



ACTIVATING TRADE AND INVESTMENT FOR A WIN-WIN IN THE PACIFIC

**Submission to the
Joint Standing Committee on
Foreign Affairs, Defence and
Trade's Trade Subcommittee
to inquire into and report on
Australia activating greater
trade and investment with
Pacific island countries**

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1. Introduction to Entura and our work in the Pacific

Entura is a specialist power and water professional services firm, which currently provides renewable energy, water and power engineering services in Australia and the Indo-Pacific. The activities we undertake in the Pacific – including renewable energy, water management and the development of climate-resilient infrastructure – deliver greater access to affordable, reliable, sustainable and modern energy, thus making tangible contributions to the environmental, social and economic outcomes enshrined in the UN Sustainability Goals, to which Australia is committed.

We have a unique asset-owner heritage as part of Hydro Tasmania, which grounds our technical expertise in more than 100 years of experience contributing to the development, operation and maintenance of renewable energy and water infrastructure. We deliver practical and commercially sound solutions across the whole lifecycle of energy and water assets (such as dams, hydropower stations, electrical substations, wind and solar farms, pumped hydro energy storage, battery storage and hybrid renewable power systems), helping our clients manage risks and achieve valuable outcomes.

The observations and recommendations in this submission are drawn from the work we are undertaking (or have previously undertaken) with owners, developers, utilities, banks and regulators in the north and south Pacific, including in Fiji, Vanuatu, New Caledonia, The Solomon Islands, Bougainville, Papua New Guinea, Cook Islands, Federated States of Micronesia, Tuvalu, Marshall Islands, Samoa, Tonga, Tahiti, Pitcairn Island and New Zealand. Across these Pacific nations, we are supporting a number of renewable energy projects at various stages of development from feasibility through to implementation.

Many of these nations have made significant commitments under the Paris Agreement and have an urgent focus on renewable energy and climate change adaptation. Much of this work is supported by loans and grants from the World Bank or Asian Development Bank (ADB) and we have been engaged through both these agencies, as well as others, to provide engineering advice, design, project management and training in the renewable energy arena.

Our approach to projects is based on identifying, understanding and mitigating the risks at each phase of the project cycle, while maintaining a focus on the long-term performance of the assets. Entura's renewable energy capabilities cover energy options and electricity access assessments, through to design and project deployment for hydro, wind, solar PV, and hybrid systems utilising energy storage and other enabling technology for remote regions and locations.

Entura's engineering experience includes resource monitoring, data management and data analysis; energy yield estimates; feasibility studies; project and systems design and specifications; hybrid energy system design; tender specifications and tender evaluation for civil, mechanical, renewable energy, energy storage and electrical designs; owner's engineer roles reviewing designs and overseeing construction and commissioning; and technical due diligence roles across the Asia-Pacific region.

Our Entura clean energy and water institute is an accredited training organisation which formalises a long history of knowledge sharing, capability development and training across our full range of expertise and services. We deliver short courses on a range of topics and develop customised training programs to meet specific business requirements. Our courses and programs cover a full

range of clean energy and water subjects for which Entura has achieved a reputation for excellence. We develop our courses with a clear focus on prominent drivers in the industry such as risk minimisation and business certainty, whether technical, commercial, social or environmental.

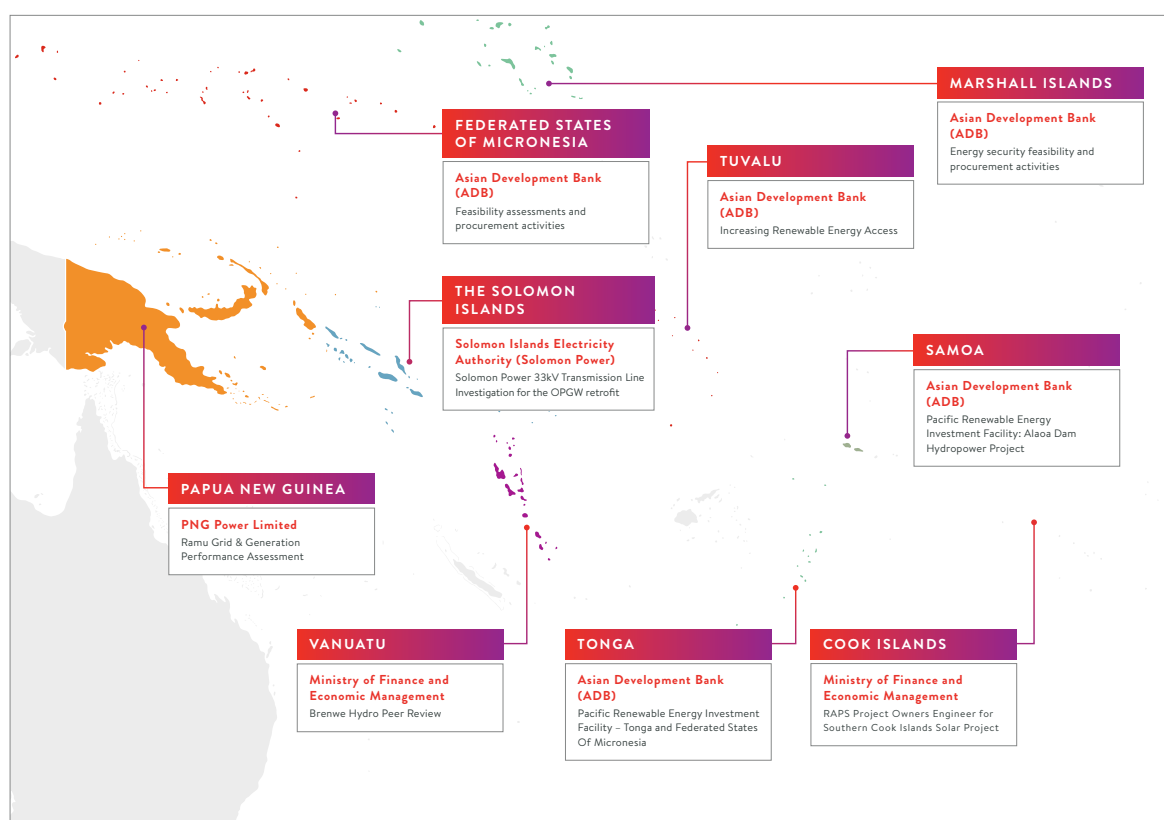
We hope that these few comments provide some valuable input into your process from the perspective of the energy sector in the Pacific but that are likely applicable across other infrastructure sectors.

2. Comments addressing the terms of reference

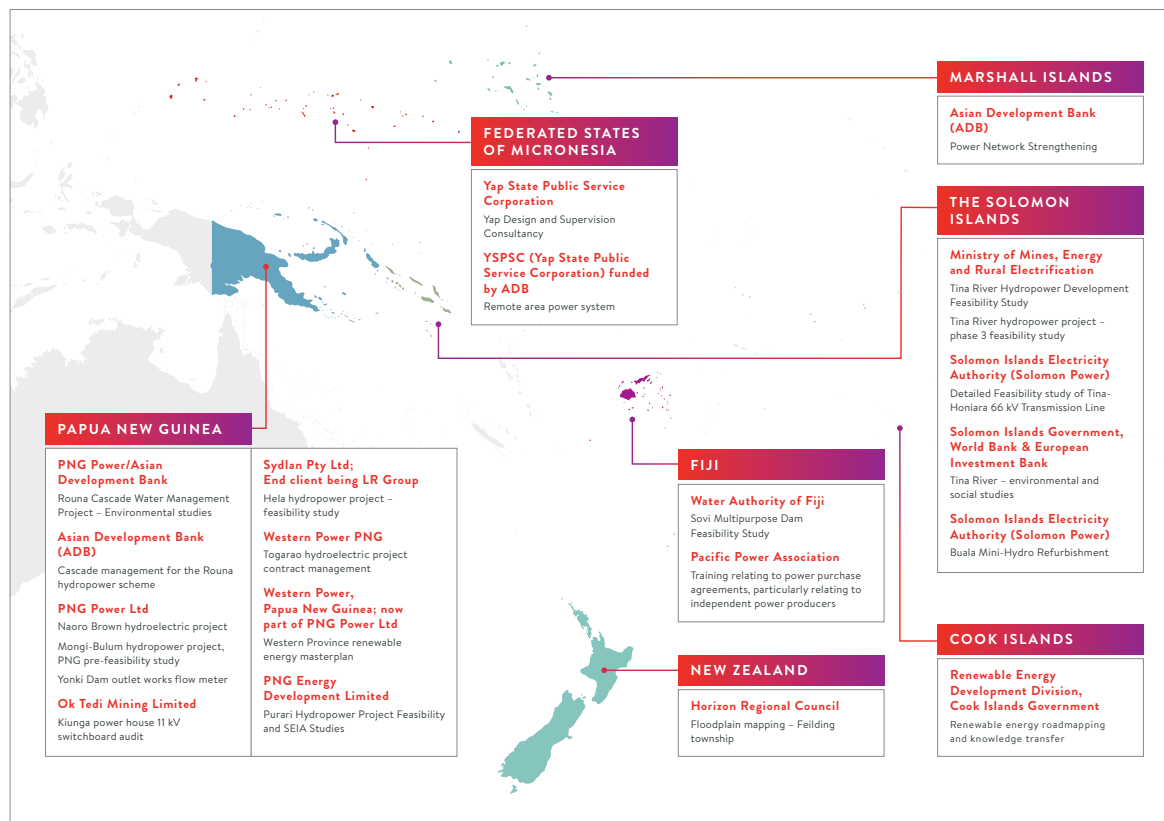
2.1 The nature of Australia's existing trade and investment relationships with Pacific island countries and the potential that is presented by the Pacific Agreement on Closer Economic Relations Plus (PACER Plus) for enhancing those relationships

As indicated in our introduction to this submission, Entura offers a broad range of renewable energy engineering and training services in the Pacific and we have developed positive relationships with the governments of many Pacific nations. The following graphics indicate completed and current projects. See appendix for a detailed table of completed projects and training courses that Entura has delivered in the region.

Work in progress in the Pacific



Work completed in the Pacific



2.2 The opportunities to strengthen trade, investment, aid for trade and employment links between Australia and Pacific island countries and how they can be captured

Throughout the Pacific, island communities are already experiencing significant impacts of climate change, are embracing ambitious renewable energy targets (many as high as 100% renewables over the next decade), and recognising the environmental benefits of reducing or replacing carbon-intensive diesel power generation with modern hybrid renewable energy systems. In addition, many Pacific nations still face major challenges to increase their population's access to electricity, particularly in remote areas, and to provide reliable and secure electricity necessary for economic growth. Climate change also presents these nations with new uncertainties and risks, adding to the economic and social challenges they already face.

Renewable energy can underpin economic and social development, as well as meeting environmental goals. As part of Hydro Tasmania, we have experienced this first hand, through our involvement over the long term of Tasmania's hydropower-driven industrialisation and development over the past century.

Within this context, there is a strong need and demand for renewable energy planning and implementation, for extension of electricity supply and access, and for initiatives to build climate change adaptation and resilience. Australia is well-placed to capture these opportunities through close alignment and collaboration with funding agencies such as the ADB and the World Bank, such

as in joint planning or co-investment. Entura can offer advice and expertise that draws on the relationships and experience we have built in the region over the past decade.

Entura can support Australian investors or funding bodies with the consulting services needed for development of renewable energy ‘roadmaps’, which plan a staged transition to renewables to meet economic and social goals as well as clean energy master planning. To provide the energy security, self-sufficiency and system stability required by Pacific nations, it is essential that funding bodies engage in a process of holistic, pragmatic long-term planning for a successful energy transition, rather than focusing narrowly on smaller short-term or ad hoc projects. It is only through high-level long-term planning that a nation’s power system can ensure the right scale and mode/s of renewable energy technologies coupled with the right enabling technologies at the right moment. To ensure the project benefits are achieved, it is important to have an asset development strategy, which should include staged investment planning, implementation, operations, maintenance and management.

With the advancement in renewable energy technologies and with the need for ongoing local capacity to operate and maintain these assets, there is a growing need for training, capacity/capability development and institutional strengthening in Pacific nations. Moving from diesel power generation to modern hybrid renewables and storage will require new skills on the ground, particularly in the operation of systems that are more heavily computerised and digitised.

Entura can support Pacific nations with formal and informal training and development programs through the Entura clean energy and water institute, ECEWI (launched in 2012). So far, ECEWI has offered 155 courses/programs across water and clean energy topics, across 9860 training days, for 2530 students (70% international, 30% Australian) in Malaysia, Mekong, Philippines, PNG, Pakistan, Bangladesh, southern Africa and the Pacific. For example, for a client in PNG, Entura developed an Australian-accredited program to train new and existing hydropower operators. Local staff were included in the asset management process and have now had first-hand exposure to best-practice techniques, which will build greater self-reliance and reduce the requirement for imported expertise.

Entura has also been a founding member, supporter and sponsor of the Isolated Power Systems (IPS) Connect Forum/Conference since 2015, in association with the Pacific Power Association (PPA) and the International Renewable Energy Agency (IRENA), which has facilitated visits from Pacific utilities to Australian remote hybrid power systems for participation in professional development sessions and conferences.

2.3 The barriers and impediments to trade and investment between Australia and Pacific island countries and how they can be mitigated

- **Funding**

- *Aid*: Another impediment to trade and investment is that many Pacific nations tend to have small or constrained economies, which inhibit industry and the capacity to self-fund nation-building infrastructure. Aid money is needed; however, the plethora of caveats and requirements from agencies can leave Pacific nations indebted for a long time. There is an opportunity here to identify alternative and more agile funding models. For example, although New Zealand has a smaller economy than Australia’s, it appears to be successful at optimising its smaller investments by prioritising projects with maximum social and environmental benefit.
- *Aid for trade*: The benefit of Australian ‘aid for trade’ in the Pacific is not yet fully realised, but Entura is interested in working with the Australian government to explore opportunities for ‘aid for trade’ benefits in the power sector. Japan and other nations

are utilising a tied-funding approach, which enables them exclusive access to a pipeline of work. For Australia to optimise its influence on the Pacific region, a more focused and granular ‘aid for trade’ approach may be a way to expand mutually beneficial opportunities.

- *Seed funding:* Many utilities and project owners in the Pacific are often challenged by the lack of the necessary seed funding to identify the best options for projects that will minimise risks and achieve the most sustainable social, economic and financial outcomes. It is vital that funding is available at an earlier stage than for ‘implementation-ready’ projects alone. Funding bodies and investors need to understand the importance of contributing to holistic long-term planning of a project pipeline rather than considering projects in isolation, and appreciate the need to provide adequate financing in early project stages (such as at concept, feasibility and preliminary design).
- *Private sector funding:* As technology becomes more mature and economics more understood, aid agencies have started to encourage more private sector funding of projects in the region; however, achieving private sector funding has taken longer than anticipated. Many of the ‘usual’ challenges such as sovereign risk and land ownership remain but are now viewed through a private sector lens.
- ***Climate change impacts***
 - Impacts from climate change are set to become more frequent and severe. This presents challenges for trade and investment, but can also create opportunities such as building new climate-resilient infrastructure or hybrid clean energy power systems. All new infrastructure needs to address the impending increase in severity of climate impacts by incorporating planning for climate adaptation and resilience. It is also important to recognise the cyclical nature of extreme weather events in the Pacific so that planning considers alternatives such as designing infrastructure either to withstand such events or to be temporary.
- ***Land availability and ownership***
 - Particularly for small islands at risk of sea-level rise, finding adequate available land suitable for development of infrastructure can be a challenge. However, beyond the land availability challenge, a significant and complex factor affecting infrastructure development and investment in the Pacific is land ownership. Customary/ancestral tenure arrangements apply to a large proportion of the land, and these arrangements are largely unwritten and include numerous parties, potentially thousands for a given piece of land. The difficulty of determining land ownership and the potential for complex disputes can seriously impact investment confidence and project timeframes. This is a complex issue with major implications for project time, cost and thus feasibility, and with no simple solution. The significance of the ownership challenge needs to be understood, and its implications anticipated.
- ***Governance and procurement***
 - *Procurement processes:* In some small Pacific nations, people are interconnected, so transparent, impartial procurement may be compromised (or be seen to be compromised). This is particularly the case in government procurement in small markets in which competition is limited, and in communities in which a high value is placed on existing relationships, kinship networks or other interests. A further procurement challenge is the difficulty of attracting and retaining quality suppliers and contractors.

- *Procurement priorities:* Procurement processes in the Pacific do not always target the right questions, particularly in relation to technology and proof of experience. A focus on lowest cost can perpetuate a cycle of short-life or abandoned projects. Although the utilities that use the end result of projects tend to recognise this and understand the challenges, they are not necessarily able to influence the procurement process.
- *Tied-funding:* Another challenge is that some aid agency funding requires the use of products from the funding country, and these products may not necessarily be suited to the given application.
- *Limitations on consultants:* In the Pacific, the ADB previously prevented consultants from providing support on sequential packages of work as a governance issue relating to the potential for conflict of interest arising from involvement in early works including the development of the pending terms of reference. This limited the ability of consultants to add value through consistency. The ADB since found that this practice led to significant wasted effort and re-work as new consultants were brought onto projects at different stages. As a result, the ADB piloted a 'one consultant' policy for each major project. This has expedited delivery of outcomes, due to consistency of consultants and better alignment of project objectives. Where subsequent phases are significant in size, they can be tendered to test the market, in accordance with procurement guidelines. As Entura has previously suggested, it may be advantageous for DFAT to consider its rules for funding projects with this in mind, so as to facilitate efficient delivery of engineering and implementation activity, without compromising governance and procurement.
- ***Lack of relevant skills***
 - Limited local skills in new renewable energy technologies are a challenge to the development of these projects and to asset operation and management in the longer term. Skills retention is also challenging as opportunities and remuneration in small island developing states is limited and more opportunities exist abroad. As indicated in (2) *Opportunities* above, a lack of relevant skills can be mitigated with exchanges, mentoring programs and institutional strengthening. Exchanges between 'sibling' companies could offer significant benefits for utilities. By embedding resources from small island developing states into Australian utilities, and vice versa, resources can learn and share relevant knowledge and skills on the job.
 - Through the Entura clean energy and water institute, Entura provides relevant, practical training courses, capacity development and institutional strengthening programs, and we are well placed to continue to support our Pacific neighbours in this way. As well, initiatives such as the Isolated Power Systems (IPS) Connect Forum/Conference has provided meaningful development opportunities. The Pacific Power Association also provides regular training programs on specific subjects of relevance, and each aid agency project provides capability and capacity building.
- ***Social safeguards***
 - Entura is committed to a high standard of international social and environmental safeguards and has been commissioned by governments and industry to help develop a number of guidelines and protocols for the sustainable development and implementation of energy and water projects. We are also expert trainers in these topics. In our work in the Pacific, we have found that there is a need for social safeguards to be scalable and fit for purpose, so that effective assessment and action based on risk is balanced with the urgency of implementation such that social and economic benefits from the project can be realised more readily. This is not to suggest

any undermining of social safeguards, but to recognise that some small projects have minor anticipated impacts and some scaling of the requirements may reduce significant obligations in time and cost that are often unwarranted in the circumstances and which delay delivery and impose additional cost pressures on marginal projects.

- ***Access and logistics***

- Access to remote locations can be a significant challenge when working with Pacific nations. Travel time and cost, accommodation, transfer of equipment and taxation all add major logistical considerations to project budgets and schedules. The relative isolation of some projects can challenge many of the conventional approaches to project delivery and asset management that would be usual in more developed nations. These issues need to be properly considered in planning and budgeting, as they can add significant cost which is frequently inadequately anticipated. Consideration could be given to building greater collaboration and cooperation with partnering utilities to reduce these challenges, and to enable greater skill development and mentoring opportunities. Exchange of personnel between utilities (perhaps for periods of several months) would enable Pacific Island resources to increase their experience within the daily working environment, enabling them to learn and then take back their learning to their own utility. Experienced resources from the host company could spend time in the participating utility, providing opportunities for mentoring. Similar exchanges could also occur between Pacific Island utilities.

- ***Project management requirements***

- A concern for Pacific governments is the cost implication of the requirement for the executing agency in the country of origin to set up and bear the cost of a Project Management Unit (PMU). Although partially funded, these requirements often burden small governments and utilities with onerous requirements to provide governance, reporting, and support fact-finding missions for the funding agency or investor. Entura recommends that the level of obligation for an applicant seeking finance is commensurate with its capacity and capability, and that funding agencies or investors could even consider establishing their own central PMU. This could provide an opportunity for some agency/investor representatives to be part of the office and thus create additional regional capacity-building outcomes.

2.4 The role and effectiveness of support structures and networks, including government, business, sport, Pacific diaspora communities in Australia, and areas of civil society, and how they can assist with identifying and capturing trade and investment opportunities for Australia and Pacific island countries

Entura recognises the importance of networks in the conduct and success of business in the Pacific. Informal networks are strong, but it can be challenging to establish or become part of them. The Australia Pacific Islands Business Council provides a starting point for new entrants. For Entura, the Pacific Power Association and Pacific Water Association are powerful networking supports. To build business relationships, it is advantageous to leverage existing relationships with well-connected parties to benefit from extended reach into their broader networks.

Entura has also been a founding member, supporter and sponsor of the Isolated Power Systems (IPS) Connect Forum/Conference since 2015, in association with the Pacific Power Association (PPA) and the International Renewable Energy Agency (IRENA), which has facilitated visits from Pacific utilities

to Australian remote hybrid power systems for professional development sessions and conference participation.

2.5 The views, norms and cultural practices relating to trade and investment in Australia and Pacific island countries and how differences can be accommodated

Despite our relative geographical proximity, there are some cultural differences relating to trade between Australia and Pacific nations. In our projects in the Pacific, we strive to build respectful relationships with governments and communities, and we continue to deepen our understanding of Pacific cultural practices and norms.

Some cultural and traditional factors can affect project activity, so it is advantageous to understand these factors and anticipate them in project planning. As one example, the timing of ceremonies or festivals and the expectations regarding involvement in such events need to be considered in setting project or meeting schedules. Another example may be the potential for strong religious views to influence decision making (such as differing perspectives on human versus divine responsibility to mitigate against climate impacts).

It is also important to recognise that the Pacific nations are increasingly experiencing cycles of movement, in which people leave their homes to seek training or employment, but then return as their families grow. Over time, these generational cycles are radically changing the traditional cultures and the economic activity of the region. The cycle of movement, however, can have implications for skills retention, and this should be factored into project lifecycle planning. Including in-situ upskilling and training, institutional strengthening and capability/capacity building as integral part of projects will benefit communities by reducing reliance on imported expertise, and therefore promoting greater independence.

Understanding and respecting cultural differences should be an ongoing goal in Australian relationships with Pacific nations and may uncover untapped potential for increasing trade and investment.

Appendix: Entura's completed Pacific projects, work in progress, and details of training delivered in the Pacific

(6 pages follow)



CURRENT PROJECTS

Project name	Client	Location	Description
RAPS Project Owners Engineer for Southern Cook Islands Solar Project	Ministry of Finance and Economic Management	Cook Islands	Renewable Energy Sector Project - 1 Project Owner's Engineer
Pacific Renewable Energy Investment Facility: Alaoa Dam Hydropower Project	Asian Development Bank (ADB)	Samoa	Entura is undertaking the Environmental and social safeguards in accordance with the ADB requirements, including involvement in stakeholder and community consultation, environmental baseline surveys and the preparation of an environmental and Social Impact Assessment. Entura is also undertaking the economic and financial assessment of the project, based on the requirements of the ADB.
Tuvalu: Increasing Renewable Energy Access	Asian Development Bank (ADB)	Tuvalu	The project will increase renewable energy penetration with investments in solar PV in the outer islands of Nukulaelae (44.8 kWp), Nukufetau (78.4 kWp) and Nui (100.8 kWp) and also in the main island of Fongafale, where the capital Funafuti is located, with 500 kWp solar PV and a 1000 kW / 2000 kWh Battery Energy Storage System (BESS). The project will see renewable energy penetration increasing to over 90% in the outer islands, and over 30% for Fongafale, increasing the overall RE contribution towards achieving the Government of Tuvalu's (GoT) goal of 100% renewable energy by 2025.
Brenwe Hydro Peer Review	Ministry of Finance and Economic Management	Vanuatu	Peer review for tender design performed by Stantec - Entura invited as sole source selection from ADB
Solomon Power 33kV Transmission Line Investigation for the OPGW retrofit	Solomon Islands Electricity Authority (Solomon Power)	Solomon Islands	SP asked Entura to carry out the site assessment for the OPGW retrofit on the existing lattice towers of Lungga-Honiara 33kV transmission Line
12 other smaller projects – various in nature.			

COMPLETED PROJECTS

Project name	Client	Location	Description
Yap Design and Supervision Consultancy	Yap State Public Service Corporation	Micronesia	Assistance in design and site supervision of 300 KW rooftop solar, 1.5 MW of wind turbines (600 kW phase 1, 900 kW phase 2) and a 1.8 MW diesel genset.
Tina River Hydropower Development Feasibility Study	Ministry of Mines, Energy and Rural Electrification	Solomon Islands	Tina River Hydropower Development Feasibility Study.
Sovi Multipurpose Dam Feasibility Study	Water Authority of Fiji	Fiji	Feasibility study for the option 6F Site. Feasibility study for water supply and hydro power generation dam, Sovi River, Fiji.
Power Network Strengthening	Asian Development Bank (ADB)	Majuro	Project to prepare an energy (implementation) plan for Majuro to achieve the targets of the National Energy Policy and Energy Action Plan and other recent reports
Buala Mini-Hydro Refurbishment	Solomon Islands Electricity Authority (Solomon Power)	Solomon Islands	Request for a team to undertake a due diligence study of a proposed \$22m network upgrade for the main population centre of Nuku'alofa in Tonga. Due diligence study to be undertaken in country and in accordance with ADB/European Investment Bank/NZ Ministry of Foreign affairs and Trade guidelines and include assessment of technical, financial, environmental and social considerations.
Detailed Feasibility study of Tina-Honiara 66 kV Transmission Line	Solomon Islands Electricity Authority (Solomon Power)	Solomon Islands	Refurbishment of the 150 kW Buala plant.
Rouna Cascade Water Management Project - Environmental studies	PNG Power/Asian Development Bank	Papua New Guinea	Concept design and construction cost estimate. Provide technical specification and tender documentation.
Cascade management for the Rouna hydropower scheme	Asian Development Bank	Papua New Guinea	Preparation of a cascade management plan for Rouna Hydropower Scheme.
Pacific Renewable Energy Investment Facility – Tonga and Federated States Of Micronesia	Asian Development Bank (ADB)	Tonga – Tongatapu and Outer Islands FSM – Yap, Chuuk (inc Outer Islands), Pohnpei, Kosrae	Studying, modelling and supervising installation and commissioning of a hydrographic system and inflow forecasting/energy generation software. Feasibility studies for upgrading Sirinumu power station, Rouna 1, 3 and 4 power stations, exploring the potential for constructing a new power station (Rouna 5), and additional storages. Dam safety and catchment condition assessment, dam safety training, flood capacity assessment, and spillway upgrade works concept.

Project name	Client	Location	Description
Remote area power system.	YSPSC (Yap State Public Service Corporation) funded by ADB	Yap, FSM	Feasibility assessment and due diligence on investment projects and assisting the implementation agencies with project design and procurement support. These feasibility studies will support both the FSM and Tonga grant applications to the Green Climate Fund.
Naoro Brown hydroelectric project	PNG Power Ltd	Papua New Guinea	Assessment of original YREDP concept designs and determination of the most appropriate hybrid diesel/renewable energy remote area power system to displace the greatest amount of diesel fuel within budgetary constraints - including assessments, network modelling and investigations, owner's engineer services on site during construction and commissioning; and capacity building and training.
Kiunga power house 11 kV switchboard audit	Ok Tedi Mining Limited	Papua New Guinea	Feasibility studies, including detailed site investigations associated with survey, hydrological assessment and geotechnical drilling. A power system study assessing modifications required to successfully connect into Port Moresby's transmission system. Full feasibility study including a summary of investigations, assessment of alternatives, preliminary design, energy assessment, project schedules and costings.
Sovi multipurpose dam feasibility study	Water Authority of Fiji	Fiji	Data collection and pre-site-visit desktop study. Site inspection included visually inspecting the switchboard and associated and calculation of existing fault level and capacity for additional generation. Preparation of detailed audit report including condition assessment upgrade options.
Hela hydropower project - feasibility study	Sydlan Pty Ltd; End client being LR Group	Hela Province, Papua New Guinea	Comparison of three alternative sites and preparation of a full feasibility study, including assessment of alternatives, geological reconnaissance mapping, preliminary design, energy assessment, project implementation schedule, cost estimation, project economic analysis, and social and environmental assessment.
Mongi-Bulum hydropower project, PNG pre-feasibility study	PNG Power Limited	Papua New Guinea	Preparation of a full feasibility study, including assessment of alternative options, geotechnical investigation, preliminary design of the project, energy assessment, project implementation schedule, cost estimation and project economic analysis.

Project name	Client	Location	Description
Tina River hydropower project - phase 3 feasibility study	Ministry of Mines, Energy and Rural Electrification	Solomon Islands	Preparation of a preliminary feasibility study, including assessment of alternative options, engineering geological reconnaissance, preliminary design of the project, energy assessment, project implementation schedule, cost estimation, and project economic analysis.
Yonki Dam outlet works flow meter	PNG Power Limited	Eastern Highlands, Papua New Guinea	Identification of the optimum hydropower development scheme among several options; detailed feasibility study; environmental screening and a scoping study for the Environmental and Social Impact Assessment (ESIA); additional environmental and social management planning services.
Togarao hydroelectric project contract management	Western Power PNG	Papua New Guinea	Determination of the specification requirements for the flow meter and sourced a suitable ultrasonic unit from an Australian supplier.
Western Province renewable energy masterplan	Western Power, Papua New Guinea; now part of PNG Power Ltd	Papua New Guinea	Represented the client (Western Power) as the Employer Representative for the 1.4 MW run-of-river project.
Floodplain mapping - Feilding township	Horizon Regional Council	New Zealand	Assessment of the available resources and identification of cost-effective solutions to optimise electrification of PNG's Western Province – including mapping renewable energy resources and load profiles; high-level screening to identify and optimise economical solutions for each village; and general system designs.
Purari Hydropower Project Feasibility and SEIA Studies	PNG Energy Development Limited	Papua New Guinea	Development of a hydrological rainfall-runoff model to produce a rainfall hyetograph and flood hydrographs and flood mapping.
Power Utility Management Training on Power Systems Simulation and Tariff Design	HOMER / Secretariat of the Pacific Community	Pohnpei, Micronesia	Site visit and review of previous studies; installation of hydrological gauge site, hydrological data collection, yield and flood assessment; dam location and type assessment; full supply level optimisation; river diversion arrangement; sediment monitoring, analysis and impact assessment; aquatic surveys and impact assessment; system studies; review of cost estimate and construction program.



ENTURA CLEAN ENERGY AND WATER INSTITUTE (ECEWI)

We own. We operate. We consult. And we're proud to share our knowledge and experience.

The Entura clean energy and water institute formalises a long history of knowledge sharing, capability development and training across our full range of expertise and services. We regularly deliver short courses on a range of topics and can develop customised training programs to meet specific business requirements.

Our courses and programs cover a full range of clean energy and water subjects for which Entura has achieved a reputation for excellence. We develop our courses with a clear focus on prominent drivers in the industry such as risk minimisation and business certainty, whether technical, commercial, social or environmental.

The Entura clean energy and water institute is an accredited training organisation in Australia and it proudly collaborates with the Asian Institute of Technology, Bangkok and Universiti Tenaga Nasional, Kuala Lumpur, to deliver specialised courses in the south and south-east Asian region.

HYDROPOWER TRAINING EXPERIENCE

Course	Client	Location	Description
Hydropower operator training certification	Ok Tedi Mining Pty Ltd	Tabubil, Papua New Guinea (Participants: Papua New Guinea)	Capability and competency assessment of operators against the Australian Electrical Supply Industry Certificate III qualification performance criteria. The program involves review and assessment of operating procedures, staff capability and evidence review and training gap analysis to enable certification against the Australian qualification standards.

RENEWABLE ENERGY TRAINING EXPERIENCE

Course	Client	Location	Description
Power Purchase Agreements (Techno-commercial)	Pacific Power Association	Nadi, Fiji (Participants: Pacific Islands)	Comprehensive training program for utility senior management on the requirements of PPAs. The 5 day course focussed on practical outcomes for members to take directly into development, negotiation, and execution of PPAs
Hybrid isolated power system planning and implementation	Public	Flinders Island, Tasmania (Participants: Australia, Pacific, NZ)	Commercial aspects of development and funding of renewable projects, managing risks, feasibility assessments, strategic planning, project scheduling, procurement strategies, and construction and commissioning. Forming part of IPS2016 forum and attending by participants from Pacific islands, New Zealand and Australia.
Remote renewable power installation and maintenance	Yap Public Service Commission	Victoria, Australia (Participants: FSM)	Overview of managing remote area power systems from installation and maintenance planning.
Wind resource assessment and remote community power	Vanuatu DoE and Meteorology Office	Vanuatu (Participants: Vanuatu)	Provided an introduction and overview of wind data analysis and wind project development, including wind turbine technology, siting considerations, energy estimates and project finance requirements.
Remote area power systems development	Homer	Web based delivery (Participants: Micronesia)	Focused on preparation of a business case for a RAPS project. It covers consideration of the project drivers, status of the existing power supply, evaluation of the proposed power supply option, alternative options, risk evaluation, project delivery models and procurement strategies.