and pumps that would be necessary.
- The argument that by exporting coal and gas, Australian does not incur a responsibility for climate change does not wash on the world stage as the atmosphere is common to all nations.

With acceptance that combustion of fossil fuel is the primary cause of human contribution to climate change and that renewables, solar, wind and storage, are now technologically and economic available, discussion leading to government policy and programs on climate change should focus on

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\(^1\)It should be recognised that the Nuclear Energy industry has not gone away and will continue to promote its interests as a non-polluting, meltdown proof, source of reliable base load power with modern materials and technology which does not produce nuclear weapons material. Governments will be lobbied and should keep an independent watching brief on nuclear energy developments and claims.
the transition from fossil fuel to renewables. In the NT there are significant opportunities which have the potential for renewables based industries.

The thrust of the following answers to the questions in the NT Government Climate Change discussion paper, is that rather than an evolutionary approach as implied in the discussion paper, a revolutionary approach to renewables and climate change mitigation is necessary.

Q1 What if any greenhouse gas emissions target should the Northern Territory adopt?
   (a) An overall emissions target—net zero emissions
   (b) An overall emissions target—x%
   (c) Specific targets for each sector
   (d) A tiered target (specific target by 2025, then 2030)
   (e) No emissions target

I would suggest a combination of (a), and (c). That is an overall target of net zero emissions in line with the 2016 Paris Agreement, with milestone (not specific) targets for the major sectors to be reviewed say every five years with the option of reallocation. In this way the “targets” are understood as check points along the way, not as end points in their own right. (d) is not necessary as it is the same as the sum of (c).

Q2. What should businesses and governments be doing to reduce emissions?

There is no question that a campaign which is to extend over 30 years requires governmental consistency, continuity and responsiveness to unexpected knowledge—the unknown unknowns of Donald Rumsfeldt. This requires bipartisan support, something which has been sadly lacking in Australia. If governments are confined to short termism the result will be a few evolutionary jerks and no real change. The electricity industry has until recently lacked the confidence to invest that comes with continuity of government policy and support programs. Major companies are making investment commitments towards reducing emissions driven by commercial and cost comparison considerations. In the absence of coherent government policy one can be sure they are looking primarily to their own interests. At the Territory level the NT government could build on the Cool Mob program conducted by the NT Environmental Centre and promote increased energy efficiency in the NT homes and businesses buildings. There are considerable reductions in emissions to be gained by reducing the energy consumption of the built environment.

For some time now the solar PV installations on private dwellings has been sending a message to government that the people are ahead of them. More recently I note that business recognises the price Australia is paying for the policy vacuum and, as well as urging government to act in the National Interest, is embarking on independent programs of decarbonisation. Notably BHP Billiton “has applied carbon prices in valuations since 2004.” (Ref 2).
Q3. How else can we apply aboriginal knowledge and practices to help us mitigate and adapt to climate change?

The inference in the Climate Change discussion paper is that the indigenous practice of cool burning could be utilised to develop a carbon offsets industry. Such a development should start with a feasibility study which addresses the complete suite of infrastructure that is necessary for a viable industry, which could support community development.

Essential information needed for an initial feasibility study includes anticipated annual carbon dioxide equivalents to escape into the NT atmosphere, price of carbon offsets, cost of running the business and profit available for community development. For those parts of the country subject to the development of the on shore gas industry, it is essential that the gas industry infrastructure, access roads, pipes both surface and buried, storage areas, do not fragment areas which are burnt. For cool burning to be an effective means of land management, prevention of wild fires and decarbonisation of the atmosphere the patterns of burning must be conserved.

Q4. What potential opportunities can you see emerging from climate change in the Territory?

Following are outlines of four opportunities which embody the principles of triple bottom line accounting. That is they have favourable social, environmental and economic outcomes.

- Electricity generation could be the key to the future energy needs of the NT. Darwin to Alice Springs presents a 1600km north south axis along which a series of solar farms, including concentrated solar, could be developed, spaced such that the sun would always be shining somewhere along the way. Along that north south axis there are several small communities, some of which already have independent solar PV generation. There is potential for small scale solar, wind turbines and battery storage to provide renewable systems in remote communities. Spur lines running east west could meet many purposes including connections from small communities with their own generation capacity to the main transmission line, as well as developing local capability of support and maintenance.

- Transport is another principal user of energy in the form of liquid fuel dieseline and petrol. It is technically feasible to produce hydrogen gas from electricity and water. There are R&D programs leading to the development of hydrogen powered vehicles.

- There is potential for export markets of energy either as gas or electricity via undersea high voltage direct current cable.

- Improvements of energy efficiency of existing buildings.

- In the light of the NT government for an onshore gas industry including of the LNG capacity at Darwin, offsets arising from fugitive gases and how they are paid for could be problematic for the NT. However the knowledge of the aboriginal communities about cool burning of the bush could be developed into an export industry, complimenting the renewables generation of electricity for local and export consumption and the production of portable hydrogen fuel for transport.
Q5. How can the fossil fuel industry further reduce emissions from energy production?

1. Become fanatical at eliminating accidental fugitive gas escaping and find alternatives to venting and flaring.
2. Encourage more efficient use of energy in industry, transport, households and cities and townships.

Q6. What type of regulations do you think would assist industry in being accountable for their impact on climate change?

A carrot and stick approach to regulation is suggested. At a declared date government and industry, on a company by company basis, including the emitters in their supply chains, agree on a baseline of the sources of emissions under each company’s control and their annual quantity. The price of emissions must be significant to the bottom line. Companies are to report annually on their emissions, verified independently and are required to purchase carbon offsets equivalent to their emissions.

It is critical to the successful application of any regulatory regime that it functions without fear or favour by well trained and resourced people who know that their decisions will not be undermined by political interference in response to lobbying by the affected industry or company.

Q7. What actions are you willing to take to mitigate or reduce the impact of climate change?

As a retired person, my contribution to decarbonisation is to seek to live an energy minimisation life. Diesendorf (Ref 3) in Sustainable Energy Solutions for Climate Change (What you can do; page 295) gives a comprehensive list of practical measures that householders can do to reduce their carbon emissions.

Q8. What support do you need to help you to mitigate or adapt to climate change?

Government program to assist home modifications and a motor car registration which encourages decarbonisation, such as a fee structure which encourages mileage management. I have already referred to the Cool Mob program.

References
1 Executive Summary Low Emissions technology Roadmap June 2017 A report by CSIRO Energy and CSIRO Futures
2 BHP Climate Change Portfolio Analysis February 2014

Errol Lawson
Dear Sir/Madam

NORTHERN TERRITORY GOVERNMENT CONSULTATION ON CLIMATE CHANGE

The Green Building Council of Australia (GBCA) welcomes the opportunity to provide input to the Northern Territory Government’s consultation on Climate Change – Mitigation and adaptation opportunities in the Northern Territory. We congratulate the NT Government on the release of the discussion paper and for creating the opportunity for stakeholders and the NT community to contribute to the NT’s response to climate change.

As the discussion paper identifies, while climate change mitigation and adaptation activities raise challenges and costs, there are also significant opportunities to make positive changes for the community and the economy and to reduce future risks and costs.

The GBCA has worked closely with state, territory and local jurisdictions all over Australia, as well as with the Australian Government, to help shape climate change policy and develop initiatives and activities that make practical contributions to emissions reductions and climate change adaptation. The GBCA welcomes the opportunity to share our experience and work closely with the NT Government on its journey towards greater climate and economic resilience and lower emissions.

While there is plenty of scope for jurisdictions to create their own programs and initiatives to meet specific challenges, there are also a number of programs, initiatives and policies already in place which the NT Government can promote, adapt and adopt to drive change.

The GBCA welcomes the opportunity for further conversation beyond this consultation period, if there are any sections within this submission that the Department of the Chief Minister would like to explore in greater detail.

Our comments are presented as follows:

Q1: What (if any) greenhouse gas emissions target should the Northern Territory adopt?
It is important that all states and territories do their part to contribute to Australia’s national commitment to emissions reductions ratified in the Paris Agreement. As a signatory to the Paris Agreement, Australia has undertaken to reducing GHG emissions by 26-28% below 2005 levels by 2030.

Many local councils, states and industries – recognising the opportunities accompanying positive climate action and the risks of lagging behind – have made commitments that go above and beyond the national targets.

Ultimately, we know that as a nation and a global community we must strive for net zero carbon emissions by the middle of this century. The greatest success will be achieved where there is a shared vision for emissions reductions and a long-term, clear pathway to achieve it. The GBCA supports the NT Government setting its own targets for emissions reduction which align with other jurisdictions across Australia. Clear targets will demonstrate leadership and provide industry, businesses and the community with policy certainty regarding action on climate change.

Buildings in Australia account for around 23% of our total carbon emissions, but emissions reductions in the building sector are among the most cost effective to achieve. The technology already exists to achieve net zero emissions buildings, the challenge is implementing policies that will encourage uptake and overcome barriers. A range of initiatives, examples and policy recommendations are outlined in the following sections.

Q2: What should businesses and governments be doing to reduce emissions?

There are many ways in which the NT Government and businesses can play a role in reducing emissions. Energy efficiency and encouraging greater uptake of renewable energy are two areas in which greatest opportunities lie. The GBCA commends the NT Government on its target to achieve 50% renewable energy by 2050. The buildings sector can play a significant role in this by reducing overall energy demand through energy efficiency measures and including renewable energy technology in buildings and developments. Significant work has already been done by governments and industry to identify opportunities and some of these are outlined below.

- **GBCA Carbon Positive Roadmap**

  In June 2018, the GBCA released the Carbon Positive Roadmap for the built environment, a discussion paper which establishes the steps required for commercial, institutional and government buildings and fitouts to decarbonise.

  The roadmap clearly outlines the high-level outcomes, actions, targets and policy positions required. These are proposed alongside changes to the GBCA’s Green Star rating tool to ensure it helps lead industry through the next decade of transformation.
The paper proposes a range of policy positions for industry to support and calls for upgrades to energy efficiency requirements in the national construction code and an expansion of requirements for the mandatory disclosure of energy efficiency in buildings and fitouts. Broader reforms in the energy sector are also discussed, with practical incentives to support building upgrades and retrofits and the development of carbon neutral products and services.

The City of Melbourne recently released its Draft Climate Change Mitigation Strategy to 2050 which includes recommendations from the Carbon Positive Roadmap to address emissions in buildings and precincts.


- **Low Carbon, High Performance**

The Australian Sustainable Built Environment Council (ASBEC), of which the GBCA is a member, has developed several key policy papers over the past several years that offer evidence-based recommendations for governments and industry to improve the energy and emissions performance of the built environment sector. The 2016 report, *Low Carbon, High Performance*, provides a policy suite that will pave the way for a smooth and economically efficient transition to zero carbon emissions.

Recommendations from *Low Carbon, High Performance* include:

- Mandatory minimum standards for buildings, equipment and appliances with a future trajectory aligned with the long-term goal of net zero emissions. Please see further information in Q6.
- Targeted incentives and programs such as:
  - Introducing incentives for high performing buildings. For example, investigate the introduction of stamp duty concessions and differential council rates in partnership with local government for buildings that achieve third-party certification.
  - Work together with local government to explore the introduction of planning incentives for high performing new buildings.
  - Establish rising minimum standards for public housing and facilitate funding mechanisms to facilitate public housing retrofits.
- Energy market reforms to ensure that the energy market supports roll-out of cost-effective energy efficiency and distributed energy improvements.
- Support a range of data, information, training and education measures. This could be achieved by partnering with local government and industry bodies to access information about existing programs and initiatives and working together to disseminate information and education across the business and wider community. For example:
Work with the GBCA to raise awareness, share information and offer education regarding Green Star, and with the NABERS team from the NSW Government regarding NABERS.

- Leveraging government market power by setting ambitious energy efficiency and sustainability targets for government-owned, occupied and operated buildings.


- World Green Building Council Net Zero Carbon Buildings Commitment

Many governments and businesses across Australia and the world are eager to drive change from within their own organisations. The GBCA is a partner in the World Green Building Council (WorldGBC) Net Zero Carbon Buildings Commitment. Launched at the Global Climate Action Summit in San Francisco in September 2018, the Commitment challenges companies, cities, states and regions to reach net zero operating emissions in their portfolios by 2030, and to advocate for all buildings to be Net Zero in operation by 2050. The Commitment also requires these achievements be verified on an annual basis by an independent third-party system, such as Green Star.

In Australia, GBCA members AMP Capital Wholesale Office Fund, Frasers Property Australia, GPT Wholesale Office Fund, Stockland’s retirement living and logistics divisions, Cundall, and the City of Sydney have entered into the commitment, the first in Australia and among the first globally to do so.

The GBCA would welcome the opportunity to work the NT Government and NT businesses to make similar commitments. Reducing carbon emissions in the NT’s buildings sector can lead to significant reductions in operating costs as well as a range of other benefits such as improved productivity and future-proofed asset values. More information about the Net Zero Carbon Buildings Commitment is available at https://www.worldgbc.org/thecommitment and https://new.gbcAustralia.org.au/news/industry-news/global-commitment-net-zero-carbon-buildings/.

- Governments leading by example

Many jurisdictions are showing remarkable leadership on climate change policy, but also through making practical commitments to drive change in buildings and developments for which they have responsibility. Several examples of state governments leading by example are included below:

- The Queensland Government (Queensland Health) set a minimum requirement for their new $1.8 billion Sunshine Coast University Hospital (SCUH) project to achieve 4 Star Green Star Design and As Built certifications. Ultimately SCUH has achieved 6 Star Green Star Design and As Built certifications and has become a world-leading example of sustainable healthcare.
The NSW Government (Housing NSW) demonstrated strong leadership when it committed to achieving Green Star certification for its Redfern Housing Development. The project achieved a 5 Star Green Star rating through focusing on good passive design and energy and water savings. The project’s design aimed to reduce energy consumption by 74% when compared with standard residential buildings of similar size – a saving of around $26,000 across the entire development in energy consumption each year alone.

The South Australian Government, together with the City of Adelaide, launched the Carbon Neutral Adelaide Program to make the City of Adelaide the world’s first carbon neutral city. Alongside this ambitious goal, the SA Government is also demonstrating leadership through its own facilities and developments. Earlier this year, the New Royal Adelaide Hospital achieved a 4 Star Green Star rating. The SA Government also committed to achieving Green Star certifications for community development projects under its control – Bowden is targeting a Green Star – Communities rating and homes built within the development are also required to achieved Green Star ratings. The Tonsley development achieved a 6 Star Green Star rating.

Case study – Bowden

Renewal SA’s Bowden development, situated on the western edge of the Adelaide City Parklands, is redefining sustainable living in South Australia. Each and every building delivered on the 16.3 hectare site must achieve a 5 Star Green Star rating – or above. Renewal SA has raised the bar even higher, by also committing to achieve a Green Star – Communities rating for the entire precinct.

Rivergum Homes’ Terraces on Sixth, comprising three stunning six-storey terraces, is just one inspiring example. The first terraces in Australia to receive a 5 Star Green Star rating were designed to be energy-efficient. North-facing orientation, cross-ventilation and high-performance glazing control heat gain and loss, while maximising natural light. According to Rivergum Homes’ General Manager – Property, Robert Alvaro, “each terrace comes with a raft of sustainability features we believe go beyond what’s considered to be the norm.”

All water fixtures and fittings were selected to minimise water consumption and are complemented by 2,050-litre rainwater tanks installed in the grounds of each dwelling. A third pipe system provides recycled water to all toilets. A 1.5kW solar photovoltaic panel system generates renewable energy for each dwelling.

“We wanted to ensure that what we did was environmentally friendly while, at the same time, enhancing the comfort levels for occupants,” Robert says. Working with the Green Star framework “demanded a fundamental shift in thinking from the traditional approach, not to mention the acquisition of new and greener skills among our designers,” Robert adds.

Because the requirement for Green Star certification was new to most of the designers and contractors working on projects in the Bowden Development, Renewal SA worked with local Green Star Accredited Professionals and the GBCA to upskill those involved in the projects and streamline
the certification process. This has led to better outcomes for Bowden, as well as helping the local industry to embrace sustainable practices.

Case study – Tonsley

Tonsley is Australia's first mixed-use urban redevelopment to be awarded the prestigious 6 Star Green Star – Communities certification.

When Tonsley’s masterplan was being developed back in 2012, the South Australian Government set a clear brief for the site. The former manufacturing park was to become a sustainable centre for innovation and productivity, drawing workers, developing high-value industries and contributing to the state’s economic success. To achieve these goals, Tonsley needed to incorporate the right mix of uses, and to facilitate connections between people, businesses and educational institutions. Adaptive reuse of existing infrastructure is helping to do this by creating a central hub of activity for the community and plenty of opportunities for social and commercial interaction.

The former Mitsubishi Main Assembly Building (MAB) has been retained as the central town square. Once complete, MAB will incorporate retail outlets, eateries, meeting areas and education spaces. Flexible, modular and pod tenancies will also attract small and medium businesses.

In addition to providing an activated hub at the heart of the community, retaining the MAB ensures Tonsley is a world-leader in emissions reduction. Around 90,000 tonnes of embodied carbon emissions have been saved – the equivalent of removing 25,000 cars from the road for a year. Within the MAB, internal forests will provide beautiful natural spaces for members of the community to enjoy, while at the same time capturing carbon and purifying the air.

The environmental benefits don’t stop at carbon capture, with the MAB’s expansive roof providing the perfect infrastructure to support an extensive 3MW photovoltaic array. Tonsley’s public spaces are being created using water-sensitive urban design principles, while walking and cycle paths provide easy access to public transport and connectivity across the precinct.

Q3: How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

NT has rich history and tradition to learn from in respect to Aboriginal knowledge and practices. We believe that the NT has an opportunity to be a leader in this area and the GBCA looks forward to learning alongside the NT Government and assisting with sharing the knowledge, examples and lessons learnt across Australia.

Q4: What potential opportunities can you see emerging from climate change in the Territory?

The GBCA commends the NT Government on the actions already underway in the built environment and infrastructure sector. Some of the opportunities recognised in the discussion paper are outlined below with additional comments and opportunities identified by the GBCA:

- **Building design guidelines for Government buildings could incorporate specific environmental efficiency strategies to mitigate higher average temperatures**

The GBCA encourages the NT Government to lead by example in requiring all government owned, operated and occupied buildings to meet minimum requirements for energy efficiency and sustainability. Using industry-accepted, independent rating tools is the most straightforward and accountable way to achieve success. For example, committing to a minimum of 4 or 5 Star NABERS ratings where applicable and Green Star certification for new and refurbished facilities where possible.

There are many examples of how Green Star buildings are incorporating a range of features to mitigate higher average temperatures and increase resilience against other climate extremes. Encouraging projects to use Green Star drives new technology and innovation which are then more widely adopted across the industry.

The NT has an opportunity to encourage sustainable development and position itself as a leader in climate adaptations for buildings in tropical conditions. As climate zones shift worldwide, there will be many communities looking for experience and expertise in this field.

**Case study – Jacana House**

In the NT, Jacana House achieved a 5 Star Green Star certification in 2011. This is an 11-storey commercial development in the Darwin CBD. The building has been designed and constructed to feature a number of 'best practice' and environmentally sustainable design (ESD) initiatives including:

- Energy efficient Low-E double glazing
- Fixed external louvers to minimize solar gain and maximize daylight into the space
- Green roof and accessible green roof terrace spaces
- Energy efficient air conditioning systems using off-peak cooling and a 1 million litre chilled water storage system
- Desiccant dehumidification system designed and manufactured specifically for this project
- Efficient programmable lighting system with daylight sensors
- Low emission paints, sealants, flooring and wood products
- Water efficient fittings and a 303kL rainwater tank to reduce water demand and discharge to sewer.
• **Enhance the passive cooling capabilities of the housing stock and installing insulation will help to mitigate higher demand for electricity.**

The NT Government has an opportunity to implement best practice in passive cooling and insulation in housing stock through well-planned initiatives, partnerships and leading by example. In addition to the range of benefits to the occupants of the improved housing, there is an opportunity for the NT to become a recognised leader in this area by starting with a commitment to best practice in all new and refurbished public housing. Implementing best practice design and insulation will not only reduce the operating costs of homes for residents, but will also create healthier homes.

The Clean Energy Finance Corporation (CEFC) works with organisations and governments to finance projects that will deliver more energy efficient, healthy buildings, including social housing. One such project is a $60 million deal with housing provider, SGCH, to build over 200 new homes and upgrade many more in their existing portfolio. CEFC-financed properties will be built to a minimum 4 Star Green Star rating or a 7-star rating under the Nationwide House Energy Rating Scheme (NatHERS).


• **Investigate low-emission transport options & increased transport efficiency including public transport and alternative fuels.**

Green Star encourages low-emission and alternative transport options in a range of ways through its rating tools for buildings and communities. Points are awarded within the rating tool where projects include features such as end-of-trip facilities to encourage cycling and walking, pedestrian-friendly design, proximity to public transport links, and provision of parking and facilities for ride-sharing and electric vehicles.

The GBCA invites the NT Government to consider how the Green Star rating tools may help to inform policy development in a range of areas, including transport. Green Star rating tools include industry-agreed, best practice benchmarks across a range of categories for both buildings and communities. Further information about the Green Star rating tools is available at [https://new.gbca.org.au/green-star/rating-system/](https://new.gbca.org.au/green-star/rating-system/).

• **Conduct energy efficiency audits of existing Government dwelling designs to assist with transitioning all government buildings to energy efficient lighting and support sound decisions on upgrading, demolishing or disposal.**

The GBCA has long advocated for governments to commit to auditing their own assets to determine environmental performance. This is a great example of government leadership and an excellent opportunity to identify opportunities for improvements to energy performance and long-term reductions in operational costs.
As identified in the discussion paper, taking action on climate change will lead to many benefits and opportunities in the short, medium and long-term. In addition to the points outlined above, other opportunities for the NT community include encouraging the adoption of renewable energy technology to support the NT’s existing policy in this area, and the promotion of social innovation.

There are many examples of Green Star buildings which incorporate renewable energy technology to reduce peak demand and reliance on the energy grid. Two are outlined below:

- **Generating clean energy and reducing demand** – The 6 Star Green Star Ponds Shopping Centre in Sydney’s north-west installed 400 solar photo voltaic energy panels on its roof, providing enough renewable solar energy to power most of the car park. LED lighting in the main mall area and electricity sub-metering also helps to reduce energy consumption, while much of the centre is naturally ventilated or uses efficient economy cycle air-conditioning.

- **Renewable energy on a community scale** – In a program part-funded by the Australian Renewable Energy Agency, led by Western Australian energy provider, Synergy and in partnership with Lendlease and LandCorp, more than 50 homes in the 6 Star Green Star-rated Alkimos Beach community in WA are now connected virtually to an innovative 1.1MWh solar energy storage system. For $11 per month, homes in the community have the benefit of renewable energy generation and battery storage. In addition to reducing peak demand locally, the trial is providing valuable insight into how renewable generation and energy storage can be integrated with traditional network infrastructure.

A number of recent Green Star projects have chosen to focus on social sustainability in addition to the many environmental and financial benefits of building green. Two examples are outlined below:

- **Employment creation** – The Sunshine Coast University Hospital project supported and funded an employment initiative called ‘The Work Shop’. It provided an opportunity for lead contractor, Lendlease, to partner with Sunshine Coast Council and The Hornery Institute who was responsible for the overall strategy of The Work Shop. From this partnership, 807 jobseekers were placed into employment (82% were local people; 19% previously unemployed, and 13% young people). At peak employment, there were over 1800 skilled construction workers on site. Induction records show that over 2354 people were inducted to site from the local area which significantly exceeds the 80% local construction worker target set by the project.

- **Contractor education and Reconciliation Action Plan** – At Barangaroo, a world-leading urban development project in Sydney, Australia, the project developer, Lendlease, has partnered with training institution, TAFE NSW, to deliver the Barangaroo Skills Exchange. This program has directly employed 212 Aboriginal and Torres Strait Islander workers, including
apprentices. These workers not only learn their chosen trade and gain opportunities to achieve further qualifications, but also get valuable training in sustainable building practices.

Q5: How can the fossil fuel industry further reduce emissions from energy production?

N/A

Q6: What type of regulations do you think would assist industry in being accountable for their impact on climate change?

There are already a number of programs and regulations in place that can hold industry more accountable for their impact on climate change. The NT Government can play a significant role by raising awareness, working with other jurisdictions to lift minimum standards, and enforcing existing regulations more effectively. Several of these initiatives relating to the built environment – and the role that the NT Government can play – are outlined below.

- Lifting minimum standards in the National Construction Code (NCC)

As mentioned in Q2, setting mandatory minimum standards for buildings, equipment and appliances with a future trajectory aligned with the long-term goal of net zero emissions will be critical factors on the pathway to a net zero carbon future. While the NCC does currently include minimum energy efficiency standards for buildings, these standards have now fallen far behind industry best practice in Australia and benchmarks set in other developed countries. In July 2018, ASBEC released *Built to Perform – An industry led pathway to a zero carbon ready building code*. This evidence-driven policy document demonstrates that;

*Improved energy performance of buildings presents a win-win-win opportunity, reducing stress on the electricity network, offering bill savings, supporting a least-cost pathway to a zero carbon built environment, and improving health and resilience outcomes for households and businesses.*

*...The analysis shows that by 2030, even conservative improvements in Code energy efficiency requirements could deliver between 19 and 25 per cent of the energy savings required to achieve net zero energy in new residential buildings, 22-34 per cent of the required energy savings for commercial sector buildings, and 35-56 per cent for public sector buildings.*

Achieving these targets could reduce household bills by up to $900 per year for each household, while saving thousands of dollars each year across a whole non-residential building. This could also reduce electricity network investments across Australia by $12.6 billion between now and 2050.

The report makes three recommendations and as part of COAG and the Australian Building Codes Board (ABCB), the NT Government has an important role to play in these actions:

- Recommendation 1: The COAG Energy Council and Building Ministers Forum should commit to delivering a ‘Zero Carbon Ready’ Code. This would mean setting energy efficiency targets in the
Code, introducing net energy targets (including renewable energy potential), and establishing a clear set of rules and processes for implementation and adjustment of the targets in the Code.

- **Recommendation 2:** The COAG Energy Council and Building Ministers Forum should jointly agree to task the ABCB to deliver a step change in the energy requirements in the 2022 Code, with a strong focus on residential standards and a further incremental increase in non-residential standards.

- **Recommendation 3:** The COAG Energy Council and Building Ministers Forum should jointly establish work programs that investigate expanding the scope of the Code to prepare for future sustainability challenges and opportunities, including health, peak demand, design for maintainability, provision for electric vehicles and embodied carbon. The Building Ministers Forum and COAG Energy Council should also progress measures to complement the Code and drive towards zero carbon new and existing buildings.


- **Commercial Building Disclosure (CBD) Program**

  The Commercial Building Disclosure (CBD) Program is a regulatory program that requires energy efficiency information to be provided in most cases when commercial office space of 1000 square metres or more is offered for sale or lease.

  The NT Government can play its part in the continuing success of this program by ensuring that information is available about the program to all building owners and tenants, and raising awareness about the NABERS rating tool to all building owners and tenants in buildings/tenancies both over and under 1000 square metres.

- **Setting guidelines and minimum requirements for buildings and developments**

  Governments play a critical role in encouraging energy efficiency and broader sustainability buildings and community developments when they lead by example. As discussed in the Bowden and Tonsley examples from South Australia in Q2, governments have an opportunity to make third-party certification a requirement on appropriate developments. Requiring Green Star for such projects means that everyone working on the project understands the shared vision for sustainability and must ensure that best practice benchmarks are met.

  Governments can also leverage their influence in commercial and public buildings by setting ambitious energy performance goals for government-owned, occupied and operated buildings and facilities. For example, in 2007, the Victorian Government committed to requiring Green Star certification for all new government accommodation built for government tenancies. The Victorian Government Accommodation Guidelines and Standards 2007 state that:

  The following Green Star rating shall apply to all new office accommodation built for government tenancies:
Green Star – Office Design 5 stars (Australian Excellence) for the base building;
Green Star – Office As Built 5 stars (Australian Best Practice) for the base building; and
Green Star – Office Interiors 5 stars (Australian Excellence) for the fit-out.

This commitment had a profound effect on the commercial office building market in Melbourne. It immediately raised awareness of sustainability and Green Star amongst building owners and building industry practitioners and accelerated Green Star certifications in the state.


Q7: What actions are you willing to take to mitigate or reduce the impact of climate change?

We have seen that many stakeholders in the built environment and business community, as well as the wider community are willing to take action on climate change. Government leadership in creating a shared vision which is supported by consistent and coordinated policies and initiatives will create certainty and a culture of change.

The GBCA would welcome the opportunity to work with the Department of the Chief Minister and the NT Government to help provide information and examples that will in turn assist NT Government departments and agencies, as well as industry to adopt more sustainable practices.

Q8: What support do you need to help you to mitigate or adapt to climate change?

Through the GBCA’s work with many stakeholders in the built environment over 15 years, we have learnt that the following factors have a significant impact on people’s willingness and/or capacity to take action themselves:

- Government leading by example, such as committing to Green Star and NABERS in government-owned, occupied and operated buildings.
- Promoting existing policies and initiatives. For example, promoting the use of rating tools such as Green Star and NABERS and raising awareness of programs and opportunities such as the CBD Program, the WorldGBC Net Zero Carbon Buildings Commitment, and the Clean Energy Finance Corporation.
- Providing information about the benefits and opportunities of sustainable building and development and partnering with relevant organisations to deliver education and training. For example, working with the GBCA to offer Green Star education both to government decision and policy makers as well as to industry.
- Identifying challenges and opportunities and adopting or creating initiatives and policies to address these. For example, adopting recommendations from the GBCA Zero Carbon Pathway or ASBEC’s Low Carbon, High Performance and Built to Perform – An industry led pathway to a zero carbon ready building code.
- Providing incentives to industry to reward sustainability as outlined in Q2.
ABOUT THE GREEN BUILDING COUNCIL

Established in 2002, the Green Building Council of Australia (GBCA) is the nation’s authority on sustainable buildings, communities and cities. Our vision is to create healthy, resilient and positive places for people. Our purpose is to lead the sustainable transformation of Australia’s built environment. To do this, we: Rate the sustainability of buildings and communities through Australia’s only national, voluntary, holistic rating system – Green Star. Educate industry and government practitioners and decision-makers, and promote green building programs, technologies, design practices and operations. Advocate policies and programs that support our vision and purpose.

The GBCA represents more than 650 individual companies with a collective annual turnover of more than $40 billion. Our membership reflects the diversity of Australian business, with over 500 small to medium enterprises through to 75 companies with annual turnover of more than $100 million and 24 companies now listed in the ASX 200, with a combined market capitalisation of more than $620 billion. Members include major developers, professional services firms, government departments and local councils, banks, superannuation funds, product manufacturers and suppliers.

The GBCA appreciates the opportunity to participate in the Community Participation & Sustainability Advisory Committee. The GBCA agrees in principle with the recommendations of the Committee and looks forward to further engagement with the SA Government as part of the Committee as well as in our own right.

ABOUT GREEN STAR

Green Star is an internationally-recognised, independent, third-party certification system which assesses the sustainable design, construction and operation of buildings, fitouts and communities. Choosing Green Star can help you save money, create a healthy place for people, minimise your environmental footprint and build a better future for us all.

Green Star certification is awarded for projects which achieve 4 Star (Best Practice), 5 Star (Australian Excellence), or 6 Star (World Leadership) benchmarks. Green Star – Performance also recognises 0-3 Star achievements to assist facilities to benchmark and identify opportunities for improvement. The Green Star rating tools for buildings assess sustainability across nine impact categories: Management, Indoor Environment Quality (IEQ), Energy, Transport, Water, Materials, Land Use & Ecology, Emissions, Innovation

The Green Star – Communities rating tool assesses sustainability across five impact categories: Governance, Liveability, Economic Prosperity, Environment, Innovation
Re: Northern Territory Climate Change Strategy

To the Department of the Chief Minister,

The Indigenous Carbon Industry Network (ICIN) welcomes this opportunity to inform the Northern Territory’s Climate Change Strategy.

ICIN welcomes the release of the Climate Change Strategy Discussion Paper. The drafting and implementation of the Climate Change Strategy is critical to the future of the Northern Territory. Leadership on climate change policy is vital to growing the future of the Indigenous Carbon Industry, contributing to improved market certainty, jobs growth and enabling businesses to plan forward.

As one of our members, ALFA NT Ltd, notes in its submission to this Strategy: “One of the biggest risks to this new industry is the lack of long-term national and state/territory climate change policies and associated frameworks to support the creation and sale of carbon credits and other offsets.”

ICIN wholly encourages the Northern Territory Government to take pride in celebrating this homegrown industry, which provides unique opportunities for Indigenous people to access paid work on their country whilst fulfilling their cultural obligations to care for country in remote areas.

The Climate Change Strategy provides the opportunity to further enhance and support the recommendations and actions of the NT Aboriginal Carbon Industry (NTACI) Strategy, released earlier this year. ICIN is assisting the Northern Territory Government to deliver many of these actions by providing a platform for engagement with Indigenous carbon businesses and informing policy development to support the industry.

The Climate Change Strategy also provides the opportunity to connect these policies so that they form a vital part of the NT Economic Development Framework going forward.

ICIN notes that references to the Indigenous carbon industry and emerging opportunities to support Indigenous land management activities through the NT’s climate change response could be expanded upon. To inform the NT Climate Change Strategy, ICIN has delivered an information briefing to staff of the Department of Chief Minister. This document includes reference to much of the information which was discussed at the meeting. ICIN welcomes future opportunities to deliver briefings to support improved understanding of this industry across government.

For your immediate attention, please refer to page 8 of this document for a list of recommendations. Please refer to submissions by our members, including the Northern Land Council, the Arnhem Land Fire Abatement NT Ltd, NAILSMA Ltd and the Indigenous Land Corporation for further information.

Kind regards,
Anna Boustead
Coordinator, Indigenous Carbon Industry Network
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What is the Indigenous Carbon Industry Network?

The Indigenous Carbon Industry Network (ICIN) has evolved to support a pathway for improved communication between internal and external parties in the Indigenous carbon industry. It was initiated early in 2018 as an outcome of the Savanna Fire Forum held in Darwin. Its primary goal is to support land managers to participate in emerging carbon industries as fully as possible with a good understanding of its associated risks and benefits.

The ICIN includes Indigenous savanna carbon producers, Indigenous project developers and supporting organisations from across northern Australia. It is overseen by a Steering Committee consisting of representatives from Indigenous organisations with significant experience in hosting carbon projects across northern Australia.

Indigenous Carbon Industry Network Objectives

The Network’s core objectives are:

1. Building capacity through knowledge sharing among Indigenous practitioners.
3. Facilitating engagement and collaboration with state, territory and Australian governments in policy development.
4. Increasing access and engagement by Indigenous projects with the corporate sector.

The Commonwealth Department of Environment and Energy as well as the Northern Territory Government and Queensland Government have committed seed funding for a part-time ICIN Coordinator to support the network until June 2019.

Contact details for the ICIN are as follows:

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Growing the Indigenous Carbon Industry

What is the Indigenous carbon industry?

The Indigenous carbon industry is a major emerging industry which has recently rapidly expanded from the successful West Arnhem Land Fire Abatement (WALFA) project launched in 2006 to over 24 Indigenous savanna fire projects across the Top End of the Northern Territory, the Kimberley, Central Australia and Far North Queensland.

Indigenous carbon projects generate multiple benefits to local communities, the environment and the entire planet.

The Indigenous carbon industry is an important vehicle for Indigenous people seeking to work on their traditional lands. This provides a pathway to more job opportunities and training whilst maintaining important connections to family, community and country. The industry generates revenue for Indigenous ranger groups and land owners across northern Australia.

Through the savanna fire projects, ranger groups work with Traditional Owners and scientists to meticulously plan, map out and record their work to create detailed fire maps of their country. This process:

• brings Traditional Owners back to their country;
• supports the handing down of traditional knowledge from elders to future generations;
• facilitates other land management activities;
• supports Traditional Owners to fulfil cultural obligations to look after country;
• builds on both traditional and western knowledge of country through opportunities for exchange of cultural and scientific information; and
• provides meaningful employment and training opportunities in very remote areas, where jobs are often scarce.

The flow-on social benefits brought by the projects are still being understood but these include, greater self-determination of remote communities, improved community cohesiveness and independent resourcing of outstations and communities.

There are also significant environmental benefits brought by these savanna fire projects. Through shifting the fire regime from predominantly late dry season fires to predominantly early dry season fires, savanna fire projects increase biodiversity, improve soil health and cause a significant reduction in greenhouse gas emission emissions from savanna fires.

“This fire management program has been successful on so many levels: culturally, economically and environmentally. Through reinstating traditional burning practices, new generations of landowners have been trained in traditional and western fire management, hundreds of thousands of tonnes of greenhouse gas have been abated, and the landscape is being managed in the right way.”

Dean Yibarbuk, Fire ecologist and Senior Traditional Owner, West Arnhem Land

How does savanna fire management generate carbon credits?

The Indigenous people of Australia have always used fire in different ways to manage the land, increase food availability, fulfil cultural obligations to care for country, assist with hunting and increase access to country. Thousands of clan groups across Australia have recorded their knowledge
and use of fire over tens of thousands of years in songs and stories. Fire can be small, controlled and cool, bringing new growth to grasslands and woodlands. Fire can also be hot and destructive if not managed properly. This detailed understanding of how to manage fire at the landscape scale eluded early European colonisers, who lacked an appreciation of the role of fire in managing Australian landscapes.

During colonization, many Aboriginal and Torres Strait Islander people were either dispossessed of their lands or had their land management traditions interrupted. In most areas, people were no longer permitted or able to fulfil their cultural obligations to manage country. Fire was excluded from the landscape by new laws making it a crime to light fires. Without the careful management of fire that characterized pre-colonial Australia the landscapes were often left unburnt until the late dry season when lightning or misadventure would ignite fast moving and destructive wildfires that were massive in extent. This new regime is recognized as a key driver of species loss across northern Australia, particularly amongst small mammals and granivorous birds.

Savanna woodlands and grasslands cover about 1.9 million square kilometres, or about 23% of the Australian continent.\(^1\) The contribution of greenhouse gases due to these hotter, more widespread fires in the savanna region of northern Australia is of global significance, representing about 3% of Australia's total greenhouse gas emissions.

In the Northern Territory alone, savanna fires are attributed to about 35% of its entire greenhouse gas footprint, making savanna fire projects a particularly significant pathway for reducing the Northern Territory's total emissions.\(^2\)

Since Aboriginal Land Rights were legally recognised in 1976 and Native Title rights were recognised in 1991, Aboriginal people have been slowly acquiring their land back. Over 50% of the NT is now recognised as Aboriginal Land, including over 80% of the coastline.\(^3\) Indigenous ranger groups have established to manage these vast tracts of land. This means that the Territory’s Indigenous people are at the forefront of responding to climate change, through land and sea management.\(^4\)

Indigenous ranger groups now combine modern technology such as GPS tracking devices, fire incendiary machines and drip torches, with traditional knowledge to re-establish traditional fire regimes on their country. The Indigenous carbon industry emerged out of scientific research showing that a significant savings could be made in carbon emissions by re-establishing traditional fire regimes in the landscape, which favor predominantly early dry season burning. These savings in emissions, when measured, could create carbon credits to offset generation of greenhouse gas pollution by other industries.

Through the Australian Government’s Emissions Reduction Fund, registered carbon projects can sell Australian carbon credit units (ACCUs) through an auction to the Government. Projects may also sell their ACCUs privately, including to companies seeking to voluntarily offset their carbon emissions.

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\(^2\) Carbon in the Northern Territory (2016) Territory NRM, [https://docs.wixstatic.com/ugd/da28f0_5bc40bcd562e4e8f9bd4cc7eb58f9008.pdf](https://docs.wixstatic.com/ugd/da28f0_5bc40bcd562e4e8f9bd4cc7eb58f9008.pdf)


\(^4\) Assets and Pressures of the Northern Territory (2016) Territory NRM, [https://docs.wixstatic.com/ugd/da28f0_f71236c1b2ca4d9a91762ae281dd0944.pdf](https://docs.wixstatic.com/ugd/da28f0_f71236c1b2ca4d9a91762ae281dd0944.pdf)
**Current state of the Indigenous Carbon industry**

- Over 24 Indigenous-owned and operated savanna fire projects
- Enabling improved Indigenous fire management over 17.3 million hectares of north Australian savanna
- Abating approximately 1.2 million tonnes of CO$_2$e each year
- Generating over $16 million worth of ACCUs in the 2017/18 year
- Over 10% of all ACCUs produced (across all methods) are generated by Indigenous carbon businesses through savanna fire projects.
- Over 80% of ACCUs produced by the savanna fire emissions avoidance method are generated by Indigenous carbon businesses across north Australia.
- 68% of this industry occurs in the Northern Territory (828,069 tonnes).

On the voluntary market ACCUs delivered by Indigenous carbon businesses are already able to attract a premium price substantially higher than the standard ERF price. As recognition of the multiple benefits delivered by Indigenous carbon projects grows, so does the potential for measuring and recording the social, cultural, and ecosystem values which are delivered by the projects. For example, the Aboriginal Carbon Fund are developing a verification framework for environmental, social and cultural values of carbon farming. And the Darwin Centre for Bushfire Research is working with environmental economists and fire managers to measure the biodiversity and ecosystem service benefits delivered by fire management.

The announcement of a new savanna fire management methodology to allow the generation of ACCUs through good land management promoting sequestration and storage of carbon in northern Australian savannas is an additional emerging opportunity.

The potential introduction of compliance measures to encourage polluters to reduce their greenhouse gas emissions could further increase demand for ACCUs.

Providing funding to assist Indigenous groups with start-up costs as well as setting up their own governance structures to hold carbon projects is another important area where governments can assist. For example, in response to the document ‘Delivering Jobs and Growth in Rural, Regional and Remote Queensland through Carbon Economies – Key Policy Principles’ (Aboriginal Carbon Fund and The Wilderness Society) the Queensland Government decided to establish the $500m Land Restoration Fund. A similar policy approach for co-investment could be adopted by the Northern Territory Government.

**Future of the Indigenous carbon industry**

It is estimated that by 2020, Indigenous carbon projects across northern Australia have the potential to abate over 3.2 million tons of carbon dioxide equivalent each year, provide 600-1100 part-time or casual jobs for Indigenous land managers, generate around $40 million each year (at an average of $12/tonne) and deliver significant additional environmental outcomes.

Beyond 2020, many other methods for reducing greenhouse gas emissions through good land management practices are emerging as potential opportunities for Indigenous carbon businesses.

One example is control of feral cattle, buffalo and camels. Feral animal management is undertaken by Indigenous land managers to improve health of country and protection of sacred sites, as well as

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reduce damage to assets such as fences and waterholes. If the emissions abatement of managing feral animals could be measured in ACCUs in future, then this would provide another form of income to support Indigenous land managers whilst also promoting better biodiversity outcomes.

The Indigenous carbon industry increases the resilience of the Northern Territory in its response to climate change.

The sequestration and storing of carbon in seagrasses, coral reefs and mangroves (often referred to as ‘blue carbon’) would provide an additional source of funding for Indigenous land managers to care for sea country. The maintenance of sea country is also critical to supporting resilience of coastal areas against the impacts brought by climate change; including rising sea levels and more intense storm surge events.

Efforts to mitigate greenhouse gas emissions through land management activities are strongly tied to efforts to respond to the impacts of climate change, by maintaining resilient landscapes. Weed management is closely tied to fire management. Stopping the spread of fire weeds such as Gamba grass is critical to managing fire (and therefore increased emissions) in a hotter, less predictable climate, given that its higher fuel load means it has the capacity to burn many times hotter than native grasses and infestations are very difficult to eradicate. Under new emissions avoidance methodology rules, carbon projects containing Gamba grass are forced to remove the area from their project if land managers are unable to eradicate the infestation within 12 months. This means the spread of Gamba grass is a direct threat to the viability of savanna fire projects.

Indigenous land managers deliver environmental and cultural services for the benefit of the entire nation, and the world.

Ongoing funding of Indigenous ranger groups remains critical to supporting the NT’s response to climate change. A recent study by Social Ventures Australia found a 3:1 return was delivered by government investment in Indigenous ranger groups across north Australia.

Additional income brought by carbon projects enables Indigenous land managers to undertake effective fire management as part of their land management activities.

Investing in the science to support the development of future carbon methodologies as well as supporting engagement of Indigenous groups in accessing these opportunities is critical to the future growth of this important industry.

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Recommendations to the Northern Territory Government

ICIN recommends that the Northern Territory Government:

**Emissions targets**

1. Adopt a target of transitioning to a net zero carbon economy by 2050 in line with the Queensland, Victorian, New South Wales and Australian Capital Territory governments.
2. Implement net zero carbon emissions targets and associated carbon offset policies to support emerging carbon industries.
3. Develop action plans attached to measurable targets to support the implementation of the NT Climate Change Strategy.
4. Commit to a climate-based decision-making model to Avoid – then Reduce – then Offset greenhouse gas emissions.
5. Through marketing and compliance mechanisms, encourage the priority purchase of locally produced high quality carbon credits as carbon offsets.
6. Adopt a whole of government policy to reduce and then offset its own greenhouse gas footprint including vehicle use and energy use. (For example, the Queensland Government recently decided to purchase carbon credits generated by Indigenous carbon businesses to offset the emissions from its entire vehicle fleet).

**Land management**

7. Provide clear and consistent recognition of carbon rights embedded in Native Title rights.
8. Continue to provide ongoing funding support for Indigenous ranger groups to undertake mitigating land management activities and maintenance of sea country.
9. Take action to stop the spread of gamba grass into new areas. This includes proper enforcement and compliance of all landholders and support for land managers to control gamba.
10. Increase investment in gamba grass control and partner with the Indigenous carbon industry to develop collaborative responses to management and eradication of gamba grass.
11. Continue to support an annual Indigenous carbon industry forum, to facilitate knowledge sharing between Indigenous carbon businesses, as well as improved engagement with government and business sectors.
12. Continue to support ongoing funding of the vital FireNorth (NAFl) application which provides real-time maps and detailed information about fires, fire scars and vegetation types to assist land managers with fire project planning and reporting.
13. Continue to resource support and advice through the Aboriginal Carbon Unit (NT Government) at Bushfires NT.
14. Support Indigenous people to respond to the impacts of climate change by identifying areas at risk and providing funding support to respond, noting their particular vulnerability to these impacts.

**Business Sector**

15. Support ICIN to engage its members in the NT business sector through alerting ICIN to industry events, policy development and networking opportunities.
16. Continue to support ongoing funding of the Indigenous Carbon Industry Network to support Indigenous carbon businesses to participate in the carbon industry (currently jointly funded by Commonwealth, NT and QLD governments until June 2019).

17. Allocate dedicated funding to support Indigenous communities to access opportunities in the carbon market, through start-up grants and full-value pricing (previously this was carried out through the Indigenous Carbon Farming Fund).

18. Support the NT business sector to build emissions assessments into accounting for all business activities using triple bottom line assessment methods.

19. Build emissions assessments into all development assessments as part of requiring triple bottom line reporting and the climate-based decision-making model.

**Science Sector**

20. Support scientific research toward the development of methodologies for assessing the carbon stored by different vegetation types, as well as fire management and management of sea country.

21. Provide funding for the development of new methods to support increased indigenous participation in carbon markets across Australia, including support for research by Darwin Centre for Bushfire Research, CSIRO, The Nature Conservancy, NAILSMA and others toward new savanna carbon sequestration and abatement methodologies.

22. Undertake detailed mapping and engage with landholders and scientists to identify impacts of climate change upon land management activities and remote communities and support appropriate community-driven responses to those impacts.
Climate Change Discussion Paper

Submission to the Northern Territory Government

November 2018
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Jesuit Social Services

Who we are and what we do

Jesuit Social Services is a social change organisation working to build a just society where all people can live to their full potential.

For over 40 years we have been working at the hard end of social justice with some of the most disadvantaged and marginalised members of our community, who are often experiencing multiple and complex challenges. Jesuit Social Services works where the need is greatest and where we have the capacity, experience and skills to make the most difference.

We have a presence in Victoria, New South Wales, the Northern Territory and internationally, through our leadership of the Justice in Mining Network and involvement in the Jesuit Prison Network.

Our practical support and advocacy covers five main areas:

- **Justice and crime prevention** for people involved with the criminal justice system.
- **Mental health and wellbeing for people with multiple and complex needs** and those affected by trauma, suicide, and complex bereavement.
- **Settlement and community building** for disadvantaged communities, and recently arrived migrants and refugees.
- **Education, training and employment** for people with barriers to sustainable employment.
- **Gender and culture** providing leadership on the reduction of violence and other harmful behaviours prevalent among boys and men, and building new approaches to improve their wellbeing and keep families and communities safe.

The promotion of education, lifelong learning and capacity building is fundamental to all our activity. We believe this is the most effective means of helping people to reach their potential and exercise their full citizenship. This, in turn, strengthens the broader community.

Research, advocacy and policy are coordinated across all program and major interest areas of Jesuit Social Services. Our advocacy is grounded in the knowledge, expertise and experiences of program staff and participants, as well as academic research and evidence. We seek to influence policies, practices, legislation and budget investment to positively influence participants’ lives and improve approaches to address long term social challenges. We do this by working collaboratively with the community sector to build coalitions and alliances around key issues, and building strong relationships with key decision-makers and the community.

Our Learning and Practice Development Unit builds the capacity of our services through staff development, training and evaluation, as well as articulating and disseminating information on best practice approaches to working with participants and communities across our programs.
Our work in the Northern Territory

Jesuit Socials Services’ work in the Northern Territory commenced in 2008 with an invitation to work collaboratively with the Central and Eastern Arrernte people in Santa Teresa and Alice Springs.

Since then, at the invitation of a number of other communities and Aboriginal Community Controlled Organisations, our work has grown to include the communities of Atitjere and Engawala on the Plenty Highway and Tennant Creek. Our work in Central Australia has focused on building the governance and service delivery capacity of the communities and organisations we work with.

To enable a more strategic response to the structural issues we see playing out in the lives of people on the ground, in 2015 we established an advocacy presence in Darwin. Over the last three years, we have developed a strong network of relationships within government and community leaders and have been strong advocates on youth justice issues.

Responding to a need identified by Aboriginal legal services in the Northern Territory, in early 2017 we received funding from the Department of Territory Families to pilot the Northern Territory’s first Youth Justice Group Conferencing program in the Darwin, Palmerston and Katherine regions. With the success of this pilot, we are working with other organisations and government to promote restorative practices in the Top End and Central Australia.

We acknowledge the Traditional Custodians of all the lands on which Jesuit Social Services operates and pay respect to their Elders past and present. We express our gratitude for their love and care of the land and all life.
**Recommendations**

1. Recognising the serious and imminent risk posed by climate change to the planet and people, Jesuit Social Services calls on the Northern Territory Government to act swiftly to legislate an emissions reduction target of net zero by 2050 and set a clear path to transition to a low-carbon future.

2. In developing its response, Jesuit Social Services calls on the Northern Territory Government to adopt an ecological lens. This means:
   - Developing explicit strategies to protect the determinants of health and wellbeing for our community, across the social, cultural, economic and environmental domains.
   - Prioritising resources to mitigate the risk to and building resilience in communities most vulnerable to climate impacts.

3. We ask the Government to continue in dialogue with the community to develop a way forward to protect people and the planet, delivering ecological justice for all.

Specific responses to the discussion paper questions are provided at Appendix A.
Introduction

Jesuit Social Services welcomes the opportunity to contribute to the Northern Territory Climate Change Response Discussion paper. As an organisation, we recognise the significant and imminent risks that climate change poses to our communities and the natural world. We acknowledge the imperative to take immediate action – to mitigate these risks, but also harness the opportunities for a more sustainable and equitable future.

The primary purpose of our submission is to ensure the voices of the most disadvantaged and marginalised are considered and present the concept of ecological justice as a framework for understanding and responding to the climate challenges we face.

In an increasingly complex era of climate crisis, environmental degradation and rising social inequity, new challenges to building a just society are appearing. Jesuit Social Services has always worked with people on the margins of society. While often the least responsible for ecological risks and threat, these populations are the most affected by their emergence.

Recognising that environmental challenges pose particular risks to people with whom we work, for several years our organisation has sought to bring an ecological perspective to all our operations. The interconnection between environmental and social issues has influenced our practice, policy, and organisational identity. It has shaped our strategy to ensure we are equipped to address social justice issues of the future, and to lead peer organisations around issues of ecological justice.

We present this submission recognising that there is no time to wait to address the risks of climate change and because we acknowledge that we cannot disentangle questions of environmental and social justice. This submission makes an urgent call to the Northern Territory Government to take action on climate change and offers the lens of ecological justice as a means to expand the discussion and chart a way forward.

This submission:

● Explains the concept of ecological justice and its relevance to the Northern Territory Government’s climate change response.

● Presents opportunities for the Northern Territory Government to address the impact of climate change through an ecological lens.

Jesuit Social Services’ responses to the specific questions asked by the NTG on the Have Your Say website are included at Attachment A.
Ecological Justice

For Jesuit Social Services, justice rests on the principle that ‘everything is interrelated’. Ecological justice is a holistic paradigm that includes both social and environmental justice. Ethical action in the environmental sphere is therefore central to achieving overall ecological justice. For the last eight years, Jesuit Social Services has integrated ecological justice into our way of working, program delivery, organisational culture, advocacy and policy.

An essential element of a just society is the health and wellbeing of people, families and communities experiencing disadvantage. The rapid climate change already being experienced in many parts of the world has direct and significant implications for environmental and social justice. Climate change affects health in multiple ways, including through exposure to extreme heat, poorer air quality, extreme weather events, water borne diseases, and reduced food security. Both physical and mental health are at risk.

Importantly, the adverse impacts of climate change are not spread equally. It is becoming increasingly clear that people already disadvantaged – because of their income, where they live, or their ethnic, educational or social backgrounds – are often the most exposed to the adverse effects of climate change.¹

Jesuit Social Services’ understanding of justice is influenced by its respect for Aboriginal and Torres Strait Islander peoples, whose law and culture are the oldest in the world. Their culture rests on an understanding of the relationships between land, ecosystems and human communities and has informed their care of the land over thousands of years. Justice for Aboriginal and Torres Strait Islander peoples must be the foundation of any commitment to ecological justice in Australia.

The role of the community and public sectors

While Australia has a long and internationally-recognised history of environmentalism and green movements, links between community sector organisations, environmental movements and the pursuit of ecological justice are limited.

The community sector in Australia has started to address the need for climate resilience strategies and preparedness for environmental threats, risks and degradation, recognising its unique position working with those who are most vulnerable to these threats.² There is also rising public and community sector awareness of the impacts of ecological injustice in areas such as energy equity, where the impact of increasing energy poverty on vulnerable populations is becoming evident.

Jesuit Social Services has consistently argued that public policy must pay greater attention to the role of structural factors and social inequality as key determinants of health and wellbeing, and therefore as drivers of demand for community services.

¹ Intergovernmental Panel on Climate Change (IPCC), IPCC Special Report on Global Warming of 1.5°C.
Building on this awareness, Jesuit Social Services is seeking to encourage within the community and public sectors the incorporation of ecological justice as a central consideration for public policy and social service delivery. For further discussion, see our position paper, *Ecological Justice: Expanding the Conversation* (2018).³

**The impact of climate change in the Northern Territory**

The Northern Territory faces a range of environmental, social and economic challenges from climate change. The specific impacts will be influenced by the different climatic conditions within the Territory. The Top End is a humid tropical zone with distinct wet and dry seasons. Because the coast of the NT is relatively close to the equator, the top end is exposed to tropical cyclones. In contrast, Central Australia is largely semi-arid.

The CSIRO, Bureau of Meterology and the National Climate Change Research Facility (NCCARF) have highlighted some of the main changes that will be expected in northern Australia, including:

- **Rising temperatures.** It is predicted with very high confidence that average temperatures will continue to increase in all seasons, and that there will be more hot days and warm spells. Depending on the extent of emissions increases over coming decades, Darwin could experience between 89 and 227 days a year above 35°C by 2070 – compared to an average of 11 days per year between 1971 and 2000.

- **Increase in severity of extreme weather events.** While the number of cyclones may fall, the number of more powerful tropical cyclones is likely to increase.

- **Rising sea levels.** Over the past 20 years, sea levels have risen between 7mm and 11mm a year in northern Australia, with the effects already being felt – for example, salt-water inflows have reduced melaleuca forest in the NT by two thirds. Continued rises in average sea levels are predicted with very high confidence.

- **Fire.** Up to one third of northern Australia is burnt, making fire the largest source of greenhouse gas emissions in northern Australia. Large late season wild fires are major contributors of greenhouse gas.

- **Rainfall.** Changes to rainfall are possible but unclear, but increased intensity of extreme rainfall events is projected, with high confidence.⁴,⁵,⁶

In the Northern Territory, we can expect that – without mitigating actions by Government – the impacts will be felt first and worst by people on low incomes and those experiencing social exclusion (having the least resources or capacity to adapt), Aboriginal and Torres Strait Islander people whose wellbeing is intrinsically tied to the health of land and waters, people working outdoors, children and the elderly, and people with agricultural or coastal-dependent livelihoods.

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³ See [here](#).

⁴ CSIRO (2015) Climate Change in Australia’s Top End (online)

⁵ CSIRO and Bureau of Meteorology (2016-17) Climate Change in Australia website: Projections for Australia’s Natural Resource Management (NRM) Regions ([online](#))

⁶ NCCARF (2013) Supporting evidence-based adaptation decision-making in the Northern Territory: A synthesis of climate change adaptation research ([online](#))
Despite these risks, current policy settings have the Northern Territory on a trajectory to increase rather than decrease emissions: greenhouse gas emissions have risen 28 per cent over the last 10 years and will continue to rise due to with the INPEX Ichthys project, the opening up of the Territory to gas fracking, new land clearing permits, and increased offshore gas processing.

Yet the time to act is narrowing: the most recent report of the Intergovernmental Panel on Climate Change (IPCC) has made it clear that, globally, we have just 12 years to make the changes that will limit global warming to moderate levels, in order to avoid the frequency and severity of impacts associated with warming beyond the 1.5°C ‘tipping point.’

Threats to the environment and society are serious and imminent unless governments – including the Northern Territory Government – take swift action to reduce emissions.

**Ecological justice in the Northern Territory**

Ecological justice in the Northern Territory requires recognition of the violence and dispossession inflicted upon a people whose system of law and life was inherently ecological: where social and environmental relationships were balanced.

The dispossession of ancestral lands and cultural genocide has had devastating intergenerational social consequences for First Nations people in Australia. Viewing the circumstances of Aboriginal and Torres Strait Islander people through a lens of ecological justice highlights how social disadvantage and economic marginalisation are caused by the loss of relationships with country.

The forced severing of healthy familial relationships with land has had a clearly negative impact on the wellbeing of Indigenous peoples, resulting in disadvantage and trauma that is in turn reflected in high incarceration rates, deaths in custody, low health indicators, low education rates, poverty and intergenerational trauma. It is the responsibility of all governments and communities to heal the ecological injustices of the past, that impact upon the present so we can care for our common home together.

The reality of climate changes is that it is the people least responsible for its emergence who will be most affected. The frame of ecological justice allows us to see the compounding disadvantage that result from social and economic marginalisation and exposure to environmental risks.

**Understanding the impacts through an ecological lens**

An effective response by the Northern Territory Government requires explicit engagement with the risks posed by climate change to the most marginalised in our community. Without action by Government, the impacts of climate change are likely to exacerbate disadvantage that people experience on a range of social and economic indicators, including health, housing, food security, and employment.
Recognising the connection between country and people, and the extent of disadvantage already experienced by Aboriginal and Torres Strait Islander people, it is important to underscore that these communities will uniquely and disproportionately bear the brunt of climate change, unless the Government takes action to specifically address these risks. This includes the expected impact on:

- **Health** – including increased risk of heat stress and dehydration, respiratory illness, increased transferability of viral and other diseases.\(^8\) Up to an additional 346 temperature related deaths per year have been predicted for the Northern Territory by 2100.

- **Service access** – in the Top End, the increased severity of tropical storms is likely to disrupt access to health, education and other essential services, and increase the cost of food and transportation as roads, railways, airstrips and communications are damaged or cut off for longer periods by big storms and flooding.\(^9\)

- **Food security** – in addition to potential disruption to food supply noted above, rising temperature will affect the seasonal availability of bush tucker, as plant flowering and fruiting times change. Rising sea levels and more big storms will cause many coastal freshwater places to become saltier, again, affecting the availability of traditional food sources.\(^10\)

- **Housing and potential displacement** – people living in already overcrowded and poor quality housing will face further strain due to rising temperatures and adverse weather events. In the extreme, sea-level rises, coastal flooding and water shortages may force communities’ displacement.\(^11\)

- **Social, cultural and spiritual wellbeing** – recognising the connection between health of country and health for Indigenous people, the ‘sickness’ of country caused by climate impacts and environmental degradation pose a particular threat to Aboriginal and Torres Strait Islander peoples’ sense of wellbeing.\(^12\) Social and cultural life will be affected through reduced availability of traditional food sources, loss of livelihood, loss of access to sacred site and hunting grounds, and potential physical displacement.\(^13\)

A 2009 report to the Commonwealth, Northern Territory and Western Australian Government provides a more fulsome discussion of the risks of climate change for Indigenous communities in northern Australia – across the domains of health, infrastructure, education and livelihood – including case studies that highlight the context-specific natures of climate change impact in specific communities.\(^14\) Further case studies have been presented by the CSIRO.\(^15\)

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\(^8\) CSIRO (2014)
\(^9\) Ibid.
\(^10\) Ibid.
\(^11\) Ibid.
\(^12\) Green, D. and Minchin, L. (2014) Living on Climate-Changed Country: Indigenous Health, Well-Being and Climate Change in Remote Australian Communities, *EcoHealth* [online]
\(^13\) CSIRO (2014)
\(^14\) Green D., Jackson, S. and Morrison, J. (2009) *Risks from Climate Change to Indigenous Communities in the Tropical North of Australia* Department of Climate Change and Energy Efficiency: Canberra [online]
\(^15\) CSIRO (2014)
While Jesuit Social Services welcomes the inclusion in the Discussion Paper of the impacts of climate change on human health and wellbeing, we suggest that this discussion needs to be broadened to a more fulsome exploration of the impacts on the social, economic and environmental determinants of health and wellbeing, in particular, for Aboriginal and Torres Strait Islander people and other people in our community experiencing disadvantage.

**Ecological approaches to climate resilience**

Adopting an ecological framework allows us to consider a multifaceted (and likely more sustainable) response to climate change. It requires us to develop a holistic strategy that sets out a path to mitigate the risks to and maximise shared benefits across the social, cultural, economic and environmental domains.

From an ecological perspective, it is clear that part of this response must include looking to the knowledge and practices of Aboriginal and Torres Strait Islander people; a people whose system of law and life was inherently ecological – where social and environmental relationships were balanced.

Across Australia, we are recognising that the inheritance of land and water management practices not suited to the particularity of this continent has contributed to the environmental degradation and climate change we are now experiencing. There is growing acknowledgement that practices of caring for country that have been maintained by Aboriginal and Torres Strait Islander people for generations show the way forward. Recognising the exploitation and dispossession experienced by Indigenous peoples, Indigenous control over and benefits from the use of this knowledge and experience must be safeguarded.

Across the Territory, there are already a range of examples of Aboriginal communities developing locally relevant responses to climate adaption – one of the most well-known being the West Arnhem Fire Abatement project, as well as other smaller examples such as the erosion control by the Ltyentye Apurte Rangers in Santa Teresa in Central Australia (overleaf).

An effective climate changes strategy would promote programs like these that protect the environment, strengthen culture, and provide economic opportunities on-country.
Erosion Control in Santa Teresa

In the last few years, the Ltyentye Apurte Rangers have been doing a lot of erosion control work, as a result of Ecosystem Management Understanding planning with Traditional Owners of the Santa Teresa Aboriginal Land Trust.

The rangers have built 20 kilometres of new fences and repaired another 20 kilometres of fences. They made a large paddock, next to important springs, to keep out feral horses, cattle and camels. They also made a large paddock for local people to keep their horses in. The rangers have also constructed whoa boys to slow the flow of water and channel it across roads and slopes around Santa Teresa. This work to repair the country will help prepare it for climate change.\(^\text{16}\)

In Victoria, Jesuit Social Services’ focus on ecological justice has brought into view the importance of ensuring the opportunities we create for economic and social inclusion are ecologically sound. For this reason, we have recently established an Eco Skills Centre in Melbourne’s north.

Brunswick Ecological Skills and Learning Centre

The establishment of the Brunswick Ecological Skills and Learning Centre (or simply the Eco-Skills Centre) is a demonstration of our commitment to create a larger focus on Ecological Justice in the work we do in communities. The Eco-Skills Centre will promote ecological justice, ensuring that justice and equity are central to ecological sustainability. It will help build knowledge and skills, including through practical ‘hands on’ projects, to strengthen understanding about ecological justice and what it means in practice in our homes and in communities.

Strategies for achieving the goals of the Eco-Skills Centre are the development of the Centre as:

- **A Skills Centre** for engaging people in pre-accredited and accredited training, who have previously experienced barriers to participation in training and employment, to develop their skills in areas where there are employment opportunities related to more environmentally sustainable sectors of the economy (e.g. energy, waste management and recycling, building and construction, and local food production).

- **A Community Ecological Demonstration Hub** showcasing practical projects for members of local and surrounding communities (e.g. permaculture, food production, energy production and storage, and home and community based waste management, and recycling and re-use). These projects will provide small scale demonstrations of how people can apply these innovations in their own home and community, to provide economic benefits and to reduce environmental impacts.

\(^{16}\) Mooney, M., Walsh, F., Hill, R., Davies, J., Sparrow, A. and Central Land Council Lytentye Apurte Rangers (2014) Climate change: Learning about what is happening with the weather in central Australia, report by CSIRO with Central Land Council, Alice Springs, Australia ([online])
- A Community Learning and Information Exchange centre – for people wishing to:
  - become more aware of what they can do to reduce their environmental impact
  - reduce their household costs through more environmentally sustainable activities
  - access information about who can support them be more environmentally aware and practical
  - gain advice about training and employment in the area of environmentally sustainable skills
  - participate in community workshops and seminars, promoting the creation of a more ecologically just society.

In the Territory, transition to a low-carbon future provides a major opportunity to unlock jobs in the green economy – for example, including activities that contribute to carbon sequestration (such as native plant food and medicinal industries, reforestation, hemp industries, sustainable agricultural and carbon neutral hydrogen production), renewable energy (especially solar), and a host of other green jobs that can be identified in partnership with communities and business. Consideration should be given to the range of jobs that are created, from low-skill, entry-level positions to high-skill, higher-paid jobs, and opportunities for advancement in both skill and wages.17

Already there are innovative examples in the territory delivering environmental, social and economic benefits – including internationally recognised programs such as Bushlight, Alice Solar City and the Desert Knowledge Australian Solar Centre.18 Opportunities like these should continue to grow.

An ecological response must also explicitly address the fact that the burdens of climate change will not be felt equally. A fair and effective climate change strategy must seek to mitigate the risk to and build resilience in communities already experiencing the greatest disadvantage and with the least capacity to adapt.

This means ensuring people ‘living on the margins’ become part of the solution and stand to benefit from the new opportunities that are created. It also means explicit strategies to support adaption and resilience, for example, support for low-income households to improve the energy efficiency of their homes and appliances, and measures to assist renters improve the efficiency of their homes.19

An ecological approach to systems transformation

The discussion paper acknowledges that “we all have a role to play” in responding to climate change. At the same time, the Northern Territory Government must take the lead: setting clear targets to reduce emissions and supporting transition by business and within the community to a low-carbon future.

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17 ACOSS Climate Change (online)
18 Northern Territory Roadmap to Renewables (2017) (online)
19 See for example reports by the Brotherhood of St Laurence exploring the distribution of benefits of energy savings measures among high and low income households, including Johnson, V., Sullivan, D. and Totty, J. (2013) Improving the energy efficiency of homes in Moreland Warm Home Cool Home and Concession Assist social research final report (online) and Sullivan, D. and Johnson, V. (2012): The power to save (online)
Jesuit Social Services suggests that deep and sustainable change by government and organisations will require an interrogation of our relationship with the natural world. This process of reflection and transformation has been one that Jesuit Social Services has been undergoing since 2008 (see overleaf).

Organisational change and leadership in ecological justice

Jesuit Social Services used its original Way of Proceeding as a basis to develop its ecological approach. This Way of Proceeding recognizes three interconnected domains that must be considered in all aspects of the organisation’s operations.

1. **Human Spirit** - Focusing upon essential anthropological and spiritual questions around what it means to be human and enquiries into the conditions within which humans thrive and have healthy relationships. This involves an informed and discerning process of understanding ourselves, our fellow humans and our relational context.

2. **Practice Framework** – Developing a relational way of being and acting that reflects and lives ecological justice. This promotes environmental awareness and ecological justice across our practice areas and our advocacy including justice and crime prevention, settlement and community building, mental health support and wellbeing, and education, training, and employment.

3. **Business Processes** – Adopting environmentally sustainable business practices and processes. Discernment in relation to our financial and other resources so they respect and contribute to, rather than harm, efforts to build a just society.

Conclusion

This paper has presented ecological justice as a framework for understanding and addressing both the risks and opportunities presented by climate change. An ecological approach considers the interrelated natures of the environmental, social and economic spheres, and provides a framework for action that will support and equitable and holistic response to what is the most pressing challenge facing our country and our planet.
Appendix A. Responses to Climate Change Discussion Paper

1. **What (if any) GHG emissions target should the Northern Territory adopt?**

Legislate a science-based emissions reduction target of net zero by 2050. It should include interim targets to ensure the overarching target is achieved and integrate sector-specific targets (with the recognition that some sectors are more difficult to decarbonise than others).

The legislated targets must be supported by an enforceable whole-of-Government framework with strong regulatory controls. This should include an overarching climate change strategy, supported by specific, targeted action plans that provide a clear pathway to transition.

2. **What should business and governments be doing to reduce their emissions?**

Deep and rapid emissions reductions targets are required across all sectors and at all levels.\(^{20}\) In short, business and government need to be doing everything they can to decarbonise and transition to a low-carbon economy.

The Government has an instrumental role to play in setting the framework for change. This requires action on three fronts to help reduce emissions:

i. **At the level of government policy** – implementing a zero-emissions target

ii. **At the level of government operations** – leading by example to reduce emissions

iii. **Through government advocacy** – advocating for Commonwealth, COAG and international action consistent with the Paris Agreement.

Similar action is required by government to strengthen our climate resilience and support adaptation, namely:

i. **At the level of government policy** – setting a clear path for transition to a low-carbon future and providing targeted support to households, communities and businesses to support that transition.

ii. **At the level of government operations** – take action to mitigate the climate risk to government and assets and services (and associated flow-on effect to communities)

iii. **Through government advocacy** – advocating for Commonwealth, COAG and international action to support effective adaptation.

A clear framework set by government will assist business to initiate change, through investor certainty, clear regulatory parameters in which to operate and targeted support where appropriate.\(^{21}\)

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\(^{20}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.

Jesuit Social Services joins the call by the Arid Lands Environment Centre to halt harmful activities and seize the opportunities to develop the green economy. This means reinstating the moratorium on fracking and slow land clearing. Instead, the Northern Territory Government should continue to invest in activities that sequester carbon (such as native plant food and medicinal industries, reforestation, hemp industries, sustainable agricultural and carbon neutral hydrogen production), renewable energy (especially solar), and supporting green jobs for communities.

3. How else can we better apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

There is widespread recognition that Indigenous knowledge and land and water management practices hold a key to our response to climate change and our ecological future.

Aboriginal knowledge and practices must be recognised, respected and paid for. However the question of how we can better apply Aboriginal knowledge and practices is most appropriately answered by Aboriginal people, communities and organisations.

4. What potential opportunities do you see emerging from climate change in the Territory?

There are many opportunities to be harnessed from transition to a low-carbon economy, including but not limited to:

- Protecting and improving the health of Territorians
- Protecting the ecosystems we rely on. For example, the Northern Territory’s marine and coastal ecosystem contribute $1 billion per year to the economy - these ecosystems are at high risk with rising temperatures.
- Significant cost savings to government, households and business through energy efficiency and savings realised by maximising renewable energy generation.
- Technological innovation and the growth of investment in low-carbon sectors. The NT has the potential to be established as a leading international solar/renewable energy research hub.
- Increase in energy and water security
- Creation of new jobs and industries – the NT could be a net renewable energy exporter
- Establishment of safer and climate smart infrastructure

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22 Hanna and Ogge, *Cooked with Gas: Extreme Heat in Darwin*.
23 Crossman et al., *Economic Values of the Northern Territory Marine and Coastal Environments*.
24 Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.
28 Langworthy et al., *Roadmap to Renewables: Fifty per Cent by 2030*.
30 Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5°C*.
Making communities more sustainable\(^{33}\)

The simultaneous achievement of the United Nations’ Sustainable Development Goals, if carefully integrated into climate action planning and implementation.\(^{34}\)

5. How can the fossil fuel industry further reduce emissions from energy production?

New extraction of fossil fuels (including natural gas) is incompatible with reducing climate risk and limiting warming to within the 1.5 \(\degree\)C ‘tipping point’ identified by the IPCC.\(^{35}\) In line with the Paris Agreement, fossil fuels must be phased out by 2050.\(^{36}\)

To achieve this target, there can be no new fossil fuel extraction and any existing fossil fuel operations will need to adhere to strict mandated targets to ensure the necessary reductions are achieved.

6. What type of regulations do you think would assist industry in being accountable for their impact on climate change?

There are clear calls from business for action by Government to respond to the threat of climate change. At the global level, the Corporate Leaders Group has brought together business leaders to accelerate progress on addressing climate change; members include Unilever, Coca Cola, GSK and Lloyds Banking Group. The Group has called for governments to adopt a net zero emissions target by 2050.\(^{37}\) They argue this target will send a strong signal and galvanise business action, unlocking the innovation and creativity required to transition to a low-carbon economy.

In Australia, the Business Council of Australia has called on government to implement a clear and comprehensive energy and climate policy at the national level to meet current and future absolute emission reduction targets, and deliver secure and reliable energy supply, affordable energy supply, and a strong, internationally competitive economy.\(^{38}\)

As noted in response to question 2, an effective response by the Northern Territory Government would combine a clearly legislated zero-emissions target, a comprehensive roadmap for government and industry to achieve that target (with sector-specific plans), and ongoing advocacy to the Commonwealth and COAG for action at the national level.

\(^{33}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5\(^\degree\)C*.

\(^{34}\) Intergovernmental Panel on Climate Change (IPCC), *IPCC Special Report on Global Warming of 1.5\(^\degree\)C*.

\(^{35}\) Tyndall Centre for Climate Change Research Manchester et al., *Natural Gas and Climate Change*.

\(^{36}\) Ibid.


\(^{38}\) Business Council of Australia, Energy and Climate Change (online)
7. Are you prepared to pay higher prices for goods and services as businesses pass on the cost of mitigation?

As articulated in our submission, climate change will disproportionately impact low income households and disadvantaged communities.

Low income earners tend to live in areas more likely to be adversely affected by climate change, and have far less ability to move or make other necessary adjustments to their living circumstances. On average, low income earners spend a greater proportion of their total weekly household budget on energy and water than wealthier households. Few households with low incomes are able to afford significant energy efficiency measures such as insulation, new hot water systems or rainwater tanks. Given that energy and water are essential services, when the prices of these services increase, householders are left with little option but to pay the extra.  

We encourage the Northern Territory Government to work community sector organisations like Jesuit Social Services for fair and equitable responses to climate change and shield low-income households are shielded from price hikes for essential goods and services, and provide financial and technical assistance to support adaption and resilience, for example, support for low-income households to improve the energy efficiency of their homes and appliances, and measures to assist renters improve the efficiency of their homes.  

The Northern Territory Government has an important role to play ensuring people and communities already experiencing the greatest disadvantage, who are often the least responsible for climate change, do not unfairly bear the brunt of mitigation and adaption.

8. What support do you need to help you mitigate or adapt to climate change?

First, it is crucial that people understand the risks posed by climate change. Without this knowledge, it is not possible to address climate risk.

Jesuit Social Services encourages the Northern Territory Government to continue a dialogue with Territorians, working together to develop tailored strategies to reduce the risks and maximise the shared benefits from the opportunities. Strategies must be evidence based, people centred and informed by best-practice in other regions in Australia and internationally.

Territorians will require ongoing information and support to mitigate and adapt to climate change. This includes providing households, communities and businesses to access the resources and develop the skills to implement change that supports an ecologically sustainable future.

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39 ACOSS Climate Change (online) 
40 See for example reports by the Brotherhood of St Laurence exploring the distribution of benefits of energy savings measures among high and low income households, including Johnson, V., Sullivan, D. and Totty, J. (2013) Improving the energy efficiency of homes in Moreland Warm Home Cool Home and Concession Assist social research final report (online) and Sullivan, D. and Johnson, V. (2012): The power to save (online)
LAND MANAGEMENT

Authors: Anna Boustead; Michael Brand; Editor: Dr Ellin Lede

Land use, land-use change, and forestry (LULUCF) and agriculture account for almost 60% of the NT’s GHG emissions (2016 emissions; NT Climate Change Discussion Paper). This submission provides insights into how evidence-based practices and programs can increase climate resilience.

Mitigating climate risk. To mitigate climate risk, global greenhouse gas (GHG) emissions must reach net zero by around 2050. That is, the amount of anthropogenic (attributable to human activity) carbon emissions must be less than that which is taken up (sequestered) by natural or artificial systems. To achieve this, carbon emissions must either be phased out, or compensated for (offset) by 2050 (at the latest)\(^1\). All sectors must rapidly decarbonise.

LAND CLEARING

Land clearing is major contributor of GHG emissions in Australia (responsible for up to 25% of total emissions)\(^2\). Historically the NT has had relatively low rates of clearing. However, recently, land clearing rates have rapidly increased\(^3\).\(^4\). It is highly concerning that there remains a native vegetation protection policy vacuum in the NT. It is crucial the climate services provided by the NT’s vast intact landscapes (sequestration) are recognised and protected.

CARBON OFFSETTING

Carbon offsetting refers to the process whereby emissions are sequestered in order to compensate for the emissions generated elsewhere.

Suggested climate-based decision-making model\(^5\)

1. Avoid or mitigate new sources of greenhouse gas emissions by favouring low emissions technologies, activities and developments
2. Reduce emissions from existing activities where possible through increasing energy efficiency and transitioning to renewable energy sources
3. Offset any remaining emissions which cannot be avoided or reduced, giving priority to high-quality local carbon offsets

It is important to note that carbon offsets should not be viewed as a silver bullet solution to reduce the NT’s greenhouse gas emissions, as: a) this would be very expensive; b) the capacity for land

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management activities to offset significant emissions is limited; and c) offsetting effectively displaces emissions elsewhere rather than absorbing them directly. Offsetting should only be utilised when emissions cannot be avoided or reduced.

**Indigenous land management and the carbon industry.** The NT is uniquely placed to respond to climate change through land management activities due to the Territory’s intact savannas, rangelands, grasslands and mangrove coastline. Savanna woodlands and grasslands cover about 1.9 million square kilometres, or about 23% of the Australian continent.

In the NT, savanna fires account for approximately 35% of total greenhouse gas emissions, making savanna fire projects a particularly significant pathway for reducing the NT’s total emissions. The Aboriginal people of the NT have significant experience in caring for country, having managed their lands for tens of thousands of years throughout different climatic periods and across some of the most inhospitable environments in the world. Over 50% of the NT is recognised as Aboriginal land, including over 80% of the coastline. This means that the Territory’s Indigenous people are at the forefront of responding to climate change, through land and sea management.

The climate benefits of this work have recently been recognised through the development of scientific methodologies which allow Indigenous ranger groups conducting fire management activities to claim the carbon credits generated from these activities. These can then be sold directly to the Australian Government via the Emissions Reduction Fund or to voluntary buyers seeking to offset their climate impact. In the 2017 financial year, Indigenous savanna fire projects in the NT abated at least 828,069 tonnes of CO₂ equivalent emissions.

Indigenous carbon businesses have generated over $50 million worth of Australian Carbon Credit Units across Northern Australia since 2001. 68% of this industry occurs in the NT, where 91% of the total carbon credit generation by savanna fire projects can be attributed to Indigenous-owned carbon projects. It is estimated that by 2020 the industry could be abating 3.2 million tonnes of CO₂ equivalent emissions each year across north Australia.

**Significant benefits.** While managing such vast tracts of land in very remote areas is expensive, Indigenous carbon projects create multiple significant co-benefits. They provide Indigenous people with unique employment opportunities on their country, opportunities for inter-generational exchange of traditional knowledge and deliver environmental benefits of national and global significance. This makes the ongoing funding of Indigenous ranger groups critical to supporting the NT’s response to climate change. A recent study by Social Ventures Australia found a 3:1 return was delivered by government investment in Indigenous ranger groups across north Australia.

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8 Carbon in the Northern Territory (2016) Territory NRM, <https://docs.wixstatic.com/ugd/da28f0_5bc40bcd562e4e8f9bd4cc7eb58f9008.pdf>
CLIMATE RESILIENCE AND LAND MANAGEMENT

It is also important to note that efforts to mitigate greenhouse gas emissions through land management activities are strongly tied to efforts to respond to the impacts of climate change. This particularly applies to the coastal zone of the NT. Maintaining natural coastal protection from mangroves and reefs can be far more cost-effective - and successful - when compared to engineering alternatives.

Approaches to increase/maintain the sequestration (carbon uptake) capacity of the NT’s coastal zone should be investigated. For example, seagrasses are one of the most effective natural ecosystems for capturing and storing carbon\textsuperscript{14}. Mangroves also play a crucial role in carbon abatement as well as providing a range of invaluable ecosystem services including protection from erosion and storm surges\textsuperscript{15}. It must be noted that marine ecosystems are at high risk from increasing temperatures; the extensive mangrove dieback recently observed in the NT was attributed in part to higher ocean temperatures\textsuperscript{16}. Comprehensive land management strategies are required.

In the future, it is likely that emerging economies such as the trade of biodiversity credits and developing methodologies for avoided clearing of mangroves and savanna woodland will increase financial incentives supporting good land management activities.

\textit{Emissions from the pastoral sector.} Another significant source of greenhouse gas emissions from land management activities within the Northern Territory is the pastoral sector. In 2016, ruminant animals including cattle were responsible for generating 17% of the NT’s emissions\textsuperscript{17}.

GHG emissions must be rapidly reduced across all sectors, including the pastoral sector. It may be possible to achieve this through climate smart pastoral practices. For example, Australia’s red meat industry is investigating the potential to become carbon neutral by 2030, in collaboration with the CSIRO\textsuperscript{18}. Alternative land uses could also be considered. Seven Emu Station serves as an example of this. Cattle and feral animals were removed from 80,000ha of the property after it was purchased by the Australian Wildlife Conservancy and this has dramatically increased biodiversity, attracting tourists from around the world\textsuperscript{19}.


\textsuperscript{18} CSIRO, “The Australian Red Meat Sector Could Be Carbon Neutral by 2030.”

Weed and fire management. Weed management is tied closely to fire management. Extreme fire behaviour is projected to increase in the NT as a result of climate change\(^{20}\). Stopping the spread of fire weeds such as gamba grass and supporting landholders to eradicate fire weeds is critical to managing fire (and therefore increased emissions) in a hotter, less predictable climate. The extremely high fuel load of gamba grass means it has the capacity to burn many times hotter than native grasses and infestations are very difficult to eradicate\(^ {21}\).

Feral animal management. An additional potential pathway for reducing the emissions by ruminant animals is control of feral cattle, buffalo and camels. Feral animal management is undertaken by Indigenous land managers to improve health of country and protection of sacred sites and by pastoral land managers to improve the health of their cattle stocks and reduce damage to assets such as fences and waterholes. If the emissions abatement of managing feral animals is measured, this may provide another form of carbon offset whilst also promoting improved biodiversity outcomes.

RECOMMENDATIONS

1. Implement a science-based emissions reduction target (net zero by 2050 with interim targets) and associated carbon offset policies to encourage climate resilient land management practices and support emerging carbon farming industries
   a. Continue to support Indigenous ranger groups to undertake mitigating land management activities such as fire management and maintenance of sea country

2. Support research toward the development of methodologies for assessing the carbon stored by different vegetation types, as well as fire management and management of sea country

3. Build emissions assessments into all development assessments
   a. Where emissions cannot be mitigated by an activity, the polluter should be required to offset emissions, giving priority to local and high-quality carbon credits

LAND CLEARING

4. Develop legislation to support protection of native vegetation in order to minimise future land clearing where possible

5. Where avoidance of land clearing is not possible, the project proponent must be required to offset this clearing through revegetation of the equivalent vegetation type

CLIMATE RESILIENT LAND MANAGEMENT

6. Stop the spread of gamba grass by better resourcing gamba grass control and banning the deliberate spread of gamba grass

7. Support the pastoral industry to reduce emissions from raising cattle and to undertake mitigating land management activities (in line with a determined emissions reduction target)

8. Ban the clearing of mangroves since they provide essential coastal protection services and store vast amounts of ‘Blue’ Carbon and invest in research into how this sink may be further optimised

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\(^ {20}\) Climate Change in Australia, CSIRO, Australian Government Department of Environment, and Bureau of Meteorology. “Climate Change in Australia,” 2016

To whom it may concern  
Re: Climate Change Discussion Paper

Thank you for the opportunity to provide comment on the Climate Change Discussion Paper and provide input into a NT Climate Change strategy.

The recent UN Intergovernmental Panel on Climate Change report (Oct. 2018) by leading scientists warns that we have 12 years to contain greenhouse gas emissions to avert an impending crisis. They urge all nations to do more to contain greenhouse gas emissions.

Hence, the NT needs to legislate an emissions reduction target of net zero by 2050. This should include sector-specific targets and interim targets to ensure the 2050 target is achieved. Business leaders around the world are calling for this and a net zero emissions reduction target will provide investor certainty.

Businesses and Government need to be doing everything they can to decarbonise and transition to a low-carbon economy – there is no time to waste.

Climate change and the transition to a low-carbon economy in the NT offers many opportunities. An example is using renewable energy as an agent for economic development and new jobs and industries. The NT could become a leading international renewable energy research hub and a net exporter of renewable energy. Business certainty will stimulate the creativity and innovation required to transition to a low-carbon economy.

In line with the science-based Paris Agreement target, fossil fuels must be phased out by 2050. New extraction of fossil fuels - including natural gas - is incompatible with reducing climate risk and limiting warming to 1.5°C. There should be no new fossil fuel extraction and existing fossil fuel operations need strict mandated targets working towards complete phase-out by 2050.

Business leaders are calling for a net zero emissions target by 2050. Sector-specific emission targets will recognise the difficulties and opportunities across different industries.

It is crucial all Territorians understand the risks posed by climate change. Tailored strategies must be developed to reduce risks and optimise the co-benefits. Mechanisms need to be available for residents and business owners to access finance and develop capacity to implement climate solutions.

The NT Government should embrace a Community Solutions Panel project where a rotating group of randomly selected local residents deliberate together to reach shared judgement on difficult issues such as climate change solutions. This technique taps into the knowledge and skills of everyday people and improves trust in government. It is being used elsewhere around the country with great success.

Let the NT be a leader in the climate change space, not a laggard.

Yours sincerely

L. Harrison
Darwin
24 November 2018
Northern Land Council submission to the NT Department of the Chief Minister

*Climate Change – Mitigation and Adaptation Opportunities in the Northern Territory Discussion Paper*

December 2018
About the Northern Land Council

The Northern Land Council (NLC) was established in 1973. Following the enactment of the Aboriginal Land Rights (Northern Territory) Act 1976 (CTH) (Land Rights Act), the NLC became an independent statutory authority responsible for assisting Aboriginal people in the northern region of the Northern Territory to acquire and manage their traditional lands and seas.

The Land Rights Act combines concepts of traditional Aboriginal law and Australian property law and sets out the functions and responsibilities of the land councils. Section 23 of the Land Rights Act sets out the NLC’s core functions, which gives it the responsibility to:

- identify relevant Traditional Owners and affected people;
- ascertain and express the wishes and opinions of Aboriginal people about the management of, and legislation in relation to, their land and waters;
- consult with traditional Aboriginal owners and other Aboriginal people affected by proposals;
- negotiate on behalf of traditional Aboriginal owners with parties interested in using Aboriginal land or land the subject of a land claim;
- assist Aboriginal people carry out commercial activities; obtain Traditional Owners’ informed consent, as a group;
- assist in the protection of sacred sites; and
- direct a Aboriginal Land Trust to enter into any agreement or take any action concerning Aboriginal land.

In 1994, the NLC became a Native Title Representative Body under the Native Title Act 1993 (Cth) (Native Title Act), whose role and functions are set out under Part 11, Division 3 of the Native Title Act.

In this capacity, the NLC also represents the Aboriginal people of the Tiwi Islands and Groote Eylandt.

Within its jurisdiction, the NLC assists Traditional Owners by providing services in its key output areas of land, sea and water management, land acquisition, mineral and petroleum, community development, Aboriginal land trust administration, native title services, advocacy, information and policy advice. Relevant to this submission, is a responsibility to protect the traditional rights and interests of Traditional Owners and other people with interests over the area of the NLC, which is constituted by more
than 210,000 square kilometres of the land mass of the Northern Territory, and over 85% of the coastline.

NLC’s strategic vision is:

To have the land and sea rights of Traditional Owners and affected Aboriginal people in the Top End of the Northern Territory recognised and to ensure that Aboriginal people benefit socially, culturally and economically from the secure possession of their land, waters and seas.¹

¹ Northern Land Council Annual Report 2016/17, p i.
NLC’s submission to the *Northern Territory Climate Change Discussion Paper*

The NLC welcomes the release of the draft *Northern Territory Climate Change Discussion Paper (Discussion Paper)* by the NT Department of the Chief Minister and is encouraged in particular by the growing recognition of the land and sea management sector as an emerging and significant economic contributor to the broader Northern Territory economy.

The NLC wants climate policy decisions to be based on both the best available science and traditional knowledge. We have seen what this combination can produce with the rise of the Aboriginal carbon industry.

**Case study: Wurrk Carbon Abatement Project**

In the south of Kakadu National Park, Traditional Owners from a number of clan groups have converged to realise an Indigenous-led vision of utilising traditional burning methods to support Traditional Owners and Parks Australia staff care for country, and to minimise carbon pollution. As the interest-holder in the relevant land by way of the Kakadu National Park lease, the Director of National Parks has registered the Wurrk Project with the Clean Energy Regulator on the basis that the benefit of carbon credits will return to Traditional Owners and to support them to work on and care for country. The Financial Agreement governing this arrangement, to which the Director of National Parks, the Wurrk Steering Committee (comprised of Traditional Owner representatives), and the NLC will be parties, will provide for Traditional Owners to have full control over the sale of carbon credits and use of the income for fire management related projects, community-based programs and/or infrastructure. Since registration of the Wurrk Project, it has accrued 45,000 carbon credits. The NLC will continue to support Traditional Owners develop other carbon projects using similar models and a collaborative approach by all parties.
It is also imperative that policy choices, including the related implementation, strike a balance between the principles of Caring for Country and the need to facilitate a range of economic opportunities which our constituents may take advantage of. Working in collaboration with Aboriginal people to make policy decisions is the best way to get this balance right and achieve effective outcomes which will be long-lasting.

The NLC will provide comments in response to specific sections of the Discussion Paper below, but in general terms we make the following observations:

- The Discussion Paper would benefit from including sections which briefly address the important matters of **implementation** (including anticipated timeframes), **governance** and **evaluation**. It is our experience that without some context or commitment to these elements, strategies often languish.

- Some policy decisions require more continuing basic research and we encourage any strategy to make an allowance for ongoing investment in providing a policy evidence base. For instance, while national accounting frameworks are useful, there are some circumstances unique to the NT which may be usefully measured. The Discussion Paper incorporates a welcome focus on renewables, but research into further abatement and adaptation technologies is lacking.

- The NT has historically been subject to a variety of largely non-transparent and informal carbon offset arrangements. Conditionally, the NLC would welcome a predictable transparent set of requirements related to carbon offsets, especially for new high emission sources. If such an offset arrangement is to be introduced in the NT it should be a requirement that affected emitters source abatement from NT providers first.

- One of the largest contributors to carbon abatement in the NT is the Aboriginal carbon industry. The NLC welcomes the recent announcement of the **Aboriginal Carbon Strategy**, which is the subject of a separate submission.

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2 For example emissions from Savannah fires are presented as part of ‘Land Use, Land change and Forestry’. Establishing Savannah fire as a separate category is more than justified in the north Australian context.
Many of the recommendations included in that submission stand and, if implemented, would make a substantial contribution to the NT’s overall climate change approach.

- As with many of these strategies there is a primary focus on GhG reduction. However, given the relative national contribution of the NT, a larger emphasis on adaptation would be sensible. As climate impacts become more apparent, the NLC believes that adaptation will play a more critical role. We encourage the NT Government to give more weight to this factor, especially given the particularly vulnerable nature of remote top end communities.

In addition to the above observations and recommendations, the NLC makes the below responses to specific aspects of the Discussion Paper, in the order that they appear in the Discussion Paper.
Context: Northern Territory
An emissions target (p 11)

A number of other Australian states and territories have GHG emissions targets ranging from 20% reduction to net zero emissions. Having a specific GHG emissions target could ensure that each sector in the Northern Territory takes responsibility for protecting the environment and contributing to Australia’s national emissions commitment to the Paris Agreement (26-28%), while generating economic value.

A target could:
• provide certainty for industry allowing them to make business decisions that improve their energy efficiency and overall economic outcomes
• lead to more innovative methods in addressing land management practices
• drive energy efficient behaviours and solutions
• promote further economic development by driving low emissions investment in cleaner technology - such as renewables - to produce lower emissions electricity.

NLC’s response:

A target alone, while useful for the reasons stated, can only be considered in conjunction with mechanisms used to achieve it. For instance would the target be voluntary or mandated or achieved using a cap and/or offsets arrangements – sourced from where? We would like to know more about what the triggers for offsets are likely to be. Language around ‘high impact’ developments has been used, the definition of these will be critical.
Opportunities for the Northern Territory (p 15)

Significant opportunities exist in Aboriginal knowledge and practices. One option is the use of a carbon management program to mitigate the high level of emissions in the management of fire on Aboriginal land. This would also provide local employment opportunities.

NLC’s response:

The above paragraph which relates to Aboriginal knowledge and practices paints this as an opportunity and not one which is already occurring (such as the Wurrk Carbon Abatement Project described above). This section of the Discussion Paper requires significant updating and should extend to mention expansion and new methodologies.

Business and Industry - Resources (p 19)

Excerpt:

Further research in collaboration with industry on suitable locations for underground carbon storage.

NLC’s response:

The NLC requests clarification in respect of the meanings of the commitment to ‘Research suitable locations for underground carbon storage’, and questions whether this is feasible or cost-effective when compared with other research priorities.
Business and Industry – Resources (p 19)

Excerpt:

*Develop ways to minimise emissions from gas extraction, transport and processing, and work with other jurisdictions to offset emissions from the Northern Territory gas industry.*

NLC’s response:

The NLC requests clarification in respect of the meaning of the commitment to ‘work with other jurisdictions to offset emissions’.

Carbon economy – Opportunities (p 27)

Excerpt:

*Establish a system of voluntary carbon credits.*

NLC’s response:

Is this system intended to operate in addition to an emissions target and mandated fracking offsets commitment, a mechanism proposed to achieve targets, or is it a separate mechanism? Clarity here is essential to our ability to assess the strategy.
The NLC supports the aims of the Discussion Paper, and the recognition of the land and sea management sector as an important contributor to the NT’s economy.

The NLC believes that above recommendations (and requests for further clarity) in respect of certain aspects of the Discussion Paper will make the Discussion Paper, and resulting policies in respect of climate change, a more solid basis for actions directed towards climate change mitigation, and used to facilitate economic development for the NLC’s constituents and communities.

Should you have any further questions regarding this submission, please contact Kristen Lynch on 08 89205111 or email kristen.lynch@nlc.org.au.
Dear Sirs

RE: CLIMATE CHANGE DISCUSSION PAPER

The NTCA thanks the Northern Territory Government for the opportunity to make a written submission in response to the Climate Change Discussion Paper.

The Northern Territory Cattlemen’s Association (NTCA) has been the peak primary industry body in the Northern Territory for the past thirty-four years. Representing over ninety per cent of the Territory’s cattle herd, from small family pastoral businesses and Indigenous organisations to large corporate entities, its members are custodians of over 700,000km2 of the NT landmass.

The NTCA makes the following submissions:

The NTCA notes that the two focus areas addressed by the discussion paper are mitigation and adaptation opportunities. We have arranged our comments to address each focus point.

Mitigation

The greenhouse gas emissions figures cited in the climate change discussion paper state that Australia is responsible for 1.3 percent of global greenhouse gas emissions and that the Northern Territory is responsible for 3 percent of the Australian total. If we assume these figures are correct, we have established that the Northern territory is responsible for a meagre total of 0.039 percent of the total global greenhouse gas emissions.

We believe that the reality of greenhouse gas emissions in the Northern Territory is that CO2 emissions are below what is captured by our large land mass. If the sources and sinks of CO2 across the NT were effectively accounted for then the NT landmass would extract more CO2 from the atmosphere each year than what it added. This is supported by the data collected from NASA’s Orbiting Carbon Observatory-2, or OCO-2, satellite. (Source: https://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=12072)

Given the very minimal to positive current effect of the NT landmass on global greenhouse emissions we believe that NT Government policy is best placed to support sustainable land management practices that enable the pastoral estate to successfully contribute to the economy while responsibly managing the land for future generations. Therefore, we do not support the introduction of an emissions target as we believe that we are already operating as carbon neutral at worst, or carbon negative, and the introduction of a carbon target will result in higher operating costs for producers and artificially skewed market conditions.
Adaptation Opportunities

The best mechanism for protecting the Northern Territory pastoral industry into the future is to ensure we have a resilient industry with producers that are equipped to adjust to conditions and meet challenges, whether it be climate driven or as a result of another stressor. This includes ensuring producers have access to energy and fuel to conduct business. We support policy that encourages the adoption and availability of alternative energy sources such as solar and decentralised power generation. However, we do not support market-based instruments that put upward pressure on the cost of traditional fuel and energy sources. The transition to cleaner energy sources should be through innovation and the development of alternative technologies.

The NTCA does not support carbon sequestration via woody vegetation, with any increase in woody weeds and forestation comes a decrease in grasslands and a subsequent decrease in production and profitability. Any policy which promotes the reforestation of land and restricts the ability of pastoralists to manage their land will greatly restrict the sustainable organic growth of a long term sustainable and net emission industry.

Several options to reduce the methane emissions at a property scale and a per head scale while also enhancing the resilience of the pastoral sector exist in areas that target herd efficiency and improving land condition. There is presently an opportunity for NT Government to work with the pastoral sector to extend information on these opportunities and to assist with implementation and adoption strategies. This would be a positive move to enhance the ability of NT pastoralists to withstand business stressors as well as implementing a measure to reduce total emissions.

Further information

The NTCA thanks the Northern Territory Government for the opportunity to provide this submission. If you would like to discuss further, please do not hesitate to contact Chief Executive Officer, Ashley Manicaros.

Regards

Ashley Manicaros
CEO
Dear Sirs

RE: CLIMATE CHANGE DISCUSSION PAPER

The NTCA thanks the Northern Territory Government for the opportunity to make a written submission in response to the Climate Change Discussion Paper.

The following comments are in addition to the submission provided on the 23 November 2018.

**Woody Weed Sequestration**

The NTCA does not support carbon sequestration via woody vegetation, with any increase in woody weeds and forestation comes a decrease in grasslands and a subsequent decrease in production and profitability. Any policy which promotes the reforestation of land and restricts the ability of pastoralists to manage their land will greatly restrict the sustainable organic growth of a long term sustainable and net emission industry.

Both anecdotal and documented (Lewis, 2002; Burrows, 20161) evidence indicates substantial amounts of woodland thickening across the savannahs of Northern Australia over recent decades. Reasons for this may include changed rainfall patterns, changed fire regimes, increased atmospheric CO2 (reference?). Whatever the reason(s), the amounts of Carbon sequestered in this increased vegetation is potentially enormous (Burrows, 2016).

While this may be a good thing from the point of view of reducing net CO2 emissions, increased woody vegetation alters the nature of the open savannahs traditionally associated with Northern Australian landscapes with consequent impacts on native flora and fauna. On pastoral land the impacts can include reduced pasture production and increased costs for mustering, pasture management, weed management etc.

NTCA believes that there is inadequate recognition of the Carbon already being stored in woody vegetation and on pastoral land. NTCA also cautions against imposing increased and unreasonable regulation around vegetation management and particularly, land clearing and use of fire to control woody vegetation.

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1 Vegetation Management in Queensland - Some essential facts for politicians, rural industry and all Queenslanders, 2016, Dr Bill Burrows FTSE.
Restricting the ability of the pastoral sector to properly manage their land resources and undertake sensible and managed development will result in a long-term decline in productivity, profitability and ultimately inability of the pastoral sector to contribute to the NT economy.

Further information

The NTCA thanks the Northern Territory Government for the opportunity to provide this further submission. If you would like to discuss further, please do not hesitate to contact Chief Executive Officer, Ashley Manicaros.

Regards

Ashley Manicaros
CEO
NTCOSS Submission in response to NTG Discussion Paper “Climate Change and Adaptation Opportunities in the Northern Territory”

NTCOSS is a peak body for the community sector in the Northern Territory and is a voice for people affected by social and economic disadvantage and inequality. The community sector in the NT is made up of community managed, non-government, not for profit organisations which work in social and community service delivery, sector development and advocacy. The community sector plays a vital role in creating social wellbeing for all Territorians and in building safe and healthy communities by providing services that enable people to access and participate in health services, education, employment, economic development, and family and community life.

The impact of climate change will have a devastating impact on those who are most vulnerable and less able to adapt – the impact is being felt now, and unless both the cause and affects are addressed now that burden will only increase. NTCOSS members work with communities right across the NT – some of our members are already reporting that climate change is having a detrimental impact on their clients. For example the increased number of days over 35 in Darwin affects low income families more adversely due to limited capacity to pay increased energy costs and limited housing options. In Central Australia, reliable access to good quality water at risk as the frequency and duration of droughts continue to increase.

NTCOSS endorses the submissions made by Anglicare NT (copy attached).

In addition, we call on the NTG to:

- Invest in development of a renewable energy industry in the NT
- Improve energy standards for all dwellings
- Retrofit public housing to reduce energy costs, esp during harsh weather conditions
- Facilitate access to low cost energy efficient household goods – eg NILS for energy efficient appliances
- Provide incentives for private, public housing and social landlords to improve energy and water efficiency
- Provide rebates for solar power/hot water targeted to low income households
- Ensure access to information, education and workshops to enable households to take control of their energy and water usage, including increasing the ability of tenants to advocate to landlords to report damage that may contribute to higher living costs eg leaking taps and faulty appliances. This could also include education for landlords.
- Development of initiatives that protect water supply and quality

I note that NTCOSS has raised many of these issues and advocated for many of these policies for a number years, including in our annual Pre Budget Submissions and regular Cost of Living reports, which are available upon request.

I look forward to the outcome of this process.

Caitlin Perry
Senior Policy Officer
Northern Territory Council of Social Service
Working days: Monday, Tuesday and Wednesday
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I acknowledge the Larrakia people, traditional owners and custodians of the country on which I live and work.
Submission to the Northern Territory Government’s Climate Change Discussion Paper.

Prepared by Graeme Sawyer and Lauren Mellor, on behalf of the Protect Country Alliance.

November 2018

INTRODUCTION

The Protect Country Alliance is a network of landholders, communities, and civil society groups concerned about gas fracking proposals or projects in the Northern Territory.¹

We welcome the focus on climate change adaption and mitigation measures for the Northern Territory, outlined in the current Climate Change Policy Discussion Paper, and are pleased to provide the following comments.

It is the view of the Protect Country Alliance in reviewing the NT Government’s Climate Policy Discussion Paper that the Northern Territory Government is fast headed in the wrong direction on the pathway out of pollution.

Proposed plans to open up the Beetaloo shale gas basin and beyond to fracking gasfields would be a disaster for the climate, locking the Northern Territory into unprecedented pollution levels at the very time when we need to be doing all we can to prevent new emissions and adapt to climate change already underway.

The climate science demands urgent action to reduce emissions, and keep new stores of fossil fuels in the ground. The IPCC Special Report on Global Warming of 1.5 oC³, released on 8 October 2018 determined the feasibility of limiting warming to 1.5oC.

The report synthesised the best available scientific evidence; citing more than 6,000 scientific references. Thousands of expert and government reviewers contributed to the process. This report determined limiting global warming to 1.5oC would require rapid and far-reaching transitions in land; energy; industry; buildings; transport and cities.

Global net human-caused emissions of carbon dioxide would need to fall by approximately 45% from 2010 levels by 2030, reaching net zero by around 2050, requiring broad and unprecedented changes in all aspects of society.

The IPCC report further warns that, unless rapid and deep emissions reductions are realised, the 1.5oC carbon budget threshold could be passed in as little as 15 years. Warming at 1.5oC is not considered ‘safe’ for most nations; communities; ecosystems; and sectors and poses significant risks to natural and human systems (when compared to current global warming of 1oC).

The NT Government’s proposed policies to turn the Northern Territory into an onshore and gas export hub are clearly incompatible with the requirement for urgent and deep

¹ https://www.protectcountrynt.org.au/about
cuts to Australia’s emissions and require urgent review as part of the development of its climate policy going forward.

Fortunately, the speed with which the costs of clean energy are reducing, and its availability, mean the transition to a carbon neutral economy is imminently achievable.

It is the view of the Protect Country Alliance that Territorians would be better served by harnessing the future of Territory to the next system of energy based on renewables which has the advantages of being cheaper and sustainable, and delivering more equitable access to energy than ever before.

COUNTING THE COSTS OF CLIMATE INACTION

The NT Government has committed to implementing Recommendation 7.8 of the NT Fracking Inquiry Report which states that there should be no net increase in emissions from shale gas fracking in the NT. It proposes that seeking offsets may be one solution for addressing the significant emissions from shale gas fracking.

However, the task of offsetting emissions from NT fracking appear insurmountable, from a political, environmental and economic perspective.

Analysis by the Australia Institute shows that the cost of offsetting emissions generated in the NT through gas fracking could cost up to $4.3 billion per year when the shale gas industry is at full production by 2030, and $53 billion over the decade from 2030-40.²

There are also significant risks of inaction for emissions-intensive resource-based economies as the global economy decarbonises. The IPCC report states that by 2050, all fossil fuels – including natural gas – must be phased out³.

The risk of investing in the development of what is likely to become stranded assets such as the shale gas stored in the Beetaloo basin poses a significant threat to the economic viability of economically-vulnerable jurisdictions such as the Northern Territory⁴.

There is no cost or technological impediment to delay a transition to a carbon neutral economy right now. Wind and solar power is now the cheapest form of new build technology, with the cost of renewables reducing year on year.⁵

It is essential that the NT Government gets all its electricity generation capacity onto renewables and non-carbon polluting sources like Hydrogen, to take advantage of price reductions as well as reduce carbon emissions.

If the NT’s CO²e pollution levels to climb to the point where we become the highest per capita polluters in the world the NT puts at risk significant opportunities in carbon management and the ability to attract initiatives like the savanna burning methodology to be used as viable offsets in other countries, shutting down a potential export market.

² http://www.tai.org.au/content/massive-nt-fracking-emissions-will-cost-billions-offset-0
³ Ibid
⁴ Tyndall Centre for Climate Change Research Manchester et al., Natural Gas and Climate Change.
The NT Government’s climate policy framework must consider cleaner alternatives, such as building a world class solar-powered manufacturing industry the NT.

With new cable technologies this can be a distributed industry offering real long term and sustainable jobs in regional areas of the NT.

Community-run solar projects have a strong social licence compared to fossil fuels, and can replace diesel generators in remote areas of the Northern Territory, supported by strong targets of at least 80% employment for Territorians to receive training to build, operate and maintain the solar power generators. These types of forward-thinking policies can ensure continued social support for energy transition policies as the government takes action on climate change.

There is a significant opportunity in the NT to make emissions savings but to also reduce energy costs which is a significant impediment to economic growth, investment and cost of living for all Territorians.

1 DEGREE OF WARMING: IMPACTS AND OUTLOOK FOR THE NT

The NT has some very clear evidence of damage from climate change even at the current 1 degree level of warming and this should provide a very clear motivation for action beyond what is being proposed in the current discussion paper.

Recent reports from the IPCC6 and the UN7 indicate that actions so far are inadequate and efforts need to be significantly increased.

The NT is witnessing significant coral reef bleaching, extensive mangrove die-offs, temperature change interfering with the sex ratio of reptiles which threatens their population, and rising sea levels which threaten to inundate wetlands and low-lying areas.

Mangroves are an essential nursery area for much of our marine systems and freshwater species, including iconic species like the Barramundi and mud crabs. To have mangroves dying at 1.0 degree should spark concern as to what will occur at 2 degrees or more. Reports from groups like NASA make explicit the dangers of increases in temperature beyond 1.5 degrees8.

These threats impact at the very foundation of the Territory’s lifestyle and the long-term sustainable aspects of the economy and its underlying employment and wealth-creation drivers.

Climate induced changes pose a significant and immediate threat to the NT’s growing tourism sector, including fishing, wetland cruises and bird watching, pastoral and agricultural industries as well as impacting on general lifestyle and social aspects of the NT.

It is very clear that the NT Government needs to do everything it can to reduce emissions and to encourage other governments to do the same.

6 IPCC report Summary for Policy Makers October 2018
7 https://www.unenvironment.org/resources/emissions-gap-report-2018
8 https://climate.nasa.gov/news/2458/why-a-half-degree-temperature-rise-is-a-big-deal/
Recent analysis shows there is a strong possibility that the world could reach 2 degrees of warming by 2030\(^9\). These findings provide a strong base of evidence for increasing the NT Government’s ambitions on climate action, by bringing forward the date by which it aspires to achieve zero carbon emissions, starting with significant reform to the energy sector.

GAS: A BRIDGE TO NOWHERE

Unconventional gas producers claim that gas is a transition fuel but it is a bridge to nowhere. More gasfields are simply not climate friendly given the amount of methane that is being vented and flared and are not needed given the plunging costs of alternatives in renewable energy and battery storage.

Methane is a powerful greenhouse gas, 86 times more powerful than carbon dioxide when its atmospheric warming impacts are considered over a 20-year time period, and 34 times more powerful over a 100-year time period.\(^10\)

Reducing methane emissions is an important part of any strategy to avoid dangerous climate change, as agreed by world governments at the December 2015 UN Paris climate conference.

It is therefore imperative that the NT Government fully consider the actual emissions profile of gas when developing both energy and climate policies for the future.

The NT Government’s Climate Policy Discussion Paper makes references to a comparison between coal and gas, as though these two fossil fuel options are the only options that ought to be considered when planning for the NT’s contributions to Australia (and the world’s) energy generation mix.

But this comparison relies on false assumptions about the emissions profile of gas, carbon and methane emissions over project lifecycle and leaks and fugitive emissions from gas extraction.

One comparison of gas to coal that is useful for NT policymakers is contained in the chart below, developed by former gas-industry chemical engineer and independent energy advisor Dr Tim Forcey, to demonstrate the significant emissions profile of the NT’s shale gas resource when compared to other large-scale Australian coal projects.\(^11\)

The chart compares the greenhouse gas emissions potential from NT shale oil and gas with the well-known proposed Adani Charmichael coal mine in Queensland.

Potential global greenhouse gas emissions from the Adani mine are reported to be 5 billion tonnes, which is approximately equal to nine-years-worth of Australia’s emissions (recently reported to be 0.55 billion tonnes per year).

\(^11\) Submission to NT Fracking Inquiry, January 2018, Dr Tim Forcey, https://frackinginquiry.nt.gov.au/?a=479474
Northern Territory shale oil and gas is one of Australia’s largest potential sources of greenhouse gas emissions. As shown on the following chart, the potential global greenhouse gas emissions from NT shale oil and gas could be approximately 4 to 7 times larger than the potential total emissions from the Adani coal mine.

Unconventional gas extraction is a significant producer of greenhouse gas emissions. Its extraction produces high levels of fugitive methane – a potent heat trapping greenhouse gas that escapes during extraction, processing and transport.\(^\text{12}\)

The latest measurements of fugitive emissions above US unconventional gasfields suggest they could be as high as 17\% of production.\(^\text{13}\)

In fact, when emissions are above 3 to 4\% of production, the climate impacts of using gas to generate electricity are actually worse than for coal powered generation.\(^\text{14}\)

\(^\text{12}\) https://www.lockthegate.org.au/renewable_energy_power_generation#_ftn1
\(^\text{14}\) https://www.lockthegate.org.au/renewable_energy_power_generation#_ftn2
In Australia, there has been little direct measurement and reporting of actual emissions from existing unconventional gas operations and as a result the Australian gas industry claims\textsuperscript{15} that its fugitive emissions amount to only 0.1\% of production.\textsuperscript{16}

Australian methane-emission reporting methodologies rely to a significant extent on assumed emissions factors rather than direct measurement. The assumptions used to estimate methane emissions include some that are out-dated, and some that lack demonstrated relevance to the Australian unconventional oil and gas industry.

Despite Australian Government greenhouse-gas reporting requirements having been established in 2009 and Australia’s unconventional gas industry operating at significant scale since 2010 and rapidly expanding since, there has been no comprehensive rigorous, independently verifiable audit of gas emissions.

Indeed, to quote CSIRO, “reliable measurements on Australian oil and gas production facilities are yet to be made.”\textsuperscript{17}

New gasfield emissions measurements from US shale regions show that, if the measured rates of emissions from the US are applied in Australia, experts estimate that fugitive emissions could equate to 92MT per annum of carbon dioxide equivalent per annum- equivalent to annual emissions from our entire transport sector.

**GAS POLICIES PUT NT OUT OF STEP ON CLIMATE ACTION**

Plans to open the NT to onshore shale gas fracking, and the growth of the Territory as an LNG export hub, cannot be made to fit into sensible climate policy settings.

\textsuperscript{15} http://www.abc.net.au/cm/lb/4421188/data/greenhouse-gas-emissions-study-of-australian-csg-to-lng-data.pdf


The NT Fracking Inquiry predicted an addition emissions load in the Northern Territory from a large gas development to be 38.9 mtpa of CO\textsubscript{2}e\textsuperscript{18}. The table on page 12 of the Discussion Paper only goes up to 25 mtc\textsubscript{2}e pa, understating the emissions growth by a wide margin.

The NT Government’s Climate Policy Discussion Paper shows that onshore gas development and production from the Inpex gas plant will be a significant emissions growth driver in coming decades, taking the NT from production of 3% of Australia’s total emissions, to an alarming 20%.

Since the conclusion of the NT Fracking Inquiry estimates of the gas resource in the Beetaloo sub-basin have significantly increased, from approximately 200 tcf to 500 tcf\textsuperscript{18}.

Therefore, estimates of emissions from planned shale gas fracking in the Beetaloo basin and implications for any proposed climate policy must also be revised in light of these new findings.

![Graph showing emissions growth]

The climate pollution of fracking gasfields would be a disaster for the NT internationally at a reputational level, and have severe implications for many industries into the future.

Sensible climate policy would keep the polluting methane gas in the Beetaloo basin in the ground altogether, while transitioning the NT towards 100% renewables. The emissions that are now locked in from the offshore gas are already enough of a problem, without deliberately adding to these challenges through new onshore shale gas.

**CLEAN ENERGY ALTERNATIVES TO GAS**

Fortunately, rapid advances and falling costs in renewable power and storage technologies means that a secure, dependable, cost effective power system can now be achieved without gas.

In its report *Pollution and Price: The cost of investing in gas*, the Climate Council of Australia shows that renewable energy and storage can provide a secure, affordable

\textsuperscript{18} Page 228, NT Fracking Inquiry Final Report, 2018.
alternative to new fossil fuels. The electricity system must balance power supply and demand, and withstand disturbances to the power system such as severe weather. These challenges can be addressed without increasing reliance on expensive, polluting gas power.

There are many renewable energy technologies that can provide around-the-clock, on-demand power, including solar thermal, sustainable biomass, and pumped hydro-power. Combining these technologies with wind, solar PV, and largescale energy storage can accommodate electricity demand 24 hours a day and also meet the technical requirements for grid stability.19

Modelling of Australia’s National Electricity Market (outlined in Pollution and Price), shows that accelerated renewable uptake, storage, a smart grid and energy efficiency will achieve lowest consumer prices, reliability and meet Australia’s emissions reduction commitments. New renewable energy power generation, such as wind and solar, is now cost competitive with new gas or coal, and avoids fuel costs.

POLICY RECOMMENDATIONS

The Protect Country Alliance recommends the following evidence-based policies to strengthen and improve the NT Government’s Climate Policy Discussion Paper:

To increase climate resilience, rapid, far-reaching, and deep reductions in greenhouse gas emissions are required (net zero carbon emissions by 2050).

There is scientific consensus: greenhouse gas emissions need to decline rapidly to net zero1. Net zero emissions is achieved when more greenhouse gases are stored or sequestered than are released to the atmosphere.

This is consistent with the Paris Agreement science-based target (ratified by 197 countries, including Australia): Limit global warming to less than 2°C – and pursue efforts to limit warming to 1.5°C (above pre-industrial levels) 2. This target and the following recommendations were selected as within this threshold, the climate system is likely to remain in a habitable and stable state.

**Recommendation 1**: Legislate a science-based emissions reduction target of net zero by 2050. Include interim targets and sector-specific targets (with the recognition that some sectors are more difficult to decarbonise than others.

**Recommendation 2**: Commit to decarbonising the economy, so climate risk can be mitigated and the co-benefits and financial opportunities associated with a low-carbon transition can be realised.

**Recommendation 3**: Commit to decarbonising the economy, so climate risk can be mitigated and the co-benefits and financial opportunities associated with a low-carbon transition can be realised.

**Recommendation 4**: Ban the development of new shale oil and gasfields, and prevent new fossil fuel reserves being explored for, or exploited.

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Public Health Association of Australia submission on the Northern Territory Climate Change Discussion Paper
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Preamble

The Public Health Association of Australia

The Public Health Association of Australia (PHAA) is recognised as the principal non-government organisation for public health in Australia working to promote the health and well-being of all Australians. It is the pre-eminent voice for the public’s health in Australia.

The PHAA works to ensure that the public’s health is improved through sustained and determined efforts of the Board, the National Office, the State and Territory Branches, the Special Interest Groups and members.

The efforts of the PHAA are enhanced by our vision for a healthy Australia and by engaging with like-minded stakeholders in order to build coalitions of interest that influence public opinion, the media, political parties and governments.

Health is a human right, a vital resource for everyday life, and key factor in sustainability. Health equity and inequity do not exist in isolation from the conditions that underpin people’s health. The health status of all people is impacted by the social, cultural, political, environmental and economic determinants of health. Specific focus on these determinants is necessary to reduce the unfair and unjust effects of conditions of living that cause poor health and disease. These determinants underpin the strategic direction of the Association.

All members of the Association are committed to better health outcomes based on these principles.

Vision for a healthy population

A healthy region, a healthy nation, healthy people: living in an equitable society underpinned by a well-functioning ecosystem and a healthy environment, improving and promoting health for all.

The reduction of social and health inequities should be an over-arching goal of national policy and recognised as a key measure of our progress as a society. All public health activities and related government policy should be directed towards reducing social and health inequity nationally and, where possible, internationally.

Mission for the Public Health Association of Australia

As the leading national peak body for public health representation and advocacy, to drive better health outcomes through increased knowledge, better access and equity, evidence informed policy and effective population-based practice in public health.
Introduction

PHAA has a range of policies relating to public health and climate change. Those relevant to this consultation include Climate Disruption, the Food System and Food Security and Safe Climate policy.

The recently released report of the Intergovernmental Panel on Climate Change (IPCC) Global warning of 1.5°C clearly outlined the catastrophic impacts of climate change and the urgent necessity to do everything we possibly can to limit warming. The differences between a 1.5°C and a 2.0°C increase are significant and dire for sea level rise; biodiversity and ecosystems including species loss and extinction; ocean temperature and acidity; risks to health, livelihoods, food security, water supply, human security and economic growth. We have already passed the first degree of increase, and require unprecedented transitions of our systems to halt our rapid progress towards a second.\(^1\)

The comprehensive assessment of 41 indicators of climate change and health in Australia released this week confirms that policy inaction to date threatens Australian lives.\(^2\)

**Climate disruption**

We have a responsibility to protect our planet’s ecosystems for future generations. Global, intergovernmental policy action is needed to mitigate and adapt to climate disruption. In Australia, action from federal, state and local governments is also needed.

Climate disruption due to increased anthropogenic greenhouse gas (GHG) emissions is already causing higher surface temperatures, rising sea levels, more frequent and severe flooding and drought events. These, plus ocean acidification, will impact upon biodiversity and ecosystems and increase pressures on the global food system.\(^1\) Without prompt intervention, such changes are likely to adversely affect food security, population health and global health equity.

PHAA calls for the following actions:

1. There is an urgent need for research on climate disruption impacts on the food system and its impacts on health, and to raise awareness of this issue.
2. National food and nutrition policy should incorporate action to protect agriculture, fisheries and the food system from climate disruption.
3. Australia should adopt policies to achieve emissions reductions targets consistent with global warming projections of less than 1.5°C.

One matter of heightened concern in the East Arnhem region is that rising sea levels could mean living on low-lying islands such as Milingimbi (population approx. 1,200) will no longer be viable. This will result in ‘climate change refugees’. Milingimbi already has a precarious fresh water supply and rising sea levels could mean permanently displacing this freshwater, as well as more significant sea level changes submerging the island altogether.

**Food security**

Food security is foundational to health equity. The Food and Agriculture Organisation of the United Nations defines it as a state in which,

‘... all people at all times have physical, social, and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life’

It is possible that climate disruption and associated phenomena will affect food security in unforeseen ways. For example, there is some evidence that increased atmospheric CO\(^2\) may be diluting the protein and mineral content of foodplants. A precautionary approach to ensuring food security should be adopted.
At-risk populations – especially those who experience socioeconomic disadvantage including Australian Aboriginal and Torres Strait Islanders, the homeless, the elderly and those already experiencing high rates of food insecurity – are likely to be most vulnerable to the effects of climate disruption and may be forced to spend an even greater proportion of their income on food.

**Safety**

A safe environment and climate are core determinants of human health along with the socioeconomic and political structure of society, and the multitude of individual and organisational factors affecting health and health services.

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**PHAA Response to the online questions**

**1. Greenhouse emissions target**

*What (if any) Greenhouse gas emissions target should the Northern Territory adopt?*

The Territory should adopt an ambitious target of net zero emissions. NT could even adopt a ‘below-zero’ target, acting as a carbon sink. The reasons include:

- The Territory is highly vulnerable to impacts of climate change. Darwin in summer is regularly near the limit of human survival, and this is contributing to population decline.
- With its small population and lack of major urban centres the Territory has less inertia and greater capacity for innovation and change
- Since most of the Territory’s emissions are from land use, these are relatively easy to reduce with multiple benefits including reduced smoke, enhancement of biodiversity, reduced fire risk
- The Territory should lead by example.

This is consistent with PHAA’s policy goal of achieving emissions reductions targets consistent with global warming projections of less than 1.5°C.

**2. Business, government and climate change**

*What should businesses and governments be doing to reduce emissions?*

Key strategies could include:

1. Recognise the threat of climate change to all aspects of contemporary society, through including climate change in all strategic policy, investment strategy, insurance considerations, emergency planning, and policy and program decisions across portfolios including energy, transport, infrastructure, agriculture, health, education and the environment.
2. National food and nutrition policy and industry should incorporate action to protect agriculture, fisheries and the food system from climate disruption.
3. Reduce demand through avoiding unnecessary activities that drive up emissions. The need for office workers to wear warm clothes to protect themselves from air-conditioning is an example of the absurdity of some electricity production. Similarly, cold bedroom temperatures to enable use of doonas at night are evidence of electricity being too cheap to create a disincentive to waste.
4. Increase efficiency, with minimum standards for all appliances, repair rather than replace, and choice of durable equipment.
5. Consider climate change as part of a broader development picture, consistent with the 2030 Agenda for Sustainable Development.\(^3\)

6. Plan development that will contribute to emissions reductions, in all policies:
   a. Urban planning to enable people to live near their employment
   b. Facilitate active transport including both public transport and cycling and walking
   c. Food production and choice: local production, low packaging, less animal feeds
   d. Waste minimisation and management

3. Benefiting from Aboriginal and traditional knowledge

   How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

Aboriginal people as almost one third of Territorians could be engaged to ensure all Territorians benefit from unique opportunities for the Territory to achieve benefits in planning for a climate constrained future.\(^4\)

Many Aboriginal people aspire for livelihoods based on relationships with kin, community and Country, rather than engagement in the market economy. Industries based on small scale local production, such as bush harvest and art have inherent limits to growth. Aboriginal knowledge of land, flora and fauna, culture, language and spirituality provide unique opportunities for the Territory to develop within the safe boundaries at which we do not imperil the environment that supports us.

As is the case globally, in the Territory Indigenous voices provide an opportunity for sustainable development that meets the needs of people alive today without undermining the resources that will enable future generations to meet their own needs.

Aboriginal development based on cultural knowledge provides opportunities in tourism, although we note the need to off-set greenhouse gas emissions related to tourism.

The Territory could also consider adopting a different structure for the typical working day that better suits the climate, i.e. not working during the hottest part of the day.

4. The opportunities

   What potential opportunities can you see emerging from climate change in the Territory?

Domestic and workplace initiatives

The Territory should provide opportunities for composting for businesses and members of the public with no suitable outdoor space. The heat and humidity mean composting or bokashi break down very quickly and the end product is very useful, particularly given the low-fertility of the soil in the NT. In the UK the public can be fined if they do not dispose of their waste correctly in their bin collection (e.g. in the correct bins, clean recycling).

More recycling bins should be available in public spaces.

There could be greater incentives and/or regulation on new builds to include rainwater tanks, grey water recycling and solar power.
Aboriginal carbon farming

Aboriginal carbon farming is a valuable opportunity for the Territory as a source of economic and social development through strong national climate change policy. Since estimates are that up to 90% of NT is under Aboriginal land management of some form, effective two way management can enable both Aboriginal and non-Aboriginal knowledge and tools to contribute to land management. The success of the West Arnhem Land Fire Abatement project to achieve goals of carbon reduction, through two way land management is an example of how this can work.

Electric transport

Assistance to move to electric transport options would be worthwhile initiative. Transport often accounts for a significant proportion of personal emissions and this is likely to be high in the NT where long distances are often traversed.

In July 2018 PHAA made a submission to an inquiry by a committee of the Commonwealth Parliament into the use and manufacture of electric vehicles in Australia. In this submission, we noted:

“In order for electric vehicles to fulfil their promise to reduce carbon emissions, recharging must occur using renewable energy.”

At current life cycle prices, economic incentives such as Government subsidies for up-front costs of the purchase of electric vehicles and regulation or subsidies to drive roll out of supporting recharging and battery infrastructure are required. The government could also consider a move to electric government transport.

Other useful transport initiatives might include:

- Light rail linking Palmerston with the city
- better shading along footpaths and cycle paths to encourage greener means of transport
- free inner city bus loop - important for the middle of the day when it might be too hot to walk.

5. Energy production and climate change

How can the fossil fuel industry further reduce emissions from energy production?

The following statement within the discussion paper is alarming, and suggests that the paper was not independently written, but influenced by promoters of gas:

“When used for electricity generation, gas can result in between 37% and 54% lower GHG emissions than that of coal-generated electricity. By exporting gas to other parts of Australia or the world for electricity generation, the Northern Territory can play an important role in assisting these locations to potentially reduce their overall GHG emissions by shifting generation fuel from coal to gas. This allows us to help others transition towards lower carbon economies.”

On the contrary, fossil fuels including gas must be phased out urgently. Most remaining known reserves of coal, oil and gas must remain unburnt to minimise likelihood of catastrophic climate change. Structured planned elimination is far preferable to hasty shut downs due to economic collapse as we have seen elsewhere.
As in other areas, the Territory should be leading, particularly as we are already powered by gas which was identified as a transition fuel in the 1980s. The transition should be near complete, and the Territory should be powered entirely by renewables by 2030.

6. The best ways to regulate

What type of regulations do you think would assist industry in being accountable for their impact on climate change?

While regulation is useful, culture change is needed, so ensure that industry takes advantage of opportunities in a climate constrained future. Already many industries are recognising fossil fuels as potential stranded assets, and urging governments to facilitate developments that reduce emissions.

7. Your role

What actions are you willing to take to mitigate or reduce the impact of climate change?

While personal action is important, and serves to educate oneself and demonstrate change to the community, climate change mitigation and adaptation depend on society-wide change beyond the scope of individual action.

Personal changes include consideration of diet, transport, travel.

8. Help us help you

What support do you need to help you to mitigate or adapt to climate change?

Climate change brings major threats to contemporary society, the scale of which are difficult to conceptualise, leading to the denial and deferment that is widespread in Australia and elsewhere. Government, businesses and communities must work together through education and community development to support just transition to a sustainable economy through all sectors.

At a more structured level, NT Government support for large scale, community-owned renewable energy would provide benefits for government, industry and community.
PHAA strongly supports the Northern Territory having a clear strategy and set of policy actions on climate change. Avoiding catastrophic change requires urgent action:

- The Northern Territory should adopt a maximum of net zero emissions target
- Cross-portfolio and interagency co-operation will be required to ensure systemic policy action
- Aboriginal culture, knowledge and industry could be meaningfully engaged
- Electric vehicles re-charged using renewable energy should be incentivised
- Fossil fuel extraction should cease with a move to 100% renewable energy by 2030

The PHAA appreciates the opportunity to make this submission and to contribute to strong climate change action in the Northern Territory.

Please do not hesitate to contact PHAA should you require additional information or have any queries in relation to this submission.
References

1. 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 the efforts to eradicate poverty: Summary for Policymakers, (2018).


RePower Alice Springs

Submission to the NTG Climate Change Discussion Paper

30th November 2018

RePower Alice Springs is an independent volunteer-run community group, working on behalf of the people of Alice Springs. Our central aim is to achieve 100 per cent renewable energy for the Alice Springs electricity network by 2030 through advocacy, community engagement and development of community solar projects. RePower sees community solar as making a major important contribution to the 100 per cent renewable energy target for Alice Springs.

The following is our response to the questions in the discussion paper:

1. What (if any) greenhouse gas emissions target should the NT adopt?

Net zero emissions by 2025, and a carbon sink thereafter, aiming for negative emissions equivalent to our current emissions of 16MtCO$_2$e by 2050. This is consistent with RePower’s mission of 100% solar power for Alice Springs by 2030 and the urgency of strong action demanded by the latest IPCC report of 8 October 2018. Target must be in legislation, and include interim and sector-specific targets to track and enforce progress.

2. What should businesses and governments be doing to reduce emissions?

Recommendation 1 of last year’s Roadmap to Renewables report to the NT Government said: “To ensure long-term benefits for all Territorians, the NT Government should include renewable energy as a central pillar of economic policy, maximising benefits of forthcoming disruptive change in the electricity sector caused by the global transition to competitively priced renewable energy.” The Northern Territory Government’s response was to support this. This support must now be translated into action and investment.

The NT Government should invest in and actively encourage solar energy through direct investment, subsidies and other mechanisms. Electric vehicles can contribute to reduced greenhouse gas emissions if their energy source is not fossil fuel dependent; and act as batteries in storing solar energy for late use. However the impacts of private vehicles in traffic congestion, particulate pollution and sedentary lifestyles are not overcome through a simple change to electric vehicles for private use.
Government investment in solar energy can be complemented by strategies that increase the cost of emissions; and exerting influence on the Commonwealth government taxation system. Major companies, including Woodside, BHP and Rio Tinto are all calling for a carbon price. Much of the community wants it, industry now wants it, the environment must have it and governments are lagging behind. The NT Government should lead, and not limit this lead to research. Operating examples of big solar are now in abundance interstate and internationally, with big economic development and job opportunities. The NT government should adapt these opportunities for the local situation. The town of Port Augusta is a suitable model for Alice Springs, with similar climate although half the population and is now an energy exporter. Increasing investment in solar power and batteries in Government buildings, with high energy efficiency requirements will lead in the medium term to government savings.

The NT Government should actively support NT Airports proposal to increase its investment in solar in Alice Springs (and Darwin). It has the money, is developing the plans and wants more government engagement and support.


3. How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?

NT Government should identify and help develop recognised methodologies for strategic savannah burning by Aboriginal people for carbon credits in Central Australia, which will provide significant social and environmental benefits beyond carbon storage. There are big opportunities here for Central Australian Aboriginal people, their land and our environment.

4. What potential opportunities can you see emerging from climate change in the Territory?

A renewables economy with many future-oriented jobs plus innovations to export. There is an urgent need to move away from the current energy and gas extraction industries which are environmentally damaging, potentially stranded assets with boom and bust, ultimately redundant jobs.

While there is evidence of people leaving NT because of increasing heat, there are opportunities for research in heat mitigation. NT has no large cities which are particularly vulnerable to heat island effect. Water supplies are relatively secure, so there are opportunities for research and development in heat mitigation, air-conditioner efficiency, and agriculture and food production in changing climate conditions. Darwin has led the way in cyclone standards for buildings, so there is experience in developing building codes that can tolerate extreme weather events.

5. How can the fossil fuel industry further reduce emissions from energy production?

The NT government must assist fossil fuel industries modernise, and use their expertise in renewable energy. This can be done through a permanent ban on fracking, in line with the science-based Paris Agreement target, fossil fuels must be phased out by 2050. Any new extraction of fossil fuels – including natural gas – is incompatible with reducing climate risk and limiting warming to the 1.5 degrees now required. For the NT Government to now support this extraction, including fracking, is environmentally and ultimately economically irresponsible.
6. What type of regulations do you think would assist industry in being accountable for their impact on climate change?

A carbon tax or price would assist industry accountability for impacts on climate change. This could achieve widespread community support through appropriate messaging and community activism. Major resource industry players, including Australia’s biggest oil and gas producer Woodside, are now calling for a carbon price for investment certainty, as they recognised the importance of carbon pricing for environmental protection. To fail to introduce a tax/price quickly is to not only let the environment and community down but also industry and the market. Ultimately, circumstances will demand a price on carbon, so delaying this investment has high costs and risks.

To emphasise this, the Corporate Leaders Group, including Unilever, Coca Cola and the Lloyds Banking Group has called for governments to adopt a net zero emissions target by 2050. The NT Government must heed this call.

All forms of fossil fuel subsidies should be identified and eliminated immediately.

7. What actions are you willing to take to mitigate or reduce the impact of climate change?

RePower already works tirelessly and voluntarily in many ways consistent with its mission to achieve 100% solar power for Alice Springs by 2030 by:
- Building community capacity
- Advocacy
- Community power projects and partnerships
with considerable impact and traction considering its meagre resources.

Its mission and advocacy reflect the wishes of many Alice Springs residents. Three-quarters of the respondents in RePower’s 2017 survey wanted 70-100 per cent solar power for Alice Springs by 2030. Over 80 per cent of the 542 respondents in RePower’s 2018 survey said they are willing to invest in an Alice Springs solar farm. A number of respondents would be willing to invest over $100,000; while the most common range was $1000 to $5000.

Personally, members of Repower Alice Springs are highly committed to reducing their own carbon emissions through choices in transport, entertainment, consumption, recreation and family size.

8. What support do you need to help you to mitigate or adapt to climate change?

NT Government buy-in, literally and otherwise, is needed to transition the NT faster, to fully renewable power and a renewables economy. While the Alice Springs community is willing to put its money where its concerns are, it expects governments to take leadership in demonstrating the possibilities of renewable energy, and mitigating and adapting to climate change.

In summary, RePower Alice Springs, formed in response to catastrophic government failure to respond to the urgent need to invest in renewable energy, urges NT government to recognise that climate change is a global emergency, requiring leadership and action on many fronts.

We advocate:
- Ambitious emissions reductions
- Consideration of climate change mitigation and adaptation in development of every policy
- Collaboration with industry and the community particularly in developing renewable energy,
- Recognition of the opportunities for Aboriginal leadership,
• Support for individual action.

We look forward to close collaboration following this inquiry.
In its recent report the IPCC makes a compelling case for the world to aim for a target of no more than 1.5°C in global warming. To do this, it says, “Pathways limiting global warming to 1.5°C with no or limited overshoot would require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems (high confidence). These systems transitions are unprecedented in terms of scale, but not necessarily in terms of speed, and imply deep emissions reductions in all sectors, a wide portfolio of mitigation options and a significant upscaling of investments in those options.” This leaves no doubt that we no longer have any room for prevarication or half measures. If we want to mitigate the possibly catastrophic effects of global warming we must act strongly and decisively now. We in the NT must be willing to take strong action to preserve our livelihood into the future.

1. What (if any) greenhouse gas emissions target should the NT adopt?

Page 11 of the Climate Change Discussion paper shows that the NT has 1% of Australia’s population and emits 3% of Australia’s GHG. In other words, we are producing three times more GHG per population than the rest of Australia. That, plus the warnings from the IPCC quoted above, makes it obvious we must take drastic action to reduce the harm we are causing.

It is clear that we must reach a target of zero emissions by 2030.

2. What should businesses and governments be doing to reduce emissions?

All NT businesses should urgently audit every aspect of their activities to find methods of reducing their carbon footprint. Then, business should implement best practice to reduce their GHG emissions. Whether it is putting solar panels on rooftops of factories and warehouses, making more efficient use of transport and transitioning to electric vehicles or devising farming methods that maximise sustainable use of the land while minimising land clearance, answers must be found by auditing business practice and then implementing mitigation techniques.

The NT government should assist business in this task by conducting research, offering incentives for best practice and having each department that works with the business community offering as much assistance as possible.

The NT government should go all out to invest in solar power generation and other forms of renewable technology. For example, Alice Springs is one of the sunniest places on the planet yet its main power source is from gas turbines. That is an absurd situation. A major plank of the government’s infrastructure platform should be developing a large solar farm here. This could be done in partnership with businesses and the community so that everyone would feel they have invested in a the new carbon free future.
The NT government should do everything in its power to develop a carbon pricing scheme. That would be a major step towards the ending of hidden carbon subsidies.

The NT government should review, reduce and finally eliminate all fossil fuel subsidies in the Territory.

The NT government should put in place a carbon neutral target for all its departments. Things like replacing its vehicle fleet with electric cars, reducing carbon costs in its buildings, being more efficient in government worker movements (for example, using computer-based conference calls, instead of driving or flying government employees to meetings).

The NT government should support and actively work with the Alice Springs Town Council in implementing its ‘Climate Action Plan 2018 – 2021’.

3. How else can we apply Aboriginal knowledge and practices to help us to mitigate and adapt to climate change?
Reducing the GHG emissions from the Northern Territory offers a great opportunity for Aboriginal communities to gain meaningful employment in their own country. Taking care of the land and developing carbon offset programs could develop meaningful industries in Aboriginal areas for the first time.

4. What potential opportunities can you see emerging from climate change in the Territory?
If the NT government, business and community strongly invest in the carbon-free future we could become leaders in many facets of economic life. We could gain expertise in the renewable energy field, which could possibly lead to new industries springing up around it. For example, instead of investing in gas pipelines we could invest in a massive solar farm in the centre of NT and using the newest technologies in high voltage wire distribution systems, we could export power. ‘Mining the Sun’ would be a sustainable, long-term and carbon-free industry, instead of the dirty, polluting gas and oil we seem to be fixated on.

In developing new building techniques that are centred on mitigation and adaptation we may start a whole new export technology with concomitant new jobs. CDU could become a centre for training in these new technologies for Australia and the Asian region, bringing in huge benefits for the NT economy.

5. How can the fossil fuel industry further reduce emissions from energy production?
We must stop fracking in the NT. The argument that it doesn’t increase carbon emission in the NT because we are exporting it is foolish. Burning our fossil fuel in China will still cause increased CO2 emissions that will be felt here. The atmosphere does not stop at our borders. We must develop industries that are beneficial to the ecology and sustainable in the long term. Short term money grabs like the fracking industry are the exact opposite of what is needed.

6. What type of regulations do you think would assist industry in being accountable for their impact on climate change?
The NT government should promote a carbon pricing scheme.
The NT government should review and eliminate any fossil fuel subsidy that is now in place.

The government should maximise assistance for businesses to achieve carbon neutrality. The government should set a regulation that only businesses that can demonstrate best practice in this area can tender for government contracts.

7. **What actions are you willing to take to mitigate or reduce the impact of climate change?**
As a retiree I cannot afford to pay for solar panels for my house but I certainly would invest in any scheme that was put in place to develop a solar farm here in Alice Springs.

I work as a volunteer in various community groups that are ready and willing to help in the reduction of the Northern Territory’s carbon footprint.

8. **What support do you need to help you to mitigate or adapt to climate change?**
Government support of a community based solar power farm in Alice Springs that I could invest time and money in to make it successful.
Emissions from increased NT gas production would dwarf all other sources of NT emissions and threaten Australia’s national targets. Allowing fracking and offsetting its emissions, as promised, is an expensive way to keep emissions stable and could make it harder to reduce emissions. The NT and Commonwealth should develop the policy now with public consultation, not in secret over three years as planned, and ensure offsets are secured by gas companies, not subsidised by taxpayers.

Submission

Tom Swann
November 2018
ABOUT THE AUSTRALIA INSTITUTE

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. We barrack for ideas, not political parties or candidates. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

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Summary

The Northern Territory (NT) Government has released a *Climate Change Discussion Paper* for consultation about what climate policies it should have. There are many worthy options in the *Discussion Paper*, but all of them are dwarfed by the emissions from gas expansion. The NT should focus on rising gas emissions.

The gas industry is already increasing NT emissions. Between 2016 and 2020 the Ichthys Project will increase NT emissions by a further 50%. The NT Government has also overturned its moratorium on fracking in the NT.

The NT Government’s Fracking Inquiry found emissions from fracking would increase Australia’s national emissions by at least 5%. Annual lifecycle emissions from this gas (including burning the gas) could be up to six times larger than the NT’s entire emissions for 2016, and one hundred times larger than the savings from the NT’s renewable energy target.

**Shale gas annual emissions scenarios vs savings from NT renewables target**

![Graph showing shale gas emissions scenarios vs savings from NT renewables target](image)


Numerous eminent Australian scientists have argued the NT should retain its moratorium, which is a better option than offsets. As the *Discussion Paper* argues, offsets should be a “last resort”. That is not the approach the NT has taken.
The NT government has committed to the recommendations of its Fracking Inquiry, that fracking must only go ahead if its lifecycle emissions are fully offset. This should be the NT’s main and urgent priority for climate change.

NT gas emissions are a threat to Australia’s national emissions targets. Offsetting NT fracking emissions is also a threat. If NT fracking gets lower cost offsets, this leaves higher cost offsets for reducing emissions. If the offsets fail, Australia’s emissions will increase. The offsets are needed just to keep emission where they were.

The NT Government has given no detail on this policy. The NT Government has said only that it has written to the Australian Government, which will “assist” with offsets, and that it will develop the policy by the end of 2021. That is three years’ time, after much industry and government activity has been ‘locked in’.

Attempts to find out what these talks involve have been blocked. Both governments have blocked Freedom of Information requests for correspondence about fracking offsets, which is being kept secret. This is no basis for public consultation. The NT should release these letters.

Offsetting emission on this scale will be a challenge and costly. The cost of offsets will be in the hundreds of millions of dollars per year, potentially rising to billions per year.

The gas industry should pay for these offsets. They are required to make fracking “acceptable” under NT policy. Governments paying for these offsets will make taxpayers subsidise the gas industry for no climate benefit.

The NT Government should not develop this policy in secret with the Commonwealth. Recent history raises concerns around Commonwealth pressure on fracking in the NT, including with a one-off payment rushed through in days just as the moratorium was lifted. This payment would not cover one year’s emissions from fracking.

The NT Government does not appear to think it will get much benefit from fracking. Immediately after overturning the moratorium, reported in the NT News as doing the Commonwealth a ‘favour’, the NT Government demanded extra funding from the Commonwealth. But FOI documents show the Commonwealth has already rejected an NT request for ‘matched’ royalty payments from fracking. The NT should not assume the Commonwealth will fund their offsets policy.

There is a risk of great political and corporate pressure to break the promise. The NT Government should conduct public consultation now, prior to significant government and industry activity, making it clear that the gas industry will pay.
Gas emissions are the main threat

The *NT Climate Change: Discussion Paper* discusses a wide range of important matters relating to reducing emissions in the NT.¹

But these other issues are dwarfed by the threat of emissions from gas.

Given this, it is alarming that the Discussion Paper gives such little attention to gas. In the 35-page document, the ‘gas industry’ is mentioned only five times, ‘onshore gas’ three times, ‘offshore gas’ once and ‘LNG’ four times.

Emissions from the gas industry should be the *main* priority for the NT in developing its climate change policy.

**EXPANSION OF THE GAS INDUSTRY**

The expansion of the gas industry is already the single greatest source of increased NT emissions in recent and future years. The *Discussion Paper* shows from 2016 to 2020 NT emissions will grow by around 50% as the result of the Ichthys LNG Project. Other gas projects could see overall emissions double again by 2030.

**Figure 1: Gas is driving NT emissions increases**


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¹ NT Government (2018) *Climate Change Discussion Paper*
Increasing emissions from NT’s increasing gas production is part of a national trend. The Commonwealth Government data makes clear the increased emissions over the year to March 2018 were “largely driven” by increased LNG exports, through increased fugitive emissions and stationary energy use.\(^2\)

**NT TARGETS SHOULD NOT GIVE GAS A FREE RIDE**

The *Discussion Paper* asks what kind of emissions target the NT should set for itself.

The NT should have a long-term target of net zero emissions across the economy by 2050 at the latest in line with the Paris Agreement. It should also have shorter term targets expressed for absolute reductions consistent with the long-term goal.

This is in line with the science and international best practice – for example, California, Victoria or the Australian Capital Territory.

The NT government should not set a target that allows for increased gas emissions merely to allow gas production to increase.

If the NT continues to increase gas production, unabated, it will make undermine any reasonable targets the NT might set. It will also undermine the federal government’s emissions targets.

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NT gas is a threat to national emissions targets

Large increases in NT gas production threaten Australia’s emissions targets and any ambitions for higher targets.

The Fracking Inquiry found that fracking in the Northern Territory could be responsible for an increase in Australia’s emissions of more than 5%.

The Climate Change Authority has recommended emissions reductions of at least 45% below 2005 levels by 2030 as consist with the global goals of limiting warming to below 2 degrees. Federally, Labor supports this target and the Greens want a higher target. Reaching such targets will be more difficult if the NT allows a large increase in unabated gas production.

Currently the only emissions policy that applies to gas production nationally is the ‘safeguard mechanism’. This policy is not designed to reduce emissions and is ineffective at limiting emissions increases, as seen in Australia’s rising emissions from LNG. NT Government policy around gas is therefore

Any Australians concerned about reducing Australia’s emissions in line with science should be concerned about NT government policy on gas emissions. Similarly, the NT government should be concerned about the impact of future national emissions policy in line with the science.

Emissions from fracked gas would be equivalent to the emissions of nearly all of the brown coal power stations in Victoria. While Australia must progressively phase out coal power to reduce its emissions, this will be significantly undone by NT gas emissions.

Despite the importance of offsetting fracking, the NT government has done little on this.

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Emissions from NT fracked gas

The *Climate Change: Discussion Paper* now says offsets should be used “as a last resort.” The NT Government has not taken this approach to fracked gas.

Instead, the NT Government has overturned the moratorium, provided that all Australian lifecycle emissions from any new unconventional gas production in the NT are offset.

This means that the NT’s climate task is even bigger than portrayed above.

Eminent Australian scientists have urged the NT Government to re-introduce its moratorium on gas extraction, saying that offsets do not represent “an acceptable outcome”.

FRACKING TO DWARF OTHER NT EMISSIONS

The *Final Report of the Scientific Inquiry into Hydraulic Fracturing in the Northern Territory* (‘Fracking Inquiry’) reported that unconventional gas development in the Northern Territory would result in very large amounts of greenhouse gas emissions.

Fracking would increase Australia’s total emissions by more than 5% and potentially produce as much as 18% of Australia’s emissions (Figure 2).

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5 The Australia Institute (February 2018) *An Open Letter to the Scientific Inquiry into Hydraulic Fracturing in the NT and the Northern Territory Government*,
The Fracking Inquiry looked at two emissions scenarios, with gas production of 365 PJ/year and 1240 PJ/year.

The 365 PJ/year scenario was assumed to be combusted entirely in Australia and found to increase Australia’s greenhouse gas emissions by 26.5 Mt CO2e per year. This was 5% of Australia’s emissions at the time, much larger than the NT’s current emissions, and bigger even than emissions after the ramp up of the Ichthys project.

The higher 1240 PJ/year production scenario was found to result in 98.8 Mt CO2e per year. This is equivalent to 18% of Australia’s 2016 annual emissions.

However in this scenario, 875PJ is assumed to be exported resulting in 58.9 Mt CO2e from combustion in customer countries and 38.9 Mt CO2e from lifecycle emissions within Australia, being equivalent 6.6% of Australia’s 2016 emissions.

To put these vast emissions in context, emissions from fracking would 100 times bigger than the emissions savings under the NT Government’s *Roadmap to Renewables: 50% by 2030* policy (Figure 3).
While building more renewable energy in the NT is a worthy goal, this work may be undone 100 times over by unabated emissions from fracking.

**SCIENTISTS URGE NT TO KEEP MORATORIUM**

The vast scale of emissions from fracked gas in the NT led 34 of Australia’s leading scientists to urge the NT Government *not* to overturn the moratorium on fracking:

> Our view is based on the scientifically robust carbon budget framework. On this basis, most existing fossil fuel reserves must remain unburned. Any new fossil fuel development is incompatible with the goal of the 2015 Paris climate agreement that aims to limit the rise in global temperature to well below 2.0°C above pre-industrial levels and to make every effort to limit the rise to 1.5°C.

> As scientists and experts concerned about the wellbeing of the people of the Northern Territory, Australia and the rest of the world, we strongly urge that
that onshore shale gas and shale oil development does not go ahead in the Northern Territory under any circumstances.\(^6\)

When the NT Government announced it would overturn the moratorium on the condition all emissions are offset, many of the same scientists wrote again:

... our view remains that development of onshore shale gas and shale oil fields in the Northern Territory should not go ahead under any circumstances ... we do not accept that “offsetting” the domestic emissions of unconventional gas development would represent “an acceptable outcome”\(^7\)

In a world tackling climate change, most fossil fuel carbon must stay in the ground. The NT’s unconventional gas reserves are amongst the biggest untapped pools of carbon in the world. The moratorium should be reinstated.

However, given the NT has committed to offsetting NT fracking emissions, developing this policy should be a top and urgent priority.

**NT GOVERNMENT TO OFFSET FRACKING EMISSIONS**

The Fracking Inquiry recommended that unconventional gas extraction should only be permitted if all of its 135 recommendations are accepted and implemented.

The Fracking Inquiry found that emissions of the scale involved in fracking would be “unacceptable”. In Recommendation 9.8, the Inquiry urged:

That the NT and Australian governments seek to ensure that there is no net increase in the life cycle GHG emissions emitted in Australia from any onshore shale gas produced in the NT.\(^8\)

For fracking to meet the “acceptability criteria” and go ahead, the Fracking Inquiry said the increase in life cycle GHG emissions in Australia from any onshore shale gas produced in the NT ... must be fully offset.\(^9\)

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All recommendations were accepted by the NT Government when it lifted the gas moratorium in April.

Having agreed to implement all Inquiry recommendations, the NT Government has accepted responsibility for emissions from exported NT gas, including fully offsetting them.

If an appropriate offsets policy cannot be developed, fracking must not occur.

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What is the plan for offsets?

The *Discussion Paper* say offsets should be as “a last resort” only. But if offsets are going to be used for fracking, then the policy must be robust, transparent and developed well in advance of further government and industry activity.

So far, the NT Government has provided no information about what this policy will look like. It is known only that the NT has asked the Commonwealth for help, but it is not known what role the Commonwealth will have and what the NT has asked for.

The NT has blocked Freedom of Information requests about its offset discussions, including a letter from the Chief Minister to Prime Minister Turnbull.

The NT Government says it will develop its offsets policy in three years’ time. This is after substantial gas expenditure and activity. The policy should come first.

OFFSET DISCUSSIONS

There is no sign the NT has done any substantial work on fracking offsets, and the *Discussion Paper* gives no detail.

The *Discussion Paper* says only the NT government is “discussing” fracking offsets with other jurisdictions and that the Australian Government will “assist”.  

The *Discussion Paper* also says the NT is developing an offsets policy for activities within the NT. These appear to be separate developments, although some fracking offsets could be in the NT.

The NT Government’s September 2018 fracking *Implementation Report* states there has been some progress, but explains only that that “the Chief Minister has written to the Prime Minister to commence discussions on offsetting greenhouse gas emissions.”

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The *Implementation Report* also says the NT Government aims to develop the offsets policy in December 2021 – in three years, well after substantial gas company and government expenditure and activity.12

Fracking industry development should not go ahead without clarity about how offsets will operate. The policy should be developed as an urgent priority.

There should be a detailed policy proposal and consultation process around offsets before any policy is implemented.

## GOVERNMENT SECRECY OVER OFFSET DOCUMENTS

The NT Government seems to think the Australian Government must help it with offsetting fracking emissions. However, it has left it completely unclear what they have asked the Australian Government to do.

The Australia Institute has attempted to find out using Freedom of Information requests to the Department of Prime Minister and Cabinet (PMC). The request sought correspondence between the NT Government and the Commonwealth about offsets and fracking.

PMC blocked access to most of the documents, because the NT Government objected to their release. This included two letters from the NT Chief Minister to the Prime Minister. One of those letters requested assistance with offsets.

While the NT Government has sought help with offsets from the Commonwealth Government, they do not want the public to know what they have asked for.

This is a poor basis for public consultation about the single most important part of NT climate policy.

The NT Government should release these letters and make clear what it has asked the Commonwealth to do.

As discussed below, it appears in these letters the NT Government asked the Commonwealth for money.

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Options for offsetting emissions

If fracking goes ahead the NT will be responsible a large offset task that will pose financial and practical problems. The NT will have to find an offset plan that is feasible, works at scale and is additional to pre-existing offsets.

It is essential to emphasise that if the offsets work, they will merely to keep emissions where they are – not to reduce Australia’s emissions.

Similarly, any policy action used to offset NT fracking cannot be used to meet Australia’s required emissions reductions and can at best stop any increase. In addition, if offsetting fracking secures lower cost abatement, then other offsets are likely to be more expensive.

The simplest way to offset fracking emissions – through contracts for Australian Carbon Credit Units – would cost between $347 and $509 million per year, and could go as high as $4 billion per year in later years.

It would be unfair for NT residents to pay for the offsets, given the high levels of socio-economic disadvantage and likely low revenue from fracking. While the Commonwealth Government pressured the NT to allow fracking, Australian taxpayers should not pay just to keep Australia’s emissions at the same level.

The cost of offsetting emissions, in line with the Fracking Inquiry’s recommendation, should be borne by the gas industry.

HOW TO OFFSET FRACKING EMISSIONS

While it is unclear how the NT will offset fracking emissions, the Fracking Inquiry outlines possible strategies:

- early retirement of coal-burning power plants; fitting of carbon capture and storage to gas or coal-fired power stations; higher emission standards for fossil fuel-burning vehicles; increased uptake of electric vehicles; international offsets; carbon credit offsets in agriculture and savannah burning; formal offset policies and markets; increased deployment of renewable energy; and reductions in deforestation.\(^\text{13}\)

\(^\text{13}\) Scientific Inquiry into Hydraulic Fracturing in the Northern Territory (2018) *Final report*, page 239
The Australia Institute has examined some of these options in detail.\textsuperscript{14} The key issues are feasibility, scale and additionality.

For offsets to work, they must be additional to whatever would have happened anyway. This is called additionality. Additionality is about ensuring we get what we pay for, which can be difficult to assess. Offsets policies need to be rigorous to avoid wasted funding and resources.

**Purchase credits**

The simplest way to offset fracking emissions would be to contract for Australian Carbon Credit Units (ACCU).

The last round of auctions for the Emissions Reduction Fund contracted ACCUs at an average of $13.08 (per tonne of CO2e). Using this figure, offsets in the Fracking Inquiry’s middle scenario would cost from $347 million a year, and in the high scenario it would be $509 million a year.

These estimates are based on recent costs for ACCUs. In a scenario in line with the Paris Agreement, carbon prices would need to be higher than $100/ t CO2e. The cost of offsetting NT fracking could then be as much as $4 billion a year.

ERF methodologies are intended to ensure abatement is additional, however there has been significant controversy about how effective they are.

Methane is a major source of emissions from fracking and is far more potent in the short term than the longer term. While the above figures use a 100-year Global Warming Potential for methane, using the 20-year Global Warming Potential for offsetting NT fracking emissions in the high scenario would cost $735 million.

**Other options**

Other options for offsetting emissions are more challenging still.

Carbon Capture and Storage is not a viable option. It is not operating anywhere in Australia at commercial scale, despite large amounts of government R&D funding.\textsuperscript{15}

Closing down coal power stations is a difficult option for the NT as it will need to convince other state jurisdictions to take large actions. Policy would also need to


ensure this was additional to state and company action already underway to close old coal stations and build more renewables.

To illustrate, the NT would need to secure the closure of nearly all of Victoria’s coal power plants immediately. Then at the point when Victoria's coal stations would have closed anyway, the NT would need to start shutting down coal stations in NSW or Queensland. Once coal has been phased out, the NT would need to secure offsets elsewhere.

Similarly, increasing vehicle standards and electric vehicle uptake is important for abatement, but a poor option for offsetting NT fracking emissions. Vehicle emissions within the NT will not be sufficient and many relevant policy levers are federal.

Moreover, if such policies are used to offset increased emissions from fracking they cannot be used to reduce Australia’s overall emissions.
Offsets a threat to reducing Australia’s emissions

It is important to emphasise that offsetting NT fracking emissions will not reduce Australia’s emissions. Rather it will only stop Australia’s emissions from increasing.

If the offsets do not work, then Australia’s emissions will increase. Offsets are frequently subject to controversy over their integrity. The policy of allowing fracking when offset is still a risk to Australia’s targets.

Moreover, given that Australia must reduce its emissions, any offsets for fracking must also be additional to what we need to do to reduce emissions.

Put differently, policies used to offset NT fracking emissions cannot also be used to reduce emissions.

As a result, if the NT gets access to lower cost abatement options to offset fracking, this may increase the cost of reducing Australia’s emissions.

If the lower cost options go towards reducing Australia’s emissions, this may increase the cost of offsetting NT emissions.

The Commonwealth Government, being responsible for Australia’s overall emissions, therefore should take a strong interest in getting this policy right.
Who should pay?

Offsetting NT fracking emissions will have substantial cost. Who should pay?

It could be paid for by the NT Government or the Commonwealth, ultimately by taxpayers, or it could be paid for by the gas industry.

**NT GOVERNMENT?**

The NT Government is responsible for a jurisdiction with high levels of socio-economic need. This is reflected in its high per capita share of federal GST funding. Such funding is needed to provide services to address need. It should not be diverted into funding gas production.

While the gas industry has touted fracking as a way to make the NT independent from Canberra, the reality is that fracking revenue will remain a small part of NT revenue. In Queensland, where large amounts coal seam gas has been extracted for many years, it is still providing less than 0.5% of government revenue.\(^{16}\)

Funding offsets out of royalties would further reduce what is likely to be modest revenue, further undermining the case for the industry.

**COMMONWEALTH GOVERNMENT?**

The Commonwealth Government could fund the offsets through the Commonwealth Emissions Reduction Fund (ERF). Currently there is only $250 million remaining the ERF. Even if topped up to its initial funding of $2.55 billion, the ERF would offset NT fracking emissions for only a few years and certainly less than a decade. Substantial new ongoing annual funding would be needed.

Offsetting NT fracking emissions in this way would mean taxpayers are paying so that emissions stay where they are. This is poor policy and likely to be unpopular.

As discussed below, the Commonwealth has already refused an NT Government request to ‘match’ revenue from fracked gas.

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The NT Government has agreed with the Fracking Inquiry that fracking would be unacceptable if its emissions were not offset in full. This is now a condition of going ahead.

If the gas industry wishes to frack for gas in the NT, it should fund the measures needed to make that acceptable.

NT and Australian taxpayers should not subsidise NT fracking. That is what would happen if the NT or Commonwealth governments fund the offsets.

Industry funding could be administered by the NT or Australian government through a levy, or through an obligation to surrender ACCUs. Royalties should not be reduced to compensate, which would be equivalent to subsidising these emissions.
Political pressure raises concerns over policy talks in secret

The secrecy of talks between the NT and Commonwealth over offsets raises concerns.

The issue has seen significant political conflict and negotiation between the NT and the Commonwealth Governments. Some of it has been in public, but some in secrecy, with both governments blocking access to documents.

It is clear, however, that the Commonwealth wanted fracking in the NT, and the NT wanted more Commonwealth money, and both jurisdictions have publicly linked the two.

This raises concerns about the NT being pressured into making decisions about fracking due to Commonwealth pressure and funding.

The Commonwealth put enormous pressure on the NT Government to allow fracking, in public statements and formal correspondence. Scott Morrison as Treasurer threatened to cut the NT’s GST if the NT did not allow fracking.

The Commonwealth Government devised and then announced $260 million in a ‘GST top-up’ to the NT in a matter of days at exactly the same time that the NT announced it would overturn its fracking moratorium. Surprisingly, the Government has refused to release the letter in which Treasurer Scott Morrison committed to the funding and offered it to the NT. This all raises the suggestion that the prospect of funding may have been used in the campaign to pressure the NT into fracking.  

At the same time the NT Government also used the opportunity to issue demands. The NT News reported it as follows:

  The Territory has helped the Federal Government by re-moving its ban on fracking and now it’s time the Commonwealth returned the favour. ...

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The day he announced his fracking moratorium was no more, Chief Minister Michael Gunner wrote to Prime Minister Malcolm Turnbull with a list of demands.¹⁸

The demands included funding for remote housing, funding to implement the recommendations of the youth justice Royal Commission, and to “match its contribution to a planned regional royalties fund.”

FOI documents show the Commonwealth rejected the request to match fracking royalties.

**Figure 4: FOI document – Turnbull letter to Gunner**

While it is not the Commonwealth Government’s position to match revenue arising from state or territory royalty arrangements, I am pleased that lifting the moratorium provides other opportunities to support the development of a sustainable gas industry in the Northern Territory. On 27 April 2018, the Minister for the Environment and Energy, the Hon Josh Frydenberg MP, said, “I think it will be a benefit to Australia.”

Source: PMC (2018) FOI Documents

NT Government appears to think it has ‘done a favour’ for the Commonwealth by allowing fracking. But the Commonwealth has already indicated it won’t provide ongoing funding for fracking in the NT, and so will not fund offsets. The GST top up itself was not sufficient to cover the estimated costs of one year of fracking emissions.

The prospect of political pressure over this policy if developed in secret makes public consultation even more important.

In developing the offsets policy, the NT should make clear that the NT will not subsidise the gas companies. If the Commonwealth won’t do it – and they should not -- then the gas companies will need to pay for the offsets.

¹⁸ Sorensen (2018) *Pollies jostle over fracking - Gunner lists funding demands*  
Conclusion

Gas extraction is already the main contributor to rising emissions in the Northern Territory, and lifting the moratorium on unconventional gas will only make this worse.

Despite the enormity of the offset task that confronts NT if fracking goes ahead, the NT Government does not plan to complete its offsets policy until 2021. It has not been transparent about what discussions on offsets are underway. It has blocked access to documents under FOI and commenced secret discussions with the Commonwealth.

Increased gas production in the NT will drive up domestic emissions. If fracking is to go ahead, the NT Government must as promised implement its offsets policy well in advance of any gas activity or expenditure. It should ensure that the policy is rigorous and additional so that it does not threaten Australia’s targets. Offsets should be paid for by the gas companies, not subsidised by taxpayers, who stand to derive relatively little benefits from the gas production.

Consultation on the policy should be done in public rather than in secret conversations with the Commonwealth, which risks undue political pressure for a bad outcome.
Postscript: role of NT offsets

This submission has been critical of the use of offsets to offset fracking emissions. However the Discussion Paper also discusses developing offset policy in the NT.

Rigorous offset programs have the potential to be valuable on economic, environmental and social grounds. Such programs could offset or even reduce emissions in the NT or elsewhere in Australia. However, such programs should not be relied on to reduce the NT’s emissions.

By way of illustration, at current prices under the Emissions Reduction Fund (which funds programs in the NT and elsewhere) offsetting the NT’s current emissions would cost more than $230 million a year. The cost would be greater in future years, if gas production increases and with increasing prices for offsets, as lower cost abatement opportunities are exhausted. Offset opportunities in the NT are likely to be sold to emitting entities outside of NT, while will limit their availability for offsetting emissions in the NT.

There is a risk that offsets policy will allow low quality offsets that do not genuinely offset emissions. Moreover, if offset programs are used to offset increased emissions, rather than reduce emissions, then they could make genuine abatement more costly or difficult.

The NT should therefore consider a limit on the use of offsets for territorial emissions, say of 10%.

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19 Last round of ERF Auctions at $13.8 per tonne CO2e, total 2016 emissions of 16.5 MtCO2e.
To: Chief Minister, Northern Territory Government  
From: Tiwi Land Council / University of Melbourne Scientific Reference Committee  
Regarding: The Northern Territory Government Climate Change Discussion paper

Dear Chief Minister,

We thank you for the opportunity to make a submission in relation to the Northern Territory Government’s Climate Change Discussion paper, and we welcome your government’s initiative on this important topic. With this letter we wish to inform you of the work that the Tiwi Land Council / University of Melbourne Scientific Reference Committee has undertaken to better understanding and preparing the Tiwi Islands for Climate Change, and to invite you to collaborate with us in this endeavour.

The Tiwi Land Council / University of Melbourne Scientific Reference Committee was established on 23 February 2011 for the purposes advising the Tiwi Land Council on matters that have a scientific and/or research basis and to build research collaborations between the Tiwi and the University of Melbourne.

In recent years Traditional Owners and the Tiwi rangers have become increasingly concerned about changes in coastal areas, flood regimes, and temperature in the Tiwi Islands, which poses risks to settlements, infrastructure, carbon farming, forestry and fishing. The Tiwi Land Council have been very proactive in seeking to understand these changes so they can begin to adapt to them. They invited the National Climate Change Adaptation Research Facility (NCCARF) to run a workshop on sea-level rise with the Tiwi Islands Regional Council and other interested people, and this was conducted in April 2017.
Following on from this, the Tiwi Land Council requested a further workshop on climate change adaptation through the Scientific Reference Committee. This workshop was hosted by the Tiwi Land Council at Warrumiyanga on November 1st 2017. We have attached the minutes of the report to this submission, which Ms. Mavis Kerinaiua presented at the National Climate Adaptation Conference in Melbourne in May 2018.

For your information, The University of Melbourne has now committed to conduct two research projects to better understand climate change impacts in the Tiwi Islands.

- an assessment of coastal change using remote sensing data, other data as held by local authorities and the TLC, and possibly shoreline monitoring. This project should provide information about erosion and inundation hot spots and the risks this poses to social and ecological assets in those locations. The data will also serve as a baseline for future monitoring of coastal change in the Tiwi Islands.
- a collation and mapping of the Tiwi people’s observations of environmental change in recent times, and of their concerns about these changes. This catalogue of observations should go some way towards identifying priority areas for further research and/or adaptation action, and it too can serve as an initial baseline for future monitoring of change.

Climate change adaptation in the Tiwi Islands will require partnerships between local people, local government, and several arms of the Northern Territory and Commonwealth governments. The Tiwi Land Council has identified the lack of such a partnership as a key barrier to adaptation. We would like to build these partnerships now so that further actions can proceed efficiently and effectively. To this end we would very much welcome:

- continued engagement with the Northern Territory government on climate change issues, which we propose might occur through a staff member from your Economic and Environmental Policy unit attending the annual meeting of the Scientific Reference Committee held in Darwin.
- your support to organise a meeting of the representatives from: the Tiwi Land Council, the Tiwi Islands Regional Council, your office, relevant NT government agencies (including Power and Water Corporation, Northern Territory Police, Fire
and Emergency Services, and the Department of Health), and the Office of Township Leasing with the Department of Prime Minister and Cabinet.

It is our hope that such arrangements might serve as a template for constructive and measured engagement with other Indigenous land-owning groups across the Northern Territory.

Please do not hesitate to contact Kate Hadden or Jon Barnett (details below) for further information. We thank you for taking the time to read this submission, and we look forward to working with you to advance understanding and action on climate change in the Tiwi Islands.

Yours Sincerely

Gibson Farmer Illortaminni
Chairman of the Tiwi Land Council

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Australian Research Council Laureate Professor, The University of Melbourne

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To whom it may concern,

Response to Climate Change: Mitigation and Adaptation opportunities in the Northern Territory

Tourism Central Australia (TCA) is the Regional Tourism Organisation for Central Australia and is dedicated in leading sustainable tourism approaches. The Northern Territory has experienced a rapid growth in tourism over the past 50 years, and acknowledges that it has positively and negatively impacted on the natural environment. In accordance with TCA’s Social and Environmental Policy many office and industry practices have been adapted to assist in achieving the results as stated in the Northern Territory Climate Change Policy.

Tourism Central Australia has adopted an aggressive approach to actioning climate change. An overall Territory reduction in emissions to 26-28% by 2030, in alignment with the Paris Agreement, is achievable, yet TCA hopes this can be exceeded. A tiered target approach will assist in meeting the different targets over the next several years and will provide guidance on how TCA and the tourism industry are tracking in regards to the commitment. As infrastructure and business numbers increase it will become more critical to develop and promote tiered targets for differing industries.

Tourism industry members need to collaborate with Territory and Federal Governments to create opportunities for establishing a Carbon Management Program. The tourism industry is highly dependant on the natural features of the Territory, hence involved research on improved resource use will allow for a better understanding of how to mitigate any negative impacts. Policy development and an upgrade to infrastructure will allow for greater use of solar power; more efficient water management and increased waste management. TCA has Ecotourism Australia certification, along with Climate Action Certification and encourages all local tourism businesses to implement sustainable policies, actions and certifications. With sufficient industry development
knowledge there is the opportunity to develop niche eco-tourism experiences and products reflecting the natural attractions of the Northern Territory.

The extensive distances between tourism attractions has created a high demand on car and plane use for transportation. An investment in carbon sequestration projects and carbon off-set emission projects would be highly beneficial for the natural and built environments, as well as the health and wellbeing of the residents. Due to the heavy reliance on the transport sector in the Northern Territory, this should be a top priority.

There is abundant potential for the Northern Territory to mark itself as a leader in technology and emission reduction. Strict regulations surrounding carbon emissions from the transport industry need to be developed and maintained, and an increased awareness of resource use and availability needs to be documented. TCA, on behalf of the Central Australian tourism industry, support initiatives to improve the quality of the natural environment and take significant action against climate change.

Kind regards,

Stephen Schwer

CEO

Tourism Central Australia