PREO
Powering Renewable Energy Opportunities

Powering Resilience and Economic Opportunity in Pacific Island Countries

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Transforming Energy Access

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About PREO and this insight piece

This insight piece explores how productive use of renewable energy (PURE) can strengthen resilience and expand economic opportunity across the Pacific Island Countries. Drawing on six businesses supported by the Powering Renewable Energy Opportunities (PREO) programme, it examines how locally led enterprises are applying renewable energy to strengthen food systems, connect remote producers with markets, improve healthcare delivery, increase water security and create greater value from local resources.

The case studies demonstrate the wider role that renewable energy can play in addressing the interconnected challenges facing Pacific communities, including high energy costs, dependence on imported fuels and products, geographic isolation, fragmented supply chains and growing exposure to climate impacts. They also highlight three lessons for future investment: the importance of trusted local networks, the significant impact that targeted funding can achieve in small island economies, and the potential for proven business models to attract follow-on capital, expand and be adapted across other island communities.

The Powering Renewable Energy Opportunities (PREO) programme is a demand-led productive use of renewable energy (PURE) initiative that stimulates partnerships, innovation and learning to improve the livelihoods of communities in sub-Saharan Africa and Pacific Island Countries. Co-funded by the UK government's Foreign, Commonwealth and Development Office (FCDO) through its Global Research and Technology Development (GRTD) portfolio via the Transforming Energy Access (TEA) platform, and the IKEA Foundation, PREO is delivered by the Carbon Trust and Energy 4 Impact, Prosper Global' platform for shaping clean energy market systems.

PREO's mission is to enable businesses to harness renewable energy to improve incomes, build climate resilience and reduce reliance on fossil fuels, supporting progress towards Sustainable Development Goals 7 (affordable and clean energy), 8 (decent work and economic growth) and 13 (climate action).

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Cover image: Motu Juice. Vava'u, Tonga. 2025.

With thanks to the PREO-supported businesses and local partners whose experiences and insights informed this report.

This material has been funded by UK government's Foreign, Commonwealth & Development Office (FCDO) through its Global Research and Technology Development (GRTD) portfolio; however the views expressed do not necessarily reflect the UK government's official policies.

Executive Summary

Pacific Island Countries are among the world's most climate-vulnerable nations. At the same time, many communities face high energy costs, reliance on imported fuels, fragmented supply chains and limited economic opportunities. Across the region, Productive Use of Renewable Energy (PURE) offers a route to decarbonisation, while also strengthening resilience, supporting livelihoods and improving long-term economic security.

Through the UK Government's Transforming Energy Access platform, PREO is supporting locally-led enterprises that are using renewable energy to solve practical challenges facing Pacific communities. From strengthening food systems and healthcare supply chains to improving access to clean water and creating new income opportunities, these businesses demonstrate how PURE can contribute to resilient and inclusive development.

Three insights for future investment

Across Samoa, Tonga and Solomon Islands, successful projects have relied on trusted local partnerships, community engagement and business models tailored to local circumstances. PREO's experience suggests that sustainable energy access is most effective when renewable energy is integrated into existing livelihoods, local institutions and community priorities rather than introduced as a standalone technology intervention.

Across the portfolio, three lessons stand out for future funders and investors seeking practical, scalable routes to resilience and inclusive growth in Pacific Island Countries.



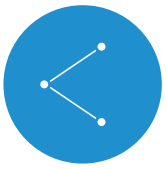
Local networks turn technology into lasting value

Trusted partnerships, community engagement and business models adapted to local circumstances are central to successful delivery. Renewable energy creates the greatest value when it is integrated into existing livelihoods, institutions and community priorities, with local partners shaping how solutions are introduced, operated and sustained.



Targeted funding can unlock significant local impact

In Pacific Island markets, relatively modest, well-directed funding can enable enterprises to install productive assets, test commercial models and build evidence of demand. The case studies show how targeted support can reduce operating costs, strengthen essential services and create room for reinvestment, helping locally led businesses turn limited capital into practical and visible outcomes.



Proven models create routes to growth and replication

The portfolio also points to opportunities for business growth, expansion and wider market impact. By demonstrating that renewable-energy-enabled models can work in sectors such as agriculture, food processing, fisheries, healthcare and water, these projects can help de-risk future investment, attract follow-on capital and provide approaches that can be adapted across other island communities.



CASE STUDY 1

Sunshine Pacific Limited

Using renewable energy to strengthen local food production in Samoa

Photo: Sunshine Pacific Limited. Samoa. 2025.

Sunshine Pacific Limited

Sector: Agriculture and food production

Country: Samoa

On the island of Upolu in Samoa, Sunshine Pacific Limited supplies fresh produce to one of the country's largest supermarket groups, Frankie Supermarket. Operating in a context where local agricultural producers face rising costs, labour shortages and increasing pressure to improve productivity, the business has invested in a combination of renewable energy and modern farming practices to strengthen its operations.

Through support from PREO, Sunshine Pacific Limited installed a solar PV system as part of a broader effort to reduce operating costs and improve the economic viability of local food production. By lowering electricity expenditure, the investment has helped create additional financial capacity within the business, providing confidence to explore further innovations and improvements across its operations.

The wider significance of the project becomes clearer when viewed in the context of Samoa's development challenges. Unlike many Pacific Island countries, Samoa has close to universal access to electricity and relatively reliable transport infrastructure. However, agriculture faces a different set of limitations. A long-established pathway for Samoans to work overseas, particularly in Australia and New Zealand, has contributed to labour shortages across several sectors, including farming. At the same time, imported food products have become increasingly prevalent, contributing to concerns about food security, nutrition and the long-term resilience of domestic food systems.

Countering these challenges, Sunshine Pacific Limited has invested in automated agricultural systems and hydroponic methods that allow for less labour-intensive fresh food production at scale. This approach helps address workforce limitations while increasing the availability of locally grown produce within Samoa's food system. The result is not simply a more efficient agricultural enterprise, but a model for how technology can help strengthen domestic food production in contexts where labour availability is becoming an increasing challenge.

The case study also highlights the role renewable energy can play in enabling agricultural productivity. Lower energy costs improve business competitiveness, create opportunities for reinvestment and help reduce the risks associated with operating energy-intensive agricultural enterprises. In Pacific Island economies where imported fuels and energy costs can place considerable pressure on businesses, these gains can have a significant impact on long-term viability.

For PREO, Sunshine Pacific Limited demonstrates the importance of locally relevant innovation. The project's value lies not only in the renewable energy technology itself, but in its ability to support wider food system outcomes, including increased domestic production, reduced dependence on imports and stronger economic resilience. By providing a visible example of how renewable energy can support profitable agricultural enterprises, the project creates a practical demonstration that other producers can learn from and potentially replicate.

Why it matters

- **Supports domestic food security**
- **Reduces operating costs for agricultural producers**
- **Demonstrates how renewable energy can help address labour constraints through automation**
- **Creates a model that other farmers may replicate**



CASE STUDY 2

Motu Juice

Turning local resources into local value in Tonga

Photo: Motu Juice. Vava'u, Tonga. 2025.

Motu Juice

Sector: Agri-processing

Country: Tonga

Across Tonga, coconut trees are abundant. They are woven into the landscape and have long been part of the country's agricultural identity. Yet much of the coconut milk consumed in Tonga is imported. Local coconuts are often left unused, while processed products travel thousands of kilometres through international supply chains before reaching supermarket shelves. At the same time, Tonga remains heavily dependent on imported fuels and is vulnerable to disruptions in energy supply. These interconnected challenges create a striking contradiction: abundant local resources alongside over-reliance on imported goods and energy.

Motu Juice was established to help address that challenge. The company has developed a small-scale coconut processing facility capable of transforming locally sourced coconuts into shelf-stable coconut milk products that can be sold and consumed within Tonga. Through support from PREO, Motu Juice installed solar panels, battery storage and associated energy infrastructure, enabling the facility to operate using locally available renewable energy rather than relying on expensive and sometimes unreliable diesel-powered electricity.

Reliable power is particularly important for food-processing operations where interruptions, voltage fluctuations and equipment damage can have significant operational consequences. By combining solar generation with battery storage, the facility is able to maintain stable operations and reduce exposure to the wider challenges affecting Tonga's energy system.

Motu Juice's business model illustrates how PURE can support greater value creation within local economies. Instead of exporting raw materials or relying on imports, the company processes coconuts domestically, creating local jobs, building new skills and generating products that can substitute imported alternatives. The facility currently produces hundreds of pouches of locally processed coconut milk each day, demonstrating how relatively small-scale infrastructure investments can support domestic manufacturing and food production. Furthermore, while Motu Juice's model started with coconut milk, it is flexible and can preserve any shelf-stable canned food, meaning the company has the tools and potential to expand in the future.

Another notable aspect of its operations is its focus on maximising the value derived from local resources. The company has developed uses for almost every part of the coconut, converting different outputs into products including food ingredients, animal feed and biomass fuel. This approach helps minimise waste while creating additional revenue streams and strengthening the overall business model. Rather than treating by-products as waste, they become inputs for other productive activities, keeping more value within the local economy.

The broader significance of the project lies in what it demonstrates for small island economies. Many Pacific nations face similar challenges: abundant natural resources, high dependence on imported products, exposure to volatile fuel prices and geographically dispersed populations. Motu Juice shows how renewable energy can help unlock local economic activity by supporting processing, manufacturing and value addition close to the source of production.

For PREO, the project is a strong example of how targeted support can help local businesses test and prove new models. The "factory in a box" concept provides a practical demonstration of how renewable energy, local entrepreneurship and resource-based industries can work together to strengthen economic resilience. When successfully replicated, the model will help other isolated communities across the Pacific and the world derive greater value from local resources while reducing reliance on imported products and fuels.

Why it matters

- **Reduces reliance on imported food products.**
- **Creates value from locally available resources.**
- **Supports local employment and skills development.**
- **Strengthens resilience to fuel shortages and supply disruptions.**



CASE STUDY 3

Archipelago Energy

Connecting remote fishing communities to new markets in the Solomon Islands

Photo: Mbambanga community, Archipelago. Solomon Islands. 2025.

Archipelago Energy

Sector: Fisheries

Country: Solomon Islands

The geography of the Pacific presents a unique set of development challenges. Communities are often dispersed across vast distances, transport links can be slow and expensive, and access to critical services and economic opportunities varies significantly between urban centres and remote islands. In the Solomon Islands, where many coastal communities depend on small-scale fishing for their livelihoods, these challenges are particularly visible. Fish is abundant, but without access to reliable cold storage and routes to larger markets, much of its value can be lost before it ever reaches consumers.

Archipelago Energy's Hapi Fis project was developed in response to this challenge. Supported through PREO, the initiative combines renewable energy with market access to help fishing communities capture more value from their catch. The project provides solar-powered freezers to local partners, allowing fish to be stored safely and aggregated before being transported to Honiara, where demand from hotels, restaurants and other buyers supports significantly higher prices than those available locally.

The innovation lies not simply in providing cold storage, but in creating the infrastructure that links remote producers to higher-value markets. For many communities, access to refrigeration can extend the time available to sell products, reduce losses and improve the consistency of supply. By combining solar-powered cold storage with a structured route to market, the project enables fishing communities to participate more effectively in the wider economy while retaining a greater share of the value generated by their catch.

The project also points to future opportunities for local value creation. As volumes increase and capabilities develop, activities such as fish processing, filleting and packaging could take place closer to the point of harvest, allowing communities to retain more income and create additional employment opportunities. In this context, renewable energy acts as a platform that enables broader economic activity rather than an end in itself.

One of the most striking lessons from the project is the importance of local leadership and community ownership. In the Solomon Islands, successful project delivery depends heavily on trust, relationships and cultural understanding. Archipelago Energy works through local partners who have deep connections within their communities and who understand local priorities, expectations and social dynamics. Partner selection relies on building relationships and establishing trust over time, helping ensure that equipment and services are embedded within the community rather than imposed from outside.

This local approach helps create opportunities that extend beyond the original project objectives. Once solar-powered equipment is installed, communities can explore additional income streams and new uses for the infrastructure. Archipelago Energy is also investigating complementary opportunities, including electrified transport services along existing routes, which could further reduce costs while improving connectivity between remote communities and regional centres.

The project highlights a wider challenge facing many remote island communities. While headline electricity access rates may appear relatively high, access is often unreliable, expensive or insufficient to support productive economic activity. Renewable energy technologies can help address part of this challenge, but long-term impact depends on business models that connect energy access with livelihoods, enterprise development and local economic growth.

For PREO, Archipelago Energy provides a compelling example of how renewable energy can support rural development when combined with local leadership and access to markets. The project demonstrates that improving livelihoods is about creating reliable links between producers and customers, building trusted local partnerships and ensuring that communities can benefit directly from the value they create, which are equally important foundations for sustainable development.

In the Solomon Islands, Hapi Fis shows how renewable energy can help unlock economic opportunities in places that are often overlooked by conventional infrastructure and investment. By connecting remote fishing communities to higher-value markets, the project is creating new pathways for income generation, local enterprise and long-term resilience.

Why it matters

- **Increases incomes for fishing communities**
- **Improves access to markets**
- **Reduces dependence on diesel-powered refrigeration**
- **Demonstrates the role of local networks in successful project delivery**



Photo: Mbambanga community, Archipelago. Solomon Islands. 2025.



CASE STUDY 4

Blackfrog Energy

Improving access to essential healthcare

Photo: Blackfrog Energy. Fiji. 2026.

Blackfrog Energy

Sector: Healthcare logistics

Country: Fiji

Delivering healthcare across the Pacific Island Countries presents unique logistical challenges. Communities are often spread across hundreds of islands, with many only accessible by boat or long journeys over difficult terrain. For vaccination programmes, maintaining the cold chain during transport is critical. Yet unreliable electricity, extreme weather events and long travel distances can make it difficult to ensure vaccines remain within the required temperature range, particularly when serving remote and off-grid communities. These challenges are expected to become more pronounced as climate change places increasing pressure on critical infrastructure and essential services.

PREO-supported company, BlackFrog Technologies and partners, is helping address this challenge through its Emvólio vaccine carrier technology. Across Fiji, 40 solar-powered Emvólio units have been deployed alongside portable solar panels to support vaccine delivery in remote communities. Working in partnership with Fiji's Ministry of Health and Medical Services, the initiative is helping strengthen the "last mile" of vaccine delivery, ensuring health workers can safely transport vaccines while maintaining the strict temperature controls required for their effectiveness.

The Emvólio system was specifically designed for challenging operating environments. The portable, battery-powered refrigeration device maintains vaccines at the required 2°C to 8°C range during transport and field outreach, while solar charging capability enables operation in locations where conventional electricity access may be limited or unreliable. The technology is World Health Organisation-prequalified and includes temperature monitoring and tracking features that help improve accountability throughout the vaccine supply chain.

For Pacific Island nations such as Fiji, where populations are dispersed across numerous islands and healthcare workers may travel significant distances to reach communities, innovations like Emvólio can help strengthen immunisation programmes and improve access to essential healthcare services. The deployment also enhances resilience during emergencies, helping reduce the risk of vaccine spoilage during cyclones, floods or power outages that can disrupt conventional cold-chain infrastructure.

Healthcare workers have now been trained to use and integrate Emvólio into Fiji's national immunisation programme, building local capability alongside the introduction of the equipment. This focus on capacity building helps ensure the technology can be effectively adopted and sustained over the long term, while strengthening healthcare delivery systems more broadly.

BlackFrog's work demonstrates how PURE can support critical services by combining renewable energy, healthcare innovation and local capacity building, the project is helping improve health outcomes, strengthen resilience and ensure essential services can reach some of the Pacific's most remote and climate-vulnerable communities.

Why it matters

- **Supports healthcare resilience**
- **Improves delivery of critical medical products**
- **Reduces energy requirements compared with conventional refrigeration**
- **Strengthens essential services in remote locations**



CASE STUDY 5

Bluemont

Strengthening water security through renewable energy

Photo: Bluemont. Tonga. 2026.

Bluemont

Sector: Water Security

Country: Tonga

For many remote Pacific Island communities, access to safe drinking water remains one of the most pressing development challenges. Communities often depend on rainfall harvesting and limited freshwater resources, leaving them vulnerable to droughts, changing rainfall patterns and the growing impacts of climate change. When water supplies run low, communities may be forced to rely on costly and logistically complex deliveries from larger islands, highlighting the need for more resilient and locally managed solutions.

In Tonga's Vava'u island group, PREO-supported company Bluemont is demonstrating how renewable energy can help address these challenges. The company has deployed solar-powered desalination systems on the islands of Hunga and Matamaka, converting seawater into safe drinking water using 100% renewable energy. Each system can produce up to 4,300 litres of fresh water per day, providing communities with a reliable, weather-independent water supply while reducing reliance on imported fuel and emergency water deliveries.

The project is significant for communities that have historically relied almost entirely on rainwater harvesting. Access to dependable sources of clean water can improve health outcomes, strengthen sanitation, support local livelihoods and increase resilience during periods of drought. As climate change continues to place pressure on water resources across the Pacific, such solutions offer a practical example of how renewable energy can help communities adapt to increasingly uncertain environmental conditions.

A key element of the project has been local ownership. Community members, including women, as well as representatives from the Tonga Water Board, have been trained to operate and maintain the systems independently, helping ensure long-term sustainability beyond the initial deployment. By combining renewable energy, water security and local capacity building, Bluemont's work demonstrates how decentralised infrastructure can strengthen resilience while enabling communities to take greater control of critical resources.

Why it matters

- **Improves community resilience to climate impacts**
- **Reduces dependence on fuel-powered water infrastructure**
- **Supports long-term water security**
- **Enables locally managed service delivery**



CASE STUDY 6

SDG Changemakers

Creating more value from Fiji's coconut economy through renewable energy

Photo: SDG Changemakers, Fiji. 2026.

SDG Changemakers

Sector: Agriculture and agri-processing

Country: Fiji

As illustrated earlier in the case of Motu Juice, across many Pacific Island Countries, coconuts are both a cultural staple and an important agricultural resource. Yet much of their economic potential remains untapped. While established markets focus on copra and other coconut products, husks are frequently discarded or underused. Processing these by-products locally offers an opportunity to create additional income, develop new enterprises and supply materials for agriculture and environmental restoration.

PREO-supported SDG Changemakers, trading as OraSoil, has established its first semi-commercial processing Spoke in Savusavu, Fiji. The site provides a practical demonstration of how renewable energy and local processing can help capture more value from coconuts. It is also generating operational lessons to inform a wider network of 10 community enterprises linked to a central Fibre Hub.

Connecting community Spokes with a central Fibre Hub

OraSoil's model brings initial processing closer to coconut-producing communities. At each Spoke, coconut husks are processed into cocopeat and coir fibre, with shells separated for additional uses. Communities would operate their own Spoke businesses and retain the profits generated by those operations.

The planned Fibre Hub will purchase and aggregate materials from the Spokes, manage quality assurance and undertake further manufacturing, packaging and distribution. Orasoil leads market development, connecting community production with buyers who require consistent quality, reliable volumes and finished products.

This structure allows communities to participate in value addition while accessing shared infrastructure and markets that would be difficult for individual enterprises to develop alone. Products include growing media, coir matting and geotextiles for landscaping, erosion control and ecosystem restoration.

Moving from demonstration towards commercial scale

The Savusavu Spoke is already supporting product development and local market testing, including cocopeat and seedling mixes. Its experience is helping OraSoil understand processing costs, equipment performance, customer requirements and the support future community operators will need.

Renewable energy is an enabling part of this approach. A 10 kW solar PV system with battery storage currently powers the dehusker and decorticator.

The next phase is to expand local processing and establish the Fibre Hub, subject to securing funding and finalising commercial arrangements. The next phase is an initial scale up to 50,000 coconuts a month, with a longer-term ambition for a network of ten community Spokes linked to a Hub designed to handle the equivalent of 300,000 husks a month. These are planned capacities, with expansion dependent on reliable supply, proven processing performance and sufficient customer demand.

Building viable community businesses

Access to equipment is only one part of making the model work. Community enterprises also need training, working capital, dependable purchasing arrangements and clear operating responsibilities.

OraSoil is therefore developing the commercial and financing arrangements needed to support replication. The aim is to make participation accessible while ensuring that both the Spokes and the Fibre Hub can operate as financially viable businesses. Demonstration, practical training and ongoing mentoring are central to this approach.

Locating future Spokes within communities could also improve participation by women and young people. Feedback from women's groups suggests that proximity to home could help address travel, childcare and other commitments that limit access to employment at more distant processing sites.

Creating value through connected local enterprises

For PREO, OraSoil illustrates both the opportunity and the practical work involved in linking renewable energy with agricultural value addition. The project has progressed from an initial processing concept to an operating demonstration Spoke and a defined pathway towards a wider Spoke and Fibre Hub network.

Its next stage will depend on translating operational learning into reliable production, securing buyers and raising the finance required for expansion. If these conditions are met, the model could help coconut-producing communities earn more from existing resources while building local processing capacity and supplying products that support more resilient agriculture and landscapes.

Why it matters

- **Creates additional value from coconut husks that are often discarded or underused.**
- **Gives communities a business model through which they can retain profits from local processing.**
- **Connects decentralised Spokes with shared manufacturing capacity, quality assurance and market access.**
- **Demonstrates the practical requirements for renewable-energy-powered agricultural processing.**
- **Builds a pathway towards wider participation by women, young people and rural enterprises.**



Photo: SDG Changemakers, Fiji. 2026.

Conclusion

From energy access to resilience, growth and local development

The experiences of Sunshine Pacific Limited, Motu Juice, Archipelago Energy, BlackFrog Technologies, Bluemont and SDG Changemakers illustrate a broader shift in how renewable energy is contributing to development across Pacific Island Countries. Rather than being viewed solely as a source of electricity, renewable energy is increasingly acting as an enabler of economic opportunity, stronger public services and greater resilience to climate and economic shocks.

Collectively, these examples demonstrate how PURE can support priorities that are central to both Pacific governments and the UK's international development objectives in the region. They show how renewable energy can help strengthen food systems, improve healthcare and water security, support local enterprise, create jobs and reduce dependence on imported fuels. At the same time, they highlight the role that clean energy can play in helping communities adapt to the growing impacts of climate change, including more frequent extreme weather events, disruptions to supply chains and increasing pressure on essential services.

The case studies also reinforce a lesson that is becoming increasingly clear across the Pacific: long-term impact depends on strong local partnerships, trusted community relationships, local skills and business models that respond to locally identified priorities. Whether supporting fishers in the Solomon Islands, healthcare workers in Fiji, farming communities in Samoa and Tonga, or remote island communities seeking reliable access to clean water, successful interventions are those that place local ownership and participation at their core.

This aligns closely with the objectives of the UK's Ayrton Fund and the Transforming Energy Access platform, which seek to accelerate clean energy innovation while delivering wider development outcomes and action towards achieving the Sustainable Development Goals. As these projects demonstrate, renewable energy can be a catalyst for more inclusive economic growth, improved climate resilience and stronger public services when it is integrated into the systems and livelihoods that communities rely upon every day.

As Pacific Island Countries continue to navigate the intersecting challenges of climate change, economic vulnerability and geographic isolation, locally led innovation will be increasingly important. PREO's portfolio shows that when renewable energy is combined with entrepreneurship, local leadership and practical development needs, it can help create more resilient communities, stronger local economies and sustainable pathways to long-term prosperity.

PREO
Powering Renewable Energy Opportunities

PREO promotes the productive use of renewable energy (PURE) in sub-Saharan Africa and the Pacific Island Countries to stimulate local economic development and support global progress towards the Sustainable Development Goals (SDG7, SDG8 & SDG13). By bolstering investment and engagement in the PURE sector, PREO strives to realise the potential of PURE as a key driver in a just and inclusive global clean energy transition. The PREO programme supports collaborative partnerships that are designed to meet the specific needs of local communities. For more information, please visit: PREO Powering Renewable Energy Opportunities

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