Chapter 3
A Right Way, Wrong Way and Better Way for Energy Engineers to Work with Aboriginal Communities

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The land is the mother and we are of the land; we do not own the land rather the land owns us. The land is our food, our culture, our spirit and our identity.
Dennis Foley, a Gai-mariagal and Wiradjuri man, and Fulbright scholar

Abstract Aboriginal Australians have an intrinsic relationship to Country, kinship and community. The processes related to colonisation have decimated traditional lifestyles, ecology and even families. The challenge for energy engineers lies in the ability to reconcile the profession of engineering with the contemporary and traditional cultural and physical needs of Aboriginal people. A discussion around Aboriginal peoples' most deeply held values will be linked to both global and professional ethical canons. This discussion has implications for Aboriginal and Indigenous peoples globally. A fictitious case study—the 'Warrigal Downs Energy Hub'—provides us with a hypothetical project to which we can link both examples and frameworks. Our team of Aboriginal and non-Aboriginal educators and engineers provides us with a right, wrong and even better way to work sensitively, meaningfully and reciprocally with Aboriginal people in Australia and, indeed, globally.

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3.1 Introduction

Government and business interests have taken strong precedence over the needs of Traditional Owners through the brutal processes of colonisation which involve displacement of Indigenous peoples the world over. In energy engineering justice, morality and human rights largely remain outliers in decision-making—particularly in the case of First Nations people and communities (Sovacool and Dworkin 2015; Sovacool et al. 2017).

This chapter expands on some of the ethical concerns for engineers when working with Aboriginal Australians from an energy engineering perspective. We have chosen to focus on two important Aboriginal cultural or ethical tenets to frame our discussion. These are the deep spiritual and cultural relationship Aboriginal people have with Country.[1] The second of these is the need for recognition and respect for community and inclusive decision-making. We examine, briefly, a collection of ethical codes developed to address these tenets—some of which have been specifically written for engineers. To further apply principles of good ethical practice, we present a hypothetical case study—*The Warrigal Downs Energy Hub*—where we examine commonly encountered ethical situations and provide possible solutions for consideration.

The authors of this chapter are a team of Aboriginal and non-Aboriginal colleagues—engineering educators; facilitators of an 'Aboriginal Content in STEM' programme and industry professionals. We draw on our lived and professional experiences to propose some practical ways forward for those energy engineers working with Aboriginal communities. Many of these insights will be relevant to Indigenous communities in other countries who have experienced similar decimation of land, culture and identity.

For the purposes of this paper, the authors recognise the following expressions: 'First Nations' relates to Traditional and Sovereign Owners of Country prior to colonisation. 'Indigenous' is also used in this context, and can be seen used widely in global documentation (for example, *UN Rights of Indigenous Peoples*). However, in South Australia, the nomenclature preferred by Traditional Owners is 'Aboriginal people'. (In fact, the land on which this paper was written is the home of the Adelaide Plains Aboriginal people, The Kaurna people.)

Martin (2005: 28) cautions against the extensive use of principles of universality, stating that the 'one-size-fits-all' model can be viewed as disrespectful. There were more than 250 diverse Aboriginal language groups in Australia at the time of colonisation (in 1788) and traditional ways vary from coast to mountains to desert. That said, colonisation and connection to land or Country are often seen not just as common experience across Australian Aboriginal communities, but are *in common* with Indigenous communities globally.

[1] Country (capitalised) refers to the cultural and ancestral homelands of Aboriginal people. Traditional Owners (capitalised) refers to the Aboriginal and/or Torres Strait Islander peoples who inhabited the land prior to and after colonisation in 1788.

Nurysheva, Amrebayeva and Amrebayev in Chap. 4 touch on themes which are resonant of Australian Aboriginal ethos: a holistic worldview where community well-being is strongly linked to nature and an individual's relationship to their community. In referring to First Nations people in America, Sovacool et al. (2017: 680) point to the efforts of Indigenous peoples to prevent fossil fuel development. Manno and Martin (in Sovacool et al. 2017) cite responsibility and concern for land (Country), along with concern for each other (community), as the overriding reasons for such struggles.

For this reason, an exploration of the experiences of Indigenous peoples and energy ethics, globally, might provide us with some useful and transferrable comparisons.

3.1.1 Relationship to Country

The deep **relationship between Aboriginal Australians and Country** is the first defining feature of the culture and spirituality of those who have lived on mainland Australia and in the Torres Strait Islands for more than 60,000[2] years (Pascoe 2012: 4). As such, Aboriginal Australians have managed their lives in ways which are harmonious with the seasons, the climate and the land (Gammage 2011; Jordan 2012; Pascoe 2018).

Aboriginal ways of life are deeply imbued with a knowledge of the land which has evolved over tens of thousands of years. This knowledge encompasses sophisticated farming methods; use of fire to manage the land and engineering solutions to harvest food (Gammage 2011; Jordan 2012; Pascoe 2018). Ganesharajah (2009) emphasises that Aboriginal peoples' relationship with their land is regarded as intrinsic to their health and well-being both spiritually and physically.

Massacres, relocation from traditional communities to Christian and government missions and the forced removal of children from parents have seen a wholesale displacement of Aboriginal Australians from Country in ways which can only be described as devastating and traumatic. At the time of European colonisation, Aboriginal people numbered up to 1,000,000 (Williams 2013) across 250 identified Countries[3] within Australia. The Australian Government Institute of Health and Welfare (2017) now estimates that there are 761,300 Aboriginal people living across urban, regional and remote areas representing 3% of the overall Australian population (Australian Bureau of Statistics 2018).

In the twentieth century, displacement has been coupled with direct damage to Country through, for example, the British testing of nuclear weapons and the min-

[2] There is now some evidence that Aboriginal people may have lived in Australia for 120,000 years (Bowler et al. 2018).

[3] There were more than 250 Aboriginal language groups in Australia at the time of colonisation. Less than half of these languages are spoken today and many of these are endangered. The term 'Country' refers to a clearly defined area, territory or community.

ing industry. There is further impending damage predicted as a result of climate change which will impact, particularly, on those living in remote areas (Green 2006; Zander et al. 2013).

Arguably, the most notorious example of damage to Country and displacement of Aboriginal people from communities took place during the 1950s and 1960s when the British conducted a series of nuclear tests in South Australia at Maralinga—the traditional homelands of the Aṉangu Pitjantjatjara peoples (Tynan 2016). The tests caused significant levels of radioactive contamination. The land, to this day, is barely habitable and there remains a legacy of health and spiritual distress. Effects on the health of local Aboriginal people in the vicinity of the tests, include blindness, poisoning and sickness (Mittman 2017). There was also wholesale displacement of the local communities who were 'relocated' to the Yalata community which was in some cases hundreds of kilometres away from their traditional lands. There was a stripping away of traditional ways of life, with little regard for the cultural needs and differences of those placed together.

> *Needless to say […] Anangu Pitjantjatjara people regard the site with fear and suspicion. It is 'poison country', which has caused a range of previously unknown health problems […] and will haunt the community for many generations to come.* (Mittman 2017: 31).

Since Maralinga, several uranium mining proposals have been instigated in Australia's Northern Territory, including mining developments within the geographical area of the World Heritage listed Kakadu National Park. The Ranger Uranium mine is situated on the lands of the Mirarr Aboriginal people. The mine has been operating for more than 30 years and it has been fraught with problems including hundreds of leaks of contaminated water, spills and serious breaches of environmental licence conditions (ABC News 2013). Over the years, the Ranger Uranium Mine has generated more than 30 million tonnes of liquid tailings waste (Australian Nuclear and Uranium Sites 2019; Gundjeimhi Aboriginal Corporation 2019).

That Kazakhstan has experienced a similarly dubious association with the nuclear industry is echoed earlier by Nurysheva, et al. The country, like Australia, has seen nuclear testing alongside uranium mining and storage of nuclear industry by-products. Like the Aboriginal communities impacted by Maralinga in the 1960s, testing at the Semipalatinsk in Northern Kazakhstan has left an intergenerational legacy as a result of radioactive contamination. The tests have rendered irrevocable damage to the environment, to the people and to subsequent generations. The land has only recently (in 2016) been deemed safe for human habitation. The Kazak people remain staunch advocates for nuclear non-proliferation on the world stage. Nurysheva et al. describe the peace-loving nature of the Kazak people as antethematic to war and weapons of war.

The processes of colonisation have marginalised and ignored the voices of Aboriginal peoples, globally, on matters related to Country. For example, Hurlbert and Rayner (2018) present the case of a proposed gas pipeline in Canada. Here, the Chippewas First Nations were unsuccessful in their appeal against the development when they expressed their concern over the failure to 'consider environmental

harms, the impact of leaks on land, resources, Aboriginal hunting and trapping, fishing rights or health'.

In looking to the future, Green (2006: 1) cautions how extreme weather conditions caused by fossil fuel emissions and ensuing climate change are predicted to impact significantly on the mental and physical well-being of Aboriginal peoples living in remote areas. This is because of a 'heightened sensitivity to ecosystem change' which is likely to see an increase in bushfires, dust storms, saltwater inundation and droughts. Zander et al. (2013) explore how Aboriginal people may need to adapt to the impact of rising sea levels due to climate change either by moving off Country, or staying on Country with Government help. Changes such as loss of land, floods and extreme weather events are now regarded as undeniable and predictable.

3.1.2 Community Connection/Consultation

Connection to community and inclusive decision-making is a defining feature of Aboriginal communities. Traditionally, Aboriginal peoples share resources and have a strong sense of collective ownership. Martin (2008: 29) explains how there is a clear understanding of 'reciprocity' and 'responsibility' in day-to-day decisions. This includes any developments impacting on communities. Aboriginal people, whether living in urban, regional or remote areas, value decision-making protocols which are respectful of Elders, kinship structures and the communities as a collective.

However, since colonisation, 'White Australia' policies have silenced Aboriginal voices in decision-making, the process of silencing has been enacted through displacement from land, denial of citizenship and the forced removal of children from families (the 'Stolen Generations'). Stanner (1969) famously describes the 'cult of forgetfulness practised on a national scale' which has denied past wrongs and ignores Aboriginal rights to sovereignty and self-determination.

Lack of due regard for the sanctity of Country, along with lack of meaningful consultation by non-Aboriginal interests, has effectively demeaned the trust between Aboriginal and non-Aboriginal Australians. Since colonisation, Aboriginal Australians have largely been excluded from decisions in a variety of systemic ways. Firstly, these have included the invasion of their lands by early agriculturalists. Secondly, Aboriginal people were forced to live under a paternalistic 'protectorate' system, which (until 1968) saw all Aboriginal people denied voting rights, citizenship and the right to make their own decisions.

There has been an imposition of Eurocentric development which has seen inappropriate housing and other settlement solutions, along with the taking of natural resources without consent. This invariably starts from a position of profit making—rather than wealth sharing—and is at odds with the traditional Aboriginal community cultural norms. Calma (2007), in addressing the Tangentyere Council on the

matter of housing leases for Aboriginal people in the Northern Territory, summarised the right to consent and self-governance:

- *Our consent should be sought and freely given prior to the authorisation…of any development activities*
- *We should have full information about the scope and impacts of the proposed development activities on our lands…*
- *We should have the choice to give or withhold consent over developments.*

Nearly one-third of all global uranium reserves are found in Australia. Commercial uranium mining since 1910 has seen a combination of both a flagrant disregard for the health of Country as well as self-determination and decision-making—with little or no regard for the concerns of Traditional Owners (Iserles and Brown 1999; Phillips 2015). Graetz (2015) describes the negative impact energy production in uranium mining has had on Australian Aboriginal people, emphasising the importance of developing mutually beneficial outcomes and positive grassroots relationships with Traditional Owners.

However, consultation does not always result in desirable outcomes for Aboriginal people.

The uranium deposit on Mirarr land took years of negotiations between government and mining proponents, to the point where the Mirarr people became exhausted from years of endless meetings, negotiations and 'consultation'. In 1996, the project went ahead, despite the continued open opposition of the Mirarr people and the fact that the mine was located in a UNESCO World Heritage area. They remain staunchly opposed to mining on Country and have become one of the largest national and international campaigners against uranium mining in the world (Gundjeimhi Aboriginal Corporation 2019). Their efforts finally culminated in the mining company signing an agreement preventing the development of the mine from ever occurring without the explicit consent of the Mirarr Traditional Owners. This led to 15 of the world's biggest mining companies committing *never* to mine in World Heritage Areas (Australian Nuclear and Uranium Sites 2019). Unfortunately, though, the landscape is forever altered, and the $67 million allocated to rehabilitate the land will never cover the costs which are estimated to be closer to $500 million (Phillips 2015). In a similar vein to the Kazak people (referred to in Chap. 4 by Nurysheva et al.), the Mirrar people have found it deeply distressing that uranium from their lands (which should have remained underground) could potentially be used for nuclear weapons or may have been exported to nuclear power plants in other countries where there have been major environmental incidents and disasters (Gundjeimhi Aboriginal Corporation 2019).

Aboriginal people's relationship to Country, inclusive decision-making and the ethical right to self-determination have complex implications for engineers across all sub-disciplines—including energy engineering. These values are deeply imbued with traditional connotations which are cultural (lore) and canonical (law). These do not provide 'ethical' frameworks in a true Western paradigm. However, where ethics is understood to be a process which evaluates 'human happiness, human good or human wellbeing' (White 1988: 22), the denial of these rights by others poses a strong ethical issues. Many of these issues are now embodied in ethical frameworks.

3.2 Towards an Ethical Framework

The measurement of human good, well-being and happiness benchmark the degree of ethical integrity in any decision made—including those of energy engineering planners and analysts (White 1988; Sovacool and Dworkin 2015). Energy Justice is a subset of ethics, and can be viewed as a 'global…system which fairly distributes the benefits and costs of energy services' (Sovacool and Dworkin 2015: 436). Where Western legislation allows for engineering development, there has been risk of displacement of people; the taking of resources; desecration of land and the diminishing of culture. Acknowledgement of the central importance of an Aboriginal community or person's connection to Country to their well-being, along with strong community-based consultation, begins to provide a framework for ethical decision-making in energy engineering.

Historically speaking, engineering, ethics, justice and Indigenous peoples are a relatively contemporary marriage. Principles of 'redress'; 'free and informed consent' and 'sustainability' as outlined in the *United Nations Declaration on the Rights of Indigenous Peoples* were formally enacted as recently as 2007 and only officially endorsed in Australia in 2009 (United Nations 2008; Reconciliation Australia 2017).

In order to address the ethical impasse between Western development and traditional communities, there are some significant agreements or guiding principles which outline the ethical obligations of engineers to Indigenous and/or Aboriginal communities (see Fig. 3.1). Woven throughout, we can see a strong emphasis on Country, consultation and the right to self-determination. These agreements coalesce across global, national and professionally developed codes of ethics or professional conduct. The codes/agreements listed in figure 3 address, specifically, culture, regard for country and consultation.

3.2.1 Universal Declaration of Human Rights (1948)

The Universal Declaration of Human Rights is an overarching canon of ethical responsibility which recognises (in Article 1) the inalienable rights to freedom and equality and our responsibility towards each other in the enactment of these rights (United Nations 2015 p. 4) and in Article 22 the 'economic, social and cultural rights indispensable for dignity' (United Nations 2015 p. 46).

3.2.2 UN Declaration on the Rights of Indigenous Peoples (2007)

The UN Declaration (United Nations 2008) further develops notions of social responsibility, cultural and ethical rights specifically to Aboriginal peoples' relationship to Country.

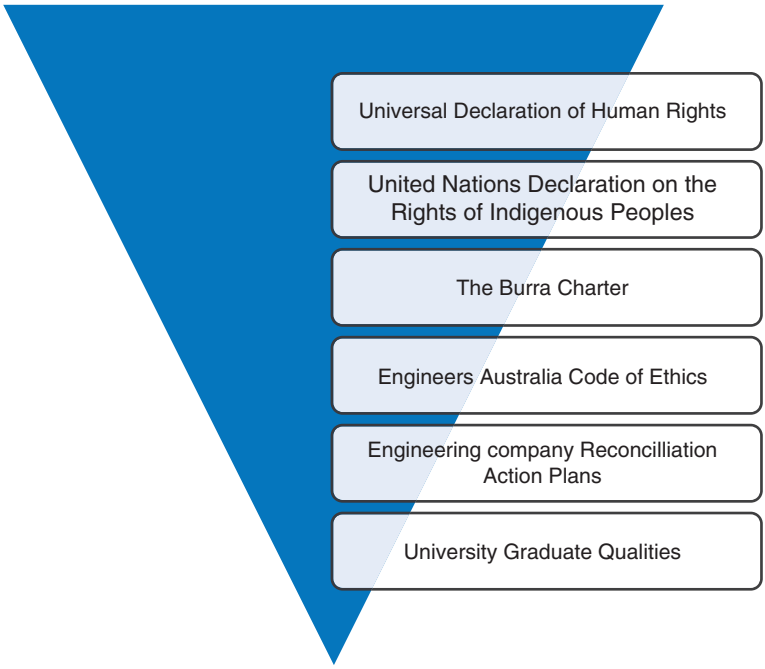

Fig. 3.1 International, national, professional, educational and industry standards for engineers

For example, from a global perspective, the United Nations *Declaration on the rights of Indigenous Peoples* (2007) recognises that Indigenous peoples have:

> *The right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied...lands, territories, waters and costal seas and other resources and to uphold their responsibilities to future generations in this regard.* (Article 25, p. 10).

It also recognises the right to self-determination and governance in terms of economic, social and cultural development (Article 3, p. 4) and 'redress' and 'restitution' where consent has not been sought (Article 11, p. 6).

3.2.3 The Burra Charter (1978)

The Burra Charter also segues from the United Nations, via the UNESCO World Heritage Committee. It was developed by the Australian chapter of the International Council on Monuments and Sites (ICOMOS 2013) and recognises '…management of a place should provide for the participation for whom the place has significant *associations* and *meanings,* or who have social, spiritual or other cultural responsibilities for the place' (Article 12: Participation). Also, 'Co-existence of cultural values should always be recognised, respected and encouraged. This is especially

important in cases where they conflict' (Article 13: Co-existence of cultural values). First adopted in 1979, this is a widely consulted document for principles for building and development work on traditional lands.

3.2.4 *Engineers Australia Code of Ethics*

In terms of the professional ethical obligations of Engineers, the *Engineers Australia Code of Ethics* also draws our attention to promoting 'the involvement of all stakeholders and the community in decisions and processes that may impact upon them and the environment' (Article 4.1, p. 3) along with the incorporation of 'social, cultural, health, safety, environmental and economic considerations' into any given engineering task (Article 4.2, p. 3).

3.2.5 *University Graduate Qualities*

Universities require all students to understand the value of ethical behaviours and to be comfortable with different social contexts. Increasing numbers of Australian universities are committing to Indigenous Graduate Attributes, with the aim of increasing 'awareness', 'knowledges' and 'abilities' to work with Aboriginal and Torres Strait Islander peoples and communities (Bodkin-Andrews et al. 2018). Universities Australia (2011) provides a best practice framework for Indigenous Cultural Competency in Australian Universities.

3.2.6 *Reconciliation Action Plans*

Where the *Engineers Australia Code of Ethics* refers to culture in its broadest sense, many Australian organisations (including civil, mechanical and electrical engineering companies) have a 'Reconciliation Action Plan' (RAP). RAPs aim to develop knowledge about Aboriginal history, culture and the importance of working together. They are developed by companies and organisations in collaboration with Aboriginal community members providing guidelines around consultation and collaboration (WSP 2016).

In summary, the examples provided here acknowledge cultural and spiritual connection to land and inclusive decision-making. Sovacool and Dworkin (2015) express concern about the lack of regard for ethics and morality during the planning and analysis processes in the Energy industries. Despite this, the guiding documentation and best practice examples for working with Aboriginal communities are available and, indeed adopted, by professional engineers. In a world where the voices of First Nations peoples have been actively and systemically silenced, the

process of developing the culturally sensitive engineering professional must start with undergraduate education (Duff et al. 2018) which, in turn, aligns strongly to the ethical cannons of the profession.

The following case study the—*Warrigal Downs Energy Hub*—highlights how these ethical principles may apply providing some steps towards developing reciprocity for engineer and community alike, while preserving the integrity and care of Country and consultation.

3.3 The Warrigal Downs Energy Hub

The Warrigal[4] Downs case study highlights some of the many complexities and conundrums which beset community and engineer, alike. These issues have arisen because of complex social, political, historical and cultural factors. In Australia, they are complicated by the systems of governance which recognise local, state and federal legislation, meaning what is required in one jurisdiction may be quite different in another.

Our purpose in creating a hypothetical case study is to suggest a broad range of 'typical issues' besetting large engineering projects which take place on the lands of Aboriginal people. In examining some of the all-too-common 'worst practice' examples, we turn to a more optimistic scenario, supported by engineering studies and best-practice examples.

In our case study, ABC Energy Corporation has prepared a business model for a new solar, wind and hydro-electric Energy Hub, to be known as the 'Warrigal Downs Hub'. The privately funded hub anticipates payback within 15 years. It is designed for a 25-year operation (noting such Hubs will be maintained with a view to lengthen this significantly, pending technological developments versus the rise of maintenance costs as the plant ages).

The proposed Hub sits within a remote Southern coastal zone of South Australia and features a number of watercourses including a small river. All watercourses flow into the ocean. There are hilly regions with caves along much of the coast. This land is used by the current landowner for the grazing of livestock and growing cereal crops across the plains. It has been designated for this use since 1844.

Prior to colonisation, the area was a trade route for Aboriginal communities between the hills and the sea. It is known for its significant Aboriginal cultural artefacts and sacred sites. There is a high-voltage transmission line to the North East of the site. Linking of the Hub to this line will allow the feeding of energy back into the grid.

The following **Hub** components link to both energy engineering and civil engineering works.

[4] 'Warrigal' is the derivative of a Koori Aboriginal name which means 'Dingo' (ABC 2012). The Dingo is a ubiquitous indigenous animal (similar to a dog) living in and with strong mythological links to the Australian outback.

3.3.1 Operations and Maintenance Facility (OMF)

1. Operations including site offices; car parking; storage of smaller parts; workshops.
2. Battery storage (batteries; smaller transformers).
3. Major Transformer and links to the high-voltage transmission line.
4. Other services (water, telecommunications, low voltage power) to be connected from existing services. Sewerage for the OMF is captured onsite and pumped out of large holding tanks for treatment offsite.

This facility adopts a large hardstand zone, site clearance significance to accommodate the infrastructure for this component.

3.3.2 Solar Panels

These will ideally be located on near-level plains. New access roads will be constructed, and services will be trenched, linking panels back to the transformer site.

3.3.3 Wind Turbines

These will be typically located through hilly zones to maximise use of windy zones along the coast. New access roads with wide sweeping bends are required to allow transportation of long turbine blades and other components on low loader trucks. Services will be trenched to link turbines back to the transformer site.

3.3.4 Hydro Energy

This is proposed to store energy, with the construction of dams at high and low levels the intent. Water can be pumped from low to high, then released downstream through a power-generating turbine. Concrete spillways direct flow to a low-level dam. Water is topped up from nearby creeks or the ocean.

3.3.5 Access Roads

These are typically unsealed and used for maintenance access once construction is complete.

3.3.6 Fencing and Gates

These restrict public access to the site, in particular, the transformer and battery storage site.

3.4 Principles for Engineers to Work with Aboriginal Communities

3.4.1 Connection to country: Two-Way Learning

The Wrong Way
Standard procedural documentation may call for university educated experts with a degree. This eliminates the opportunity to call upon local Aboriginal knowledge.

Aboriginal knowledge of the land, the complexity of ecosystems and interconnection of natural systems offer sustainable solutions that are ignored. Solutions designed without regard of Aboriginal knowledge may result in inappropriate, unsustainable, costly and complex solutions that do not meet the needs of Aboriginal people and, if socially or environmentally unsustainable, the needs of the mainstream community.

Far from being 'invisible', 'tribal' and 'ignorant', there existed sophisticated knowledge systems which had for centuries seen land managed (Gammage 2011; Pascoe 2018) and fit-for-purpose engineering systems implemented.

For example, Jordan (2012) rejects the notion that engineering came to Australia with the arrival of non-Aboriginal colonists. The author describes a complex engineering project for the purposes of fish trapping within the Budj Bim lava flow landscape in South Western Victoria. Here, Aboriginal people used a complex system of hydraulic works, stone races, canals, channels, trapping points and a sink hole.

Aboriginal people have for tens of thousands of years lived in harmony with the land, tended the land, cultivated crops and managed ecosystems through fire management. Knowledge that is ancient, tested and has sustained the oldest living civilisation has been disregarded and historically denied (Pascoe 2018; Watson 2015).

Stewart et al. (2019) list several examples of successful Aboriginal enterprises worthy of two-way learning. These include conservation of biodiversity through using traditional knowledges of ecology. They also include managing carbon emissions through traditional fire management methods. These have been used for broad land management, but potential has also been identified for energy efficiency and renewable energy projects (Stewart et al. 2016).

Two-way learning recognises the sophistication of knowledge occurring in harmony with the natural environment. It is to these knowledges we are just now starting to turn as the natural environment undergoes the onslaught of climate change. For two-way learning to be successful, there needs to be the recognition that there are different knowledge systems and that each knowledge system is as valid as the other. To exchange knowledge freely, there has to be a level field of power as well as mutual trust.

The Right/Better Way
Call upon local Aboriginal knowledge of the flora, fauna and cultural heritage of the project area. Work with Aboriginal people to make traditional knowledge systems and cultural practices an integral part of the design and proposal of works. Take the time to get to know and build trust with Aboriginal people. Give Aboriginal people the voice to share their knowledge of the land. This could, for example, mean that an engineer, a planner and a botanist are working alongside a group of Aboriginal rangers that the local Aboriginal community selected for their knowledge about how to best to protect the land and cultural sites at the site of the proposed development.

3.4.2 Connection to Country: Caring for Country

The Wrong Way
Development plans allowed for limited input from the Aboriginal community, and approval for construction has been achieved. Civil engineering works have commenced onsite. Road corridors have been cleared, existing natural vegetation stripped, trees felled and removed, and the excavation of hillsides and levelling of hilltops have occurred to accommodate the large cranes required to lift the wind turbine components into place.

The construction of large dams now inundates previously inaccessible lands, and vegetation up to the high-water level will struggle and likely die from inundation over time.

Pollution, desecration and destruction of animal habitat destroys the very spirit of the Traditional Owners. Watson (2015) describes the impact colonisation has had on Aboriginal people as ‘muldarbi’, the ‘demon spirit’. This Aboriginal ancestor spirit did not act in ways that let the natural world benefit to the collective. Colonisation demanded the all of the natural world for the colonisers. The ‘uncivilised’ were to be absorbed and, their worldviews and knowledges to be annihilated.

This approach fails to take into consideration the close cultural connection of Aboriginal people to their land, which is viewed as mother. As such, Aboriginal

people see the nurturing and custodianship of land as central to physical and psychological well-being. The solutions presented here are likely to negatively impact on an entire, interrelated geographical and ecological system. However, there *are* laws (in addition to the ethical imperatives) to safeguard both the ecology and the 'traditional knowledges'. Robinson and Raven (2017) point to the *Convention on Biological Diversity* and the *Nagoya Protocol* along with state and federal laws, Indigenous lore and the codes of ethics such as those listed above. Native Title law also gives Aboriginal Australians a voice in the way land is used and the ability to make decisions around heritage in impact assessment and mitigation.

The Right Way/Better Way
Alternative solutions to affecting the land need to be reviewed. Is the inclusion of hydro necessary? This has a lasting effect on a previously free draining river valley. Is it necessary to clear such a large area of vegetation? Can this be done in a way that has minimal disruption to the local fauna and in a way that ensures that the area can be revegetated in a timely manner?

3.4.3 Consultation: The Project Approval Process

The Wrong Way
In reference to the location of the Warrigal Downs Energy Hub, a parcel of land was identified based on geographical features; close proximity to an existing high voltage power line corridor and high coastal winds. No early stakeholder engagement has been undertaken with Traditional Owners of the land. This links to the mind-set of Terra Nullius and a complete ignorance of local connections to Country.

Stakeholder engagement cannot be used once off and forgotten; this is a continual process. It requires integrity, openness and genuine effort. It is not a process to be simply checked off a list, but an integral part of the potential future success of a project.

In engineering, Aboriginal groups are often 'consulted' about infrastructure projects at the tail-end of project planning, with participation often being limited to involvement in cultural heritage surveys. In other words, the majority of decisions about the project have already been made before Aboriginal groups become involved. A best-practice approach to engagement with Aboriginal communities would see Aboriginal people involved in all stages of project planning, not just in the final stages. In this way, the community should help identify land that may or may not be appropriate for development, outline any areas of cultural sensitivity and even gain an early understanding into economic development opportunities.

To be able to support this type of approach, a whole shift in the way Aboriginal involvement is viewed must be implemented and, to do this, those responsible for project delivery need to be educated and exposed to the importance of Aboriginal culture.

This, of course, would need to start at university. Australia's engineering students, who will one day be responsible for the delivery of infrastructure projects across the country, learn about more than just engineering as part of their degrees. They also learn about finance, planning, ethics and management. There has been a paucity of learning about Aboriginal heritage and culture and the importance of engaging with Aboriginal communities on infrastructure projects (Duff et al. 2018). Instilling an early respect for Aboriginal tradition and intrinsic knowledge would surely benefit infrastructure project delivery and ensure that social and cultural outcomes are optimised. This benefit would be further emphasised by expanding the definition of sustainable development to include the considerations and values of the Traditional custodians of the land.

Karanasios and Parker (2018) provide an analysis of 71 renewable electricity technologies projects developed in remote communities of Canada. The authors conclude that solutions should not be imposed on the communities. Instead, positive interactions with the communities should be initiated at early stage while having supportive policies in place. This would allow individual communities to determine and achieve electricity generation goals based on their own visions and capacities, not restricted to the deadlines of others. The same study provides a list of Indigenous community-driven projects which were successful because of court decisions favouring community participation in projects.

The Right Way/Better Way

Engaging at the outset of the project with the Traditional Owners/custodians of the lands to extensively review potential locations for the engineering works planned needs to occur. Aboriginal people must both agree to the location of the proposed site and the purpose of the proposed site. Where this may include, for example the construction of an access road, it must be ensured that the Aboriginal community is actively participating in the decision-making process regarding the location of road alignments, turbine pads, and creek and river crossings. Effects on road alignments through the environment must be considered and addressed. Clearing of vegetation needs to be highlighted, noting not just significant trees but also any areas and other vegetation that are of significance to the Aboriginal people. It is vital that the Traditional Owners understand the purpose, benefits and detriments of the proposed project and are not only consulted but given voice and veto in the decision-making process.

3.4.4 Consultation: Respect and Inclusion

The Wrong Way
Many engagement programmes use typical consultation materials and standard project descriptions. These are then used uniformly across a number of stakeholder groups who may have an interest in an infrastructure project. Opportunities for providing feedback are generally limited to feedback on dedicated free call phone lines or open workshop situations. Community engagement meetings are limited to a window of time that suits the organisers—following standard procedures that are suited to the organiser's needs, not the unique culture of the Aboriginal community.

When planning to undertake engagement with Aboriginal communities in relation to infrastructure projects, careful consideration should be given to when, how and why to engage. Aboriginal communities differ across Australia—no two are the same, and what may have worked well at one community may not be appropriate or suitable for another.

Community engagement is not a 'one-size-fits-all' solution to project feedback. As with any Australian community, engagement with Aboriginal communities must be undertaken with respect in the first instance, followed by a willingness to really listen to what is being said and to act accordingly. Appropriate language must be used both in presentations and in community engagement material, the timing of engagement must be considered; are there any community events occurring that may limit people's willingness to be involved in the project? Are there any cultural sensitivities that need to be observed and does the community really understand the implications of the project and what is expected of them?

In Australia, Aboriginal people have sometimes been forced to modify traditional ways, making changes to living environments without sufficient resources. O'Rourke and Nash (2019) explain how these modifications have been necessary for basic energy efficiency and warmth, as well as for the maintenance of cultural continuity. Unfortunately, policy-makers have undervalued the significance of aspects such as the grounds of the property for improved and sustainable living (O'Rourke and Nash 2019). Jenkins et al. (2018) argue that the energy justice and transitions frameworks can be combined—mitigating environmental impacts of energy production through 'sociotechnical change' in ways which are more socially and ethically sound.

Bullock et al. (2018) point to successful and collaborative forestry, energy and mining projects where Indigenous peoples' participation has been encouraged—engaging and giving voice to Aboriginal values.

A case in point from Australia is the Ara Irititja Project (Hughes and Dallwitz 2007) where a cultural repository of previously removed artefacts and cultural items such as photographs and recordings was developed on the Anangu Ngaanyatjarra, Pitjantjatjarra and Yankuntjatjarra lands. In-depth consultation over several years resulted in the establishment of a complex, layered resource where men and women's sacred stories are kept on separate servers. Access to cultural information is limited according to

status and kinship rules within those Aboriginal communities. This has ensured that the Ara Irititja resource is culturally sustainable. According to Hughes and Dallwitz (2007), this project was successful as technical 'experts' maintained humility about their technical expertise. Their success involved creativity and patience as well as a willingness to wait. Hughes and Dallwitz (2007) further describes an openness to the idea that there is *no* standard response—only community and individual requirements.

The Right Way/Better Way
Engagement with Aboriginal communities needs to be targeted to needs of the community in question. Are PowerPoint or whiteboard presentations really the most appropriate forum for all communities? Does everyone want to receive brochures, hand-outs and feedback forms? Some communities might prefer to just sit with a few members of the project team and talk through their concerns or understanding in person. Is it appropriate to have meetings with only women/only men as there could be areas within the project scope which have traditional meaning for different genders? Ensure that all ages within the community are involved. Some members of the community may not understand highly technical language. Engagement materials should be reviewed for appropriateness and the project team ideally should have received training in cultural awareness and active listening. Ensure that there is more than one meeting and that people have the opportunity to ask questions. Aboriginal people know a great deal about the land and much of this information is invaluable to infrastructure projects. When engagement is undertaken early in project planning and when respect for people and Country is shown. Aboriginal people are often more than happy to share some of their knowledge with engineers and project proponents.

3.4.5 Consultation: Redistribution of Wealth and Reciprocity

The Wrong Way
ABC receives all wealth created from the Warrigal Downs Energy Hub. The current farming landowner receives an annual payment for use of the land. Access is provided for operation and maintenance around the farming activities currently undertaken across the remainder of the project site. Specialist technicians are employed operate and maintain the Warrigal Downs Energy Hub. No wealth is provided to the local or Aboriginal community. Construction companies utilise their own labour force mobilised from interstate.

ABC commit to upgrading of nearby council roads after construction of the Warrigal Downs Energy Hub is completed. This is seen to benefit the local farming community. Limited engagement with the local Aboriginal community has resulted in a shoehorn 'one size fits all' approach, without due care given to specific local factors for this project and the local community.

Reciprocity and responsibility are important elements of Aboriginal culture. Land ownership is bound in moral, ethical and legislative constraints with Traditional Owners on one hand (moral) and the current (post-colonial) land owners on the other. Reconciling the two is very difficult (Bourke et al. 1998).

When considering infrastructure projects, it is crucial that we explore opportunities other than profit through land that can benefit local Aboriginal communities. One of the most important aspects of including Aboriginal people is through employment in all phases of development, construction and operation. Where Aboriginal people have ownership, at the very least in regards to participation, projects are not only more likely to succeed on a long-term economic basis, but also likely to contribute positively to the social and economic fabric of the Aboriginal community in question.

The creation of wealth requires significant investment in infrastructure to construct the Warrigal Downs Energy Hub prior to power being generated. Corporations/governments funding such infrastructure will only approve such a development with a business case and supporting engineering investigations (monitoring of wind speeds, solar hours, etc.) to prove such an investment is worthy.

It is important that we do not only consider the worthiness of such an investment through the lens of corporations and governments, but provide for reciprocity and give due respect to possibilities of creating positive impact in Aboriginal communities.

The Right Way/Better Way

A successful model is holistic, considers the outcomes beyond an economic profit for corporations and governments and includes positive environmental, social and cultural benefits.

For governments/corporations, a profitable Warrigal Downs Energy Hub will produce more power with a pay back to the grid than the investment costs upfront, noting a payback period of nominally 25 years.

For instance:

- Can this payback period be extended, with an additional allocation of profits being fed back into the local Aboriginal community?
- The business model includes a yearly payment to the landholder where the solar panels and wind turbines are located. Should local Aboriginal communities receive a portion of this payment as Traditional Owners of the land?
- Scholarships at university could be offered to Aboriginal people from the area.
- Nearby Aboriginal communities could be supplied with free/discounted electricity.

Include Aboriginal employees within the Warrigal Downs Energy Hub's maintenance crews, who are required to operate such a plant. This boosts

local and Aboriginal employment opportunities. Ensure that there are training opportunities.

ABC engages with the local Aboriginal community and, together with the Aboriginal people, identifies local Aboriginal projects and employment opportunities that will benefit the community.

ABC directs a percentage of wealth created to these community projects including the upgrading of existing sporting facilities, along with community housing and revegetation of nearby abandoned lands (which were contaminated from defence base operations). These works are scheduled over the next 10 years with funding allocated from a percentage of profits. Local Aboriginal people are assigned job-specific training to allow them to join the maintenance crews for the operation of the Warrigal Downs Energy Hub. A scholarship is set up to encourage local Aboriginal people to go on to further study perhaps in the areas of engineering or construction.

The local community would prefer to see commitments made to local employment for Aboriginal and non-Aboriginal people, and community projects such as land remediation, community housing, public artwork opportunities and the like. Working collaboratively together with the Aboriginal community to form a plan for improving the community as a whole, identifying areas of shortfall that most benefit, bringing long-term solutions rather than quick fix solutions. Incorporating the Warrigal Downs Energy Hub into the community by bringing employment, and other opportunities (such as permanent Aboriginal artwork on the turbine masts) have been identified.

3.5 A Model for Working Together

The *Warrigal Downs Energy Hub* traverses two key tenets which are intrinsically linked to health, well-being and self-efficacy of Aboriginal Australians—a strong connection to Country and the importance of community and inclusive decision-making.

Aboriginal people should be consulted about a renewable energy project in a timely fashion just prior to and not after, a planning approval has been granted (Calma 2007). In current engineering practice, their opportunity for involvement with a project is brief and tightly restricted to a process that more or less mirrors that of a ‘site-clearance’. In other words—ensuring that there are little or no archaeological or anthropological issues at a chosen site.

In many instances, if a project is planned on ‘freehold’ land, Aboriginal people may not even get the opportunity to have a say at all. This process is isolating. It restricts Aboriginal involvement and is the antithesis of the recognition of Aboriginal people as Traditional Owners who retain a close ancestral, cultural and spiritual connection to the land. Regardless of land tenure and ownership, Aboriginal people

know about Country and there is great value in involving Aboriginal groups at all levels of project development.

Renewable energy projects align well with traditional Aboriginal cultural values associated with sustainability. As such, there is a wider opportunity for Aboriginal Australians to have input into national, state and territory energy and sustainable development initiatives. But Aboriginal involvement needs to be more elemental than this, and should be incorporated into all facets of renewable energy development, including target-setting, policy-making, site selection, assessment criteria, engagement requirements and approval conditions.

It must be stressed that the damage to trust caused by the processes of colonisation, coupled with Western corporate and governmental economic imperatives, makes meaningful reconciliation between engineering companies and Aboriginal communities challenging. However, the suggested 'right way' solutions provided the Warrigal Downs hypothetical case study have been replicated in best-practice examples elsewhere and/or already have a direct correlation to the ethical codes/cannons listed in Fig. 3.1.

We can, therefore, begin to suggest a model for engineers to work with Aboriginal communities which links ethics with best practice. Table 3.1 suggests a model for engineering professionals and Aboriginal communities to work together which is regardful of Country, consultation, inclusion and self-determination.

3.6 Conclusion

The authors of this paper have drawn on their experience as Aboriginal community members and educators, professional engineers and university faculty to look at the intersection of energy engineering with two tenets of Aboriginal culture—connection to Country and community inclusion in decision-making.

The challenges are complex and require engineering project developers to move away from a silo-ed view of Aboriginal cultural heritage beyond being it treated as another 'issue' or 'impact' requiring 'assessment' through a jurisdiction's statutory environmental and planning processes.

All stages of planning and development in an energy (or other) engineering project should be underpinned by respect for Aboriginal and other Indigenous peoples. Respect arguably needs to start in the formative years of a future engineer's schooling, but particularly at university where students are taught to see Aboriginal cultural heritage and engagement not simply as an 'issue' or 'constraint', but as an opportunity. Engineering students should be taught about Aboriginal concepts of Country and outline the benefits of involving Aboriginal communities in all stages of project planning and development. They should also be taught about the importance of Traditional Owners' insights and knowledge—demonstrating cultural respect.

Consider that Aboriginal people do not necessarily need an engineering model to tell them where the best location to place renewable energy might be. Consider that Aboriginal people may not need to be qualified ecologists to know how to best avoid

Table 3.1 Warrigal downs: model for working together

Principle	Links to ethical documents	Practice
Remember the sanctity of working on Country for Aboriginal peoples and humanity	United Nations Declaration on the Rights of Indigenous Peoples (Article 8, 10, 29, 32) The Burra Charter (Article 3) Engineers Australia Code of Ethics 4.3 (Engineers Australia 2018)	Minimise lasting damage to land. Consider the impact on native flora and vegetation Provide sustainable solutions
Respect for country—traditional knowledges and two-way learning	United Nations Declaration on the Rights of Indigenous Peoples (Article 18) The Burra Charter (Article 4) Engineers Australia Code of Ethics 1.3, 4.2	Take time to work with Aboriginal people on Country. Engineers, planners and environmental scientists working with communities who hold traditional knowledge Work with custodians to identify cultural and ecologically significant sites Conduct more research to utilise tradition knowledge in modern applications
Give voice to Aboriginal peoples, recognising right to self-determination	Universal declaration of Human rights (Article 27, 29) United Nations Declaration on the Rights of Indigenous Peoples (Article 3,4, 23) The Burra Charter (Article 2) Engineers Australia Code of Ethics 1.2, 4.1	Work with traditional owners to locate suitable locations to consider cultural and ecological impacts Fully disclose purpose, detriments and benefits of any project Allow right of veto Regime shift to community ownership where possible
Act with respect—listen	United Nations Declaration on the Rights of Indigenous Peoples (Article 19) The Burra Charter (Article 7)	Engage early, regularly and respectfully Consider communication and cultural protocols related to the message Talk to the right person and make information meaningful so consent is truly informed Ensure all who interact with Aboriginal communities are given cultural training
Ensure appropriate remuneration; compensation and right to profit from engineering projects	United Nations Declaration on the Rights of Indigenous Peoples (Article 28) Engineering company rReconciliation Action Plans (e.g. Engineers Without Borders Reconciliation Action Plan 2013–2015) (EWB 2019)	Consider job training and opportunities; providing new amenities or educational opportunities to communities and individuals. Consider, also, a share of profits
Take time to understand culture	The Burra Charter (Article 6) University Graduate Qualities (As defined in Universities Australia 2011)	Work collaboratively, taking into consideration language and decision-making processes

important environmental areas; and consider that Aboriginal people may not need to be qualified hydrologists to know the pathway of water drainage across a landscape. This is not to say that thorough environmental studies should not be undertaken for a project, more that there are different ways of addressing how a project may impact upon any given site.

Despite the decimation through colonisation, Aboriginal people continue to fight for the survival of their culture which remains intrinsically bound to Country. They also continue to fight for their right to be included in decision-making in all developments which are often imposed upon them.

However difficult, working together is possible where there is a due regard for the cultural leadership and knowledge of Aboriginal people in projects which impact upon Country and community. We hope, in the collaborative writing of this paper and case study, we have modelled Reconciliation-in-action and provided a practical, ethical framework for energy engineers working with Aboriginal and other First Nations communities.

> *There is no starting point or endpoint in a circle and therefore all things in the circle have an equal and valid place where there is no 'other' but you are recognised as 'another'.*
> *Karen Martin* (2008) *Noonuccal, Quandamoopah and Bidjara woman*

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