1. Project Data

Summary project data				
GEF project ID	<u> </u>	1136		
GEF Agency project ID		179		
GEF Replenishment Phase		GEF-3		
	lude all for joint projects)	UNDP		
Project name		Wind Energy Applications		
Country/Countries		Erithrea		
Region		Africa		
Focal area		Climate Change		
Operational Program Priorities/Objectives	or Strategic	6-Promoting adoption of renew	able energy by removing barriers	
Executing agencies in	volved	Department of Energy		
NGOs/CBOs involvem	nent	No		
Private sector involve	ement	one of the beneficiaries; throug	h consultations	
CEO Endorsement (FS	SP) /Approval date (MSP)	06/01/2004		
Effectiveness date / project start		06/24/2004		
Expected date of proj	ect completion (at start)	06/20/2007		
Actual date of project	t completion	03/31/2009		
Project Financing				
		Project Financing		
		Project Financing At Endorsement (US \$M)	At Completion (US \$M)	
Project Preparation	GEF funding		At Completion (US \$M) 0.32	
Project Preparation Grant	1	At Endorsement (US \$M)		
	GEF funding	At Endorsement (US \$M) 0.32	0.32	
Grant	GEF funding	At Endorsement (US \$M) 0.32 N/A	0.32 N/A	
Grant	GEF funding Co-financing	At Endorsement (US \$M) 0.32 N/A 1.95	0.32 N/A 1.95	
Grant GEF Project Grant	GEF funding Co-financing IA/EA own	At Endorsement (US \$M) 0.32 N/A 1.95 N/A	0.32 N/A 1.95 1.70	
Grant GEF Project Grant	GEF funding Co-financing IA/EA own Government	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98	0.32 N/A 1.95 1.70 0.50	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96	0.32 N/A 1.95 1.70 0.50 N/A	
Grant GEF Project Grant Co-financing Total GEF funding	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27	0.32 N/A 1.95 1.70 0.50 N/A 2.27	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94 5.20	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-financing)	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94 5.20 aluation/review informatio	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-financing)	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94 5.20 aluation/review informatio	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-financing TE completion date TE submission date	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94 5.20 aluation/review informatio 03/01/2009	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	
Grant GEF Project Grant Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-financing TE completion date TE submission date Author of TE	GEF funding Co-financing IA/EA own Government Other*	At Endorsement (US \$M) 0.32 N/A 1.95 N/A 1.98 0.96 2.27 2.94 5.20 aluation/review informatio 03/01/2009 Ikhupuleng Dube	0.32 N/A 1.95 1.70 0.50 N/A 2.27 2.20 4.46	

^{*}Includes contributions mobilized for the project from other multilateral agencies, bilateral development, cooperation agencies, NGOs, the private sector, and beneficiaries.

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF EO Review
Project Outcomes	S	S	N/A	S
Sustainability of Outcomes	L	L	N/A	ML
M&E Design	N/A	S	N/A	S
M&E Implementation	N/A	HS	N/A	HS
Quality of Implementation	N/A	S	N/A	S
Quality of Execution	S	S	N/A	S
Quality of the Terminal Evaluation Report				S

3. Project Objectives

3.1 Global Environmental Objectives of the project:

The Global Environment Objective of this project is to reduce emissions of greenhouse gases and other kinds of pollution from fossil fuel use in Eritrea by developing solar and wind energy technologies.

Eritrea has a shortage of modern forms of energy, especially in its rural areas. Biomass contributes the largest share of energy supply, followed by oil products. All electricity is generated by thermal means using oil products. Eritrea has abundance of solar radiation throughout the whole year, undeveloped geothermal potential and good wind energy potential. In the case of wind, preliminary analysis has shown significant wind energy potential in Eritrea. However, several barriers, including Capacity /Institutional Barriers, Awareness/ Experience Barriers and Technical Barriers, need to be addressed.

3.2 Development Objectives of the project:

The project's development objectives are:

- Introduction of a novel energy technology in Eritrea;
- Demonstration of the technical, economic, financial and institutional viability of both large and small wind energy applications through investments;
- Measuring the performance and assessing the replication potential of these applications;
- Providing wind power investment models suitable for Eritrea's rural electrification and grid based electricity generation;
- Lowering dependence on imported fossil fuels and reducing greenhouse gas emissions from existing diesel facilities in Eritrea through partial displacement by renewable energy sources:
- Helping government institutions, local communities and stakeholders to develop their knowledge and capacities in planning, installing, operating, maintaining and monitoring wind energy systems.

The three immediate objectives of the project are:

- (1) To develop necessary personnel and institutional capacities to plan, install, operate and manage on- and off grid wind systems and increase awareness amongst decision makers in governmental and private institutions both at the community and central level.
- (2) To install a small wind farm in Assab and integrate the wind generated electricity into an existing conventional electricity grid thus demonstrating that on-grid wind energy is technically, financially, and institutionally feasible and can be a least cost electricity supply possibility in Eritrea at high wind speed sites.
- (3) To install eight small scale decentralized wind stand-alone and wind-diesel hybrid systems in the selected wind rich villages and production sites of Eritrea to demonstrate the technical, financial, institutional and socio-economic viability of off-grid wind energy systems.
- 3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

No major change in objectives or activities was reported.

4. GEF EO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

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

Please justify ratings in the space below each box.

4.1 Relevance	Rating: Satisfactory
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The development of alternative and indigenous renewable energy sources are top priority issues driving Eritrea's energy policy. Eritrea has been proactive in ensuring the harnessing of renewable energy for development. The Department of Energy's primary objective is "to avail ample, dependable and sustainable energy for the growing needs of all sectors in Eritrea at an affordable price". To achieve this broad objective, the issues of adequacy, affordability, environmental sustainability, social equity are of critical importance. The adoption and usage of renewable energy sources to attain these objectives are high on the agenda. Also important is energy security in terms of reducing dependency of imported petroleum products, and increasing electricity generation capacity and access in rural areas. The current power sector performance is characterised by inefficiencies and managerial short-comings, hence power sector reforms are top on the agenda.

In line with the policy objectives of the government, major activities are being implemented or have been implemented. Since 1991, generation capacity and distribution lines have increased. Eritrea

Electricity Corporation (EEC) has been reformed to operate on commercial principles. Tariff reforms and a new regulator position have enabled an environment for private sector participation. To increase access to electricity and to ring-fence the interests of the poor, a Rural Electrification Fund has been setup. Recognizing the role of modern energy in poverty reduction and achieving the MDGs, the government of Eritrea has been expanding energy services to rural areas by using renewable energy sources.

Therefore, the project fits in well and is an integral part of Eritrea's energy policies and investment programmes.

4.2 Effectiveness	Rating: Highly Satisfactory
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The overall project effectiveness can be rated as satisfactory. According to the TE, "the project is almost complete and has very satisfactorily addressed its objectives". The project has contributed to the removal of technical and institutional barriers affecting the dissemination of renewable energy technologies, through capacity building activities, awareness raising on the benefits of wind technologies. Furthermore, the project has resulted in an informed framework for the adoption and wider dissemination of wind energy technologies.

The TE notes describes the successful achievement of project objectives to reduce greenhouse gases and improve the of quality of life.

Most capacity building activities have been covered fully. Strategies have been established to implement the last remaining components, which are training of technical experts on technical back up of the wind energy off-grid, and training of local communities on operations of the systems.

The wind park has been commissioned and connected to the grid. The targeted production was exceeded. All the necessary physical preparations for such a pilot wind park operation have been properly carried out. Technical training and establishment of the performance monitoring system was accomplished and the system is operating well.

The procurement process has been carried out. The civil works are 98% complete. The power houses in all sites are complete. Diesel generators in sites requiring them have been installed. The local power networks have been erected in all sites and the materials for the last site (Beylul) have been procured. Implementation guidelines by communities have been produced by the Project Management Unit, circulated for comments, comments incorporated and final guidelines circulated for the implementation phase. Operators of the systems to be trained have been identified and nominees' details sent to Project Management Unit.

According to the TE, the project start-up was timely and efficient, however, implementation started to drag after the initial 6-8 months, due to non-delivery by the Technical Advisor (TA) on critical path activities. The TA was selected through an international competitive bidding process and the contract was in place within four months of expected project start-up. However, due to non-delivery or poor delivery by TA the contract had to be terminated.

Due to under delivery by TA, PMU decided after consultation with UNDP and in the presence of TA, to apply the most suitable procurement guidelines, i.e. the World Bank ones, for the purpose of international competitive bidding. Since TA failed to prepare design and specifications of the grid connection equipment and works, this had to be sub-contracted.

The equipment procurement process was substantially slower than expected. This was due to the required correspondences needed by the PMU from the TA. With the termination of the TA's contract, however, the work became straightforward and project's momentum increased.

According to the TE, the procurement process has delayed the project milestones significantly due to the non-performance of the TA, delays in civil works in the Assab Wind Farm component, failed contract negotiations and cost increases necessitating top-up financing by UNDP. Further delays experienced were due to breach of contract by Fortis and shipping delays by Soyut. Notwithstanding these setbacks, the procurement process has been conducted according to credible procedures acceptable to the UNDP (World Bank Guidelines). PMU has carried out its task in a commendable manner including Selection Committees in all necessary steps and has detailed the selection processes.

4.4 Sustainability	Rating: Moderately Likely
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According to the TE, the project was success. The project has been implemented on the background of appropriate energy policies and has led to improved institutional capacity of delivering alternative sources of energy such as wind. The likelihood of continuation of project outcomes/benefits after completion of GEF funding depends on a number of factors.

(1) The project implementation approach is based on the need for beneficiaries to contribute towards operations, maintenance and equipment replacement. This means that the tariff should cover operational and replacement costs. During the evaluation, tariff levels have not been set and the system was supposed to run for a month before tariffs are set, based on cost recovery and affordability. In the event that affordable levels do not match the cost of service, there is a risk on sustainability. This might lead to underfunding for maintenance and operational purposes. This might be mitigated by provision of funds or state subsidies

- to keep the systems running at the required level of reliability and sustainability of the Assab Wind Farm.
- (2) Sustainability also depends on the progress made in preparations for replications. The key determent is availability of finance. Donor finance is critical in ensuring sustainability, given the financial constraints. There is a need to quickly mobilize the required resources. Institutions such as the World Bank have indicated willingness to contribute in funding should they be approached. Also a number of institutions have funded energy projects in Eritrea or other countries.
- (3) To gain maximum benefits, there is need for an approach that maximizes income generation activities. This would need the support of the private sector. Local technological adoption of systems such as wind mechanical systems for water pumping would ensure the sustainability of the project and build local capacity.
- (4) Other critical areas that need attention are local standards, improved stakeholder interaction and utility long term transmission and generation planning.

Therefore, the sustainability of the project can be rated as Moderately Likely. According to the TE "Since components of the projects are still to be finalised it is possible that the sustainability of the project would move to very satisfactory, especially if the level of cost recovery is adequate to sustain the operations and maintenance of the systems and finance could be mobilised for the replication phase".

5. Processes and factors affecting attainment of project outcomes

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

The project budget was to be shared equally between GEF and Eritrea. The budget is directed to the procurement of equipment and executing civil works, typical of such pilot projects, capacity building, and barrier removal programmes. Given the financial constraints faced by Eritrea, GEF agreed to finance on a grant basis half of the equipment of the decentralised systems component and the grid reinforcement in addition to the training and technical assistance components. Thus, the bulk of the equipment procurement financing was left to Eritrea. Most of this was eventually covered by UNDP, which stepped in to cover a budget deficit caused by budgetary constraints and cost escalation. Eritrea's share was reduced and their financial participation was reserved for civil works and other local expenses.

However, Eritrea also contributed with significant level of in-kind services. Eritrea paid for the diesel gensets at the wind-diesel pilot sites. Additional costs were incurred in putting the local distribution network in four sites. The contribution from Eritrea was high and demonstrated their commitment to the project.

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

The duration of the project was originally 3 years, but the project has been extended by 2 years. The original timing took into consideration necessary projects components and essential execution of international missions of experts as effective as possible, thus minimizing travelling costs especially with regard to the timing of the training seminars.

The project was well started but later experienced serious delays due to non-performance by the Technical Advisor (TA)., The TA delayed or totally failed to deliver critical inputs, which caused delays in project procurement and overall implementation. According to the TE "the TA's lack of delivery was compounded by an unrealistically short time-scale for the procurement of major equipment components, in the background of the need to acquire a learning curve by the PMU, without support from the TA". With the termination of the TA contract and injection of additional financing by UNDP, the project picked up momentum but was further delayed by contractual issues.

A contract for the supply, installation and commissioning of the distributed wind energy sites between Eritrea and the Dutch company *Fortis Wind Energy* was cancelled shortly after signing. Eritrea awarded the subsequent contract to a Turkish company- Soyut Construction and Engineering Co. Inc. Soyut Construction and Engineering also faced unforeseen problems in the shipping of equipment. Most shipping agencies were weary of Somalian piracy. The Project Management Unit worked hard to find shipping lines ready to transport the equipment.

Therefore, the causes of the project delays can be summarized as follow:

- (1) PMU staff did not have prior experience in the wind energy related ICB process and requirements;
- (2) TA failed to provide sufficient technical support to PMU and seriously delayed preparations of bid documents;
- (3) A number of clarifications were required during the bidding process before contracts could be agreed upon;
- (4) There was reluctance by potential suppliers to bid;
- (5) Long negotiating process on details with the selected suppliers.

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

According to the TE, the country's ownership and stakeholder participation has been very high. All critical segment of the energy community contributed positively to the project implementation. Some examples of the high level of ownership are given in the TE and can be summarized as follow:

(1) Beneficiaries contributed directly by providing labor for installation of the local electricity reticulation. Some of them bought electricity meters. The beneficiaries also carried out their

- own internal wiring, based on EEC specification and inspected by EEC. They also have the obligation to pay timeously for the energy used.
- (2) Department of Energy hosted the project and integrated the PMU within its proper structures. DoE through the PMU carried out day to day project management and coordinated the implementation of the project with relative stakeholders. The DoE has been helpful in introducing wind technology in villages and hands over the projects to the beneficiaries through well documented procedures. DoE established project monitoring procedures and assessed performance. As an integral part of GoE, DoE partially financed the project. DoE has shown total commitment to the success of the project and wider adoption of wind energy and other renewable technologies.
- (3) Energy Research and Training Centre (ERTC) was an essential player in the project implementation. The wind data gathered by ERTC has been used to select and design the systems as well as to select future sites for replication. According to ERTC, they are totally committed to the project and were ready to fulfil their project mandate as soon as the necessary training was provided by the supplier.
- (4) The regional administration offices were financing the construction of local electricity networks and the procurement of diesel generators for the hybrid systems, which was handed over to local administrations.
- (5) The UNDP Office played an active role in supervising the project progress and facilitated in its implementation. It provided valuable operational support and positive interventions in providing the complementary financing to cover the initial commitment of GoE. In the absence of a TA, UNDP took a positive role to assist the PMU with procurement guidelines. The efficient performance of the UNDP office through the sizeable financial contributions has provided the life-line to the project at a very critical stage.

The key participating stakeholders, DoE, EEC, ERTC, regional administration offices local administration offices and households have effectively been integrated into the project and have contributed to the project in a very positive manner. There is a need to engage donors and other financiers in preparation for the replication phase.

6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 M&E Design at entry	Rating: Satisfactory
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According to the PD, a solid project monitoring and evaluation system was put in place. The daily monitoring of the project was to be conducted by the PMU, which would submit progress reports every six months, annual reports, and a final report.

Each progress report should have reviewed the activities for the previous reporting period and provided an assessment of the actual project status. It should also have provided an updated time schedule based upon the project status. The different tools for Monitoring and Evaluation of the project were described as follow in the PD.

- (1) Annual Project Report: The PMU reports annually to the Executing Agency, UNDP and GEF on the project output achievements and outcomes. This is done by preparing Annual Project Reports (APR) after consultation with stakeholders. The new APR/ GEF Project Implementation Report (PIR) format is used. The UNDP Country Office uses the APR to assess performance of the project management and to determine strategies for the future. It would also be supplied to the GEF Monitoring & Evaluation Team.
- (2) Evaluation: At the end of the project the executing agency organizes an independent evaluation of the project. If necessary, an independent evaluation would also be conducted at the mid -term point of the project life.
- (3) Monitoring and Operation of Installed Systems: An evaluation of the operation statistics of the wind park in Assab would take place after one year of operation. Targets would be set regarding technical availability and performance. Actual achieved availability and performance of the systems would be compared with those targets. The O&M contractor of the wind park was required to submit regular operation reports containing key operational data beforehand so that failures can be identified before the one year evaluation.
- (4) For the pilot systems installed in the rural areas a programme of regular visits would be prepared before installation. Together with establishment of communication lines and procedures between the local operators and ERTC, these visits would allow for the close monitoring of the functioning of the system and the performance of the local operators. In addition, the implementation of a database at the ERTC would be a useful tool for reviewing operational data of the pilot systems. This would allow for comprehensive comparisons of the different systems as well as comparisons of the various systems' behaviour over time.

(5) Monitoring by UNDP: UNDP would keep close contact with all partners of the project, especially the project management, and consultants during their assignments. UNDP would also join the project management in field visits, and assist as appropriate in the resolution of any problems that might arise during project implementation. As the GEF implementing agency for this project, UNDP also assumes responsibility for its implementation, as outlined in its National Execution Manual.

6.2 M&E Implementation	Rating: Highly Satisfactory
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The PMU conducted daily monitoring and submitted regular reports to UNDP. The PMU has produced Project Implementation Reports (PIR) for 2005, 2006, 2007 and 2008 as per UNDP and Eritrean requirements. Similarly, the Mid Term Review was conducted in August 2008. Project Annual Progress Reports were produced for the periods July 2004- June 2005; July 2005-June 2006, and July 2006-June 2007, and December 2008.

Two Tripartite Review Meetings (TPR) were held and the last TPR was awaiting the Terminal Evaluation Report. The TPR mechanism has helped to take early diagnostic measures to rescue the project and ensure its success.

According to the TE, the project monitoring system put in place is state of the art and is ideal for monitoring and evaluation. The implementation of the project itself has been continuously monitored by project partners and a Midterm review has been carried out. Project Review reports have been produced on annual basis and these have been complemented by Tripartite Review meetings. .

7. Assessment of project implementation and execution

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 Quality of Project Implementation	Rating: Satisfactory
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According to the TE, UNDP was in a position to implement the project due to its large country presence, and its energy and environment policies. UNDP has been involved both through the grant, and subsequently in the final technical and financial analyses leading to the project proposal. As an implementing agency for the GEF, UNDP had experience with capacity development and technical assistance in a range of areas, such as procurement of services and experts. It greatly assisted the project by injecting money and thereby reducing Eritrea's contribution. UNDP was very effective in the facilitation of payments and financial management.

7.2 Quality of Project Execution Rating: Satisfactory	
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The project execution was characterised by a consultative approach that took on board inputs from critical stakeholders and thus ensured stakeholder buy-in and active involvement. The partnerships established were effective and well-coordinated and the PMU has managed to mobilise all stakeholders to the common objective of ensuring the success of the project, taking into consideration local structures and community priorities. According to the TE, the piggy back execution approach seems to have been effective and has established synergies between this project and other developmental projects. Even the site selection was adopted from the local administrations' own developmental master plans.

The procurement of wind technology, installation, capacity building programmes, awareness campaigns, training programmes, implementation guidelines for operation of off-grid systems and establishment of monitoring and evaluation systems have been conducted by and executed by PMU according to all acceptable guidelines and standards and very efficiently. The TE notes that the project team should be commended for the execution of the project in an efficient, dedicated and professional manner, despite receiving limited support from international wind energy specialists as originally envisaged.

8. Lessons and recommendations

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

The following useful lessons are given in the TE:

- (1) The clarity of roles by the various stakeholders and the involvement of the stakeholders during the decision making stages, coupled with strong political will, are critical for the success and ownership of projects.
- (2) There are strong synergies between the project and other ongoing energy activities. These synergies were very useful in designing the different delivery modes and also ensured social acceptability of the project by the different players.
- (3) The implementation modalities were based on tried and tested principles, which ensured the project's success.
- (4) The monitoring mechanism is very effective and will be very useful for future wind energy activities and the operation of the wind farm.
- 8.2 Briefly describe the recommendations given in the terminal evaluation.

Despite the project's success, a number of issues need to be addressed within the scope of the project or to be taken into consideration in designing future projects:

- (1) The projected saw serious delays in procurement of equipment. There is a need to allow sufficient time for procurement for the necessary steps, including pre-qualification.
- (2) There is a need to ensure that the local institutions and the PMU are given training in wind energy related international procurement procedures prior to the implementation of the project.
- (3) The usage of a TA should be revisited to ensure a proper track record and experience in similar projects. The TA should demonstrate staff competence and field experience in the relevant activities. Targeted short time assignments should be considered.
- (4) The design of energy systems should take into consideration local conditions, as international equipment supplies are not necessarily good at areas such as civil works.
- (5) To ensure long-term sustainability, there is a need to carry out research on increasing local content of energy technologies where feasible. This is the most effective way to remove barriers and the development of local industry. The improvement in local content should be complemented by the development of local standards.
- (6) There is a need to integrate the wind energy technology into income generation activities such as water pumping for irrigation. This will directly benefit the private sector, which has a higher penetration rate in farming activities. This will also create a sustainable market for private sector expects trained in wind energy systems and will ensure continuation of capacity building, as the experts will in turn train their employees. The deployment of wind mechanical systems will displace diesel pumps.
- (7) Issues such as frequency control are very important in integrating wind technologies in small power systems. The lack of system stability studies has limited the dispatch capacity

- of the wind farm to 35% of the total energy generated, though the system can run with a capacity factor of 44%. There is need to carry out system stability studies by power experts in the design of wind systems to be integrated to the grid.
- (8) System development plans are vital to ensure that wind potential is properly assessed and incorporated in future generation options.
- (9) More time is needed to evaluate the performance of the off-grid systems, since such systems are still being installed. Some time is needed before the performance could be evaluated and more awareness being created with credible field results.
- (10) The regulator will increasingly play an important role in the future electricity market structure and the involvement of the private sector during the replication phase. There is need to develop mechanisms to build the capacity of the regulator in facilitating future electricity investments.

9. Quality of the Terminal Evaluation Report

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

To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The TE contains a detailed assessment of outcomes of the project. Objectives and achievements are described.	S
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report is consistent, and all assessments are well documented. Ratings are given and justified in most of the categories.	S
To what extent does the report properly assess project sustainability and/or project exit strategy?	The project sustainability and the exit strategy are well assessed with details and justifications.	S
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	The lessons learned are given all along the repot, as well as in a summarized part. All lessons are documented and justified.	S
Does the report include the actual project costs (total and per activity) and actual co-financing used?	Project costs, total and per activity are included, and presented in very clear tables. Cofinancing is also given and the financial management, and variations are explained and documented;	S
Assess the quality of the report's evaluation of project M&E systems:	The M&E system implementation is described shortly. The quality assessment is given but in a very short way. The M&E design at entry is however not described in the TE.	MS
Overall TE Rating		S

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