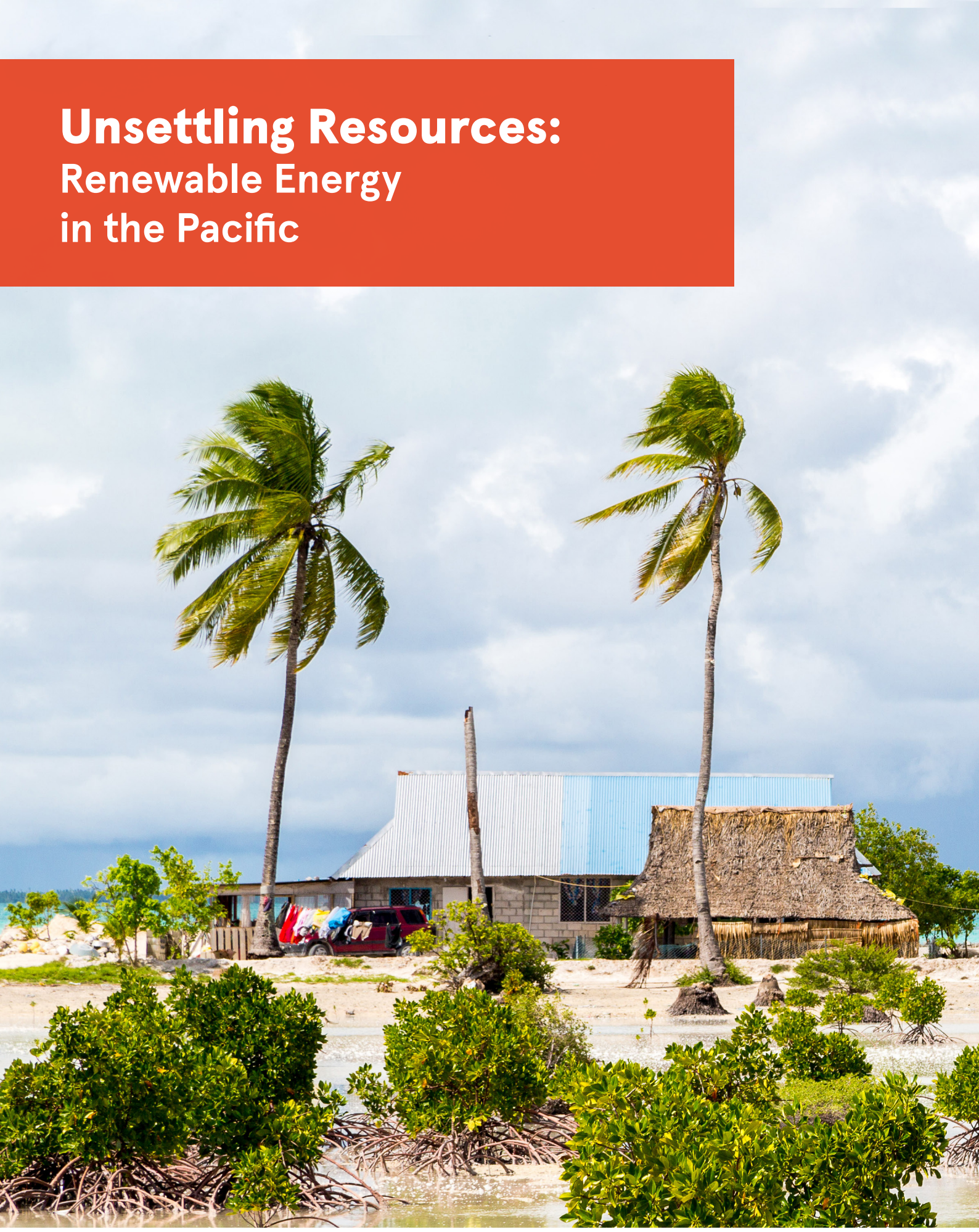
Unsettling Resources:
Renewable Energy in the Pacific



THE UNIVERSITY OF SYDNEY
Sydney Environment Institute

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The University of Sydney is located on the Gadigal lands of the Eora Nation. The Sydney Environment Institute acknowledges that these lands were never ceded, and we pay our deepest respects to elders, caretakers and custodians past, present and emerging here in Eora and beyond.

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Introduction and themes of the workshop

1.1 The project

Sponsored by the Sydney Environment Institute, the Unsettling Resources Renewable Energy in the Pacific project seeks to identify challenges, opportunities, and sources of contention for how we transition to renewable energy in the Pacific.

Climate change is the greatest threat to Pacific Island Countries (PIC), which face increasingly severe weather events. The region is also powered predominantly by imported fossil fuels and suffers from low electrification rates in many areas, making the transition to renewable energy a policy priority to reduce emissions and promote energy security and resilience.

The project examines how the region, as a moral and diplomatic leader in addressing climate change, is decarbonising. Countries across the region have devised and implemented ambitious energy roadmaps and enhanced nationally determined contributions for COP26, to combat climate change, promote energy security, and energy access. These initiatives are owned by PICs and designed to drive significant positive impacts on the livelihoods, security, and wellbeing of Pacific Island people. With these ambitions, however, come complex implementation challenges involving technical, social, and financial barriers that are unique to each island context.

We seek to identify what renewable energy technology is being adopted, how it is being financed, promoted and implemented, and what this means for communities faced with potential 'displacement effects' of sharing space with renewable technology. We also seek to exchange ideas with practitioners and scholars examining the political, legal, economic, geographic, and cultural factors shaping the transition to a low carbon world, and gain a better understanding of the factors influencing states as they decarbonise including from community groups, private energy companies, Multilateral Development Banks, bilateral aid, and foreign investment.

1.2 Aim and structure of the workshop

In September 2021, the Unsettling Resources project team convened an event series for exchanging ideas about trends in renewable energy and the reality of the energy transition in the Pacific, which included a Practitioners' Workshop and an academic Research Symposium.

The Practitioners' Workshop held on 8 September 2021 was an exploratory forum. We convened the workshop to better understand the specific challenges and opportunities faced by PICs in 2021 as they seize the short window for transitioning away from diesel generation onto low carbon, resilient and equitable energy pathways, and provide energy access to remote and dispersed populations.

Pacific nations are mobilising their resources to achieve a complex structural shift from away from diesel generation, with its high transportation costs and price spikes, to a more sustainable pathway that can

tackle climate change and promote both energy security and energy access. We sought to explore both commonalities and key differences in how the technological, human resources and investment challenges of the roadmaps are being tackled by PICs and their development partners.

The workshop was attended by individuals and stakeholders from a broad range of organisations, including World Bank, IFC, The Pacific Community, DFAT, University of the South Pacific, ANU and the University of Sydney. The event was facilitated by the Unsettling Resources project team: Professor Susan Park, Professor of Global Governance, Department of Government and International Relations; Dr Katherine Owens, Senior Lecturer, The University of Sydney Law School; and Gemma Viney, PhD Candidate, Sydney Environment Institute.

In conversation with scholars and practitioners, we sought to grapple with the following questions:

1. What renewable energy technology is being used and where in the Pacific?
2. What is driving the risks and models of renewable energy technology transferral in the region?
3. What governance frameworks and climate finance exist for the renewable energy needs of PIC?
4. What community challenges and priorities exist and how are they being addressed?
5. What are the impacts and benefits of renewable energy projects on local communities?

The workshop was organised into three panel sessions. The first panel considered Australia's role in the Pacific shift to renewables, and the potential of recent policies initiatives to 'step up' and support the Pacific in strengthening energy security and climate and disaster resilience, including the Australian Infrastructure Financing Facility for the Pacific. The second panel then discussed the challenges and opportunities of renewable electrification from a Pacific perspective. The third panel addressed the financing of renewable electrification in the Pacific, and the challenges of mobilising and deploying large amounts of public and private climate finance across and within PICs.

1.3 Organisation of the summary

This workshop summary describes the observations and recommendations made by workshop participants during our rich discussions throughout the day. Section 2 summarises the keynote addresses of the workshop convenors. Sections 3 to 7 summarise the key threads arising from our workshop discussions and lace together discussions from each of the workshop sessions in relation to Australia and the Pacific, governance and capacity building, effective finance, and public and private coordination. Section 8 then concludes by providing our reflections and research agenda.

1.4 Key themes

Several prominent themes emerged from the individual presenters' remarks that informed our discussions. These themes are summarised here not as conclusions or recommendations from the workshop but to frame the material summarised in this report.

1. A limited supply of domestic fossil fuel resources means that PICs depend on imported diesel for electricity generation, but diesel generation costs are significant and can represent up to 25% of a country's GDP. This challenge commingles with small economies of scale, geographical dispersion, aging electricity infrastructure, limited generation capacity, and low electrification rates in many PICs.

2. To combat these challenges and demonstrate their strong moral and political desire to decarbonise, PICs are embarking on a structural shift away from diesel generation to renewable energy, with NDCs under the 2015 Paris Agreement and Energy Roadmaps targeting up to 100% renewable energy generation. The transition will enable PICs to reduce emissions, improve adaptation and resilience, achieve energy security, and improve energy access to advance the livelihoods, security, and wellbeing of Pacific Island people.

3. Pacific Island countries face technical, social, financial barriers in the renewable energy transition that are unique to each island context. Solutions must be locally adapted, particularly in the context of land-constrained atolls. Development partners need to experiment with different forms and sources of support and project structures to meet the needs of each PIC.

4. Large amounts of public and private finance will be needed to rapidly implement national roadmaps. Development partners will need to engage closely and effectively with Pacific Island people to assist them to effectively absorb this level of support on a programme and project basis and use the support to attract ongoing private sector support to their economies.

5. Grant-based funding will not be sufficient to cover the costs of providing energy in the Pacific, and there is an urgent need for public donors to find ways to de-risk and promote private investments across the region to enable private companies to enter these markets and mobilise change.

6. Collaborative approaches to grants and lending are emerging in the region to provide concessional assistance for PICs (e.g., the Tina River Hydropower Project in the Solomon Islands). Development partners have begun to coordinate with national banks across the islands to provide support to the private sector, particularly small and medium-sized enterprises who can reach more isolated communities.

7. New structures are needed to crowd in the private sector, pair local energy needs with providers and build a market for off grid renewable energy solutions in PICs.

8. With limited offtakers for renewable energy projects, private developers in on and off grid contexts must adopt a capital-intensive build/own/operate model that constrains cash flow for new developments. New mechanisms are being developed that can take over projects and provide liquidity to developers to enable those developers to purpose new opportunities.

9. Australia seeks to demonstrate its value to the Pacific through the quality of its financing and development outcomes, which are both demand and supply driven. Australia's 'Pacific Step Up' and new initiatives such as the Australian Infrastructure Financing Facility for the Pacific (AIFFP) are promising but remain undefined from a public perspective in terms of strategic priorities and how AIFFP can be positioned to maximise local benefits for Pacific states.

10. Pacific Island countries need either new or enhanced coordination mechanisms at the regional, national, and sub-national levels to synchronise development partners, local communities, ownership, government actors and decision-making to take advantage of the technologies available. Decisions are still being made, however, about how to build more effective governance structures and capacity building structures in each country and across the region.

11. Strong government leadership and public vision is required for effective coordination between key ministries, the private sector, civil society organisations, beneficiaries, potentially development partners. Reforms to the regulatory environment are required in many PISIDS, however, to establish independent institutions, particularly in relation to tariff structures, and reduce unnecessary government intervention.

12. Critical issues of capacity exist in PICs in relation to the regulatory environment, institutional capacity for energy planning, project origination and procurement, operating and maintaining projects and the financial capacity of consumers. Local officials are needed who have the capacity to drive and coordinate transition activities and achieve co-benefits for Pacific communities.

13. Renewable energy development planning must consider the ability of households to pay to access energy, especially in the context of loan- based financing. An unresolved question is the type of financing facility needed to develop and support the smaller scale projects needed in many PICs, and to address the determinants of energy access problems.

14. Renewable energy uptake must also be managed in a way that supports community ownership of these systems and technologies, and the ability of the community to maintain this infrastructure in an ongoing way. Talanoa is important in this context in enabling Pacific Island communities to understand the benefits of larger generating systems and the opportunities that increased energy access will bring for their livelihoods.

15. Opportunities for capacity building need to be linked to exposure with practical project experience. Training relationships with other countries can serve an important function in developing undergraduates from Pacific Island schools and colleges to work on a range of renewable energy applications.

The common threads arising from each of the workshop panels were: 1) Australia's role in the Pacific; 2) governance and capacity building; 3) effective finance; and 4) public and private coordination. Sections Three to Seven will summarise these key threads, drawing together discussions from each of the workshop sessions.

Keynotes

The PICs face significant challenges: the IPCC Special Report (2018) highlights that they face devastating impacts of climate change, including increasing droughts and water scarcity, coastal flooding and erosion, changes in rainfall that affect ecosystems and food production and adverse impacts to human health. They are also losing their land to sea level rise and are increasingly battered by more ferocious cyclones and suffer from increased temperatures. Yet the Pacific Islands contribute less than 0.2 percent of anthropogenic global carbon emissions with relatively stable emissions over the last decade.

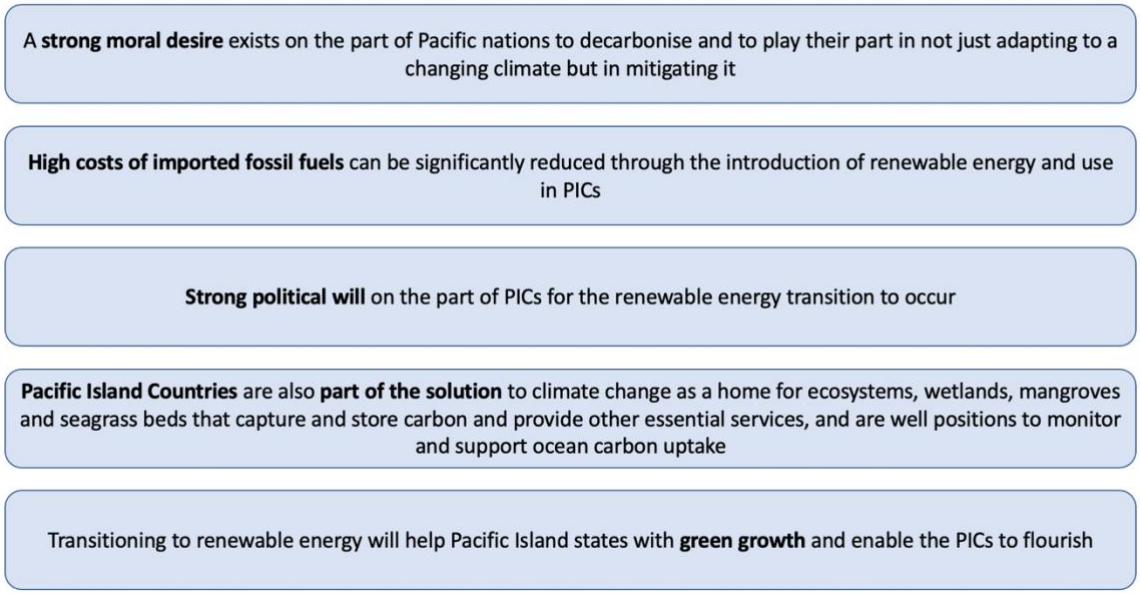
There are five reasons why we are discussing the need for renewables in the Pacific:

1. There is a strong moral desire on behalf of Pacific nations to decarbonise, and to play their part in not just adapting to a changing climate, but in mitigating it. Indeed, they must do both. The International Energy Agency states that 40 percent of the world's energy must come from renewables by 2040 (IEA, 2021). As part of the High Ambition Coalition Pacific Islands Countries are advocating for '1.5 to Stay Alive' at the UNFCCC COP26 negotiations. They are willing to change their energy systems and use to achieve their Nationally Determined Commitments.
2. The high costs of imported fossil fuels can be significantly reduced through the introduction of renewable energy and use in PICs. This is an economic opportunity to benefit from the transition towards a sustainable energy system.
3. Not only do PICs advocate for eliminating fossil fuels as a moral action and for economic reasons, there is strong political will for the transition to occur.
4. Pacific Island Countries are also part of the solution to climate change, which is increasingly under threat. The region is home to ecosystems, wetlands, mangroves, seagrass beds that capture and store carbon, as well as provide other essential services. The Pacific Islands 'govern over 20 percent of the ocean within national exclusive economic zones. Pacific Island countries have a great opportunity to monitor and support ocean carbon uptake.' This means that the 'destruction of natural ecosystems can release stored carbon…[and] managing land use and development is therefore important for maintaining gas sequestering systems' (SREP 2021: 105). Shifting from the dependence on fossil fuels will therefore help mitigate climate change.
5. Finally, transitioning to renewable energy will help Pacific Island states with green growth. This is where development and economic growth are achieved within the parameters of environmental

limits. Over the last decade major economic and development institutions from the ADB, World Bank, and OECD have increasingly advocated for green growth for all states including small developing countries even with very low greenhouse gas emissions. Quite simply development can no longer be considered outside the Earth's parameters, and all development must reflect this.

The focus on why the PICs should take up renewables when the onus is often on the largest greenhouse gas emission producers often undermines the significant positive focus that the transition can have for enabling the Pacific to flourish.

Figure 1: Key opportunities and challenges



Australia and the Pacific

3.1 Bilateral relationships: Australia's role in the Pacific energy transition

The Pacific region is one of Australia's highest foreign policy priorities and Australia is the Pacific's largest development assistance partner. But Australia's position on climate change, including its refusal to increase its insufficient 2030 domestic emissions target, is seriously compromising that relationship. At the same time, Australia's lack of effective domestic climate policy has meant that Australia's role in the Pacific transition to renewables has become increasingly important, and the Government stands to gain significantly from supporting the Pacific transition to more sustainable and affordable sources of renewable energy.

Prime Minister Morrison announced Australia's 'Pacific Step Up' in 2018, which seeks to intensify Australian engagement and support in the region, and the Government has since focussed on

demonstrating its value to the Pacific through providing high quality financing and infrastructure development products that are both supply and demand driven. Key ppolicy initiatives include the new Office of the Pacific within DFAT and the new Australian Infrastructure Financing Facility for the Pacific (AIFFP), a $AU 2 billion fund that is designed to establish Australia as a valued partner in climate action.

The AIFFP, established in 2019, uses aid grant funding of up to $500 million and long-term loans of up to $1.5 billion to support infrastructure development. The Government seeks to partner through this facility with both Pacific governments and the private sector to design and implement projects that build Australia's profile as an infrastructure development partner. While the AIFFP has the potential to support transformative projects in the Pacific, the facility remains undefined from a public perspective in terms of strategic priorities and how it can be positioned to maximise local benefits for Pacific states.

Much of the AIFFP's current focus is on the commercial sector, and objectives include supporting responsible loan-based lending for infrastructure in the Pacific and tackling issues of debt sustainability. Key questions remain, however, in relation to how public funding through the AIFFP can best used within specific island contexts in the Pacific, and how the AIFFP can be used to leverage private investment in the region. Specific questions remain to be answered in relation to the strategic priorities of the AIFFP for renewable energy development, how the AIFFP can be positioned to maximise local benefits for Pacific states, how the AIFFP can facilitate links between Australia's renewable energy sector, including technology innovators, and the Pacific.

Governance and Capacity Building

4.1 Energy regulation, public institutions, and public incentives

Renewable electrification will require governance, market, and regulatory reform in many PICs. Variable renewable energy generation sources will need to be integrated or further integrated into diesel-powered grids and distributed energy resources will need to be deployed to provide additional energy access. This transformation process will stretch current institutional arrangements, which often rest on one state-owned utility operator.

Strong public institutions will enable PICs to manage the transition effectively, ensure public financial stability and attract private sector investment. Effective national institutions are critical, for example, in enabling development partners to quantify risks and develop risk mitigation measures, and a solid and financially sustainable energy utility is particularly important. Strong government leadership and public vision is also required for effective coordination between key ministries, the private sector, civil society organisations, beneficiaries, and potentially development partners.

Reforms to the regulatory environment are required in many PICs, however, to establish independent institutions, particularly in relation to tariff structures, and to reduce unnecessary government

intervention. Consumer safety standards are necessary to ensure that Pacific people are not exposed to substandard products. PICs also have limited planning and regulatory capacity for generation and transmission with often one, state-owned, provider of energy and/or dedicated government department.

Pacific Island countries are considering how to restructure sector entities effectively and introduce competition and new market-based regulatory mechanisms. But a variety of challenges remain, particularly in relation to developing cost reflective tariffs and independent and financially viable regulatory institutions (ADB, 2020). In this regulatory environment, where the cost of 'doing business' can be higher, particularly in relation to tariffs, market-based regulatory mechanisms will become increasingly important. Mechanisms such as smart subsidies and structures for viability gap funding inform private investors of what they can expect from a scheme and what they will need to bring to the partnership.

4.2 Capacity

Pacific Island countries have struggled to absorb donor support effectively on a program and project basis. Issues of capacity exist in relation to the regulatory environment, institutional capacity for energy planning, project origination and procurement, operating and maintaining projects and the financial capacity of consumers. Local officials are needed who have the capacity to drive and coordinate transition activities and achieve co-benefits for Pacific communities.

Limited investment in PICs in relation to project identification, origination and procurement capacity can, in turn, undermine the confidence of investors that generators will be selected and integrated into the energy system in a transparent and robust fashion. Rapid deployment of new generation relies on utilities and governments leading the early stages of the process by structuring projects effectively to make those projects 'bankable' and tapping into the variety of funding sources available. The process is challenging but most effective when the state utility or relevant government department structures the project and brings it to the market with an allocation of risk that will attract private investors. Where individual proponents propose projects, this may strain human resources within public bodies, who must then assess each of these projects on a case-by-case basis.

Some necessary capacity could be developed through the significant readiness support available for PICs from institutions like the Green Climate Fund (GCF), which can be used to develop skills in concept note writing and project proposal development. The GCF's Readiness Program, for example, is designed to strengthen the institutional capacities, governance mechanisms and planning and programming frameworks in PICs to enable national institutions to engage more effectively and efficiency with the Fund. At least 50 per cent of support through that program has been earmarked for particularly vulnerable countries, including PICs (GCF, 2021).

Much more needs to be done, however, to train local engineers, technicians, community groups and women's collectives, and young people on generation and battery technologies. Gender equality, and training women on installation and repair of generators and distribution lines, is critical. Project developers and those executing projects should be required to maximise the opportunities for these outcomes under projects. Dependence on external project support must also be minimised to avoid progression issues due to a lack of available expertise, an issue that has been particularly acute during COVID. Building this capacity within PICs will, in turn, incentivise private sector investment, as there will be local people on the ground who can operate and maintain the infrastructure. Where energy planning and development support is to be provided by development partners, particularly in the smaller PICs, there needs to be a high degree of cultural sensitivity in the way that support is provided.

Opportunities for capacity building must also be linked to exposure with practical project experience. Training relationships with other countries can serve an important function in developing undergraduates from Pacific schools and colleges to work on a range of renewable energy applications. Multilateral funds need to go 'beyond funding modalities' and devise solutions that are tailored to these specific island contexts and facilitate innovation that meets these local realities (GCF, 2020).

4.3 Community ownership and engagement

Participants highlighted the difficulty of enabling PICs to better understand the benefits of larger generating systems and the opportunities that increased energy access will bring for their livelihoods, including increased levels of disposable income. Finding local people with the skills and training to work with and maintain these new generation and storage technologies is also very challenging. Some projects in the past have been poorly conceived and are poorly suited to the local context. There have also been complex land issues to resolve in some cases, with land being a very precious resource in the vast ocean.

A sustainable transition therefore requires renewable energy uptake to be managed in a way that supports community ownership of these systems and technologies and enables the community to maintain this infrastructure in an ongoing way. Talanoa is important in this context in enabling Pacific Island communities to understand the benefits of larger generating systems and increased energy access.

Multilateral funds can play a key role in promoting community ownership and engagement in PICs. Country ownership has become a cornerstone of climate finance and the 2015 Paris Agreement on Climate Change, under which countries determine and own their development pathways and make pledges regarding the national actions that will be taken to meet global temperature goals (GCF, 2020). Under this approach, donor interventions are aligned with national climate policies and strategies, there exists intensive national stakeholder engagement across both government and non-government stakeholders, and improved recipient access to climate finance (GCF, 2020). Multilateral climate funds like the Green Climate Fund are seeking to provide simplified and improved access to funding, including

direct access, and support for programmatic approaches in accordance with country strategies and plans (GCF, 2020).

Effective Finance

5.1 A small market

Renewable energy technology has become more accessible and more affordable over time and enhanced energy solutions are available in the Pacific, particularly in relation to small-scale solar generation. Pacific Island Countries all grapple, however, with problems of scale and remoteness, limited public infrastructure and the limited financial capacity of energy consumers, which must be considered in renewable energy development planning and especially in the context of loan-based financing. An unresolved question is the kind of financing facility needed to support the development of the smaller scale projects needed in many PICs, and to address the determinants of energy access problems.

5.2 Public finance, private finance, and private sector engagement

Large amounts of public and private finance are going to be needed to implement national roadmaps over a very short space of time. Development partners will need to engage closely and effectively with Pacific Island people to assist them to effectively absorb this level of support on a programme and project basis and use the support to attract ongoing private sector support and their economies.

Development partner support has, however, been largely grant based and disbursed in partnership with governments, with few incentives for the private sector to participate in these initiatives. Grant-based funding will not be sufficient to cover the costs of providing energy in the Pacific, and there is an urgent need for public donors to find ways to de-risk and promote private investments across the region to enable private companies to enter these markets and mobilise change. 2000 MW of new generation is required to meet the Pacific's 2030 targets, but only 19 MW has been constructed in the last five years, with only five or six active private developers in the Pacific.

A variety of financing mechanisms should be considered, including loan-based resources for the development of significant generation infrastructure. Collaborative approaches to grants and lending are emerging in the region to provide effective concessional assistance (e.g., Tina River), and there is also the potential for development partners to coordinate with national banks across the islands to provide support to the private sector, and particularly small and medium-sized enterprises who can reach more isolated communities.

In this context, the specific role of the Australian Infrastructure Financing Facility for the Pacific or its strategic objectives in relation to Pacific renewables is still under construction, and the fund is in the early stages of building a pipeline of investment. Development partners like Australia need to focus not only on public funding but also harnessing the national clean tech sector, and creating structures for market

building, pairing local energy needs with providers in an off-grid setting. With no offtakers for renewable energy projects, developers must currently adopt a capital-intensive build/own/operate model that constrains cash flow for new developments. New mechanisms are being developed that can take over projects and provide liquidity to developers to enable those developers to purpose new opportunities.

Public and Private Coordination

6.1 Regional coordination

Stronger regional partnerships will be needed to combat common challenges, develop programmatic financing approaches, support energy reform processes, private sector development and capacity building. Participants identified the need for better collaboration among the renewable energy centres at the Pacific Community, The University of the South Pacific and Secretariat of the Pacific Regional Environment Programme. Financial cooperation is a significant issue, as is the financing of a regional framework.

The Pacific Community has now released a new regional Framework for Energy Security and Resilience in the Pacific 2021-2030 (PC, 2021). The framework identifies key challenges, both ongoing and developing, facing the pacific over the forthcoming decade. These include:

Climate change impacts, in relation to both the commitment of PICs to meeting regional NDCs and adaptation planning to mitigate the threat of climate change to regional environmental security.

Inadequate data and energy security indicators, particularly in relation to transport and miscellaneous fuel use and rural energy use more broadly.

Petroleum dependence, as PICs have, since 2000, maintained an 80% dependence on imported petroleum fossil used predominantly in transport and electricity generation.

Renewable electricity progress, and the lack of meaningful improvement in electrical energy security despite considerable regional investment.

Pandemic impacts, with COVID-19 having delayed implementation of planned renewable energy developments within the region and had significant economic impacts for some Pacific economies, particularly those highly dependent on tourism.

The framework also identifies opportunities regarding energy security and resilience for the region, including in relation to progress in the development of cost-effective renewable energy technologies, an increased number of energy centres with a regional or sub-regional focus and additional and more effective opportunities to develop Pacific women as energy professionals through the implementation of the Pacific Energy and Gender Network Strategic Action Plan (PEGSAP) 2020–2030.

In light of these challenges and opportunities, collaborators on the framework developed a set of 6 priority areas (including in relation to policy, planning and capacity development, energy sector finance

and cooperation and sustainable electric power development) with 23 energy initiatives appropriate for a pacific regional approach.

6.2 The 'grid'

Connectivity to a regular energy distribution grid in PICs will not always be practicable. Small scale generation and distributed energy resources are often required and will need to be aggregated in many places to meet local demand. Geospatial assessment is an effective strategic and coordination tool and facilitates a process of both on and off grid planning and development between PICs and development partners.

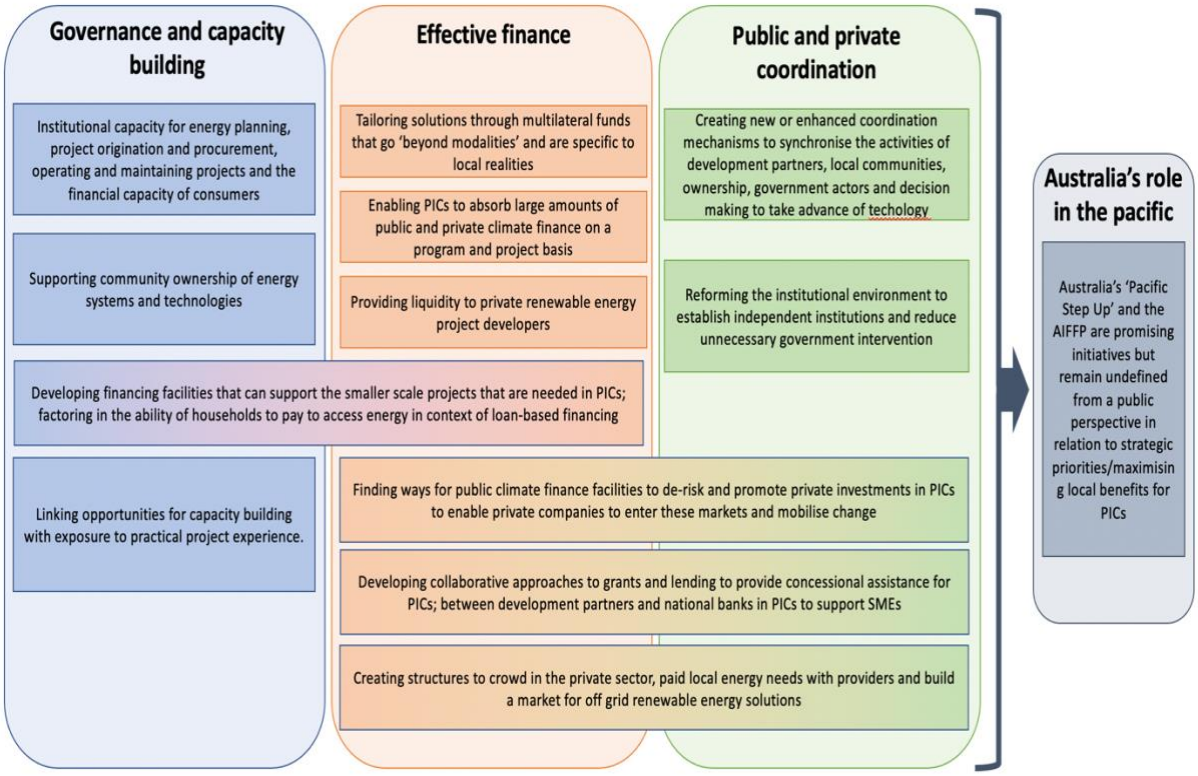
6.3 Coordination structures and processes

New coordination mechanisms are needed to synchronise local communities, ownership, actors, and decision-making to take advantage of the technologies available. Decisions are still being made, however, about how to build more effective governance structures and capacity building structures in each country.

Fundamental decisions need to be taken on whether to opt for private sector or public sector proponents, solicited or unsolicited proposals, country based, regional, multi-country or multi sovereign operations and the institutional mechanisms needed to coordinate these factors. Transformational process approaches and new forms of public-private partnership are needed to build electricity infrastructure at the scale required and are beginning to emerge in the region (e.g., the Tina River Hydropower Project).

New forums are also needed to pair energy demand in the Pacific with smaller scale developers in an off-grid context. Pacific communities are not necessarily cognisant of the potential benefits of renewable energy or able to communicate their needs to either public institutions or private partners. This lack of coordinated demand can lead to an ad hoc approach to private sector project development that can displace local actors and/or lead to poor technology outcomes.

Figure 2: Key issues for developing effective solutions



Reflections

There are five key themes that emerged over the course of the workshop as critical factors to address for PICs to transition to renewables within their desired timeframe. Each is dealt with in turn.

Across our stakeholder sessions, a recurring theme was the **capacity** of PICs to ensure a sustainable transition. This is an endemic issue for all developing countries in relation to ensuring sufficient technical knowledge and staff to maintain renewable energy systems and use. It is an issue that is particularly acute in the Pacific given the significant distances between centres and sparse populations. The geographical space and heterogeneity of PICs, means that population densities are diverse and require different solutions. Papua New Guinea has been identified as having concrete examples of how to manage renewable energy options for different communities. If and how this might be replicable across the Pacific requires further investigation. Capacity also is significant at a range of levels: in terms of government capacity to identify suitable projects, how to access funding, how to communicate with utility companies, how to engage with communities. Capacity also raises concerns in terms of good governance.

A second major theme relates to **renewable energy process and sequencing**. Stakeholders and scholars identified concerns with how PICs can access and order the necessary ingredients to establish renewable

energy systems and use. This underscores what the energy is needed for and how best public and private sector providers can serve disparate communities. Further reflection is also needed on how the state, public providers, private companies, and development financiers can work together and in what capacity, to gain a better understanding of how the renewable transition can succeed. One energy project has taken 10 years to become operational, which is a success story, but decarbonisation will need to occur in the short and immediate term. It is therefore important to understand the role that different partners can play at different stages to bring renewable energy to fruition. This will require experimentation with different roles for different actors in different stages of the transition.

A third theme that emerged returns us to **market incentives**. In what ways can public finance contribute through establishing the right incentive structures for crowding in market actors? How can public agencies and funders help the private sector do what the private sector does best, which is to invest and operate? There is a fine line between public actors providing the necessary examples and support while not crowding out private investment.

A fourth theme is **access to finance**. While public and private actors each play a role in the renewable energy transition, accessing financing will facilitate the shift for all players. There is development funding for the sustainable transition in PICs, but it remains a challenge for PICs to apply for funding from myriad development lenders (although processes have been streamlined in the Green Climate Fund). Climate financiers like the Clean Development Mechanism and other mechanisms are valuable for providing financial support for linking local needs to global concerns.

A final theme concerns **regional approaches and aggregation**. How can PICs upscale to gain the benefits of economies of scale given the vast geographical distances and heterogenous populations? One key issue is how to achieve scale to be garner sufficient investment. Pacific Island Countries are increasingly collaborating and coordinating their activities, particularly in relation to the regional working groups, which might facilitate the types of investment within the timeframes necessary to provide that expedient climate adaptation and mitigation.

Ultimately, the transition to net zero must not leave PICs behind. The halting progress at COP26 highlights the precarious future of many Pacific nations, and rapid and targeted innovations in governance and process will be critical to propel renewable energy transitions of the scale and pace required. Governments, development partners, the private sector and Pacific communities must work together in new and more effective ways to create opportunities to promote climate resilience and energy security and ensure that Pacific Island people can continue to flourish through an inclusive, just, and sustainable energy transition.

References

Asian Development Bank. (2021). *Pacific Energy Update 2020*. Philippines.

Green Climate Fund. (2020). Meeting of the Board, 12-14 March 2020, *Independent Evaluation of the Green Climate Fund's Country Ownership Approach*.

Green Climate Fund. (2021). *Country Readiness*. www.greenclimate.fund/readiness.

Hoegh-Guldberg, O. et al, IPCC. (2018). *Impacts of 1.5.C Global Warming on Natural and Human Systems*. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of* . s.l.. Intergovernmental Panel on Climate Change.

International Energy Agency. (2021). *Net Zero by 2050*. Paris. www.iea.org/reports/net-zero-by-2050.

Secretariat of the Pacific Regional Environment Programme (SPREP). (2021) *State of environment and conservation in the Pacific Islands: 2020 regional report.* Apia, Samoa

Pacific Community. (2021). Framework for Energy Security and Resilience in the Pacific (FESRIP) 2021-2032. New Caledonia.