




Impact of Renewable Energy Literacy on Caring for Country and Wellbeing: Pilot Study conducted with Gawler Ranges Aboriginal Corporation (GRAC)

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Article Information	Abstract
<p>https://doi.org/10.69798/10149982</p> <p>ISSN (Online): 3066-3660 Copyright ©: 2026 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International (CC-BY-4.0) License, which permits the user to copy, distribute, and transmit the work provided that the original authors and source are credited.</p> <p>Published by: Koozakar LLC. Atlanta GA 30350, United States. Note: The views expressed in this article are exclusively those of the authors and do not necessarily reflect the positions of their affiliated organizations, the publisher, the editors, or the reviewers. Any products discussed or claims made by their manufacturers are not guaranteed or endorsed by the publisher.</p> <p>Edited by: Oluseye Oludoye PhD </p>	<p>In Nyunga (Aboriginal) culture, the health of Country is inextricably linked to the health and wellbeing of its people. In South Australia (SA), energy literacy has been highlighted as a major concern for Aboriginal native title holders asked by SA Government to support the development of the Hydrogen and Renewal Energy (HRE) industry. They feel they do not have enough knowledge of the HRE industry to provide Free, Prior, Informed Consent (FPIC) to developments which may impact the health of Country and in turn their community's wellbeing. In response, a qualitative pilot study was undertaken in 2024 with the Gawler Ranges Aboriginal Corporation (GRAC), a Native Title Prescribed Body Corporate (NTPBC). The data collection involved a cultural immersion field trip where interviews were conducted on Country. The research team employed the traditional Aboriginal ngapartji-ngapartji relational methodology to establish respectful, reciprocal relationships between the non-Aboriginal member and interviewees. In total 10 (n) GRAC members were interviewed; 9 (n) were voice recorded and transcribed. A manual thematic analysis and close reading of the transcripts followed. Results indicated a gap in the Nyunga Directors knowledge about the HRE industry which impacted their overall wellbeing.</p> <p>Keywords: Wellbeing, Energy Literacy, Aboriginal Engagement, Environment, Indigenous Research Methods, Renewable Energy</p>

INTRODUCTION

Geography, which means the Gawler Ranges region, define who I am as a Nyunga, in particular the water sources, like rock-holes and water soaks, found in the natural environment of the region. Waterholes are the source of my cultural identity, the essence of my spirituality and foundations of my belief system, if those waterbodies become contaminated or damaged so does my spiritual and cultural being as a Nyunga (Reid, 2023).

For millennia, many Indigenous communities have developed bodies of knowledge about nature through direct experience, creating systems of belief that interpret their biophysical environment (Mazzocchi, 2006; Pasqualetti, Jones, Necefer, Scott, & Colombi, 2016). As Bagele Chilisa highlights, these relational ontologies reflect people's "connections with the living and the non-living, with land, with the earth, with animals, and with other beings. There is an emphasis on the I/We relationship as opposed to the Western I/You relationship with its emphasis on the individual" (2012 p. 21). Self-determined engagement with and management of their environment/land is linked to improved health and wellbeing for these communities (Lambert, 2018 p. 99).

In Nyunga (Aboriginal) culture, the health of Country is inextricably linked to the health and wellbeing, physical and spiritual, of people (Andrews, Stanley, & Eades, 2024; Brady *et al.*, 2024; Fatima *et al.*, 2023; Lester, 1995; Sangha, Dinku, Costanza, & Poelina, 2024; Sangha, Le Brocque, Costanza, & Cadet-James, 2015a, 2015b; Yashadhana, Fields, *et al.*, 2023; Yashadhana, Zwi, *et al.*, 2023). Caring for Country is considered a ngapartji-ngapartji relationship or reciprocal relationship (Andrews *et al.*, 2024; Fatima *et al.*, 2023; Reid, 2023; Sangha *et al.*, 2024). Aboriginal People understand that the land and waters gift to humans a cultural values framework. Nature teaches them about how to think and behave in an ethical and moral way to protect and nurture the environment in which they live. They believe that if they care for the land then the land will reciprocate and provide them with all the necessities of life and that it is their custodial responsibility as tjumu.

For Nyunga people of the Gawler Ranges Country, water bodies, specifically those that exist in this geographical, ecological environment, are the foundation of Aboriginal wellbeing. In arid and desert environments, water is a sacred resource that must be shared and kept clean for the ecosystem to survive, an ecosystem that people are a part of (Reid, 2023 p. 185). The Gawler Ranges, otherwise known by many families and clan groups as Wilyaru Nyunga which means the ancestral homelands of the yellow-footed wallaby, is a cultural and ecological community who are dependent on having healthy waterholes to exist. It is the responsibility of Nyunga families to care take and manage the water holes.

In precolonial times the waterhole was the centre of ceremonial activity, birthing, and a place where trade and commerce occurred, and therefore the core of social, economic and political discourse and knowledge development (Reid, 2023 p. 91). The implication being that if the waterhole was healthy then people's physical, mental and spiritual wellbeing was healthy. This reciprocal relationship is reflected in the waterhole story as told by Tjapaltjarri, senior Warlpiri man:

Long before Yapa (Aboriginal People) lived in this place the animals had to learn to share the water resources that are found in this region because every creature needs water to survive. The animals used ngapartji-ngapartji to make sure that not everyone went down to the waterhole together and drink too much water all at once. They never all come down as a herd all at once or gorge themselves on the water; they take what they need then leave. They respect each other; they have a relationship built on trust and ngapartji-ngapartji (reciprocity). We Yapa we sit down and watch the waterhole and we learn from them animals how to treat each other (Reid, 2023 p. 145-146).

This excerpt demonstrates how the behaviour of the animals teaches Nyunga families of the importance of respectful relationships with the animals and environment.

Nyungas associate ill health and negative wellbeing with the poisoned waterhole which has occurred in the Gawler Ranges since the 1860s largely due to pastoralism, notably the sheep industry and the

impact of feral goats (Hedges *et al.*, 2025; Kneebone, 2010).

As a consequence of colonisation, the waterhole has become poisoned and devoid of its innate cultural and spiritual value, as captured in Tjapaltjarri's Waterhole story:

The only animals that don't respect the way we use water in the desert are cattle, sheep, donkeys and camels, and they don't come from this country in the first place; kardiya mob [non-Aboriginal people] come with these animals. You see them they all rush down to the waterhole and trample everything in their path - they shit and piss in the water and pollute it for everyone else. Them animals got no respect - they only care for themselves not anyone else. (Reid, 2023 p. 146)

In the Gawler Ranges, contamination has made the waterholes unusable for ceremony and affected ecosystems and biodiversity, impacting mammals, birds, plants and invertebrates (Gawler Ranges National Park Advisory Committee, 2017; Hedges *et al.*, 2025; Kneebone, 2010; Smith *et al.*, 2023). Species, such as the malleefowl, grasswren, yellow-footed wallaby, the rare Night Parrot, and native butterfly species of the Gawler Ranges are currently threatened (Gawler Ranges National Park Advisory Committee, 2017; Hedges *et al.*, 2025; Kneebone, 2010; Smith *et al.*, 2023). This has had an impact on Aboriginal People's wellbeing. For instance, butterflies are the essence of Nyunga's cultural identity, as they are the totem of some families, and pollinators of native plants. If the plants are not pollinated, the plants die, and Aboriginal People's source of medicinal plants and food becomes diminished.

Currently, there is significant interest from renewable energy industries in the ancestral lands of the Nyunga people of the Gawler Ranges due to there being optimal sites for wind and solar project development: they are the only place in SA where wind and solar co-exist at optimal levels (South Australia Department of Energy and Mining, 2024 p. 7). As the Native Title body for the area, the Board of Directors (BoD) of the of Gawler Ranges Aboriginal Corporation (GRAC) are responsible for engaging in the decision making process for land release licencing purposes, as outlined in the Gawler Ranges East proposed release areas information pack: "HRE Act requires

collaboration between Native Title Groups, DEM, landowners and other relevant parties to identify areas on Crown land such as pastoral leases that may be suitable for the development of large-scale renewable energy projects" (South Australia Department of Energy and Mining, 2024 p. 5). However, there are significant cultural heritage and environmental considerations to make – a stressful process that can impact people's wellbeing.

The Pilot Study

The pilot study was initiated following concerns raised by the BoD of GRAC about the decision-making process to release land in the Gawler Ranges region for use by the renewable energy industry. For this to occur they felt they required more understanding of Free Prior Informed Consent (FPIC) and its relevance to how industry developments could impact their native title rights and interest. Despite the fact that GRAC Directors had participated in (7n) information sharing meetings conducted by the Department of Energy and Mining (DEM) (South Australia Government Department of Energy and Mining, 2024) between March 2023 and March 2024, there was still a heightened sense of uneasiness amongst the group, mostly because the language used was too technical.

These feelings of uncertainty are not unique to GRAC. Previously, the DEM held three South Australian Aboriginal Renewable Energy Forums (SAAREFs) (South Australia Government, 2023b) to gain input from Native Title bodies and other community groups about the proposed development of the HRE Act 2023. A consistent theme emerged of Aboriginal people having limited understanding of the green energy transition and their role in it as Traditional Owners (TO), as reflected in this statement from one of the members at the 2nd forum: "Capacity and capability building for Aboriginal people is key to their participation" (South Australia Government, 2023b p. 12).

At these forums, GRAC Directors explained that Aboriginal People's relationships with their ancestral lands, the waterbodies, ecosystems and biodiversity that exists within these environments mean that decisions must be made through a communal decision-making process. The process of cultural and environmental preservation within

Indigenous human rights discourses and other state based legislative frameworks requires deep reflective thinking that takes time and collaboration:

“Partner with Aboriginal people to ensure the regulatory framework delivers net economic, environmental, and social benefits to Aboriginal communities and minimises cultural, spiritual and heritage impacts” (South Australia Government, 2023b p. 7).

To address the concerns raised in these forums, the need for funding and resourcing was highlighted. Many of the Native Title Prescribed Body Corporates (NTPBC) did not have access to the required funds and resources to build the capacity of traditional owners in these legalised fields (South Australia Government, 2023b p. 2). To provide FPIC without the requisite skills and knowledge could impact Aboriginal peoples’ wellbeing. The “Energy Literacy as an Indicator of Wellbeing” pilot study was proposed to the Directors by the Adelaide University (*formerly University of South Australia - UniSA*) research team as a way of building an evidence base that would substantiate and validate the cause of their concerns and justify the need to build capacity. The pilot project sought to explore how renewable energy industry developments in the Gawler Ranges impacts Nyunga wellbeing, in this case, for those tasked with the decision-making and what capacity and capability building looks like for directors.

MATERIALS AND METHODS

Nyunga research methods

The research team was conscious of using culturally respectful research methods based on Aboriginal knowledges to gain meaningful insights into the impacts on wellbeing that RE literacy has in the decision-making process. This qualitative study used a postcolonial indigenous research approach – a relational framework based on the “waterhole” concept developed through Dr John Binda Reid’s collaborative study about Aboriginal male migration patterns conducted with 11 remote communities in the Central Australian region.

The ngapartji-ngapartji relational framework methodology used in this study was derived from the traditional knowledge systems shared by the men and learnt through their intimate relationship

with the environment (Reid, 2023). The methodology encapsulates the concept of ngapartji-ngapartji – or the ‘3R’s’, respectful, reciprocal relationships – which are core traditional values embodied by native animals and Aboriginal people when they respectfully share the waterhole, as articulated by Tjapaltjarri in the waterhole story. This is a culturally safe way of initiating and maintaining respectful, reciprocal relationships (3Rs) (Reid, 2023 p. 98-99) between Aboriginal and non-Aboriginal people which can occur in the workplace, social space or in the research context, such as the waterhole. Figure 1 reflects the central and sacred role of the “waterhole as the spiritual place of knowledge production and transfer” and ceremony (Reid, 2023 p. 91).

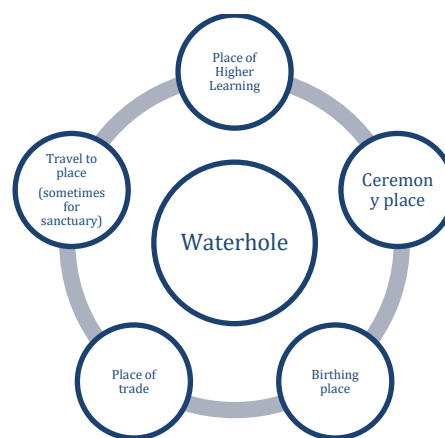


Figure 1: The Waterhole Concept

This project management approach underpins the UniSA Aboriginal Research Strategy and other Indigenous research institutes ethics policy frameworks such as the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Code of Ethics (AIATSIS, 2020).

As a GRAC Director himself, Reid understood that decision-making is communal and directors are accountable not only to the wider Gawler Ranges community but their ancestors and Country. Given GRAC members had cited feeling stressed and angry about being pushed to make decisions about developmental work in the Gawler Ranges, this approach was particularly important to mitigate causing distress to participants if asked to give responses to sensitive questions. For instance, painful memories evoked by sharing stories of the devastation colonial practices have had on their

ancestral lands and waterways. Additionally, Aboriginal people have been under constant scrutiny and investigation by a myriad of colonial institutions, universities included (Andrews *et al.*, 2024; Reid, 2023). Among the most over-researched groups in the world, Aboriginal people have often been left out of the process, resulting in “*fame for white researchers*” (Andrews *et al.*, 2024 p. 160). Due to a deficits approach, negative stereotypes have also been reinforced (Andrews *et al.*, 2024). A result of overexposure and oversurveillance, has created distrust, anger and apathy. Reid cites the development of “*coping and desensitising strategies, such as providing what might be seen as the appropriate answers to survey questions, rather than answers which reflect prevailing conditions*” (Reid, 2023 p. 108). Therefore, trust and respectful, reciprocal relationships were a priority.

LITERATURE REVIEW

A database search that focussed on Aboriginal engagement (Cairney *et al.*, 2017; Duke *et al.*, 2021; Fatima *et al.*, 2023; Moggridge, Betteridge, & Thompson, 2019; Yashadhana *et al.*, 2023); wellbeing and cultural values (Bainbridge *et al.*, 2015; Brown *et al.*, 2016; Cairney *et al.*, 2017; Pasqualetti *et al.*, 2016; Taylor, 2018; Taylor & Guerin, 2019); renewable energy (Chandrashekeran, 2021; Hunt, Riley, O’Neill, & Maynard, 2021; Maynard, 2022; O’Neill *et al.*, 2021; O’Neill, Beck, Cheng, & Nolan, 2022; Pasqualetti *et al.*, 2016; Stefanelli *et al.*, 2019; Warner, 2021); energy literacy (Brounen, Kok, & Quigley, 2013; Martins, Madaleno, & Dias, 2020; Moore, Turcotte, & Winter, 2014; NERA, 2019; Opoku & Adom, 2023; Sun, Wu, & Zhang, 2023); and FPIC (O’Neill *et al.*, 2021; Savic & Hoicka, 2023) was undertaken. A consultation of grey literature was also included in the literature review, such as government reports and the proceedings from the DEM SAAREF forums and workshops (Australian Government, 2022; First Nations Clean Energy Network, 2022; NERA, 2019; Sangha *et al.*, 2015b; South Australia Government, 2023a, 2023b).

This process identified gaps in knowledge about the energy literacy competency of Indigenous Australians and their understanding of human rights discourse such as the United Nations

Declaration on the Rights of Indigenous Peoples (UNDRIP) of which FPIC (Assembly 2007) is an important element. It confirmed the need for more research to be done in this area by Aboriginal people about Aboriginal engagement and empowerment in the green energy transition and the impact on wellbeing. This was underscored by the comments participants made about the need for protection and management of cultural heritage and the environment.

Early Engagement and Trusting Relationships

Reid’s dual role as the lead of the project and member of GRAC was integral as he provided the relational connection and knowledge of both ways of thinking, reflecting a postcolonial indigenous approach that respects relational ways of knowing and living (Chilisa, 2012; Manuel-Navarrete *et al.*, 2025). A local academic was engaged to support Reid so that the team was made up of members who lived and worked on the Eyre Peninsula region where the Aboriginal participants lived. Dr Michelle Jäger’s background is not in Allied Health (her PhD was in Creative Writing, and she teaches into the Pathway Programs at the university), but due to the regional location there are limited options as skilled workers are in high demand. Reid also wanted to source local staff to invest the skills and knowledge shared by himself and the GRAC members in the regions.

All participants were familiar with the cultural metaphor of the waterhole being the university of the bush and the concept of ngapartji-ngapartji. The non-Aboriginal member of the team, Jäger, had attended a workshop run by Reid with staff members at the Whyalla campus of UniSA. The GRAC BoD had also participated in knowledge translation workshops conducted by Reid. For the purposes of the study, the approach involved building relationships and respectful listening and recording of stories from Traditional Owners about Country on Country using their own traditional methods of knowledge production and transfer, which is storytelling or yarning (Chilisa, 2012; Geia, Barbara, & Usher, 2013).

Prior to the fieldtrip, Jäger attended a GRAC Board meeting in July 2024 held on the Whyalla UniSA campus, sharing her personal and professional story with the Nyunga Directors, attempting to establish connection and familiarity with the group she

would interview (Geia *et al.*, 2013). She also attended one in December 2025, sharing what she had learnt from the GRAC BoDs and from using an Aboriginal research methodology.

Fieldtrip

A field trip was organised between the UniSA researchers and the Nyunga Elders of the GRAC BoD to travel to the sacred waterhole of Paney in the Gawler Ranges to conduct the data collection. Given the time constraints of the Pilot Project, it was hypothesised that the trip out to Country would create a more relaxed atmosphere and allow for greater connection between the non-Aboriginal researcher and the interviewees. An association of collaborators from a carbon farming company (Ai Carbon); a renewable energy company (CIP); and an Indigenous energy advocacy company (IEA), who are assisting GRAC to develop policy and guidelines to be used by the DEM to regulate land release licences, attended and were inclusive of the research story.

The fieldwork group comprised of the following:

- 2 UniSA researchers (1 Aboriginal male and member of GRAC; 1 non-Aboriginal female)
- 9 Aboriginal BoD of the GRAC, excluding Reid (one was an outgoing BoD) (4 male and 5 female)
- 4 people from Ai Carbon
- 3 from IEA
- 1 representative from CIP (community liaison officer).

Data Collection: Interviews

The researchers co-designed the verbal scripts and conducted the interviews, recording them on Country in the spiritual and cultural lands of the GRAC members, the Gawler Ranges. All participants were given copies of the interview questions in advance. The scripts contained five overarching questions with additional prompts. The consent forms and verbal scripts were phrased in accessible, culturally appropriate language; for example, question 3:

How do you feel in your heart and your head as a Traditional Owner (TO) when you negotiate agreements between your mob and big companies? Does it make you feel good - bad- or excited?

Whilst these questions guided the interview, a culturally appropriate “yarning up” style was encouraged, which is more relaxed and unstructured, promoting self-expression: “a journey both the researcher and participant share” (Geia *et al.*, 2013 p. 15). Interviewees were consulted on how they wished the process to be conducted: they could be interviewed by either researcher, in a group or individually, and in a location that suited them (due to the heat, some chose to be interviewed in their cabin). Those who were more comfortable being interviewed by Reid, who they knew, could be so. Those who felt this relationship might restrict what they said, had the choice of Jäger. By offering a choice of interview format and interviewee, existing relationships and collective knowledge construction were honoured (Chilisa, 2012 p. 206).

9 (n) interviews were conducted onsite during the trip. 1 (n) was conducted via phone post-fieldtrip. Due to technical difficulties during recording, the participant’s availability, and the time restriction, this data is not included. Of the 9 (n) participants, 5 (n) were female and 4 (n) were male. There was a mixture of age ranges, from a recent school leaver to Elders. 5 (n) were interviewed by Reid, including the one by phone; 5 (n) by Jäger. All current BoDs were interviewed, excluding Reid.

The field trip took place over three days in October 2024, with the group staying at Paney Homestead. Interviews were carried out between RE negotiations, presentations, and trips to significant sites. This included a trip out to Paney Waterhole, where Reid set the tone by reiterating the significance of the waterhole and ngapartji-ngapartji. The group visited Old Paney Homestead where the story was relayed of how a young Aboriginal boy was “accidentally” shot by the wife of the pastoralist. This incident, alongside a presentation given by a ranger on the preservation of the near-extinct red-tailed phascogale, highlighted the detrimental impact that Western/colonial thinking and practices have on the Gawler Ranges Country and health of its people. The sharing of cultural, historical, and personal stories alongside information sharing about renewable energy and land management between John, the GRAC directors and non-Aboriginal members created a friendly, more balanced atmosphere. Additionally, although Jäger’s skill set

and knowledge of qualitative research methods, allied health and the renewable energy industry were limited, this helped mitigate what Chilisa (2012) refers to as the “asymmetrical relationships between the interviewer and interviewee” (203).

Data Analysis

The Otter ai app interpreted and transcribed the recordings verbatim. Jäger checked the audio of the interviews, cleaning up the transcripts. For instance, Otter ai did not recognise the names of cultural mobs, such as Kokatha or Barngarla. Transcripts were deidentified. Reid re-checked the transcripts to ensure cultural accuracy.

Otter ai also identified key words and summarised the conversation. Below is an example of the key words identified from one interview:

Key words identified from BoD 5 transcript: Adelaide, renewable energy, hydrogen industry, media knowledge, community benefit, ancestral lands, informed consent, Native Title, United Nations Declaration, energy literacy, solar power, wind turbines, hydrogen knowledge, research importance.

Each researcher manually compared the Otter ai generated key words and summaries across the transcripts to identify the most frequent themes and phrases. The researchers then manually compared and grouped these into overarching themes. As there were only 10 interviews, a thematic analysis was conducted by each researcher using colour-coding to validate the ai generated output and ensure a thorough analysis. The researchers met to discuss their findings and refine the themes, resulting in an extra theme which was evident but not captured by Otter ai.

RESULTS

Five key themes were identified from the analysis: Renewable Energy; Free Prior, Informed Consent (FPIC); Energy Literacy; Wellbeing; and Education and Research. Wellbeing was not a key word identified by Otter ai. However, the researchers agreed upon it as one of the overarching themes following their analysis of the transcripts and the frequency of negative emotions and feelings linked to past, present and future

negotiations and decision-making about development on Country.

Interpretation of these themes revealed a clear pattern of deficits in people’s knowledge about the renewable energy industry and anxiety about the impacts on Country, validating the questions and concerns raised in the SAAREF reports and the literature review. A summary of each theme and examples in the voices of the GRAC BoDs’ follows.

Summary of Results

Renewable Energy

A lack of knowledge about the renewable energy industry and technology was cited by all BoDs:

Not much, John, I mean, I know with the solar it’s supposed to either make electricity, make energy to power the lights, equipment. Yeah, that’s about all I know, is just, it’s to produce energy. (GRAC BoD 8)

Yeah, I’ve heard the same, about the hydrogen bomb. I think everyone’s heard about that. Yeah, with the hydrogen energy, I do know that countries overseas are using hydrogen and they also power cars and busses as well. Yes, we cannot burn coal forever. The climate change is upon us, and it’s upon us now, but as to the technology, I’ve got absolutely no idea (GRAC BoD 1).

I suppose we learned about it in school. For a little bit, and then I mean, I’ve been out of school since 2007, so nothing since then besides what’s been coming up in the last few years. (GRAC BoD 5).

Free, Prior, Informed, Consent

Interviewees cited limited or no knowledge about the concept of FPIC:

Like, uh, inform the other people...Talk about it...before we can say anything about what they want to do (GRAC BoD 7).

Heard it a fair bit. But, I don’t know more, like, trying to think (GRAC BoD 4).

However, all, even those who had not heard of it, had some understanding of what it might mean, and indicated that being informed was important for

making decisions which would impact the community and Country:

I guess it's having all that knowledge, having as much information as you can before actually making decisions again, and consenting to, you know, your decision, how it's gonna affect Native Title (GRAC BoD 5).

Participants expressed concerns that as BoD's they did not feel adequately informed but would like to be given their responsibilities:

I'm not fully informed. I'm, I'm – really to make, I can make, you know, I can make those decisions as a group, but to be more informed would be greatly more beneficial for me to make those decisions (GRAC BoD 8).

Frustrated? I think only because it's our land and we're giving consent to people that we don't know fully what they're doing. So, sort of like frustrates, like we want to know everything for what they're doing, so then we can fully give them our consent to do stuff on our land (GRAC BoD 9).

Energy Literacy

While some participants were unsure about the concept of energy literacy, once it was explained, all participants agreed that there was a strong need to improve competency in this area, not only for the GRAC BoD, but the wider community. This included knowledge of technological developments on Country, and the day to day understanding of energy bills and consumption:

Energy, sort of like power or something like that?... Literacy just brings words to my head. That's all. I guess if...training... Government, can do, like, training, like, courses for the Aboriginal people, so we can – GRAC, Gawler Ranges Aboriginal Corporation could help us get a better understanding (GRAC BoD 9).

I think it's a great idea, obviously, even for myself, but more so for, you know, the rest of the community, whether you've got the young ones, the elders, it's just getting that knowledge out there in a way that they can understand (GRAC BoD 5).

Current barriers to developing energy literacy were discussed by participants, such as technical jargon and a lack of cultural understanding:

...They leave you like, you know, you've got to interpret it, try and interpret that word, or interpret those words that they're throwing, especially when they want you to make a quick, bang, bang, bang, quick, quick decisions, when you haven't got the full knowledge to you know, to know what you're talking about, to what they're talking about, understanding. (GRAC BoD 8)

We'd have to actually know a bit about it and explain to the black fellas, especially the illiterate fellas and all that, to them properly. How, you know, simplify. Probably, you know, that's how we've got to do it...And pictures too, because that's how our ancestors did it (GRAC BoD 2).

Wellbeing

Impact on wellbeing tied to decisions they were required to make on behalf of the GRAC community as BoDs was discussed by all interviewees. Negative emotions and feelings were expressed by all but one. Interviewees referred to emotions such as sadness or anger, and feeling upset or frustrated about making the wrong decision and the potential impacts on Country, Cultural Heritage and future generations, as well as the previous destruction of Country and erosion of Culture because of developments (particularly mining) and colonisation:

Um, I feel unsure, like if I'm making the right decisions, in that regard, in like, am I making the right decisions for, for, for the Gawler Ranges' people. You know, because, you know, you know, they say, oh, it's not gonna hurt the animal, you know. How do we know that, like the vibrations or from the solar wind farms...Makes me feel bit sad because, you know... I don't want to make the wrong decision, and it just makes me sort of feel a bit down on myself (GRAC BoD 8).

There's a lot of gaps... it's really the unknown, because we're signing off on documents, but are our future generations, 50, 100 years' time, going to pay the price? (GRAC BoD 1)

I feel a bit, bit out of place, I think... Well, seeing all that Country all the time... Then giving it away

and going out there, and seeing it not there, yeah, and not to mention the other people's feelings that I might have hurt...Not to mention all the people who's been there, slept there, camped there, ancestors, cooked there (GRAC BoD 7).

Aboriginal people who don't belong to that land, giving our country away, without the consent of the proper owners of the land... And that really makes me angry... And the mining company knows all of this, and they play each other, play us against each other (GRAC BoD 3).

However, several interviewees attributed good feelings to being properly informed and educated by the companies the board were dealing with, as well as supported by fellow Board members, their legal team, and community:

Definitely a good feeling ... we've got a great board and the legal team behind us that, you know, they can also explain things if we're not entirely clear from our dealings with these companies before we make these decisions (GRAC BoD 5).

That's why I'm glad I'm with GRAC, this group where we've seen that firsthand and been through that firsthand. So now we want to make this group like, how John is doing this, making us like, trying to make us understand better. So, we can make good decisions for our mob (GRAC BoD 4).

Education and Research

All interviewees thought that further research and education into and about renewable energy and the industry was important to understand what was happening on Country and the long-term effects and potential benefits:

Definitely think there needs to be a lot more research to help us Aboriginal people get a better understanding. I personally haven't really, I don't really know anything about it, and I would love to know more about it and, and I think that everyone knowing more about it just helps, um, knowing more about what we're doing out on our, what people are doing on our land, like different companies and all that (GRAC BoD 9).

What does it [renewable energy industry] do? Does it bring jobs? Does it bring jobs out there? (GRAC BoD 7).

Obviously, give you a great idea of, you know, numbers of how many people actually know about the hydrogen and renewable energy. And being able to, I guess, you get the research done and be able to present it to community in a way that suits them, and so that they can have that knowledge for themselves as well. (GRAC BoD 5)

Who was responsible was another issue discussed. Suggestions included the government, companies, the younger generation, GRAC, Aboriginal researchers, self-education, and neutral bodies like IEA:

Of the research? The younger generation hopefully ... come up and get into those fields of things where they can come in and teach our people the benefits of having a renewable energy or the not benefits of, you know, saying, well, you know, that's not going to be good here, you know? (GRAC BoD 8)

Ourselves. But also, like, the corporate, like the companies we work with. I know they've got a lot of, like, community, like, a lot of information, but it'd be good if they could hand it out. (GRAC BoD 4)

From some other company, or someone that's totally neutral. That can benefit every Australian. Yeah, to read and understand. But the animated one should be produced for Indigenous Native Title holders, so that we can look at and we can understand it fully. (GRAC BoD 1)

How and where were also topics of consideration, with a variety of methods and options suggested: Not in a classroom. Talk with these big words. Get us out on country, speak plain English. Get us to do things with you (GRAC BoD 3).

Well, first of all, you'd have to go to the classroom, I reckon. Yeah. Well, they got a big board and ... Take us out on the field... On the job (GRAC BoD 7).

I think one of the ways that would be, like, a simpler way of doing is, like, have an animated thing? Because that's how they show how it's done, how things are made, you know, start from scratch, you know. How it's made, you know, rather than just having, just having a conversation, yeah, because

it just goes straight over the top of their heads. (GRAC BoD 1).

Participants highlighted the importance of those wanting to develop on Country understanding the significance of Culture and the reciprocal, respectful relationship with Country, and their responsibilities as Custodians. Education was not considered a one-way process, but rather collaborative:

Yeah, it's just, I think, you know, culturally, they've got to understand our Culture, and that's the people that are bringing this, this renewable energy, into our, into the lands, onto the lands, I should say. And that, you know, that the animals can't, you know, the animals cannot be put off there, how they hunt and or how they feed (GRAC BoD 8).

Depends where they're working, you know, like the land, you know, they gotta ask us about the land... You know? ... We don't want them just going to pull something up and dig something up, move something out of the way without us knowing. (GRAC BoD 7).

They need to work with us, so we can work with them. So, you're meeting in the middle, making the decisions together. (GRAC BoD 6).

DISCUSSION

The outcomes of the data collection and analysis indicate a desire amongst the GRAC BoD to build their energy literacy and decision-making capacity to better represent the more than 450 members of the Gawler Ranges Aboriginal Corporation NTPBC. They identified education and hands on training as a way of enhancing their energy literacy competencies. The necessity for further research to better understand the renewable energy industry and the potential impacts on wellbeing and Country, particularly in reference to cultural heritage management and environmental assessment and management. Another factor associated with these responsibilities was knowing more about the principles of UNDRIP, in particular, FPIC (UN General Assembly, 2007). The need to understand more about the international human rights framework is mentioned in the interview transcripts as it relates to renewable energy proponents gaining FPIC through

collaborations and negotiations of an Indigenous Land Use Agreement (ILUA) to allow exploration and development to occur on Aboriginal land.

The findings support the literature that was scoped and reviewed which indicated people from other international Indigenous cultural contexts want and need to be energy literate to make informed decisions about engaging with the renewable energy industry and manage their personal energy consumption (Fatima *et al.*, 2023; Savic & Hoicka, 2023; Stefanelli *et al.*, 2019). Additionally, First Nations Peoples in Canada and north America are using Indigenous human rights discourse to negotiate core benefits for their people which may include training, education, and using profits from royalties to establish their own wind or solar farm or hydrogen production company (Savic & Hoicka, 2023).

What is clear from the journal articles and grey literature sources is that government and industry are driving the expansion of the renewable energy industry due to the impact climate change is having on the environment. The reservations that Aboriginal groups have is that this transformation of the energy market away from fossil fuel dependency to renewables is occurring at a rapid pace. For example, the first SAAREF was held in November 2022 and the SA HRE Bill was legislated in July 2024, allowing limited time to educate the SA community about the impact this rapid transition will have on them (Griffiths, 2023).

The inadvertent impact that arises from this rapid transition, is how Aboriginal People's spiritual and cultural wellbeing is affected. Native Title groups like GRAC are at the forefront of the renewable energy transition because wind and solar farms and carbon farming projects – enterprises that all contribute to the lowering of greenhouse gas emissions – are occurring on their ancestral lands. Ernst & Young and First Nations Clean Energy Network (FNCEN) recent report notes that to meet Australia's net zero emissions target by 2060, approximately 43% of clean energy infrastructure “will be sited in regional and remote areas where First Nations groups and communities have rights, interests and aspirations” (Ernst & Young & First Nations Clean Energy Network, 2025 p.6). Therefore, the pressure to make the right decisions for community, Country and Culture has and will

continue to have significant impact on the GRAC members' and other Native Title groups' wellbeing given the growing urgency and pressure.

Dealing with the gap in knowledge of traditional owner groups asked to engage with the renewable energy industry under the pretext of FPIC can be dealt with through collaborative research with Native Title groups. This is pertinent considering the rapidly increasing material and information emerging in this space. For instance, the Australian Government's leading practice principles for engaging First Nations in renewable energy projects clean energy policy framework (Clean Energy Council & KPMG, 2024) and the Government's First Nations Clean Energy Strategy policy framework (Australian Government, 2024), which aims to promote "a sustainable clean energy future for all Australians" by placing "Country and Culture at the heart". Building knowledge and skills in these emerging industries is important as it empowers Nyungas to make informed decisions and actively benefit from the clean energy transition. Whether benefits which are "meaningful and valued" by Aboriginal nations (Bainbridge *et al.*, 2015) occur as a result, remains to be seen.

Limitations and Challenges

Given this is a pilot project, the findings have limitations, particularly due to limited time and resources. A 3-month period was granted to complete the study, including the final report which meant that the sample size was small. Though all BoDs were interviewed, initially, we hoped to interview a larger group from the GRAC community, however, availability of members over the time allocated was limited. Time to consolidate and review data was restricted. Though the report was disseminated to the BoDs and the findings were presented at a GRAC Board meeting, more time would have allowed for member checking. The authors acknowledge the limitations of interviewing one Native Title group and wish to avoid generalisations, historically a significant issue in research when engaging with Aboriginal and Torres Strait Islander peoples in Australia (AIATSI, 2020; Duke *et al.*, 2021). There are 26 registered NTPBCs in South Australia.

Another factor that was highlighted was the essential need for relationship and trust building between researchers and interviewees. Some

participants were understandably hesitant to sign consent forms or be interviewed given past dealings with institutional bodies, a point which reflected the findings in the literature review (Andrews *et al.*, 2024; Bainbridge *et al.*, 2015; Geia *et al.*, 2013; Reid, 2023). Time is paramount when using the traditional ngapartji-ngapartji methodology as it allows for these relationships to be built. Fortunately, the research coincided with the visit to the sacred waterhole at Paney. Being on Country allowed for greater connection and comradery between interviewees and the non-Aboriginal interviewer due to the relaxed atmosphere and sharing of stories and culture.

Although the inclusion of a non-Aboriginal researcher was implemented to mitigate bias due to Reid's relationship and affiliation with GRAC, this could have been further managed with access to a larger research team and time.

CONCLUSION

This pilot study highlights the need for the capacity building of the GRAC BoDs and the wider GRAC community when negotiating renewable energy developments with industry and government through collaborative, reciprocal engagement. Lack of energy literacy and understanding when making decisions that affect the health of Country, were cited by participants as negatively impacting wellbeing. Caring for Country is the primary responsibility of custodians of the waterbodies in the Gawler Ranges and industry, government and pastoralists need to understand the deep significance of water to Gawler Ranges Aboriginal people through the cultural lens. Any damage to these sacred sites unduly impacts the wellbeing of all Nyungas who have bloodline connections to these important cultural, ecological places and spaces. As these changes are taking place across SA, a larger study is recommended that includes the broader GRAC community and other Native Title Groups to help address the limitations of the pilot. This needs to be done with particular focus on energy literacy, FPIC and UNDRIP as it relates to Aboriginal cultural heritage protection as well as environmental preservation and management.

Abbreviations

The following abbreviations are used in this manuscript:

3Rs	Respectful, reciprocal relationships
AHS	Australian Heritage Services
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
BoD	Board of Directors
CIP	Copenhagen Infrastructure Partners
DEM	Department of Energy and Mining
DEW	Department of Environment and Water
FNCEN	First Nations Clean Energy Network
FPIC	Free, Prior, and Informed Consent
GRAC	Gawler Ranges Aboriginal Corporation
HRE	Hydrogen and Renewal Energy
IEA	Indigenous Energy Australia
ILUA	Indigenous Land Use Agreement
NERA	National Energy Resources Australia
NTPBC	Native Title Prescribed Body Corporate
QLD	Queensland
SA	South Australia
SAAREF	South Australian Aboriginal Renewable Forums
SARIG	South Australian Resources Information Gateway
TO	Traditional Owners
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UniSA	University of South Australia

Acknowledgments

The authors acknowledge the in-kind contribution by the following partners:

- Gawler Ranges Aboriginal Corporation (GRAC)
- Ai Carbon (carbon farming company)
- Indigenous Energy Australia (IEA)
- Department of Energy and Mining (DEM)
- The Department of Environment and Water (DEW)

Conflicts of Interest

Dr John Reid is a Director of the Gawler Ranges Aboriginal Corporation (GRAC) – a position he declared in his ethics application to the UniSA Human Research Ethics Committee (HREC) when he undertook the pilot study with Dr Jäger. Apart from this, the authors declare no competing interests.

Ethics Approval

The UniSA Human Research Ethics Committee (HREC) gave approval for Energy Literacy as an indicator of Aboriginal Wellbeing pilot study - Protocol ID: 205644

Consent to Participate

As part of the UniSA HREC process the research team obtained Informed Consent from the 10 members of the Gawler Ranges Aboriginal Corporation to be interviewed.

Availability of Data and Materials

The dataset is subject to ethical considerations with access restricted to authorised members of the research team only and is thus not available for public use.

Funding

Internal Aboriginal grant seed funding 2024 from the UniSA for \$17,500.

Author Contributions

Conceptualisation, J.R.; methodology, J.R.; software, N/A; validation, J.R. and M.J.; formal analysis, J.R. and M.J.; investigation, J.R. and M.J.; resources, J.R. and M.J.; data curation, J.R. and M.J.; writing – original draft preparation, J.R. and M.J.; writing – review and editing, J.R. and M.J.; visualization, J.R. and M.J.; supervision, J.R.; project administration, J.R.; funding acquisition, J.R. All authors have read and agreed to the published version of the manuscript.

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