1. Project Data

Summary project data			
GEF project ID		2699	
GEF Agency project ID		3462	
GEF Replenishment Phase		GEF-3	
Lead GEF Agency (include all for joint projects)		UNDP	
Project name		Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)	
Country/Countries		Pacific Island Countries (Cook Islands, Fiji, Kiribati, Nauru, Niue, Papua New Guinea, Samoa, Solomon Island, Tonga, Tuvalu and Vanuatu)	
Region		Asia	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		OP6: Promoting the adoption of renewable energy by removing barriers and reducing implementation costs; SP4: Productive uses of renewable energy	
Executing agencies involved		Secretariat of the Pacific Regional Environment Programme (SPREP)	
NGOs/CBOs involvement		None involved	
Private sector involvement		None involved	
CEO Endorsement (FSP) /Approval date (MSP)		September 6, 2006	
Effectiveness date / project start		January 24, 2007	
Expected date of project completion (at start)		November 30, 2011	
Actual date of project completion		November 30, 2016	
Project Financing			
		At Endorsement (US $M)	At Completion (US $M)
Project Preparation Grant	GEF funding	0	0
	Co-financing	0	0
GEF Project Grant		5.225	5.225
Co-financing	IA own	0.5	0.4
	Government	26.47	51.46
	Other multi- /bi-laterals	1.013	10.95
	Private sector	0	0
	NGOs/CSOs	0	0
Total GEF funding		5.225	5.225

Total Co-financing	27.983	62.81
Total project funding (GEF grant(s) + co-financing)	33.208	68.035
Terminal evaluation/review information		
TE completion date	August 31, 2016	
Author of TE	Mr. Roland Wong	
TER completion date	May, 2018	
TER prepared by	Spandana Battula	
TER peer review by (if GEF IEO review)	Molly Watts Sohn	

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	S	S	MU	MS
Sustainability of Outcomes		MU	MU	ML
M&E Design		S	S	S
M&E Implementation		MS	MU	MS
Quality of Implementation		S	MS	MS
Quality of Execution		S	MS	MS
Quality of the Terminal Evaluation Report		-	S	MS

3. Project Objectives

3.1 Global Environmental Objectives of the project:

The Global Environment Objective of the project is the reduction of the growth rate of GHG emissions 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 (PD pg 10).

3.2 Development Objectives of the project:

The Development Objective of the project is the promotion of the productive use of renewable energy to reduce GHG emission by removing the major barriers to the widespread and cost-effective use of commercially viable Renewable Energy Technologies (RETs) (PD pg 10). The project intended to achieve this objective through six components, and they are:

Component 1: Technical Capacity Development and Technical Support;
Component 2: Market Development Support;
Component 3: Institutional Strengthening;
Component 4: Financial support;
Component 5: Policy and regulatory support; and
Component 6: Information and awareness enhancement.

3.3 Were there any changes in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

The TE does not report of any changes to the objectives.

4. GEF IEO assessment of Outcomes and Sustainability
Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 Relevance	Rating: Satisfactory

The project is consistent with GEF's strategic priorities on climate change and specifically Strategic Priority 4 on productive uses of renewable energy. It is also aligned to Operational Program 6 on promoting the adoption of renewable energy by removing barriers and reducing implementation Costs (PD pg 13). The project is also relevant to the Pacific Island Countries (PIC) development priorities to "address the problems of global warming and sea level rise that pose a serious threat to the sustainable development and existence of all PICs" (TE pg 54). The design of the project is aligned to Pacific Islands Energy Policy (PIEP) that prioritizes the region's need for utilizing commercially viable RETs for mitigating GHG emission. Finally, the project is also relevant "to the strengthening of the Alliance of Small Islands States' (AOSIS) in demonstrating the strong commitment of the PICs to a number of commitments including those of the Johannesburg Renewable Energy Coalition (JREC), the International Action Programme on RE adopted at the International RE Conference held in Bonn in June 2004, the Johannesburg Plan of Implementation, the Barbados Programme of Action (BPoA) and the Mauritius Strategy" (TE pg 54).

4.2 Effectiveness	Rating: Moderately Satisfactory

The project had six components out of which 3 of them Satisfactorily achieved all its targets while 3 of the components were Moderately Satisfactory. The project assisted in building capacity by conducting trainings for technicians and community members, carrying out feasibility studies, and provided capital funds. However, it was not able to remove barriers to RE market development, and didn't meet its targets on public awareness. The project was able to reduce only 6,363 tonnes CO2 equivalent in the PICs from RE based electricity generation as compared to its target of 2 million tonnes. Thus, the TER gives a Moderately Satisfactory rating to effectiveness of the project. Below is a detailed analysis of the components of the project:

Component 1: Technical capacity building/tech support:

The TE rated this component as Satisfactory as "Component 1 activities have had a significant impact on catalysing current investment levels in renewable energy in the Pacific region" (TE pg 33). Under this component, the project intended to improve the knowledge of key stakeholders in all participating PICs

by preparing RE resources, and providing technical training and assistance to implement RE projects. The project successfully provided training courses and renewable energy resource monitoring studies necessary for policymakers to formulate RE strategic plans and policies. Some of these studies has led to RE development in the PICs, for example "the RE resource monitoring study in Tonga has led to the preparation of the Tonga Energy Roadmap that provides action plans within the Tongan strategic energy planning framework" (TE pg 33). In addition, "the RE awareness raising program in Samoa between 2008 and 2013 (that is a part of Component 6) coupled with hydrometric surveys at 6 small hydro sites and wind data collection, catalyzed RE development by the Government of Samoa as a means of reducing fossil fuel imports and power generation-related GHG emissions" (TE pg 33).

Component 2: Market Development:

This component was only Moderately Satisfactory in removing barriers to RE market development. The TE says that the project "facilitated the expansion of the market for RET applications in the Pacific region, albeit not all to the levels envisaged in the targets. The development of RE supply chain enterprises in many of the PICs for manufacturing, supplying and installing RE systems is simply not realistic due to the lack of profit potential in small remote markets of some of the PICs" (TE pg 35). The project did manage to provide resources to strengthen capacity of the Kiribati Solar Energy Company in 2009, and provided training resources of local community leaders and personnel in the operation and maintenance of solar PV installations in the Solomon Islands, Tonga and Tuvalu. However, the TE notes that there is a gap in the sustainability due to limited qualified personnel to assist PIC governments in scaling up RE projects and investments in the remote PICs with small populations (TE pg 37).

Component 3: Institutional strengthening:

The TE rated this component as Satisfactory "since most targets in this Component have been met and has resulted in strengthened PIC institutions that have played a catalytic role in renewable energy development" (TE pg 37). The project successfully provided capacity building assistance in various PICs, for example, it trained government officers for monitoring, surveillance and quality assurance for solar PV installations on the Cook Islands, and trained technical staff at Nauru Utility Corporation and the Niue Power Corporation on solar PV operation and maintenance. The project helped establish 6 energy offices with energy plans and some have national energy coordination committees, three PICs have adopted national energy and climate change mitigation plans, 6 PICs have established national coordinating mechanisms including all within the public sector, and lastly, 10 RE projects have been designed and implemented by local experts (TE pg 38).

Component 4: Financial support:

Under this component, the project aimed to improve the availability of financing to PICs for the development of RE programs and as per the TE, it met all its targets. The project achieved in getting US $130 million from various donors including Tonga, Cook Islands, Samoa, Fiji, Kiribati & Vanuatu. Around US $218,000 were invested in rehabilitating existing RE installations, and ADB had committed to provide US $5 million to rehabilitate 5.5 MW of small hydro projects in Samoa. However, the project was not able to remove private financial barriers "due to the small markets, high investment risks and absence of attractive electricity tariffs. While it has been easier for PICs to accept donor-funded RE projects, there has been difficulty in the identification of an RE project that could be implemented and

demonstrated as a project for productive purposes that is sustainable and competitive with fossil fuel based alternatives" (TE pg 39).

Component 5: Policy and regulatory support:

This component was only Moderately Satisfactory because some of the targets had not been met. The project finished 8 national plans and strategies for RE, 5 PICs adopted RE/CC policies and guidelines and 6 of them adopted technical standards for RE systems components and their installations. However, out of 11 energy pricing studies, the project completed only 2 studies, and only one PIC had specific policies and incentives for RE-based livelihood and productivity projects. The TE notes that "despite partial achievement of the targets, the outputs of this Component strengthened the readiness and drivenness of all PICs to develop RE" (TE pg 43). The project's assistance to staff as well as other regional partners provided complementary support to each PIC towards the development of their policies, standards, acts and provisions related to RE development and the setup of quality RE systems (TE pg 43).

Component 6: Information and awareness enhancement:

This component helped in increasing knowledge and awareness raising of RE amongst key stakeholders in PICs which reflected in the policies and national programs of all PICs on the importance of developing renewable energy to mitigate climate change and to reduce the cost of electricity. The project conducted 24 training workshops, 3 PICs had operational annual RE awards, and 7 PICs had ongoing public RE awareness programs. Some examples of awareness raising programs include updating of school curriculums in Tonga on RE learning in primary schools, conducting M&E of solar water pumping at 3 secondary schools in Kiribati enhancing education and awareness, producing DVD documentaries on renewable energy for each of the 10 participating PICs, and the set-upp of a renewable energy information centre in Honiara, the Solomon Islands (TE pg 45).

4.3 Efficiency	Rating: Moderately Satisfactory

The TE reports that the efficiency of delivery of project activities were Moderately Satisfactory. The project had difficulties in implementation over a vast region that required higher operating and management costs mainly associated with travel. Also the limited capacities and remote locations of some of the PICs caused delays in adaptive management decisions that were noticeable on the implementation of activities (TE pg 56). In terms of financing, the project received more than expected co-financing and the significant impacts of the project in the PICs shows it was cost effective (TE pg 23).

4.4 Sustainability	Rating: Moderately Likely

The TER rates the sustainability of the project as Moderately Likely. The project has financial resources with governments of the PICs, and RE development has been embraced within national energy policies and plans. However, there are issues with socio-political and institutional sustainability due to maintenance of RE installations and lack of capacity. Below is a detailed assessment of sustainability criteria:

Financial resources: The TE states that the financial resources for the development of RE in PICs are available from donors as well as intergovernmental agencies. The TE mentions that "financial resources are available in all PIC governments for personnel to coordinate and manage RE project development consistent with national energy policies mandating accelerated RE development" (TE pg 61). As all PICs have national energy policies targeting 100% renewable energy, agencies are likely to pool in their resources for conferences and workshops to promote renewable energy development, however there's no confirmation of financial commitments. Thus, the financial sustainability seems moderately likely.

Socio-political: The TE reports that the social political risks are low as PICs have "strongly embraced RE development within their national energy policies and action plans" (TE pg 61). However, in terms of RE installations, sustainability is questionable as the beneficiary communities are not able to fully pay for the maintenance and the upkeep of the RE installations. "For example, some of the solar PV installations have a 2 to 3-year service contract after which the community will be in charge of maintenance; community-based maintenance without any fiscal resources may result in higher risks of power disruptions" (TE pg 61). Thus, socio-political sustainability seems Moderately Unlikely.

Institutional framework and governance: As per the TE, "all PIC governments have dedicated government personnel in charge of oversight of RE policy and legal framework, and RE product standards, and promotion of RE development" (TE pg 62). But some of the PICs with remote communities have insufficient human capacity to effectively disseminate RE knowledge and implement RE installations that are commercially viable.

Environment: The TE states there are no environmental risks affecting the sustainability of the project.

5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The actual co-financing amount of $62,810,000 was much higher than the expected amount of $27,983,000. The TE states "higher co-financing estimates were a result of the increased interest and investment of other donors to RE/EE development in the PICs, and the ability of PIGGAREP to adaptively improve its integration with these donor projects especially after 2010" (TE pg 23).

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The project experienced initial delays in finalizing work plans and allocating budgets to each country. It also faced difficulties in sourcing vendors, suppliers and engineering consulting for small remote energy markets. Delays did expose vulnerabilities of meeting RE targets and the sustainability of some of the indicators (TE pg 114).

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

The project had strong ownership from all the countries, for example in Kiribati, the relevant government agencies supported the project and continue to operate to sustain the use of solar PV and biofuels for the country. The TE describes that the project provided assistance to PICs capacity building which helped in developing and adopting policies and setting up quality renewable energy systems (TE pg 56).

6. Assessment of project's Monitoring and Evaluation system
Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 M&E Design at entry	Rating: Satisfactory

The project document provided an M&E design with provision for project inception workshop and report, monitoring reports, annual project report, implementation and quarterly reports, and mid-term and terminal evaluation reports. The TE states that the inception workshop provided an elaboration of the M&E design and assigned M&E functions to national coordinators in each PICs. The M&E design had performance and impact indicators for project implementation along with their corresponding means of verification, and most of the indicators met the SMART criteria for the purposes of effective M&E implementation. Thus, the TER gives a Satisfactory rating to M&E design at entry.

6.2 M&E Implementation	Rating: Moderately Satisfactory

The TE rated M&E implementation as Moderately Satisfactory in "consideration of the logistical challenges in effectively monitoring and evaluating this project (including the difficulties of communication and capacities of PICs to effectively and efficiently report activities), and considering the actual outcomes and impacts of the PIGGAREP project" (TE pg 28). The project had a mid-term evaluation and many of the feedback from M&E activities were used during implementation, however, the project M&E faced constraints as the Project Manager had sole responsibility of the M&E functions, a responsibility that consumed a considerable portion of their time (TE pgs 22 & 28).

7. Assessment of project implementation and execution
Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and

responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 Quality of Project Implementation	Rating: Moderately Satisfactory

The TE rated UNDP's quality of implementation as Satisfactory but the TER gives a Moderately Satisfactory rating because of flaws in implementation. UNDP was highly involved during the stages of the project and played a key adaptive management role in 2013 in leveraging the project for additional resources from Small Island Developing States (TE pg 19). UNDP also provided co-financing resources, however, the turnover rate of the Energy and Environment Officer position in UNDP Samoa was high throughout the duration of PIGGAREP which was problematic because it resulted in delays. (TE pg 29).

7.2 Quality of Project Execution	Rating: Moderately Satisfactory

The Secretariat of the Pacific Regional Environment Program (SPREP) was the executing agency of the project. The TE states during the early stages of the project "senior management involvement of SPREP was noticeably absent. This did cause issues with the progress of implementation early during PIGGAREP, drawing in UNDP to a large extent to troubleshoot and remedy some of the progress issues" (TE pg 29). However, the TE states that later on SPREP's senior management had improved considerably.

8. Assessment of Project Impacts

Note - In instances where information on any impact related topic is not provided in the terminal evaluations, the reviewer should indicate in the relevant sections below that this is indeed the case and identify the information gaps. When providing information on topics related to impact, please cite the page number of the terminal evaluation from where the information is sourced.

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

The TE does not report any environmental changes.

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

No socioeconomic changes reported

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. “Capacities” include awareness, knowledge, skills, infrastructure, and environmental monitoring systems, among others. “Governance” refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities: the project did build capacity and awareness on renewable energy, for example in Kiribati, the project’s feasibility study contributed in utilizing copra to make biofuel. Also, "the initial RE awareness programs, and subsequent institutional strengthening and capacity building assistance, the Government of Samoa through its well-qualified Renewable Energy Department within MNRE, were able to effectively implement a number of renewable energy projects in Samoa including hydropower, solar PV, wind and biogas” (TE pg 68).

b) Governance: There was no impact on governance.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

No unintended impact was reported

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

The TE does not report any GEF initiatives adopted at scale.

9. Lessons and recommendations

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

The TE described the following key lessons:

1) Project implementation teams need to carefully prepare procurement packages for goods or services to ensure that the desired goods or services are procured and that risks of a prolonged tendering process are minimized;
2) Regional projects providing soft assistance and technical support require streamlined institutional arrangements for efficient delivery; and
3) All GEF climate change mitigation projects should employ a part time Chief Technical Advisor (CTA) to provide oversight to project management and technical guidance.

9.2 Briefly describe the recommendations given in the terminal evaluation.

The TE provided following recommendations for corrective actions and follow up (TE pgs 73-74):

1) Project should carefully schedule its activities as it will determine the extent the targets can be achieved;
2) Targets on GEF projects should be reviewed and reset to adapt to changing baseline conditions;
3) Make annual budgetary allocations for retaining a pool of key technical personnel for supporting sustained operation and maintenance of existing RE systems, and efforts to fiscally and technically plan for RE capital replacements; and
4) PIC governments should focus on creating and sustaining enabling conditions that would encourage regional RESCOs to set up local RE service centres that will strengthen local O&M skill sets and improve local access to standardized RE equipment.

10. Quality of the Terminal Evaluation Report
A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF IEO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The report was elaborative in its assessment of outcomes, and impacts through the project.	S
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report is consistent and convincing in giving rating according to the evidence presented.	S
To what extent does the report properly assess project sustainability and/or project exit strategy?	The report provided a detailed assessment of sustainability and exit strategy.	S
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	The lessons learnt are adequate with evidence presented, and the TE also provides recommendations	S
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The report includes co-financing amount but there are no actual project costs listed.	MS
Assess the quality of the report's evaluation of project M&E systems:	The report assessed M&E system however, more details on implementation is needed	MS
Overall TE Rating		MS

11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

No other sources were used in preparation of the TER.