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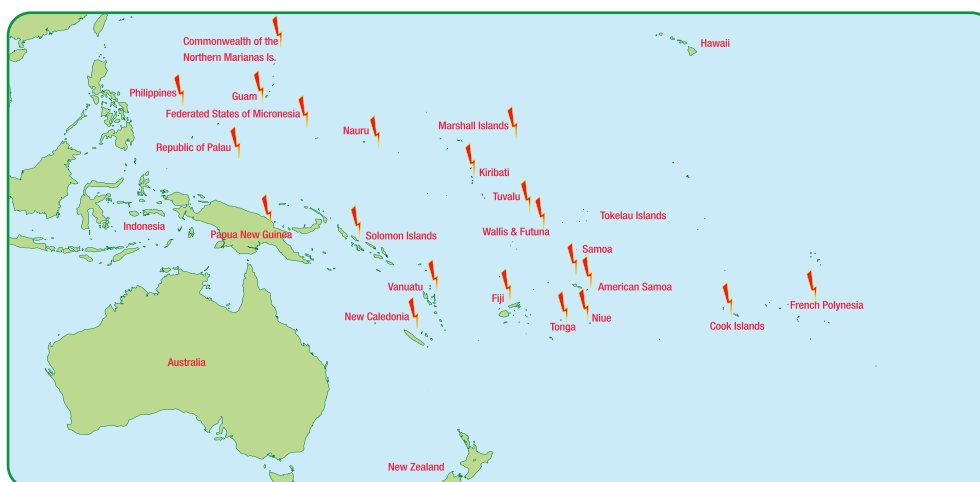
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## EDITOR'S NOTE

**Gordon Chang**

Executive Director

Preparations are well advanced for our upcoming 33<sup>rd</sup> Conference in Nadi, Fiji to be hosted by the Pacific Power Association (PPA.) This is the second of the PPA Conference to be hosted by PPA, the first PPA Conference was hosted in Brisbane Australia in 2022. This year the conference theme is **"Ensuring fair rates and reliable services while accelerating investments in renewable energy and grids"**. The conference venue will be the Crown Plaza Resort Hotel at Wailoaloa, Nadi.

Critical issues will be addressed at the Conference, and particularly the fuel crisis with the ever-increasing cost spiral. In addition, our Association has been addressing fuel price hedging, and we will look at the simulated hedging that has been conducted from last year by ADB. There will be a detailed discussion and assessment of the process at our Conference. At this year's conference I urge all members to register and reserve their hotel accommodation to take advantage of the early bird rate offered by the Crown Plaza Resort Hotel.

In addition, our Association, since our last issue of the magazine, welcomes these new allied members. I hope that you can join us at the conference.

Allied Members:

1. **ELECTROPAR LTD T/A PLP NEW ZEALAND:** PLP New Zealand is based in Auckland, New Zealand. Their primary activity is distribution, transmission and substation hardware. Their secondary activity is solar racking system, PPE and fusing.
2. **LPINZ LTD:** LPINZ Ltd is based in Auckland, New Zealand. Their primary activity is design, supply, install LV/ MV/HV equipments, power audit, UPS, batteries and generators. Their secondary activity is EV chargers, lighting/surge protection and earthing design/supply/install.

3. **PACIFIC POWER ENGINEERING AUST.:** Pacific Power Engineering Aust. is based in Victoria, Australia. Their primary activity is spare parts, generators and electrical in solar, wind and BESS systems. Their secondary activity is Turnkey/ Design build renewable energy solar, wind and BESS systems.

4. **DELTA ELECTRONICS AUSTRALIA PTY LTD:** Delta Electronics Australia Pty Ltd is based in New South Wales, Australia.

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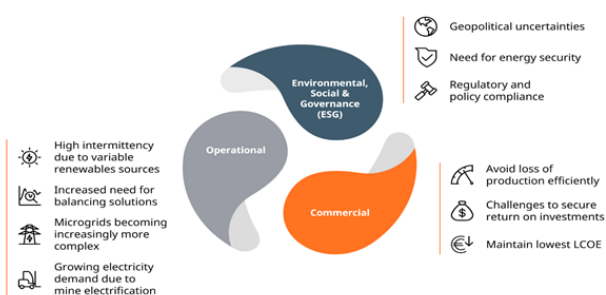
1. **SPL TE UIRA API NO TE MAU MOTU:** SPL Te Uira Api No Te Mau Motu has officially joined PPA as an Active Member based in Uturoa, French Polynesia.

## Towards 100% Renewable Energy for Mines

Christoffer EK, Director-Decarbonisation Services, Sustainable Technology Hub, Wartsila Finland Oy

Addressing commercial and technical challenges- Wärtsilä Energy. As mines work their way towards decarbonised operations, they might face a multitude of complexities, requiring operators and their partners to acquire a holistic approach to decarbonisation. For mines to fully decarbonise, various environmental, technical and commercial aspects will need to be considered. Environmental, social and governance considerations include geopolitical uncertainties, the need for energy security, and compliance with regulations and policies. Financial and commercial challenges involve maintaining the lowest levelised cost of electricity (LCOE), securing returns on investments, and avoiding losses in production efficiency. On the technical side, the high intermittency of renewable energy sources increases the need for balancing solutions, such as grid balancing engines. Additionally, the growing complexity of microgrids and rising electricity demand due to mine electrification add further challenges. Microgrids are designed to add protection to an area that is reliant on a constant electrical supply, such as mining operations.

### Today's mines face a complex mix of challenges



In this article, we will address the technical and commercial challenges that mines may encounter during the decarbonisation journey. Mines microgrid's are changing due to the energy transition, with different power generation assets being introduced (energy storage, solar and / or wind) alongside balancing power generation – a process known as hybridisation. We will do this by exploring an energy management system as a solution to hybridisation

challenges and present a new commercial model for hybrid mines.

### Addressing hybridisation challenges with energy management system

In this section we will examine how hybridisation challenges can be taken care of with an energy management system. As the proportion of the power generation coming from variable and intermittent sources, such as solar and wind, is increasing, operating and optimising the power system becomes increasingly complex. Instead of simply dispatching balancing power units to meet the load of the mines, operators need to consider a multitude of variables, such as: what will be the renewable yield in the coming minutes and hours? How much spinning reserves will be needed to manage system stability? Which assets will provide these most efficiently? What is the battery's state of charge, and how should it be dispatched? Which are my most efficient assets to run to meet loads and system requirements?

If these complexities are not addressed, significant amounts of renewable energy may be curtailed to maintain system stability, resulting in poor return on investment for renewable projects. Adding renewables may not result in decreased fuel consumption if the different assets in the power system aren't used optimally. This may result in suboptimal loading of engines and therefore high costs and emissions. In worst case scenario, the system may fail to meet requirements, causing reliability issues and potential blackouts, which directly impacts mine operations and revenue.

Wärtsilä's Digital Energy Platform, GEMS, addresses these technical complexities associated with system hybridisation. GEMS is a technology-agnostic controls and optimisation software that monitors, controls and optimises energy assets and system performance to reduce costs while meeting the system constraints. The platform utilises sophisticated renewable and load forecasts in its optimisation and supports a wide variety of power generation assets to achieve optimal system performance.



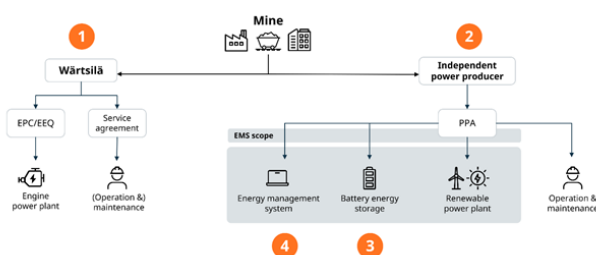
The GEMS software integrates and controls individual resources and entire fleets comprising energy storage, renewables and balancing power generation. Using machine learning and historical and real-time data analytics to optimise the energy mix, GEMS enables customers to remotely monitor, operate, identify and diagnose equipment with unrivalled safety, reliability, and flexibility. GEMS can also act as a microgrid controller, offering secondary and tertiary control to optimise power generation further.

### Unlocking the full potential of microgrids

The typical structure mines use in hybridisation projects does not enable taking advantage of sophisticated systems like GEMS, and traditional procurement practices do not provide a commercial framework to incentivise system-level optimisation. The following is a typical example of how a mine may approach microgrid hybridisation and what kind of commercial challenges this approach entails:

1. The customer has an engine power plant sold with typical performance guarantees. At the same time, a service agreement has been signed with further guarantees on the lifecycle performance of the assets.
2. In some years, the customer wants to take advantage of cost-efficient solar power and signs a power purchase agreement with an independent power producer (IPP).
3. Further down the road, the customer is concerned about the fluctuation of the solar power generation and requires the IPP to also install energy storage for smoothing.
4. The IPP owns, operates and maintains the solar power and the battery and usually an energy management system, which mainly dispatches the battery against the solar power.

### Typical hybridisation structure used by mines

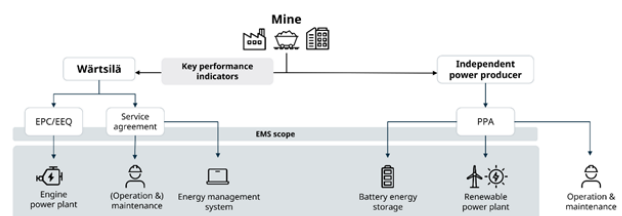


On the other side, the IPP purchases the assets and potential services from third parties and has typical guarantees for each asset, such as performance ratios or power and capacity guarantees. These guarantees are passed through to the customer under the power purchase agreement.

Here, each party is only incentivised to reach the guaranteed values of the individual assets that they are liable for and try to optimise what is within their scope. No one has the incentive or the capability to optimise the whole system. All this results in renewable energy curtailment, suboptimal utilisation of the energy storage system, unnecessarily high fuel consumption and running hours on the engines, potential reliability issues, and, in the end, an overall higher LCOE.

To tackle the challenge of individual guarantees, Wärtsilä has created a commercial concept, where the energy management system integrates all the power generation assets. The engine power plant and the service agreement are there to provide the reliability and act as the backbone of the system, while the IPP who owns the solar power and energy storage system oversees the operation and maintenance. The GEMS energy management system can control and optimise not only the renewables and the energy storage system, but also the engine power plant. Energy storage is now not only supporting renewables but also creating additional value by replacing balancing power spinning reserves. Furthermore, GEMS forecasting capabilities are improving dispatch decisions for both the engine power plant and the energy storage system.

### Rethinking the structure maximises value



The guarantees on the individual assets are still in place, but there is an additional obligation for the energy management system to dispatch all the assets and optimise the entire system. It is now the shared interest of the customer and Wärtsilä to ensure the entire microgrid is running efficiently and reliably. This will result in a lower LCOE, optimised spinning reserves, and minimised curtailment. Instead of providing individual guarantees, this would

be an outcome-based commercial model that covers all the assets in the microgrid. Wärtsilä is measuring the overall optimisation of the grid with a revenue-based contract on the overall grid performance.

### **In conclusion: By embracing a holistic approach mining operations can master the complexities of hybridisation**

The transition to 100% renewable energy in mining operations presents both significant challenges and promising solutions. By adopting a holistic approach that integrates advanced energy management systems like Wärtsilä's GEMS, mines can effectively navigate the complexities of hybridisation, optimise energy usage, and enhance system reliability. Our decarbonisation services use outcome-based agreements, so our gain is based upon our customers' goals, like savings, emissions and reliability. The shift towards an outcome-based commercial model fosters collaboration among stakeholders, ensuring that all components of the energy mix work together

efficiently. This not only reduces the LCOE, but also maximises the potential of renewable resources, paving the way for a sustainable and resilient future in mining operations.

Wärtsilä has all the capabilities needed to integrate and optimise hybrid microgrids. Our combined software, hardware and agreement solutions, paired with our knowledge and expertise, empower microgrid operators to reduce CO2 emissions and cost savings, without compromising reliability.

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## Grid Readiness: The Delivery Challenge at the Heart of the Pacific Energy Transition

Janendra Prasad, Director/Principal Consultant,  
Scinergy Pacific

Across the Pacific, the ambition for renewable energy is both genuine and urgent. Governments have adopted some of the world's most ambitious renewable energy and decarbonisation targets, while development partners have invested heavily in renewable generation, battery energy storage, grid infrastructure, and sector reform initiatives. Yet as investment accelerates, a critical question is emerging: are utilities, power systems, and institutions ready to absorb, integrate, operate, and sustain these investments over the long term?

For many Pacific utilities, the challenge is no longer whether renewable energy can be deployed, but whether existing grids can accommodate increasing levels of variable renewable energy while maintaining reliability, stability, and affordability. Equally important is whether the institutions responsible for planning, operating, and maintaining these systems possess the capability, resources, and operational readiness required to successfully navigate the energy transition.

The Sixth Pacific Regional Energy and Transport Ministers Meeting, PRETMM6 held in Port Moresby in May 2026 put this tension into sharp relief. Ministers acknowledged what practitioners have observed for years: the region already has the policy frameworks, strategies, and international commitments. What it urgently needs now is delivery. The Manubada Call to Action, adopted by Pacific ministers at PRETMM6, called unequivocally for a shift from dialogue to action for accelerating implementation and delivering tangible outcomes that Pacific communities can experience.

That shift from ambition to delivery is not primarily a financing challenge. It is a readiness challenge. And at its centre is a question that Pacific utilities, governments, regulators, and development partners are increasingly asking: is the grid – and the institution that operates it – genuinely ready for what we are planning to invest in?

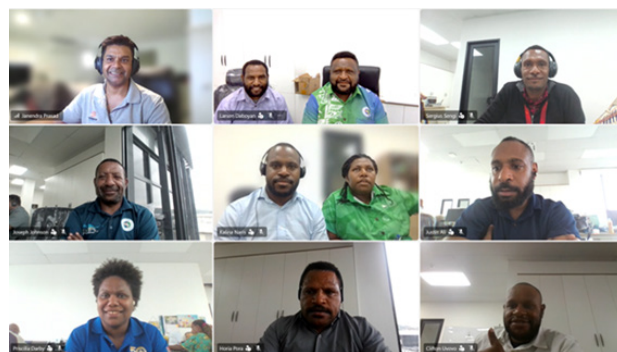
"The region already has the policy frameworks and international commitments. What it urgently needs is delivery. And delivery begins with readiness."

A utility can install solar generation in months. Building the operational capability, digital systems, workforce skills, asset management practices, and institutional arrangements needed to support that generation may take years. This mismatch between infrastructure deployment and utility readiness is increasingly becoming the critical constraint on renewable energy integration across the Pacific.

### The Pacific Energy Transition is Now a Delivery Challenge

Renewable energy targets have been set, projects are being financed, and technologies are increasingly available. Across the Pacific, investment has shifted from demonstrating renewable energy to deploying it at scale. The question now is not whether deployment is possible – it is whether the systems, skills, and institutions needed to sustain it are in place.

The results, however, have often fallen short of expectations. Renewable energy uptake has not progressed at the pace required to meet targets. Projects have been commissioned and then underperformed. Grids have struggled to absorb variable renewable energy generation. Utilities have faced operational challenges they were not equipped to manage. The problem is rarely the technology itself.



*Regional stakeholder consultations highlighted a common challenge across Pacific utilities: the need to strengthen grid and utility readiness before renewable energy deployment can accelerate.*



## A Ministerial Mandate for Grid Readiness

Grid readiness is no longer a peripheral technical concern. It has been formally recognised at the highest levels of Pacific regional decision-making as a strategic prerequisite for achieving renewable energy targets, attracting investment, maintaining reliability, and supporting long-term energy system transformation.

At PRETMM6, Energy Ministers approved strengthening grid readiness and system integration capability including storage, control systems, SCADA, and protection upgrades as a dominant delivery priority, the next phase of the Framework for Energy Security and Resilience in the Pacific. Critically, Ministers also approved grid readiness, alongside quantifiable targets and operations and maintenance, as a core principle for any future energy investment. This is a significant shift: grid readiness is no longer an optional preparatory step. It is a condition of investment.

Senior Energy Officials went further, endorsing the Pacific Islands Electricity Grid Readiness Assessment Framework (PieGRAF) as a practical and repeatable tool for benchmarking utility grid readiness and calling for its systematic uptake across Pacific utility grids. They also agreed that regional policies should prioritise grid readiness ahead of project commissioning, explicitly acknowledging that the sequence matters: readiness comes first.

"Grid readiness is now a core principle for any future energy investment under FESRIP 2.0. It is no longer a preparatory option — it is a condition of investment."

## Utilities Must Be Ready Before Renewable Energy Can Scale

Understanding grid readiness begins with understanding what it is — and what it is not. Many stakeholders, including some with significant experience in energy project development, assume that a readiness assessment simply determines whether a renewable energy generator can connect to the grid. That is a grid connection study. It answers a much narrower question. A grid readiness assessment asks something far more demanding: whether a utility has the full suite of technical, operational, digital, institutional, workforce, and investment capabilities required to plan, integrate, operate, and sustain higher levels of renewable energy over the long term.

In practice, readiness assessments examine questions such as:

- Can the power system safely absorb additional renewable generation?
- Do operators have the tools and visibility needed to manage a more complex grid?
- Are SCADA, communications, and control systems fit for purpose?
- Does the utility have the workforce, governance structures, and planning capability required to support ongoing transformation?
- Are priority investments identified and sequenced appropriately?

Weakness in any one of these areas can become a constraint on renewable energy integration regardless of how much generation capacity is installed.

Senior Energy Officials at PRETMM6 were unambiguous on the operations and maintenance dimension: O&M is non-negotiable for any energy capital investment and must be embedded in project design, resourcing, and institutional capacity from the outset. A grid that is technically connected but institutionally unprepared to maintain its assets will not deliver the outcomes that communities and governments are investing in.



*PRETMM6 Senior Energy Officials emphasised that operations and maintenance are non-negotiable components of successful energy investments and long-term grid reliability.*

## What Readiness Assessment Reveals

Across the Pacific, many utilities possess the key ingredients needed for a successful energy transition: strong government commitment, ambitious renewable energy targets, donor support, and a growing pipeline of clean energy projects. Yet readiness assessments often reveal a more complex operational reality.

Many utilities have established policy and institutional frameworks that support renewable energy development. However, beneath these strengths, significant gaps frequently emerge in operational capability, asset condition, digital systems, grid management technologies, and long-term financial sustainability.



*The energy transition is not about replacing thermal generation overnight; it is about optimising the entire power system to maximise renewable energy while maintaining system stability and reliability*

In numerous island power systems, installed generation capacity can differ substantially from reliably available capacity due to ageing assets, deferred maintenance, limited spare parts availability, and constrained maintenance resources. As demand continues to grow, utilities often find themselves operating with limited reserve margins, reducing their ability to accommodate higher levels of variable renewable energy while maintaining system reliability.

This is precisely the type of issue that conventional project-focused assessments can overlook. Renewable energy projects may appear technically feasible in isolation, while broader utility and network constraints remain unresolved. Readiness assessments expose these system-wide risks before major investment decisions are made.

Common findings include limited supervisory control and monitoring systems, underutilised battery energy storage assets, insufficient grid visibility, and the absence of advanced tools needed to manage increasingly complex power systems. Smart grid technologies, demand response capabilities, distributed energy resource management, and modern energy management systems remain largely absent in many Pacific networks.



*Field assessments provide the evidence base for structured readiness analysis going beyond desktop review to engage directly with utility staff and physical systems. Scinergy Pacific field teams have conducted structured grid readiness assessments across multiple Pacific utilities, combining physical system inspection with operational interviews and data analysis.*

Data availability and quality also frequently constrain investment planning. Limited resource data, incomplete asset information, and gaps in network performance monitoring can make it difficult to undertake bankable feasibility studies and attract private sector investment.

Workforce capability is another recurring challenge. While utilities are actively building local skills and expertise, many lack structured workforce development strategies, succession planning, and long-term training programs required to support increasingly sophisticated power systems.

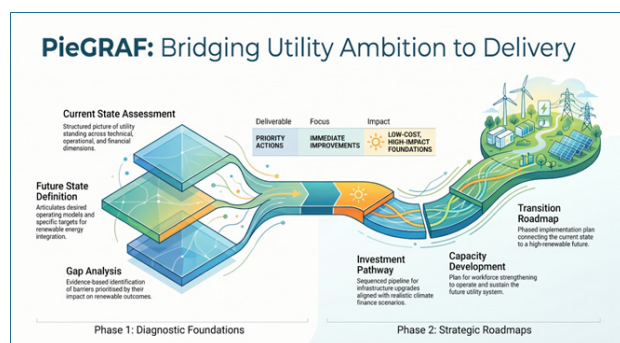
Importantly, these findings should not be viewed as shortcomings. Rather, they provide an honest assessment of where utilities stand relative to the complexity of the energy transition they are being asked to deliver. The true value of a readiness assessment lies not in the score or ranking, but in the roadmap it provides—helping utilities, governments, and development partners prioritise investments, build capability, and ensure renewable energy projects deliver lasting benefits for Pacific communities.

*"The value of a readiness assessment is not in the score — it is in the structured, evidence-based picture of exactly where the gaps are and which of them, if addressed first, would have the greatest impact on enabling renewable energy integration."*



## What a Well-Executed Readiness Assessment Delivers

A grid readiness assessment is only valuable if it leads to action. The purpose is not to produce a score or a ranking. It is to produce a clear, structured, evidence-based foundation for practical decision-making by utilities, governments, regulators, and development partners. The readiness roadmap is the critical output. It translates structured assessment evidence into a practical, phased plan one that answers the questions that utilities, governments, and development partners actually need to answer: What must happen first? What can wait? Where should limited resources be concentrated for maximum impact?



*PieGRAF maps the path from grid readiness to renewable energy delivery.*

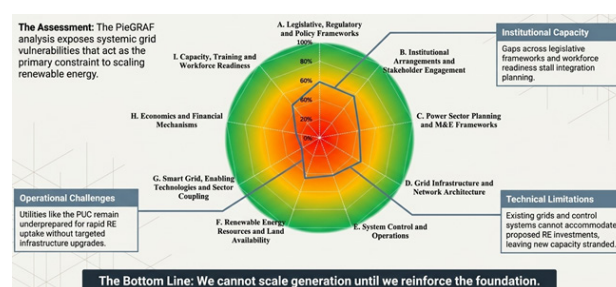
The same readiness principles extend beyond renewable generation. Emerging initiatives such as electric mobility, distributed energy resources, and demand-side management will place additional demands on utility systems and reinforce the need for proactive planning, network strengthening, and operational preparedness

**"EV integration is a power system issue. Grid readiness assessments and network strengthening must be completed before deployment – not after. The same lesson applies to every renewable energy investment."**

## A Regional Framework for a Regional Challenge

Recent readiness assessments undertaken across Pacific utilities have revealed a remarkably consistent pattern. While policy and legislative frameworks are often relatively mature, operational control systems, digital infrastructure, workforce capability, and long-term investment planning remain recurring constraints. The specific challenges differ between countries, but the underlying readiness gaps are strikingly similar.

Assessments conducted across utilities in Vanuatu, the Solomon Islands, and Timor-Leste point to parallel constraints – strong and improving policy frameworks, but persistent gaps in operational systems, digital infrastructure, and long-term investment planning capability. In Vanuatu, renewable integration has accelerated, but control system limitations and workforce gaps continue to create operational risk as penetration rises. In Timor-Leste, capacity expansion modelling has exposed the degree to which generation investment decisions are being made without a clear picture of the system's ability to absorb and manage new capacity. The pattern is consistent enough to make a compelling case for a regional programme rather than a sequence of isolated country assessments.



*PieGRAF Radar chart: a quick visual snapshot of Pacific utility readiness, showing common gaps in operational systems, digital capability, workforce capacity, and investment planning.*

This consistency makes a compelling case for a coordinated, region-wide approach. A regional programme deploying structured readiness assessments systematically across Pacific utilities would serve multiple purposes. It would identify shared priorities that could be addressed through pooled regional investment. It would give development partners a consistent, comparable evidence base on which to align their support with actual utility needs rather than project pipelines. It would provide the foundation for a more coordinated, coherent approach to donor engagement reducing the duplication of effort and misalignment of investment that has been a persistent challenge in the Pacific energy sector.

Energy Ministers at PRETMM6 endorsed exactly this kind of coordinated approach, approving the establishment of a regional coordination and technical mechanism led by SPC, supported by SPREP and PPA, to align programmes, embed technical support, integrate planning, financing and procurement, and coordinate partners behind Pacific priorities. Grid readiness assessments can and should be a central input to this mechanism.

## Conclusion: Readiness is the Work

The Pacific energy transition will not succeed simply because more solar panels and battery systems are installed. It will succeed because utilities are equipped to plan, operate, maintain, and continuously integrate new technologies into reliable power systems.

Across the region, the conversation is increasingly shifting from renewable energy deployment to renewable energy delivery. That shift requires investment not only in infrastructure, but also in people, systems, institutions, operational capability, and long-term planning.

Before asking how much renewable energy a grid can accommodate, perhaps the more important question is whether the utility is truly ready for the future it is being asked to deliver.

Readiness is not a preliminary activity undertaken before the energy transition begins. It is the foundation that determines whether renewable energy investments deliver lasting value, system reliability, and meaningful outcomes for Pacific communities.

The starting point is assessment — honest, structured, and evidence-based. Pacific utilities that have undergone rigorous grid readiness assessments are better positioned to attract investment, absorb donor support effectively, and deliver the outcomes that communities and governments are counting on. The Pacific Islands Electricity Grid Readiness Assessment Framework provides a practical, regionally developed tool to begin that process. For utility leaders, governments, and development partners, the question is now a simple one: do you know where your readiness gaps actually are?

"The energy transition in the Pacific is a utility transformation challenge. Readiness — technical, institutional, operational, digital, and human — is not the preparation for the work. It is the work."

### ABOUT THE AUTHOR

**Janendra (Jay) Prasad: Director / Principal Consultant – Scinergy Pacific**

Jay Prasad is a Chartered Professional Engineer and Director of Scinergy Pacific, a Pacific-owned energy advisory firm supporting governments, utilities, development partners, and investors across the region's energy sector. With more than

30 years of experience in utility operations, power systems engineering, renewable energy integration, and strategic planning, he has worked extensively throughout the Pacific Islands and Australia.

Scinergy Pacific is a Pacific-focused energy advisory and engineering consultancy specialising in energy transition planning, grid readiness assessments, renewable energy and battery energy storage integration, capacity expansion modelling, utility transformation, policy and regulatory advisory, and institutional strengthening. The firm combines international technical expertise with deep regional experience to help utilities, governments, development partners, and investors navigate the practical challenges of transitioning to cleaner, more resilient, and sustainable energy systems.

Scinergy Pacific has supported a diverse range of energy sector initiatives across the region, including renewable energy integration studies, utility strengthening programmes, energy transition roadmaps, investment planning, grid modernisation, and institutional capacity development. Its work focuses on bridging the gap between policy ambition and implementation by addressing the technical, operational, financial, and organisational challenges facing Pacific power systems.

Committed to delivering practical, independent, and evidence-based solutions, Scinergy Pacific works alongside its clients to strengthen institutions, build local capability, enhance utility performance, and support the delivery of reliable, affordable, and sustainable energy outcomes across Pacific Island countries and territories.



Scinergy Pacific is dedicated to delivering practical, independent, and evidence-based advice that builds local capability, strengthens utility performance, and supports sustainable energy outcomes across the region.

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## I Thought this was Impossible - The D.N.A. of 100% Renewables

Barbara Elliston, Business Development Executive,  
Pacific Renewable Energy Training Alliance (PRETA)

"For most of my 35-year career in power system engineering, I thought this was impossible," Carruthers is quoted as saying. "It is a glimpse of the future and, bar the birth of my child, the most exciting thing I have ever witnessed."<sup>1</sup>

Fortescue's head of operations and engineering, Glen Carruthers, was referring to an incident in October 2025, where iron ore miner Fortescue's inverter-based power technologies kept the lights on at when bushfires caused a major transmission outage and removed all thermal generators from its network. (The load supported was 85MW).

Keeping the lights on – that is the test of resilience, not whether there is enough BESS storage when the sun doesn't shine. The ratio of solar PV to BESS storage is not too difficult to work out, but keeping the lights on when there is a system disturbance, a machine fault, a significant load drop-off, a network circuit outage, etc, has been exercising the intellect of power system and transmission engineers, and fierce debates have been ongoing.

As more power systems engineers (like myself, and Glen above) become believers, one major roadblock to getting to 100% renewables will be dismantled. If the power systems these engineers are responsible for can keep the lights on when there is no thermal generation available, no legacy inertia we previously relied on, then 100% doesn't seem so daunting.

How do we, as island grids, achieve a 100% renewable power system?

1. Priority one and urgent - Network tariffs reform  
Many island grids are vertically integrated – generation, transmission/distribution, customers. Tariffs are often variable, based on price per unit (c/kWh).

To enable customers to see the true cost of the network – which is not variable, not based on energy units purchased or units exported back to the grid – a more cost-reflective tariff is the

fundamental first step towards 100% renewable.

By separating the cost of network from the energy flows, island grids will at least be able to identify the revenue required to "keep the lights on". The cost of the network should be reflective of the demand a customer has – does the customer want to have 5kW of demand, or 10kW, and this capacity is for power to flow in either direction, with network pricing separated from energy pricing.

2. Network readiness  
Identification of the hosting capacity of the network, either regionally or at feeder level, is a key step towards 100% renewable. Power systems engineers have a number of commercially available tools to do this. EMT studies, protection settings, load growth analysis – and the belief that 100% is achievable.
3. Community engagement and information sharing  
To achieve 100% renewable energy provision, communities need to understand renewable energy systems better. For example, everyone knows to drive on the road you need to learn (and get a license), that the scooter/car tyres need air, that the vehicle really should get some servicing, and that it needs charging or refueling. And cleaning perhaps. And the purpose is to get from A to B.

Such basic knowledge is where the DNA of renewables starts. Where communities have enough understanding, they will know how to get from A to B – I want to have a cooler home, I want to have cheaper water heating, I want to have a lower power bill. From A, where I am now, to B, where I want to get to.

When communities and individual families are able to install renewable energy systems in their own facilities and homes, not only providing economic benefits, but resilience, and significant reduction in international fuel dependence and pain.

This is an area where basic renewable training can really help. The training can be at community level but also in schools. And for potential future renewable energy workers, to join renewable energy teams in the work place.

4. Electrical training, including trade apprenticeships, engineering schools  
These training courses are available now, almost everywhere. However, to enable 100% renewables

<sup>1</sup> <https://reneweconomy.com.au/i-thought-this-was-impossible-fortescue-green-grid-rides-through-transmission-failure-with-no-fossil-fuels/>

in the near future, many more, thousands, of new entrants are required – both regionally and internationally. (A key risk is that trained workers then are recruited and leave, but that does not negate the need to train and build capacity/capability.)

The public profile of renewables and the rewards of working in the sector need to be better communicated, especially where such communication campaigns can be linked to community engagement mentioned in the previous point, where renewable energy is part of the community's DNA.

#### 5. Aftercare

Many Pacific Island nations are dependent on imported diesel for our power generation needs. At around \$1/kWh(FJD) diesel fuel cost at current fuel prices, any reduction in the expected output of renewable energy systems carry a heavy cost.

For example, each 400W solar panel can be expected to generate 550 to 700 kWh p.a. or between \$550 to \$700 FJD of benefit annually (offset diesel generation). If you lose 15% of the output because of a dirty panel, every single dirty panel will be costing \$100 p.a. – if you have 10 panels, that's \$1000 p.a. you are losing just because the panels are not clean. Which brings up the next issue: working at heights.

#### 6. Working at heights and roof preparation

Besides needing to get onto a roof to clean rooftop solar panels, there are many roofs in the Pacific region needing to be repaired or remediated. The cost of roof work may exceed that of the solar hardware and software combined.

In order for mass participation, on people's own roofs, there needs to be better recognition that roof work will be an integral part of achieving 100% renewables.

This also means working at heights training, in addition to training a renewable energy workforce. This has the added benefit of much better resilience to cyclones. Working at heights training is readily available, and is a matter of funders and providers and utilities recognizing that there is a cost here that needs to be addressed.

#### 7. Recycling and repatriation

Finally we come to recycling and repatriation.

The systems all look shiny when new. There comes a time, though, when these come to end of useful or economic life. Current indicative costs of recycling lithiums batteries range from AUD\$9 to \$14/kg – in Australia where this is available. For a 40kg battery, that's A\$400 to over A\$550 just to recycle it at end of life.

Programs need to be in place so that the communities do not end up with a waste problem when renewable energy systems are discarded. Currently there are problems repatriating lithiums as freight carriers do not want to load them due to insurance concerns – nobody wants their boat to go up in flames, as had happened already.

Funders, donors and governments all have a role to play to ensure that the shiny solar and BESS hardware being generously provided are responsibly repatriated at end of life.

The DNA of 100% renewables is where each of the above points are addressed and communities and practitioners alike "get" renewables. Where utilities do not fear insufficient residual revenue to maintain their networks. Where communities will have a better understanding of how they can use renewable energy systems to improve their own standards of living, reducing their power bills, and no longer rely on imported fuel. And our sector will be able to recruit from communities with a better understanding of what renewables are and the opportunities available. The future is electric.

To reach this stage, a much more holistic approach to renewable energy training is needed. PRETA, the Pacifica Renewable Energy Training Alliance, was established by like-minded individuals to plug the gaps in renewable energy training, working with existing providers and linking training offers, providing a much needed catalyst to make existing training offerings more effective. PRETA has a training MOU with the PPA, and encourages utilities and communities to reach out on any training needs.

#### Author: Barbara Elliston

Barbara is business development exec for PRETA in New Zealand, and also sits on the boards of Te Aponga Uira (Cook Islands), Unison Networks, ETEL Transformers and RPS (all NZ), and Smart Energy Council (Canberra). Barbara was inducted into the Hall of Fame of the Smart Energy Council in May 2026. Barbara is also a member of the Common Quality Technical Group of the NZ regulator the Electricity Authority.



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## Improving Distribution Network Reliability in Resource: Lessons from EDEQ

Sherry Zhang, Technical Marketing Specialist,  
NOJA Power

Across many Pacific Island nations, utilities face unique challenges in delivering reliable electricity. These include isolated grids, difficult terrain, limited technical resources, and increasing expectations for service quality. In such environments, improving network reliability without significant capital expenditure is a critical priority.

The experience of Empresa de Energía del Quindío (EDEQ S.A.E.S.P.) in Colombia provides valuable insights into how utilities operating in similar conditions can enhance reliability through targeted deployment of automation and protection technologies.



*NOJA Power's OSM Recloser and Recloser Controller in a rural site in Quindío, Colombia.*

### Background: Network Challenges in a Complex Environment

EDEQ serves the Quindío region in Colombia, a mountainous and tropical area covering approximately 1,845 km<sup>2</sup>. The network includes rural, forested, and urban environments, presenting a range of operational challenges.

Like many utilities in emerging and remote regions, EDEQ has focused on improving service quality, optimising operational costs, and modernising its distribution network. Over the past decade, the organisation has progressively implemented automation and protection solutions to address these challenges.

### Integrating Reclosers into the Network

EDEQ initially deployed reclosers to address one of the most common challenges in overhead distribution systems: transient faults. These faults, often caused by vegetation, adverse weather conditions, or wildlife, can lead to unnecessary outages if not effectively managed. By installing reclosers at strategic locations across the network, EDEQ was able to automatically clear transient faults, significantly reduce both the duration and frequency of outages, and improve overall visibility of network performance.

Over time, the role of reclosers within the network expanded beyond basic fault clearing. As operational experience grew, these devices became increasingly important in supporting more advanced applications, including network automation and load management.



*The EDEQ team with NOJA Power's OSM Recloser in a rural site in Quindío, Colombia.*

### Advancing Towards Grid Automation

As EDEQ gained further experience, the utility progressively extended the use of reclosers into smart grid automation applications. This included the ability to rapidly isolate faulted sections of the network, automatically transfer load between feeders, and enhance the overall operational response to network events.

These capabilities contributed to a measurable improvement in key service quality indicators by reducing the number of customers affected during an outage and minimising restoration times. Such an approach is particularly relevant for island and radial networks, where system redundancy is limited and access to fault locations can be constrained, often resulting in slower field response.

### Leveraging Data for Preventive Maintenance

In addition to their switching and protection functions, EDEQ utilised the built-in monitoring capabilities of the equipment to support more informed decision-making. By continuously analysing network data, the utility was able to identify recurring fault patterns, assess the condition and performance of assets, and plan maintenance activities with greater precision.

This transition towards a data-driven operational approach enabled EDEQ to optimise both technical performance and cost efficiency. For utilities operating in resource-constrained environments, this represents a practical and scalable pathway to improving reliability without the need for significant investment in additional infrastructure.



*NOJA Power's RC-10 Recloser Controller in use at an EDEQ substation - level I of automation through SGA.*

### Long-Term Benefits and Operational Experience

After more than a decade of implementation, EDEQ has achieved sustained improvements in network reliability, alongside reductions in operational costs through more targeted and efficient interventions. The increased flexibility in network operation has also enhanced the utility's ability to respond to changing system conditions and support future grid developments.

Importantly, EDEQ emphasises that many of these benefits have been realised not through large-

scale new investments, but through the effective optimisation and utilisation of existing technologies and tools.

### Lessons for Pacific Island Utilities

The experience of EDEQ highlights several key lessons that are directly applicable to Pacific Island utilities:

#### 1. Start with targeted deployment

Strategically placing automation devices can deliver immediate improvements in reliability.

#### 2. Expand use cases over time

Technologies such as reclosers can evolve from basic protection devices to central components of grid automation.

#### 3. Use existing capabilities effectively

Many performance gains can be achieved by fully utilising built-in features and data.

#### 4. Focus on cost-effective improvements

Optimising existing assets can deliver strong outcomes without major capital expenditure.

### Conclusion

As utilities across the Pacific region work to modernise their networks, practical and scalable solutions are essential. The experience of EDEQ demonstrates that meaningful improvements in reliability can be achieved through a combination of automation, data utilisation, and strategic planning.

These lessons provide a valuable reference point for utilities seeking to enhance service quality while operating within the constraints typical of island and remote power systems.



*NOJA Power's OSM Recloser and Recloser Controller in a rural site in Quindío, Colombia.*

## Lessons Learned from the Electrification of Outer Islands in Chuuk

Kembo Mida, Chief Executive Officer, Chuuk Public Utility Company & Sebastien Pitot, Senior Project Manager and FSM Resident Coordinator, Trama TechnoAmbiental SL (TTA)

### Context of Chuuk's electrification

Chuuk is one of the four states of the Federated States of Micronesia (FSM) in the North Pacific and is home to the largest population among the four states. The state comprises 40 inhabited island municipalities dispersed across hundreds of kilometres, both within Chuuk Lagoon and on remote outer atolls. Two-thirds of Chuuk's population of 34,000 lives in geographically isolated island communities.

Providing public services in Chuuk has always been challenging. Communities are scattered across volcanic islands and low-lying atolls separated by long distances. As a result, access to electricity and clean water has remained limited for many communities.

Chuuk's electricity access rate currently stands at approximately 35%, making it the least electrified state in the FSM and one of the least electrified states in the Pacific. At present, only two islands (Weno and neighboring Tonoas) have grid electricity service, both supplied by diesel generation. Tonoas was electrified in 2022 and has 300 customers.



Figure 1. Mini-grid under construction in Eot, Chuuk

### Our ongoing electrification efforts

Access to reliable electricity is essential for economic development, healthcare, education, communications, and overall quality of life. Expanding electricity access is therefore a key priority for CPUC.

Three major electrification programs are currently underway and will bring electricity service to an additional 11 islands, increasing Chuuk's electrification rate to more than 60%:

- Under the World Bank-funded SEDAP, CPUC is implementing solar mini-grid projects on Udot, Eot, and Satowan, with completion expected in 2026.
- Under the FSMSE and CREWS, financed by the European Union, the Australian Department of Foreign Affairs and Trade, and the Asian Development Bank, electrification works are underway on Fefen, Etten, and Piis-Paneu, with completion targeted for 2028.
- The World Bank-funded ARISE project will support the electrification of Uman, Tol-Wonip/Munien, Moch, and Onoun, also expected to be completed by 2028.

Once completed, these projects will provide clean, 24-hour electricity service to approximately 2,000 additional customers, benefiting an estimated 12,000 people and nearly doubling CPUC's current customer base.

Across these initiatives, CPUC has worked closely with its Owner's Engineer, Trama TecnoAmbiental (TTA), a Spanish engineering consultancy specializing in rural electrification through renewable-energy mini-grids.



Figure 2. Solar mini-grid in Monowe, Udot, Chuuk



## Our technical approach

Given the remoteness of the communities served, project designs prioritize operational sustainability, resilience, and ease of maintenance.

The mini-grids consist of solar photovoltaic generation combined with lithium battery energy storage systems and small backup diesel generators. System sizing is based on detailed household and institutional demand surveys conducted during the design phase - the average household consumption is 1.8 kWh per day.

Generation facilities are installed on public land or existing public buildings, making use of rooftop structures and solar canopies where possible. All equipment and structures are designed for marine environments and Category 3 typhoon conditions.

Distribution networks are installed underground wherever feasible to reduce exposure to falling vegetation and storm damage. The projects include service connections and standardized household wiring to ensure safe and reliable electricity access.

All customers are equipped with prepaid Cash Power meters, ensuring consistency with CPUC's existing service model.

To strengthen resilience and support local economic development, the mini-grids will also include productive-use-of-energy facilities, such as complementary water treatment systems, ice-making equipment, and cold storage facilities. These assets are intended to improve community services while creating local economic opportunities.

Overall project costs average approximately USD 12,000 per connection, which is among the highest per-connection costs for remote communities in the world.



Figure 3. Solar mini-grid in Eot, Chuuk



Figure 4. Community meeting in Udot, Chuuk

## Our key lessons and our recommendations

### 1. Community engagement is essential:

Successful implementation depends on strong partnerships with local communities and traditional leadership. These projects represent by far the largest infrastructure investment ever undertaken in the islands concerned. Continuous consultation, clear communication, and active community participation are critical throughout planning, construction, and operation.

### 2. Site selection must be addressed early:

Suitable public land is scarce on our islands. Early engagement with municipalities, churches, and other landowners is essential to identify suitable sites and avoid conflicts. Providing tangible benefits to host sites, such as roof rehabilitation or community-use solar canopies, has proven effective in securing support.

### 3. Attracting qualified contractors requires finding ways of derisking the project:

Remote island projects can be difficult to market contractors due to unfamiliarity with the local context, complex logistics, limited local services, and relatively small contract sizes. Detailed site information with clear instructions, support for the logistics, and active engagement with potential bidders can significantly improve procurement outcomes.

### 4. Logistics drives project complexity:

Transporting equipment and materials to remote islands remains one of the most significant challenges. Poor maritime infrastructure, high

transport costs, and limited on-island transport options must be identified and considered from the earliest design stages. Close collaboration with local communities helps identify practical solutions and minimize issues.

### 5. Utility operations must evolve:

Outer islands electrification requires utilities to develop new operational models. For decades, CPUC's activities were concentrated on Weno. Expanding service to remote islands has required the establishment of regional operational capacity, new maintenance procedures, and specialized training for staff.

### 6. Cost-reflective tariffs support sustainability:

Long-term sustainability depends on electricity tariffs that fully recover operational costs, including staffing, logistics, maintenance, and equipment replacement. Our experience has shown that communities are often willing to pay tariffs higher than those found in urban centres because electricity service replaces more expensive and less reliable alternatives such as diesel generators, kerosene, and cooking fuel.

### 7. Legal support is a critical project cost and should be funded accordingly:

Development partners routinely fund engineering, environmental, geotechnical, financial, and other technical consultants required for project implementation. However, legal services are often expected to be absorbed by the utility, despite being equally essential to successful project delivery.

In remote Pacific island jurisdictions, finding qualified attorneys who understand local laws, customary land tenure systems, local languages, and community practices can be extremely difficult. Yet legal work is required throughout the project lifecycle, including land access negotiations, lease agreements, easements, procurement reviews, regulatory compliance, contract administration, dispute resolution, and interpretation of national and state laws.

For utilities such as CPUC, legal support cannot simply be obtained through government legal offices. In some circumstances, the utility's interests may differ from those of the government, making reliance on government legal counsel inappropriate

or potentially creating conflicts of interest.

Development partners should recognize legal services as an essential project implementation cost. Just as engineering, environmental, and geotechnical services are funded through project budgets, legal services directly associated with project development and implementation should also be eligible project expenditures. This approach helps ensure timely project delivery, proper risk management, and compliance with local legal requirements while avoiding the financial burden on small island utilities with limited operating budgets.

### Outlook

CPUC has developed a state-wide electrification strategy aimed at achieving universal electricity access across Chuuk. Reaching the remaining unelectrified communities will require an estimated additional investment of USD \$26.5 million.

While significant challenges remain, recent projects have demonstrated that renewable-energy mini-grids can provide reliable, sustainable electricity services even in some of the most remote island communities in the Pacific. Building on these experiences, CPUC continues to seek development partners interested in supporting the next phase of Chuuk's electrification journey.



Figure 5. Solar mini-grid in Penia, Udot, Chuuk



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## The 2<sup>nd</sup> Additional Regional Training for additional Pacific Islands Countries under the Project for Energy Transition

JICA Experts Team,  
Seed Okinawa Co., Okinawa Enetech Co., Okinawa Electric Power Co.

### TRAINING REPORT

April 2026

#### 1. Background

To provide continuous learning opportunities, participants from seven Pacific countries were invited to attend the second Regional Training under “The Project for Energy Transition for PICs.” The objective was to enhance their technical knowledge and skills in introducing the concept of energy transition in their countries. The training included lectures on renewable energy (RE) integration, operation and maintenance (O&M), as well as hands-on training in PV system maintenance.

Participants also had the opportunity to exchange

views with those from other countries on RE issues and challenges through group discussion.

#### 2. Schedule and Venue

The training was conducted over five days, starting on March 23, 2026, at the EFL Lautoka Training Center (Navutu Depot).

#### 3. Organizer

This training was organized by the Department of Energy (DOE), Ministry of Public Works, Transport and Meteorological Services (MPWTMS), Energy Fiji Limited (EFL), Pacific Power Association (PPA) and Japan International Cooperation Agency (JICA).

#### 4. Participants

| No. | Country         | Mr./Ms. | Name                             | Position/Organization                                         |
|-----|-----------------|---------|----------------------------------|---------------------------------------------------------------|
| 1   | Solomon Islands | Mr.     | TABAA Bruno MI-Shack             | Project Manager / Engineer                                    |
| 2   |                 | Mr.     | KWAIMANI Timothy                 | SIEA Electrical Engineer / Outstation department SP           |
| 3   | Tonga           | Mr.     | LEGER Alfred Julius Celestine    | Interim Power Generation Manager /                            |
| 4   |                 | Mr.     | HAVEA Matapa Sialevani           | Acting General Plant Supervisor / Mech & RE Engineer          |
| 5   | Vanuatu         | Mr.     | JACQUIER Ron                     | Electricity Project and Plan Manager / Electrical Engineer    |
| 6   |                 | Mr.     | KERZREHO Tanguy                  | Poweer Generator and Distribution Manager                     |
| 7   | PNG             | Mr.     | ALU Alu                          | Manager-Electricity Undertaker Licensing and PPAs Engineer    |
| 8   |                 | Mr.     | ALOKAKA Frederick Emmanuel       | PPL Senior Manager Generation Business Improvement / Engineer |
| 9   | RMI             | Mr.     | JORDAN Baren                     | NEO Energy Coordinator                                        |
| 10  |                 | Mr.     | JOSEPH Roy                       | NEO Solar officer                                             |
| 11  | Cook Islands    | Mr.     | ROURU Teati Pou Tai              | TAU / Electrician Line's man / Senior field service officer   |
| 12  |                 | Mr.     | UTANGA Frederick Ngatupuna Tiona | Electrical apprentice technician                              |
| 13  | Nauru           | Ms.     | DIMAPILIS Gretel                 | RE Trainee / Technician                                       |
| 14  |                 | Mr.     | JACOB Detroit                    | NUC RE Manager / Electrical engineer                          |

### 5. Training contents

The training contents were as shown on the table below.

| Day                                  | Start | End   | Detail                                                                                                                                                                              | Trainer                                |
|--------------------------------------|-------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 1 <sup>st</sup> Day<br>3/23<br>(Mon) | 9:00  | 9:15  | Opening ceremony, remarks from<br>DOE : Mr. Deepak Chand, Deputy Director of Energy<br>EFL : Mr. Maciu Waqaira, Deputy Manager Training<br>JICA : Mr. Ogawa Tadayuki, Chief Advisor |                                        |
|                                      | 9:15  | 9:30  | GI for participants                                                                                                                                                                 | JICA team                              |
|                                      | 9:30  | 12:00 | 01 - Basic of Hybrid power Generation, Global Trend<br>02 - Renewable Energy Initiatives by DOE                                                                                     | Filimoni Tarai                         |
|                                      | 12:00 | 13:00 | Lunch time                                                                                                                                                                          |                                        |
|                                      | 13:00 | 14:00 | 03 - Feasibility Study of Taveuni project                                                                                                                                           | Ram Maharaj                            |
|                                      | 14:00 | 15:00 | 04 - Overview of Diesel Generation                                                                                                                                                  | Maikeli Droese                         |
|                                      | 15:00 | 16:00 | 05 - EFL Grid code review                                                                                                                                                           | JICA Expert                            |
| 2 <sup>nd</sup> Day<br>3/24<br>(Tue) | 9:00  | 10:00 | 06 - Demand & Response Overview                                                                                                                                                     | Jeshneel Kumar                         |
|                                      | 10:00 | 12:00 | 07 - Technical Challenges and countermeasures in<br>increasing RE penetration                                                                                                       | Rohitesh Lal                           |
|                                      | 12:00 | 13:00 | Lunch time                                                                                                                                                                          |                                        |
|                                      | 13:00 | 15:00 | 08 - Basic of system Analysis                                                                                                                                                       | JICA Expert (DCC)                      |
|                                      | 15:00 | 16:00 | 09 - PV System Operation Monitoring                                                                                                                                                 | Maciu Waqaira                          |
| 3 <sup>rd</sup> /25<br>(Wed)         | 09:00 | 12:00 | Challenges in Energy Transition                                                                                                                                                     | Training Participants                  |
|                                      | 12:00 | 13:00 | Lunch time                                                                                                                                                                          |                                        |
|                                      | 13:00 | 16:00 | Visit to EFL National Control Center, Lautoka Police<br>station PV facility                                                                                                         | Manoj Kumar                            |
| 4 <sup>th</sup> Day<br>3/26<br>(Thu) | 09:00 | 10:00 | 10 - Basic of EFL SCADA system (Navutu Depot)                                                                                                                                       | Samisoni Savukimoala                   |
|                                      | 10:00 | 12:00 | 11 - O&M of PVs (I-V checker, line tracer. I-V curve,<br>hands on.                                                                                                                  | Rusiate Faivakibau /<br>Filimoni Tarai |
|                                      | 12:00 | 13:00 | Lunch time                                                                                                                                                                          |                                        |
|                                      | 13:00 | 14:00 | 12 - Battery Energy storage systems (BESS)                                                                                                                                          | Maikeli Naciqa                         |
|                                      | 14:00 | 16:00 | 13 - Processing Grid Connected Applications at EFL<br>HPGS using Homer                                                                                                              | Rusiate Faivakibau                     |
| 5 <sup>th</sup> Day<br>3/27<br>(Fri) | 09:00 | 10:00 | 14 - EFL NCC function and Grid Code.                                                                                                                                                | Manoj Kumar                            |
|                                      | 10:00 | 11:00 | 15 - Measures to Disposal of RE equipment                                                                                                                                           | Vishal Prasad                          |
|                                      | 11:00 | 12:00 | 16 - Future Maintenance planning, budget, schedule                                                                                                                                  | Josese Atama                           |
|                                      | 12:00 | 13:00 | Lunch time                                                                                                                                                                          |                                        |
|                                      | 13:00 | 14:00 | 17 - PV construction, commissioning                                                                                                                                                 | Mohammed Ahzaaz                        |
|                                      | 14:00 | 15:30 | Training Overall opinion / Evaluation Test, Questionnaire                                                                                                                           | JICA Experts                           |
|                                      | 15:30 | 16:00 | Closing Ceremony (Certificate and remarks)                                                                                                                                          |                                        |



## 6. Training proceedings

The Regional Training began with opening remarks from DOE Director Deepak Chand of DOE, Training Manager Maciu Waqira of EFL, and JICA Senior Advisor Ogawa Tadayuki.

The training program was completed as planned without issues, including the visits to the Lautoka Police station PV, EFL National Control Center and as well as hands-on training of inspection of solar PV facility using measurement instruments. The new trainer's candidates prepared excellent presentations, and the certified trainers partially updated their materials since last year's training. Trainers and trainees engaged in many discussions and shared experiences from their respective countries.

Finally, the JICA experts gave the participants a test to evaluate their knowledge and understanding of the topics discussed during the training, also a questionnaire was taken to gather their opinions on the overall training.

## 7. Training results

### • Trainees

Most participants in this second regional training session demonstrated a high level of knowledge about renewable energy, including its composition, characteristics, and challenges. All participants face the same challenges in the energy transition, so numerous opinions and advice were exchanged during the group discussions and the presentation of country reports.

Due to these interactions between participants resulted in a lack of time for other lectures on the day's program. The JICA team believes that a sufficient level of understanding was achieved during these exchanges.

On the final day of the training, an assessment test was administered for the participants. The test results showed an overall average of over 80% correct responses, indicating a high level of understanding of the training topics among participants. The result of the test per country is shown on the table below.

| Country | Results Avg |
|---------|-------------|
| Solomon | 100%        |
| Tonga   | 87.5%       |
| Vanuatu | 90.0%       |

|               |            |
|---------------|------------|
| PNG           | 91.0%      |
| RMI           | 56.0%      |
| Cook          | 79.0%      |
| Nauru         | 78.5%      |
| Total Average | 83.5%      |
| Max. / Min    | 100 / 56.3 |

### • Trainers

The good performance of DOE and EFL RE trainers was noted, with the JICA team observing significant improvement in some trainers.

This time, four new prospective trainers participated in this regional training session, leaving a very good impression on the participants. They are young engineers with a strong enthusiasm for teaching, even though they lack sufficient experience in the subject area selected by the JICA team of experts. The team have high hopes for them in future training sessions.

The materials used during the presentations were significantly adapted from the originals provided by the expert team. One of them prepared entirely new material, demonstrating their commitment to this type of training.

The trainers certified during the previous project, as always, demonstrated their extensive experience and skills as trainers.

Some comments of the trainer from the training participants and JICA experts is shown in the table below.

| No. | Trainer Name   | Comments from participants and JICA Experts                                                                                                                                                                            |
|-----|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Filimoni Tarai | Excellent experience with the DOE-managed solar power facilities on remote islands; excellent coaching skills.                                                                                                         |
| 2   | Ram Maharaj    | A very good candidate for a trainer position. He is an electrical engineer who is working on special projects such as the Taveuni PV, on which he gave an excellent presentation. The material was very well prepared. |

| No. | Trainer Name         | Comments from participants and JICA Experts                                                                                                                                                                                                                      |
|-----|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3   | Rohitesh Lal         | A very good candidate for a trainer position. He gave an excellent presentation on the theoretical aspects of the assigned topic, "Technical Challenges and Countermeasures in increasing RE Penetration."                                                       |
| 4   | Maikeli Drose        | He is an experienced, nominated trainer. This time, he was assigned the topic of overview of diesel generation in hybrid power systems. The explanation of diesel generation itself was very good.                                                               |
| 5   | Manoj Kumar          | A very informative presentation on how the EFL power system is operated.                                                                                                                                                                                         |
| 6   | Jeshneel Kumar       | He addressed a "demand response" topic that is not widely known in Pacific countries. He explained the upcoming trial test that will be carried out with the JICA expert team and WAB.                                                                           |
| 7   | Rusiate Faivakibau   | He is a certified trainer with very good presentation skills. This time, he introduced a new topic: "Processing of Applications Connected to the Electrical Grid at Energy Fiji Limited," which provided interesting insights into EFL's interconnection policy. |
| 8   | Samisoni Savukimoala | His presentation on the SCADA system was very good, highly informative and easy to understand. The on-site explanation was also very well guided, and he successfully answered many questions from the participants.                                             |
| 9   | Maciu Waqaira        | His skills as a trainer are undeniable. The presentation topic is very important for some PICs that need to improve the management of their solar power facilities..                                                                                             |

| No. | Trainer Name    | Comments from participants and JICA Experts                                                                                                                                                                                                                                                                                                                                                            |
|-----|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10  | Maikeli Naciqa  | He is a certified trainer with good presentation skills. He gave an excellent presentation on BESS function, types, configuration, and modes of operation, providing valuable information that is much needed in PICs where the penetration of RE is continuously increasing.                                                                                                                          |
| 11  | Vishal Prasad   | This was his first time participating in regional training, and he left a very good impression on the JICA experts' team. The assigned topic, "Measures for the Disposal of Used Renewable Energy [Solar] Equipment," is not very common, but its importance is increasing worldwide. The material well conformed, providing information on types of equipment, recycling methods, among other topics. |
| 12  | Josese Atama    | He is a certified trainer with very good presentation skills. In his presentation "Future maintenance planning, budget, schedule & structure" he responded to many questions from the participants and gave advice.                                                                                                                                                                                    |
| 13  | Mohammed Ahzaaz | He is a very good trainer that made a presentation on the EFL inspections of RE facilities. He gave a very useful presentation focused on workplace safety, inspections of photovoltaic installations, procedures, equipment used, common mistakes during inspections, and standards.                                                                                                                  |

#### • Training

The results of the questionnaire carried out at the end of the training program are shown below.

1. More than 14 trainees assessed the training program good (training material, trainers, training curriculum). (Q12, Q13, Q14)

| Item              | Yes, very much | Yes | Partly yes | No, not at all | Yes, very much + Yes |
|-------------------|----------------|-----|------------|----------------|----------------------|
| Training material | 57%            | 43% | 0          | 0              | 100%                 |
| Trainers          | 57%            | 43% | 0          | 0              | 100%                 |
| Curriculum        | 36%            | 57% | 7%         | 0              | 93%                  |

2. More than 12 people of training participants understand the training content. (Q10)

| Item          | Yes, enough | Yes | Partly good | No, poor | Yes, enough + Good |
|---------------|-------------|-----|-------------|----------|--------------------|
| Understanding | 22%         | 64% | 14%         | 0        | 86%                |

3. All participants consider the training content useful. (Q14)

| Item                     | Yes Applicable | Adaptable | Reference | No useful | Yes, applicable + adaptable |
|--------------------------|----------------|-----------|-----------|-----------|-----------------------------|
| Knowledge and experience | 64%            | 36%       | 0         | 0         | 100%                        |

The results show that the objectives were cleared with a very good average.

#### ● Training Questionnaire Results

|                      |                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------|
| Training             | Project for Energy Transition in PIC's 2nd Regional Training for Additional Countries, RE Integration / O&M |
| Period               | 2026/3/23- 2026/3/27                                                                                        |
| Participants Country | Solomon Is., Tonga, Vanuatu, PNG, RMI, Cook Is. and Nauru                                                   |

Q.1 Have you achieved course objective, which is to understand the basic knowledge and skills for Grid Integration of Renewable Energy Generation Systems / Operation & Maintenance of Renewable Energy Generation Systems?

| Fully Achieved | Achieved | Partially Achieved | Not Achieved |
|----------------|----------|--------------------|--------------|
| 7              | 6        | 1                  | 0            |



Q2. Any comments or suggestions, especially if your rating is "Partially achieved" or "Not achieved."

#### Solomon Islands

- The course was well structured and met its objectives. More time could be allocated to advanced practical case studies, especially on real grid integration challenges in island power systems.

#### Tonga

- Very informative and helpful for application and implementation in my home country.

#### PNG

- When doing simulations in training, please do advise participants to install demo or full licensed programs for participants to actively participate in the simulation lectures.

#### RMI

- Short period of time

#### Cook Islands

- Very impressed clear understanding of all Presentation

#### Nauru

- No further suggestions. The course objectives were met effectively

Q3. Please describe the subjects that were especially useful.

#### Solomon Islands

- Demand & Response Overview, Basic of EFL SCADA system, BESS and the Presentation on Challenges and Transition of PIC
- Solar hybrid subject, assessment and technical report, hand on training and the in house speakers

#### Tonga

- Demand side management is typically useful as my country aims to reach 50% RE penetration by 2030. The EFL SCADA system was useful as they described the system architecture and equipment specifically used.
- On the solar PV testing and the Maintenance planning

#### Vanuatu

- O&M of PV, Demand response, Policy and checks for solar commissioning (Ahzaaz presentation)
- Renewable challenges and commissioning of solar systems



## PNG

- 1. Basics of the Scada System 2. the site Visit to NCC. 3. Day 4 on Licensing Solar Projects
- Everything presented were 70% new to me helped me understand the role of PV and BESS on the grid and upkeep of them.

## RMI

- As someone from the Energy Authority and not the Utility side, I found all the lectures very helpful as they can also help the regulator to make better decisions in terms of policy.
- In my work side I'd say PV construction and commissioning

## Cook Islands

- Bess, Scada, Demand Response Pilot program, Maintenance, planning, monitoring,

## Nauru

- The course provided a very clear and comprehensive overview of both grid integration and O&M practices. The balance between theoretical knowledge and practical application was excellent.
- I found that BESS and disposal off RE equipment

Q4. Please describe the subjects that were not necessary.

## Solomon Islands

- Overview of Diesel Generator
- All subjects were relevant to the course objectives and useful for my work.

## Tonga

- All were necessary to understand the full scope of an electrical utility particularly in tge pacific region.
- All subjects are necessary

## RMI

- All the subjects were very necessary

## Cook Islands

- All okay
- Data collection

## Nauru

- No topics felt unnecessary.

Q5. Please describe the subjects that were not covered but should have been included.

## Solomon Islands

- Details of Homer Pro Software
- HOMER SOFTWARE : More detailed sessions on battery energy storage systems (BESS), grid-forming inverters, and real case studies from Pacific island utilities would be beneficial.

## Tonga

- I believe the basic structure of PPA and its design could be covered with more details.

## Vanuatu

- What must be done when commissioning a big solar farm and what is the maintenance schedule for such system

## PNG

- Maybe do the HOMER software fully,
- Homer Program

## RMI

- Everything was covered

## Cook Islands

- All okay
- Require extra hands on training, maintenance, and physical checks

## Nauru

- All subjects covered were relevant to the core objectives of the course.

Q6. Do you find the period of the course appropriate?

| Long | Appropriate | Short |
|------|-------------|-------|
| 0    | 10          | 4     |



Q7. Do you find the number of participants on the course appropriate?

| Too many | Appropriate | Too few |
|----------|-------------|---------|
| 0        | 14          | 0       |

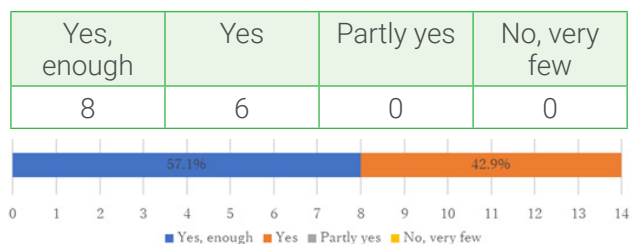


Q8. Were you able to learn from the experiences of other participants in the course?

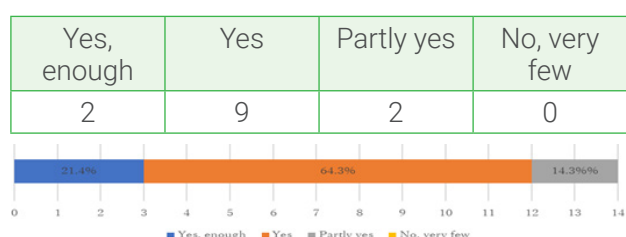
| Yes, very much | yes | Partly Yes | No, not at all |
|----------------|-----|------------|----------------|
| 9              | 5   | 0          | 0              |



Q9. Did you have enough opportunities to participate actively in the course, such as discussions and interchange of opinions?



Q10. Were you able to understand the lectures clearly or not?



Q11. Any comments or suggestions, especially if you answer, "Partly yes" or "No, poor."

#### Solomon Islands

- The lectures were clear and well delivered. Some technical sessions could include more simplified explanations for complex topics.

#### RMI

- Perhaps we can use microphones next time as some might have earring problem
- Limited of time

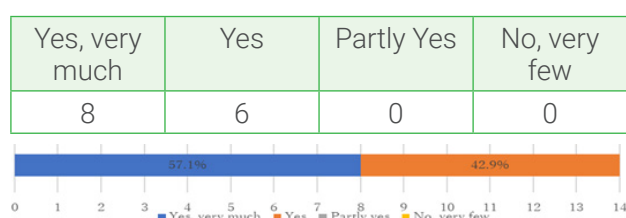
#### Cook Islands

- Some presentations we're kind of difficult, and different to understand because I have very few knowledge in RE systems n some presentations we're very new for me.

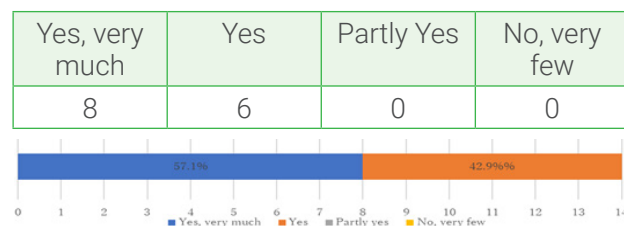
#### Nauru

- No comments / suggestions

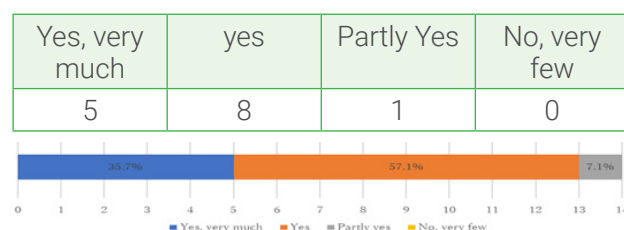
Q12. Were you satisfied with the presentation slides and other materials used in the course?



Q13. Were you satisfied with the trainer's performance in the course?

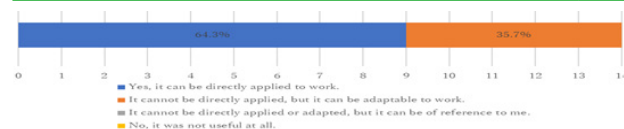


Q14. Were you satisfied with the training curriculum? (Contents of the lectures)

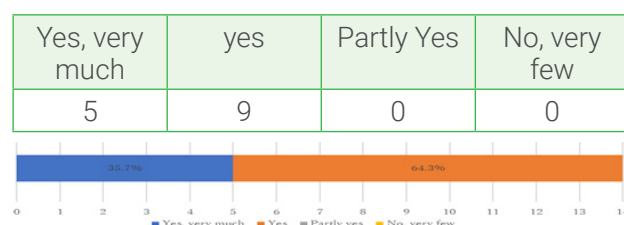


Q15. Do you think the knowledge and experience you acquired through the course is useful?

|                                                                             |   |
|-----------------------------------------------------------------------------|---|
| Yes, it can be directly applied to work.                                    | 9 |
| It cannot be directly applied, but it can be adaptable to work.             | 5 |
| It cannot be directly applied or adapted, but it can be of reference to me. | 0 |
| No, it was not useful at all.                                               | 0 |



Q16. Did you get appropriate facilitation (e.g. an advice for better understanding of the lectures, advice for making an action plan, etc.) by JICA Experts in order for you to achieve your objective?



Q17. Any comments or suggestions for improvement concerning Q1~Q15 above, especially if your ratings are negative. Please also write the question number corresponding to each of your comments.

## Solomon Islands

- Include more advanced and practical case studies, especially focusing on island grid challenges, battery storage systems, and real-world implementation examples.

## Vanuatu

- Perhaps more time for homer

## RMI

- Everything was well planned. My only suggestion would be to consider others diet. All the food was too spicy for some participants.

## Cook Islands

- The course was eventually accurate as I understood most presentations

## Nauru

- No specific suggestions

Q18. Of the knowledge and/or skills you acquired through the training, please choose the useful knowledge (method, service, organization, system, institution, concept), techniques and skills which can be adoptable or adaptable to solve problems in your country.

## Solomon Islands

- Firstly learning from other PIC who are advanced in RE is really welcoming. It is good to understand their challenges and how they are responding to these challenges. Fiji for example is investing into studies on grid stability/policies/framework advancing for future PV integration into their system. I will return and present some of their approach back home in my workplace.
- Hybrid power system design (PV + diesel + battery)  
Grid integration of renewable energy, Demand response concepts, Power system stability (voltage and frequency control), Use of simulation tools such as HOMER Pro, Maintenance planning and performance evaluation of PV systems

## Tonga

- Solar PV maintenance and performance measurement using IV curve analyzer. System analysis for Renewable power system integration.
- The training provided practical skills such as equipment maintenance, safety management, efficient energy generation, which can be adapted to improve reliability and performance at power stations in my country

## Vanuatu

- Method of Commission Home solar system and method of checking solar farm performance
- Inverter set at 0.95 power factor and buy an u/i solar string tracer

## PNG

- I come from the regulator perspective so Licensing of renewable energy Projects especially Solar lecture on Day 4 was very useful.
- Demand Response and BESS-PV System O&M

## RMI

- Integration of RE to reduce GHG
- Solve disposal battery storage that are not working anymore

## Cook Islands

- Make proper Road Map for my country.
- Maintenance, planning, grid code, and data collection for future reference

## Nauru

- I plan to acquire basic knowledge and skills in Grid Integration and Solar O&M. Since our projects often face instability and early failure, I will adapt the power quality techniques and adopt the preventative maintenance schedules I learn to make our solar plants much more reliable.
- The last part of the lecture about inspections on solar roof tops

Q19. Please describe how you would adopt or adapt it into your organisation or country. If there are any obstacles to adoption or adaptation, please describe them.

## Solomon Islands

- In terms of Demand Response, i will try and adapt some of the techniques other PIC gone through and try and simulate for our network, especially with Hydro and PV installations coming up.
- The knowledge gained will be applied in improving hybrid system operation and planning in my organization, particularly in optimizing diesel and solar integration across outstation powerhouses.  
It will also support better decision-making in renewable energy projects and system stability improvements.  
Obstacles:  
Limited funding for advanced technologies like BESS  
Lack of real-time monitoring and smart grid infrastructure



Need for further technical training and capacity building

Tonga

- Train technicians using IV curve analyzer to provide PV performance tracking and solar system maintenance. We also need power system analysers to perform system grid impact assessments and verify reports from IPP's and Donor Projects.
- I would adopt these skills by implementing improved maintenance procedures, strengthening safety practices, to enhance efficiency and reliability at the power station; however, challenges may include limited funding, outdated equipment, and the need for additional staff training.

Vanuatu

- Propose a similar sign up form and procedure for connecting PV home systems to the grid when there is the relevant regulation in my country.
- Change the approach of controlling the solar farm

PNG

- I am thinking of working with EFL on the Licensing process for renewables
- Demand Response: Initiate discussions with NSO to work on this especially in C centers. BESS: correct mode of operation in Hybrid setups  
PV O&M: Efficiency calculations

RMI

- I would apply first the maintenance training as we are facing aging of infrastructure with no maintenance then i would add more solar PV to reduce GHG emission.
- Reach out and encourage them to store them in a proper place

Cook Islands

- To enable 100% of RE Energy, to save fuels
- Discuss with supervisor and manager, show them presentations on how we can change or align work ethics to be safe, in the work area.

Nauru

- I plan to help my senior team by bringing in the Solar O&M and Grid Integration tips I've learned, especially for setting up regular maintenance schedules to stop parts from breaking early. The main challenge is that the high-tech tools we need for monitoring are quite expensive for our current budget.
- The guidelines in the presentation are similar to what we use in Nauru and after this presentation, I can improve on our inspection works

Any comments.

Solomon Islands

- I would like to thank JICA and all the facilitators for organizing this comprehensive training. It has been invaluable opportunity to exchange knowledge and experience with colleagues from across the participating PIC.
- Overall, the training was very valuable and relevant to my work. I appreciate the effort made by the organizers and trainers. I look forward to more advanced training in the future, especially focused on practical implementation in island grid systems.

Tonga

- Thank you very much JICA and Enetech for the opportunity to learn from the lectures and trainings and to share our knowledge on topics covered in the training.

Vanuatu

- Thanks a lot to all of you. God blessed you

Cook Islands

- This training is my first, and I really enjoyed the time here, learning to see new projects planned, skills for maintenance, aware of safety and budget measures, maintenance to be taken and communication to the other colleagues and presentations. The next training would be better to have a supervisor and a new apprentice to teach them new skills and understanding. Thank you JICA and EFL. From the Cook Islands ck meitaki maata.

Nauru

- Thank you for the training.
- This training has been very useful as it broadens my knowledge in regards to the solar energy sector

## 8. Certification for the training participation

Training completion certificates were issued to participants; these certificates were provided to remind the participants that they are expected to continue working as "core trainers" for their respective countries.

## 9. Way Forward

This 2nd Regional Training for additional countries was a good opportunity to confirm that the trainers -both new candidates and certificated trainers- are still improving in their teaching skills and are willing to continue in these activities in the future.

To further expand the concept of regional training, several challenges need to be addressed, such as reviewing the training program, preparing materials dedicated to hands-on training, and changing the site visit venue.

For the next regional training planned for November, the JICA experts' team is expecting to change the program content by including the use of the microgrid training simulator.

JICA's team of experts will continue conducting regional training courses to provide technicians at Pacific utilities and ministries personnel with opportunities to expand their knowledge and practical skills in the energy transition, while also strengthening systems that can adapt to future changes in the global landscape.



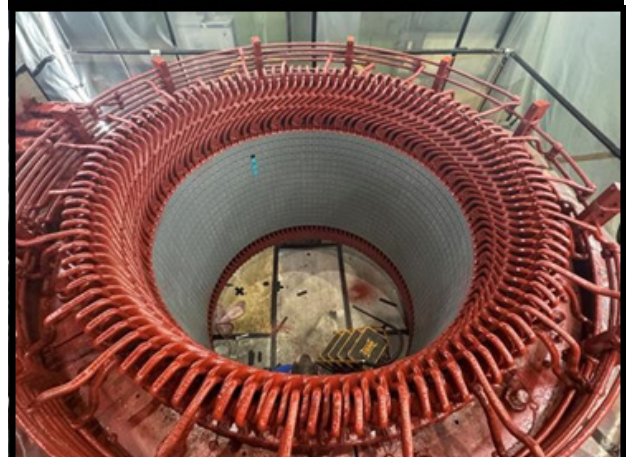




## Restoring Reliability at Wailoa Power Station

Tony O'Brien, Managing director,  
Australian Winders

How Australian Winders turned a maintenance scope into a full rewind program for Energy Fiji Limited's TIBB 24,500 kVA hydro generators



*Completed Unit 4 stator after rewind and schedule-driven return to service at Wailoa Power Station*

What Began As Inspection, Testing, Rotor Pole Refurbishment And Re-Wedging Work Ultimately Developed Into A Staged Rewind Program For Units 4 And 3, Delivered In A Remote Tropical Environment And Completed Ahead Of Schedule.

### Inspection revealed a deeper problem

Australian Winders first attended Wailoa in May 2022 for inspection, testing, rotor pole refurbishment and re-wedging on Unit 2, then returned for the same scope on Unit 3 in August 2022. During that outage, Energy Fiji Limited also requested an internal inspection of



Unit 4, which quickly showed that Units 3 and 4 were in significantly poorer condition than Unit 2.

The main concern was high partial discharge at the coil crossover region, where the top and bottom coils were effectively touching. As-found geometry in Units 3 and 4 was heavily compromised, with wedges as thin as 2–3 mm and poor under-wedge support. Australian Winders assessed that this likely dated back to the original factory build, where a thicker middle strip appears to have been introduced in a large percentage of slots to create crossover clearance in the end-winding, unfortunately at the expense of wedge support and slot-build quality.

### From interim repairs to full rewind

Unit 4 received interim life-extension work in 2023, including lead changeout and PD repairs, but the long-term solution remained a full rewind. Unit 4 became the first rewind in August 2024, completed in six weeks from handover to hand back. Unit 3 followed in June 2025 and was completed in five weeks. After Unit 3 was rewound, the client requested offline PD testing on Units 1 and 2. Those results came back high and aligned with the station's online monitoring, confirming the path forward for the remaining machines.

### Remote delivery, built on site

The logistical challenge was as significant as the electrical one. Wailoa is a remote site, and the program had to be delivered in difficult tropical conditions, with heavy rain, flooding, accommodation limitations, communication issues and long supply runs. Australian Winders shipped a 20-foot sea container of tooling, materials and site-support equipment to Fiji, effectively mobilizing a full rewind capability into the jungle.

The team-built work platforms, fabricated site specific items as needed, and established temporary controlled conditions with constant dehumidification and overnight stator heating. DC current was also used to heat coils to about 70°C for installation.



*Removed Unit 3 coil showing PD-related damage*



*As Found PD-Related damage at coil crossovers*



*Monosavu Region, Fiji*

### Project at a glance

**Client:** Energy Fiji Limited

**Site:** Wailoa Power Station, Fiji

**Machines:** TIBB 24,500 kVA three-phase hydro synchronous generators

**On-site team:** 1 site manager/test engineer, 1 rewind supervisor, 5 winding specialists Roster: 10-hour day shifts, 14 days on, 1 day off

**Completed rewinds:** Unit 4 in August 2024; Unit 3 in June 2025 Future program: Unit 2 and Unit 1 scheduled to follow

### A better design, not just a replacement

The rewinds improved the machine design rather than simply replicating the as-found build. Australian Winders increased crossover clearance to approximately 10–12 mm, compared with the original condition where the coils were effectively touching. Ripple spring technology wedges were installed during both the re-wedge works and the full rewinds. Unlike older flat-packed slab-style wedge systems, ripple spring wedges maintain constant pressure on the coils while accommodating thermal expansion and repeated thermal cycling.

### A full engineered rewind package

Australian Winders supplied and designed everything required for the rewinds: new stator coils manufactured in-house at Australian Winders Perth workshop and headquarters, leveraging our specialist high voltage coil manufacturing capability. AW Also manufactured and supplied new and embedded RTDs, wedges, side packing, conductive fleece, blocking, binding and bracing materials, surge ropes, insulating materials, paints and epoxy resin systems. The existing main leads were refurbished, re-tinned, re-insulated and fitted with new hardware.

The circuit rings were also redesigned, including a new cleat clamping arrangement, after the original clamping-bolt arrangement showed flashover risk during HV withstand testing. All auxiliaries replaced, routed and terminated in a new terminal box with spares.

### Staged testing and a strong outcome

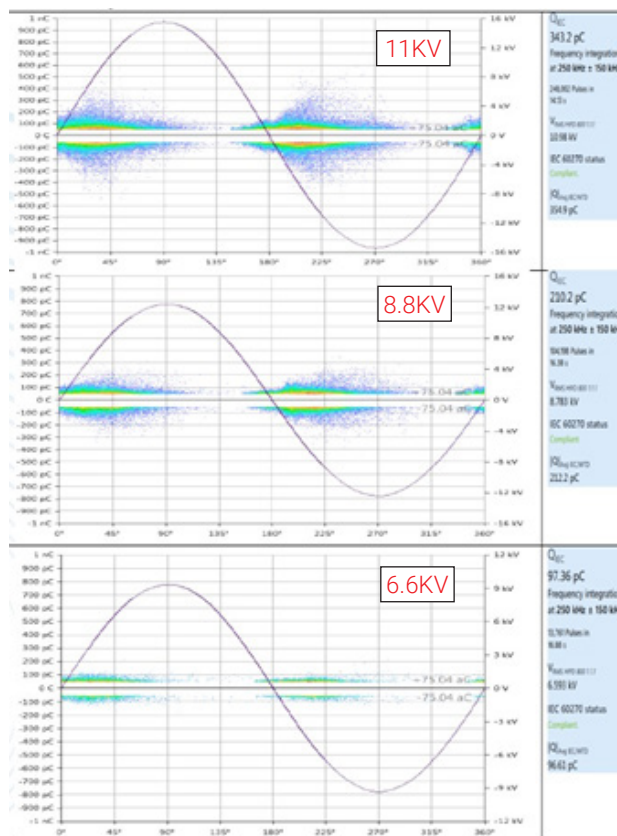
Testing and quality assurance were built into every stage of the works, including as-found ELCID, ELCID after stripping and slot cleaning, and final ELCID during commissioning. HV withstand testing was carried out on the circuit rings after winding removal, while daily IR, PI and HV withstand tests were performed during coil installation. Final commissioning also included winding resistance, tan delta and capacitance, RTD checks and offline partial discharge.

Both rewind units were returned to service successfully ahead of schedule, with excellent offline PD results. The schedule raised eyebrows at the outset, but Australian Winders delivered the first rewind in six weeks and improved by a further week on the second – setting the benchmark for the remaining units in the fleet.



Bird's-eye view inside the makeshift controlled enclosure built on site to manage humidity, cleanliness and rewind conditions.

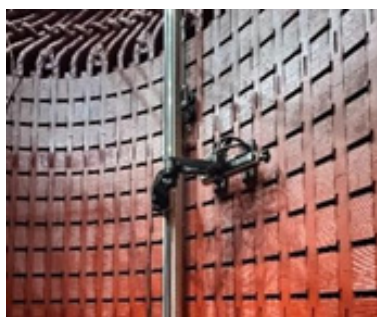
### PHASE RESOLVED PARTIAL DISCHARGE (POST REWIND)



Excellent Post Rewind PD Levels, PD Levels Negligible

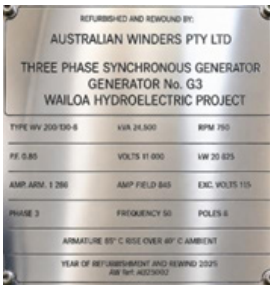


Offline PD Testing



Core Testing (ELCID)





New AW Nameplate



AW Makeshift Clean Conditions & FME Zone ready for rewind



AW Team Preparing support rings & core for



AW Team Installing new coils

At Wailoa, Australian Winders did more than rewind two generators. It identified the root cause of a long-term winding issue, engineered a better solution and delivered major hydro generator rewinds in one of the most logistically demanding environments in the region.

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# Practical Transformer Diagnostics:

## The Minimum Toolkit for Reliable Condition Assessment



MIT525/2

5 kV Advanced Insulation  
Resistance Tester  
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## 100% Renewable Energy Blue Pacific - The Time is Right

Richard Neumann, Senior Adviser,  
Smart Energy Council

The 6th Pacific Regional Energy and Transport Ministers' Meeting (PRETMM6) in Port Moresby concluded in May 2026 with the Manubada Call to Action, focusing on accelerating practical implementation of renewable energy, maritime connectivity, and sustainable transportation.

Pacific Energy Ministers reaffirmed their shared vision for 100% renewable energy for the Pacific, which had previously been ensoresed at PRETMM3. So why is it back? Here's six reasons.

First, surging fossil fuel prices have put the focus squarely on energy security. Pacific nations already spend USD 9 billion a year on fossil fuels - money that could be better spent on health, education and human development.

Second, China has emerged as a global force in manufacturing of solar panels, batteries, electric vehicles and power electronics, driving down costs and increasing supply. Renewable energy is no longer a luxury but the cheapest form of new energy, in addition to being a practical means of dramatically reducing greenhouse gas emissions and pollutants. Here's the link to my [article](#) published in the Lowy Institute's [interpreter](#) on why your next car is likely to be an EV made in China.

Third, through the Australian Infrastructure Financing Facility for the Pacific, including its REnew Pacific off-grid funding vehicle, and the Australia-Pacific Partnership for Energy Transition, Australia has stepped up its engagement in renewable energy projects within the region. This is helping to build supply chains and improve workforce capability.

Fourth, by holding its inaugural conference in Fiji in March 2026, the Sustainable Energy Industry Association for the Pacific Islands (SEIAPI) has demonstrated that it is ready to tackle policy challenges in the region. SEIAPI has also worked with philanthropic foundations and the University of the South Pacific's TAFE campus to establish the region's first dedicated training centre for rooftop solar and battery installers, planned for a July 2026 opening. If Pakistan can install 25GW of

solar panels in two years with training by TikTok, imagine what the Pacific can achieve!

Fifth, the \$100 million blended finance facility [Transforming Island Development through Electrification and Sustainability](#) (TIDES) - seed-funded by the United Kingdom and New Zealand governments - has begun operating. It provides a vehicle to bring together funding from donors, philanthropists and investors to derisk projects.

Finally, Palau President Surangel S. Whipps Jr, has committed to making 100% renewable Pacific a centrepiece of the Pacific Island Forum Leaders Meeting that he is chairing from 30 August and the Pacific Pre-COP in Fiji and Tuvalu in October is a key moment to drive international financing and partnerships to scale the Pacific's transition.

The Smart Energy Council's (SEC) Pacific Working Group which I have the honour and privilege to chair is also committed to supporting this goal.



Photo: Smart Energy Council Pacific Working Group and Pacific Utility Delegation Members

For too long the Pacific was seen as too hard, a dumping ground for inappropriate technology and a place for old cars and ships to serve one last owner before they die.

Now we have the political support and economic motivation to bring together appropriate renewable energy and storage technology made or bought in Australia backed by warranties, together with grant or blended finance and installed by trained industry professionals.

The working group is harnessing energy, enthusiasm and expertise to support the energy transition in the region.



SEC Director Barbara Elliston and I have published an [article](#) on the necessary steps to support grid decarbonisation. We highlighted the importance of having flexible diesel generators and big batteries with grid-forming inverters to enable diesel generators to be switched off completely when there is sufficient renewable energy in the grid. We also noted the benefits of smart meters to provide grid operators with voltage information on the low voltage network and to facilitate time-of-use tariffs.

In May 2026 I hosted a delegation of Pacific utility representatives to attend the Smart Energy Conference and Exhibition. The program was carefully constructed to provide utilities with the lessons learned from Australia's rooftop solar revolution and cheaper home batteries program that they can draw on, including a briefing by South Australia Power Networks and a tour of the University of New South Wales' realtime simulation lab.

Participants also toured an electrified bus depot and the largest off-depot electric truck charging facility in Australia to look at how transport decarbonisation can provide growth opportunities for utilities as well as tools for balancing the grid by harnessing second life batteries for stationery storage. We see transport electrification as an important part of the equation in reducing the region's reliance on imported fossil fuels. Smart charging and vehicle-to-grid technologies help utilities to balance loads while rewarding participating consumers.



*Pacific and International Delegates at the Leichhardt bus depot which is being converted in stages to support the rollout of electric buses while continuing to operate.*

They also had the chance to meet our members and see the depth and breadth of experience they can draw on. A highlight for us all was the signing of an [MOU](#) between the Nauru Utilities Corporation and Smart Commercial Energy to quit diesel power.



**Seated (LtoR):** David McElrea (SEC), Huon Hoogesteger (SCE), Anthony Dimapilis (NUC), Lugano Kepae (NUC). **Standing (LtoR):** Scott Hamilton (RECAP), Kathryn Hoogesteger (SCE), Lauren Hamilton (SCE), Melissa Reader (Austrade), Jason Verspuy (Austrade).

We know that much more funding is required to complete the transition.

Accordingly, as an outcome of the recent Energy Investment Forum convened by PCREEE in Port Moresby, we are working on a Pacific renewable energy investment prospectus.

To inform the prospectus we prepared a [survey](#) which was circulated to PIC utilities with the support of Gordon Chang from PPA and Solomon Fifita from PCREEE. We were delighted with the quality of the responses and there's still time if others would like to complete it.

The prospectus will present one priority project for each grid and hopefully be a base for a future Pacific Energy Commissioner to streamline discussions with donors, investors and philanthropists to accelerate the energy transition in the region.

The prospectus will also highlight the necessary regulatory work that needs to be undertaken to support the widespread adoption of forecastable renewable energy. If energy is primarily drawn from the sun, it is important to have tariffs that encourage consumers to use electricity when the sun is shining and conserve it when it is not.

We look forward to continuing the journey with you.

Author: Richard Neumann is a former diplomat and senior adviser at the Smart Energy Council. He chairs the Smart Energy Council's Pacific Working Group and is a member of the advisory council for the Franco-Australian Centre for Energy Transition.



## Engineering Renewable Resilience: Delivering the Kawene 3 MW Solar Farm in Vanuatu for UNELCO

Charles Mickey, Neha Kapoor, Nikhil Singh,  
Pacific Engineering Projects Limited

*"The Kawene Solar Farm demonstrates what can be achieved through strong partnerships, sound engineering, and meaningful local participation in Pacific renewable energy development."*

### Powering Vanuatu's Renewable Energy Transition

Across the Pacific, island nations are accelerating efforts to reduce dependence on imported fossil fuels while strengthening energy security and resilience. In Vanuatu, where electricity generation has historically relied heavily on diesel generation, renewable energy infrastructure is increasingly playing a central role in shaping a more sustainable energy future.

The successful completion of the Kawene 3 MW Solar Farm, located outside Port Vila on Efate Island, represents a major milestone in that transition. This is the largest solar project in Vanuatu and has been delivered for Union Electrique du Vanuatu (UNELCO) by Pacific Engineering Projects Limited (PEP). UNELCO, under concession contracts with the Government of Vanuatu, a typical PPP example, is the biggest utilities provider for the production, transport and supply of electricity and water in Vanuatu, and operating on Efate Island. Pacific Engineering Projects Limited (PEP) is a design and build contractor with one of the largest geographic footprints in the Pacific. This UNELCO project demonstrates how utility-scale renewable energy infrastructure can be successfully executed in geographically remote and logistically challenging environments.

More than simply another solar installation, the Kawene project reflects the combined strengths of engineering capability, effective project coordination, maximum local workforce participation, and resilient execution under Pacific operating conditions. It also highlights how partnerships between utilities, contractors, and local communities can deliver lasting outcomes for national energy systems.

For Pacific utilities facing similar challenges—ranging from remote logistics and climatic exposure to workforce development and grid integration—the Kawene Solar Farm provides valuable lessons in planning, delivery, and collaboration.



*The completed 3 MW Kawene Solar Farm on Efate Island contributes renewable generation capacity to Vanuatu's electricity network.*

### Engineering a Utility-Scale Solar Installation

The Kawene Solar Farm was designed as a 3-megawatt (MW) grid-connected photovoltaic (PV) installation, providing renewable energy directly into Vanuatu's national electricity network. The project required detailed engineering consideration to ensure long-term operational reliability in one of the Pacific's most environmentally demanding climates.

At the core of the installation are 4,320 high-efficiency 700W TOPCon photovoltaic panels, mounted across 108 fixed-tilt mounting bays and supported by 1,944 screw pile foundations. The fixed-tilt configuration was selected to optimise solar capture while maintaining structural simplicity, durability, and ease of maintenance.

The mounting system was specifically engineered to withstand local environmental stresses, including high humidity, salt-laden coastal air, and cyclone exposure—critical considerations for long-term asset performance in tropical island conditions.

The project utilised screw pile foundations, requiring adaptation during construction to achieve installation integrity across variable subsurface conditions. To verify our design, which was carried out in accordance with AS/NZS 1170-2011, we carried out infield pull out testing of 20 piles. The pull-out tests validated our design. Only after this verification was the pile manufacture commenced.

The electrical design incorporated an integrated network of direct current (DC) strings feeding into 27 Huawei SUN2000-110KTL-M2 inverters, enabling efficient conversion from DC to alternating current (AC) before transmission into the grid through a dedicated step-up electrical system including new a new transformer.

To ensure operational visibility and system performance monitoring, the project also included two Supervisory Control and Data Acquisition (SCADA) panels, allowing communication, remote monitoring, and performance tracking. A comprehensive earthing system was installed to maintain electrical safety and compliance with international standards.

In utility-scale renewable projects, reliability is not determined solely by generation capacity. Instead, long-term performance depends on selecting technologies suited to local operating conditions and integrating robust monitoring, electrical protection, and structural resilience into the overall design. These principles guided engineering decisions throughout the Kawene project.



*Installation of 4,320 high-efficiency PV panels formed a key stage of construction.*



*A total of 1,944 screw piles were installed using our own equipment to support fixed-tilt mounting structures under challenging ground conditions.*

### Construction at Scale in a Remote Pacific Environment

While utility-scale solar farms are increasingly common globally, constructing such infrastructure in Pacific Island settings presents a distinct set of challenges.

The Kawene Solar Farm required significant civil, mechanical, and electrical works delivered within a remote environment outside Port Vila, demanding precise coordination of materials, equipment, workforce mobilisation and sequencing.

Construction statistics illustrate both the scale and complexity of the project:

- 22,510 metres of DC cabling installed
- 1,514 metres of AC cabling installed
- 280 metres of RS485 communication cable
- 250 metres of fibre optic cable installed
- 280 metres of trenching work completed
- 2,630 metres of cable tray systems installed
- 4,320 photovoltaic panels installed
- 108 fixed-tilt mounting bays assembled
- 27 grid-connected inverters installed and commissioned

Each component formed part of a tightly coordinated delivery programme requiring close integration between civil works, electrical installation, commissioning teams, and utility coordination.

The installation sequence began with surveying and site preparation, followed by screw pile installation and structural mounting assembly. Trenching and cable containment systems were then completed to facilitate electrical interconnection across the

site. PV modules, inverter systems, communication infrastructure, and monitoring systems were subsequently installed and commissioned to achieve operational readiness.

Given the remote location and dependence on imported equipment, scheduling accuracy and logistics planning became critical success factors throughout the project lifecycle.



*Civil and electrical works included trenching, cable installation, and integrated communications infrastructure.*



*Grid integration included Huawei inverter systems and SCADA monitoring for operational performance tracking.*

### Building Local Capability Through Workforce Participation

One of the project's most significant achievements extended beyond engineering delivery—it was the meaningful involvement of Ni-Vanuatu personnel across construction and project implementation.

PEP maintained a strong commitment to local workforce participation throughout the project, supporting skills development while strengthening domestic renewable energy capability.

At the supervisory and technical level, Ni-Vanuatu personnel contributed through site management, engineering, and supervisory functions, including:

- 1 Site Manager
- 3 Project Engineers
- 2 Supervisors

Field operations also saw strong local representation through:

- 6 heavy-duty machine operators
- 2 Foremen
- 24 skilled labour personnel
- 12 unskilled labourers from the Maliudu community

Importantly, female participation was also represented within the workforce, including:

- 1 Surveyor
- 1 Structural Engineer
- 1 Skilled Labourer

Complementing local expertise, expatriate specialists provided targeted technical support in key disciplines, including project management, electrical engineering, and surveying:

- 1 Project Manager
- 2 Electrical Engineers
- 1 Project Engineer
- 2 Surveyors

The integration of local and international expertise fostered effective knowledge transfer throughout the construction process. This approach not only strengthened project delivery capability but also contributed to the development of local technical skills relevant to future renewable energy projects in Vanuatu.

In Pacific infrastructure development, successful projects increasingly depend on building capability alongside assets. Kawene demonstrates how workforce inclusion can create both immediate and long-term value.

### Equipment and Construction Execution

Delivering a utility-scale solar installation required deployment of specialised construction and testing equipment suited to site conditions and programme requirements.

PEP owned key equipment utilised throughout the project included:

- Two drilling rigs for screw pile installation
- Two compressors supporting drilling operations



- Excavators and jackhammers for trenching and civil works
- Crane trucks for heavy lifting and equipment placement
- Side loaders for material handling and logistics
- Fluke electrical testing and commissioning equipment
- Surveying and site set-out instrumentation

Equipment selection was carefully matched to local ground conditions and terrain, ensuring efficient progress while maintaining safety and quality requirements.

Testing and commissioning activities were particularly important during final delivery phases, requiring precision verification of electrical systems, communications infrastructure, earthing systems, and grid interface performance prior to energisation.

### Overcoming Pacific Delivery Challenges

No major infrastructure project in the Pacific proceeds without challenges, and Kawene was no exception.

The project team encountered several logistical and operational constraints requiring adaptive planning and problem-solving.

### Port Congestion and Shipping Delays

As with many Pacific projects, imported equipment and materials were subject to shipping disruptions and port congestion. To minimise schedule impacts, procurement and delivery sequencing were carefully coordinated, allowing construction activities to continue despite delays affecting some imported components.

### Remote Site Logistics

Mobilising personnel, construction materials, and specialised equipment to a remote site required detailed logistical planning. Flexibility in programme management proved essential, particularly where weather or supply chain issues affected timelines.

### Weather and Environmental Conditions

Construction activities were undertaken under tropical conditions characterised by rainfall, humidity, and challenging site accessibility. Work schedules and installation activities were adapted to maintain safety and productivity while preserving installation quality.

### Challenging Ground Conditions

The rocky site environment required engineering adjustments to support screw pile installation and ensure structural stability. Construction methodologies were modified where required to maintain design integrity while progressing works efficiently.

Ultimately, proactive planning, technical adaptability, and close coordination between project stakeholders enabled successful delivery despite these constraints.



*Rocky ground conditions required engineering adjustments to maintain installation integrity.*

### Why UNELCO Selected Pacific Engineering Projects Limited

The successful delivery of the Kawene Solar Farm was built on a foundation of trust, technical capability, and demonstrated project delivery experience.

UNELCO selected Pacific Engineering Projects Limited following an international tender process, in which the company emerged as the most economically advantageous bidder among the compliant offers. This selection also reflects its proven capability to deliver engineering, procurement, and construction (EPC) projects, particularly in constrained island environments where logistics, climate exposure, and infrastructure limitations require strong practical experience and adaptive execution.

PEP's approach combines engineering expertise with a strong commitment to workforce participation, safety, and quality outcomes. The company's experience in delivering infrastructure projects within remote and geographically complex settings provided confidence in its ability to manage both technical

and operational risks associated with the Kawene development.

Equally important was PEP's commitment to integrating local workforce participation into project execution—an approach aligned with broader goals of skills transfer and sustainable development in the Pacific. The project team also made contribution to Rotary club of Port Vila.

Rather than focusing solely on construction outcomes, the project sought to strengthen local capability while delivering resilient energy infrastructure designed for long-term operational performance.

### A Strong Partnership with UNELCO

The Kawene Solar Farm was delivered in close partnership with UNELCO, whose technical collaboration and operational support were instrumental throughout the project lifecycle.

From design coordination through construction and final commissioning, UNELCO's team provided critical oversight and alignment to ensure the project met technical, operational, and network integration requirements.

Key personnel supporting project delivery included:

- Tanguy Kerzreho – Director of Electricity Production Distribution and Transport
- Ron Jacquier – Electricity Project and Plant Manager
- Benjamin Garae – Project Manager
- Nathalie Dovan – Renewable Energy Manager

The project benefited from strong communication, collaborative problem-solving, and a shared commitment to strengthening renewable generation in Vanuatu.

Partnerships between utilities and delivery contractors are often decisive factors in project success. In the case of Kawene, alignment between stakeholders ensured challenges could be addressed efficiently while maintaining programme objectives and technical quality.

### UNELCO and PEP project team



*Close collaboration between PEP and UNELCO supported successful project delivery and commissioning - Tanguy Kerzreho of UNELCO Inspecting work in progress with PEP Site Manager Charles Mickey*



*PEP Regional Manager Nishant Pratap and PEP Site Manager Charles Mickey with Vanuatu Prime Minister Hon. Jotham Napat at the Ribbon Cutting ceremony*



*Close collaboration between PEP and UNELCO and the Government of Vanuatu supported successful project delivery and commissioning – preparation for Ribbon cutting with The Prime Minister, Honorable Jotham Napat, the deputy Prime Minister and Minister of Finances, Honorable Johnny Koanapo, the Minister for Climate Change, Honorable Ralph Reganvanu UNELCO Managing Director Fredric Petit*

### Looking Ahead

The completion of the Kawene 3 MW Solar Farm marks more than the delivery of a renewable energy asset—it represents a practical example of how Pacific nations can successfully implement utility-scale clean energy projects despite geographic and logistical constraints.

For Vanuatu, the project contributes directly to reducing reliance on diesel-based generation while supporting broader renewable energy ambitions and improving long-term energy resilience.

For Pacific utilities and infrastructure providers, Kawene demonstrates the importance of combining sound engineering, adaptive project management, strong partnerships, and workforce participation to achieve successful outcomes.

As renewable energy deployment accelerates across the region, projects such as Kawene provide valuable lessons in designing and delivering infrastructure suited to Pacific realities.

Through collaboration, technical excellence, and local participation, the Kawene Solar Farm now stands as an important contribution to Vanuatu's renewable energy future.

## Battery Chemistry and Electric Vehicles

Scott Hamilton and Richard Neumann,  
Smart Energy

Next time you turn the key in the ignition, stop for a second and listen to the starter motor crank the engine into life. Did you know this is an electric engine?

The first production passenger motor vehicle to incorporate an electric starter motor was the Cadillac Thirty in 1912.

Until then, [battery electric cars were popular](#), especially with drivers not wanting to get out and turn a crankshaft which was both difficult and dangerous because of the threat of kickback.

Fast forward a decade and the limitations of the six volt lead acid battery meant that internal combustion engines won the day, particularly with the convenience of curb-side and forecourt refuelling which began to appear around that time.

Electric Vehicles feature prominently in the TV series '[For All Mankind](#)', highlighting an alternate timeline where technology advances faster due to the accelerated space race. NASA Administrator Tom Paine is seen with an electric car in the early 1980s, having a range of about 60 miles. Astronaut Ed Baldwin scoffs at the early, slower EV which barely hits 60 mph compared to his fuel guzzling Corvette.

Battery chemistry and consumer sentiment has finally caught up, providing electric vehicle owners the convenience of charging anywhere there is electricity, including from their own rooftop solar systems.

What is this battery chemistry and what does it mean we are replacing dependency on fossil fuel imports from authoritarian regimes transporting oil through supply chain bottlenecks such as the Strait of Hormuz.

From the early days of the Tesla Roadster until today's performance vehicles, the dominant chemistry remains high energy density lithium nickel manganese cobalt (NMC) batteries, with concerns about supply chains including forced labour in Congo cobalt mines.

For those who are price conscious, they are more likely to drive an electric vehicle with a lithium,



iron, phosphate battery (LFP), a technology that has already overtaken NMC for stationary storage batteries from households to industrial and grid-scale systems.

The ability to make 'gazillions of solar panels' allowed the Chinese manufacturing companies to drive the cost of PV panels from 'premium' to 'commodity' in under a decade. Energy storage is on the same trajectory now.

LFP battery prices have plummeted 60% over the last two years reflecting the relative abundance of the metals and rapid learning in the manufacturing process. LFP batteries are also less prone to burning or thermal runaway than NMC batteries.

This year China's automakers will debut vehicles using sodium batteries, an alkali metal next to lithium on the periodic table but found in such abundance that it will reduce the requirement to extract lithium from fragile ecosystems.

Unlike lithium chemistries, sodium batteries don't burn or run the risk of thermal runaway. Also, sodium batteries do not lose power when operating in extreme cold. The world's biggest battery company, CATL, just announced that sodium-ion will enter large-scale production this year.

Other automakers are trialling alternative chemistries including magnesium rich batteries.

There's also another alternative to lithium and sodium chemistries for stationary batteries: vanadium flow batteries, first invented by the University of New South Wales and later commercialised in Canada and China.

Vanadium is found in Australia and there are plans to both mine vanadium and manufacture vanadium flow batteries in Australia, including to supply the [Kalgoorlie Big Battery](#).

Vanadium flow batteries can be discharged to zero and fully charged to 100% without suffering any degradation. They can also operate in extreme heat, a key performance indicator for Australia and other global sun-belt countries (between the Tropics of Cancer and Capricorn) now and in the future as temperatures rise. Field data is available from companies such as Europe-based CellCube Energy Storage which has projects on five continents.

| Name                          | Acronym  | Energy Density |          | Strengths/Uses                                           |
|-------------------------------|----------|----------------|----------|----------------------------------------------------------|
| Nickel Manganese Cobalt (NMC) | (Li-ion) | 150-300 Wh/kg  | High     | Excels where space/weight matter most                    |
| Lithium-Iron phosphate        | LFP      | 90-205 Wh/kg   | Moderate | Dominates stationary storage due to safety and longevity |
| Manganese Rich                | LMR      | 200-280 Wh/kg  | High     | Aims to combine high density with LFP-like cost          |
| Sodium-ion                    | Na-Ion   | 140-175 Wh/kg  | Lower    | Low cost option where density is less critical           |
| Vanadium Redox Flow           | VRFB     |                | Low      | Ideal for utility-scale, long-duration storage           |

The [world's largest](#) vanadium flow battery was recently installed in China's Xinjiang region. At 200MW/1000MWh, the five hour battery is the first GW scale vanadium flow battery.

Australia's VSUN has deployed a [78kW/220kWh](#) vanadium battery in the remote Kimberley in partnership with Horizon Power to test how the technology operates in harsh environments and integrates in off-grid and remote grid systems.

Future Vanadium batteries are likely to provide twelve hours storage, ideal for data centres and industrial applications.

At the end of life, Vanadium batteries can be fully recycled. The electrolyte forms the majority of the weight and cost of the battery. It does not degrade. It can either be poured into a new battery that will last another 25-30 years or the vanadium can be precipitated out and sold as a powder to the steel alloy industry. The remaining steel, plastic and copper from the battery housing can be recycled too.

So if you want to slash your transport expenses, make your next car electric with an LFP battery, or sodium battery once they become available.

Scott Hamilton is Adjunct Associate Professor at the Department of Chemical and Biological Engineering at Monash University, Senior Advisor and Director of the Smart Energy Council.

Richard Neumann is a former Australian diplomat and currently chairs the Smart Energy Council's Pacific Working Group.

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## MEC Awards \$2.8million Contract to Strengthen Power Reliability in Majuro and Ebeye

Marshall's Energy Company

Marshall's Energy Company (MEC) has announced the award of a \$2.8 million contract for the supply of emergency service vehicles and equipment, marking a major step forward in improving power reliability across Majuro and Ebeye.

The contract has been awarded to Pacific Engineering Projects Ltd, and will deliver a fleet of 27 specialized utility vehicles designed to enhance MEC's and KAJUR's ability to respond to outages, maintain infrastructure, and support long-term system improvements.

MEC Chief Executive Officer Jack Chong-Gum highlighted the significance of the investment, noting that aging equipment has long limited the speed and efficiency of response efforts.

"This investment will transform our ability to restore power faster, carry out preventive maintenance more effectively, and reduce the frequency and duration of outages," he said. "Our customers in both Majuro and Ebeye will see the difference—shorter wait times and more reliable electricity."

### Boosting Response Capacity and Efficiency

The new equipment will directly strengthen field operations. Bucket trucks will allow crews to safely repair overhead lines, while crane trucks, excavators, and telehandlers will support faster infrastructure repairs and installations. Mobile test rigs will also enable teams to identify potential issues before they result in outages, improving preventive maintenance across the grid.

For customers in Ebeye, served by KAJUR, this investment represents a significant upgrade in local response capability, reducing reliance on equipment transfers from Majuro and allowing for faster, independent action.

### Investing in People and Safety

Beyond improving service delivery, the procurement reflects MEC's commitment to its workforce. Line crews and technicians will benefit from modern, safer, and more reliable equipment, supported by

comprehensive training programs to ensure proper operation and maintenance.

MEC emphasized that empowering its employees with the right tools is essential to delivering safe and efficient service to communities.

### Delivery Timeline and Distribution

Delivery of the equipment is expected to begin in May 2026, with full deployment anticipated by early 2027. The fleet will be strategically distributed, with 18 units allocated to Majuro and 9 units to Ebeye, ensuring both locations are equipped to respond quickly and effectively to power system needs.

### Supporting Long-Term Energy Goals

This procurement is funded under the Renewable Energy Generation and Access Increase Project (REGAIN), supported by the World Bank. The project aims to expand renewable energy capacity and improve energy access across the Marshall Islands, including outer island communities.

In addition to supporting daily operations, the new equipment will play a critical role in installing and maintaining renewable energy infrastructure, helping MEC advance national energy goals and strengthen system resilience.





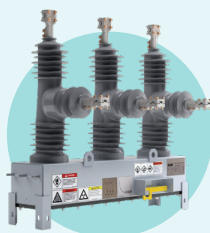
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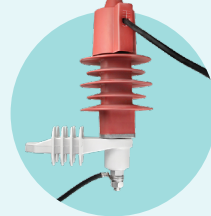
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## MEC Advances Reliability Efforts with Engine 6 Overhaul Following PS1 Demolition

Marshall's Energy Company

Marshall's Energy Company (MEC) is moving forward with critical upgrades to strengthen power reliability and improve fuel efficiency across Majuro, following the demolition of Power Station 1 (PS1) last year.

The removal of PS1 marks a significant transition in MEC's infrastructure, as operations continue to shift toward more modern and efficient generation assets. With two of MEC's largest generators now operating out of Power Station 2 (PS2), the Company is prioritizing upgrades that will ensure these units continue to perform at optimal levels.

As part of this effort, MEC has scheduled a major overhaul of Engine 6, one of its larger Deutz generators, to begin in June. This maintenance work is long overdue and is expected to take approximately six to eight weeks to complete.

During the overhaul period, MEC will carefully manage generation capacity to maintain stable service. The Company acknowledges that this work comes at a time when fuel efficiency and supply remain critical concerns, and notes that the overhaul is directly tied to ongoing efforts to address the broader fuel situation.

Once completed, the Engine 6 overhaul is expected to significantly improve the unit's performance, allowing it to run more efficiently and consume less fuel. This will help reduce operational strain, support more reliable electricity generation, and contribute to long-term cost savings.

MEC emphasized that while the maintenance period may present temporary challenges, these upgrades are essential investments in the resilience and sustainability of the national power system.

The Company remains committed to keeping the public informed and appreciates the community's patience and understanding as it continues working to deliver safe, reliable, and efficient power services.

## Powering Progress: Driving a Stronger Energy Future

Pacific Power Association and Pacific Women In Power

As Pacific Island countries accelerate their transition to renewable energy and expand access to reliable power, the World Bank's Pacific Women in Power (PWIP) initiative in partnership with the Pacific Power Association (PPA) and the Pacific Community (SPC), is helping the energy sector diversify its talent pool and improve overall service delivery.

At the 6th Pacific Regional Energy and Transport Ministers' Meeting (PRETMM6), PPA, PWIP and SPC highlighted a critical challenge and opportunity for the region's energy sector. While Pacific utilities face a growing demand for skilled engineers, technicians, and supervisors, women remain heavily underrepresented in these roles. PWIP responds with practical solutions—supporting utilities to improve workforce data, remove employment barriers, and reform recruitment, training, and retention practices.

Launched in 2023, the initiative focuses on driving measurable impact. To date, the program covers more than 3,000 utility employees, has rolled out over 140 targeted activities, and has trained more than 600 individuals. Participating utilities are introducing new policies, expanding apprenticeships and internships, and strengthening mentoring and outreach programs to build the next generation of energy professionals.

This progress is backed by improved workforce data, now accessible through the [Pacific Power Association's Gender Portal](#). For the first time, governments and utilities have a clear picture of current workforce gaps and ongoing progress enabling data-driven decisions and strengthening institutional accountability.

'PWIP is about more than inclusion—it is helping build a stronger, more resilient energy sector across the Pacific,' said the Executive Director of the Pacific Power Association. 'These results show that practical, data-driven approaches can achieve impact at scale.'

Momentum continued to build at PRETMM6 in Port Moresby, where ministers from 19 Pacific Island countries and territories endorsed the MANUBADA Call to Action. This commitment marks an important step forward, formally embedding workforce



inclusion into national energy policies and ensuring accountability through regular progress reporting.

Looking ahead, the program is poised to scale its impact across the region. By expanding partnerships and deepening institutional reforms within utilities, the initiative ensures that the Pacific energy transition is both sustainable and inclusive.

PWIP's momentum demonstrates that expanding opportunities inherently strengthens systems. Driven by the continued leadership of governments and regional partners, the initiative is successfully powering a more resilient, inclusive energy future for the Pacific.



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## From Data to Decisions: Analytics as the Engine of Pacific Energy's Future

Nicholas Phillips, Head of Technical Sales-Asia Pacific,  
Itron



The energy transition presents island utilities with a paradox. The very tools that promise to make our grids cleaner, cheaper, and more resilient — rooftop solar, batteries, electric vehicles, smart inverters — also introduce complexity that traditional planning and operations methods weren't designed to handle. Managing that complexity fairly and efficiently is the defining challenge for Pacific utilities over the next decade.

This year's PPA conference theme — ensuring fair rates and reliable services while accelerating renewable investment — captures that challenge precisely. But beneath each of those three goals lies a common requirement: better information, better analytics, and the institutional capacity to act on both.

**The fairness question is becoming urgent.** As rooftop solar adoption grows, utilities face a structural problem that analytics can illuminate but instinct alone cannot anticipate. When higher-

income households install solar and reduce their bills, the fixed costs of the network don't disappear. They shift, quietly and unevenly, onto customers who couldn't afford to participate. Understanding who is bearing those costs, and whether current tariff structures reflect the actual drivers of network expenditure, requires data. Getting rate design right isn't just a financial exercise; it's a matter of equity, and island communities — where the social fabric is tight and trust in the utility matters — will feel the consequences of getting it wrong.

**Reliability on island grids demands a new kind of vigilance.** Our networks were built for one-way power flows from large generators to passive customers. High renewable penetration reverses that assumption. Frequency stability, fault detection on radial feeders, and the management of thousands of small distributed devices all become harder — unless utilities can see what's happening in near

real-time and respond intelligently. The good news is that modern grid analytics, applied to the right data sources, can do exactly that. Predictive asset management, automated fault location, and inverter behaviour monitoring are no longer theoretical capabilities reserved for large continental utilities. As accessibility widens Pacific utilities should be claiming their share of that future.

**Accelerating renewable investment requires saying yes faster.** One of the most underappreciated barriers to renewable uptake is the slow, conservative, and often opaque process by which utilities assess connection applications. Hosting capacity analysis, powered by real network data rather than worst-case assumptions, gives utilities the confidence to approve more connections more quickly and without compromising safety or stability. Battery storage optimisation, virtual power plant modelling, and renewable pathway analysis all contribute to an investment environment where the question shifts from "can we afford to do this?" to "can we afford not to?"

**At the centre of it all is data infrastructure.** Specifically, the metering and communications foundation that makes advanced analytics possible in the first place.

For instance, the shift from theory to practice is already visible in places facing many of the same challenges as island systems. In Victoria, Australia, we are helping Utilities use low-voltage DER management system to gain near real-time visibility of rooftop solar generation and, when directed by the market operator, temporarily moderate exports during minimum-demand events to help preserve grid stability. While in the West of Australia, which is an effective, but large microgrid, battery storage and stability are king. Project Jupiter is using technology to support the integration of rooftop solar and customer and community batteries at scale, demonstrating that storage creates the most value when paired with the analytics and orchestration needed to operate it intelligently.

In Colorado, Itron and Xcel Energy have shown how customer batteries paired with rooftop solar can become an operational resource for the grid, with public program milestones reporting nearly 2,000 batteries and more than 15 MW of battery capacity onboarded to support peak reduction and reliability.

Each of examples show what can be done by orchestrating renewables, engaging consumers and

defining end-to-end programs considering all angles of where analytics could be used. Without it, utilities are flying partially blind — making rate decisions on averaged assumptions, responding to outages reactively, not making the most of renewable energy and approving connections conservatively because the alternative feels too risky. With this foundation, the picture changes fundamentally.

The Pacific energy transition is not a distant aspiration — it's already underway. The utilities that navigate it well will be those that invest not just in solar panels and batteries, but in the intelligence to manage what those assets create.

# Welcome!

## TO THE NEW ACTIVE AND ALLIED MEMBERS

**SPL TE UIRA API NO TE MAU MOTU:** SPL Te Uira Api No Te Mau Motu has officially joined PPA as an Active Member based in Uturoa, French Polynesia.

There have been four (4) new Companies who have joined the PPA as Allied Members since our last PPA Magazine.

**ELECTROPAR LTD T/A PLP NEW ZEALAND:** PLP New Zealand is based in Auckland, New Zealand. Their primary activity is distribution, transmission and substation hardware. Their secondary activity is solar racking system, PPE and fusing.

**LPINZ LTD:** LPINZ Ltd is based in Auckland, New Zealand. Their primary activity is design, supply, install LV/ MV/HV equipments, power audit, UPS, batteries and generators. Their secondary activity is EV chargers, lighting/surge protection and earthing design/supply/install.

**PACIFIC POWER ENGINEERING AUST.:** Pacific Power Engineering Aust. is based in Victoria, Australia. Their primary activity is spare parts, generators and electrical in solar, wind and BESS systems. Their secondary activity is Turnkey/Design build renewable energy solar, wind and BESS systems.

**DELTA ELECTRONICS AUSTRALIA PTY LTD:** Delta Electronics Australia Pty Ltd is based in New South Wales, Australia.

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NiuPower is an independent power producer headquartered in Papua New Guinea.

We mobilise capital to deliver, operate and maintain energy generation or storage technologies as hybrid solutions or as part of a grid or microgrid. We adopt a practical, flexible and modularised approach to meeting the specific needs of a customer.



One of our core capabilities is the ability to partner with Government at all levels, indigenous owners of land and State-Owned Enterprises to deliver business outcomes.

NiuPower currently owns a 60MW gas fired power station near Port Moresby operated by its O&M and OEM partner, Wartsila.

Given there is gas in excess of our requirements, we are seeking to set up domestic and regional markets for LNG throughout our neighbours in Micronesia, Polynesia and Melanesia.

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