



Promoting Sustainability of Renewable Energy Technologies and Renewable Energy Service Companies in the Fiji Islands

[Project ID: 00012631]

FINAL EVALUATION REPORT

October 2010



Solar-Wind-Diesel Hybrid System in Nabouwalu, the initial proposed demonstration site for the RESCO project
Photograph taken during the final evaluation site-visit in February 2010

Supervising Agency: Multi-Country Office, Suva, Fiji, United Nations Development Programme

Team Leader: Rupeni Mario [rupenim@spc.int OR rupenim@gmail.com]; Senior Energy Adviser, Economic Development Division, Secretariat of the Pacific Community

Local Consultant: Denise Chand [denisechand@yahoo.com]

TABLE OF CONTENTS

1.0 Executive Summary	4
2.0 Introduction and Background	
2.1. Objectives of the Evaluation	8
2.2. Scope of the Evaluation and key Questions	8
2.3. Approach and Methodology	9
3.0 The Project and its Development Context	10
4.0 Findings and Conclusions	
4.1. Project Formulation	11
4.2. Implementation, Monitoring and Evaluation	11
4.3. Results	
Table 4.3.1 Development Objective with Indicators and Associated Activities	13
Table 4.3.2 Immediate Objectives, Indicators and Associated Activities	21
Table 4.3.3 Supplementary Activities	32
4.4. Conclusions	
4.4.1 General	33
4.4.2 Project outputs /outcomes and Barriers	34
4.4.3 Sequence of Events /Activities	35
5.0 Lessons Learned and Recommendations	
5.1. Lessons Learned	35
5.2. Recommendations	36
6.0 Annexes	
Annex 1 Questionnaire (8 pages)	
Annex 2 Stakeholders Consulted (1 page)	
Annex 3 List of Key Documents Reviewed (2 pages)	
Annex 4 MTR recommendations and comments (7 pages)	

What is a Renewable Energy Service Company?

A Renewable Energy Service Company (RESCO) in the context of the Charter is a company that provides electrical services to consumers from renewable energy sources, such as solar photovoltaics and wind generators. Its characteristics are:

- The serviced household does not own the generation equipment, it is owned by an external organisation such as a Government agency or the RESCO;
- The user does not participate in maintenance, all maintenance and repair service is provided by the RESCO;
- The user pays a service charge that covers the capital repayment requirement and the cost of providing for maintenance and repairs.

The concept is much like that of a conventional utility in that the generation equipment is not owned by the user and the electricity that is generated is made available to the customer for a fee. The fee charged to the user includes any required capital replacement cost (e.g. 10% of full cost under the existing rural electrification policy) and all operating, maintenance and repair costs plus a profit for the operating company.

There are two significant differences between the conventional utility approach and that of the RESCO. For a RESCO:

1. Generation may be distributed among many households instead of being centralised at a power plant;
2. Many private companies regulated by the government may provide services independently of each other.

This definition is as described by the Charter developed by the project

1.0 EXECUTIVE SUMMARY

The Project Document was signed by the Government of Fiji and UNDP in June 2000, and implementation of activities began in 2001. A midterm review was carried out in March 2003 with the final midterm review report dated June 2003 highlighting progress made in the implementation of activities but also stated a number of concerns with respect to: project coordination; steering committee membership; proposed country office's role; among others. In addition and as raised by other specific activity reports a number of recommendations for supplementary activities were formulated to strengthen the achievement of; and, realise, the relevant objectives and indicators of the project.

The final evaluation of the Project was conducted over the period February–June 2010 however reporting was not finalized until October 2010. The final evaluation report contains the main findings matched against that of the midterm review and the anticipated outputs from the supplementary activities including the barriers the project was designed to address. The final evaluation concluded that the Project has successfully produced a number of invaluable documents /reports, training activities and awareness materials on rural electrification in Fiji however, the project have not adequately addressed the barriers it was designed to – this is further elaborated in the text and summarised below.

Generally, the project has suffered from practical weaknesses (i.e. the operation of a commercialised RESCO) and inadequate control due to a weak monitoring and evaluation framework. Structurally, the project was designed with four principal pillars: (i) training; (ii) public information and awareness; (iii) technical, legal, economic, and financial analysis; and (iv) practical demonstration of private sector mobilisation to support renewable energy for rural electrification.

In respect to these four pillars, key questions were considered with the following summary of findings:

- *How effective are the strategies and activities of the project?*

Generally, the strategies and activities conform to the indicators as in the project document. There are however, some specific activities such as the establishment of a renewable energy resource database and the practical demonstration of a feasible commercial operation of a RESCO which are yet to materialise. The practical effectiveness of the strategies and activities of the project has not been achieved despite the production of a Charter, draft Renewable Energy (RE) Bill, and other comprehensive reports /documents – mainly due to the type of monitoring and evaluation framework which mainly considered the production of outputs (i.e., reports, minutes of meetings, training reports, etc) and less impact-oriented approach.

- *What are the constraints and problems encountered in the effectiveness of resource utilisation and the delivery of project outputs?*

The project has successfully delivered a number of comprehensive and invaluable reports /documents on and for rural electrification in Fiji. The monitoring of project delivery was measured against indicators by stating whether the activity has been carried out and report produced. The actual impact of whether what the report stated actually happened was not always revealed and in many cases was not realised (e.g. the respective roles of FDOE, Commerce Commission, RESCO(s) and the customers in setting the tariff as outline in the Charter were not adhered to).

- *Were there any progress made towards attaining the project's global environmental objectives as per GEF Operational Programme concerned (i.e. OP 6)?*

As outlined in the incremental costs matrix of the Project Document, 5,400 tonnes of CO₂ emissions were anticipated to be reduced per year with the commercialisation of renewable energy systems for rural electrification in Fiji. Noting that during the course of the project the demonstration site was shifted from a hybrid system to solar home systems (SHS) which thus will now have a much lower impact on reducing CO₂ emissions. The introduction of SHS at that time

reduced kerosene sales by 600 litres per month, equivalent to about 1.5 tonnes of CO₂ [and 18 tonnes of CO₂ per year] – showing an attempt towards the anticipated reduction of CO₂ emissions but not the actual amounts as anticipated.

- *The project document identified nine barriers to the implementation of renewable energy in rural electrification in Fiji. What barrier removal interventions has the project initiated to ensure long-term sustainability that was identified, developed and recommended at the mid-term review of project-initiated activities beyond the project life?*
 - i. Developed a Charter and a draft RE Bill to address the institutional framework to support private sector participation in rural electrification. The structures and responsibilities as outlined in these documents have not been institutionalized nor adhered to.
 - ii. The interventions did not address the lack of appropriate electricity tariffs to reflect the full costs for rural electricity supply as the tariff set in 2000, based on a 1999 survey by FDOE, and still exists at the time of the final evaluation exercise.
 - iii. Lack of financing for rural electrification – there is no sufficient evidence to state that the project has created an environment that increases financing for rural electrification in Fiji. It is however noteworthy that the project led to the conceptual development of a Renewable Energy (RE) Fund with detailed outline of components and operational requirements – the RE Fund was not established; and the development of standards for SHS which is now been used in a World Bank, FDOE and ANZ Bank sustainable financing project for SHS.
 - iv. Institutional barriers to fee collection – this has been addressed through the introduction of prepayment meters where customers are required to pay a monthly fee to the Post Offices.
 - v. Lack of expertise in business management and marketing strategy – activities led to the development of a comprehensive business plan for RESCOs, this however has not been tested /tried by a RESCO. There were short term trainings provided on business management and marketing but these ceased as the project concluded.
 - vi. Limited expertise in design, installation, operation and maintenance of renewable energy systems – the project contributed to addressing this through additional training of Fiji-based personnel and provision of additional resource materials, for the short term only.
 - vii. Lack of information and awareness of the potential for renewable energy systems among decision-makers and villagers – there was a public awareness campaign with FDOE and a private sector communications company, PASIFIKA. The awareness campaign was conducted including its evaluation within a 6-month timeframe.
 - viii. Incomplete assessment of renewable resources – renewable energy resource assessment has been part of FDOE's on-going activities. The project in addition to providing some monitoring equipment also proposed to design a resource database which is still to be completed.
 - ix. Institutional constraints – the project has developed a framework to clearly delineate responsibilities for key stakeholders participation in rural electrification programmes. The present practice is a mix of what is described in the Charter and the Rural Electrification Policy (1993). As such, institutional constraints have not been adequately addressed.

- *Has the project leveraged co-financing and policy changes?*

There is no substantial additional financing and policy changes as a result of the project. However, it is noteworthy that at the commencement of the project the setting up of the RESCO demonstration site was made possible through funding from Japan and the Fiji Government. Further, with respect to SHS, FDOE still pursues the 1000-2000 SHS required for the proof of concept of RESCO. FDOE estimates that 15,000-20,000 SHS are required for the fully commercialization of a RESCO. As for policy changes, this has not been successful as the proposed elements in the Charter /draft RE Bill has not been enacted nor strictly practiced.

- *To what extent has the public been involved in the project and whether public involvement has been appropriate to the goals of the project?*

Public involvement was through a public awareness campaign with feed-back sought from targeted groups only. Reports show that there has been some knowledge of renewable energy and its nature as compared to conventional sources; also that the public is interested in renewable energy solutions but still have doubts on costs and reliability issues. These revealed that the feed-back was limited and do not reflect the views of the general public. The public campaign was appropriate in that information was disseminated but not so much in that whether the information was understood by the general public.

- *To what extent has the project impacts reached the intended beneficiaries, both within and outside project sites?*

In the respective communities the impacts were immediate in terms of minimising the use of kerosene for lighting – kerosene consumption fell by 600 litres per month – there were no references to the use of batteries and candles. Students interviewed during the final evaluation exercise did state that studying and doing homework were more enjoyable with the SHS as to a kerosene lantern. As for the near-by communities, the initial demonstration site has triggered interest thus the current expansion in the use of SHS lighting purposes.

- *What are the likelihoods of continuation of project outcomes and benefits after completion of GEF funding?*

Despite the incompleteness of some activities and the perception of stakeholders, there are indications that the RESCO concept will be further developed and implemented in Fiji for rural electrification. It is now a matter of formalising the framework formulated by the project and enhancing the practical aspects with the up-scaling to 15,000 SHSs for RESCO(s) to operate commercially – these to be progressed in the context of the rural electrification policy, national energy policy, related regulations and legislation and, the proposed Fiji Sustainable Energy Bill.

- *How has the state of renewable energy application in Fiji changed, within the life of project implementation, and what has been the contribution of the project to those changes?*

Renewable energy in Fiji since 2000 has developed considerably noting an increase in the number of SHS units installed and serviced by the current RESCO(s) from 60 to about 1400 at present; the expansion in hydro-power and commissioning of a 10MW wind farm by the Fiji Electricity Authority; and other small micro- /pico-hydro rural electrification schemes including biofuels (coconut oil). With respect to the Fiji RESCO project contribution, the final evaluation exercise reveals that the documentations have actually highlighted issues and stated possible solutions for rural electrification in Fiji [and the region] – for example:

- the Charter [and the draft RE Bill] have stated how a RESCO could operate with clear responsibilities;
- a business plan outlining a structure and operational mode for the commercialisation of RESCOs; and
- the weaknesses in some of the traditional approaches to projects in the Pacific (i.e. a traditional public awareness campaign – development of awareness materials and dissemination within a short timeframe, the assumption that there will be some socio-economic benefits, and a project design that is ambitious and not impact oriented).

The final evaluation raises practical concerns, which are now recommended to be addressed immediately:

- Re-examine the Charter [and the draft RE Bill] in the context of the rural electrification policy, national energy policy, other current legislation and regulations to promote the use of renewable energy and, the proposed Fiji Sustainable Energy Bill. This will allow for the opportunity for the RESCO concept to be re-considered in the operational context of current rural electrification initiatives.

- ii. Further review the project documents including the draft outline of a RE Fund, the business model(s) for RESCOs, training programmes, among others so as to provide the basis for current proposed similar initiatives such as the Fiji Renewable Energy Power Project and the Sustainable Financing for Renewable Energy Project.
- iii. Re-examine the modality of the RESCO Project Management Unit and consider an arrangement that would encourage and allow for a better participation of the private sector in the implementation of similar energy initiatives.

Furthermore, there are a number of project outputs and lessons learned worth noting for current energy initiatives in Fiji. These are summarized as follows:

- The lessons learned (Section 5.1 of this report) which are applicable and noteworthy for consideration in the design and implementation of similar projects such as the Fiji Renewable Energy Power Project (FREPP) which has the objective of the removal of major barriers to the widespread and cost-effective use of grid-based renewable energy supply via commercially viable renewable energy technologies; and
- The RE Fund – a detailed description of guidelines and implementation modalities developed as part of the supplementary activities of the project in 2005 are worth considering in the context of having as a financial mechanism for rural electrification in Fiji – as is with the current World Bank, FDOE and ANZ Sustainable Energy Financing Project.
- There is the whole-of-sector approach whereby energy projects need to consider how it would impact the socio-economic dimensions of a community needs to be considered from the onset and not to simply assume that the project will eventually address them.

In the midst of its very ambitious scope and anticipated outputs, the Fiji RESCO project has highlighted fundamental requirements and practical challenges in rural electrification that were not specifically addressed during its course of implementation. It is therefore expected that the above recommendations together with the lessons learned will help materialise earlier attempts to commercialise the operation of RESCOs in Fiji.

2.0 INTRODUCTION AND BACKGROUND

2.1 Objectives of the Evaluation

To determine to what extent the project has achieved its objectives and has removed barriers to the implementation of renewable energy systems for rural electrification in Fiji. It is intended to analyze and assess the relevance, sustainability, impact and effectiveness of the strategies, project design, implementation methodologies and resource allocations that have been adopted for the purpose of achieving the objectives stated in the project document.

The specific objectives of the evaluation are as follows:

- To identify and evaluate the effectiveness and outcome of strategies and activities of the project;
- To identify and evaluate the constraints and problems, which have been or are being encountered, the effectiveness of resource utilization and the delivery of project outputs;
- To assess progress towards attaining the project's global environmental objectives per GEF Operational Programme concerned (OP No. 6);
- To assess the barrier removal interventions that were identified/developed/recommended at the mid-term review to ensure long-term sustainability of project-initiated activities beyond the project life;
- To identify the manner and extent to which the project has leveraged co-financing and policy changes
- To assess the level of public involvement in the project and recommend on whether public involvement has been appropriate to the goals of the project;
- To review and evaluate the extent to which project impacts have reached the intended beneficiaries, both within and outside project sites; and
- To assess the likelihood of continuation of project outcomes and benefits after completion of GEF funding.

2.2 Scope of the Evaluation and Key Questions

The scope of the evaluation covered four objectives which are consistent with the Monitoring and Evaluation (M&E) policy and procedures of UNDP/GEF. These are: i) to monitor and evaluate results and impacts; ii) to provide a basis for decision making on necessary amendments and improvements; iii) to promote accountability for resource use; and iv) to document, provide feedback on, and disseminate lessons learned.

The key questions considered in the evaluation were as follows:

- How effective are the strategies and activities of the project?
- What are the constraints and problems encountered in the effectiveness of resource utilization and the delivery of project outputs?
- Were there any progress made towards attaining the project's global environmental objectives as per GEF Operational Programme concerned (OP No. 6)?
- What barrier removal interventions the project has initiated to ensure long-term sustainability that were identified /developed /recommended at the mid-term review of project-initiated activities beyond the project life;
- Has the project leveraged co-financing and policy changes?
- To what extent has the public been involved in the project and whether public involvement has been appropriate to the goals of the project?
- To what extent has the project impacts reached the intended beneficiaries, both within and outside project sites?
- What are the likelihoods of continuation of project outcomes and benefits after completion of GEF funding?
- How has the state of renewable energy application in Fiji changed, within the life of project implementation, and what has been the contribution of UNDP & GEF to those changes?

In pursuing the above, the following key issues were considered:

- Changes in the enabling environment such as policy changes, increasing stakeholder involvement, alternations in institutional capacity.
- Impact: Aside from direct and obvious impacts, the project may have generated indirect or collateral impacts. These are difficult to quantify, but may be usefully illustrated according to types and examples and evaluated using narrative approaches, through case studies, and evaluations, such as:
 - Political influence: Contributing to an enhanced political profile that supports renewable energy in the country;
 - Enhancement of information and access to it: Generating and disseminating information on renewable energy and its status that contributes to the global and regional information base;
 - Replication: Promoting the adoption of successful GEF approaches in other locations and projects
 - Catalytic effects: Generating other positive steps, catalyzing state legislation that is outside the project's objectives;
 - Financial leverage: Prompting the availability of new and additional resources and co-financing;
 - Synergy: Fostering positive synergies across conventions and focal areas; and
 - Empowerment: Boosting the stature and power of focal points through finance, information, and projects.



Interviews with customers in February 2010



Students were also consulted

Furthermore, the final evaluation looked at a more outcome /impact achievement of the project activities. That is, whether the project has actually removed the barriers identified in the project document; has the Charter [and the draft RE Bill] contributed to the up-scaling of use of solar home systems (SHS); how has the RESCO approach made a difference in the rural communities; and whether the project achieved its objective of reducing GHGs. It is also notable that the evaluation exercise was not conducted to identify the weaknesses of those who have been initially involved in the project but rather to highlight what the project has accomplished and what it did not as envisaged due to certain reasons.



Field diaries (and receipts) that record the service schedules and activities conducted during the RESCO visits

2.3 Approach and Methodology

The final evaluation exercise took a standard approach including the review of project documents, conducting interviews with key stakeholders and a field visit to the RESCO demonstration site, Vunivau Settlement in Vanua Levu.

Face-to-face interviews were conducted and where not possible questionnaires were used – a sample questionnaire is appended as Annex 1. Key stakeholders consulted were the customers (including the elders and students), implementing and executing agencies, consultants involved in the implementation of activities, personnel directly involved with the project, RESCOs, and other energy experts.

The field visit in February 2010 covered a total distance of 900km by road as indicated in the Figure below. It is also indicative of the total distance between the current SHS sites consisting of about 1,400 SHS serviced by one RESCO.

3.0 THE PROJECT AND ITS DEVELOPMENT CONTEXT

The project, *Fiji: Promoting Sustainability of Renewable Energy Technologies and Renewable Energy Service Companies*, supported by the UNDP /GEF aimed at removing barriers to the implementation of renewable energy systems for rural electrification in Fiji. These barriers, as described in the project document, are:

- i. Lack of sustainable institutional framework to operate rural electrification on a commercial basis and provide reliable service;
- ii. Lack of the appropriate electricity tariffs to reflect the full economic costs for rural electricity supply;
- iii. Lack of financing for rural electrification;
- iv. Institutional barriers to fee collection;
- v. Lack of expertise in business management and marketing strategy;
- vi. Limited expertise in design, installation, operation and maintenance of renewable energy systems;
- vii. Lack of information and awareness of the potential for renewable energy systems among decision-makers and villagers;
- viii. Incomplete assessment of renewable resources; and
- ix. Institutional constraints.

The broad development objective of the project was the provision of electricity services to rural areas, to support and sustain social and economic development with minimum disruption to the local, regional and global environments and, with maximum economic efficiency.

Further, the project was aimed to reduce greenhouse gas emissions through the development of a sustainable institutional framework to accelerate commercial utilisation of renewable energy systems to substitute for current use of diesel generators (in Nabouwalu), and where feasible for replication in other parts of Fiji.

However, several mid-course adjustments on the project were made, such as the shifting of the RESCO demonstration to the Vunivau SHS Project instead of the earlier envisaged Nabouwalu hybrid system. Based on the findings of the mid-term review, and the review of the reports that were prepared and submitted by project consultants, several gaps were identified. To address these gaps, supplementary activities were carried out to: (1) strengthen the achievement of; and, (2) realise, the relevant objectives and indicators of the project.

The supplementary activities were as follows:

- i. Completion of the renewable energy (RE) resources database;
- ii. Evaluation of the RE Charter and proposed RE Bill;
- iii. New Survey of Potential RESCOs;



Current SHS sites serviced by a single RESCO in Vanua Levu

- iv. Preparation of RESCO bidding documents;
- v. Performance evaluation of the Nabouwalu hybrid power plant;
- vi. Performance evaluation of the Vunivau SHS project;
- vii. Design of a RE fund;
- viii. Documentation of the public awareness campaign;
- ix. Completion /finalization of the selected project reports;
- x. Assessment of present impacts of the Fiji RE project activities;
- xi. Design of a sustainable follow-up programme for the replication of relevant project interventions; and
- xii. Recommended Fiji RE project Phase II.

4.0 FINDINGS AND CONCLUSIONS

The findings and conclusions are based on the review of existing project documents, interviews with key stakeholders and a field visit¹ to the pioneering Fiji RESCO demonstration site. A list of stakeholders consulted is provided in Annex 2.

4.1 Project Formulation

The project has been formulated based on a set of GEF eligibility criteria and in relation to the requirements of the GEF's Operational Programme 6 (OP6) on Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs. In as much as it is a barrier removal project, its design was based on the analysis and understanding of the barriers /issues /concerns to the development and implementation of renewable energy-based power generation in the Fiji Islands. More specifically, the project has four immediate objectives with specific outputs as referenced in Table 4.3.2 of this report. The project also had identified risks and prior obligations including a monitoring and evaluation procedure.

The linkages in the immediate objectives and the context of the project are not explicit with the objectives and indicators in Section C of the project document not directly addressing the development objectives of the project. The project is supposedly be to develop an enabling environment for the widespread-use of renewable energy technologies for rural electrification and not to implement one-off type activities such as providing short-term training to technicians and policy makers – these are discussed in subsequent Sections of this report.

The project design basically has two main components (i) to develop an enabling environment to allow for the operation of RESCOs; and (ii) the demonstration of the operation of a RESCO. The design was such that (i) and (ii) are implemented concurrently which logically cannot happen as a successful operation of a RESCO will materialize only if there is a framework in place, that is, developed, enacted and enforced. The project however, continued along the path of whether there is a framework or not which perhaps led to the belief that a RESCO could simply operate without a proper framework. Additionally, the Charter that was endorsed by Cabinet at that time did not sufficiently consider all aspects of rural electrification as outline in the Rural Electrification Policy (REP1993) – a better approach perhaps would have been to review the REP1993 and incorporate the RESCO elements and take it through the national process of adopting the revised REP.

4.2 Implementation, Monitoring and Evaluation

Section F.2 of the project document provides details on the implementation arrangement consisting of:

- i. An executing agency being the Fiji Department of Energy (FDOE) where the project was established;

¹ This was the first ever visit by the implementing agency to the demonstration site.

- ii. A Project Steering Committee (PSC) consisting of FDOE, PWD (Public Works Department), FEA (Fiji Electricity Authority), NLTB (Native Land Trust Board), local landowner representatives, provincial government, project donors, PICHTR, UNDP, academics and the private sector; and
- iii. An implementing agency (on behalf of GEF) being the UNDP Fiji Multi-Country Office to which the FDOE was responsible for technical and financial reporting.

Monitoring and evaluation were to follow UNDP rules and procedures. In addition, the performances of project activities were to be measured against the indicators in the project planning matrix shown in Section C of the project document.

Key documents reviewed over the course of the final evaluation included minutes of meetings, quarterly reports, and the mid-term review report. A list of these documents is appended as Annex 3.

In the course of the implementation of the project and part of the monitoring and evaluation there was a mid-term review (MTR) exercise. The MTR final report had ten recommendations² – that highlighted areas requiring immediate attention – of which most were administrative revealing that there was a lack of coordination and collaboration among the key stakeholders: the project management unit, implementing and executing agencies and the consultants. As such, limited (in some cases none at all) efforts were undertaken for corrective measures that could have salvaged the delivery aspects of the project.

² Annex 4 provides the list of recommendations from the MTR and the Final Evaluation Team's comments.

4.3 Results

The following table format has been adopted from the MTR report summarising the mid-term review findings in June 2003 with the final evaluation results, against the project indicators and associated activities as outlined in the project document in pages 13-20. Presented below are: Table 4.3.1 which addresses the development objectives, Table 4.3.2 highlighting the immediate objectives with the respective indicators and associated activities – where there is repetition of indicators and activities, these are referenced accordingly; and, Table 4.3.3 on the Supplementary Activities.

TABLE 4.3.1 Development Objective with Indicators and Associated Activities

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
Development Objective: The project is aimed at reducing CO ₂ emissions through setting up a sustainable institutional framework to accelerate commercial utilization of renewable energy hybrid systems to substitute for current use of diesel generators in Nabouwalu, for replication in other parts of Fiji.				
<p>Indicator: An effective government-adopted institutional and management policy framework in place for RESCOs to have a major role in renewable energy-based rural electrification by end of July 2002.</p> <p>Associated Activities:</p>	<p>First draft of the policy framework to be ready by end of January 2002</p>	<p>A framework, in the form of a Charter with defined roles for the private sector and for FDOE, was prepared and was approved by Government in March 2003. The Government has agreed to draft a Parliamentary Bill based on the Charter.</p>	<p>In addition to the Charter, a draft Renewable Energy Bill was developed but not enacted.</p>	<p>On its effectiveness, the contents of the framework have not been fully realized for RESCOs to have a major role, apart from just providing servicing to the systems.</p>
<p>A regulation Charter for RESCOs is drafted. The Charter will address: asset valuation, ownership and liability transfer or equipment lease; Land acquisition; Issue of licenses; Management autonomy and authority, and local involvement in the proposed RESCO; Investment application procedure, and competitive bidding procedure; and Import duties and other taxes</p>		<p>A Charter for RESCOs has been prepared that emphasises individual household renewable energy systems for rural electrification in Fiji, although provisions are made also for centralised generation and reticulation systems.</p>	<p>The itemized aspects anticipated to be addressed by the Charter are not been fully adhered to as current RESCO operations do not strictly follow the Charter. It is noteworthy that the rural electrification policy entails the options of (1) diesel schemes (2) house wiring and (3) grid-extension, to the community. The charter does not exactly encompass these options.</p>	<p>The current rural electrification programme (i.e. with respect to SHS) follows a mix of guidelines, i.e. pre-Charter and some elements of the Charter. Further, the findings reveal that the Charter was designed specifically to address the RE component of rural electrification. The better and perhaps the most logical option would have been that the RESCO project to review the Rural Electrification Policy of 1993 and incorporate the RE component.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>A report to define FDOE's role. Define the role of FDOE as a technical regulator [in] setting up quality and safety standards; establishing technical specifications; and conducting equipment testing to ensure the quality of the procured systems.</p> <p>Outline FDOE's role to provide information and technical assistance to the RESCO, the government's role to enable local communities to participate in PV dissemination and facilitate affordable financing [for the RESCO].</p>		<p>These issues are covered in the Charter document.</p>	<p>FDOE roles and other issues been covered by the Charter however not been strictly practiced or referenced in current SHS /RESCO-type projects. This thus, raises the issue of whether there was a need for a Charter.</p>	<p>As required by the indicator the activity has been completed successfully.</p>
<p>A report to define [the] Commerce Commission's role. Work with the Commerce Commission to define its role as an independent economic regulator to approve the electricity price and oversight the fiscal accountability of the RESCO.</p>		<p>The role of the Commerce Commission, as discussed in the Charter, is to advise the DOE in establishing the tariff in RESCO-operated centers. The Charter provides that actual tariffs are set by negotiations among the DOE, the RESCO[s] and users, with DOE acting as binding arbitrator.</p>	<p>There is no indication of the Commerce Commission participating in tariff-setting for rural electrification. The current rural electrification monthly tariff on SHS is F\$14 and is calculated based on a survey by FDOE in 1999 where kerosene lighting costs were in the range of F\$6-14 per month.</p>	<p>With RESCOs currently not operating as a commercial entity – i.e. the fees are set and collected by FDOE – the involvement of the Commerce Commission is not required.</p>
<p>Disseminate the drafted Charter among all stakeholders and policy-makers and eventually submit to the Cabinet for approval.</p>		<p>Completed. Charter approved by Cabinet in Mar 03.</p>	<p>Participating and potential RESCOs are not aware of the Charter and its contents.</p>	<p>Approval at that time (2003) but not disseminated widely to stakeholders – the pioneering RESCO (RES Fiji Ltd) and the current RESCO (Powerlite Ltd) have requested copies of the Charter and have mentioned during discussions that they are not aware of a Charter /framework specifically for RESCOs.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Indicator: A commercial and sustainable RESCO operates the Nabouwalu hybrid system and other renewable-based power systems by November 2002.</p> <p>Associated Activities:</p>	<p>Potential RESCOs identified by end of Nov 2001</p>	<p>The project is not pursuing Nabouwalu as a RESCO demonstration site. Selection of an alternative site(s) has not been finalised.</p>	<p>The RESCO demonstration site was relocated to Vunivau Settlement as the Vunivau SHS Project. The decision to relocate the demonstration site was made by a simple discussion during a steering committee meeting dated 23 August 2003. There were no proper analysis to substantiate the relocation and no attempt to change the details including the calculations of emission reduction opportunities in the project document.</p> <p>There is no commercial RESCO operation yet, as the current RESCO (and the pioneering RESCO – RES Fiji Ltd) had to rely on other means of business activities to supplement its revenue.</p> <p>Discussions with FDOE also revealed that about 20,000³ SHS would be commercially practical under the current service model – i.e. the current RESCO practice.</p>	<p>Partially achieved with respect to the Charter definition of a RESCO (page 3 of this report) – however not strictly in the commercial sense.</p>
<p>An information sheet to determine the concession areas.</p> <ul style="list-style-type: none"> • Define and publish the selection criteria and procedures of the bidding for the RESCO to facilitate a transparent bidding process • Determine the concession area including Nabouwalu for the potential RESCOs to bid 		<p>Competitive bidding for a RESCO for Nabouwalu has not been pursued. The focus has shifted to individual Solar Home Systems (SHS), for which large-scale projects are planned in 2 phases. DOE targets 18,000 SHS over 10 years. At the 7 May 2003 Tripartite Review Meeting, project management was requested to prepare documentation to support the shift away from Nabouwalu as a RESCO demonstration site, for approval by the project Steering Committee and UNDP/GEF. This is also a key recommendation of this review.</p> <p>Survey data for concession areas is being collected and is nearly complete (80 villages and about 4,000 households have been surveyed so far). The information is being entered into a computer database. However, information from the database (which among other things is needed to complete the analysis of economic and tariff issues) is not yet available. DOE staff is not yet trained in effective use of the database. Bidding documents have not yet been prepared.</p>	<p>There is an undated 9-page <i>Village and RESCO Selection Criteria</i> document – presented as a draft document.</p> <p>There has been a tender process following rigorous government procedures.</p>	<p>The information sheets are available in draft form and used as references /guidelines to the current rural electrification activities.</p>

³ It is of noteworthy that this is the estimated amount of systems to be installed for a fully commercialised RESCO operation reference “Renewable Energy Policy Development Background: For the Charter for Renewable Energy Based Rural Electrification with Participation of Private Enterprise” paper. Note that the current pursuance for the 1000 – 2000 SHS is still considered as “proof of concept” pilot project

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings – April 2010	Analysis and Comments
Number of RESCOs participate in the bidding process		A small number of potential RESCOs have been identified but no bidding has yet commenced.	The initial bidding was awarded to RES Fiji Ltd, the pioneering RESCO. The current RESCO that services the 1,400 SHS in Vanua Levu is Powerlite Ltd.	There are few (3-5) potential RESCOs – in that these are existing engineering companies. With the isolation and notable distances between the villages /sites for SHSs, there is a need to decentralize the RESCO operations for better service delivery.
<p>Selection criteria and procedure for the bidding published:</p> <p>Prepare a minimum technical specification for the bidding proposals as well as an information package to be given to potential [RESCOs].</p>		Technical specifications and procedures for RESCO use have not yet been prepared.	<p>The bidding procedure is a standard government tender process however been tailored to address some specifics such as experience with SHS /rural electrification.</p> <p>Technical specifications were prepared and presented in a report dated June 2003.</p>	Have successfully been delivered as required.
A RESCO is selected		No bidding has yet commenced.	RES Fiji Ltd was selected in 2001 to pilot the RESCO concept. Powerlite Ltd is the current RESCO in operation servicing about 1,400 SHS.	As required by the indicator this activity has been completed.
<p>Indicator: Information on renewable energy technologies disseminated to the public (public awareness campaign) by July 2003</p> <p>Associated Activities:</p>		Materials and content of the campaign are not yet finalised. It is unlikely that the full requirements of this indicator will be met by July 2003. Activities are planned to be carried on through to the end of 2003.	A public awareness campaign was carried out by FDOE in early 2004 with an impact survey by PASEFIKA in April 2004.	Has been produced and disseminated but the assessment methodology and scope of the impact was not properly conducted as the impact survey was for a targeted audience and not the general public.
<p>Increased public interest and demand for renewable energy systems</p> <p>Conduct [a] public awareness campaign. Develop and disseminate information about the renewable energy technologies, [their] benefits, potential[s], constraints, problems and impacts, as well as [the] RESCO concept through posters, newsheets, radio broadcasts, etc. The campaign will target villagers, school teachers, NGOs, government decision-makers,</p>		A local Public Relations Officer (PRO) has been recruited under the Project. The PRO has been involved in community survey work and appropriately conducts information workshops on renewable energy in villages in conjunction with this. Villagers in target areas for renewable energy-based rural electrification are clearly the most important group for public awareness in the short term, as lack of acceptance of renewable energy technology among the rural population may be	<p>The impact survey was conducted with targeted groups that are already aware of energy issues. The results stated were as follows:</p> <ul style="list-style-type: none"> ▪ RE projects are well known ▪ RE solutions are cheaper than diesel generation ▪ Hydropower was better known as a major source of RE ▪ Fossil fuel is recognized as being polluting <p>This impact survey is not representative as it</p>	<p>The impact survey of the awareness campaign was carried out too soon (April 2004) following the campaign in early 2004.</p> <p>Such campaigns could have been conducted at the initial stages of the project.</p> <p>The awareness campaign seems to be carried out in the context of just having an awareness activity as it was left too late into the project</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings – April 2010	Analysis and Comments
<p>public-service workers, and potential investors. Where appropriate, the awareness programmes will use the Nabouwalu system as demonstration for awareness raising campaign.</p>		<p>a key constraint. However, the effort needs to be broadened to include the entire rural population, e.g., via the schools. As of the first quarter of 2003, about 10 percent of the Project budget for public awareness has been expended. However, a draft brochure and an information video are being prepared for use on TV, in national workshops, and for general dissemination. An opportunity exists to broaden the campaign by working with the FEA (which now conducts renewable energy feasibility studies and public information campaigns throughout rural Fiji, not only in its service territory as formerly), and this and other avenues should be explored by Project management.</p>	<p>does not state the general public perception of renewable energy.</p>	<p>timeframe.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Indicator: FDOE staff is technically capable of RE system evaluation and testing by July 2003 <i>and</i> All renewable energy systems are met with quality assurance from February 2003.</p> <p>Associated Activities:</p>		<p>Equipment testing and sustained quality assurance mechanisms have not been finalised under the project and do not yet affect the broader market for renewable energy systems in Fiji.</p>	<p>SHS Equipment Testing for PV-modules, batteries, voltage regulators, pre-payment meters, inverters and fluorescent lights, 32-page manual was prepared and dated 2003. The manual covers testing and selection procedures. On the capability of staff, a number of training activities were conducted in May 2002 to June 2003.</p>	<p>Current staff members are technically capable despite the high turnover of staff since 2000 – this is attributed to government human resource development programmes. The project also played a key role in this regard in terms of producing training materials that are still been used.</p>
<p>Prepare technical specifications and standards for renewable energy components and systems, such as wind turbines, inverters, PV panels, battery charge controllers, and batteries.</p>		<p>Equipment specification and records concerning equipment performance at DOE are reportedly poor. The experience of earlier projects (for PV, Namara) has not been well recorded or analysed, nor applied to subsequent projects (Naroi and Vunivau).</p> <p>A detailed report on the technical and economic performance of the Nabouwalu hybrid system would be highly desirable.</p> <p>Detailed technical specifications and standards for renewable energy equipment have not yet been prepared but are planned as part of the training on equipment testing and specifications in April 2003.</p>	<p>Specifications for SHS including that of individual components were presented in a report dated June 2003.</p> <p>These specifications are currently being used widely by the FDOE for its SHS rural electrification programme – one of the few documents produced by the project that is currently being used by FDOE.</p> <p>The standards are now been used for a WB /FDOE /ANZ renewable energy sustainable financing project</p>	<p>This been successfully completed with the focus on SHSs.</p> <p>One of the most successful components of the project as this has been used to complement current initiatives in expanding SHSs in rural electrification.</p>
<p>Increased consumers' confidence in renewable energy systems as a result of the improved quality of renewable energy equipment</p>		<p>Demands from the rural public for renewable energy systems are frequently received by FDOE, indicating public interest. However, the relationship between public interest in renewable energy and quality assurance programs under the project cannot at this stage be demonstrated.</p>	<p>There is an increased demand for RE systems however, the increasing demand is not directly due to the quality of the systems. The increased demand for RE systems appears to be driven mainly by the cost of petroleum products (fuel) and carting of fuel to these remote areas. On the current system quality the customers are satisfied with the lighting and power-point for a transistor radio.</p>	<p>Prompt service schedules with available spare-parts on demand [which is not the current situation] will build this consumer confidence and not on system quality only.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Improved capacities of FDOE staff in testing renewable energy equipment.</p> <ul style="list-style-type: none"> • Provide training [to] FDOE staff in equipment testing techniques and procedures. 		<p>Little equipment testing is now carried out. The Project has provided training in equipment testing and troubleshooting.</p> <p>There was once a well-equipped testing laboratory at DOE, but at present it is little used, due to limited equipment installations in recent years. Some equipment testing is reportedly now done in the field. However, it is not clear how new and untried equipment can be adequately tested in this way prior to distribution. (this paragraph is irrelevant and outside the scope of training required for this activity)</p> <p>The USP has a lab capable of calibrating anemometers and in the past was capable of SHS component testing. Cooperation between DOE and USP for equipment testing may be a way of gaining capacity for testing without extensive investment. DOE may wish to consider outsourcing (contracting outside of DOE) of testing functions may be a means to meet the need for testing in a cost effective way, without investing in a new lab.</p>	<p>There were trainings provided to FDOE staff through the project. Due to staff turn-over during the period 2000 – 2010, experienced technicians at FDOE have moved on to other employers.</p> <p>Such very useful training seems to be carried out on an ad-hoc basis, i.e. as part of a project such as the Fiji RESCO which normally has a finite period. The suggestion of working with traditional training institutions like USP in the MTR is commendable and should have been considered during the setting-up of a mini-laboratory at FDOE.</p>	<p>A sustainable training mechanism is needed to maintain the human resource capacity at FDOE [and other RESCOs]</p> <p>A major portion of the project training component should have been used to develop a dedicated training programme in institutions such as USP (and FIT (now Fiji National University – College of Engineering and Sciences)).</p>

Additional Comments to the presentation in Table 4.3.1

- i. The development objective of the project aims at reducing CO₂ emissions through setting up a sustainable institutional framework to accelerate commercial utilisation of renewable energy hybrid systems to substitute for current use of diesel generators in Nabouwalu⁴, for replication in other parts of Fiji. Indicators in Table 4.3.1 (and as presented in the MTR) only made reference to the institutional framework and does not address the emissions component.
- ii. The incremental cost matrix presented in Annex 3 of the project document highlighted the global and domestic environmental benefits. In the original proposed demonstration site at Nabouwalu the incremental global benefits was a reduction of 5,400 tonnes of CO₂ emissions per year and, a domestic benefit of an estimated US\$2.5m savings from diesel imports. It is noteworthy that these incremental costs were not recalculated when the demonstration site was shifted to Vunivau with the use of SHS instead of a solar-wind-diesel hybrid system. This then makes the evaluation exercise difficult as the project does not have a baseline to make comparison with.
- iii. Improvements in energy production, savings or installed capacities – the accomplishments in July 2004 stated the total installed capacities of 25 kW of SHS with a commentary that they were in good condition and operational. There were no stated calculations of the tonnes of CO₂ emissions avoided per year and the watt-hours generated per year. Note that the targets in as per the Project Implementation Report were: 250 units of SHS (at 100 W_p per unit) to be installed, operated and maintained by a RESCO; 54.75 MWh/year delivered at 6 hrs/day, 365 days/year; and 47 tonnes CO₂ emissions avoided per year at SFC = 0.3 l/kWh for typical diesel generator sets – reference additional comments to this regard in Table 4.3.3, below.
- iv. F\$14 /month tariff – since the initial phases of the project in 2000 the tariff has not changed over the years despite the obvious increase in operational costs for providing the RESCO services, particularly for transportation costs to access the site(s) – it is noteworthy that the monthly tariff of F\$14 does not go directly to the RESCO as payment for service rendered. The payment to RESCO by FDOE was F\$19.95 per household serviced (from 2000 – 2009); and F\$15.95 per household serviced every 2 months in 2010, this has recently further decreased to F\$14.43⁵ per household serviced every 2 months – the reason being that the number of SHS have increased. With the 2 months service schedule it is also notable that the total tariff collected will be F\$28 (i.e. F\$14 x 2).

In addition, during the field visit in February 2010, customers raised the issue of having to pay a substantial cost to cover required transportation to reach a designated Post Office to pay the monthly fee. The transportation costs could amount up to F\$11 return, tallying to F\$25⁶ as a monthly expense (or \$50 as a bimonthly expense).

⁴ The demonstration RESCO site was shifted from Nabouwalu (solar-wind-diesel hybrid system) to Vunivau (stand-alone SHS). It is noteworthy that this has not changed the development objective of the project.

⁵ FDOE anticipates that the service fees will further decrease to as much as F\$10 per system serviced every 2 months

⁶ It should be also noted that rural customers don't normally have a substantial amount of cash to enable them purchase more than one month's recharge – therefore this forces the customer to still travel to the Post Offices on a monthly basis.

TABLE 4.3.2 Immediate Objectives, Indicators and Associated Activities

Immediate Objective 1: To develop a regulatory and financial framework for RESCO(s).				
Indicator: Legal and regulatory framework for RESCO[s] established by the end of July 2002.		These have been addressed in Table 4.3.1		
Indicator: A RESCO is awarded to have the concession right to provide renewable energy services to Nabouwalu and other defined government stations or villages through a competitive bidding process by end of July 2002.				
Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings – April 2010	Analysis and Comments
Indicator: Financial framework and incentive policies for the RESCO established by November 2002.		<p>Consultant services to support this area are not yet completed. One consultant contract was terminated for lack of performance and the work was distributed to the remaining consultants, contributing to delays. The consultants' reports are expected to be finalised by August 2003. Collection of data from government rural stations – a key input to the consultants' reports – is also seriously delayed.</p> <p>A first-draft report on economic issues has been prepared, which reports initial findings on expenditures for energy by rural households. However, analysis of the costs of the range of renewable energy technologies in use in Fiji, including mini-grid hybrid, hydro, and biomass systems and individual Solar Home Systems under RESCO operation has not been completed, nor have policy issues (e.g., subsidies) been fully addressed. In its present draft, the report does not adequately evaluate the economic sustainability of potential RE systems and their affordability; nor does it adequately treat issues of institutional capacity, environmental impacts, or the policy environment. The extent of replicability of the RE-based power generation initiatives that are promoted by the project have not yet been determined.</p> <p>The Nabouwalu project is not the focus of the economic issues report. Rather, the report is (or will be) generalised to include cost-of-energy estimates for all renewable energy systems in use in Fiji. The consumer survey work underway to support this analysis is similarly broad and covers more than 80 villages throughout Fiji.</p> <p>A business plan for a RESCO operating Solar Home Systems is under preparation. Financial incentive policies are included in the approved RESCO charter (discussed above).</p>	<p>Business plan documents were prepared as part of the activities including sheets to monitor cash flows, recurring costs, among others.</p> <p>The rural electrification programme however continues to operate in a mix of conditions where neither the Charter nor the rural electrification policy is strictly followed. E.g. FDOE sets and collects the tariff, and procures and disseminates the spare parts – a task stated by the Charter that should be done by the RESCO.</p>	<p>The current number of installed SHS (1,400 systems) is a progress towards a feasible RESCO operation. However there is a need to closely review the Charter in the current context of the rural electrification programme.</p> <p>The status is that incentive policies for RESCO operations are limited at present – it is envisaged that such incentives will be adopted in the proposed Sustainable Energy Bill for Fiji.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Associated Activities:</p> <p>A report of the estimates of economic costs and electricity pricing of renewable energy system[s]</p> <ul style="list-style-type: none"> • [Recruit a] consultant to estimate the full economic costs of the hybrid system in Nabouwalu • Estimate the appropriate electricity pricing to include [all operation and maintenance, fuel and partial capital recovery charges...] • Conduct a consumer survey to investigate consumers' ability and willingness to pay for electricity in Nabouwalu... • Identify the commercial risks associated with the investment in renewable energy • Conduct a financial feasibility study of the proposed RESCO [in Nabouwalu] to ensure the commercial viability and sustainability • Define a method of payment from the government [to the RESCO] where the government wants the RESCO to meet social obligations for rural electricity [i.e., recommend a preferred subsidy arrangement] • Develop financial incentive policy to attract investment in renewable energy • Hold workshop...to disseminate the study results among policy-makers 		<p>A first-draft report on economic issues has been prepared, which reports initial findings on expenditures for energy by rural households. However, analysis of the costs of the range of renewable energy technologies in use in Fiji, including mini-grid hybrid, hydro, and biomass systems and individual Solar Home Systems under RESCO operation has not been completed, nor have policy issues (e.g., subsidies) been fully addressed. In its present draft, the report does not adequately evaluate the economic sustainability of potential RE systems and their affordability, nor does it adequately treat issues of institutional capacity, environmental impacts, or the policy environment. The extent of replicability of the RE-based power generation initiatives that are promoted by the project have not yet been determined.</p> <p>The consultant awaits survey data before completing work on the next draft of this report.</p> <p>The Nabouwalu project is not the focus of the economic issues report. Rather, the report is (or will be) generalised to include cost-of-energy estimates for all renewable energy systems in use in Fiji. The consumer survey work underway to support this analysis is similarly broad and covers more than 80 villages throughout Fiji.</p> <p>A business plan for a RESCO operating Solar Home Systems is under preparation. Financial incentive policies are included in the approved RESCO charter (discussed above).</p>	<p>“Establishment of Economic framework and incentive policies for RESCOs”, report dated November 2003, 62 pages and covers a wide range of issues: social survey results, subsidies, payment systems, among others.</p> <p>Financial Feasibility and Commercial Viability of Rural Sector Renewable Energy Service Companies in Fiji, dated August 2003 outlines that of renewable energy in general.</p> <p>Preparing a Business Plan for Fiji, dated 2003 outlines the process and assembling steps for a business plan.</p>	<p>Outputs to the respective activities have been successfully completed in that the required surveys and reports were produced by the Consultants. The contents were considered excellent with the only issue now is to actually practice the approaches outlined in these reports.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
Result[s] of the consumer survey[s]		Survey work is largely complete but the database is not yet accessible to the FDOE or to the consultants.	The database work was delegated to the supplementary activities – reference Table 4.3.3 of this report.	Survey results available but not been documented as the proposed database is still to be developed.
A report of the financial feasibility study		The contract of the consultant initially appointed for this work was terminated for lack of performance. The DOE did not appoint a replacement but assigned this task mainly to the economic issues consultant, with support from the other consultants.	Financial Feasibility and Commercial Viability of Rural Sector Renewable Energy Service Companies in Fiji report dated August 2003 produced.	This activity has been successfully completed.
A financial regulation charter drafted to define a method of payment from the government		The charter approved by Cabinet in March 2003 provides for capital subsidies for renewable energy technology but no subsidies for operation and maintenance or spare parts.	The Charter is as described in the MTR however, government still subsidizers for the services by the RESCO.	Government still provides for the capital for the hardware only. The operational and maintenance is expected to be covered by the amount payable by Government to the RESCO, currently at F\$14.43 /HH serviced every 2 months.
The energy service fee that RESCO can charge the consumers		<p>No energy service fee has been finalised, pending (i) completion of the economic issues report, the financial feasibility study, and the RESCO business plan and (ii) completion of a competitive bidding and negotiation process for RESCO services.</p> <p>The current F\$14 monthly fee for SHS is intended to cover operation and maintenance costs (not capital costs). A monthly fee of F\$21 has been proposed to improve cost recovery, taking into consideration rural consumers' willingness and ability to pay. The current fee and the proposed increase have yet to be confirmed by the Economic and Financial issues consultant.</p>	A monthly fee of F\$14 was agreed to then in 2000 and still current. This fee has been set in the context of a survey conducted in Vunivau in November 1999. Note that this fee is charged by FDOE and customers pay to Post Fiji. The RESCO is paid a fixed amount per household serviced (F\$19.95 /HH 2000 – 2009; and now at F\$14.43 in 2010 per HH) by the FDOE.	The RESCO presently provides a bimonthly service of the SHSs and does not participate in the formulation and collection of fees.

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
The amount of investment in renewable energy in Fiji [increased]		<p>DOE expects that renewable energy systems (chiefly Solar Home Systems) will be supplied by the government through overseas grant aid or concessional loans. A government application for 2,000 (phase 1) followed by 16,000 (phase 2) Solar Home Systems has been submitted to several donors. Phase 1 is expected to commence in the last quarter of 2003 with phase 2 implemented progressively over 10 years. When the systems are procured, RESCOs will be invited to bid for installation, operation, and maintenance of them. RESCOs will be paid from revenues collected from users, rather than a government fee-for-service. This is the approach supported by the recently-approved charter.</p> <p>If adopted as a long term solution, this appears to represent a notable departure from a key aspect of the RESCO concept implicit in the Project Document, i.e., that private sector entities in Fiji would be prepared to <i>invest</i> in RE (supply capital equipment) in a suitable policy environment rather than simply manage government-owned RE assets. The final report on economic issues should closely analyse (i) private sector capacity to invest in RE in Fiji, (ii) the economic and financial implications of such investment and the potential commercial returns available from investment, and provide clear recommendations on means to promote such investment. If, on the other hand, the report concludes that private sector investment in RE is not commercially attractive even with appropriate policy support, detailed analysis should be presented to substantiate this and should support an alternative RESCO concept that is sustainable, replicable, and is likely to accelerate the pace of renewables-based RE development.</p>	<p>There is an increased use of RE in Fiji but perhaps not in terms of investment, particularly for rural electrification. The notable investments in RE are in the main centres, i.e. grid connected – such as the FEA wind farm and the hydro schemes.</p> <p>It is also noteworthy that at the time of the final evaluation the total number of SHSs was only 1,400.</p> <p>In terms of investment on SHSs, there is no major investment from the private sector for rural electrification.</p> <p>The increased number of SHSs was merely as initially planned by government.</p> <p>It is also noteworthy that the project did contribute in a way in that the reports and analysis conducted through the respective activities provided the background to the up-scaling of renewable energy use in Fiji.</p>	<p>People opted for the RE option due to other factors such as high fuel costs, easy maintenance options as compared to a diesel gen-set and, environmental concerns.</p> <p>The critical mass number anticipated in Phase 1 (1000-2000 SHS) is still been pursued.</p> <p>Perhaps due to the approach that Government still provides the hardware for the RESCOs to service and partially manage – as raised during the MTR. Such operations by Government does not allow for the true associate costs of use of renewable energy, particularly for rural electrification, to be reflected in the services provided.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Indicator: Full service fees are collected by [the] RESCO without local dispute by September 2002.</p> <p>Associated Activities:</p>		<p>No full service fees are currently being collected by a RESCO as (i) the full service fee level has not been determined or approved and (ii) no RESCO has been competitively selected to operate a site commercially.</p>	<p>The RESCO does not collect the service fee of F\$14 /month. The monthly fee is paid directly to Post Fiji by the customers. That is, FDOE currently pays the RESCO at F\$14.43 /HH serviced bimonthly.</p>	<p>At present the RESCO involvement is only as a service contract that does not include all its envisaged responsibilities, as outlined in the Charter, such as “annually negotiate with the DOE and users for setting user fees sufficient to pay the cost of the agreed upon level of service plus an acceptable profit”.</p>
<p>Prepayment meters installed for the RESCO consumers [in Nabouwalu]</p> <ul style="list-style-type: none"> • Install prepayment meters in the village households to ensure [that] the RESCO can collect the full amount of fees to recover their operational costs without local disputes. 		<p>By context, it is assumed that this activity was meant for the Nabouwalu project of 50+ households (confirmed by Project management).</p> <p>An allocation of US\$5,000 remains in the budget for purchase and installation of prepayment meters. However (i) installation of meters in Nabouwalu by the Project is pointless if Nabouwalu is no longer the focus for RESCO operations and (ii) the budget is less than half of what is required for 50+ meters.</p> <p>This activity should be terminated.</p>	<p>The prepayment meters were installed with the respective SHSs to curb the default in payments which has worked well but the accessibility to the purchasing of the codes were not favourable to all customers as they had to travel considerable distances to access this service.</p>	<p>The use of prepayment meters eased the fee collection component. The decision to keep the prepayment meters is a good one as a manual (i.e. from door-to-door) fee collection approach would have been difficult.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
Immediate Objective 2: To enhance the technical and financial capacities and investment opportunities of RESCO staff.				
<p>Indicator: Skilled RESCO staff capable of installing and maintaining renewable-based energy systems from August 2002</p> <p>Associated Activities:</p>		<p>Training activity has been substantially completed, but no RESCO operations have commenced.</p>	<p>A series of trainings were conducted over the period May 2002 to June 2003. All 1,400 SHSs were installed and commissioned by the respective RESCOs involved. Some of the technicians that were part of the training are still involved in the installations.</p>	<p>There is a need for such trainings to be developed and institutionalized into local training institutions such as the FNU (Fiji National University) and the CATD (Centre for Appropriate Technology Development).</p>
<p>Number of people trained in installation and maintenance of renewable energy systems</p> <ul style="list-style-type: none"> • In conjunction with the existing renewable energy hybrid power system in Nabouwalu, train the staff of the RESCO on how to install, operate, and maintain the renewable energy hybrid system. • Train the RESCO staff as trainers in this domain. 		<p>Two training workshops for about 20 trainees were conducted in 2002 on operation and maintenance of renewable energy systems (wind, hydro, and household solar), with both classroom and field work. Participation included potential RESCOs and some from government (FEA, PWD, DOE). Training was conducted at a training center in Nadave, and at Nabouwalu and Vunivau villages.</p> <p>It is intended that the RESCO trainees will train additional colleagues in their organisations. However, as no RESCO has been selected for operations under the Project, there has been no explicit follow-up to ensure that this happens.</p>	<p>A total of 156 people (with 117 people from the public sector) were trained in installation and maintenance, designing, and finance.</p>	<p>Technical know-how and capacity is currently sufficient to install SHSs. It would have been beneficial if the training component also considered developing training modules for hybrid systems despite the change in the demonstration site as this would be beneficial to future rural electrification programmes.</p>
<p>Reliable installation and maintenance services provided by RESCO</p>		<p>No RESCO yet selected.</p>	<p>The services and maintenance has been reliable at the beginning when the number of SHS was less (i.e. 60 SHS only). As the SHS numbers increased, the RESCO struggled to meet timelines and service schedules due to the vast distances between the sites.</p>	<p>To cope with the schedules and allow for quick responses to faults, the RESCO should decentralize its operations, which will eventually have added costs to the additional manpower requirement.</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
Increased consumers' confidence and satisfaction with the RESCO[s] service[s] and renewable energy systems		No RESCO yet selected. It is noted here that a successful RESCO demonstration is required to develop and demonstrate RESCO abilities to deliver quality services, under the institutional arrangements specified in the RESCO charter. The project can assist RESCOs in this regard only if a demonstration is conducted within the remaining life of the project.	There is mixed reaction to the services provided with one of the issues being the non-availability of spare parts at the time of the service. The RESCO's reasons were always been that the spare parts have not been issued by FDOE. As a result customer satisfaction becomes low as the household in most cases had to wait for the next service-run which is normally in a month's time but now on a bimonthly basis.	There is the need to allow the RESCO to provide the necessary spare parts during service schedules or for FDOE to provide the necessary spare parts on time. Timely service with readily available spare parts would boost consumer confidence.

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Indicator: Business management and marketing strategy skills of RESCO staff improved by end of July 2002.</p> <p>Associated Activities:</p>		<p>This activity is hampered by lack of a RESCO demonstration.</p>	<p>There is no measure of whether the selected RESCO operations were improved due to the project.</p>	<p>A difficult indicator to measure as there is no baseline business management information on the RESCO operations before the project.</p>
<p>Number of people trained in business management</p> <ul style="list-style-type: none"> • Provide business training for RESCO staff and managers in a) market finance, b) commercial enterprise operation and management, and business accounting, c) economic/financial project appraisal, d) preparation of tender documents, and e) marketing strategies • Prepare business plan for the RESCO 		<p>A course in general business training for 9 Fiji trainees potentially to be involved in RESCO activity (private sector and government) was conducted in 2002. Two Pacific island overseas trainees also participated.</p> <p>A more detailed course is planned for personnel of an actual RESCO once a RESCO is selected for operations.</p> <p>A proforma business plan is being prepared for potential RESCOs.</p>	<p>There were trainings in business management and finance provided as part of the project activities in 2002 and 13-17 May 2003 where there were 14 participants.</p> <p>Reports indicate that there was not sufficient feedback from the training sessions. The targeted participants for these trainings were also not properly selected as participants had a wide range of profiles.</p> <p>It is notable that the quality of training conducted was of very high standards.</p>	<p>The trainings were conducted well but is a one-off approach thus it is been carried out merely to satisfy the project outputs.</p> <p>For sustainability purposes it would have been better to design a training programme that can be delivered through an existing training institution.</p>
<p>Commercial management of [a] RESCO</p>			<p>The present RESCO(s) are existing private sector companies with other core businesses such as for the sale of RE equipment and not only RESCO-type operations.</p>	<p>This is possible if the RESCO is operated commercially as outlined in the Charter. It is however notable that the current RESCO(s) are contracted by FDOE to only provide the services (installation and maintenance of the SHSs).</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Indicator: Increased financing sources available [to] RESCO[s] by October 2002</p> <p>Associated Activities:</p>		<p>Financing opportunities for RESCOs remain limited primarily to current and potential donor programs. Multilateral lending institutions have not to date been extensively involved in investment in renewable energy.</p>	<p>At the time of the final evaluation, financing for rural electrification particularly for SHS have been part of Government's plans /obligation to increase access to electricity in rural areas and remote islands. There is additional bilateral funding but is not just because of the RESCO operations until recently through the PEC (Pacific Environment Community) Fund.</p> <p>A Renewable Energy (RE) Fund guidelines was developed as part of the 2005 supplementary activities. The primary objective was to address the lack of financing for RE-based energy systems and application of renewable energy technologies. Note that there is the current WB /FDOE / ANZ project on sustainable financing which provides additional opportunities.</p>	<p>An increased financing source for RESCO operations would perhaps be achieved if the RESCO concept (in Fiji's context) is widely shared with key stakeholders.</p> <p>The current impression is that the RESCO concept has failed in Fiji.</p> <p>Project activities to tie-in the electrification component to perhaps some productive use of electricity would have been an advantage as well.</p>
<p>An information database on potential investors and investment opportunities available.</p> <ul style="list-style-type: none"> • Compile a potential investor profile for RESCO[s] including government, bank, multilateral, bilateral and private investor [organisations] • Hold workshops with potential investors to identify the available financing sources for renewable energy • Publish the operational strategy, or funding guidelines, of the identified financing sources 		<p>A Forum for potential investors was held in December 2002, attended by private sector and government representatives, to discuss risks and investment opportunities for potential RESCOs. However, the private sector was not extensively represented.</p> <p>A 'financing guidelines' handbook has been prepared under the Project.</p>	<p>FDOE presently has information on potential investors including new opportunities.</p> <p>As and when required, special meetings are organised with the respective development partners.</p>	<p>An area that FDOE continues to strive in as compared to many other PICs.</p>
<p>Business plans for the RESCOs prepared.</p>		<p>No RESCO has been yet selected, but a proforma business plan for RESCOs is under preparation.</p>	<p>As stated above a business plan for RESCO was developed in 2003.</p>	<p>It is not apparent whether these plans have been actually used /referenced by the RESCO(s).</p>

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
Immediate Objective 3: To carry out a public awareness programme on renewable energy.				
Indicator: Increased information, increased public interest and demand for renewable energy systems from September 2001 to July 2003			There was an increased dissemination of information on RE however does not reflect an increase in demand for RE systems within the mentioned period. The increase in demand for RE systems is only notable recently (2008-2010) where proposed community projects within this period are stating RE systems as their preferred choice.	The driving factor behind the increased preference for renewable energy technologies seems to be due to the increasing fuel costs including the operational and maintenance of conventional systems.
Immediate Objective 4: To improve FDOE staff capacity in renewable energy assessment and equipment testing.				
Indicator: Improved renewable energy resource data are available by April 2003 Associated Activities:		Training activity in this area has not been completed. It is expected that additional training will be completed by July 2003.	This has been an on-going activity of the FDOE.	The project contributed to the up-skilling of FDOE staff however failed to complete the development of a RE database.
Number of FDOE staff trained in renewable resource assessment Increased skills of FDOE staff [in] renewable resource assessment <ul style="list-style-type: none"> • Provide training in FDOE staff in renewable resource assessment techniques, particularly in resource mapping, data processing and analysis, site selection, and feasibility study 		<p>Two training courses have been conducted for DOE staff on resource assessment with an additional two still to be done. The training addresses weaknesses in the current DOE renewable energy resource assessment programme and will enable DOE staff to make better use of resource data collected from the field.</p> <p>Assessment of renewable energy resources was a core function of DOE prior to the Project. The DOE has records of wind speeds, insolation, and stream flows at various sites around the country. Data collection, analysis and record keeping functions are adequate for resource assessment, but progress is constrained by high staff turnover. Newer staff will benefit from Project-sponsored training; other donors also contribute, e.g., Japan, Korea, and China.</p> <p>There are 5 wind monitoring stations (Nadi, Ra (2), Gau, and Kadavu). There is a comprehensive assessment program for potential micro-hydro sites; stream flows are monitored for at least two years. Two sites are being monitored presently; JICA is assisting with feasibility and design studies for promising sites (presently, Abaca (Lautoka)). Insolation data are being gathered in Gau.</p>	Over the years training were provided to FDOE staff in setting up of monitoring equipment, downloading of data and data analysis. The project over its implementation timeframe contributed to this activity.	The training provided was of good quality including the data analysis component. Such trainings are recommended to be an on-going activity preferably made available through training institutions.

Indicator and Associated Activities	Target Value	Mid-term Review – June 2003	Final Evaluation Findings April 2010	Analysis and Comments
<p>Improved renewable energy resource data are available</p> <ul style="list-style-type: none"> • Overview and summarise the previous assessments of the renewable energy resource data in Fiji. • Establish a database of wind speeds and solar radiation in 1–2 government stations to facilitate future replication. 		<p>Equipment for an anemometer and pyronometer station was purchased in July 2002 and installed in a rural location. Wind and solar data are currently being collected from the site.</p> <p>A report on previous assessments of renewable energy resource data in Fiji is under preparation.</p> <p>At Nabouwalu, wind and insolation data are collected, but for unknown reasons records are not kept by DOE, apparently because Nabouwalu is no longer a proposed RESCO site.</p>	<p>FDOE is one of the very few energy offices /departments that continued to conduct renewable energy resource assessments in the region. There is an enormous set of data available but are not properly documented and archived. The proposed RE resource database to be developed through the project was never completed</p>	<p>There is definitely a need for a proper database for the RE resource assessments conducted over the years.</p>

TABLE 4.3.3 Supplementary Activities

Supplementary Activities	Final Evaluation Findings – April 2010	Analysis and Comments
Completion of database of RE resources	There was no additional work on the database as FDOE had to complete its initial component before additional work could be carried out by the project Consultants. The database still has not been completed at the time of the final evaluation.	One of the basic and perhaps the easiest to implement could have been completed if the project team ⁷ had been cooperative and had dialogue to address constraints rather than backing out due to pre-set responsibilities.
Evaluation of the RE Charter and proposed RE Bill	The 2005 Final Report on supplementary activities questioned the practicality of the Charter stating that it seems unrealistic to have “pure private” RESCO operators. The current Charter is strictly to enable FDOE to include RESCOs in their existing subsidy arrangements for rural electrification. At the time of the final evaluation, the RESCO operation including that of FDOE has not strictly followed the Charter.	This review confirms the views expressed earlier in this final evaluation report – noting that the concerns raised in 2005 are actually the present situation.
New Survey of Potential RESCOs	This was conducted and revealed that there is no strong framework to govern the operations of RESCOs, even with the current Charter. A holistic approach linking the Charter and other proposed legislation with the national energy policy is required.	This reveals that the Charter was formulated without proper consideration of existing (and planned) frameworks – despite had been approved by Cabinet. It is evident in the present situation where only part of the Charter is being followed – it would perhaps have been beneficial at that time to review the Rural Electrification Policy to strengthen the renewable energy component.
Preparation of RESCO bidding documents	This has been clearly laid out in the 2005 Final Report on supplementary activities with details on the contents and the process.	Why is this been considered as a supplementary activity as it should have been carried out in the initial stages before a selection of a RESCO? How was the pioneering RESCO, RES Fiji Ltd, selected in 2001? Additional notes in Table 4.3.1.
Performance evaluation of the Nabouwalu hybrid power plant	<p>The 2005 Final Report on supplementary activities contains 16 pages highlighting the state, specifications and a process to rehabilitate the hybrid system. At the time of the final evaluation site visit, the hybrid system was not operational. Power to Nabouwalu is currently supplied by a diesel gen-set.</p> <p>This supplementary activity is one of the key recommendations of the MTR conducted in June 2003.</p>	The 16 pages report is the only evaluation of the hybrid system during the project which should have been carried out initially to substantiate the change of demonstration site. The switch to SHS in Vunivau Settlement seems to be done merely as there was available funding for the SHSs to enable the demonstration component of the project.
Performance evaluation of the Vunivau SHS project	The evaluation highlighted that customers are satisfied with the services provided however raised the issue(s) in acquiring the codes for the prepayment meters as total costs can amount up to F\$25 per month (\$14 for the monthly fee and rest on transportation to the Post Office) – this issue was also raised during the field visit in February 2010.	The issue of access to acquiring of the prepayment codes is still being raised by the customers – what happened to the recommendations from the 2005 Report? Why this has not been addressed? It is also noteworthy that rural households normally don't have large sums of cash thus they may not be able to purchase more than one month's worth of recharge.
Design of the RE fund	24 pages of the 2005 Final Report on supplementary activities provides the details of the Fund and its operations. It is noteworthy that linkages with this proposed mechanism (Fund) and the current FREPP be considered.	A worthwhile supplementary activity that when considered will address barriers (ii) and (iii) as in Section 3 of this final evaluation report.
Documentation of the public awareness	There has been some documentation of the campaign – an analysis done by PASEFIKA. Results did not /were not able to clearly	The awareness campaign should have commenced within the first year of the project in parallel to other activities. This would have

⁷ The reference to project team refers to the implementing and executing agencies.

Supplementary Activities	Final Evaluation Findings – April 2010	Analysis and Comments
campaign	provide the impact details as the awareness campaign conducted was very general, within a very short timeframe (less than 6 months) and did not have quantitative parameters to measure its impact.	allowed time for the public to digest the information with an impact assessment to be conducted towards the end of the initial project timeframe.
Completion /finalization of the selected project reports	5 of the total 17 project reports were selected and categorized into: the promotion of sustainability of RETs /RESCOs; and on design-oriented database of RE resources. The review stated that the reports generally are of good quality but some being too academic and do not propose solutions.	The review findings reveal the type of M&E framework requirements i.e. the production of reports, training sessions and meetings rather than the impact of what is stated or recommended in these reports – perhaps a reason to why most of the objectives of the project are not been satisfactorily accomplished.
Assessment of present impacts of the Fiji RE project activities	The assessment was on 2 tiers only – training /capacity building; and CO ₂ emission reduction. The training component highlight dissatisfactory in the selection of participants and poor evaluation of the training conducted. The CO ₂ reduction assessment stated that total emission reduction was 90 tonnes of CO ₂ from the displacement of kerosene only.	The training component was ad-hoc and short term with such approaches not been conducted to seriously address the barriers (v) and (vi) in Section 3 of this final evaluation report.
Design of a sustainable follow-up programme for the replication of relevant project interventions	A follow-up programme has been recommended but noting that key activities in the original project has to be completed. The issue of a need for an action plan is of the same view of the final evaluation team as such that the many outputs have not been consolidated to provide a clear perspective on the status of project activities..	A follow-up programme to complete the key elements (such as the review of the Charter to reflect the current context and enable the operations of a commercially viable RESCO) of the project is necessary at present. The replication of project interventions is possible only if the interventions were successful and sustainable (i.e. the need to have activities addressing the barriers for the long term – reference Section 4.4.2 below for further details.
Recommended Fiji RE project Phase II	There is the possibility for a Phase II however it should be designed to address new barriers. Phase II, in terms of RESCO, is not an immediate option as the current phase has to be satisfactorily completed.	The project itself should have been designed into two phases namely: (i) development of a framework for the RESCO concept – which could have focused on addressing the policy, regulatory and legislative aspects including an awareness campaign; and (ii) a demonstration of the RESCO approach. The project however, was too ambitious in assuming that (i) and (ii) above, could be implemented concurrently and completed within the 3-year timeframe.

4.4 Conclusions

The following conclusions are based on information gathered during the final evaluation exercise and are neither categorised nor ranked. Also presented below are the project achievements with respect to the barriers it was designed to address. A sequence of events /activities as they were delivered over the 2000 – 2010 timeframe is also summarised below.

4.4.1 General

- i. There is no doubt that the RESCO concept is a way to improve renewable energy services to rural and remote areas in Fiji as capacity in FDOE is limited. The RESCO approach in the Fiji context needs to be shared widely so that stakeholders are aware of the details and not perceive it as the usual RESCO operation as in many other parts of the world.

- ii. The project has generated a significant number of invaluable documents, reports, samples /models, specifications, business plans, studies, among others, specifically for rural electrification in Fiji.
- iii. The project has a weak monitoring and evaluation (M&E) framework in that the delivery aspects of the project were simply verified by only considering the production of the required reports and not what has been actually established, achieved or institutionalized as a result of the studies and activities. This may have contributed to the Charter and draft Bill not being enacted or strictly being followed as a guiding framework in the current rural electrification programme. An effective project management team (including the implementing and executing agencies) should have redesigned the M&E framework during the course of the implementation phase to enable outcome /impact measures to realise the primary objectives of the project. This could have been a key recommendation in the course of the MTR.
- iv. The project design seemed too ambitious as it states that it will – set up a commercial RESCO that will charge a fee for the electricity supplied to the consumers as a sustainable institutional framework to operate renewable energy systems, within the allocated project timeframe. The current RESCOs are given service contracts only and are not involved with the setting and collection of fees.
- v. One of the key reports /study that should have been carried out during the inception phase was not commissioned until 2005 – that is, the study on large scale RESCO based rural electrification “proof of concept” project. It is also notable that the “proof of concept” is still being pursued – i.e. towards 1,000 – 2,000 SHS (a fully commercialised RESCO is anticipated to be operational at 15,000 – 20,000 SHS).
- vi. The Charter and the Rural Electrification Policy – the contents of the Charter does not fully encompass the required coverage for rural electrification in Fiji thus a deficiency in the consideration /development process of the Charter.

4.4.2 Project Outputs /Outcomes and Barriers

The following specifically provides details on how the project has responded to the barriers it was designed to address.

Barriers to be addressed	Project Response
Lack of sustainable institutional framework to operate rural electrification on a commercial basis and provide reliable service	A Charter was developed and endorsed by Cabinet at that time but not institutionalized thus this barrier still exists.
Lack of appropriate electricity tariffs to reflect the full economic costs for rural electricity supply	There is no clear documentation /template on how the tariff has been formulated apart from a mention that the F\$14 fee was set based on a FDOE survey in November 1999 – this barrier still exists.
Lack of financing for rural electrification	Project activities may have generated additional finances for rural electrification but given that the Charter has not been strictly followed, the impact seems minimum. However, the project led to the development of solar PV standards which are currently used including in the development of the Sustainable Financing World Bank Project implemented with FDOE and the ANZ Bank. The project therefore has contributed into enabling a mechanism that is been used to draw funding for rural electrification.
Institutional barriers to fee collection	From an institutional perspective the project has satisfactorily addressed this barrier through centralizing the fee collection hub to the respective Post Offices.
Lack of expertise in business management and marketing strategy	Short-term trainings were conducted as part of the project activities – these trainings were not specifically designed to be sustained, i.e. to be continued by an institution at the conclusion of the project. As such the project has only addressed this barrier in the short term. This barrier has not been fully addressed.
Limited expertise in design, installation, operation and maintenance of renewable energy systems	Short-term training workshops were conducted with a number of stakeholders of various backgrounds and qualifications. The barrier has not been adequately addressed.
Lack of information and awareness of the potential for renewable energy systems among decision-makers and villagers	An activity with the aim to address this was conducted within a timeframe of 6 months including an evaluation of its impact – it seems that this was done only to check the indicator and not to actually address the barrier.

Barriers to be addressed	Project Response
Incomplete assessment of renewable resources	The project purchased monitoring equipment (pyranometers and anemometers) and installed in various rural sites. The resource assessments are on-going activities of FDOE and still been conducted. The proposed database for the collated data has not been completed.
Institutional constraints	The Charter was supposedly to explicitly layout the institutional responsibilities which it did in its contents however these have not been strictly followed. Thus present RESCO(s) involved in the rural electrification programme are not fully commercialized RESCO entities with the rural electrification programme (SHS component) been implemented with a mix of what has been laid out in the Charter and the status quo.

4.4.3 Sequence of Events /Activities

Events /Activities	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Project Document signed by the Fiji Government and UNDP Representative	■										
RES Fiji Ltd started with a service contract (60 SHS)		■									
Policy research paper (Nov)			■								
Investor forum and investor risk assessment report (Dec)			■								
4 training workshops conducted (May, Aug, Sept & Nov)			■								
Village and RESCO selection criteria report (Feb?)				■							
Charter approved by Government (Mar)				■							
Tripartite meeting (May)				■							
6 training workshops conducted (8-30 May & Jun)				■							
Specifications for procurement of SHS (Jun)				■							
Mid-term review report (Jun)				■							
Draft rural electrification Bill (Jul)				■							
Request to extend project to December (Aug)				■							
Financial feasibility and commercial viability of rural sector RESCOs in Fiji (Aug)				■							
SHS equipment testing manual (Aug)				■							
RESCO business plan report (Nov)				■							
RESCO experience report				■							
Work plan for supplementary activities (Aug)					■						
Transenergie final report – supplementary activities (Feb)						■					
Transenergie report (Oct)							■				
RESCO tender awarded to Powerlite Ltd only										■	
Final Evaluation (April)											■

5.0 LESSONS LEARNED AND RECOMMENDATIONS

5.1 Lessons Learned

The project over its extended timeframe and activities provided invaluable lessons to rural electrification in Fiji and the Pacific region. The following highlights key lessons learned:

- i. *National policy, regulations and legislation* – There is the need to carefully and strategically consider approaches especially where project activities will be considering new policies. The best approach is normally to first look at how existing policy /regulations /legislation can be reviewed to accommodate the proposed changes.

- ii. *Activities* – a phased approach or logical flow of activities is required for such projects – e.g. get the framework and accompanying regulations and legislation endorsed prior to the implementation of the demonstration component. Also, the educational and awareness activities have to be executed from the beginning of the project.
- iii. *Reports* – produced a number of invaluable and very comprehensive reports on and for rural electrification in Fiji (and the region). These however have not been consolidated to provide an overview on how they all contributed to the overarching objective of the project – e.g. against the incremental cost and project planning matrices.
- iv. *Impacts* – the actual difference made by the project has been difficult to measure as many indicators are not quantitative and impact oriented. Also, the indicators tend to focus on the production of reports, sheets, and criteria and, not on the establishment and institutionalizing the intended approaches to address the barriers. There should have also been some socio-economic impact indicators such as “number of students progressing to higher education” to measure how the project has affected livelihoods.
- v. *Monitoring and evaluation (M&E)* – a rigorous M&E framework would have guided and re-organised the activities and indicators at the earlier stages of the project. Immediate action on corrective measures in response to project reviews is an important feature during the course of the implementation phase and for the success of a project. Further, the need for site visits in the course of the implementation phase is required to fully appreciate the difficulties on the ground.
- vi. *Management* – good and proactive project management would have made corrective measures following issues raised during reviews and steering committee meetings. The absence of v. above also contributed to the project not adequately addressing the barriers as outlined in the project document.
- vii. *Project Document* – any changes to the activities or approaches over the implementation phase of the project should also be reflected in a revised project document (or an amendment to certain sections of the original project document) with detailed reasons. This will enable the tracking of amendments to activities /scope when projects are evaluated.
- viii. *General* – the Fiji RESCO project has paved a way to future similar projects where design, activities and anticipated deliverables are to be impact oriented and practically achievable within a reasonable timeframe and, specifically address the barriers.

5.2 Recommendations

The following have been formulated to address the key pending deliverables including the next steps to consider in materialising the RESCO concept for rural electrification in Fiji – these recommendations are stated with the view that they can be implemented immediately.

- iv. Re-examine the Charter [and the draft RE Bill] in the context of the rural electrification policy, national energy policy, other current legislation and regulations to promote the use of renewable energy and, the proposed Fiji Sustainable Energy Bill. This will allow for the opportunity for the RESCO concept to be re-considered in the operational context of current rural electrification initiatives.
- v. Further review the project documents including the draft outline of a RE Fund, the business model(s) for RESCOs, training programmes, among others so as to provide the basis for current proposed similar initiatives such as the Fiji Renewable Energy Power Project and the Sustainable Financing for Renewable Energy Project.
- vi. Re-examine the modality of the RESCO Project Management Unit and consider an arrangement that would encourage and allow for a better participation of the private sector in the implementation of similar energy initiatives.

6.0 ANNEXES

The following annexes are appended separately

- Annex 1 Questionnaire (8 pages)
- Annex 2 List of stakeholders consulted (1 page)
- Annex 3 List of key documents reviewed (2 pages)
- Annex 4 MTR recommendations and Final Evaluation Team comments (7 pages)