

Review of the PREFACE Project

Executive Summary

A joint France/Australia renewable energy development programme

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EXECUTIVE SUMMARY

1 PROJECT OVERVIEW AND GENERAL FINDINGS

The PREFACE programme is an A\$3.45 million joint effort of Australia and France¹ with the goal of advancing social and economic development through the use of sustainable renewable energy technologies in the Pacific region. The stated purpose of the project is to increase the utilization of sustainable renewable energy technologies, in particular solar photovoltaic and wind energy technologies, in island and rural communities.

The project was divided into four components, each with specific objectives.

1.1 Component I: Project Inception

This was to be an initial phase during which project staff would refine the review of the sector and prepare appropriate implementation plans. The stated objectives were (i) To assess the current state of renewable energy technology utilisation in the target communities, (ii) to identify the financial, management and technical lessons to be learnt from current successes and failures, and (iii) to prepare the implementation plan. Outputs would be (1) a sector review; (2) an overall project plan and a first annual plan.

Actual outputs

The sector review was a comprehensive database of Pacific renewable energy projects and the collection of documents relating to Pacific Island Country/Territory (PICT) renewable projects. This was the first time such a review was carried out and the results are considered a valuable regional resource that should be continued to be updated by follow-on programmes.

The project plan and a first annual plan were prepared and though optimistic, the plans are considered reasonable given the known conditions at their time of preparation.

1.2 Component II: Information, Training and Support

This component was intended to focus on awareness raising, training, and information sharing. The stated objectives of this component were to take action to increase the utilisation of sustainable renewable energy technologies in island and rural communities by: (i) informing decision makers of renewable energy opportunities, and of sustainable financial and management structures, (ii) foster sustainable financial and management structures (with a particular emphasis on private sector participation), and (iii) facilitate the sharing of lessons learnt amongst all potential stakeholders. Stated outputs for this component were to be: (1) A better understanding of the opportunities presented by renewable energy technologies among decision makers (including policy makers, public servants, NGOs, aid agencies, financial institutions, and target community leaders) and general public; (2) Strengthened financial and operations/maintenance management structures, including the utilisation of private sector participation; and (3) Information on issues such as current state of technologies, resource potential, approaches to management and financing of renewable energy applications disseminated to stakeholders throughout the region.

¹ Australia and France each contributed A\$1.5million for the basic project and France contributed an additional A\$450,000 to support a French expert for the PREFACE team.

Actual Outputs

Of the four components, the Review Team considers this component to be the weakest in execution by PREFACE. Except as regards the demonstration projects, it appears that information dissemination and training was generally *ad hoc*, taking advantage of opportunities as they arose, rather than planned. A comprehensive communications and training strategy was lacking and should have been developed early in the project. Outputs (1) and (3) were not achieved as fully as they could have been with more planning and structuring.

The project is judged to have achieved output (2) very well and the demonstration project operating and managing systems show evidence of careful attention to successes and failures of other projects in their design. For each demonstration project a different, optimized institutional system was implemented that represents a clear improvement over the systems used for earlier projects in the target country.

1.3 Component III: Demonstration Installations

The demonstration installations were designed to increase the utilisation of renewable energy technologies by the practical demonstration of a small number of replicable and sustainable renewable energy systems with a particular emphasis on sustainable financial and management structures. This component had a single objective: To increase the utilisation of renewable energy technologies in island and rural communities by the practical demonstration of a small number of replicable and sustainable renewable energy installations (the demonstration installations to specifically include sustainable financial and management structures). Stated outputs were to be a small number of new or rehabilitated replicable and sustainable renewable energy installations in each of the three Pacific sub-regions (Micronesia, Melanesia and Polynesia).

This component is partially complete. Installations of systems have been made in Vanuatu, Tonga, the Republic of the Marshall Islands (RMI) and Tonga but the implementation of management and maintenance structures is not complete and cannot be properly completed in the remaining time allocated to the PREFACE project. The wind demonstration system in the Cook Islands has been tendered but the equipment will not be delivered or installed until 2003.

The demonstrations were each designed around a different concept relevant to the target country and to the region.

1. The Vanuatu demonstration provided electrification for health and education facilities located on a remote island. The design goal was to demonstrate the use of renewable energy for community services electrification in remote areas. Twelve schools and eight health facilities located in Torba Province were electrified by solar PV for lighting and radio use. Staff houses were also electrified.
2. The Tonga demonstration provided household electrification for residents of unelectrified islands of the Ha'apai group. The design goal was to help reach the "critical mass" of PV projects in Tonga where user fees would be sufficient to pay all administrative, maintenance and repair costs of the systems. A secondary purpose was to improve the institutional structure of the Ha'api PV management structure to a more sustainable model which could be replicated in other island groups of Tonga.
3. The RMI demonstration provided household electrification for residents of Namdrik Island. The design goal was to demonstrate the rehabilitation of failed PV

electrification projects through improved technical and institutional systems. This goal is important to the region since there are many failed projects that still have operating panels and components but are not functioning due to institutional failures.

4. The Cook Islands wind power demonstration on Mangaia was designed to show the technical, administrative and economic feasibility of integrating wind power into small island grids.

Based on written communications and interviews, this component is considered by the PICTs as the most important feature of PREFACE and to fail to properly complete it would be a major failure on the part of the project.

1.4 Component IV: Project Management

The objective of this component was to efficiently and effectively manage the Project to achieve goals and objectives within budget and planned timeframe. The planned output was to be (1) Six-monthly Project Progress Reports for submission to Project Co-ordination Committee meetings; (2) Annual Plans for submission to Project Co-ordination Committee meetings; (3) Year 3 Project Review.

The review team, in accordance with objective (a) of section 2.1 and items (a) and (b) of section 2.2 of the Terms of Reference for the year three Project Review, have, examined each of these components and examined documents, visited project sites and interviewed persons involved in the PREFACE project. In judging these outputs, the team has considered them in relation to other regional projects that have included actual installations of renewable energy systems. All the outputs have been completed and given the small staff assigned to the project, the quality of overall management is considered to have been very good. Though there has been slippage in the time budgets of approximately six months for the PV demonstration projects, this is dramatically better than the performance of other similar regional projects where time slippages of years have typically occurred.

1.5 Social and Community Analysis

Education and Training

PREFACE has not had direct, measurable impact on education to date but positive benefits can be anticipated. These include greatly improved quality of lighting that can make evening study practical, the use of modern audio visual equipment for classroom presentations is now possible, new educational opportunities such as evening adult education are more practical with the provision of electricity.

Training activities associated with the demonstration projects included:

1. participation of energy officers from the countries receiving demonstrations in the project design and preparation process.
2. Training of management personnel in the operation of the projects
3. Training of technical personnel in the maintenance of the projects

These training activities appear adequate to prepare the initial management and technical teams for operation of the projects and prepare the government officials for replication of the projects in the future. However, PREFACE did not ensure that training would be available for management and technical personnel who are assigned to the projects in the future. The Team considers this to

be a serious omission since it is inevitable that project managers and technicians will have to be replaced and without adequate training, the replacements will not be able to carry on the required tasks with skill and confidence. This lack of a local training capability for project managers and technicians is considered to add greatly to the risk of long term project failure and should be addressed. It is recommended that a project extension include the development of a long term, local capability for the training of renewable energy project technicians and project management.

Health

As with education, there have not yet been measurable improvements in health directly as a result of the PREFACE project. There may be positive impacts in Vanuatu, Tonga and the RMI due to the replacement of kerosene by electricity for lighting. The 12VDC lighting is less likely to be the source of fires than kerosene and the fumes from kerosene lighting has been identified as a possible negative factor in respiratory health. The primary benefit is expected to be improved quality of care for night time trauma treatments and childbirth.

Community Activities

Based on past experience with rural electrification in the Pacific Islands, there is expected to be increased social activity as a result of having electric lights. Already, in the RMI the solar lights have been used when playing billiards or pool at night and some families have purchased videos which are likely to bring neighbours and friends to the owner's home for viewing and increased social contact. Increased evening time for church activities can also be expected to result and has already been observed in Tonga.

Youth Children and the Elderly

The impacts relating to education apply to youth and children. Health benefits apply to all groups but especially to small children and the elderly. For older persons with visual problems, the much higher quality of lighting is expected to reduce accidents and increase their capacity to do tasks such as sewing that require good visual acuity. Elderly persons and children afflicted with respiratory problems may benefit from the reduction in air pollution from kerosene lighting.

Ability of Women to Participate in Social and Economic Development

It is not possible to assess the impact of the project on women since insufficient time has passed for their effects to be clearly identifiable as permanent impacts. It is expected that there will be a minor but positive impact on the ease and speed of completion of night-time household tasks, in particular child care. There is a limited possibility that increased income can be generated by women working on handicrafts at night.

The PREFACE project emphasised the participation of women in project management by setting the goal of having at least one woman on each committee managing the solar projects.

A weakness of the PREFACE project observed in the RMI and Tonga was that women were not specifically brought into meetings and discussions regarding project activities. As women's traditional roles are that public meetings are the province of male household members, to get more women to participate, separate meetings just for women could have been held so women could feel more comfortable participating. It is recommended that women be specifically included in future user training activities and be specifically targeted for information delivery.

Gender Related Issues

There is no indication that the PREFACE project has or will have any impact on gender relations in the Pacific region. In the target countries, women are increasingly being integrated into the

public sector with women holding office and frequently participating in public organizations. The PREFACE goal of including women in project management is in line with this trend and supports government policy, such as that in Tonga, for increasing the participation of women in public life.

Community Cohesiveness

The PREFACE project design does not foster community cohesiveness as a specific objective. However increased community consultation in the demonstration project design and implementation should contribute to increased community cohesiveness and minimise the likelihood of community factions developing around the projects causing friction and jeopardising project sustainability.

Upholding of Cultural Values

Based on rural electrification experience elsewhere in the Pacific, PREFACE will probably contribute to a slow change in cultural values that may be regarded as having a negative impact on traditional values. The primary instrument of this change is likely to be the increasing use of videos where exposure to different role models may affect the social behaviour of younger people in the community.

1.6 Baseline Data and Development Indicators

PREFACE conducted user surveys in Tonga and the RMI but primarily to provide inputs to the project design. A user survey was not needed for project design in Vanuatu since it affected government facilities. A user survey in the Cook Islands was not needed because the project is to integrate wind power into an existing utility grid system.

The project did not attempt to do detailed baseline surveys for assessing development impact. The team considers this a reasonable decision because:

1. The design and implementation of high quality surveys for obtaining proper baseline data requires professionals and both time and money that were not available under the PREFACE project.
2. For this baseline data to be useful, one or preferably more follow up surveys also prepared and implemented by professionals would be required to determine development changes. These follow up surveys would have to be done after the close of PREFACE and experience indicates that without the specific driving force of the project, it would be unlikely that they would take place.
3. Development is the result of a large number of factors and even with high quality baseline and follow up survey data, identifying the specific impact of the PREFACE project would be difficult and uncertain.

The team does not believe that there can be any accurate assessment of the specific impact of PREFACE on development or social and community effectiveness in the target countries within the time available to PREFACE. After a project is completed, it takes at least one year and usually longer for social and economic systems to stabilise. Attempting to evaluate developmental impact through any means is not likely to provide an accurate assessment until that stabilisation has occurred. During the initial period after implementation, projects that work technically are invariably considered beneficial and a dramatic improvement. It is only after the initial excitement has passed that the real effects on society, community and development can be assessed.

1.7 Financial Analysis

Financial Performance of PREFACE

With the resources provided to the Review Team it proved impossible to closely correlate budgets with actual expenditures. If the project is to be completed, a cost over-run of approximately A\$250,000 is expected. This represents less than 10% of the total budget and is considered within a reasonable margin of error.

The requirement for additional time to complete the demonstration projects and the need for additional time and money for their completion appears to be caused by an initial delay in their commencement during calendar 2000. This may have been due to more time than expected having to be allocated to feasibility studies or to unexpected start up delays resulting from the many interactions with governments, regional organizations, donors and others involved in the project. Certainly the additional delay of the Cook Island wind project can at least partly be attributed to bureaucratic delays.

Financial Sustainability of the PREFACE demonstration projects

Financial sustainability consists of two components: (1) that fees and specifically designated subsidies are sufficient to cover all operating and maintenance (O&M) costs; and (2) that those fees and subsidies are actually collected.

All the projects are financially sustainable if all fees and subsidies are actually collected by the project. However, the probability of that happening is not the same in each project.

1. Vanuatu. As this is primarily a public facilities project, arrangements were made with the relevant departments to pay the O&M costs of the portion of the project which was installed on health and education facilities. If paid, this should be adequate for financial sustainability. For the private component, the installations on staff housing, arrangements were made for the deduction of user fees from staff salaries making collection reasonably assured. However the fees charged private users do not appear to be sufficient to cover all costs for the future and either the fees will have to be raised over time or additional inputs from outside sources will be necessary for financial sustainability. No specific subsidies have been arranged for the support of the private component of the project.
2. Tonga. User fees have been set at a rate considered to be comparable to the cost of kerosene and dry batteries that will be offset and one that is reasonable from the standpoint of users for the services to be provided. This fee is insufficient to pay the full O&M cost of the project for the long term. Specific subsidies in the form of personnel and services has been promised by the Tonga Government to help cover any short fall. Past experience has been that the Government has indeed supported PV projects with staff time and services but has balked at the provision of replacement batteries or other components. Sustainability appears possible but will depend greatly on the ability of the institutional structure to collect assigned fees and to gradually ramp up those fees to the point where dependence on subsidies for hardware replacement will not be necessary.
3. RMI. User fees have been set at a level believed to be sufficient to provide for all O&M costs of the project for the long term. The project is to be turned over to the RMI power utility, the Marshalls Energy Company (MEC) for operation and management of the MEC has indicated a willingness to provide cross subsidies from urban utility operation if necessary for sustainability. Financial sustainability can be achieved provided collections are maintained at a high level. That will depend greatly on the ability of the MEC to keep the systems operating and on their willingness to enforce collection rules. Since the MEC has no prior experience with PV electrification, for both technical and financial

sustainability to occur, it is likely that external support for the institutional arrangements and for development of an adequate technical capacity will be needed for at least a year following turn over to the MEC.

4. Cook Islands. Financial sustainability is reasonably assured provided the technical system performs as intended. The wind system delivers power to an existing grid on Mangaia and since utility costs are recovered from users through the power tariff, as long as the wind power system provides the expected power to the grid at the predicted operational cost, financial sustainability is likely. The primary concern of the Review Team is that past experiences with wind power systems in the Pacific has been poor with unexpectedly high maintenance required and lower than estimated power delivery provided. If this project fails to be sustainable, it is most likely to be due to technical issues rather than institutional or financial issues.

1.8 Economic Analysis

A comparison of the Ha'apai Diesel Electrification project by AusAid and the PREFACE Ha'apai solar electrification project was made. The comparison shows that on a per user basis, both projects cost about the same over all cost for providing household lighting and basic entertainment services. This indicates that for small island electrification, other factors than capital or O&M cost should form the basis for making the decision as to which technology to use. Environmental issues, economic activity issues, issues relating to reduction of economic and political dependence on fossil fuel imports and user preference all are factors which need to be considered when making the technology decision.

Understanding of the potential and constraints of RE systems for remote areas

Within the countries receiving demonstration projects, PREFACE is considered to have contributed greatly to the understanding of renewable energy system project design, development and implementation. This is largely because the project made a strong effort to include government decision makers and officials, local government and users in the project design, development and implementation phases.

Through Energy Working Group (EWG) activities within the Council of Regional Organisations of the Pacific (CROP) and through regional meetings such as the Regional Energy Meetings (REMs) and Forum Meetings, PREFACE has disseminated information regarding renewable energy, the design of renewable energy projects and the results of renewable energy projects in the Pacific. This is believed to have been beneficial to the region through the raising of awareness of the potential and constraints of renewable energy for island electrification.

Public information has been through press releases, the SPC website and word of mouth reports from friends and family affected by the PREFACE installations. The Review Team feels that more effort could be made in this area and recommends that a communication strategy be developed for implementation in a project extension or for turn over to other regional agencies for their use.

Private Sector Participation

The demonstration project components and installations were tendered internationally. Foreign respondents to the tenders were required to identify a local counterpart for system installation and later warranty services. Most prior PV projects in the Pacific have purchased equipment on tender but installations have been made by government agencies or organisations. PREFACE has extended participation to local companies in the target islands thereby helping create a local capability for installation and maintenance which is expected to improve technical sustainability.

Income Generation and Employment

Rural electrification in general has not generally resulted in significant income generation for recipients. In line with this general observation, the PREFACE demonstration projects do not appear to have much potential for income generation. Since income generation requires much more than just electricity to occur – market access, communications, transport infrastructure, capital for investment to name a few – the installation of the PREFACE solar systems appears unlikely to be sufficient in itself to have any significant income generation development unless other barriers are removed.

In any case, change will be slow in appearing. Without project monitoring for at least one year and preferably five or more years, it will not be possible to assess the impact of the PREFACE project on income generation.

Based on observations of other rural electrification projects the team anticipates that:

1. Retail businesses will be able to attract more customers through improved lighting and music played for entertainment of customers.
2. Some work activities may become more efficient or their time extended through the use of electric lighting and tools.
3. Households may become more attuned to previously unknown economic concepts such as fixed periodic payments for services, budgeting household cash flows to meet payment schedules, that will help in their integration into the broader cash based economy.
4. The local technical and management agents for the demonstration projects represent new income to the community economy and a substantial increase in cash available to the community from outside.

Energy Expenditures

Since the fees charged for the PV systems is approximately the amount which can be expected to be saved in kerosene and dry battery use, there is not likely to be any significant difference in energy expenditures for most user households. But, at least in the short term, households can be expected to enjoy some reduction in energy expenditures primarily through the reduction in dry battery use which in many households exceeds the cost of kerosene for lighting. As the fees are increased to come closer to the real cost of PV service, these savings can be expected to disappear and ultimately the systems may result in somewhat higher energy expenditures per household.

Use of Fossil Fuels and GHG Emission

Fossil fuel reductions and lowered GHG emission will result from the PREFACE project since kerosene is being replaced by solar. This is a very positive development from the perspective of the PICTs who are very sensitive to these issues. However, it must be recognised that the specific impact of the PREFACE demonstration projects in fossil fuel and GHG reductions is very small in relation to urban use in the PICTs. The main potential value of PREFACE in this area is through replication of the projects. Such replication will not take place if the PREFACE demonstrations are not completed and clearly shown to be suitable models for replication.

1.9 Technical analysis

The PREFACE team clearly used prior experience in the Pacific and data from feasibility studies to prepare technical designs for the demonstration projects. The team considers the technical designs to be attuned to the Pacific environment and generally sized to meet user requirements for

lighting and basic entertainment services. Some technical concerns were raised by team members, particularly as regards the possibility of battery problems resulting from their being located outside in the sun in closed containers and regarding probable voltage drops resulting from undersized power feeders from the batteries to the houses. These concerns are presently being addressed by the installation contractor and the technical systems are therefore considered to be satisfactory for their design purpose.

Since user surveys for grid connected rural households have indicated that the primary use of electrical power is for lighting and basic entertainment, the PV systems installed in the demonstration projects appear to meet these needs adequately. Wealthier households are likely to desire prestige electrical equipment such as videos, refrigerators and washing machines. The “one size fits all” aspect of the demonstration project does not allow the installation of larger systems for wealthier customers though some customers in the RMI have asked to have two systems installed to allow for greater power availability. The primary constraint on system sizing has been the willingness of users to pay the full O&M cost recovery for the systems. Based on experience in other projects, there is little doubt that the majority of households have the ability to pay the full O&M cost but the priority for the services provided is such that the willingness to pay that amount is often not present. As users become more used to – and dependent on – the services provided by the PV systems, willingness to pay can be expected to increase.

1.10 Technical Training

PREFACE provided good quality technical training in each project. Training materials developed by S.P.I.R.E. and PEDP were modified for local use and in some cases translated into the local language. Training was done by PREFACE experts and appears to be typical of similar training efforts used for other projects. The team considers this initial training to be adequate but insufficient for the long term.

The team found that field technicians in Tonga had acquired basic knowledge about PV systems but did not have a good capability for troubleshooting systems that have problems. This is the result of training processes that do not have a long term component. Also noted was that in none of the demonstration countries is there an organised capability for long term training of new technicians. Therefore the team recommends that as a part of follow on activities, there be the development of an in country training capability for upgrading the skills of existing technicians and training new technicians. Without this local capability, project technical sustainability is at great risk since the quality of technical services cannot be maintained.

2 NETWORKING, INFORMATION AND AWARENESS ANALYSIS

2.1 Interactions with the CROP EWG and with EWG Members

PREFACE representatives have attended all CROP EWG meetings during the term of the project prior to this review. Discussions with the EWG Chairperson indicate that PREFACE has been an active participant and has worked well within the group.

An ESCAP energy official singled out PREFACE as being the most responsive to their call for assistance with the development of their Pacific Renewable Energy program. PREFACE was praised for its rapid response, openness and in particular the willingness of PREFACE to freely provide information and to make an active effort to assist in the coordination of ESCAP activities with the PICs.

On several occasions, PREFACE attempted to coordinate its efforts with those of SOPAC, the main regional energy agency and the designated successor to SPC for energy programmes, and to

supplement SOPAC activities where their programmes were unable to fully comply with PIC requests. The 2002 REM was co-sponsored by PREFACE and SOPAC.

The Review Team considers PREFACE's interactions with the CROP EWG and its members to have been supportive and appropriate.

2.2 Dissemination of Information on Renewable Energy

The primary mode for information dissemination was through the demonstration project activities. Training activities, public meetings, meetings with national and local government officials and meetings with potential users were all major delivery mechanisms for information about renewable energy. For countries not receiving demonstration projects, information was provided through assistance programs for the development of project proposals, policy and project design. The SPC website and press releases were used for general public information purposes. Professional papers at the REM and other meetings were also used for information dissemination to countries not receiving PREFACE demonstrations.

2.3 Network Creation with PICTs, Regional Energy Agencies and International Energy Experts

Through the provision of email capabilities, PREFACE created an excellent communications network that included all the important participants in the demonstration projects. PREFACE also attempted to create a broader network of PICTs, Regional Energy Agencies and international energy experts through the use of PREFACENET, a list-server email network. Over 150 members signed up for the network representing a good cross section of the target groups. Though potentially an excellent means of two-way communication it was actually used almost exclusively for one-way communications from PREFACE to network members about its activities. While this was useful, it did not result in the interactive communications that were hoped for. Since the cost was low and the concept appropriate, the Team considers the creation of PREFACE net to be appropriate. However, given the minimal experience of most of the members with list-server type communications, there may have been more response from members if more information about the use of PREFACENET was provided to members at the time of their joining.

2.4 Development and Implementation of Other Bi-Lateral And Regional Initiatives that are Related to the PREFACE Goals, Purpose and Objectives

These have included:

- Assisted in the development of the Pacific Islands Renewable Energy Programme (PIREP) project for SPREP under GEF for the identification and reduction of barriers to use of renewables in the Pacific (successful)
- Linkages with donors for the development of projects in Tonga and RMI
- Assisted in the development of an ESCAP effort in the Pacific (successful)
- Assisted in the establishment of the NGO "Acting for the Development of Marshall Islands Renewable Energie" (ADMIRE) to develop projects using the promised US\$1 million of RMI government funds to be allocated for renewable energy and to prepare proposals for outside funding.
- Territoire Européens du Pacifique: Valorisation des Energies Renouvelables et Transfert d'Expériences et de Savoir-faire (TEP VERTES) was developed for funding by the EU (successful)
- Assisted in the establishment of SECOND (Sustainable Energy for Cook Islands Natural Development) and assisted in the preparation of proposals to the EU and Taiwan.

Additionally technical and management advisory services were provided including:

- Management advice to the SEC in Kiribati in preparation for their EU project
- Provided advice to the French Satawal project in FSM
- Worked with other regional organisations in the development of a regional energy policy.

Not only have these project development activities greatly leveraged the funds made available for PREFACE, they have provided direct training and support to PICT officials in the development of project proposals and the design of projects for renewable energy application.

A number of opportunities for PREFACE to continue interacting with regional organisations and with the PICTs exist and can be carried out if an extension is granted.

2.5 Development of Regional, Sub-Regional and National Renewable Energy Proposals

These have included

- Proposal developed for Tuvalu to GEF
- Assisted Cook Islands in preparing a wind energy study proposal to a Danish NGO
- Assisted French Polynesia and New Caledonia in a EU PTOM project proposal
- Proposal to NZODA for training attachments to PREFACE for PIs (rejected for funding)
- Developed a TA and training proposal for RMI, FSM and Palau for Taiwan funding (resulting in funding)
- Assisted in the formulation of project proposals for MICRONESIA REP by the EU.

3 CONCLUSIONS AND RECOMMENDATIONS

The team concludes that overall the PREFACE project has been well managed and has performed better with regards to both time and money budgets than most comparable regional projects that have included a hardware component. However, the team considers the project design to have been flawed in that insufficient time was provided to adequately monitor, test and, if necessary, modify the institutions that are to operate the demonstrations. It is recognised that unforeseen delays due largely to the difficult and unpredictable requirements of remote rural electrification projects in the Pacific Islands have resulted in one of the demonstration projects not being installed and the others not fully completed in the allocated time. Although installations and technical implementation will be complete by the end of 2002 for all but the Cook Islands project, the institutional arrangements are incomplete and untested. Since most project failures in recent years can be directly traced to institutional problems, these projects cannot be considered complete until the operating institutions are clearly capable and adequate for the long term sustenance of the projects.

The Review team believes that completion of all projects cannot occur without monitoring and nurturing of the operating institutions for a reasonable time. Proper completion of the demonstration projects is essential for the goals and objectives of PREFACE to be attained. In the unanimous opinion of the Review Team, that cannot be achieved without at least a one year extension of the project.

Not to properly complete these demonstration projects will result in a much higher risk of failure, Project failure will result in loss of the desired benefits to the PICTs and the region in the form of sustainable project models as well as loss of the project benefits to the immediate beneficiaries.

Other primary recommendations to better reach the goals and objectives of the project include the provision of PREFACE support for the creation of a local training capability for on site technicians, development of a comprehensive communications strategy and its implementation. These tasks also cannot be completed in the remaining time allocation and require an extension of at least one year and an additional budget of approximately A\$600,000 representing about 17% over the planned project cost.