



SUPPORTING INFORMATION

Inquiry into activating greater trade and investment with Pacific Island countries

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Prepared by Hydro-Electric Corporation
ABN48 072 377 158

t/a Entura 89 Cambridge Park Drive,
Cambridge TAS 7170 Australia



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1. Context

Following Entura's submission, and in preparation for the appearance of Entura representatives at the public hearing relating to the inquiry into activating greater trade and investment with Pacific Island countries, 15 questions were forwarded to Entura for consideration.

While the public hearing touched on topics covered by the questions, Entura has decided to submit full answers to the inquiry for the public record.

2. Questions

2.1 How do most Pacific island countries provide energy and water for their communities, and does it vary greatly across the Pacific?

The generation of utility power in the Pacific is traditionally through diesel power, with larger centralised units in the capital cities and smaller decentralised units in the outer islands. The main exception are Tahiti, Samoa, Fiji and Papua New Guinea (PNG) who have access to baseload hydropower, other renewables and indigenous gas, while also using heavy fuel oil systems as part of their energy mix. There are some small hydropower projects (<10MW each) scattered throughout the Pacific. Over the last 5 years there has been an increase in photo voltaic solar battery installations, to reduce the consumption of diesel.

For the larger grids, the transmission networks are often antiquated due to the challenges of developing new lines (such as land acquisition, access, mountainous terrain and tropical vegetation) and as a result suffer from poor reliability, reduced availability and forced outages. Populations are often dispersed, providing challenges for the network to reach all residents, resulting in fewer residents having access to electricity and lower electrification rates.

2.2 How do the costs and reliability of renewable energy stack up against diesel generators?

The renewable energy projects are economically feasible and provide significant contribution to the government's carbon reduction program, however, they are challenged by reducing diesel prices and increasing cost of enabling technology (energy storage, integrated control systems, UPS, flywheels and resistors) to support high (i.e. greater than 40%) renewable energy penetration outcomes. The diesel cost for a Pacific utility (and thus the government) is a significant component of their budget, with the on-going benefits of avoided diesel costs able to be re-invested into other assets and services.

We have seen no issues with reliability of renewable energy at this stage, with quality and performance of the equipment increasing. However, the availability of skilled maintenance personnel familiar with renewable hybrid energy systems is limited in the Pacific.

Diesel is imported into the Pacific and has had quality issues in the past and can be impacted by supply chain issues, thus effecting the self-reliance of the country.

2.3 When are the peak power demands on most islands, is solar or wind power growing in the region, and what happens with solar electricity supply at night?

The peak demands in the Pacific are typically at dinner time. From 10am until 4pm the load is at around 80% demand and tends to drop off at around 8 pm, with a night-time load of around 20-40%.

In the Pacific, 1MW of power will supply around 700 – 2 000 households, with large variability depending on the level of development. Demand in the Pacific is less than 40MW in the capital cities and for, Guam, Tahiti, Fiji and PNG it is typically between 100MW and 250MW.

Demand growth in the Pacific is either driven by population growth and the tourist industry or by small and major industrials or mining developments.

Solar power is growing, with a current focus on floating solar to address land availability. Wind power is used in the far northern and southern Pacific regions. Compared with thermal power, solar and wind power are intermittent and are only available when the sun is shining and the wind is blowing. The intermittency of the renewable energy source is typically backed by diesel generation, involving challenges with voltage control. More recently, combining battery installations with diesel generation provides a more robust solution and is complementary to the grid stability.

2.4 Why do some islands have better power or water supplies than others?

The level of service offered by the utility is a function of the ability to plan, the ability to fund or finance the work, the capability and the size of the utility, the state of the economy, the maintenance program of the utility, and very importantly, the ability of the utility to receive revenue for its services from its clients, many of whom are government departments.

Some Pacific islands have benefitted from significant development from past European, American and Australian investments into their power networks and thus have a stronger network and robust generating sets. However, many of the generators are past their half-life and in need of maintenance. Some countries have promoted Independent Power Producers (IPPs) to encourage investment (i.e. Tonga), while others have developed strong relationships with international funding agencies and, through either concession loads or grants, have transformed their energy markets to incorporate a higher component of renewables.

We believe the water sector is similar, although it lacked focus and is now a key issue for some countries.

The ability to maintain equipment in often arduous operating environments is critical to ensuring the asset performs as expected for the life of the plant. This can be an issue in the Pacific as maintenance budgets are often minimised and equipment is often run until it fails.

2.5 How is concern about climate change influencing their decisions on energy and water projects and also the implementation and location of them?

Changing weather patterns with cycles of flooding and cyclones creates additional disaster management challenges and economic impacts to the already struggling economies.

Many of the Pacific island nations have set ambitious renewable energy and emissions reduction targets set out in their Intended Nationally Determined Contribution under the Paris Agreement. These ambitions are motivated by a desire to replace the significant reliance on imported fossil fuels

at high costs, as well as a desire to influence climate change mitigation and adaptation measures given the forecasted impacts of climate change on their countries, in particular sea level rise.

These commitments and focus are also key to securing support from Multi-lateral Development Banks to implement identified projects and positive climate change effects and outcomes are key criteria for funding eligibility.

Climate change is also considered within project design and siting to protect the assets from future impacts such as sea level rise and to minimise cyclonic effects, or to understand future water inflows for hydropower.

In cyclonic areas wind may not be practicable with the exception of small scale de-mountable options. Stronger wind resource is most consistent in coastal areas that may be affected in the future. Solar is a common and most applicable technology due to the almost universally available resources across the region.

2.6 Why may it be advantageous for DFAT to consider its rules for funding projects with this “one consultant policy” used by the Asian Development Bank in mind, so as to facilitate more efficient delivery of engineering projects?

Project development involves multiple stages from concept to commissioning. For example, a project for which we provided services in Tonga was conducted in phases. For this project, Entura completed the first phase consisting of concept, ranking, feasibility, tender design and procurement. After this phase, Entura also tendered for implementation support and was nominated as the preferred consultant. This enabled collaboration with the client throughout the whole process allowing focus on the entire project, rather than just the end of the phase. The process was flexible and Entura was able to demonstrate its expertise, enabling the country representative to be engaged throughout the process. Working with the same consultant through the stages / life cycles is efficient, reduces procurement time at each stage and eliminates potential delays due to ambiguities.

We have found that if a contractor is prevented from tendering and winning following phases due to a perceived conflict of interest, new consultants can have differing views and need to spend time coming up to speed. This means time and re-work is done, making the project costs much higher than anticipated.

2.7 What problems arise when a focus on lowest cost for projects – are many abandoned or more costly in the long run?

Lowest cost for projects generally applies to the construction or implementation phases where the procurement is through competitive tenders. Appointment of consultants especially by financial institutions is based on combination of technical competence and fee.

Focus on lowest cost might result in:

- Lack of competence and demonstrated experience – the hybrid industry is still maturing and assessment of suitability of technology offered for the cheapest price is difficult
- Lower quality of work and capability of the contractor to perform and provide resources
- High cost of operation and maintenance of the project – cheaper cost up-front might be expensive to maintain in the longer term

With the emergence of battery technology and new renewable energy systems, the industry has not yet matured to the point where all the suppliers and vendors and service providers are competent, trustworthy and have demonstrated capability in utility scale hybrid energy systems. As such, it takes a lot of effort to assess vendor's claims and to be able to make recommendations. The cheapest solution often does not meet the specification (although the client may not be aware of this) and often results in stability issues and promised benefits not being realised.

2.8 Why is it essential that funding bodies engage in pragmatic long-term planning for a successful energy transition, rather than focusing narrowly on smaller short-term projects?

A focus on long term energy planning for the region/country with consideration for demand growth through population and industrial activity is highly beneficial. Long-term planning (master plan) focuses on all aspects including the upgrade of existing assets, additional generation, and setting of priorities. This encourages investment certainty with the government and private sector.

Long term planning can still support 'quick wins' contributing to long term energy reliability, with small projects sitting within the master plan. In the Pacific we have noticed larger, more complex bespoke programs for the capital cities and smaller "off the shelf solutions" for the outer islands.

Long term pragmatic planning is required to break the 'business as usual' approach which simply replaces like for like (i.e. replacing an old diesel generator with a new one). Within a master plan, thought is given to a replacement generator that can be responsive, run at low loads, and able to accept enablers to future proof the asset to accept a higher percentage of intermittent renewables.

2.9 Is there ever a lack of local skills to build, manage or maintain some projects and what can be done to assist?

Capability and capacity to develop, manage, implement and maintain power and water infrastructure remains a challenge even in the more mature Pacific nations. There is strong capability in many utilities and government agencies however the depth is often thin below senior executives.

One of the key issues is simply the administrative capacity to process these projects. This includes project management and document control, financial administration, and processing of safeguards requirements. It also relates to the ability to interface commercially with Independent Power Producers and ensure fair and appropriate returns. In many governments, access to local staff with these capabilities is limited and substantially constrains the volume of projects than can be implemented (particularly where ramp-up/down is required). Similarly, experienced technical staff are limited and typically constrained by their existing commitments.

In the power sector, as these nations move away from diesel systems to more sophisticated computer based schemes, the skill sets need to change. This is a significant change and due to the remoteness of many of these countries, islands and systems, there needs to be sufficient local capacity, backed with remote access support, to ensure the systems continue to operate and be maintained, to break the Build-Neglect-Re-build paradigm.

Entura has had involvement in various short courses to support lifting capability in understanding renewable energy project implementation including techno-commercial risks associated with negotiating Power Purchase Agreements with Independent Power Producers. The region could benefit from more holistic strategy around education and professional training in our sectors, as with other fields, to continue to build in-country expertise for future self-reliance.

2.10 Does bureaucracy, corruption with procurement or delays in payments ever prove an issue on projects –are there any cultural issues that need to be addressed?

Whilst decision-making can be slow, we find face-to-face discussion does help reduce bureaucracy, and dealing directly with decision makers can speed up the process.

We have not seen any evidence of corruption in our work. In some small Pacific nations, people are interconnected, so transparent, impartial procurement may be compromised (or seen to be compromised). This is often managed by conflicts of interest being declared.

Standard procurement guidelines can be challenged due to the low number of tenderers and often limited capability and skills and dispensation is given after careful consideration and market assessment. High value is placed on existing relationships. A further procurement challenge is the difficulty of attracting and retaining quality suppliers and contractors, because often the size of project is small and mobilisation for one-offs is costly.

Payments are frequently delayed, more because of lack of administration, delegated authority and even liquidity of foreign exchange. Understanding of taxation, ease of business and payment systems has helped. Where funding agencies are involved, we are often paid directly by the Multilateral Development Bank, with approval from the country executing agency (either utility or government) or the reverse.

Despite our relative geographical proximity, there are some cultural differences relating to trade. Understanding and respecting cultural differences is an ongoing goal but this takes time to understand. Australia is well regarded in the Pacific which helps to break down cultural barriers.

What would be your key recommendations to help or support Australian businesses seeking out more opportunities in the Pacific?

We would recommend:

- investing in networking through connecting with industry associations and Australian government agencies, such as Austrade and DFAT in country. This is extremely valuable in the conduct and success of business, and can include local partnering to leverage on-ground support and logistics and customary processes
- being patient; it takes time to develop opportunities and understand how to do business
- know your value and what you have to offer. Articulate your point of difference
- understand where funding is available and the investment models of projects. This includes the long term planning for infrastructure.

2.11 What are the biggest concerns with doing business in the region?

The main concerns about doing business in Pacific region are:

- COVID-19: travel restrictions and quarantine requirements
- remote locations requiring longer travel time. Accommodation options can be limited and equipment availability can be challenging
- limited local skills in new renewable energy technologies and operations
- reliance on funding for project development and limited ability to pay in foreign currencies

- difficulty in attracting and retaining quality suppliers and contractors
- longer lead times in decision-making (especially with third-party interests, such as financiers)
- land ownership land availability issues, especially in smaller islands.

2.12 Does availability and ownership of land prove an issue?

Yes, land availability and ownership has an impact on all facets of the projects.

Land ownership is often complex and the land tenure models and legal frameworks vary significantly across the Pacific and it is often challenging to confirm who owns the land (individuals, families, communities) or has a connection to the land which impacts on our ability to effectively engage with the project affected persons in line with the multi-lateral social safeguard requirements.

Availability of suitable land that has the right access to the energy resource, has low constructability risks and is close to any related network infrastructure can also be problematic. Climate change forecasts for atolls and other low lying areas further limit the availability of suitable land in the future. Further, where suitable land is scarce, there is often less opportunity to avoid environmental or social impacts because there are limited site options.

Scarcity of suitable land for renewable energy projects in Pacific (and in high density nations) is driving innovation for alternatives such as utilising floating solar, combining distributed solar (virtual power plant) across existing infrastructure roofing or off-shore wind to reduce the reliance on land that can be used for agriculture or other economic activity.

2.13 Do you believe the PACER Plus agreement, when ratified, increases opportunities to trade?

PACER Plus is a regional development trade agreement with 14 members which should provide opportunities for economic cooperation and development with Australian businesses. We welcome the agreement to be ratified.

To date we haven't been exposed to the tangible outcomes of the agreement, but look forward to better understanding the frameworks and any associated increase in investor confidence. We expect it will support cross border movement, investment, and facilitate ease of business and trade agreements.

2.14 Does China have a notable presence in providing energy or water infrastructure in the Pacific?

There is a presence of China across the Pacific.

China has a role in infrastructure development as it provides access to funding for Pacific governments and this often comes in the shape of a turnkey solution, utilising equipment, services and labour.