NATIONAL INDIGENOUS LAND AND SEA STRATEGY

Discussion Paper:
Renewable energy and Indigenous people

Australian Government
Indigenous Land and Sea Corporation

The ILSC GROUP

PEOPLE. COUNTRY. OPPORTUNITY.

This paper was drafted by Chris Croker, a Luritja man from Central Australia & Managing Director, Impact Investment Partners. The views expressed are for generating broader discussion and may not represent the position of the ILSC.

Even in 2022, industry consideration for the aspirations of Indigenous Australia in renewable energy is largely non-existent. The extent of renewable energy developments in Indigenous communities or on exclusively-held Indigenous lands is almost always at a very small scale (less than $1MW_{AC}$) and in off-grid communities. Initiatives like Bush-light, which ran from 2002 to 2013, designed and installed over 130 micro-hybrid renewable energy systems in homeland communities across remote Northern Territory, Western Australia and Queensland. These approaches assisted remote Aboriginal and Torres Strait Islander communities to replace expensive diesel generators with solar and battery systems. This provided multiple benefits, including reducing household energy costs, increasing energy security and reliability, and enabling sustainable economic development through the development of small businesses.

There has been limited success with Indigenous communities and businesses developing larger-scale renewable projects; however, there have been some standout successes, including the Northam Solar Farm (developed in partnership with Perth Noongar Foundation) and recent interest in large-scale renewable energy projects in the Northern Territory and Western Australia.

This paper looks at the challenges and opportunities that the renewable energy industry presents for Indigenous Australians in Australia's current national and market context.

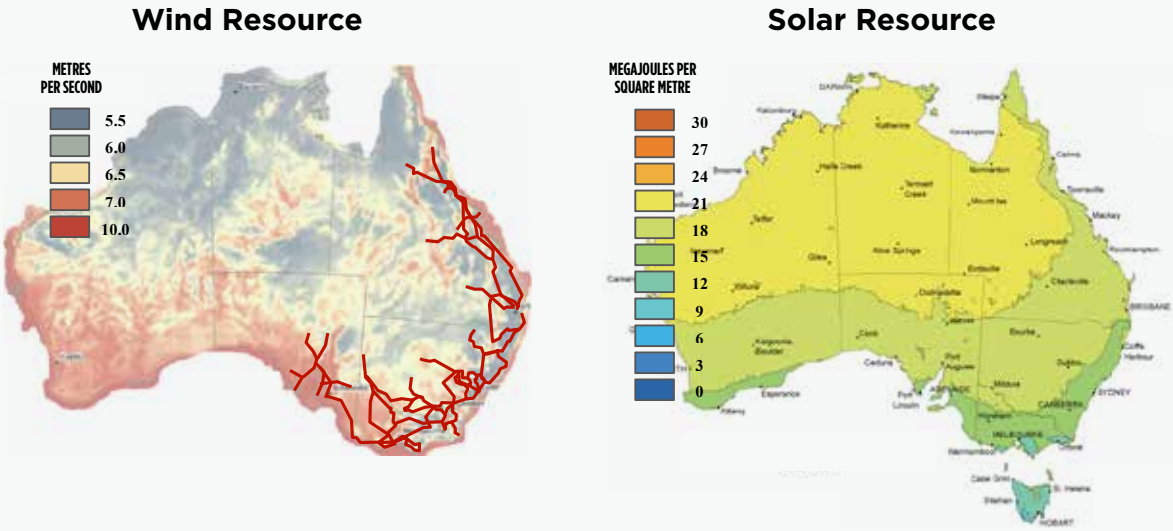
1 National Context

In Australia and globally, the development of renewable energy industries has primarily been led by industry, commercial requirements and investor needs. In nearly every instance this has been without the support of firm national legislative and policy frameworks. Within Australia, support for significantly reducing carbon emissions has been led by the separate Territory and State governments.

Historically, energy production has been centralised and monopolistic and based on fossil fuel (hydro-carbon) based generation, with consumers and communities as passive users. Clean and renewable energy provides a radically different proposition. The underlying renewable energy resources are dispersed and widely available, and new and developing technology is readily available for all scales, from solar panels on the roofs of individual households through to large-scale nation building projects, like Sun-cable and Snowy 2.0.

As one of the sunniest and windiest countries globally (**Figure 1**), Australia has enormous potential to transition to an economy powered increasingly by renewable energy. While not yet legislated at the national level, Territory and State governments have been leading the charge to help Australia meet its share of the global carbon emission reduction commitments by 2030, combined with high renewable electricity generation targets.[1]

Figure 1 Australian Wind and Solar Energy Resource. Source: The World Bank Group, World Wind Atlas and World Solar Atlas, 2021



2 Australia's Renewables Market

As with all industries, Australia's 63-65 GWh annual National Electricity Market is very diverse. **Figure 2** shows, on a simplified basis, that it is made up of Regulators, Asset Owners, Service Providers and Consumers with an electricity value chain spreading from Generation, Transmission, Distribution, Storage and Retail of electricity. Additionally, the growth in Renewable Energy has seen an increase in Decentralised Generation and Private Networks service providers and asset owners.

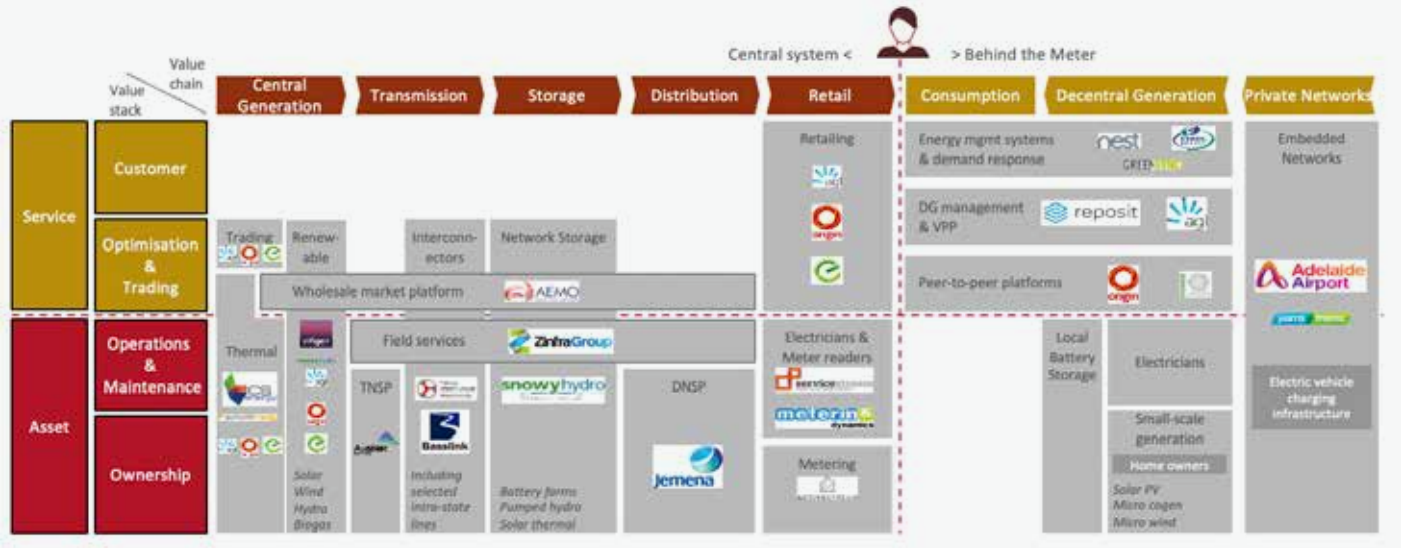


Figure 2 Overview of complete Australian electricity industry value-chain, with example participants for each segment, as at January 2022. Source: Impact IP analysis

In 2021, renewable energy accounted for 27.7% of generated electricity in Australia and was forecast to continue to grow rapidly. It is conservatively estimated that installed renewable energy capacity will increase by at least 15GW (or roughly $15-30 billion of investments) by 2030 (**Figure 3**).

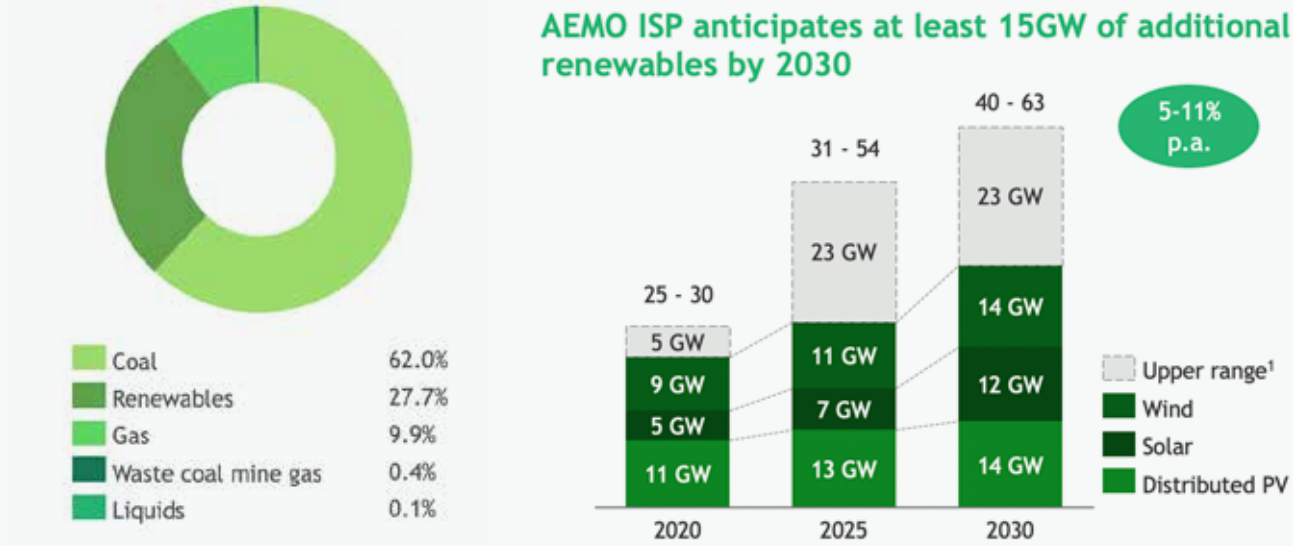


Figure 3 Australian electricity generation by source, 2020 and installed capacity of renewable energy, 2020. Source: Clean Energy Australia Report 2021 and Australian Energy Market Operator (AEMO) 2022 Integrated System Plan, 2022

In terms of the Australian Government's support for the Renewable Energy Industry, the Australian Renewable Energy Agency (ARENA) developed *The Technology Investment Roadmap 2021*[2], where ARENA and the Clean Energy Finance Corporate are prioritising the following technologies and initiatives for support:

- Hydrogen for industry, electricity generation and storage.
- Carbon capture, utilisation and storage (CCS/CCUS).
- Low emissions materials.
- Soil carbon industries.
- Energy storage technologies.
- 30/30/30 ultra-low-cost solar initiative – aiming for solar PV to achieve 30% efficiency at 30 cents per installed watt by 2030.

These renewable energy technologies and initiatives are further backed by the Australian Government's COP26 commitment made in November 2021, for ultra-low-cost solar ambition, including a commitment of $40 million by ARENA of its total $1.6 billion funding injection (received in 2020) for research and development of low-cost solar.

Cheaper solar power is also needed to make carbon capture and storage economically viable enabling power compressors that suck carbon, produced in industrial processes, out of the atmosphere.

In the lead up to the 2022 federal election, the Australian Labor Party (ALP) has pledged continued support for renewables and even more significant emission reduction targets (43% reduction by 2030). Their *Powering Australia* plan[3] includes:

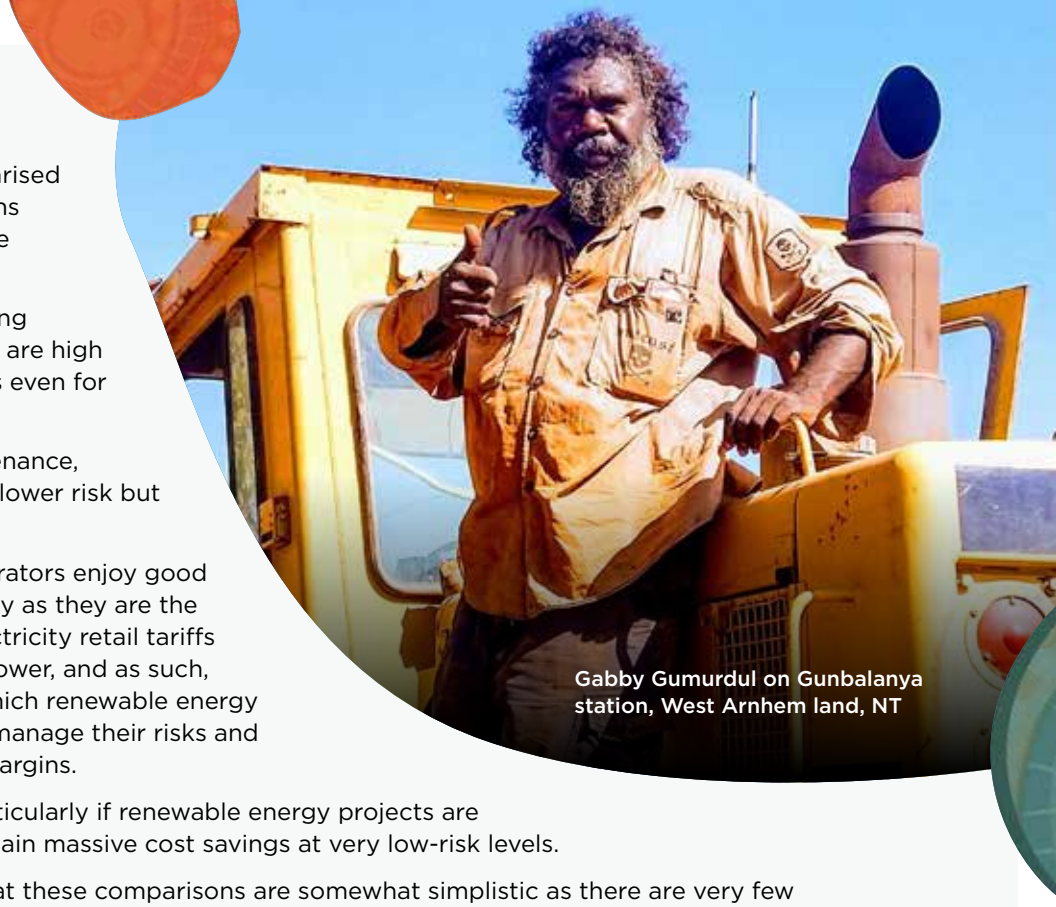
- $3 billion to invest in various green industries.
- Construction of 85 new solar banks around Australia.
- Installing 400 community batteries across the country.
- Demonstrating Commonwealth leadership by reducing the Australian Public Service's own emissions to net-zero by 2030.
- Investment in 10,000 New Energy Apprentices and developing a national New Energy Skills Program to significantly grow the renewable energy labour force.

3 The Economics Of Indigenous Participation

Figure 4 shows the economics of an indicative small to medium scale solar project developed on Aboriginal community land in WA.

Stage	Developer	Construction	Operations	Utility / Market	Consumer
Cost	$0.5m	$18m	$0.2m pa $4m life	$2m pa $40m life	$8.5m pa $170m life
Margin	100% $0.5m	10-15% $1.8 – 2.7m	20% $0.8m life	10% $4m	Behind the meter cost saving $107.5m
Risk	**Very High**	**Med - High**	**Medium**	**Low**	**Very Low**

Figure 4 Example value-chain for a 10MWAC PV project with a capital cost of $20M in 2022. 20-year life. Source: Impact IP analysis



Gabby Gumurdul on Gunbalanya station, West Arnhem land, NT

As can be seen and, as summarised in the following, risk and returns across each stage or role in the project vary widely.

- Developing and constructing renewable energy projects are high risk – high reward ventures even for experienced groups.
- The operations and maintenance, including land leasing, are lower risk but provide modest returns.
- The utilities or market operators enjoy good returns at low risk, primarily as they are the regulator, who can set electricity retail tariffs and exert strong market power, and as such, can be very selective in which renewable energy sources they purchase to manage their risks and maintain their costs and margins.
- However, consumers – particularly if renewable energy projects are 'behind the meter' – can gain massive cost savings at very low-risk levels.

It should be acknowledged that these comparisons are somewhat simplistic as there are very few Indigenous organisations or communities that could wholly utilise the approximately 30,000 MWh per year of electricity generated by a 10MW project, so 'exporting' to the grid, or an offtake agreement (power purchasing agreement) with an electricity retailer or utility, would still be required in most cases.

While a simple representation, the returns and risks offer some insight into the challenges facing Indigenous participation in the renewable energy market – these are discussed further in Section 6.

4 Opportunities

The current Australian COP26 related commitments, coupled with the forecast growth of the Renewable Energy Industry, and Australia's rich renewable energy resource (**Figure 1**), should provide numerous opportunities for Indigenous communities and people. For example:

- **The renewables market/projects are growing.** The renewable energy market and the number of projects continue to rise due to Australia's vast wind and solar resources and the growing demand for clean energy by governments, corporations and households.
- **Investors are interested.** Australian and international investors have a huge demand for technical and commercial feasibility stage projects (investment-ready stage), particularly if they can be aggregated together as an investment portfolio.
- **There are many suitable sites for renewable projects.** Across Australia, there is massive potential for suitable sites for renewable projects on Indigenous land from technical, environmental and regulatory planning perspectives. For example, there are many Indigenous held land or Indigenous communities that have a high renewable resource, are in close in proximity to infrastructure (such as transmission and distribution lines road access), and have great potential for 'behind the meter' style projects.
- **New technologies are emerging.** A relatively new opportunity that is being backed by the Australian Government and some state governments is new Hydrogen gas (H_2) ('hydrogen') investment technology. While still in its infancy, hydrogen provides a means to store and transport energy so that it can be utilised away from its source of generation, without expensive electricity transmission infrastructure. These characteristics should allow many more renewable opportunities across Australia and on Indigenous lands.

5 Challenges

Australia has a developed market and industry for renewable energy developments with many project developers, technical advisors, law firms, and engineering construction companies. Large amounts of capital are available at reasonably low cost. Yet there remain significant barriers faced by Indigenous community groups to participate. Why?

It is our view that the critical barriers faced by Indigenous community groups in developing renewable energy projects are:

5.1 Determining how to participate

The challenge for Indigenous communities' is how can they best participate in these massive opportunities, particularly given the relative risks and rewards of Indigenous participation shown in **Figure 4**. Options may be:

- Lobbying and bargaining for desired Indigenous social and economic outcomes to be embedded in key Engineer, Procure & Construct (EPC), Operation & Maintenance (O&M) contracts and ownership and governance structures that are appropriately tailored for the local Indigenous community groups.
- Direct participation and development of their own renewable energy projects. In this circumstance, community will need to address the critical barriers of cost-effectiveness and access to experience and capacity. If these barriers can be managed, then there could be significant social and economic opportunities for Traditional Owners in collaboration with their partners.

5.2 Patchy experience and advice, and limited internal capacity

Renewable energy is still a relatively new but rapidly evolving industry. Most Indigenous community groups do not currently have the internal capacity (financial and human resources) and depth of experience to develop commercially viable renewable projects on their own. Additionally, most community groups have no or very limited experience in managing large multi-million-dollar commercial enterprises and investments. Likewise, internal financial and human resources constraints mean that there is a tendency to seek advice from lower-cost or pro-bono advisors, who may initially seem good value for money, but they don't necessarily provide the right support or lack the skills to progress the project in a timely fashion.

This tendency to engage pro-bono or ad-hoc low-cost advisors also means that the skills and experience required to develop renewable energy projects aren't developed or retained in individual Indigenous organisations or across the community sector in general. Therefore, it is recommended that Indigenous community groups carefully consider what role they really want to play in renewable energy projects given – as outlined in **Figure 4** – the risk and reward with each stage of project development or ownership vary considerably.

Ranger performing a controlled burn

5.3 Limited access to early-stage funding

The development phase, or early-stage pre-feasibility and feasibility technical, commercial work and community engagement work is a risky time for project developers. There are a lot of unknowns, including the energy resource itself, which system technical design will work best, unknown capital expenditure costs, an electricity market that fluctuates widely, and a lack of clear and consistent government support or policy for renewables.

BIMA solar panels on Turrbal and Jagera/Yuggera country, Brisbane, Qld

Undertaking all the required research and studies is a costly experience, making it challenging to obtain the right advice or to progress project development. Both these 'technical' and cost uncertainties mean that it is challenging for community groups/organisations to progress their own renewable energy developments without meaningful and ongoing grants, subsidies or other support.

5.4 Limited availability of Indigenous capital

Many would see that a safer and less risky model for Indigenous groups to gain a foothold into renewable projects is by partnering or investing alongside experienced project developers. However, many Indigenous organisations do not have the financial capital to contribute to a project to 'buy into' equity ownership or to fully take on a project developer role. Even for Indigenous groups with sizable capital that could be invested, most of this Indigenous-owned capital is often tied up under restrictive trust deeds or government-controlled investment mandates.

Typically, large scale private project developers have their own internal skills and capability and can fund early-stage costs out of their own development budgets. These private developers will earn a significant development fee margin that covers the business and development risks; however, this is not the case for these smaller-scale community projects. Occasionally government grants may be available but these are predominantly tailored to later-stage project development rather than to assist early-stage pre-feasibility or feasibility for new projects.

5.5 National Electricity Market (NEM) pricing fluctuations

High priced and longer-term PPA (Power Purchasing Agreement) contracts have become harder to secure over the past 2 – 5 years, largely due to the significant growth in residential and large-scale renewables projects that have resulted in significant minute-to-minute and day-to-day price fluctuations on the NEM that have seen the risk of negative price exposure. Appendix 2 explores further risks associated with the commercial viability of renewable projects around the sale of electricity into the National Energy Market (NEM).

6 The ILSC Role

Even where there may be suitable sites on Indigenous held land for a renewable energy project, unless the project can secure the minimum required revenue to cover operating costs, external financing costs, and the opportunity cost of the capital (if Indigenous capital is invested), the projects are not commercially viable and will lose money for the community or organisation.

Impact IP recommends the ILSC provide both indirect and direct support for community renewable energy aspirations. We offer three suggestions for the ILSC to take on, at a minimum.

6.1 Build knowledge, capability and development expertise

The entirety of the ILSC or a community budget should not be primarily spent on feasibility studies for new projects. It should also include programs to help communities and organisations/companies understand both the risk and benefits of renewable energy. This understanding needs to be fostered for all scales of renewable energy projects – from residential solar to small-scale, standalone hybrid electricity systems, to utility-scale solar, wind and hydrogen opportunities.

The ILSC should:

- Work with aligned organisations, like the Clean Energy Council, the National Native Title Council or the newly launched First Nation Clean Energy Network to:
    - Provide information sessions and mentor Indigenous communities and organisations considering potential renewable energy projects to turbocharge their ability to manage them. If the relationship can be facilitated and supported, these information sessions and/or mentoring could be peer-to-peer (i.e. one experienced community organisation mentoring or providing guidance to another less experienced community organisation).
    - Build general and widespread community capacity through education, training, and technical skills development opportunities.
    - Connect Indigenous communities interested in renewables projects with First Nations energy businesses and other culturally-capable advisors to providing a network of specialists and experts for communities to access where technical advice is needed.
- Develop the base-level of expertise across community organisations by forming medium-term collaborations with key partners such as community advocacy technical and commercial partners (who could collectively play the role of a quasi-project developer). These partners should also be tasked with building the Indigenous group's capacity and providing for participation as desired by the community group over the project development cycle of a two-to-three-year horizon. This will avoid the heavy reliance on external advisors and consultants that can often mean that knowledge and capability are not retained in community organisations.

6.2 Support Indigenous community projects through concept to feasibility

It is recommended that the ILSC develop a clear and consistent mechanism that directly supports Indigenous organisations considering renewable energy investment. An entirely new support mechanism should avoid fitting renewable energy investments within existing grant frameworks. A potential support framework is outlined in **Appendix 1**.

Several points should be remembered concerning the variability across the renewable energy 'value-chain' and each segment's commercial viability:

- Small scale (less than 10MWAC) or medium-scale (less than 50-100MWAC) solar energy projects are not likely to be commercially viable if they run a standard market export model.
- While 'behind-the-meter' or community use projects are likely to be the most economically viable.
- Remote off-grid systems are likely to be able to provide both improved electricity reliability and cost savings.
- Residential – 'behind the meter' installations, even without energy storage systems (such as batteries), are likely to be commercially viable and have a short commercial payback period of between 3 – 7 years.

6.3 Increase the number of socially-aligned electricity customers/off-takers

Securing revenue is critical for projects' commercial viability. The ILSC (or another national support mechanism) could create an 'Indigenous Social Power Purchasing Agreement brand' to assist Indigenous groups for the specific projects under consideration and the future pipeline of projects.

ILSC could target a number of Government and corporate electricity customers / off-takers for grid-connected projects. The potential external off-takers should be those attracted to Indigenous-owned or generated electricity, including government organisations, large asset owners or asset managers and operators with a national footprint. This knowledge needs to be built up over time, as even though an energy market specialist firm can provide support and market information, these contracts are typically highly confidential.

Additionally, the focus should be on projects with large 'behind the meter' consumption potential on Indigenous Land, as these also provide direct cost savings to Indigenous households, businesses and communities.

7 Appendix 1: Outline of Potential ILSC Support Framework

Suppose the ILSC or other such organisations were to set up a community support mechanism that directly supports Indigenous organisations considering renewable energy investment. In that case, they should have a medium-term horizon in order to realise tangible outcomes for Traditional Owners and to provide some level of certainty to their community partners. A potential support framework is outlined below.

Stage of support	Support per community project	Overall support to be provided
Pre-Feasibility Stage **(Minimum 5 projects)**	Direct support in undertaking pre-feasibility studies. Look to undertake a minimum of five projects per 'round' or concurrently to maximise cross-project learnings and reduce individual costs. A cost-effective pre-feasibility is $30-$50k per project. At least five projects - preferably with similar offtakes/regions in order to achieve economies of scale & taking into account projects which may not go ahead.	A total of $150k - 200k per 'round' Scope of pre-feasibility: • community engagement and objectives • desktop technical and sizing • high-level financial analysis • engagement with potential customers or off-takers Gateway: No further costs should be incurred if no commercially viable offtake or cost recovery mechanism is available)
Feasibility Stage **(Minimum 2 projects)**	Look to undertake a minimum of two per 'round' or concurrently to maximise cross-project learnings and reduce individual costs. Assisted support in considering and exploring a community project's commercial and technical aspects. The parties in the feasibility stage may vary depending on the approach to design development. Need to pay particular attention to ancillary advisors such as legal, energy markets and tax. Look to provide certainty of $200k to $300k in support per project. Note: Debt financiers do not fund the feasibility stage. Most equity financiers typically also don't fund development costs until the project is within the final stages of the feasibility stage, but the risk appetite varies from project to project.	A total of $500k - $600k required per round. Other development Partners may contribute. From a commercial point of view, the key is to obtain in-principle offtake agreements or memorandum of understanding with key customers / off-takers prior to full design implementation.

Once a project reaches the investment-ready stage, ILSC and community partners should aim to be, at least, reimbursed for the development costs by third party financiers. This enables the support program capital to be recycled back into the next round or provided to the Indigenous group for equity ownership participation in the project. A development margin or multiplier will likely be available but depends on the individual project.

Ayers Rock Resort, NT

APPENDIX 2: Negative Price Exposure – a further challenge to securing commercially viable projects

The types of revenue that could potentially be generated from a renewable energy project selling electricity into the wholesale energy market - mainly into the National Energy Market (NEM) - differs with the types of power purchase agreements (PPAs) negotiated. Examples of PPAs include, sleeved PPAs, 'behind the meter' PPAs (with large customers) or contract for difference PPAs (with government or corporate buyers). Firm longer-term contracts (of at least ten years term) are more desirable as they provide lower risk and more certainty to third party financing sources.

However, these longer-term PPA contracts on favourable terms are becoming harder to secure because of significant price fluctuations in the NEM that are resulting in negative price exposure. Negative price exposure occurs where the price being paid for electricity falls below zero and generators are charged a penalty by the market to take their generated electricity.

Over the last 5 to 10 years, large scale buyers of electricity are consistently less accepting of taking certain risks for 'in front of the meter' projects, which have increasingly been seen as project owner/ developer equity risk. These risks include loss factors (through distribution & transmission), grid intervention (curtailment of generation) and negative price exposure. For grid-connected projects, the electricity component of a PPA is usually transacted as 'Cash For Difference' (CFD), and the Large scale generated certificate (LGC) component is for physical delivery.

Negative price exposure means that renewable energy projects are now being incentivised to turn off or reduce production in response to temporary market oversupply, which also acts as a financial incentive develop battery storage projects or for large-scale electricity users to consume more electricity supply to reduce the surplus of electricity.

In effect, during periods when the NEM spot price is zero or below zero, the renewable energy project will effectively earn no revenue or be forced to stop generating to avoid paying the market operator to generate (rather than receiving a PPA payment for those periods). In such a case, the currently assumed electricity generation from a renewable energy project would be significantly overestimated. These concerns are now a real and substantial risk, as evidenced by the historical prices for 2019-2021 and the instances of negative prices in every month of the year.

Figure 5 shows the monthly average percentage of 30-minutes time intervals across a 24 hour day, where prices have been zero or negative. For example, over 25% of the month of October experienced negative prices for wholesale electricity.

Warddeken rangers

Figure 5 Average % of 30-minutes intervals with negative prices, Source: NEM data, Jan 2019 – Jan 2022

The implications of negative market prices are even more critical for solar farms as the intervals with negative prices are highly concentrated around midday, which is when solar farms are at their highest generation potential. Figure 6 records the average percentage of negative price intervals during 'daylight hours' and during the peak solar irradiance hours of 11 am to 3 pm.

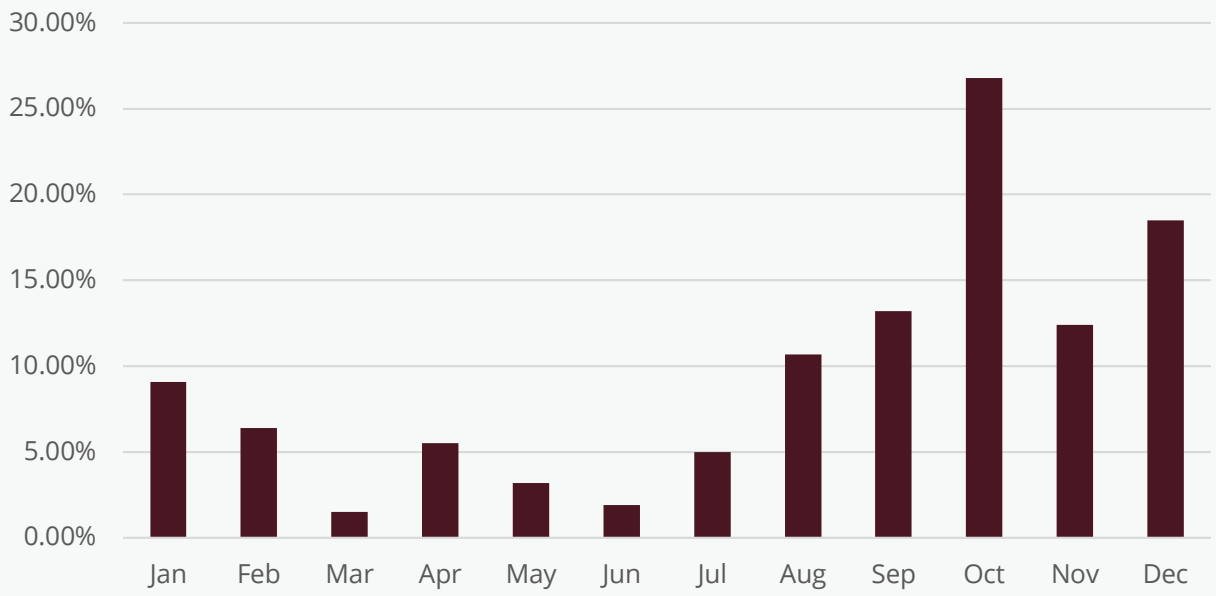
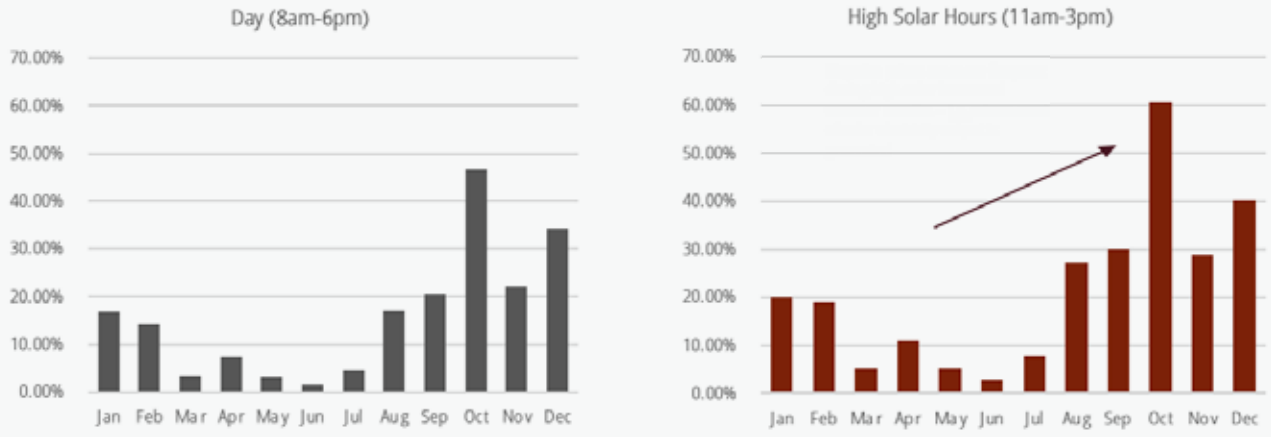


Figure 6 : Average % of time intervals with negative prices.



Fish River, NT

Endnotes

1. Renewables Ready: States Leading The Charge, Climate Council of Australia Limited
2. State and Territory 2030 Emission Reduction Targets, Tasmania: already net zero, ACT: 65-75%, SA: More than 50%, NSW: 50%, VIC: 45-50%, QLD: 30%, NT: 50% https://www.climatecouncil.org.au/uploads/9a3734e82574546679510bdc99d57847.pdf
3. https://www.industry.gov.au/data-and-publications/technology-investment-roadmap
4. www.alp.org.au/policies/powering-australia

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Join The Conversation

Come along to one of our face-to-face sessions or join an online session. Visit our website to book in.

Complete the on line survey.

Phone us on 1800 818 490 for a confidential chat.

Email your submissions to ***NILSS@ilsc.gov.au*** to share your thoughts.

Get your full Information Pack: visit ***www.ilsc.gov.au***, or email ***NILSS@ilsc.gov.au***.

A feedback report summarising what we have heard from you and how we will use this important information will be available on the website.

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