Central Australian Frack Free Alliance Submission (Round 2) to the Scientific inquiry into Hydraulic Fracturing.

1. **Intro and reiteration of CAFFA calling on a complete ban on fracking.**

    - CAFFA is a group of community members who have serious concerns over the impacts of the unconventional (shale) gas industry in the Northern Territory.
    - Since presenting to the inquiry in Alice Springs in March CAFFA has continued to engage the local community and reach out to communities across Central Australia.
    - Based on deep engagement of, and conversations with the community, CAFFA's position remains strong. CAFFA is advocating for a total ban on fracking in the NT.

2. **Overview**

    In reading over the interim report, CAFFA observed that information and research regarding the Amadeus Basin was lacking. We know there will be considerable pressure to frack for more gas given the approval of the NGP. Jemena is publically stating that they expect it to run at capacity, and that Central Petroleum has been a target as a customer. As such, this presentation aims to focus somewhat on the Amadeus basin. CAFFA urges the inquiry to pursue an in depth scientific analysis of the Amadeus basin, and is also mindful of a need for greater study of surrounding basins such as the Arthur Ck Formation and the Pedrika Basin.

    This submission will first cover social impacts, highlighting gaps and areas of concern in the interim report. The submission will then touch on some environmental concerns in regards to fracking and the Amadeus basin.

3. **<u>Social Impact</u>**

    a. **Global evidence of people turning against coal/oil/gas**

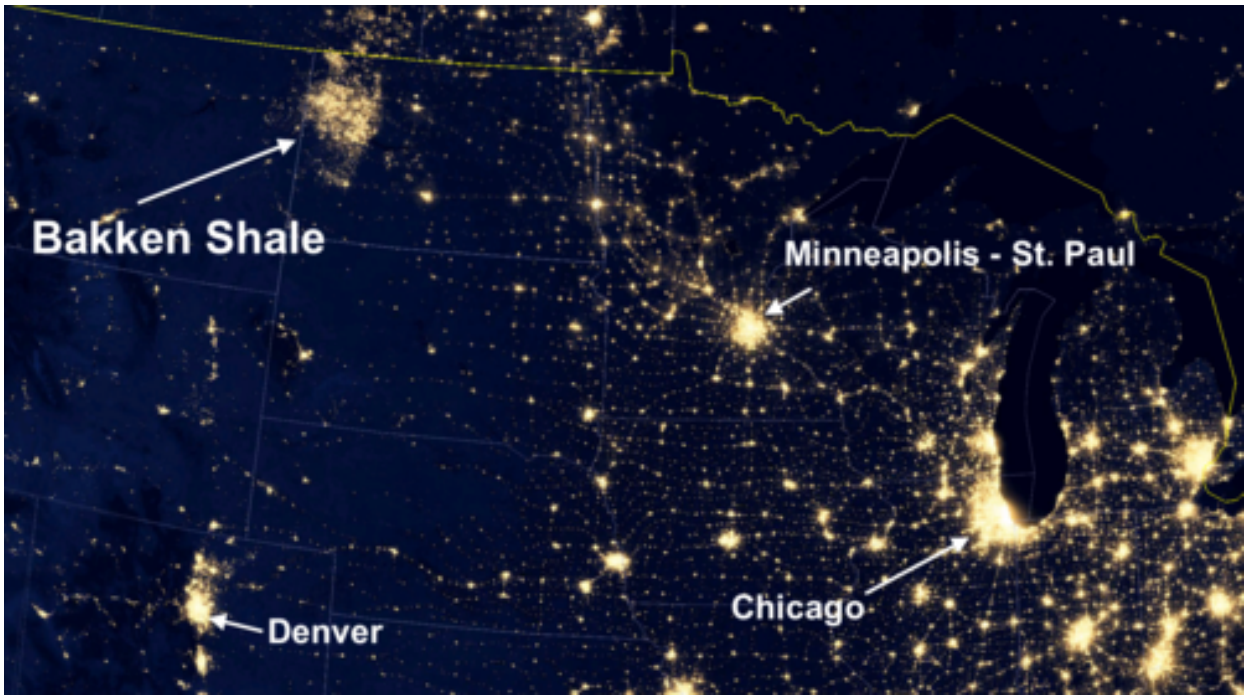
Around the world we are seeing massive opposition to the legacy industries of oil and gas. If we look to the Keystone XL Pipeline in the United States, we see that the project is in limbo despite the Trump administrations overwhelming support.

“A final Nebraska Public Service Commission hearing on Keystone last week showcased the depth of opposition to the pipeline in the state, while a local farmer has attracted attention for installing American-made solar panels on his land to protest the project.[1]”

When considering social license to operate, CAFFA would draw the panel’s attention to a very clear statement from the executive summary of the interim report,

“Overwhelmingly, the message received from the people who attended these meetings was that fracking was not safe, was not trusted, and was not wanted in the Northern Territory.”

As an Incorporated body, CAFFA is in communication with many groups across Australia and the world. These connections are maintained with the interest of sharing information and experience relating to fracking and the many risks it poses. It is through these connections that our attention was drawn to the figure below.



1 https://www.ecowatch.com/keystone-xl-solar-2467531989.html

Please note the significant patch of light (Bakken Shale) is flare from shale gas fracking, and this photo has been taken from space. The density of the gas flares is a clear indication of the impacts this industry have on the nights sky. There is reason that globally, society is standing against this. It is not “just a hole in the ground”, and there are far less imposing ways to source energy. This is shown through the image below of Tibetan Plateau in eastern China, where 4 million solar panels silently soak up the sun as part of the Longyangxia Dam Solar Park. It’s the largest solar farm in the world, spreading over 16.09 square kilometers of the high desert landscape. This solar farm could power 140,000 typical homes.

We include this not to go into great detail about the scientific capacity of solar- but to demonstrate the strong reasons that people across the globe are turning away from exploitative use of natural resources such as gas and turning on to renewable options. A movement that we strongly believe is connected to the idea of having a social license to operate.

Socially, people are motivated on this issue not by economics, but rather from concern for the natural environment and what effects this looming industry will have on the landscape that we rely. It must be understood that we find ourselves in a unique period of anthropogenic climate change, and individuals are now steering themselves towards alternative energy options above legacy industries, despite industry or government pressures.

b. Human rights means all people.

We acknowledge that the inquiry has identified that there is a diversity of communities across the NT. In identifying this, the inquiry has outsourced the social impact study to Coffey Tettratech Company.

We note that Social Impact Studies without adequate consultation cannot acceptably produce fair representation on behalf of communities. To accurately reflect the social fabricatication of the NT as a whole; all communities, regardless of size or demographic, across the Territory must be given opportunity to participate equally. This would require the panel visiting every community; ensuring appropriate consultation with consideration to time, access, and culture.

Whilst as non indigenous people, we cannot speak on behalf of the numerous aboriginal communities across the Territory, it is necessary to attempt to understand the system law and culture that underpins connection to land.

“It was their belief that by caring for country and not over exploiting the available resources, the land would in turn sustain them: the person takes care of the country and the country takes care of the person.”[2]

Noted within the interim report “Aboriginal people make up most of the resident populations in the areas of the onshore shale gas basins in the NT. Aboriginal people are linked to their land (including water bodies) by their ancient traditions and the contemporary use of their land in accordance with those traditions. As a community, Aboriginal people must be able to maintain their cultural traditions relating to that land so that their ownership rights continue to be recognised, from one generation to the next.” [3]

Looking towards other sets of values of indigenous peoples across the world we refer to the “7th generation” principle taught by Native Americans which says “that in every decision, be it personal, governmental or corporate, we must consider how it will affect our descendents seven generations into the future.”

[2] Rose, D.B. (1992). Dingo Makes us Human: Life and land in an Aboriginal Australian culture. Cambridge: University of Cambridge.
[3] https://frackinginquiry.nt.gov.au/?a=437497

First recorded anywhere from 1142 to 1500 AD, The Great Law of Iroquois Confederacy formed the political, ceremonial, and social fabric of the Five Nation Confederacy (later Six), and later was credited as being a contributing influence on the American Constitution due to Benjamin Franklin's great respect for the Iroquois system of government. [4]

The Seventh Generation Principle today is generally referred to in regards to decisions being made about our energy, water, and natural resources, and ensuring those decisions are sustainable for seven generations in the future.

What we draw from this value system is an insight into indigenous cultural values that the land is sacred and usually given by a creator or supreme being directly contradicting the world view that the land and its resources should be available for development and extraction for the benefit of humans. As we have started to witness climate change taking place, the world view is shifting towards an understanding of the importance of preserving the natural environment and setting limits so to not overexploit our available natural resources.

In relation to the Climate Change Paris Agreement it is important to note that, acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity,[5]

We note that there is a gap in the report as it does not clearly recognise the rights of **all** Territorians as an affected group of people- those living in remote communities as well as those in larger towns and cities.

Ask -> *In recognising Australia's commitment to the United Nations Framework Convention on Climate Change Paris Agreement, it is critical that we acknowledge basic human rights surrounding the threats that shale gas imposes on indigenous and non indigenous people of the Northern Territory. The report must expand to give fair representation to all.*

[4] https://www.ictinc.ca/blog/seventh-generation-principle

[5] Paris Agreement Decision of the Conference of the Parties, United Nations Framework Convention on Climate Change, *Adoption of the Paris Agreement*, 21st sess, UN Doc FCCC/CP/2015/L.9/Rev.1

Ask-> *What guarantee can this panel give that Coffey Tettratech will adequately consult all communities in the NT?*

4. Environmental Concern

a. Re-injection

i. Lack of clarity in the report as to the clear recommendation regarding the reinjection of wastewater. See below.
ii. "Santos also stated that given the low population density and lack of infrastructure in the area of its operations in the Amadeus Basin, the induction of seismic events is not considered a plausible risk to well integrity." DPIR submission. Clarity required on this statement.
iii. Interim Report p.31 "There are no known potential sites for re-injection of flowback water into conventional hydrocarbon formations in the Northern Territory outside the Amadeus basin"
iv. Interim Report p.54 "The Panel's preliminary assessment is that the practice of injecting wastewater into aquifers should not occur."
v. Interim Report p57. "Therefore until further information is obtained to determine whether or not the risks associated with this practice can be managed to acceptable levels, the practice of disposal of wastewaters by reinjection of untreated wastewaters (for example, brines) into aquifers should generally not be permitted." CAFFA seeks clarfication as to what is meant in this instance by the term "generally"?

Ask -> *There is well documented research that connects reinjection to increased seismicity. Increased seismicity has a number of negative impacts including increasing the likelihood of groundwater contamination. Given this- the report needs to be more clear and firm in its recommendation that this practice should not occur- even in areas such as the Amadeus basin where there are conventional hydrocarbon formations and already a push from companies to use this area as a reinjection site.*

b. Water Supply

i. Amadeus basin only has episodic recharge based on large rainfall events. These rainfall events are unpredictable and rare.
ii. No substantial analysis in the interim report of potential groundwater for use outside of the Alice Springs water that is covered by a water allocation plan.
iii. Whilst it is difficult to find detailed analysis of water supply available in the Amadeus basin (outside of the aquifers that Alice Springs currently draws its water from), it is clear that alternate aquifers do not contain as much water.[6]
iv. Having spoken with hydrologists who have worked specifically on the Amadeus basin CAFFA notes that it is has been acknowledged that there is a great need for baseline studies of the Amadeus Basin in its entirety prior to any judgement on the capacity for fracking. To put the water use in perspective, let us briefly examine Alice Springs water use. Pumping from the current water supply began in 1964. Since that time over 250,000 ML of water has been extracted. That is approximately 4, 700 ML per year. Conservative estimates in the interim report state that a development containing up to 1200 wells over a 25 yr period could require an average of 5000 ML per year. This is stating that if such a development were to occur in the Amadeus basin, it is equivalent to having enough water to support a second settlement the size of Alice Springs. Given the concern taken to conserve water and plan for more abundant water in Alice Springs, it is reasonable to suggest, that despite the lack of studies- There is not an unending source of groundwater in the Amadeus basin that is yet to be discovered.

c. Biodiversity and Conservation

CAFFA notes the panel is considering making a recommendation that onshore shale gas development should be excluded from all conservation reserves and sites of conservation significance[7]. In his book, Biodiversity and conservation, Jefferies notes the following, “Effective use of protected areas now recognises the importance of ecological processes and change. Reserves should not be set up which are too small, fragmented or isolated, so that their ecology is not sustainable. Reserves must account for evolutionary processes and genetic

[6] Tickell, S., (2008), Explanatory notes to the Groundwater Map of the Northern Territory. Northern Territory Government Department of Natural Resources the Environment The Arts and Sport, Technical Report No. 12/2008D
[7] P.66 https://frackinginquiry.nt.gov.au/?a=437497

variety.[8]" There is a risk with the current proposed recommendation from the Inquiry in that it could result in numerous small reserves/sites of significance. While conservation reserves and sites of significance should be excluded from gas development- baseline studies are needed to ensure these are large areas that take all biodiversity into account. An example of this are the water holes, Palm Valley, Finke Gorge, and Boggy hole, all of which could be affected by gas mining in the Amadeus basin, but would not be protected if it were simply a reserve around the specific sites.

Ask -> *That there be a comprehensive analysis into the Amadeus basin water supply and aquifers, prior even to case by case analysis of each potential site.*

d. Water contamination through leaky wells and waste

i. Not only does fracking expose the Amadeus basin Aquifer to waste as a product of the fracking (Fracking chemicals)- there are potential other chemical contaminants. This is of particular concern given the panel's trust in modern wells - "The Panel's preliminary view is that the likelihood of this occurring is low provided that leading practice is adopted. It is standard practice for a well to be lined with multiple layers of piping (casing), with a specialised cement layer between each of the pipes and also between the outer pipe and the rock strata. Analysis of the literature shows the frequency of well failures has decreased markedly with modern methods of design and construction being used" Where is the long term evidence to back this up? What proof is there that the outlined improvements will last the test of time and not leak into the future? This is of particular importance in areas such as the Amadeus basin where it is not only fracking chemicals that are causing risk to the aquifer.

ii. CAFFA would like to draw the Inquiries attention to 2 other types of contaminants that could enter the water table through fracking-

iii. In 2016 the govt pushed to have nuclear waste dumped South of Alice Springs[9]

[8] Jeffries, Michael. "Biodiversity and Conservation" Routledge. 1997.

[9] http://www.abc.net.au/news/2015-12-16/alice-springs-nuke-dump-not-welcomed-at-public-meeting/7035070.

iv. More recently a proposal for a salt mine that would double as a waste burial facility near the community of Titjikala, which sits on the Eastern edge of the Amadeus basin[10].

e. Alternative Power Options

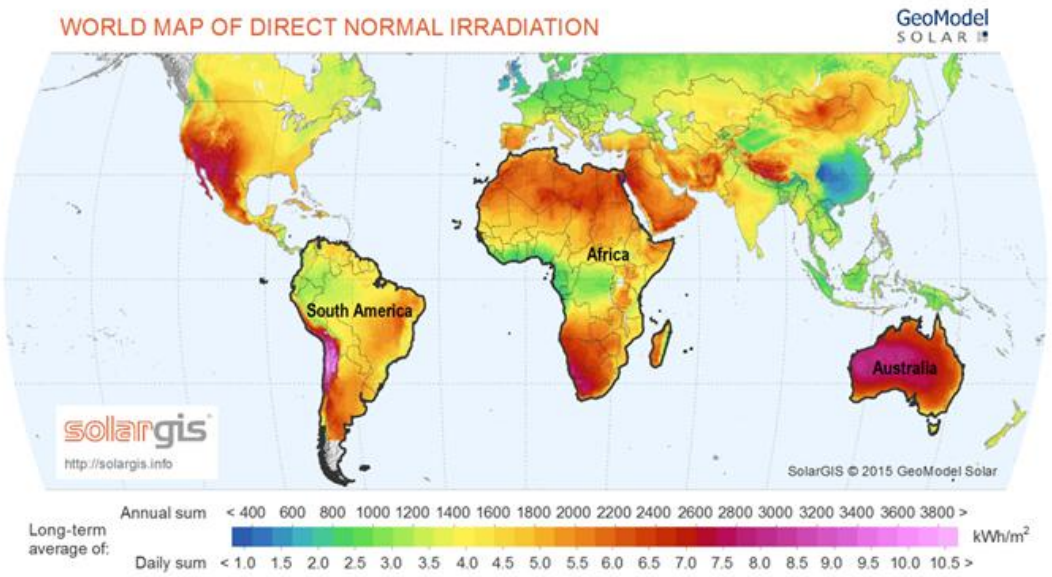
Having listed just a few environmental concerns relating to Fracking occurring in the Amadeus Basin, it is also worth noting the great potential that exists in alternative means of energy in this region.

The panel has noted in the interim report, that there is significant concern regarding Australia's ability to meet the goals set out by the Paris accord. While we have no disagreement in the panel's finding that gas extraction may result in less emissions than coal (quoted as less than half), why is this the major comparison that is made?

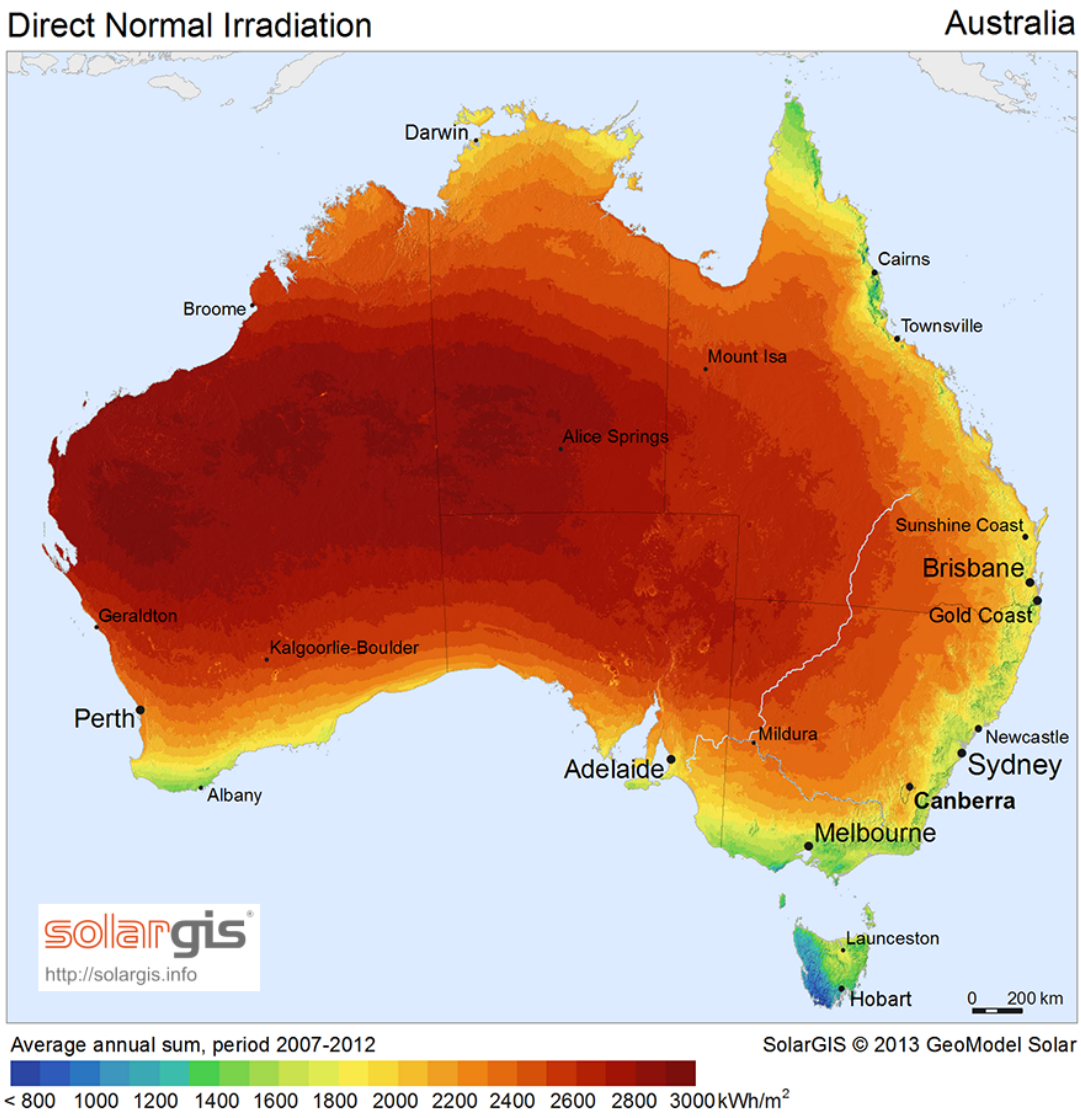
The Territory is identified as having abundant gas reserves, let us compare this to the resource of Direct Normal Irradiation from the Sun. Cedric Philibert is a renewable energy analyst at the International Energy Agency, an organisation providing statistics, analysis and policy advocacy to its 29 member countries. Through his research Australia has been identified as " by far the continent with the highest DNI resource[11]"

[10] http://www.abc.net.au/news/rural/2016-02-29/alice-springs-salt-mine-progresses-on-back-of-supply-agreement/7207646

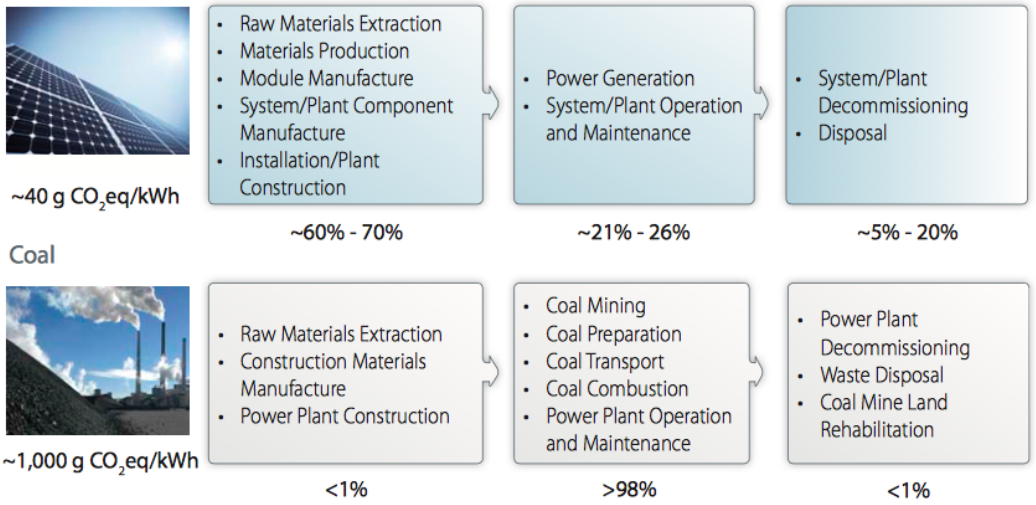
[11] http://www.abc.net.au/news/factcheck/2015-08-10/solar-coverage-fact-check-is-australia-sunniest-continent/6659316



This is particularly true of the Northern Territory and even more specifically, Central Australia and the Amadeus basin (refer to figure below).



You will see in the figure below, research that shows GHG emissions for PV to be 4% of that emitted by coal.



Source: *Burkhardt et al. (2012) and Whitaker et al. (2012) Photos from iStock/19291390 and iStock/1627655, Top (left to right): Photo from iStock/13737597, NREL/PIX 18553, iStock/12123595, NREL/PIX 16933, NREL/PIX 18968, NREL/PIX 19163*

LCA of Energy Systems

LCA can help determine environmental burdens from "cradle to grave" and facilitate comparisons of energy technologies. Comparing life cycle stages and proportions of GHG emissions from each stage for PV and coal shows that, for coal-fired power plants, fuel combustion during operation emits the vast majority of GHGs. For PV power plants, the majority of GHG emissions are upstream of operation in materials and module manufacturing.

Ask-> *As well as comparing Conventional or Unconventional Gas sources to coal, the report needs to be expanded to include Life Cycle Stages of renewables as the NT highest potential of Direct Normal Irradiation to be captured in the form of Solar PV.*