

# PACIFIC ISLANDS GREENHOUSE GAS ABATEMENT THROUGH RENEWABLE ENERGY PROJECT (PIGGAREP)

## Recommended Proactive Strategic Barrier Removal Approach

SPREP-UNDP (2012)



*Working together to renew the Pacific's future*

# PIGGAREP



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# Acknowledgements

*The PIGGAREP Recommended Proactive Strategic Barrier Removal Approach has been prepared by Mr. Frank Pool of Frank Pool Consulting.*



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## 1 Executive Summary

The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is a Global Environmental Facility (GEF) US\$5.25 million project in eleven Pacific Island Countries (PICs). Implementation of the project started on 1 January 2008. PIGGAREP's planned five year duration has been extended to six and a half years, with a scheduled end date now of December 2013.

At April 2012, remaining PIGGAREP uncommitted funds were approximately \$2.8 million. Around \$400,000 of the calendar 2011 funds are apparently unlikely to be spent, so the total unspent funds at the time of the review are approximately \$3.2 million. Planned expenditure in calendar 2012 is \$1.8 million, and planned expenditure in 2013 is \$1 million. Achieving this expenditure rate is likely to prove challenging.

The PIGGAREP Mid Term Evaluation (MTE) completed in June 2010 found that in its two full years of project implementation, PIGGAREP had been efficiently using its GEF funds to support a suite of relevant and effectively co-coordinated tangible 'soft' (feasibility studies, resource assessments, training, awareness, etc) renewable energy (RE) support activities. These activities were generally a very useful 'value-added' contribution to the many donor provided 'hard' RE equipment and hardware projects undertaken in PICs.

This strategic review takes a snapshot look at the work of the international CTA (Chief Technical Advisor) whose role was recommended in the PIGGAREP Mid Term Evaluation (MTE).

The PIGGAREP MTE recommendation regarding the need for a pro-active strategic and sustainable barrier removal approach has been significantly undermined by the accelerating provision of donor RE funding in Pacific Island countries since the PIGGAREP MTE analysis was undertaken. One of the PIGGAREP's core rationales is that it would foster the commercialisation of RE in the Pacific but the growing dominance of donor funding in RE projects in the Pacific is, if anything, moving the majority of RE applications away from commercial RE provision. This is further distorting the real pricing of electricity supply, and making it harder for the private sector to compete on a level playing field. PIGGAREP is increasingly and unavoidably straying from its declared core design intentions of choosing pro-active strategic interventions. The idea of PIGGAREP choosing carefully targeted demonstration projects has become harder with increasing amounts of donor RE funding heading towards the Pacific with very challenging timescales to both identify projects and to expend the available funds. The primary PIGGAREP problem is how it can be as strategic as possible in an environment where 'ad-hoc opportunism' must be the primary operational strategy. PIGGAREP needs to look for those strategic elements where it can make a real difference and/or add real value when other institutions cannot or are unlikely to take the lead.



## Strategic Review Recommendations

1. **Strengthen concept note/PAS development capacity** – It is recommended that:
  - RE project concept generation and project writing capacity building workshops for PIGGAREP support be attached as an optional day at any key CROP energy agency meetings;
  - PIGGAREP PMO and UNDP regional technical advisor comments and suggested changes are discussed as much as possible by phone or by Skype call; and
  - simple retainer contracts be developed for –two – four experienced Pacific RE experts to be able to provide up to 20 days per year of consultancy assistance to assist in developing new project activity funding measures in the required template for PIGGAREP support.
2. **De-emphasise PURE as the overarching formal PIGGAREP focus** – It is recommended that PIGGAREP de-emphasise PURE as the overarching purpose of PIGGAREP RE funding support. This will clarify for PIGGAREP national energy offices, project partners, and the eventual PIGGAREP final terminal evaluation team that PIGGAREP’s focus is now primarily on the effective deployment of sustainable RE projects, and not in trying to create artificial links to the now-outdated and poorly defined PURE concept.
3. **De-emphasise PIGGAREP NEW RE policy focus** – It is recommended that PIGGAREP be open to funding missing soft elements of road maps and similar exercises, but it is not recommended that PIGGAREP initiate any such work or devote substantial resources to this area.
4. **Provide component level budget planning in AWP’s and APR/PIR reporting** – It is recommended that the PIGGAREP PMO starts tracking budgets and actual expenditure by project component and provides an analysis on this in its applicable reports.

5. **Support NDBP REFW financing replication in PIGGAREP countries** – If necessary, it is recommended that PIGGAREP takes over a leading role in the replication of the Palau SEDREA REFW concept in other Pacific Island countries.
6. **Successfully update, implement or replace RESCO Manager** – It is recommended that a specific review be undertaken of 'RESCO Manager' to judge the likelihood of the current software updating funded stage leading to a practical internet based software tool.
7. **Support PIREP RE baseline and IRENA project situation updating exercise** – It is recommended that PIGGAREP consider funding any significant gaps in data availability for the PIREP updating exercise underway for IRENA.
8. **Support new net metering legislation/policies** – It is recommended that PIGGAREP give high priority to fostering and supporting any possible interest in developing net metering MOUs and legislation. These will provide clear rules to facilitate customer-led commercial RE updates through net-metering legislation and its enforcement.
9. **Analyse and publicise the full cost of sustainable electrification** – It is recommended that a suitable consultancy project be prepared for PIGGAREP funding to describe and quantify on a like-for-like basis the all-inclusive commercial cost (including from donors) of supplying reliable and financially sustainable electricity supply in PICs. The project should cover a range of maximum and minimum grid electricity demand and/or MWh/year sizes, as well as various levels of (1) relatively easy access (generally capital cities), (2) non-main islands but with reliable transport links, and (3) remote and very remote islands with small loads and irregular transport links.
10. **Expand documentation of achievements** – including for the final evaluation – It is recommended that the PIGGAREP continues systematically documenting its supported activities.



## List of Abbreviations and Acronyms

<b>ADB</b>	Asian Development Bank
<b>ADFIP</b>	Association of Development Financing Institutions in the Pacific
<b>AusAID</b>	Australian Agency for International Development
<b>BAU</b>	Business as Usual
<b>CDM</b>	Clean Development Mechanism
<b>EESLI</b>	Energy Ecosystems for Sustainable Livelihoods Initiative (of IUCN)
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organisation (of the UN)
<b>FSP</b>	Full Scale Project (of GEF)
<b>GEF</b>	Global Environmental Facility
<b>GHG</b>	Greenhouse Gases (CO <sub>2</sub> and other emissions such as methane)
<b>IUCN</b>	International Union for the Conservation of Nature (an international organisation)
<b>MOU</b>	Memorandum of Understanding
<b>MPR</b>	Multipartite Review
<b>MSP</b>	Medium Scale Project (of GEF)
<b>NDBP</b>	National Development Bank of Palau
<b>NZAID</b>	New Zealand Aid (previously NZODA)
<b>O&amp;M</b>	Operation and Maintenance
<b>PAS</b>	Project Activity Summary (of PIGGAREP)
<b>PICs</b>	Pacific Island Countries
<b>PIGGAREP</b>	Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project
<b>PIREP</b>	Pacific Islands Renewable Energy Project (GEF/UNDP/SPREP)
<b>PMO</b>	Project Management Office
<b>PSC</b>	Project Steering Committee (of PIGGAREP)
<b>REFW</b>	Renewable Energy Fund Window
<b>PURE</b>	Productive Uses of Renewable Energy (the objective of GEF SP-4 projects)
<b>PV</b>	Photovoltaic
<b>RESCO</b>	Renewable Energy Service Company
<b>RE</b>	Renewable Energy
<b>RFQ</b>	Request for Quotation
<b>SEDREA</b>	Sustainable Energy Development through Renewable Energy Applications
<b>SHS</b>	Solar Home Systems
<b>SIDS</b>	Small Island Developing States
<b>SIDS.DOCK</b>	AOSIS/Denmark/WB/UNDP global SIDS Partnership Programme on RE and EE
<b>SPREP</b>	Secretariat of the Pacific Regional Environmental Programme (Based in Samoa)
<b>UNDP</b>	United Nations Development Programme



## 2 Context to PIGGAREP Strategic Review

The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is a Global Environmental Facility (GEF) US\$5.25 million grant funded project. This project is being implemented in 11 Pacific Island Countries (PICs) by UNDP through SPREP (South Pacific Regional Environment Programme), which operates the PIGGAREP PMO (Project Management Office).

On-the-ground PIGGAREP activities in the 11 PICs began on 1 January 2008. PIGGAREP originally had a five-year duration, this has now been extended to six and a half years, and so PIGGAREP is now scheduled to end in December 2013.

Remaining PIGGAREP uncommitted funds (at April 2012) were around \$2.8 million, although around \$400,000 of funds committed for expenditure in calendar year 2011 are likely to not be spent for various reasons, so the remaining unspent funds at the time of the review were around \$3.2 million. Planned expenditure in calendar 2012 is \$1.8 million, and planned expenditure in 2013 is \$1 million. On past expenditure rate levels, and given that it is common for many funded project activities to be late, and some scheduled project activities do not eventuate for various reasons that are outside the control of the PIGGAREP PMO, for PIGGAREP to actually achieving these planned expenditure rates is likely to prove very challenging in practice.

As a full-scale project (FSP) funded by GEF, a Mid Term Evaluation (MTE) of PIGGAREP was undertaken at around the midpoint of the project's scheduled duration. A MTE review mission was fielded in November 2009 to coincide with the second annual PIGGAREP Multi-Partite Review (MPR) meeting held in Fiji. A draft MTE report was developed and, following feedback from key stakeholders, the final MTE report was completed in June 2010 and uploaded on to the SPREP website. The positive findings of the MTE included that in its two full years of project implementation, PIGGAREP had been efficiently using its GEF funds to support a suite of relevant and effectively co-coordinated tangible 'soft' (feasibility studies, resource assessments, training, awareness, etc) RE support activities. These activities were generally a very useful 'value-added' contribution to the many donor provided 'hard' RE equipment and hardware projects undertaken in PICs. These PIGGAREP supported activities were assessed to be highly likely to lead to more successful and sustainable applicable projects with high development impacts than would have otherwise been the case. The PIGGAREP 'soft' interventions were assessed to be very useful to help mitigate the all too common '*parachute in an RE technology not designed to Pacific conditions, commission, hand over to a (nominal) community owner with a handshake and photo, then forget, and if it (predictably) fails then it's not our fault*' donor funded RE project approach in PICs. Such an approach has led to many RE projects not being sustainable post-project end in the last 30 years of donor supported RE projects in the Pacific.

A positive feature is that PIGGAREP seems to have generally avoided devoting significant resources to supporting the development of RE policies or roadmaps that make it appear that the respective Pacific countries are firmly and whole-of-government committed to ambitious RE targets, when in fact there is often not a real national ownership (even in the counterpart national government agency) of what are donor driven and unrealistically ambitious RE goals. PIGGAREP seems to be very strongly grounded in providing tangible funding support for 'soft' project elements of real RE implementation focused projects. This PIGGAREP 'soft' RE support is highly relevant and effective in an environment where increasing amounts of donor RE funding are now becoming available in the Pacific, with increasingly short timescales and a very common 'hardware only' focus. This increasing availability of donor RE funding makes it more difficult for PIGGAREP to operate in a strategic barrier removal fashion. PIGGAREP increasingly has to operate in a flexible 'ad-hoc opportunistic' way to add maximum value. By and large, PIGGAREP seems to be doing an excellent job in this regard of maximizing its 'value-added'.

Since the PIGGAREP MTE was undertaken and completed, there has been an ever-increasing donor RE project funding and prioritisation dominance in the Pacific with increasingly short timescales. This growing donor dominance of tangible RE project funding in the Pacific is crowding out the private sector. One of PIGGAREP's core rationales is that it would foster the commercialisation of RE in the Pacific. This is a highly laudable and appropriate goal, but the growing dominance of donor funding in RE projects in the Pacific is, if anything, moving the majority of RE applications away from commercial RE provision. This is further distorting the real pricing of electricity supply, and making it harder for the private sector to compete on a level playing field.

For example, the press releases about the commissioning of the New Zealand government donor funded 1 MW solar PV installation in Tonga explicitly stated that the provision of this 1MW PV system by New Zealand will enable the electricity tariff to be reduced to consumers in Tonga. How is Tonga supposed to replace the New Zealand PV system at the end of its 20-25 year life when there is no replacement fund? In reality, it is implicitly assumed that another donor will provide the replacement PV system. And how is a private sector PV developer supposed to compete with a free system provided by the New Zealand government? This is just one example of a major and growing trend in the Pacific. In the short term, PICs cannot be expected to turn down free PV hardware from donors. This will reduce electricity tariffs and help the PICs economic situation, but it inevitably crowds out the private sector from the provision of RE and reduces the long-term sustainability of PIC energy systems if the donors stop providing money for RE, as has happened before. The best that can be realistically achieved is for the private sector to be involved as much as is possible in the supply, installation and maintenance of RE systems. , The full cost of electricity supply, including donor hardware contributions, is determined and made known as widely as possible, so as many people as possible are aware of the true cost of electricity supply just in case the no-cost donor RE hardware provision stops in the future.

A flexible and responsive PIGGAREP source of RE 'soft' funding adds considerable value to the uptake of RE in the Pacific. The problem is that PIGGAREP is increasingly and unavoidably straying from its declared core design intentions of choosing pro-active strategic interventions (and hence implicitly not just reacting to donor RE priorities), and working towards growing the private sector commercial provision of RE in the Pacific. PIGGAREP was also explicitly stated to be focused on PURE, the Productive Use of Renewable Energy. As analysed at length in the PIGGAREP MTE, PURE was a concept that was briefly fashionable between 2002-2006, but then faded from the literature and from public use as no one could really identify what was PURE and what was SURE (the Social Uses of RE). It was also realised that for a project to deliver PURE outcomes it needed to add huge elements of MSME business

development, to the point where the RE element almost disappeared. So it is probably well overdue that PIGGAREP looks for, identifies and documents any links between its funding support and PURE and reports on any links found. PIGGAREP should now stop using PURE as a the key element in its selection of what RE activities to fund. It is suggested that the most important criteria for PIGGAREP funding support is the impact of the supported RE intervention, followed by leverage and then PURE.

This PIGGAREP strategic review will attempt to analyse this evolving environment and offer tangible suggestions of how PIGGAREP can continue to provide the maximum value, relevance, effectiveness and efficiency, and strategic relevance, in its remaining operations and unspent funding.

This strategic review continues on from the key finding from the PIGGAREP MTE that the PIGGAREP is clearly doing an excellent job in supporting the high value 'soft' components of available RE projects where the hard (equipment cost) component funding is largely being met by donors. This strategic review takes the PIGGAREP MTE as its starting point and will not repeat the extensive analysis undertaken in the MTE of how:

- PURE was added as a purpose of the project at its final design/funding approval stages to align with PURE being a then GEF funding window;
- the project design was not aligned with helping achieve the PURE objective in practice;
- as is now well understood, PURE does not generally arise spontaneously from the provision of RE or from electrification per se – it generally needs extensive SME development support for RE to become really income generating from RE in practice;
- donor provision of RE hardware in the Pacific was crowding out the private sectors commercial development of RE;
- every project intervention was being claimed as being strategic from the PIGGAREP side, whereas in fact most RE interventions were being driven by donor priorities, and most of the donor RE interventions were simple hardware provision focused;
- the Pacific had, if anything, too many 'demonstration' projects that were highly unlikely to be sustainable to the end of their physical lives, and too few 'replication' projects that learnt from successful and unsuccessful demonstration projects. As such, a focus on replication projects had a good chance of being sustainable in Pacific conditions and in real world Pacific community or electricity utility operation;
- it was unrealistic to expect that PIGGAREP could achieve its results through its strategically targeted and focused demonstration projects when PIGGAREP lacked hardware funding. As such, 'demonstration' projects were more likely to be driven by the donors who were providing the bulk of the funding;
- the project was excessively focused on maximizing the co-funding levels that could be claimed, even if the project's linkage with the co-funding activity was somewhat tenuous. The focus on the quantity of co-funding that could be claimed was not being balanced by the quality of the co-funding.
- A Chief Technical Advisor (CTA) was needed to give strategic direction to the PIGGAREP's remaining implementation.



### 3 Analysis and Recommendations

This strategic review has been undertaken to give practical effect to the MTE finding that there did not seem to be a suitable focus on initiating the pro-active strategic and sustainable barrier removal aspects that were the overarching stated rationale for the GEF funding of PIGGAREP. To some extent, this strategic review takes the place of the role that was recommended in the PIGGAREP MTE that PIGGAREP immediately recruit a suitably qualified and experienced international CTA (Chief Technical Advisor). This CTA will take the lead in implementing the necessary strategic barrier removal approach needed to complement the excellent existing PMO efforts in managing the large number of specific project elements across the 11 PIGGAREP PICs.

However, as will be explained below, to a large extent the PIGGAREP MTE recommendation about the need for a pro-active strategic and sustainable barrier removal approach has been undermined by the significant and probably still accelerating provision of donor RE funding in Pacific Island countries since the MTE analysis was undertaken. For example, section 3.9 (RET projects/programmes with parallel funding and/or cost sharing by 2012) of the PIGGAREP PMO April 2012 summary of PIGGAREP activities listed 26 donor funded RE projects underway in the Pacific. This is almost certainly an underestimate of the number of RE donor funded hardware focused projects underway or subject to approval in the Pacific at present.

An example of the speed and scale of new RE donor funds coming available to PICs is the PEC Fund, a commitment by the Government of Japan. This amounts to ¥6.8 billion (approx. US\$66 million) of funding to support Forum Island Country (FIC) projects with a focus on the provision of solar power generation systems and sea water desalination plants, or a combination of both. This money has to be spent in a very tight timeframe where undertaking suitable feasibility studies (FS) and other soft elements is a real challenge. PIGGAREP has had to, quite rightly, move quickly (and without worrying too much about strategic niceties) and provide suitable project 'soft' funding to ensure that these PEC Funds are spent on as useful and sustainable purposes as possible.

Another example, the SIDS DOCK project's Project Document (Pro Doc) was finalised in March 2011. The total program budget of \$14.5 million has to be spent (including \$4 million in the Pacific) in an 18 month implementation period from 1 July 2011 to 31 December 2012<sup>1</sup>. The SIDS DOCK funding is in the process of being extended with an additional \$15 million of Japanese funding awaiting approval, with the proposal being that some of the extra funds be channeled through PIGGAREP in an approach that is entitled PIGGAREP Plus (PIGGAREP+). PIGGAREP has made a strong and commendable effort

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1 SIDS DOCK Support Program, A joint initiative of UNDP, ESMAP and the World Bank, March 2, 2011

to identify suitable funding proposal concept notes and prioritise these concepts for SIDS DOC / PIGGAREP+ funding.

Additionally, the EU is funding a range of renewable energy projects throughout the Pacific, including a €14.4 million multi-country programme in Palau, Federated States of Micronesia and Marshall Islands, implemented by Secretariat of the Pacific Community (SPC). An additional €9 million funding is now under programming under the upcoming EDF-10 funding window. Then there is the \$4 million under the World Bank GPOBA (Global Programme for Output Based Aid) earmarked for Improved Electricity Access in Vanuatu, but with few practical details yet available. This list is not exhaustive; rather it is an insight in to donor RE funding already in, and more heading towards, the Pacific. In this context, it is logical and indeed commendable that PIGGAREP is worrying less about the details of its funding strategic alignment and focusing more on assisting this wave of donor RE funding to be as effective as possible.

Finally, the idea of PIGGAREP choosing carefully targeted demonstration projects has got harder with so much donor RE funding heading towards the Pacific with challenging timescales to both identify projects and to expend the available funds. The primary PIGGAREP problem is how it can be as strategic as possible in an environment where 'ad-hoc opportunism' must be the primary operational strategy, while still looking for those strategic elements where PIGGAREP can make a real difference and/or add real value when other institutions cannot or are unlikely to take the lead.

### **3.1** Strengthen Concept Note/PAS Development Capacity<sup>2</sup>

The need to develop (in turn) a specific project idea, a concept note, and then a Project Activity Summary (PAS) proposal to obtain PIGGAREP funding for any proposed PIGGAREP supported measure is a significant burden on overstretched national energy offices in the Pacific.

It can be argued that streamlining the process, or cutting out the need for a formal PAS, would generate more project funding ideas, give a greater choice of funding options and improve the quality of PIGGAREP spending. A greater number of projects to chose from and an improved quality of projects subsequently funded would also increase the expenditure rate of PIGGAREP – which clearly remains a challenge given the large remaining PIGGAREP funds and the limited time until PIGGAREP's scheduled end date of December 2013.

A counter argument is that the existing specific project activity funding process articulation and documentation (as painful as it is to overloaded national energy office staff) is a vital element in sustainable energy project development capacity building and the necessary national ownership of specific RE projects in the Pacific countries covered by PIGGAREP. Providing extensive written comments (as is currently done) for proposed project ideas/concept/PAS draft documents is consistent with this perceived critical national energy office staff capacity building function. However, in practice the updating of proposed project ideas/concept notes and formal PAS requests will become a daunting process for national energy office staff, and one that they may put off doing. Under this argument, the development of project ideas, concept notes and PAS' must continue to be driven exclusively by

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2 A separate exercise to generate a streamlined and updated PAS template is also underway and will be provided in a separate document, as specified in this consultancy's TOR

national energy office staff if the applicable Pacific countries are to have the necessary ownership of the proposed and eventually realised RE projects or activities.

Two project writing workshops have already been held with PIGGAREP funding support. It is reported that these project proposal writing workshops were an extremely useful means of building suitable Pacific national energy office proposal development capacity. Some informal assistance by consultants has also been reported. However, there is currently no easily accessible mechanism in place by which appropriate consultants can be funded to assist in any specific project activity generation and its necessary documentation, so PIGGAREP has yet to explicitly utilise this source of support. .

There is also an argument that the whole PIGGAREP activity funding process is too ad-hoc and not strategic enough, and that there should be an annual round of PIGGAREP funding proposals which should be strictly judged against explicit barrier removal criteria. New activity funding options would then have to wait for the next formal funding round. While this idea of a more formal and competitive project funding process is sound in principle, in practice this would reduce the PIGGAREP expenditure rate and would lead to a further necessary extension of the current six and a half year PIGGAREP duration (which has already been increased from its original five years scheduled duration).

RE donor project funding in the Pacific is steadily increasing with further increases in RE funding highly likely, including from the steady progress being made in implementing the CIF (Clean Investment Funds) of \$100 billion per year of global clean energy development funding. The primary value of the current PIGGAREP soft project-element funding model is that it is very flexible. The approach used is highly responsive to national needs, and it has already proven to be highly effective. It is not recommended that this overall flexible project activity funding approach be changed<sup>3</sup>. Rather, it is recommended that additional national capacity building and assistance, as well as carefully targeted consulting capacity, should be funded and be readily accessible. This would generate a wide choice of specific PIGGAREP activity funding options and the maximum quality of project funding options available to PIGGAREP. A significant increase in specific PIGGAREP funding options is required to compensate for the fact that some approved PIGGAREP funding activities will inevitable not happen for a variety of reasons outside of national energy office and PIGGAREP PMO control. High quality and specific PIGGAREP funding options that are in total greater than the budget for any particular year are required to make up for the almost inevitable shortfall in actual expenditure over that budgeted in any period.

It is recommended that RE project concept generation and project writing capacity building workshops for PIGGAREP support be attached as an optional day at any key CROP energy agency meetings. These workshops would target new energy agency staff, provide refresher training for previously trained staff, and would be a way for national energy agencies to get hands-on assistance in developing specific project funding ideas.

It is also recommended that PIGGAREP PMO and UNDP regional technical advisor comments and suggested changes be discussed as much as possible by phone or by Skype call in preference to the current default option of providing detailed and extensive comments in writing. For national energy office staff updating material to respond to extensive written comments is clearly a daunting prospect.

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3 Strongly supported by personal communications with Dr Herb Wade and Peter Johnson

It is also recommended that simple retainer contracts be developed for –two to four experienced Pacific RE experts to be able to provide up to 20 days per year of consultancy assistance to assist in developing the necessary specific and concise wording for new project activity funding measures in the required template for PIGGAREP support, alongside the extra report writing workshops provided for relevant national energy office staff.

### 3.2 De-emphasise PURE as overarching formal PIGGAREP focus

As detailed in the PIGGAREP MTE, the Productive Use of Renewable Energy (PURE) overarching stated purpose of PIGGAREP was clearly a late addition to the PIGGAREP design. PURE was almost certainly added to the PIGGAREP design after most of the analysis and documentation had been finalised, as PURE was at that time a fashionable and available funding objective available for GEF funded RE projects. As also detailed in the PIGGAREP MTE, PURE was a concept that was defined in a GEF-FAO workshop in June 2002. By 2006, the specific concept of PURE had lost traction and had fallen from favor in GEF projects. The PURE concept was no longer as popular because some social uses of electrification were claimed to be productive (eg schools, health care etc), and it also became clear that providing electricity (including in the Pacific) in and of itself rarely leads directly to the development of productive uses for that new electricity supply. In other words, the provision of electrification is a necessary but not sufficient condition on enhanced income generation in rural Pacific Island communities.

To develop productive uses for a newly provided electricity supply, one also needs to provide all the necessary elements for the development of local micro and small and medium enterprises (MSME). This includes providing accessible rural finance and banking services; developing appropriate income earning products and services; developing suitable marketing and product branding services; providing suitable ICT links to markets; facilitating transport access to appropriate markets; and providing suitable formal ownership or legally enforceable access to the necessary land and resources for the MSME businesses. It has also become increasingly apparent that just providing electrification to un-electrified communities in the Pacific can even weaken their financial situation in some cases.

On the supply side, when providing electrification money needs to be set aside from local sources to cover the new systems' operation and maintenance (O&M) costs. This is necessary if the new systems are to have any realistic chance of operating sustainably. This is because donor funding almost never includes the ongoing R&D provision, and national governments generally have too many financial demands and insufficient tax revenue to subsidies on an ongoing basis rural electricity supplies.

On the demand side, the users need to find the money to buy electrical appliances, equipment and lights, as well as pay their electricity bills. With necessarily limited funds, the users will logically tend to buy at lower initial costs, including old second-hand appliances and equipment and lights etc. This leads to high resulting energy bills from these generally inefficient energy using devices. Without developing new sources of local income in the recipient community alongside the new provision of electrification, well meaning and no direct cost (donor provided) electrification can make the financial situation of remote un-electrified communities worse rather than better, as is generally assumed. For these and related reasons, PURE is hardly mentioned in the literature after 2006 and was no longer mentioned in GEF-4 or GEF-5.

The concept developed by UNDP to cover these wider implications of electrification affordability alongside the common electricity supply-only focus is 'Energy-Plus', where the provision of 'modern' energy services is linked to the development of enhanced income earning activities that will enable the recipient community to meet, at least, the O&M costs of the new 'modern' energy services. In general terms, the new 'Energy-Plus' approach is similar to PURE but it avoids the artificial and vague distinction between productive and social uses of electrification that bedeviled the PURE concept. This consideration of the affordability of any new electrification schemes is very useful and is to be applauded. However, as stated by UNDP, the generation of enhanced incomes that would enable any electrification schemes to be affordable to their recipient communities is a highly complex and slow process that is well beyond the realistic scope of RE focused projects like PIGGAREP, or even of most individually focused rural electrification projects. For PIGGAREP, the most that can be achieved in this regard is that the affordability by the recipient communities of any new rural electrification schemes should be at least formally considered in project funding applications. This could include the use of household electricity usage and affordability survey studies as have now been undertaken by UNDP for a number of communities/islands in the Pacific (Cook Islands, Fiji, RMI, Samoa, Solomon Islands and Vanuatu).

It is recommended that the PIGGAREP literature start talking about the affordability of any new rural or other electrification schemes that are being supported by PIGGAREP. It is also recommended that PIGGAREP de-emphasise PURE as the overarching purpose of PIGGAREP RE funding support, and that this change be incorporated in the updating of the PAS forms that are being separately undertaken in this consultancy. This will clarify to PIGGAREP national energy offices, project partners, and the eventual PIGGAREP final terminal evaluation team that the PIGGAREP project focus is now primarily on the effective deployment of sustainable RE projects, and not in trying to create artificial links to the now-outdated and poorly defined PURE concept where the productive uses of providing RE has never developed spontaneously anywhere as it was supposed to do.

### **3.3** De-emphasise PIGGAREP new RE policy development focus

An issue that arises in some PIGGAREP documentation is the need to focus more on RE policy development, including linkages to other sector plans and priorities. In principle, having suitable RE policies and appropriate linkages with other national government priorities and plans is a critical element of RE barrier removal activities.

However, in practice there has always been a significant disconnection between PICs having suitable RE plans and policies and what actually happens on the ground as a result of the plans and policies. This is also a significant issue that is not even widely talked about for developed countries such as Australia and New Zealand. In these two countries, sustainable energy and climate change government funded agencies frequently develop ambitious RE and EE , plans and even policies and laws that are approved and passed by parliament. Yet these governments continue with their fossil fuel focus and do not adequately fund the necessary measures or enact the necessary regulations to make significant progress towards the ambitious RE plans, strategies and policies.

In Pacific countries, the disconnection between ambitious RE plans, strategies and policies and reality is generally even wider. Often, the ambitious plans, strategies and policies have no real local ownership, let alone any realistic chance of obtaining the necessary levels of local funding to make

a measurable impact. An example of this disconnection in action is the current development, focus on and proliferation of Energy Road Maps. In a current Pacific Island road map exercise that was underway in a Pacific Country where the author was recently working on another project, it was clear that there was next to no real local ownership of the road map development exercise (or indeed of any other donor-led RE or EE studies in that country). While in theory road map exercises are being sought by donors to aid in enhanced coordination and national ownership of the efforts of multiple donors, it is not clear that this is the real result of any recent road map exercises or similar.

It is recommended that PIGGAREP be open to funding missing soft elements of road map and similar exercises, but it is not recommended that PIGGAREP initiate any such work or devote substantial resources to this area.

### **3.4** Provide component level budget planning in AWP and APR/PIR reporting

The PIGGAREP AWPs (Annual Work Plans) and 2011 Annual Report provide a long list of activities and budgets by country and for regional projects, but do not break down the proposed activities by project component. The AWPs are all about activities, budgets, and expenditure timing. The PIGGAREP APR/PIRs (Annual Project Reports / Project Implementation Reports) provide information on activity by project component, but do not provide any budget figures. The recent PIGGAREP Table of Achievements to Date report is an excellent start in quantifying what PIGGAREP has achieved, but lacks budget (inputs) used to achieve these outputs. None of these reports provides either activities, outputs or budgets by project component. So it is not clear if PIGGAREP is apportioning its budgets by project component in broad alignment with the ProDoc (Project Document) or not, nor is it clear if this is being tracked and managed by the PMO or anyone else.

It is recommended that the PIGGAREP PMO start tracking budgets and actual expenditure by project component and provides an analysis on this in its applicable reports.

### **3.5** Support NDBP REFW financing replication in PIGGAREP countries

As is more or less standard in GEF RE projects, the PIGGAREP design contained a component relating to the development of suitable new RE financing mechanisms. To date, little specific work has been undertaken in this area, initiated or funded by PIGGAREP. This was probably appropriate given the enormous amount of time and money required to develop new funding mechanisms, and the relatively low chance that this will translate into a sufficiently active and effective funding mechanism that makes all the design, development and management oversight worthwhile.

In the Pacific, one of the most promising RE financing mechanisms developed, launched and implemented is in Palau where the REFW (Renewable Energy Fund Windows) has been developed at the NDBP (National Development Bank of Palau) with comprehensive support from the UNDP-GEF SEDREA project. This Palau REFW approach involves:

- the development of suitable standard technical equipment specifications for selected RE technologies (in particular on and off-grid PV and SWH);

- The use of clearly time-bound subsidies to drive the uptake of these selected standard RE systems by early adopters;
- capacity building of the local National Development Bank (NDB);
- the development of suitable capacity in local RE installers and O&M providers;
- the purchase of an initial set of standard specification on and off-grid PV equipment by the local NDB and then the sale of the initial set of PV equipment by the local NDB to establish market confidence in such appropriate standard specification PV equipment.

The National Development Bank of Palau (NDBP) has trialed this concept of specifying (through suitable expert consultancy inputs) standard RE modules of on and off-grid PV installations. The on-grid PV system uptake is critically dependent on the ability of relevant residential homeowners and commercial businesses to connect to the electricity grid and to provide excess PV generation to the grid under suitable financial terms when the end user does not need this generation for their own use. The simplest and easiest to implement system of connecting end-user owned PV to the local grid is net metering. Net metering can be implemented initially by an MOU between the relevant NDB and the relevant electricity supply utility, as was done in Palau during the SEDREA development phase. For full scale implementation a suitable national Net Metering Policy/Act is required, as is currently in place in Palau. Cook Islands has a net metering policy set by the utility (TAU) and American Samoa has a net metering policy under its administrative code. This net metering approach has apparently been very successfully implemented in Rarotonga, Cook Islands.

An early and well-received initiative was undertaken by IUCN (International Union for the Conservation of Nature) through ADFIP (Association of Development Financing Institutions in the Pacific), and with PIGGAREP support, to replicate the very promising Palau REFW approach through NDBP to the wider Pacific Island Countries and Territories (PICTs). This was envisaged to include both an EE (energy efficiency) component relating to the construction of EE houses with subsidised house mortgages, and a renewable energy (RE) component that would be more directly relevant to PIGGAREP's focus. However, the current status of the IUCN-led ADFIP initiative is unclear, and it may be that this process has lost its further necessary development momentum.

It is recommended that PIGGAREP actively approach IUCN and ADFIP to ascertain the current status and next development steps for the provision of standardised RE equipment<sup>4</sup> through NDBP funding with subsidies that are clearly time bound. If necessary, it is recommended that PIGGAREP take over a leading role in the replication of the Palau SEDREA REFW concept to other Pacific Island countries.

### 3.6 Successfully update, implement or replace RESCO Manager

PIGGAREP, as well as via a national project in Kiribati, has authorised considerable sums of money to the further development of the 'RESCO Manager' software package. The idea is to prepare a web-based, open source and free to download software application of the RESCO Manager software package.

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 4 If possible, this should be a collaborative effort with SEI-API (Sustainable Energy Industries of the Pacific Islands) and use their RE standards on installation guidelines and advice on suitable RE equipment for Pacific Island conditions.

Effective management of a large number of scattered and remote rural electrification installations and consumers is a critical task in the enhanced uptake of RE in the Pacific. The hardware for most remote area RE systems in the Pacific is donor provided (along with some provided from national budgets or nationally controlled resources). However, it is very rare that donors or national funding sources make any provision for funding ongoing O&M, and national governments generally lack the discretionary funds needed to fully pay for ongoing remote area electrification O&M. An all too common experience in the Pacific is donor funded RE systems that within a few years of donor hand-over stop working from the lack of minor repairs and parts (eg, electrical fuses, terminals and connectors). In particular, a major cause of failure is when solar PV systems need new batteries and replacement inverters for those that have been overloaded and/or which were never designed to be used continuously. So RE system users need to regularly pay into an account so that money is accumulated to pay for O&M, major parts and replacements if their RE systems are to have any realistic chance of working beyond a few years. There is little question that the financial management and O&M provision of RESCOs is important, and that a suitable software tool that is regularly updated, has appropriate technical support, and is openly available to download would be very useful.

RESCO Manager is a software tool that was originally developed for use in Kiribati. RESCO Manager has been developed<sup>5</sup> to assist in the ongoing management of rural energy service companies' (RESCOs) customer billing, customer credit control, and O&M technical provision. The question then is whether the specific existing 'RESCO Manager' is a promising basis for this forward looking necessary software tool and whether it will stay relevant in the absence of an ongoing institutional 'home' and ongoing funding for necessary upgrades and technical support.

A review of the main RESCO Manager website<sup>6</sup> does not give a pathway to any updated versions to be downloaded. The reviewer has been advised that version 3.3 is available for downloading at <http://rescomanager.org/m/files/RescoManager-3.3-0.tgz>. This is apparently a gzip compressed archive file, but attempts to access this version by the reviewer were unsuccessful. The lack of updated and current information on the RESCO Manager website<sup>7</sup> unfortunately does not give one confidence in the currently underway RESCO Manager updating exercise being likely to lead to a medium term sustainable software product. With a lot of digging around the website one can find a downloadable previous version 3.0<sup>8</sup> that is not directly listed on the main webpage. This is not simple to download and use as it is stated that it 'has to be installed as a complete Ubuntu Linux operating system'. It is also stated 'It [RESCO Manager] requires some hard disk partitioning and formatting. Due to the risk of erasing all the data on your computer, while this process takes place, we strongly advise you to do it under the guidance of someone with the required technical expertise.' This is clearly not a user-friendly software approach for people in remote Pacific rural communities to do themselves. It is also not clear how much RESCO Manager is actually being used. A total budget of approximately \$99,000 is included in the 2012 PIGGAREP Annual Work Plan for Q2 2012 for 'RESCO Manager Server' proposed by Fiji, Kiribati and Tonga.

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5 "RESCO Manager is a software application for managing the financing, selection, installation, operation and maintenance of renewable energy equipment." see <http://rescomanager.org/info>

6 The RESCO Manager searchable website does not lead one to any downloadable software beyond version 3.0, see <http://rescomanager.org/activities/>

7 The latest RESCO Manager news item on its website is dated May 2010, see <http://rescomanager.org/news/>

8 See <http://rescomanager.org/download>

It does not appear that the current concept of 'RESCO Manager' can operate with data entry over the internet. RESCO Manager is still organised around manual data entry, which is slow, resource intensive and prone to adding data entry errors which are not always picked up. The RESCO Manager software tool needs to be able to deal with real time data provided over the Internet, and it needs validation modules that check for data entry, meter reading and billing likely errors<sup>9</sup>.

The alternative is to stop any further PIGGAREP funding of RESCO Manager Server maintenance if it is not being used; stop any further development of RESCO Manager unless an updated version is substantially completed and ready to be uploaded to the RESCO Manager website for free and easy downloads; review the real prospects for RESCO Manager becoming a successful and ongoing relevant software tool; and if necessary look for alternative approaches. The management of RESCOs is a problem in regions beyond the Pacific, so a wider multi-stakeholder alternative approach should be considered. A suitable home for such a RESCO management tool could be IRENA, or it could be done through an existing open source and properly supported software tool. An example for a future RESCO Manager type tool is the Canadian RETScreen suite of free downloadable multi-language software tools that has been available since 1998. This is a [Microsoft Excel-based free software package](#) designed to run on Windows OS computers, and can also be run [VirtualBox](#) for Mac. This sort of ongoing significant institutional support is required for RESCO Manager or its successor software tool to be relevant and to justify PIGGAREP development funding and ongoing support.

It is recommended that a specific review be undertaken (recommended to be led by the UNDP Regional Technical Advisor at the Pacific Center) of 'RESCO Manager' to judge the likelihood of the current software updating funded stage leading to a true modern internet based software tool that would be readily downloaded and installed, would be widely used and would have realistic prospects of attracting the necessary funding and support for ongoing further software upgrades and technical support. Otherwise, it is recommended that any funding for 'RESCO Manager' be suspended until a broader ownership and more long-term sustainable approach for a suitable RESCO management easily downloadable and usable (and regularly updated) software tool can be found.

### **3.7** Support PIREP RE baseline and IRENA Project situation updating exercise

As detailed in the PIGGAREP MTE, PIREP, while officially funded as the design stage of PIGGAREP, also developed an invaluable and comprehensive individual and collective compendium of the energy situation, the status and prospects for renewable energy, and the history and success or otherwise of the many RE projects and interventions across its applicable 15 Pacific Island Countries in 2004, based on data from late 2003 to early 2004<sup>10</sup>. Since its publication in 2005 in 15 country reports and several consolidated regional summary reports, the PIREP outputs have provided the underpinning data and analysis basis for countless RE (and even EE) projects in the Pacific<sup>11</sup>. In 2008, a proposal was

9 Personal communication, Dr Herb Wade

10 Expanding and Updating the Pacific Islands Renewable Energy Project (UNDP/GEF/SPREP PIREP) Reports & Data – A Recommended Approach for Improving Renewable Energy Project Implementation, Replication and Sustainability, by Peter Johnston and Herbert Wade, 23 August 2008

11 The author of this PIGGAREP strategic review has personally relied on the PIREP work for the ADB-GEF PEEP project design phase, for the UNDP-GEF Palau SEDREA MTR exercise, and for the EC BizClim Vanuatu Rural Tourism and Renewable Energy project that is in its final report development phase.

developed by the two key authors of the PIREP analyses to update the PIREP data and analyses, but this did not succeed in attracting the necessary funding.

As detailed in the PIGGAREP MTE recommendations section 6.2 entitled “Start Documenting ‘Warts and All’ Lessons Learned From Demos”, PIREP made an excellent start in documenting (in a suitably sensitive way) many of the ‘warts and all’ lessons of the then (to around the end of 2004) existing RE projects in PICs. This honest ‘warts and all’ documentation of the applicable PIGGAREP PICs’ RE projects was a key task for the PIGGAREP international CTA recommended in the PIGGAREP MTR. It is pleasing to see that PIGGAREP has made a promising start to documenting the results of its supported RE projects through a series of country focused videos.

It is understood<sup>12</sup> that the PIREP analyses are now in the process of being updated by one of the original project consultants, Dr Herb Wade, as a desk exercise funded by IRENA – the recently formed International Renewable Energy Agency. The intention is understood to be that the results of this updating work would be openly available on the relevant part of the IRENA website, and that it would be developed in a ‘living document’ format that is designed to be periodically updated. Gathering suitable baseline data and consolidating it into one common format document would be of considerable value for future RE projects in the Pacific, as demonstrated by the acknowledged huge value that has been derived from the original 2004 PIREP data gathering, analysis and consolidation exercise. This PIREP updating exercise is highly relevant to the objectives of PIGGAREP. It is anticipated that the current IRENA funded PIREP updating project could provide the basis to cover most aspects of the PIGGAREP MTE’s recommended up-to-date, comprehensive, honest, but yet suitably forward looking appraisal of PIC RE project experience to date, lessons learned, and recommendations for future PIC RE projects (as was done for PIREP). This would then be an extremely valuable baseline document for donors looking to implement future RE projects in PICs; to private sector operators wanting to successfully implement commercial RE projects; and to policy makers, advisors, tariff setting agencies and the interested PIC public on what works, what does not, and how to maximise the likelihood of ongoing sustainable operation of RE projects in PICs.

However, it is understood<sup>12</sup> that IRENA funding for this PIREP updating work is not sufficient to cover any necessary travel for country visits by suitable experienced international consultants, or even the funding of suitable national consultants to collect available energy supply and renewable energy project status data. It is also not known if the funding available for the IRENA PIREP updating exercise is really sufficient to undertake the necessary work in a suitably comprehensive manner.

It is recommended that PIGGAREP approach IRENA and/or Dr Herb Wade, and invite them to submit a proposal on how to utilise any PIGGAREP funding to address any significant gaps in data availability for the PIREP updating exercise underway for IRENA.

### **3.8** Support new net metering legislation/policies

Residential and commercial user installed PV systems are now commercially viable in many if not most PICs, even without subsidies or donor financial support. For example, Rarotonga in the Cook Islands has had an impressive uptake of consumer installed PV systems, installed without subsidies (except what is inherent in net-metering) and without any donor financial support. Consumer

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12 Personal conversation with Dr Herb Wade

installed PV is now being installed in Palau (following the updating and extension of an earlier MOU between the utility (PPUC) and NDBP as the provider on the necessary finance) and in American Samoa under net metering policies. Net metering of consumer installed RE, and specifically of solar PV, is the simplest, most highly effective, most politically sustainable, and most proven policy tool that enables significant amounts of grid-connected consumer installed RE/solar PV to be installed in the Pacific. Although a publicly owned electricity utility, such as TAU in the Cook Islands, could and did implement net metering on its own, net metering should generally be established under an appropriate legislative mechanism that is mandated and enforced by the government. In effect, net metering is the policy mechanism that makes the practical replication of the Palau ELP (Energy Loans Program) and in particular its REFW (RE Funding Window) possible in an implementation sense for grid-connected consumer PV in Palau.

It is recommended that PIGGAREP give a high priority to fostering and supporting any possible interest in developing net metering MOUs and then legislation to provide clear rules to facilitate customer led commercial RE update through net-metering legislation and its enforcement.

### **3.9** Analyse and publicise the full cost of sustainable electrification

In several PICs capital, fuel and O&M costs are often not fully charged for in electricity tariffs. This is an ongoing barrier to RE supplementing a sizable fraction of conventional diesel generator based electrification in the Pacific. Diesel generator sets are frequently provided at no cost by donors, as are replacement generators, thereby weakening the incentives for local ownership of strict and regular diesel generator maintenance, and leading to (in many cases) old, inefficient and unreliable generators continuing to be used for baseload power well past their use-by date.

In many cases, poles and wires are also partly paid for by donor grants or soft funding. RE systems generally have been, and continue to be, provided by donors at no direct initial cost to the country or end user. Even large grid-connected RE systems such as large PV arrays or large (in the Pacific Island context) hydro schemes are often provided at no cost to the country or end user. Even if not provided by donors for free, large hydro schemes are often funded by concessionary loans, and also generally benefit from large related technical assistance (TA) grants. With increasing amounts of donor funding and TA funding now being spent in the Pacific, and with even larger funding streams being on the horizon, this donor-free, hard equipment supply distortion of the true cost of electrification is only likely to get more acute, not less.

It is also common for both implicit and explicit cross-subsidies to exist between consumer classes and/or between main island grids and outer island grids. Outer island grids frequently rely on government financial support. There are also many examples in both main island and outer island grids for the grid operator to struggle to pay for diesel supplies, or for underfunding to result in unreliable electricity supply or in long periods when electricity is not available. Governments also have an understandable tendency to keep electricity tariffs below realistic levels, and to implicitly hope that somehow the electricity suppliers will manage to keep supplying reliable enough electricity, or that a donor will step in and solve the problem, or that it will be a problem for the next government (i.e. a NIMTO (Not In My Term of Office) problem deferred). In many cases the undercharging for electricity supply leads to the failure of the electrification system(s) to keep operating reliably, or in some cases to keep operating at all (i.e. the effective end of any grid electricity supply in that location).

There is a general and understandable reluctance for electricity supply authorities, and for governments as well, to be realistic about the real cost of electricity supply in Pacific Island countries. With only a few exceptions, the full cost (including donor supplied hardware) of reliable electricity supply ranges from high (around US 30–60 cents/kWh for large (Pacific Island) grids) to very high (US\$1.00–1.50/kWh for smaller grids) to extremely high (US \$1.50–\$2.50 for stand-alone systems in rural areas and in very remote islands). This reluctance to be fully explicit about the true cost of electricity supply in PICs is not helped by donors and over-enthusiastic NGOs and RE proponents who often promise that (donor provided) RE systems will reduce the cost of electricity supply, or even provide ‘free’ energy<sup>13</sup>. Someone has to pay for the initial capital and ongoing O&M costs. The cost of capital should be openly accounted for, even if it was supplied at no direct cost to the recipient Pacific Island government and the Pacific Island rural end users. Otherwise, who will pay to replace the hardware at the end of its life, if not another donor?

There is also a reluctance of the many over-enthusiastic proponents of RE to explicitly talk about the fact that with intermittent PV and wind RE connected to a grid, a suitable diesel generator set almost always needs to run continuously to cover the RE intermittency, and/or to provide reactive power and frequency control (as is the case for most wind power turbines). Only hydro with reasonable water storage, and bioenergy and geothermal can provide firm power. In most wind and PV RE systems without storage (in practice anything that is not storage hydro) a diesel fuel saving of only about 10% overall is possible. Beyond 10% overall wind or PV MWh contribution, new rapid load following capable compatible diesels may be needed, adding too much RE to an electricity grid can lead to increased short term capital requirements, and perhaps even ongoing O&M costs rising, not decreasing. For smaller systems, battery storage can reduce the need to diesel generator sets constantly running as spinning RE intermittency reserve. However, batteries are expensive, have limited lives, and need careful management for users to get a decent life out of them, and to ensure their safe operation<sup>14</sup>.

Only when the full costs (including donor support) of RE are explicitly calculated and talked about on a common and realistic basis, can the real value of RE alternatives be fully considered and meaningfully compared to the diesel generator based grid that is predominantly the electrification baseline situation in the Pacific Islands. A number of very useful tariff studies have been undertaken with support by UNDP (via Government of Denmark and GEF funding) in recent years, but the results are often deemed to be ‘commercially sensitive’ and so the data in these tariff studies cannot be quoted. It is also not clear how realistic these tariff studies are in understanding the full electricity supply cost. For example, from a review of the Palau PPUC Tariff Study (by the consultant for the Palau SEDREA project MTE) it does not appear that donor provided capital equipment contributions are accounted for in their tariff analysis methodology<sup>15</sup>.

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13 As an example, the language and press releases around the recent ‘Energy for All’ movement is often extremely vague about, or do not mention at all, who is expected to pay for the necessary ongoing running costs and O&M, and how the (donor provided) systems will be replaced at the end of their physical life. In practice, most ‘Energy for All’ hardware will need to be replaced by a new generation of donors, so their long-term sustainability is questionable. The ‘Energy Plus’ approach where long term enhanced income generation and affordability are explicitly considered is a more sustainable and therefore more useful approach.

14 See new IRENA publication Electricity Storage and Renewables for Island Power: A Guide for Decision Makers: <http://www.irena.org/DocumentDownloads/Publications/Electricity%20Storage%20and%20RE%20for%20Island%20Power.pdf>

15 Note that the four (4) tariff studies supported by UNDP in Palau, Tuvalu, Solomon Islands and Pohnpei, FSM all were undertaken by the same consultant company, Ridgway Capital Projects Limited, NZ. With the tariff studies being confidential, it is not clear if the four tariff studies consistently account for donor capital contributions, as was the case for the Palau tariff study.

A very useful Pacific wide electricity utility benchmarking study has recently been undertaken for the PPA (Pacific Power Association). The data used was often incomplete, not checked and corrected where it was not fully accurate, and so the comparability of the data on tariffs is incomplete and not fully representative of all applicable costs<sup>16</sup>. Some excellent work has also been done recently in this area by SPC-GIZ<sup>17</sup>. Useful work on small and island power utility benchmarking and analysis has also apparently been undertaken in the Caribbean, the USA (including many smaller utilities) and in Europe for island utilities<sup>18</sup>. Both the recent PPA and SPC-GIZ work has identified the need to address key data gaps and for the regular updating of work on true electricity supply costs including O&M; the cost and value of RE alternatives in actual real-world electricity supply systems; and actual delivered diesel fuel costs. A systematic and ongoing approach is needed, not another one-off exercise. This could include the use of standardised data and formats, perhaps in a spreadsheet that is regularly updated to reflect changes in oil prices, transport costs, and RE equipment costs etc<sup>19</sup>. This also highlights the need to work alongside regional institutions such as PPA and SPC that have an ongoing interest in electricity systems and utility sustainability. Long term oriented Pacific donors such as ADB (Asian Development Bank), WB (World Bank), the EU, AusAID and NZAID should also, in principle, be interested in this work. The home for such a study should be an institution with a long-term interest in energy sustainability in the Pacific or in wider small island states and remote areas, such as IRENA, which has a focus on data provision, long-term dynamic knowledge products and the widespread dissemination of results<sup>20</sup>.

It is recommended that a suitable consultancy project be prepared for PIGGAREP funding, with co-funding by suitable partners if this can reasonably readily be arranged, and with an institutional structure for regular updating and for open public access. The work would then be undertaken by suitable consultants, and would describe and quantify on a like-for-like basis the all-inclusive commercial cost (including from donors) of supplying reliable and financially sustainable electricity supply in PICs. This would cover a range of maximum and minimum grid electricity demand and/or MWh/year sizes, and at various levels of (1) relatively easy access (generally capital cities), (2) non-main islands but with reliable transport links, and (3) remote and very remote islands with small loads and irregular transport links. Critically, these studies would need to include a reasonable rate of return on all relevant applicable assets, including those provided by donors. Governments may decide to not include a return on assets provided by donors, but this cost should be explicitly calculated and the tariff discount to consumers from donor capital cost provision should be calculated and explicitly communicated to electricity users. End users must be constantly reminded that their tariffs are lower due to the generosity of donors, and the extent of the savings should be clearly marked on all applicable electricity bills. Only with explicit accounting and a realistic return on applicable capital costs can one usefully talk about 'commercial' costs of electricity supply and the contribution of (generally donor provided) RE hardware. Only then can the private sector realistically compete on RE provision.

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16 PPA Final Benchmarking Report, Peter Johnston, PPA, Fiji, Feb 2012

17 Cost of Renewable Energy in Pacific Island Countries, – DIREKT Workshop, Renewable Energy-Economics, Application and Legislation, 16th March, 2012

18 PPA Final Benchmarking Report, Peter Johnston, PPA, Fiji, Feb 2012

19 Personal communication, Dr Herb Wade

20 Personal communication, Dr Herb Wade

### 3.10 Expand documentation of achievements – including for the final evaluation

PIGGAREP has provided support for numerous 'soft' elements of a wide range of RE projects. As detailed in the MTR and in this strategic review, it is not argued that this PIGGAREP support for applicable RE project soft elements should fundamentally change. However, this support for the soft elements of RE projects will inevitably lead to significant challenges in PIGGAREP's final evaluation of the overall impact of PIGGAREP in improving the uptake and sustainability of the RE measures supported in the applicable PICs. In April 2012, the PIGGAREP PMO prepared a very useful analysis of what PIGGAREP has supported under each of the six PIGGAREP components to date. This list of PIGGAREP supported activities is an excellent start towards developing a comprehensive list and documenting PIGGAREP'S contribution to the expanded uptake of RE in the Pacific, including but not limited for the PIGGAREP final evaluation. It has also been suggested by the Project Manager of PIGGAREP that PIGGAREP might be able to use SPREP's Climate Change Division's Resource Economist to undertake a Cost Benefit Analysis (CBA) on PIGGAREP interventions. If possible, this is an excellent idea.

It is recommended that PIGGAREP continue systematically documenting its supported activities. It would be useful if this excellent start to PIGGAREP achievement documentation is supplemented by: additional information regarding what part of the total activity expenditure PIGGAREP has funded; the cost and characteristics of co-funded activities by other donors and interested parties in the relevant activity; whether the RE installation project or RE specific supporting activity actually went ahead and when; whether the RE project or activity is operating sustainably and whether it has good prospects of sustainable operation; any independently verifiable indicators of success; and the level and degree of attribution of co-funding from other financial sources towards the PIGGAREP supported RE project or activity.



## Annex A: People Interviewed

**Kosimiti Latu**, Deputy Director General, SPREP, Apia, Samoa, [kosil@sprep.org](mailto:kosil@sprep.org)

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## Annex B: Documents Reviewed

ADMIRE Mid-Term Evaluation – RMI – J van den Akker – March 2012  
Annual Project Report and Project Implementation Review  
Biofuel CNO FS for Kiritimati in Kiribati – April 2012 – GH Zieroth -Final  
China-Pacific 20120414 Clarification Letter re EE Appliances Funding of \$300k ea for 8 PICs  
EDF-10 Pacific ACP EUR 28M Funding 2012-2014 Programming & Implementation Documentation Consultancy ToR – 12 April 2012  
Energy Plus Approach for the Poor – Report for Asia & Pacific – UNDP Sept 2011  
Net Metering Policy for American Samoa – May 2008  
Net Metering Policy for Cook Islands – Oct 2011  
Net Metering Policy for Palau RPPL 8-39 as Signed by President – Jan 2012  
Palau-SEDREA MTR 20120131 Final Evaluation Report v5  
PAS 20110912 VAN Talise Hydro Technical Visit & RET Awareness  
PAS 20120213 VAN Talise Hydro Community PURE Training for Financial Sustainability  
PAS Template  
PEC Fund – Solomon Islands \$4m for 2000 SHS w RESCO for O&M  
PICs – How Viable are Their Economies – Hezel SJ – EW Center 2012  
PIGGAREP 20050502 Project Brief – Final  
PIGGAREP 20060803 ProDoc w GEF CEO Endorsement  
PIGGAREP 20070124 ProDoc with signatures – final  
PIGGAREP 20080130 Final Inception Report  
PIGGAREP 20080318 PAS Summary Assessment Criteria  
PIGGAREP 20080530 APR-PIR 2007-2008 final  
PIGGAREP 20081114 MPR1-2008 Summary Record – Final  
PIGGAREP 20091127 MPR2-2009 Summary Record – Final  
PIGGAREP 20100610 Mid-Term Evaluation Final Report  
PIGGAREP 20101125 MPR3-2010 Summary Record – Final  
PIGGAREP 20110714 CI Writeshop Hailed a Success  
PIGGAREP 20110809 APR-PIR 2010–2011  
PIGGAREP 20110810 RTA Worksheet for APR-PIR 2010-2011 Comments  
PIGGAREP 20110824 APR-PIR 2010–2011 – Final

PIGGAREP 20111006 Palau ELP-Replication-Workshop Report – A Matakiviti

PIGGAREP 20111006 Palau Workshop re Extension of ELP Approach to ADFIP Members – BTOR – A Matakiviti

PIGGAREP 20111108 Annual Report 2011 Presentation for 4th MPR – session 2

PIGGAREP 20111108 Key Outcomes of the 14th Project Board Meeting -Final

PIGGAREP 20111108 MPR4-2011 Summary Record – Final

PIGGAREP 20111208 RFQ for 21 Days Strategic Approach Development Consultancy

PIGGAREP 20120302 Revised Calendar 2011 AWP

PIGGAREP 20120323 Updated Workplan for 2011 and 2012

PIGGAREP 20120404 2012 Workplan Draft – Revised

PIGGAREP 20120412 Samoa 400kW PV FS for PEC Funding by IT Power

PIGGAREP 20120416 Table of Achievements to date – Nixon Kua

PIGGAREP 20120425 QPR\_Q1-2012 draft v3

PIGGAREP 20120618 15th PB Meeting – Incl Strategic Review Presentation & Discussion

PIGGAREP PAS Approval & Implementation Processes

PIGGAREP+ 20110811 Project Proposals Evaluation for SIDS DOCK – Final

PIGGAREP+ 20111111 SIDS FSM+Palau+RMI – Concept Note for SIDS DOCK

PIGGAREP+ 20111116 CI Palmerston Island SHS – Concept Note for SIDS DOCK

PIGGAREP+ 20111117 Tonga Solar Water Pumping – Concept Note for SIDS DOCK

PIGGAREP+ 20111123 Tuvalu EE Show Home – Concept Note for SIDS DOCK

PIGGAREP+ 20111123 VAN Talise Hydro T&D Lines for 3 Villages – Concept Note for SIDS DOCK

PIGGAREP+ 20120322 Project Development Plan – Short Version

PIGGAREP+ Budget Estimates of Proposed Projects

PIREP Business Case for Private Sector Demo projects – H Wade – SPREP 2005

PPA 20110404 5-Year Strategic Plan – final working draft

PPA 20120210 Final Benchmarking Report – Johnston

PIGGAREP Quarterly Progress Reports

RE 20020615 GEF-FAO Productive Uses of RE Workshop Summary

RE 20050515 PURE Financing & Delivery Models – UNDP REP-PoR Bangkok

RE 20070215 Economic Assessment for PIC Rural Electrification – A Woodruff – SOPAC TR397

RE 20100930 International Financing Mechanism in PICs -TL Jensen

RE 20120315 Costs in the Pacific – K Syngellakis -SPC-GIZ

RE 20120316 PIC Grid-connected PV Legislative & Regulatory Frameworks – TL Jensen

Samoa EPC Annual Report 2009-2010 @ 16 Nov 2011

Samoa EPC Corporate Plan for 2011-2014

SIDS DOCK 20110303 Danish Funded w UNDP & WB ESMAP – ProDoc – \$14.5M to Dec 2012

SIDS DOCK 20120115 Briefing Note (Updated January 2012)

SIDS DOCK 20120120 Update

PIGGAREP Workplans and Budgets



## Annex C: TOR for this consultancy

### Request for Tenders/Quotations

File: AP 3/7/2/1  
Date: 8 December 2011  
Contact: Sili'a Kilepoa Ualesi  
siliau@sprep.org  
Subject: Request for Tenders/Quotations:

**Consultancy to Prepare a Recommended Proactive Strategic Barrier Removal Approach for the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)**

### 1. Background

The Secretariat of the Pacific Regional Environment Programme (SPREP) is an intergovernmental agency that provides assistance and technical advisory services to Pacific Island countries, territories and administrations in the protection and management of their environment to ensure they achieve sustainable development for present and future generations.

SPREP's membership comprises 21 Pacific Island countries and territories and 4 developed countries (Australia, New Zealand, France and the United States of America). SPREP has a current staff establishment of more than 70 staff.

The Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP) is a 6.5-year project financed by the Global Environmental Facility (GEF), with the United Nations Development Programme (UNDP) as the implementing agency, and executed by SPREP. PIGGAREP aims to reduce the growth rate of emissions from Greenhouse Gases (GHG) from fossil fuel use in the Pacific Island Countries (PICs) through the removal of the barriers to the widespread and cost effective use of feasible renewable energy technologies (RETs). It consists of various interventions that will contribute to the removal of the major barriers to the widespread utilization of commercially viable RETs. The project is expected to bring about in the PICs: (1) Increased number of successful commercial RE applications; (2) Expanded market for RET applications for power generation and productive uses; (3) Enhanced institutional capacity to design, implement and monitor RE projects; (4) Availability and accessibility of financing to existing and new RE projects; (5) Strengthened legal and regulatory structures in the energy and environmental sectors; and, (6) Increased awareness and knowledge on RE and RETs among key stakeholders.

Implementation of the PIGGAREP started in July 2007 and the project went through a mid-term review at the end of 2009/beginning of 2010. Key recommendations from the mid-term review included:

- i) Implement a proactive strategic barrier removal approach;
- ii) Start documenting and building on 'warts and all' lessons learned from demonstrations;
- iii) Move towards budgets that reflect alignment with PIGGAREP objectives;
- iv) Strengthen PIC national human resources; and
- v) Focus on barrier removal and replications as primary PIGGAREP success indicator.

The detailed mid-term evaluation report can be accessed here:

[http://www.sprep.org/att/publication/000917\\_PIGGAREP\\_MID\\_TERM\\_REVIEW\\_FINAL\\_REPORT.PDF](http://www.sprep.org/att/publication/000917_PIGGAREP_MID_TERM_REVIEW_FINAL_REPORT.PDF)

At the PIGGAREP Multipartite Review Meeting (MPR) held in Apia, Samoa in November 2010 key project partners (i.e. the 11 participating countries, SPREP and UNDP) discussed the findings and recommendations of the mid-term review. Among others it was agreed that once the new Project Manager was fully onboard a consultant be contracted to assist with operationalizing the key recommendation to implement a proactive strategic barrier removal approach.

In addition as part of the Pacific component of the recently launched US\$14.5 million Alliance of Small Island States (AOSIS), Government of Denmark, UNDP, and World Bank (WB) global SIDS Partnership Programme on Renewable Energy and Energy Efficiency ('SIDS.DOCK'), it has been approved in principle that additional resource be provided to PIGGAREP. In context of a recommended proactive strategic barrier removal approach specific considerations possibly would have to be given for these additional resources to PIGGAREP such as SIDS.DOCK program focus, expediency (there is a very short time-frame for delivery of the initial funding), program management set-up, etc.

## 2. Key Responsibilities and Accountabilities

The consultant will be responsible and report to the SPREP Director or his designated representative through the Project Manager of the PIGGAREP. In consultation with SPREP, UNDP and the PIGGAREP Board and based on key available documentation, he/she will perform the following:

- Provide recommendations on a proactive strategic barrier removal approach(es). Factors to consider include:
  1. **Alignment with PIGGAREP objectives including preference to be given to projects that:**
    - Have an explicit focus on Productive Uses of Renewable energy (PURE);
    - Have an explicit focus on commercial provision of renewable energy; and
    - Demonstrate that it is consistent with a 'Strategic Barrier Removal Approach' (in practical terms among others this could be that proposed activities build on, follow-up on, add-value to, etc. already PIGGAREP supported (i.e. completed, ongoing or planned) activities;
  2. **Show that the recommended approach(es) could be delivered in the remaining time of the project and within budget;**

3. **Ensure that there is balance between ‘upstream’ activities (enabling environment) and ‘downstream’ activities (specific investment projects) within PIGGAREP (possibly with more upstream activities to be supported);**
4. **Contributes to a better balance between ‘cost-effectiveness’ and ‘innovation’ (possibly more innovation to be supported);**
5. **Demonstrate that possible proposed ‘demonstration projects’ meets the following criterion:**
  - They are explicitly aiming to foster commercial renewable energy supply and/or PURE;
  - Has a wide replication potential;
  - The demonstration project must use fully proven/reliable technologies; and
  - That all costs are accounted for (included those provided by donors) in the setting of sustainable energy tariffs.
6. **Demonstrates potential for sustainability;**
7. **Specific considerations for the planned additional resources from SIDS.DOCK to PIGGAREP; and**
8. **Practicality**, i.e. a proactive strategic barrier removal approach has to be manageable and workable for the participating countries, SPREP & UNDP.
  - Assess the current preparation, appraisal and approval procedures for country and regional level interventions supported by PIGGAREP including the template used for concept notes – i.e. the Project Activity Summary (PAS) – and based hereon recommend more efficient and effective procedures including PAS template.

### 3. Deliverables

- A comprehensive document (draft and final version) which details practical and specific suggestions for a proposed proactive strategic barrier removal approach for PIGGAREP; and,
- A report (draft and final version) which assesses the current preparation, appraisal and approval procedures for country and regional level interventions supported by PIGGAREP and recommends more efficient and effective procedures including the PAS template.

### 4. Required Qualifications and Experience

Candidates must have the following:

1. Advanced degree (at least M.Sc. or equivalent) in engineering, energy, environmental management or other field relevant to the assignment;
2. Extensive knowledge and experience with climate change and energy issues of the PICs;
3. Substantial, relevant and practical working experience with the design and implementation of renewable energy projects/programmes preferably regional level interventions;
4. Significant working experience in Pacific Island Countries, Small Island Developing States and/or other developing countries; and
5. Excellent working knowledge of English.

## 5. Terms and Conditions

**Duration:** The consultancy period will be for a total of twenty-one (21) days of which two (2) weeks is to be spent being based at SPREP in Apia, Samoa.

## 6. Deadline

- a) By email: Subject matter to be clearly marked **“Quotation for Consultancy to Prepare a Recommended Proactive Strategic Barrier Removal Approach for PIGGAREP”** and send to [siliau@sprep.org](mailto:siliau@sprep.org) (Most preferred option) OR
- b) By post or fax: Application to be addressed and sent to: The Director, SPREP, P O Box 240, Apia or fax number (685) 20231 and clearly marked **“Quotation for Consultancy to Prepare a Recommended Proactive Strategic Barrier Removal Approach for PIGGAREP ”**

All enquiries to be directed to the Project Manager of PIGGAREP , Ms Sili’a Kilepoa Ualesi on telephone (685) 21929 ext 222 or Email: [siliau@sprep.org](mailto:siliau@sprep.org)

An electronic copy (PDF-format if possible) of the full application must be forwarded to SPREP. Preferably the electronic copy should be sent to SPREP via email address above.

**Closing date: 23 December 2011, 5:00pm, Samoa time:** Late quotations will not be considered.





Working together to renew the Pacific's future

# PIGGAREP

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# SPREP

Secretariat of the Pacific Regional  
Environment Programme