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WARNING: This document may contain images and names of people who have sadly passed away.

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Cover Photo

Bushlight system, Bidan Aboriginal Community West Kimberley (by Bidan Aboriginal Corporation); Rooftop solar (by Australian National University); Wind turbines (by James Prest).

Cover Artwork: 'Seeing Country' by Nyapuru Laurel

Nyapuru Laurel was a Walmajarri artist and educator from the Kadjina Community (part of Millijidee Station) in the Kimberley region of Western Australia on the edge of the Great Sandy Desert. Along with her sisters, brothers and mothers, Nyapuru advocated to set up the remote Wulungarra Community School and, through her work, contributed to the passing on of knowledge of the land, law and culture to future generations. She passed away in August 2015. Extracts from 'Seeing Country' are located throughout the document.

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Acronyms

ACRE: Australian Centre for Renewable Energy
ANU: Australian National University
ARENA: Australian Renewable Energy Agency
CAEPR: Centre for Aboriginal Economic Policy Research
CfAT: Centre for Appropriate Technology
FPIC: free, prior and informed consent
ILUA: Indigenous land Use Agreement
NTA: Native Title Act 1993 (Cwlth)
NTRB: Native Title Representative Body
PBC: Prescribed Body Corporate
UNDA: University of Notre Dame Australia
UNDRIP: United Nations Declaration on the Rights of Indigenous Peoples

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INTRODUCTION

The need to decarbonise energy use and cut emissions is driving investment in large-scale renewable energy projects, including on lands over which Aboriginal Traditional Owners hold rights and interests in north-west Western Australia (Mella et al 2017, Chambers et al 2018). Yet until recently, deployment of renewable energy on Aboriginal communities in these regions has not been widespread, other than at small scales¹ (Byrnes 2016). This paper seeks to provide context and background to recent developments, by orienting the trajectory of a transition to renewable energy on Aboriginal lands in the North-West across three scales. It first examines the case of large-scale projects, including major energy export initiatives. Secondly it looks to the history of small-scale community owned standalone renewable energy systems before, thirdly, discussing current developments in remote utility owned networks.

The prospect of large-scale renewable energy projects being developed on lands over which Traditional Owners hold rights and interests is likely to present risks in the distribution of socio-economic and environmental impacts, as well as opportunities for Aboriginal benefit, through partnerships, equity and ownership, employment, training, sustainable income generation, and potentially through improved access to affordable energy. In Western Australia, the extent to which these benefits will be realized will depend at least in part upon the legal regime governing native title, being the Native Title Act 1993 (Cwlth) ('NTA'). This paper calls for prioritizing the economic inclusion and participation of Traditional Owners in large scale projects. In doing so it proposes that an opportunity exists for governments and the renewable energy sector to make explicit reference and commitment to the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP) and to 'free, prior and informed consent' (FPIC), as a suitable guide to engagement with Traditional Owners in relation to large scale projects. This paper calls for greater levels of support as being immediately advantageous; for the many capable and independent Aboriginal prescribed body corporates ('PBCs') who rightfully hold the predominant stake in economic development in these regions, as well as for those native title representative bodies ('NTRBs') who will likely play a critical role in securing benefit from widely distributed renewable

energy resources.

The discussion then looks to the rich history of Aboriginal engagement with renewable energy at small scales, identifying the origins of the renewable energy transition in these regions as aligning closely with self-determined efforts by many Aboriginal people in seeking to return to Country, throughout the 1980s. It discusses shortcomings in early supplier-led deployments, as outlined in the key touchstone report in the history of renewable energy in remote Australia 'Renewable Energy in Remote Australian Communities (A Market Survey)' (Lloyd 2000), before examining the Australian Government funded Bushlight response (2002-2013). This example represents a positive case study of co-designed, co-operated and community-owned renewable energy services, supported by community energy planning processes and dedicated repairs and maintenance, and backed by Aboriginal innovation in energy demand management.

At the level of remote utility owned networks, recent efforts by the state-owned provider to share the benefits of a transition to renewable energy with a number of larger remote Aboriginal communities in the Kimberley represents a positive step in this process of 'scaling up'. This case study offers an example of a locally adapted approach to benefit sharing, cognizant of both the limitations and the opportunities provided by a shift to renewables in remote, high cost networks.

This paper does not seek to represent the views of Aboriginal peoples in these regions, and acknowledges the spectrum of opportunities for Aboriginal leadership, participation and benefit within the energy transition are undoubtedly greater and more varied than the small number of examples discussed here. Rather, by highlighting a number of unique successes and challenges within a non-exhaustive timeline of Aboriginal participation in renewable energy development across scales, from small to large, this paper seeks to contribute context and background to the trajectory of the energy transition currently underway in Australia's North-West.

¹ The Clean Energy Regulator defines 'small-scale' as installations of less than 100kW in size.

BACKGROUND

Regional Setting

The site of Australia's earliest human habitation, and home to the oldest living cultures in the world, the Kimberley and Pilbara are a vast, culturally and resource rich area encompassing more than 932,413 square kilometres, in the remote north-west corner of Western Australia. Aboriginal people comprise a significant proportion of the population of both regions, whose recent history includes the return to Aboriginal Traditional Owners, through diverse forms of land title, large areas of ancestral lands; 'Country' on which Aboriginal people are known to have lived sustainably for at least the last 50,000 years (Jebb 2003, Veth 2019). The violent appropriation by the British Crown of Aboriginal land and resources, and the systematic disruption of Aboriginal socio-economy in these regions, began with the introduction of the colonial pastoral industry in the latter half of the nineteenth century (Jebb 2003). This ongoing process of dispossession was accompanied by punitive, discriminatory systems of control, including the forced removal of many Aboriginal people to reserves and missions² (Paterson 2015). By the late 1960s, the decades long practice of labour exploitation of large groups of Aboriginal people on pastoral stations, often on their traditional lands, was altered with the introduction of the Pastoral Award (1966-1969) (Anthony 2004, Morphy 2010). The reaction of many pastoralists to this guarantee of an award wage to the Aboriginal workforce was one of widespread retrenchment, displacing many people further, as Aboriginal workers and their families migrated to larger communities and reserves nearer to regional townships (Kolig 1981).

Resistance to these unyielding colonial impacts included the consistent struggle by Aboriginal people for legal and moral recognition of their rights to lands and waters, and to Aboriginal self-determination and autonomy. From the 1970s onward some Aboriginal groups in Australia became increasingly successful in this fight to take back their land, and in 1976 the Commonwealth Government passed through parliament land rights

legislation over the Northern Territory - the Aboriginal Land Rights (Northern Territory) Act 1976 (Cwlth). This began the process of recognising, via a non-Indigenous regime of law, the continued collective ownership of Country by Traditional Owners in the Northern Territory. While in Western Australia the Aboriginal Land Trust (ALT) was created in 1972 to hold title to lands reserved for Aboriginal use, recognition of land rights was not progressed further during this period and the Western Australian Aboriginal Land Bill, proposed in 1985, did not pass both houses of Parliament. Further, as Sanders notes:

Aboriginal reserves, covering about 10 percent of this large jurisdiction, have remained outside the rateable land base of local governments though formally within their incorporated land bases. This has meant Western Australia's many discrete Indigenous communities have developed little relationship with their encompassing local governments and have looked to other public authorities to assist them with infrastructure and public order (Sanders 2020:133).

In 1992 the landmark Australian High Court ruling of *Mabo v Queensland (No. 2)* overturned the fiction of 'terra nullius' and recognized the fact that Indigenous peoples had lived in Australia for thousands of years, enjoying rights to their lands according to their own laws and customs. It ruled that Aboriginal and Torres Strait Islander property rights, termed 'native title', could survive colonial annexation, and in the following year the Native Title Act 1993 (Cwlth) (NTA) was enacted, bringing land reform, including to Western Australia, with its implementation. The NTA provided the mechanism under which Aboriginal and Torres Strait Islander peoples could demonstrate their ongoing connection to lands and waters, and as a consequence enact their native title rights. In order to claim native title, Aboriginal claimants were required to show that their traditional Law and customs in relation to rights and interests over eligible land had continued since colonisation. Speaking of the Kimberley in this regard, Kinanne notes:

² The traumatic government policy of forced removal and segregation occurred in WA for more than a century. In 1958 about 25 per cent of all Kimberley Aboriginal adults and 45 per cent of all Kimberley Aboriginal children were living in missions <https://www.kimberleystolengeneration.com.au/about-us>.

This would not have been possible without the continuing expression of and practices in Traditional Law and culture that forms a foundation of the cultural, spiritual, social, economic and governance fabric of the Kimberley. This (land rights) recognition, and the cultural foundations that underpin it, has not been achieved without great struggle and in the face of significant social, economic and cultural trauma sustained by over a century of colonial impacts (personal communication 2019).

Many of the settlement patterns established during this period of dispossession, displacement and more recent repossession (Altman 2012) are evident today, with residents living in communities ranging from smaller remote outstations, larger gazetted communities (often on the site of earlier missions and ration depots) regional townships and town-based Aboriginal reserves (Thorburn 2017). There remains a high degree of residential mobility between these locales, with many people choosing to move temporarily or permanently between town and community life (Morphy 2010). Legacy regimes of energy service provision continue to differ markedly within each of these contexts (RSRU 2016).

Living conditions remain challenging for many Aboriginal people in the Kimberley and Pilbara. Host to large-scale international extractive investments for the export of energy and mineral resources, these regions contribute significantly to the wealth of WA and the nation (SERC 2018). However Aboriginal benefit from the export of these non-renewable resources has been uneven and median incomes remain between a quarter and a third those of non-Aboriginal residents (Cleary 2011, Taylor and Scambary 2005, Taylor 2006, Taylor 2018). The high costs that typically constrain the uptake of renewable energy, apply broadly to the costs of daily life, and these regions have typically recorded the highest prices for goods and services in Western Australia over recent decades (Taylor 2018, RSRU 2016, RDA 2018, WACOSS 2018). Public housing accounts for most dwellings in remote Aboriginal communities and while housing quality varies, it is often overcrowded and invariably energy inefficient (Dwyer and Vernes 2016). Many Aboriginal communities and town reserves have experienced a lesser standard of municipal and essential services than settlements elsewhere (RSRU 2016). The ongoing impacts

of colonisation are evident in myriad ways, including in the interaction between Aboriginal people and those who seek to pursue development in these regions. These relationships are often characterized by asymmetries in legal power, political influence and financial resources (Langton 2010).

Energy Context

Energy is defined as the capacity for doing work of one kind or another. A key driver of economic and human development and social equity (Boudet 2019, Chatterjee 2019), energy is a “material prerequisite to achieving valued capabilities” (Day et al 2016:259). It is both ubiquitous and obscure, “since it is ‘doubly invisible’- an intangible force governed by unobtrusive habits” (Lazowski 2018:2).

Aboriginal and Torres Strait Islander peoples were Australia’s first users of energy, renewable on a human timescale, burning fuel-wood for the practical purposes of cooking, heating and lighting, while maintaining deeply held understandings and ontologies related to the sun, winds and waters, as expressed in their languages, Law, songs and stories. Many of the contemporary foundations of Aboriginal empowerment are intrinsically linked to energy, including economy, education, health, connection to Country, housing and food security. The most pervasive of energy ‘carriers’, electricity “whose main benefit is its multitude of uses” (Lofquist 2020:2), provides essential services, such as the pumping of water, the storing of medicines, the preparation and cooking of food, the ability to wash clothes, bedding, people. Electric lighting, heating, space cooling, access to information technology, each are supported by access to electricity, and enable many healthy living practices in the home. Accessing reliable, affordable and culturally appropriate energy services can assist communities pursue valued activities on Country, for their own enjoyment and in connection with commerce, including tourism, art- making, agriculture, aquaculture and land care enterprises. Energy can be used as a production input or traded as a commodity.

Far from the transmission infrastructure that characterizes the east-coast of Australia and represents more than a century of investment by the State, extant energy services in the North-West have evolved in ways that reflect a unique geography, demography and history. As

Bouzarovski notes, a lack of transmission infrastructure in remote regions is often a cause of energy injustice in otherwise rich countries, and “more technologically advanced networked forms of energy provision are often absent in large tracts of states that are conventionally labelled ‘developed’” (2018:3). An interconnected electricity network services the resource industry operations of Port Hedland, Karratha and associated townships. Kununurra, Wyndham and Lake Argyle form a connected network. Construction of Lake Argyle and Lake Kununurra for irrigation and hydroelectricity in the latter half of the twentieth century was done without reference to, or consultation with Aboriginal Traditional Owners, and resulted in devastating impacts for resident Aboriginal populations (McLean 2015).

Large parts of both the Kimberley and the Pilbara remain non-interconnected and are serviced by ‘off-grid’ energy systems. The off-grid sector is made up of two sub-sectors. Historically, the Remote Area Essential Service Provision (RAESP) program has provided energy services to the more numerous but less populous smaller remote Aboriginal communities. State-owned energy utility Horizon Power is the distributed network service provider for the larger regional towns, and a small number of large discrete Aboriginal communities. In most instances power generation has relied upon the recurrent provisioning of costly gas and diesel fuels, with increasing shares of renewable energy incrementally integrated within remote networks. The division of jurisdictional accountability between the Commonwealth and the state for the funding of essential services in Aboriginal communities represents a fractious history of negotiating differing views of responsibility (EHSC 2007). In addition to this legacy of division between the Commonwealth and the state in relation to support, Aboriginal residents face a number of additional cross-cutting issues which add to the complexity and the cost of realizing reliable and affordable energy services. As described by Dwyer and Vernes “Aboriginal households in these remote areas are often times burdened by both structural (weather³, poor quality housing, fixed high energy use appliances) and socio-economic factors (overcrowding, family structure and mobility, and low income households)” (2016:7).

³ There is a strong seasonal component to energy use in these regions; during the ‘hot-dry’ and ‘wet’ seasons daytime temperatures regularly exceed 40 degrees and household energy demand may be double that of the ‘cool dry’ season.

Large-scale projects and the Native Title Act 1993 (Cwlth)

Energy demand in south east Asia is projected to grow at twice the global average over coming decades (IEA 2019). Meeting future energy demand from zero-emissions sources will be important if we are to limit the worst effects of climate change (Baldwin 2019). Three of Australia’s largest trading partners – China, Japan and South Korea – have committed to net-zero emissions by mid-century (Macdonald-Smith and Fowler 2020). In Australia favourably co-located solar and wind resources in specific locations considered proximal to growing markets are increasingly suggested as underpinning a radical opportunity; the generation and export of renewable energy at a scale that could transform Australia’s energy trading relationship with the world, while having a far greater impact on reducing global carbon emissions than is possible domestically (ABARES 2010, Garnaut 2018, Baldwin 2019, Blakers et al 2012).

Combining the global supply chains and capital-intensity seen in oil and gas projects, with the landscape-wide scale of operation previously associated with pastoralism (Csomos 2015, Pickl 2019, Roth et al 2018), a number of giga-watt scale solar and wind ‘farms’ are currently in various stages of planning, financing and approval in remote parts of north Australia (Chambers 2018, Thorburn et al 2019). As well as renewable electricity, these projects are increasingly aimed at the downstream production of hydrogen and low and zero emissions derivatives – ‘green fuels’ emerging as important clean energy commodities seen as key to decarbonizing the ‘hard to abate’ sectors of heavy industry, such as steel production (Beck et al 2019).

In considering the risks and opportunities presented by large-scale renewable energy developments, native title represents an important asset which Aboriginal Traditional Owners can potentially leverage to deliver social and economic outcomes (O’Faircheallaigh 2015, O’Neill 2014). With most native title claims now determined in the north-west⁴, each successful Aboriginal native title claimant group has established a prescribed body corporate (‘PBC’), the legally required corporation that holds land title on behalf of the group. A number of these organizations are building capacity with a view to Aboriginal equity and employment within

⁴ National Native Title Tribunal (2019).

industries associated with the advent of large-scale renewable energy projects (Chambers 2018).

The extent to which benefits for Aboriginal Traditional Owners are likely to be realized in large scale renewable energy project development, will depend at least in part upon the legal regime governing native title, being the Native Title Act 1993 (Cwlth) (NTA). The NTA sets out the procedures regulating how developments may be undertaken, and requirements likely range from weak procedural rights for small developments through to the requirement that proponents negotiate comprehensive Indigenous Land Use Agreements (ILUAs) for more complex proposals (O'Neill, Thorburn and Hunt 2019). Much of the literature on agreement making to date relates to the extractive industries and has rightly focussed on the often unequal bargaining relationships between developers, government and Traditional Owners (O'Neill 2014, O'Faircheallaigh 2015). Thorburn, O'Neill and Hunt observe that while the nature of impacts and opportunities attending large-scale renewable energy projects will likely differ from extractive industries in important ways – exploiting a non-depleting asset with a wide spatial distribution from sites that may be repowered long into the future – many of the legal, economic, informational and political asymmetries identified in relation to extractive industry agreement making provide a useful referent in evaluating the potential of large scale projects to contribute to Aboriginal development aims (O'Neill, Thorburn and Hunt 2019, Thorburn et al 2019).

In an empirical study examining the factors affecting Indigenous benefit from extractive projects, O'Faircheallaigh points to the drivers of benefit as being; the prevailing legislative regime and whether it favours Aboriginal interests, the political capacity of Traditional Owners to insist companies meet their obligations, the economics underpinning the specific development proposal, and the extent to which proponents are committed to principles of corporate social responsibility (O'Faircheallaigh 2006). Research has shown that broader benefits for landholders are more likely if Traditional Owner groups are well-resourced and well informed so as to meaningfully engage in development processes, and that developments are progressed in ways reflecting community priorities, including equity and ownership (O'Faircheallaigh 2006, Trebeck 2007).

The obligation for governments and companies to engage with Indigenous peoples impacted by large-scale development is also recognized in international law. Of particular relevance is the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP). The UNDRIP affirms that States are to consult and cooperate in good faith with Indigenous peoples through their own representative institutions in order to obtain their free, prior and informed consent in relation to developments that may affect them (UNDRIP 2007). Colchester defines FPIC thus:

The right to participate in decision-making and to give, modify, withhold, or withdraw consent to an activity affecting the holder of this right. Consent must be freely given, obtained prior to implementation of such activities and be founded upon an understanding of the full range of issues implicated by the activity or decision in question; hence the formulation: free, prior and informed consent (2004:8).

Maynard observes the UNDRIP's FPIC obligations "are the best available operationalisation of self-determination in the context of native title rights and interests because of their conformity with self-determination and their jurisprudential pedigree in international law" (Maynard forthcoming 2021). There are compelling reasons companies should fully endorse the UNDRIP and respect FPIC rights, even where not yet explicitly mandated in domestic legislation. Actualizing FPIC processes have the clear benefit of reducing financial, legal, operational and reputational risk for companies and their investors (GCN 2020, Stefanelli et al 2019, HESTA 2020). Governments too should strengthen policies and resourcing to ensure processes that uphold the UNDRIP and respect free prior and informed consent rights, in any effort to prioritize the engaged participation of Aboriginal people and their representative bodies in large scale projects (O'Neill et al 2019, Maynard 2021, AIATSIS 2020). Greater levels of legal, technical, financial, scientific and environmental support, in order to better enable the exercise of Indigenous rights, would be immediately advantageous for the many capable and independent Aboriginal PBC's who rightfully hold the predominant stake in economic development in these regions, and for those NTRBs who

will likely play a critical role in securing benefit from widely distributed renewable energy resources.

In addition to large export oriented initiatives there are likely to be innumerable opportunities for Aboriginal involvement, leadership and benefit from renewable energy development in an off-grid environment where many communities have faced unique and longstanding challenges to realizing energy security. Looking to the history of small-scale standalone renewable energy services, and to recent developments in remote utility owned networks, this paper now examines community-scale approaches to renewable energy development in the North-West, and the pathways to benefit that these can offer Aboriginal people and communities in these regions.

A history of small-scale standalone off-grid applications

Early deployment

With the granting of sub-leases and excisions from pastoral stations in these regions through the 1970s and 1980s, many Aboriginal people made self-determined efforts to resettle on Country, returning to their traditional lands and kin-based communities with the support of land councils and representative organisations (Altman and Markham 2015, Thorburn 2017). This necessitated the generation of electricity onsite, often to satisfy relatively modest energy needs⁵. Generators- diesel engines coupled with electrical alternators⁶ - had a number of advantages that made them a practical alternative for both communities and funding bodies⁷. Requiring relatively modest up front capital expenditure, generators are easy to deploy to remote sites and

⁵ Early (1997) Australian Greenhouse Office (AGO) reports suggested the average daily electricity consumption in remote Aboriginal households as being around 6 kWh per person per day. By 2000, Anda et al (2000) found that energy efficient remote Aboriginal households may use less than 10kWh per day under the right circumstances. Household energy use across northern and central Australia has increased significantly since this time with the ubiquitous use of air-conditioning to maintain thermal comfort.

⁶ The Diesel Fuel Rebate Scheme (DFRS) was introduced in 1982 to allow eligible parties to claim back the diesel excise for 'off-road' use- and eligible parties included miners, users of diesel for heating, lighting hot-water, air-conditioning and cooking for domestic purposes.

⁷ Including the Aboriginal and Torres Strait Islander Commission (ATSIC)-the first national representative body to give Aboriginal and Torres Strait Islander Australians decision making capacities (1990-2005).

are based on the familiar technology of remote area transport- diesel engine light and heavy vehicles. This form of electricity generation also had one significant risk that would come to play an outsized role in the history of Aboriginal community development following the fuel price shocks of the 1970's - the punitively high life-cycle cost of diesel fuel to sustain ongoing operations. As noted by the Western Australian Education and Health Standing Committee:

'...liquid fuels such as diesel will form the core economic input for many future economic ventures being considered by Indigenous organisations in remote regions of WA' (Education and Health Standing Committee 2008 p.99).

In this context off-grid renewable energy systems were early thought to hold much promise as a remedy, and the first systems were deployed by the late 1980s⁸. As an indicator of both a level of expertise and commitment, in 1992 then Premier Carmen Lawrence publicized the funding of "transportable solar power supplies for 50 remote and semi-nomadic Aboriginal communities" in support of the City of Perth's bid to host the United Nations Centre for Applications of Solar Energy (WA Govt 1992). Many of these early package or 'one size fits all' renewable energy systems were similarly deployed to Aboriginal communities in remote parts of the Northern Territory, Queensland and South Australia (Lloyd et al 2000).

Communities faced a host of challenges in maintaining these early systems because they were expensive (Blakers and Diesendorff 1996, Blakers 2000), distant from reliable technical support, and poorly understood compared to the diesel generators they supplemented or replaced (Lloyd et al 2000). By 1998 the Aboriginal and Torres Strait Islander Commission (ATSIC), the WA Ministry of Housing and the WA Aboriginal Affairs Department were each made aware of the high number of failures of renewable energy systems in remote Aboriginal communities in WA (Lowe et al 2001). While these experiences are particular

⁸ This was within the context of significant fuel price shocks in the late 1970s. A small solar system was deployed at Ngurawaana community in the Pilbara by March 1985, which would develop into the 'Solar Pack', a system that would be widely deployed in remote Aboriginal communities during the late 1980's.

to this context⁹, they accord broadly with observations regarding the interconnected challenges facing rural electrification programs (Anantharajah 2019). Projects are often hampered by distance from suppliers and technical know-how, while low population densities impede achieving the necessary scale to bring down costs (Inthalyeme 2019). Efforts to standardize componentry may in some cases be at odds with the efficiencies of engaging a diversity of suppliers, while the imperative to aggregate servicing must be reconciled with community preferences for flexibility and responsiveness. Costs are higher in remote areas, and the savings from deferring or avoiding investment are greater. Maximising renewable energy contributions requires a concomitant increase in the capital costs of battery storage or demand management while system designs that rely on longer generator run times have trade-offs in respect of the necessary ongoing commitment to year-round fuel provision.

The critical need for the informed inclusion and engaged participation of Aboriginal residents and communities in all stages of technology deployment proposed for their benefit is a key, often-times underestimated factor in determining how these tensions are resolved in practice.

The ACRE report (2000)

In 2000 the Australian Cooperative Research Centre for Renewable Energy (ACRE¹⁰) in collaboration with the Centre for Appropriate Technology published 'Renewable Energy in Remote Australian Communities (A Market Survey)' by Bob Lloyd, David Lowe and Laurence Wilson. The report provided a unique snapshot of the state of renewable energy deployment on Aboriginal communities at the time, noting high costs, poor reliability¹¹ and the lack of a dedicated repairs and maintenance program. The authors observed a crucial

mismatch- between community and household energy demand and the capacity of newly installed systems to reliably meet the relatively modest expectations of many residents (Anda et al 2000). The authors offered a suite of recommendations, a non-exhaustive selection of which includes:

- much greater involvement of residents in decision-making through community energy planning processes, in order to better design energy services reflective of community priorities
- greater accountability to communities in the form of quality assurance of installations¹², and education and training for residents
- a dedicated repairs and maintenance service for Aboriginal communities.

The findings of the ACRE report are congruent with observations by Painuly (2001) that the lack of comprehensive involvement of stakeholders in decision making can often frustrate community aims and priorities in the deployment of new technology, and that estimations of cost and quality are contextual. The ACRE report provides a record of the high priority given by residents to the qualities of reliability and equity between households, over more conventional industry aims related to performance. This accords with the observation by Dornan and Jotzo (2012) that the 'software' of comprehensive community engagement may be overlooked in favour of 'hardware' in technology deployment (see also Jafar 2000). Inthalyeme (2019) would later summarize this as meaning that "people, place and communication matter" and that "two-way learning"- between technology contractors, communities and service providers- is essential to successful implementation of clean energy technology on community.

Despite significant government investment over more than a decade, the ACRE report detailed the ways in which many early renewable energy projects were misaligned to community expectations, manifest in lost productivity and the subsequent setback of long-held community development aims (Lloyd et al 2000). The high costs associated with deployment to these

⁹ Noting that a contemporaneous study by the WA Department of Energy, which conducted a telephone survey of mainly pastoral properties participating in the State Government's Remote Area Power Supply (RAPS) rebate scheme (in operation from late 1996), found that 78% of those interviewed were satisfied with the operation and output of their renewable energy (mostly solar photovoltaic) systems.

¹⁰ ACRE operated from July 1996 – December 2003. Some aspects of ACRE's work continued on as the Australian Centre for Renewable Energy Ltd until June 2004, after which its remit was continued by the Research Institute for Sustainable Energy (RISE) and Murdoch University Energy Research Institute (MUERI).

¹¹ Of those remote Aboriginal communities surveyed, 64% of systems were reported as operational at the time of survey and 61% reported recent operational issues.

¹² It should be noted that improved accreditation for remote installers was assisted by the release of new standards for remote stand-alone power systems by Standards Australia in 1999, relating to Safety Requirements (AS 4509.1-1999) and Installation and Maintenance (AS 4509.3-1999).

remote locations made system remediation and recovery similarly costly, and many early installations remained on community long after their useful life had ended- a material and experiential backdrop for subsequent deployments.

Bushlight: Aboriginal innovation and energy demand management

Initiated in response to the findings of the ACRE report, the Australian Government funded Bushlight project (2002- 2013) was a socio-technical approach to co-designing community-scale standalone renewable energy services with Aboriginal communities across North Australia. Delivered through the national Aboriginal science and technology organization the Centre for Appropriate Technology (CfAT), Bushlight was premised on the understanding that the privileged position of the technology provider could lead to misplaced assumptions if not built upon the informed participation of Aboriginal communities as equal partners throughout the entire project life-cycle (CfAT 2012).

Proposing that meaningfully engaging residents through comprehensive community engagement would result in the appropriate design and informed use of energy services, Bushlight used a 'bottom-up' approach that prioritized community participation as a practical way of negotiating risk and addressing local priorities, through a process known as community energy planning (McKenzie and Howes 2006, Walsh 2002, Conrad and Campbell 2008). Based on consent and reciprocity, effective community engagement is often cited as best initiated early and tailored to the specific needs of a community, with the aim of building meaningful, long-lasting relationships (Lane and Hicks 2017). Recognized as an important means of identifying and achieving local aims community engagement is valued for its ability to build community support and resolve or mitigate opposition to specific projects (McKenzie and Howes 2006, CEC 2019). In examining the sustainability and transformative potential, via community engagement, of renewable energy services, Baudish and Bruce observe that despite community engagement being regularly recognized as an important element in technology deployment:

...there is a lack of detail in the literature concerning the practical realities of community engagement and the specifics of community engagement activities during mini grid deployment. Furthermore, there is an absence of evaluation of these activities and minimal discussion concerning conceptual approaches and rhetoric around community engagement (2015:3).

Community energy planning is a form of participatory planning that has been used successfully in Canada, where decisions that had previously been left to regional or state level energy agencies have been considered through the lens of community planning processes (Denis 2009). Adapted to local circumstances and the lived experience of residents, community energy planning privileges local decision making, in this case through the use of culturally and linguistically appropriate text and non-text based resources¹³. This approach accords with what Kukutai and Walter (2015) describe as 'recognizing other ways of knowing, building mutual capabilities and seeking to prioritize indigenous decision making' or what Yap and Yu practically identify as 'prioritizing local knowledge and insight' (2016). Walker, Simcock and Day describe community energy planning thus:

In energy terms this means asking, within a given societal context, which energy uses matter and are essential for well-being and quality of life. Energy itself is only ever an instrumental good; it is what energy is for and used to achieve that matters to well-being (2016:129).

Stephenson et al (2010) refer to such processes as seeking to gain an understanding of 'energy culture' – gaining a nuanced understanding of the material culture and everyday experience and practice of residents in relation to energy and its use within the home. Co-designed with communities, an innovative approach to managing household energy demand was developed, supporting residents through the use of an in-home energy display, known as an EMU (energy management unit). EMU's enabled daily household energy budgeting for essential and discretionary energy needs and realized substantive

¹³ See <https://cfat.org.au/bushlights-community-energy-planning-model>

household and community energy-efficiencies (CfAT 2013). The use of an 'essential' energy circuit put a floor, or minimum service level, under energy demand, mitigating the potential for houses to completely 'disconnect' from energy services by ensuring continued service to a limited number of essential energy needs, commonly identified as being refrigeration, lighting and critical medical devices (CfAT 2012).

The project sought to complement quality installations by building upon those capabilities extant within communities and service providers, through the provision of education and training resources and a dedicated nationwide repairs and maintenance program. The Commonwealth's Family and Community Services commissioned an independent review of the project which reported:

- an excellent community energy planning process had been designed, supported by a wealth of simply presented, understandable information resources
- communities had access to an integrated network comprising community support agencies¹⁴, qualified service providers and technical support
- system operators and other support staff received extensive training on system operations and basic maintenance (IT Power 2005:14).

Stapleton and Watt found that a community energy planning approach was "more likely to provide sustained energy services and encourage community empowerment at a competitive life-cycle cost per person when compared with conventional practices" (2006:2). When supported by a dedicated repairs and maintenance program, community owned standalone renewable energy services were found to bring significant social, economic and environmental benefits to 39 smaller remote living communities in the East and West Kimberley. Systems with high renewable energy fractions reduced or eliminated household and community energy costs, enabling residents to live sustainably on land with social, cultural or economic value to them, and supporting a diverse range of livelihoods on Country (CfAT 2013). Between 2002-2013, CfAT's Bushlight project built more than 140 renewable energy services in remote

Aboriginal communities across Northern Australia, providing regionally-based repairs and maintenance services to more than 275 community renewable energy services.

Funding for the Bushlight project was discontinued in 2013¹⁵. Many of these systems continue to provide reliable energy services maintained by the Australian Government's Outback Power program, through Aboriginal community-controlled organisations or by communities themselves.

Remote utility owned networks

Background: From 'chuck-in' to regularization and 'smart' prepayment meters

Regional towns and a number of the larger more populous remote Aboriginal communities in the North-West are provided energy services by the state owned regional energy provider, Horizon Power. Electricity in these regions has often been amongst some of Australia's most expensive to generate due to high underlying fuel and transport costs, and per capita energy consumption is typically high, especially during the hot summer months (AECOM 2014). These high costs are typically not fully met by revenues recovered and Community Service Obligations (CSOs) paid to the utility subsidize the shortfall. Tariff equalisation contributions support a state-wide uniform tariff policy, ensuring that retail energy prices are equal to those paid elsewhere in the state (BCEC 2016, Horizon Power 2019).

Early in their history many discrete communities and Aboriginal reserves were metered singly at their perimeter boundary. Within the context of a transition toward a 'user pays' model for energy services on remote communities, household contributions toward the payment for energy services were often made through a system known locally as 'chuck-in' (EHSC 2008). Implementation varied from semi-formal arrangements involving deductions as part of rent payments, via

¹⁴ Many capable Aboriginal controlled resource agencies and service providers were deploying and operating renewable energy projects during this time, notably Mamabulanjin Aboriginal Corporation in WA and Layhnapuy Homelands Aboriginal Corporation in the NT.

¹⁵ Building upon the work of the Bushlight program the Regional Indigenous Energy Program was a \$40m fund to construct 50 new renewable energy systems in remote Aboriginal communities. A small number of systems were commissioned before RIEP was discontinued with the repeal in July 2014 of the Clean Energy Future Plan as part of the repeal of the Clean Energy Act (2011).

income or welfare receipts or through the physical collection of monies from households (Dwyer and Vernes 2016). In recent decades an ongoing program of 'regularization'¹⁶ has been underway in remote communities and town reserves, improving household and community energy supply and increasing electricity metering, including 'prepayment metering' at the level of the individual household (ACIL Allen 2009). Importantly, regularisation has enabled residents to access state government concessions and energy rebates that were previously inaccessible.

While uncommon in the National Energy Market the use of prepayment metering is common in remote Aboriginal communities in Queensland, the Northern Territory, South Australia and Western Australia (McKenzie 2013). Residents purchase energy 'credit' through participating retailers, including community stores, prior to energy being made available in the home. Participation is on an 'opt-in' basis. Previous surveys, including a number in Kimberley communities, have reported a preference for prepaid metering over post-paid billing arrangements (SECA 2008). Prepayment can appeal to utilities and residents for different reasons, a number of which overlap. Through prepaying for energy services, households report being able to avoid running up unsustainable debts and avoid costly disconnection and reconnection fees, while the utility avoids the accrual of bad debts as a result of non-payment (ACIL Allen 2009).

Prepayment's chief risk, 'running out of credit' for energy services, is described within academic and energy policy literature as 'self-disconnection' (Rocha et al 2019). The use of the term 'self-disconnection' misrepresents the relationship between multi-dimensional poverty and energy access as Rocha et al observe:

the misleading use of the term 'self-disconnection' is problematic because it erroneously implies that households have agency and are making a voluntary choice to disconnect themselves (2019:274).

Here we adopt the term 'involuntary self-disconnection' as accurate (Klerck 2020, NTCOSS 2019). It is important to note that there are very few descriptions of the lived experience of Aboriginal residents in relation to prepayment, nor of the implications of 'involuntary self-disconnection' upon wellbeing. The work of Dwyer and Vernes (2016) is one, observing the social relations regulating the interaction of the energy system with the community, in the largest Aboriginal community in Western Australia, and Dwyer's home, Bidyadanga south of Broome.

Through autoethnography¹⁷ and semi structured interviews, the authors outline the complexities of energy payment systems from the perspective of residents, noting that in the past, prepayment had been repurposed for a diversity of aims relating to exchange and reciprocity. Dwyer and Vernes examine the ability of energy payment systems to either inhibit, or encourage, a variety of cultural practice¹⁸ - whereby an earlier form of prepayment, 'powercards', are used to discharge obligations, to fulfil contributions, to be gifted, borrowed, traded, stored or used for arbitrage, thereby distributing energy costs in unanticipated, often cooperative ways. Noting the adaptive capacity of residents, and the placing of these developments historically, within a timeline where the expectations and obligations related to the payment for energy services in remote communities has been changing over recent decades, the authors note:

In recent years things have changed for the people in Bidyadanga, especially the way utilities are provided and paid for, including electricity payment systems. Changing from the 'chuck-in' to individual household responsibility for power has led to changing cultural practices for example people having to ask for money ... to make ends meet. In some cases where households have no funds to pay for power, or supply has been disconnected, power cords are strung up between houses to 'borrow' electricity, or a family might allow other families to move into their home when the power is cut-off (Dwyer and Vernes 2016:14).

¹⁶ The Aboriginal and Remote Communities Power Supply Program (ARCPSP) was a joint project between Horizon Power and the Office of Energy funded by the WA and Commonwealth Government to improve the quality and reliability and supply of electricity to Aboriginal and remote communities. It sought to redress inequality issues by enabling access to a State-wide uniform tariff and government concessions and rebates (ACG 2009).

¹⁷ Autoethnography uses qualitative and personal experience to connect narratives to wider cultural, political and social meanings (see Adams, Jones and Ellis 2015)

¹⁸ See Jon Altman (2011) 'Genealogy of demand sharing: from pure anthropology to public policy' in *Ethnography and the production of anthropological knowledge*. ANU Press.

Residential mobility also evidently interacts with the experience of accessing energy services. Community members may be simultaneously members of a larger remote community where they commonly reside, have obligations toward one or more nearby outstations serviced under the RAESP program and obtain necessary provisions or have familial connections in a distant regional town. Each circumstance has a requisite understanding and accommodation regarding the provision and payment for energy services:

With the advent of different systems operating across different communities, if people leave to go to another town or community with a different system, they can find it difficult to understand how to fit in and pay for bills etc (2016:14).

Dwyer and Vernes' unique contribution is to suggest the benefit of deep community partnering and engagement in determining community preference in relation to paying for energy services. In seeking to describe the entwined nature of energy within broader structures of community networks, and its relationship to wellbeing¹⁹ this echoes the observation by Yap and Yu that:

Individuals all live as part of a community and so the contribution of the community collectively to the wellbeing of an individual and how the individual contributes to the collective wellbeing of the group to which they belong, are all omnipresent in the conceptualising of wellbeing (2016:320).

Based on interviews conducted with residents in 2016, Dwyer and Vernes' work speaks to the importance of gaining an understanding of, and appreciation for, Aboriginal perspectives relating to benefit and risk within the energy transition in the North-West. Their work also takes place during a consequential policy transition in the region, as four decades of policy consensus under which the Commonwealth funded remote Aboriginal housing, energy and water services was overturned (Sullivan 2016, Kagi 2014, Emerson 2014, RSRU 2016). The initial response of the Western Australian Government was to

first insist that it could not provide services for all remote communities and then to differentiate two groups of communities by location and policy direction:

one was '37 town-based reserves across 20 towns' with 'up to 3,000 Aboriginal residents'. For these, the policy 'direction' was to 'receive the same service opportunities, and share the same payment responsibilities, as other residents of the relevant town'. The other group was 274 'remote communities' (with about 12,000 residents), in these communities the policy direction was 'progressively to meet minimum standards' (Sanders 2020:134)

As Sanders notes 'while cast positively, this was in fact a threat to withdraw infrastructure support by the Western Australian Government for most of the remote communities it then identified (274) or claimed to help service (165). Only 50 of these communities with over 50 permanent residents were clearly admitted to the 'larger' category, and beyond this, the Western Australian Government's commitment was weak' (2020:134).

Locally adapted approaches to benefit sharing in the transition to renewables

Locally, as globally, the cost of equipment to generate renewable energy²⁰ has fallen precipitously over the last decade. Despite policy uncertainty at the federal level, increasing shares of renewable energy are being integrated within remote networks in Western Australia (IRENA 2019, ARENA 2019 Horizon Power 2019). Horizon Power has been trialling technologies to manage renewable energy and reduce power generation costs within previously wholly diesel-powered networks, in the Kimberley Aboriginal communities of Yungnora, Djarindjin/ Lombadina, Kalumburu, Ardyaloon, Warmun, Beagle Bay and Bidyadanga (Horizon Power 2020 (2) (3)²¹).

20 Noting that renewable energy from the sun or wind is intermittent and generally requires augmentation by storage or generation management to ensure the security and reliability of the larger network to which it is connected.

21 In remote utility owned networks, recent innovations in advanced prepayment metering have enabled community residents with access to a smartphone to monitor household energy demand and purchase energy 'credit' through a smartphone application (Horizon Power 2020 (4)). In 2020, within the context of the COVID-19 crisis, this enabled the provider to automatically apply bill relief to participating households and eligible customers were able to access one hundred dollars in emergency energy 'credit'. Additionally, credit would turn household power back on in the house

19 Dwyer uses the term 'liyan' in reference to wellbeing. Senator Patrick Dodson, a senior Yawuru man describes liyan as 'embodying the interconnectedness between a person's sense of self, the wider community and the natural landscape' (see also Yap and Yu 2018).

In addition to the integration of four megawatts (MW) of centralized solar, the utility has incentivized local Aboriginal corporations in the uptake of distributed renewable energy resources by partnering in the installation of rooftop solar on community owned buildings, a scheme known as 'Solar Incentives'. Up-front capital costs, long identified by many Aboriginal communities as a barrier to uptake, are lightened by thirty percent co-funding to a maximum of \$100,000 and complemented by access to a chattel mortgage product²². A variable pricing structure provides individual renewable energy buyback²³ offers aligned to those generation and distribution costs defrayed by the transition away from fossil fuels (Byrnes 2016).

By incentivizing investment in this way, more than 900kW of distributed rooftop solar on community buildings has been integrated into these networks. Three of the earliest communities to invest expect a payback period of less than five years. Displacing costly and environmentally damaging diesel fuels, it is expected that the program will reduce carbon emissions by two thousand tonnes per year (Matich 2020). An example of partnering through a locally adapted approach to co-investment, this can bring benefit to the community and to the provider, subject to the community's cost of capital and connection charges. As Byrnes notes "the inverse relationship between community and network service provider returns, requires a trade-off between providing sufficient incentive to stimulate renewable energy deployment and

ensuring total supply cost is reduced" (2016:15).

Increasing the uptake of renewable energy in remote networks can be seen to reduce reliance on legacy state subsidisation and costly imported fuels and can create opportunities for Aboriginal employment and capacity building (WAG 2017). Importantly, engaging communities in decision making ensures investment reflects community priorities, while returns from energy costs avoided can enable choice in the redirection of funds as Bidyadanga CEO Tanya Baxter reports on the Horizon Power website:

Tens of thousands of dollars the community will save on its power bills as a result of the solar can be invested back into the community to benefit residents. We would ultimately also like to see solar on the roofs of houses in the community, to help individuals reduce their power bills (Horizon Power 2020 (3))

There remain a number of constraints to the uptake of residential rooftop solar for Aboriginal households in the North-West. Benefitting through renewable energy buyback schemes is made more difficult for that proportion of Aboriginal residents who may not be homeowners and for those living in public or community housing (Byrnes 2016). The incremental release of renewable energy buyback allocations in relation to available network hosting capacity advantages 'first-movers', while lower incomes and household net wealth (see Best, Burke and Nishitateno 2019, Taylor 2006, Taylor 2018) mean many Aboriginal residents may have no readily deployable capital to invest in solar panels and costly feed-in management (Byrnes 2016). Some residents may simply lack information about the window of opportunity that available renewable energy allocations represent. As deployment is not yet widespread, there remains an opportunity for similarly locally adapted approaches, perhaps building upon the success of schemes such as 'Solar Incentives', to structuring incentives for that proportion of Aboriginal people who live in public or community housing or rent on the private market.

from 11am instead of 2pm in the case of disconnection (Horizon Power 2020 (4)). This could foreseeably do much to reduce risk for residents by limiting the need for adaptive behaviours such as the making of frequent trips to community stores to purchase energy, during a period in which it was advisable for many residents to practice social distancing. It is important to note that energy services networked to information technology introduce novel ways of generating value (ARENA 2019). Internationally the movement to secure local ownership and control of data relating to Indigenous peoples is known as Indigenous data sovereignty (Yu 2012, Kukatai and Taylor 2016). In Australia more research is needed to ensure that the Aboriginal energy data rights and interests are secured and leveraged for Aboriginal benefit. The Council of Australian Governments 'Closing the Gap in Partnership: Priority Reform Four' (COAG 2019) calls for the greater sharing of, and access to, data and information at a regional level, noting that "disaggregated data and information is most useful to Aboriginal and Torres Strait Islander organisations and communities to obtain a comprehensive picture of what is happening in their communities and to support decision making" (NACG 2020). Greater capacity building and sharing of data can do much to support community and service provider efforts to improve energy security within remote communities.

²² Indigenous Business Australia provides a loan product for eligible communities.

²³ Noting that the first residential customer sold electricity into a renewable energy buyback scheme in Western Australia in 1997 in Cottesloe, Perth.

A growing role for standalone power systems in WA

Promisingly, over the last five years, standalone power systems²⁴ have begun to play an increasingly important role in the energy mix in remote and regional Western Australia. Trials by Horizon Power in 2016 saw the installation of seventeen standalone power systems on properties near Esperance (Field 2019) followed by the roll-out (by the state owned utility Western Power) of fifty-seven units in 2019. One hundred standalone power systems have recently been announced for 'fringe of grid' customers in Western Australia's Mid-West region (Filatoff 2019). Standalone power systems bring benefit to the utility through deferring or eliminating the need for investment in costly transmission infrastructure, while providing customers with more reliable and higher quality energy services than traditional 'poles and wires' (Horizon Power 2020) (1). Importantly, WA's energy assets are publicly owned, and the states isolation affords it a unique opportunity:

The ability of WA to innovate outside of the rules of the National Electricity Market (NEM) is an advantage that can be leveraged for economic and social benefits. (AECOM 2014).

In April 2020 the West Australian government introduced electricity reforms with the passing of the Electricity Industry Amendment Bill 2019²⁵. These reforms introduce greater competition into electricity networks in the Pilbara and removed the regulatory barriers to Western Power's adoption of standalone power systems for 'fringe of grid' customers in the Mid-West, Goldfields, Eastern Wheatbelt and the Great Southern regions (Lavan 2020, Johnston 2020). It is suggested that developments in this important area of reform will pave the way for increasing numbers of stand-alone renewable energy systems in remote and regional areas of WA (Lavan 2020). WA energy Minister Bill Johnston has observed that "Western Australia is absolutely ahead of the curve at deploying these standalone power systems" and "we would expect over the next ten years there would be twenty

thousand farmers taking advantage of this technology" (Field 2019, Filatoff 2019). While these changes do not apply directly to the Kimberley, importantly, building familiarity and experience in the regularisation of community-scale standalone renewable energy services is a crucial step toward realizing more reliable, affordable and culturally appropriate energy services for the many small, widely dispersed remote communities in Western Australia.

CONCLUSION

Modular in design, renewable energy technologies have a diverse range of possible applications, and the opportunities for Aboriginal leadership, participation and benefit are undoubtedly greater, more varied and across a wider number of scales than the limited number of case studies examined here. Projects may be developed unilaterally by Aboriginal communities and PBCs for discrete aims of community development, household energy security and enterprise development; others may be undertaken in alliance with private sector developers or the state and progressed through agreement making processes. This paper proposes that while the benefits and risks of specific projects are likely best assessed on a case-by case basis a number of common themes- such as the efficacy of genuine FPIC processes- are of utility across scales of development, from small to large.

In considering the risks and opportunities presented by large-scale renewable energy developments, native title represents an important asset which Traditional Owners can potentially leverage to deliver social and economic outcomes. Decades of experience in extractive industry agreement making suggest broader benefits for landholders are more likely if Traditional Owner groups are well-resourced and well informed, and developments progressed in ways that reflect community priorities. The literature also draws attention to persisting legal, informational, financial and political asymmetries. This paper has argued that there exists an opportunity for governments and the renewable energy sector to make explicit reference and commitment to the United Nations Declaration of the Rights of Indigenous Peoples, and to the best practice standard of 'free, prior and informed consent', as a cornerstone of engagement with Traditional Owners in relation to large scale developments. So

²⁴ Standalone power systems use solar panels, batteries, inverters and a backup diesel generator to supply power without being connected to an electricity network.

²⁵ The Electricity Amendment Bill 2019 is available at [https://www.parliament.wa.gov.au/Parliament/Bills.nsf/553B64DCFC97DE482584BF00BBDB2/\\$File/Bill154-1.pdf](https://www.parliament.wa.gov.au/Parliament/Bills.nsf/553B64DCFC97DE482584BF00BBDB2/$File/Bill154-1.pdf) accessed 27th July 2020.

too, greater levels of support and capacity building for PBCs and NTRBs will be immediately advantageous in supporting Aboriginal participation in development processes and securing Aboriginal economic inclusion in emerging large scale clean energy opportunities.

Accessing reliable, sustainable and affordable energy remains an issue critically relevant to Aboriginal self-determination, economic development and wellbeing in the North-West. Many communities are neither large enough nor close enough to transmission, to support the expansion of national and regional grids. The need for robust and culturally appropriate far-from-grid energy solutions will persist. In highlighting the historical context of energy policy as it relates to the trajectory of Aboriginal community development, this paper has argued that the use of community owned renewable energy services for self-determined aims of community development, from the 1980s onwards, represents a rich and instructive history of initial missteps followed by small, scalable successes. The efficacy of comprehensive community engagement and community energy planning processes, backed by comprehensive repairs and maintenance and Aboriginal innovations in energy demand management, all highlight the inherent interrelatedness between Aboriginal agency and the realization of individual and communal benefit and wellbeing.

Recent efforts by the state-owned utility to share the benefits of a transition to renewable energy with a number of larger remote Aboriginal communities in the Kimberley represents a positive step in leveraging access to clean energy for community development aims. A locally adapted approach to benefit sharing, cognisant of both the challenges and opportunities within high cost networks, 'Solar Incentives' is reducing energy costs while creating opportunities for employment and capacity building. Within the context of the use of 'smart' prepayment metering, improving access to and sharing of, energy data will be important in the process of 'scaling up' local benefit, for example by incentivizing renewable energy uptake amongst residents living in community and public housing.

By highlighting a number of unique successes and challenges within a non-exhaustive timeline of Aboriginal participation in renewable energy, this paper has argued

that the extent to which Aboriginal decision making is at the centre, rather than periphery, of renewable energy policy and project development remains the key to socially sustainable project development, as well as to any estimate of the success of the renewable energy transition currently underway in the North-West.

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