

Document of
The World Bank

Report No: ICR00001288

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(Credit No. 3588A, 35880)

ON A

CREDIT

IN THE AMOUNT OF US\$49.15 MILLION

AND A GEF GRANT

IN THE AMOUNT OF US\$12.12 MILLION

TO THE

REPUBLIC OF UGANDA

FOR AN

ENERGY FOR RURAL TRANSFORMATION PROJECT

IN SUPPORT OF THE FIRST PHASE OF THE

ENERGY FOR RURAL TRANSFORMATION PROGRAM

December 23, 2009

Africa Energy Group
Sustainable Development Department
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective February 13, 2009)

Currency Unit = Uganda Shillings
US\$1950 = US\$1
US\$1.51 = SDR 1

FISCAL YEAR

July 1 – June 30

ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
APL	Adaptable Program Lending
BoU	Bank of Uganda
BUDS	Business Development Support
CAS	Country Assistance Strategy
CML	Commercial Microfinance Limited
CSF	Credit Support Facility
ERA	Energy Regulatory Authority
ERT	Energy for Rural Transformation
GEF	Global Environmental Facility
GIS	Geographical Information System
GOU	Government of Uganda
HC	Health Centers
HFO	Heavy Fuel Oil
ICT	Information and Communication Technology
IDA	International Development Agency
IFC	International Finance Corporation
ISR	Implementation Status Report
IPPs	Independent Power Producers
IREMP	Indicative Rural Electrification Master Plan
ISP	Internet Service Providers
KWh	Kilowatt hour
LOC	Letter of Credit
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDIs	Microfinance Depository Institutions
MEMD	Ministry of Energy and Mineral Development
MOES	Ministry of Education and Sports
MOFPED	Ministry of Finance, Planning and Economic Development
MOH	Ministry of Health
MOLG	Ministries of Local Government
MTR	Midterm Review
NGO	Non-governmental organization

OED	Operations and Evaluation Department
PAD	Project Appraisal Document
PCU	Project Coordination Unit
PEAP	Poverty Eradication Action Plan
PHC	Primary Health Care
PPA	Power Purchase Agreement
PRDP	Peace Recovery and Development Plan
PREP	Priority Rural Electrification Project
PRSP	Poverty Reduction Strategy Paper
PSFU	Private Sector Foundation of Uganda
PV	Photovoltaic
PVTMA	PV Targeted Market Approach
RE	Rural Electrification
REA	Rural Electrification Agency
REB	Rural Electrification Board
REF	Rural Electrification Framework
SACCOs	Savings and Credit Cooperative Societies
SHS	Solar Home System
SMEs	Small and Medium Enterprises
UCC	Uganda Communication Commission
UJAS	Uganda Joint Assistance Strategy
ULAA	Uganda Local Authorities Association
UML	Uganda Microfinance Limited
WENRECO	West Nile Electric Company

Vice President:	Obiageli Ezekwesili
Country Director:	John McIntire
Country Manager:	Kundhavi Kadiresan
Sector Manager:	S. Vijay Iyer
Project Team Leader:	Paul Baringanire
ICR Team Leader:	Bobak Rezaian

UGANDA
ENERGY FOR RURAL TRANSFORMATION PROJECT

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Project Data Sheet

A. Basic Information			
Country:	Uganda	Project Name:	UG-Energy for Rural Transform (FY02)
Project ID:	P069996,P070222	L/C/TF Number(s):	IDA-35880,IDA-3588A,TF-23624,TF-50371
ICR Date:	12/15/2009	ICR Type:	Core ICR
Lending Instrument:	APL	Borrower:	GOVERNMENT OF UGANDA
Original Total Commitment:	IDA:XDR 38.3M; (USD 49.1M) GEF: USD 12.1M (XDR 9.5 M)	Disbursed Amount:	IDA:XDR 37.3M (USD: 56.9M) GEF: USD: 11.35M (XDR: M)
Environmental Category: F		Focal Area: C	
Implementing Agencies: Ministry of Energy and Mineral Development Rural Electrification Agency Bank of Uganda Private Sector Foundation Uganda Uganda Communications Commission (UCC)			
Cofinanciers and Other External Partners:			

B. Key Dates				
UG-Energy for Rural Transform (FY02) - P069996				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	03/03/2000	Effectiveness:	07/30/2002	07/30/2002
Appraisal:	04/23/2001	Restructuring(s):		
Approval:	12/13/2001	Mid-term Review:		10/28/2004
		Closing:	08/31/2006	02/28/2009

UG-GEF Energy for Rural Transf (FY02) - P070222				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	03/09/2000	Effectiveness:	07/31/2002	07/31/2002
Appraisal:	04/23/2001	Restructuring(s):		
Approval:	12/13/2001	Mid-term Review:		10/28/2004
		Closing:	08/31/2006	02/28/2009

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes	Moderately Satisfactory
GEO Outcomes	Moderately Satisfactory
Risk to Development Outcome	Substantial
Risk to GEO Outcome	Substantial
Bank Performance	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry	Moderately Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory
Overall Bank Performance	Moderately Satisfactory	Overall Borrower Performance	Moderately Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
UG-Energy for Rural Transform (FY02) - P069996			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
DO rating before Closing/Inactive status	Moderately Satisfactory		

UG-GEF Energy for Rural Transf (FY02) - P070222			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
GEO rating before Closing/Inactive Status	Moderately Satisfactory		

D. Sector and Theme Codes		
UG-Energy for Rural Transform (FY02) - P069996		
	Original	Actual
Sector Code (as % of total Bank financing)		
General agriculture, fishing and forestry sector	8	
General energy sector	18	84
Other social services	8	
Power	55	
Telecommunications	11	16
Theme Code (as % of total Bank financing)		
Education for the knowledge economy	25	
Health system performance	25	
Other financial and private sector development	25	
Rural services and infrastructure	25	100

UG-GEF Energy for Rural Transf (FY02) - P070222		
	Original	Actual
Sector Code (as % of total Bank financing)		
General agriculture, fishing and forestry sector	3	
General energy sector	36	
Health	3	
Power	46	
Renewable energy	12	100

Theme Code (as % of total Bank financing)		
Climate change	22	
Other financial and private sector development	22	
Participation and civic engagement	11	
Pollution management and environmental health	23	
Rural services and infrastructure	22	100

E. Bank Staff		
UG-Energy for Rural Transform (FY02) - P069996		
Positions	At ICR	At Approval
Vice President:	Obiageli Katryn Ezekwesili	Callisto E. Madavo
Country Director:	John McIntire	James W. Adams
Sector Manager:	Subramaniam V. Iyer	M. Ananda Covindassamy
Project Team Leader:	Paul Baringanire	Arun P. Sanghvi
ICR Team Leader:	Abdolreza B. Rezaian	
ICR Primary Author:	Sati Achath	
	Lalith Gunaratne	

UG-GEF Energy for Rural Transf (FY02) - P070222		
Positions	At ICR	At Approval
Vice President:	Obiageli Katryn Ezekwesili	Callisto E. Madavo
Country Director:	John McIntire	James W. Adams
Sector Manager:	Subramaniam V. Iyer	M. Ananda Covindassamy
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ICR Primary Author:	Sati Achath	
	Lalith Gunaratne	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)

(Phase 1 only) Put in place a functioning conducive environment and related capacity for commercially oriented, sustainable service delivery of rural/renewable energy and Information & Communication Technologies (ICTs).

Revised Project Development Objectives (as approved by original approving authority)

Global Environment Objectives (from Project Appraisal Document)

For the Program, remove barriers and reduce implementation costs of renewable energy. For Phase 1, build in-country capacity for renewable energy.

Revised Global Environment Objectives (as approved by original approving authority)

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Establishment of a regulatory system for rural electrification, satisfactory working of RE Board, REA and REF.			
Value (quantitative or Qualitative)	None in place.	ERA approval of 3 transactions, one with light-handed procedures RE Board/Agency/Fund operating per agreed procedures		ERA, REB, REA, and REF are fully established and are supported by technical assistance provided by various consultants and development partners. A RE policy was published to guide renewable energy investments. The Indicative REMP was developed.

Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	To date ERA has issued over 5 rural electrification concessions and permits in this respect. REA was not set up by an Act of parliament and hence not fully autonomous to carry out its functions (it is not a legal entity) which limits its independence. 100 %			
Indicator 2 :	A workable financial intermediation mechanism for rural electrification is in place. "Financial sector change"			
Value (quantitative or Qualitative)	None in place.	Two transactions closed, one with support of CSF		Rural Electrification Fund (REF) is in place. -Re-financing facility in place and operational with one commercial bank and three micro financing institutions participating. -A credit support facility was established.
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	The three #fast# track projects (WENRECO, Kakira and Kisiizi), Kilembe Investments Ltd and a number of communities have been fitted from REF. % achievement (as reported by PCU): 95%			
Indicator 3 :	Satisfactory functioning of two independent grid rural electrification operations has been achieved.			
Value (quantitative or Qualitative)	No satisfactory independent grids operating (West Nile functioning poorly under UEB).	At least 90% of planned annual energy delivered (0.9*24,000 MWh) At least 90% of planned connections (0.9*2,250)		Four Independent grids operational (West Nile Rural Electrification Company, Kisiizi, Kalangala and Ngoma are operating with a bout 3400 consumers and over 10,000MWH generated per annum.
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	High connection fees, high cost of petroleum products and low private sector capacity in energy investments continues to pose a challenge. Only			

achievement)	about 50% of the planned annual energy is being generated whereas the connections are above 100% the target.			
Indicator 4 :	Satisfactory functioning of 80 percent of the energy systems provided to agriculture-linked users, health clinics, schools, and water facilities "Cross-sectoral working".			
Value (quantitative or Qualitative)	No project-supported energy systems in place.	At least 90% of planned new connections (0.9*450) At least 80% of those connected are satisfied.		-Installation of 371,975 watt peaks geared towards improved service delivery in water, health and the education sector -supported installation of over 1,100,000 watt peaks through the private sector through matching grants
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	Over 500 solar systems installed in health centers, 20 systems installed for water pumping, 10 agricultural firms and 94 educational institutions have benefited. Number of new connections: above 100%. Beneficiary satisfaction (as reported by PCU): 90%			
Indicator 5 :	Phase I coverage objectives for rural telephony, internet points of presence and rural telecenters has been satisfactorily achieved.			
Value (quantitative or Qualitative)	Non-commercial unserved areas not identified by licensees.	At least one public phone in all 154 sub-counties; Internet points of presence in 30 districts; 2 rural vanguard multi-purpose community centers.		-Internet Points of Presence installed in 32 districts. -Installation of 10,393 public access points in 154 sub-counties completed. -20 telecenters installed. -20 MCT operationalised
Date achieved	04/23/2002	02/28/2009		02/28/2009
Comments (incl. % achievement)	The use of output based aid (OBA) to stimulate investment in underserved areas resulted in coverage of far more communities than had been			

achievement)	originally anticipated. Achievement of targets: above 100%.			
Indicator 6 :	Collection of at least 80% of the telecommunications universal service levy revenues that are billable by the end of Phase I has been achieved.			
Value (quantitative or Qualitative)	No revenues collected.	At least 80% collected.		Collection rate at more than 95%
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	Collection of at least 80% of the telecommunications universal service levy revenues that are billable by the end of Phase I has been achieved			

(b) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	15 MW of renewable energy power generation facilities constructed or under-construction "Renewable power capacity"			
Value (quantitative or Qualitative)	0 MW	15 MW		18 MW (Kakira) operationalised. 0.3MW (Kisiizi) operationalised.
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	Construction of Mpanga (18MW), Ishasha (10MW) and Nyagak (3.5MW) hydropower projects is underway. Achievement of targets: above 100%.			
Indicator 2 :	320,000 cumulative Watt-peak sales of solar pv systems to households and institutions achieved.			
Value (quantitative or Qualitative)	No project-supported solar PV	320,000 cumulative Watt peak		597,765 cumulative Watt Peak installed
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	Private sector attraction through matching grants initiatives and already in place institutional arrangements boosted this activity. Achievement of targets: above 100%.			
Indicator 3 :	Solar home system price reduction of 30% from June 2000 baseline has been achieved			
Value (quantitative or	\$20/Watt peak	\$14/Watt Peak		Prices vary from \$12-17 \$/Wp depending on

Qualitative)				system configuration. Average price \$16/Wp - influenced by international market.
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	Subsidy scheme for solar dealers has been effective in addressing the issue of high initial investment costs. The Photovoltaic Target Market Approach (PVTMA) targeting subsidizing systems at consumer level commenced late and is yet to be evaluated.(100%).			

(c) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Finalization and implementation of first phase of long-term renewable energy capacity building strategy and action plan.			
Value (quantitative or Qualitative)	No plan in place.	Full plan in place		Renewable Energy Policy approved by Cabinet March 2007
Date achieved	04/23/2001	02/28/2009		02/28/2009
Comments (incl. % achievement)	The renewable energy policy was developed with the aim of attracting private sector investments in the sector. The policy enacted the post of an energy officer at local government level to enhance capacity building and sensitization. (100%).			

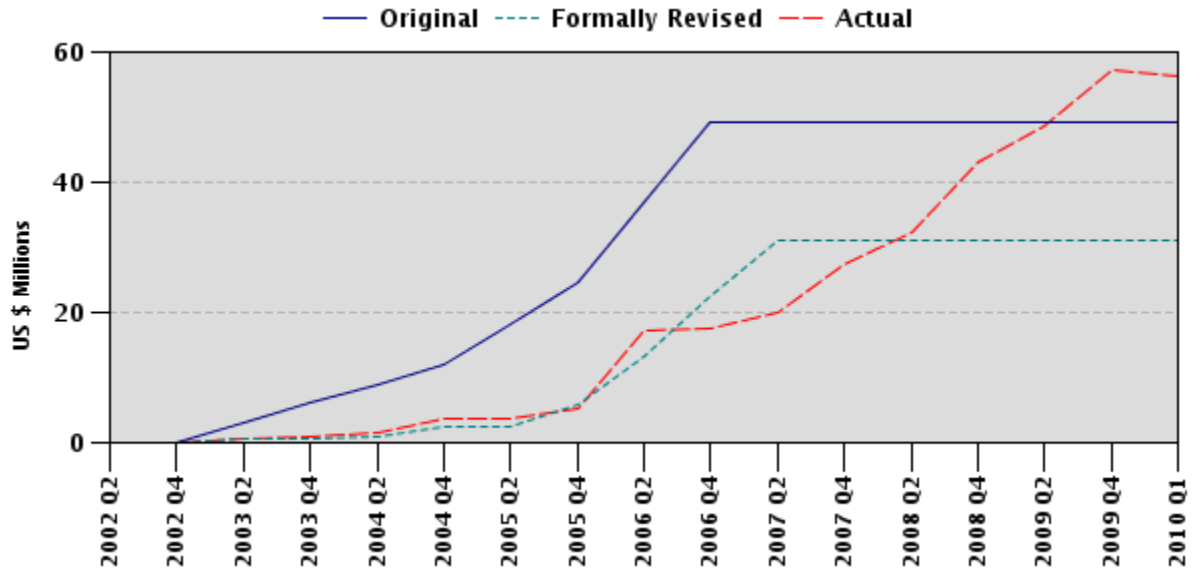
G. Ratings of Project Performance in ISRs

-						
No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	06/14/2002	S	S	S	0.00	0.24
2	12/16/2002	S	S	S	0.65	0.98
3	05/30/2003	S	S	S	0.65	0.98
4	11/19/2003	S	S	S	1.43	1.11
5	05/28/2004	S	S	S	3.63	1.27
6	12/15/2004	S	S	S	3.76	1.59
7	06/09/2005	MS	MS	MS	5.23	1.78
8	12/21/2005	MS	MS	MS	13.83	3.24
9	06/30/2006	S	S	S	17.63	3.76
10	12/22/2006	S	S	S	20.00	5.56
11	06/26/2007	S	S	MS	27.51	7.00
12	12/14/2007	S	S	MS	32.15	7.39
13	05/30/2008	MS	MS	MS	39.59	8.82
14	10/01/2008	MS	MS	MS	43.82	10.66

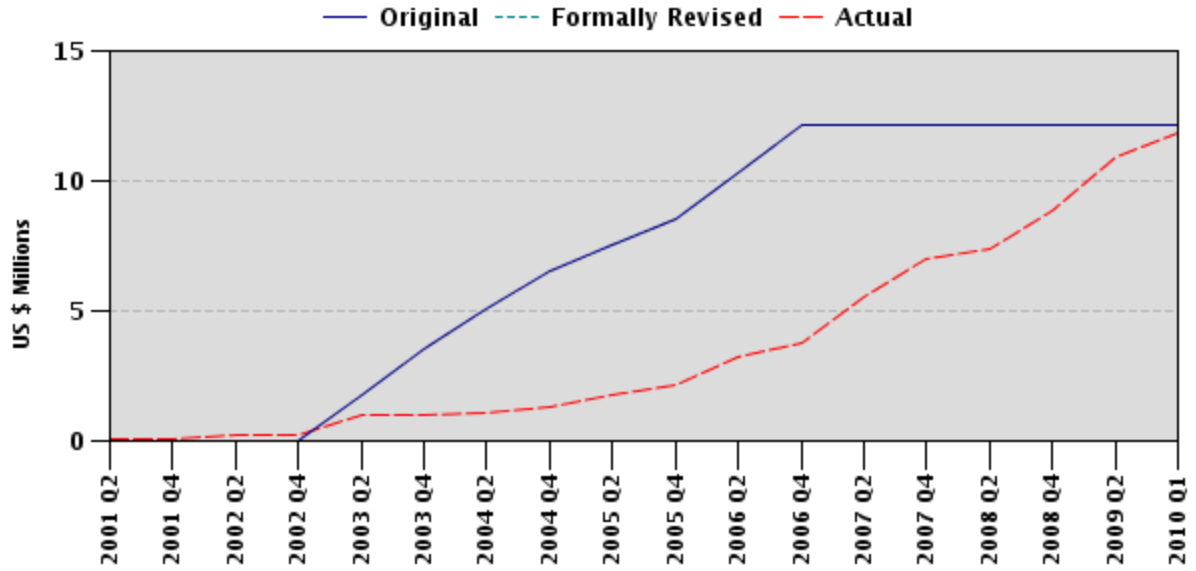
H. Restructuring (if any)

Not Applicable

I. Disbursement Profile
P069996



P070222



1. Project Context, Development Objectives, and Global Environment Objectives

1.1 Context at Appraisal

Country and Sector Background: In 2001, at the time of appraisal, Uganda's economy had been consistently registering strong economic performance, with an average real rate of growth of about 6.9 percent since 1990/91 and an average annual increase in real per capita income of 3.7 percent over the previous decade. At the same time, development in rural areas had lagged well behind urban areas. Moreover, the quality of rural life was severely constrained by lack of electricity in rural public institutions.

Uganda's energy sector was also undergoing major structural reform. In 1999, the government approved a power sector restructuring strategy involving unbundling of its main utility, the Uganda Electricity Board (UEB) into separate 'business' activities: generation, transmission, and distribution. An independent power sector regulator was also established. Despite these reforms, there remained growing economic, social and political pressures to address some of the long-standing issues impeding the development of Uganda's energy sector:

- (i) *Inadequate and unreliable electricity supply* caused by a chronic shortage of generating capacity that was stifling economic growth. The government's strategy to address these re-occurring shortages was to develop its large hydropower potential, in particular the 250 MW Bujagali hydropower project;
- (ii) *Low rural access to electricity.* Uganda had one of the lowest per capita electricity consumption (44 kWh/year) in the world¹. Grid supplied electricity was consumed by 12 % of the domestic population, mostly concentrated in the Kampala metropolitan area, while less than 1 % of the rural population had access to grid supplied electricity.
- (iii) *Adverse development impact on rural areas.* The potential for rapid rural economic growth and job creation was seriously constrained by the lack of adequate investment in rural infrastructure, of which electricity was a key component.
- (iv) *Renewable energy resource potential was under-utilized.* Apart from large-scale hydropower schemes, only a small fraction of Uganda's renewable energy resource potential had been tapped. Development had been constrained by: (a) the legal framework since only UEB was permitted to sell power; (b) lack of access to long-term financing; and (c) limited local capacity for planning and implementing such projects. The Government's strategy was aimed at

providing adequate incentives to encourage private sector-led investment of its renewable energy potential.

Information and Communication Technology (ICT). The main issues facing the ICT sector were:

- (i) *Low rural access.* As a result of telecommunications reform, telephone coverage had increased dramatically with the number of lines (fixed plus cellular) more than doubling over the two year period from 1998-2000. However, the vast majority of these lines were concentrated in the Kampala area.
- (ii) *Internet access.* The market for Internet access in Uganda was competitive but small, with some 6,000 subscribers and 6 main Internet Service Providers (ISP) with ISP services mainly in the Kampala area.

Rationale for Bank Assistance. The Country Assistance Strategy¹ (CAS), presented to the Board in November 2000, sought to build on the 1997-2000 CAS by continuing to focus on poverty reduction through sustained growth. The Government's Poverty Reduction Strategy Paper (PRSP), which was discussed by the Board on May 2, 2000, was based on the following four key pillars:

- (i) *Directly increase the ability of the poor to raise their income.* The PRSP explicitly supported the project, by promoting use of smart subsidies for rural electrification, which would encourage entrepreneurs to invest in power infrastructure in rural areas.
- (ii) *Directly increase the quality of the life of the poor.* The PRSP targeted improved delivery of public education, health, and potable water and sanitation services;
- (iii) *Create an enabling environment for economic growth and structural transformation.* The PRSP was focused on macroeconomic stability, equitable use of public resources, and the removal of constraints on private sector investment
- (iv) *Ensure good governance and security.* Actions included under this pillar were: improving public service delivery, decentralization, and reducing corruption.

¹ Document number:2 0886-UG Date of latest CAS discussion Nov. 18, 2000

1.2 Original Project Development Objectives (PDO) and Global Environment Objective (GEO) and Key Indicators (as approved)

The main objective of the long-term program was to develop Uganda's rural energy and Information and Communication Technologies (ICT) sectors, so that they would make a significant contribution to bringing about rural transformation.

The specific objective of the first phase of this 3-phase APL program (ERT-1), as described in the PAD, was to put in place, "on-the-ground", a functioning conducive environment and related local capacity for commercially oriented, sustainable service delivery of rural/renewable energy and ICTs.

The Global Environment Objective (GEO) was to build in-country capacity for renewable energy.

The key performance indicators for Phase I of the program were: (*indicators related to GEF-supported activities are shown in italics*)

Energy Sector

- Establishment of regulatory system, satisfactory working of Rural Electrification (RE) Board, RE Agency and RE Fund, wheeling system and procedures
- Workable financial intermediation mechanism for rural electrification
- Satisfactory functioning of independent grid rural electrification operations
- Satisfactory functioning of energy systems provided to agriculture-linked users, clinics, schools, and water facilities
- *Amount (MW) of renewable energy power generation facilities constructed, GEF share in total cost*
- *Volume of sales of solar PV(Photovoltaic) systems to households and institutions, GEF share in total cost*
- *Decline in prices of solar PV products*

ICT Sector

- Number of public and private telephones installed in previously un-served sub-counties
- Number of District Headquarters with Internet POP and public Internet access facility
- Number of rural tele-centers established in 'vanguard institutions'.

Following the MTR in October 2004, quantitative end of project targets were specified for each indicator while only broad end-of-program indicators were specified in Annex 1 of the PAD. Also, the energy and ICT triggers for proceeding with Phase II (and later Phases) of the Program (including the GEF triggers) were specified in the PAD (pages 23 and 24)

1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and Reasons/Justification

The PDO and Key Indicators remained unchanged.

1.4 Revised GEO (as approved by original approving authority) and Key Indicators, and Reasons/Justification:

The GEO and key indicators remained unchanged.

1.5 Main Beneficiaries.

The main beneficiaries of the project were to be:

Rural Households. There would be direct and indirect benefits of increased access to: (i) adequate and reliable supplies of electricity from grid supply or solar photovoltaic systems; and (ii) ICT services. Indirect benefits would arise from the improved services provided by rural public institutions.

Rural Enterprises. The benefits would be increased productivity and income arising from electricity access and/or more efficient use of traditional fuels. Improved access to telephones and the internet was intended to: (i) increase the ability of rural enterprises to communicate with upstream suppliers, thereby reducing the costs of doing business, and (ii) improve linkages with downstream markets, helping entrepreneurs identify suitable markets.

Public Institutions. There would be benefits related to improved service delivery arising out of (i) increased working hours; (ii) additional services, such as vaccinations, lab tests; and (iii) increased efficiency accruing from the ease of communications with sister institutions such as referral hospitals.

Global Environmental Benefits: Reductions in Greenhouse Gases (GHG).

1.6 Original Components (as approved)

The project consisted of six components. All Components were linked to achieving the PDO of putting in place a functioning conducive environment for commercially oriented, sustainable service delivery of rural/renewable energy and ICTs. Likewise, portions of Components 1 to 5 were aimed at supporting the GEF objective of building in-country capacity for renewable energy.

Component 1: Main Grid-Related Power Distribution and Generation. (IDA financing: US\$20.80 million; GEF financing: US\$4.60 million)

Extension of the main grid to un-served rural areas was to be implemented by the private sector. GEF grant financing would help finance qualifying renewable energy investments.

Component 2: Independent Grid Systems. (IDA financing: US\$6.50 million; GEF financing: US\$1.0 million)

This component supported independent grid systems which would be implemented by the private sector. A significant part of the power generation was expected to be based on renewable energy resources and supported by GEF funding.

Component 3: Solar PV Systems (GEF financing: US\$1.40 million)

The project would provide GEF financing for the installation of solar PV systems in homes, community institutions, (and rural enterprises located in relatively dispersed areas with small loads, where small independent grid systems would not be viable).

Component 4: Cross-sectoral Linkages - (IDA financing: US\$7.60 million; GEF financing: US\$0.80 million)

This component would be implemented by Ministries of Health, Agriculture, Education and Water.

- In the **health** sector, the project would finance 90% of the capital costs (IDA+GEF grant) of energy systems (including solar fridges and solar water heaters, as appropriate) for all Health Centers that met the eligibility criteria established by the Ministry of Health (MOH), and 25% of the variable costs for the solar PV energy packages only.
- In **agriculture**, the project would finance: (i) private sector investments through the RE Fund for connection of priority agricultural loads, and (ii) technical assistance to the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) for program promotion.
- In **education**, the project would finance 90% of the capital costs (IDA + GEF grant) of energy/ICT packages in selected post-primary schools and technical assistance to the Ministry of Education and Sports (MOES) to: (i) develop energy guidelines for education, (ii) implementation support, (iii) workshops, dissemination and capacity building, and (iv) M/E.
- In the **water** sector, the project would finance technical assistance to the Ministry of Water to identify and meet the energy needs of the rural water strategy, develop energy guidelines, and for capacity building as well as for monitoring and evaluation.

Component 5: Energy Sector Capacity Building, Technical Assistance and Training (IDA financing: US\$8.75 million; GEF financing: US\$4.32 million)

This component would include support to several public and private sector institutions to help them carry out their respective responsibilities under the project.

Component 6: ICT Sector (IDA financing: US\$5.50 million)

The ICT sector component would finance both **technical assistance** and **investment**.

The **technical assistance** would help the Uganda Communication Commission (UCC) in the preparation of competitive tenders to increase access in rural areas, while the **investment** component would provide funds to the UCC to finance, on a competitive tendering basis, the subsidy associated with the rural access targets, in commercially unattractive areas

1.6 Revised Components

None of the six original components were revised.

1.7 Other Significant Changes

There were no substantive design changes nor restructuring during implementation of the project. However, the following, important changes needed to be made during implementation:

Component 1 Financed with Public Funds. There was an important change in the financing source for this component as compared with what was envisaged at appraisal. Due to a disappointing response from the private sector, the Government of Uganda (GOU) financed 100% of the capital investments related to main grid extensions.

Project Coordinator. MEMD engaged a project coordinator, who acted as a focal point for project oversight and supervision, maintained a consolidated project tracking system, and undertook trouble shooting as needed. Prior to this action, the project had no clear direction and there was a lack of cohesion and limited synergies.

Extension of Original Closing Date. The original closing date of the project was extended twice. The **first extension** was for two years from August 31, 2006 to August 31, 2008, to allow the Borrower time to complete different project investment components and actions due to a slower-than-expected start-up phase. The project was then extended for a **second time** until February 28, 2009 in order to complete remaining ongoing works and enable the Borrower to utilize the Credit proceeds to pay contractual commitments.

Reallocation of IDA and GEF Funds. In October 2007, funds were reallocated under the IDA Credit and the GEF Grant (as shown in Annex 1) to accommodate a more than threefold increase (in SDR) in sub-projects financed through REA, due to the poor response from the private sector. At appraisal it had been expected that some of the private sector investments would move ahead before REA was operational. For this reason, a large allocation was provided under 2(b), which would have been disbursed by MEMD. However, these investments did not move quickly and were therefore reallocated to REA.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Project Background. ERT-1- was the first Bank-wide project under the Global Environment Facility (GEF)/World Bank Renewable Energy Strategic Partnership, which aimed to support renewable energy development through a programmatic approach parallel to the Bank's Adaptable Program Loan (APL) instrument. It was also the first project in the Bank's sub-Saharan Africa Region to utilize the newly launched Prototype Carbon Fund (PCF), which, *inter alia*, funded projects that produced greenhouse gas emission reductions which could, in the future, be traded internationally under schemes such as the Kyoto Protocol. Another first achieved by ERT was to place emphasis on private sector participation in rural electrification as well as incorporate cross-sectoral ministries as implementing agents.

Soundness of Background Analysis. As part of project preparation, the main sector issues were analyzed in depth and government strategies to deal with these issues were also considered. A QER was also held on August 3-4, 2001, which complemented several aspects of the design and overall objectives. These analyses are documented in the project file, and summarized in Section B.2 of the PAD. The PAD indicated that the bulk of specific sub-projects that would be supported under the main component of Phase I (Grid Related Power Distribution and Generation) would be developed during the course of the project and would be implemented by the private sector. However, no separate analysis was provided in the PAD regarding the interest and likely response from private sector investors during Phase I.

Lessons of Earlier Operations Taken into Account The main constraint in being able to benefit from the experience of past rural energy operations was the lack of an operational precedent. Experience with private sector led rural electrification schemes was extremely limited in developing countries, and almost non-existent in Africa. ICT experience in Africa in bringing about rural transformation was also recent but indicated the potential for rapid, private sector led expansion of rural telephony and internet services. Within these constraints, the project design incorporated lessons from recent Asian rural electrification programs.

Risk Assessment. The project design considered the risk factors and appropriate measures were adopted to mitigate all the main risks identified at appraisal. The overall risk of the project was rated as Substantial in the PAD, in recognition of the fact that the overall project design represented a new approach that offered significant prospects for high development impact, but had yet to be field tested; this overall risk rating was appropriate. The PAD also identified several specific risks, also judged to be 'substantial, as well as the corresponding mitigation measures.

- *Regulatory and institutional framework is new and may not function properly.* Mitigation measures included providing commercially-oriented rural

electrification/ICTs with transparent and objective subsidies. However, this risk did not materialize, as the regulatory framework was put in place and is functional, as evidenced from the number of licenses issued by the regulator.

- *Financial institutions and private sector may not choose to participate.* To mitigate this risk, support was planned to be provided to potential participants to make this an attractive business opportunity. Efforts would also be made to improve policy/regulatory climate as needed. This risk was underestimated for rural electrification investments. Private sector response has been disappointing, with very little interest in participating in Phase I investments. Hence, a fundamental change in approach had to be made in the main grid extension component: private sector participation shifted from providing an equity contribution for the grid extension to bidding for O&M of the grid extensions, with the Government of Uganda (GOU) financing 100% of the capital investments needed for grid extensions.
- *The RE Fund may not function effectively.* The potential concerns of political interference in the operation of the RE fund were correctly anticipated. The RE fund lacks full autonomy in its decision-making, remaining under the responsibility of the Ministry of Energy. To help mitigate these concerns, clear and transparent procedures and accountability had been built into the design of the RE Fund and the functioning of the Fund was to be reviewed on a regular basis to incorporate any required changes, including continuation of close oversight during subsequent ERT phases.
- *Cost recovery based tariffs with significant regional differentials may prove difficult to implement,* since rural people may resent being asked to pay more than urban people for electricity/ICTs. For mitigating this risk, promotional and consensus-building activities were launched by the government. During implementation, the proposed consensus was achieved and tariffs were set on a cost recovery basis. In addition, GOU also provided one-time subsidies which enabled a reduced differential in the tariff regime across different regions.

One risk that emerged during implementation, and which was not identified at Appraisal, was in regard to the implementation arrangements. The project design had assumed that the various agencies would take the lead in implementation of their activities; hence, the project implementation arrangements did not include a project coordination unit (PCU). While some agencies assumed their implementation responsibilities, it was agreed that a PCU was needed to oversee the overall project on behalf of the lead agency (MEMD) and to assist lagging agencies. Consequently, a PCU had to be established within MEMD.

Adequacy of Participatory Processes. The project provided a participatory framework involving stakeholders and direct beneficiaries in the decision-making processes. Bank missions and government met with the primary beneficiaries (rural households, SMEs, health and education facilities, energy service providers, and renewable energy small

scale power generators) and discussed the main elements of the project with them in public meetings, and took account of their interests and concerns in preparing the project design. The findings and concerns expressed in the Uganda Participatory Poverty Assessment were also taken into account.

Apart from direct meetings at the individual level, there were also discussions with representatives of the beneficiaries. In addition to the MEMD, the project team worked closely with a number of other agencies: the Ministry of Local Government (MOLG), MOH, Directorate of Water Development, Ministry of Agriculture, Ministry of Education, Ministry of Finance, Bank of Uganda, Uganda Communications Commission, the Uganda Local Authorities Association (ULAA), Private Sector Foundation, Uganda Renewable Energy Association, and Action Aid, a non-governmental organization (NGO).

2.2 Implementation

The project encountered various challenges during implementation, some of which were outside the government's control and the implementing agencies. Some of these factors adversely affected implementation.

Implementation started slowly with most components not ready for implementation at the time of Board approval in December 2001. The Bank conducted a Midterm Review (MTR) in October 2004 and used the opportunity to assess progress to date on all project components, implementation issues, and actions needed to help ensure a successful completion of the project. Less than 10% of the Credit Amount had been disbursed at the time of the MTR. Due to the poor response from the private sector in investing in grid extension schemes, it was agreed that the government would develop a 'second group' of rural investment projects in which power would be generated from renewable energy sources. Some of these new schemes would be connected to the main grid, while others would supply power to independent mini-grids.

Following this change in the source of funding for the grid extension investments, disbursements started to pick up so that by the end of 2006 approximately SDR 14, or more than third of the Credit amount, had been disbursed. However, project implementation and coordination difficulties continued to affect the project. The DO and/or IP were rated MS for much of the remaining 5 year period following the MTR-except for the final ISR, in July 2009, in which DO and IP were both rated S on the basis that 'most of the target indicators had been achieved' and implementation of most project components had improved.

Factors outside Government or Implementation Agency Control

- (i) *Increases in international oil prices contributed to higher energy costs in Uganda, which, in turn, led to increased tariffs and an increased affordability risk for low income rural consumers.*

- (ii) *Hydrology affected power availability.* The reduction in power availability from the Nalubaale/Kiira facility forced GoU to contract for short-term, emergency, thermal (diesel) power generators, the higher cost of which resulted in higher retail tariffs.
- (iii) *High international prices, due to a surging global economy and overrated markets* (e.g. PV) which was responsible for the target price reductions of 30% from the 2000 baseline not being achieved—i.e. from US\$20/Wp to US\$14/Wp.

Factors Subject to Government or Implementation Agency Control

- (i) *Low Level of Private Sector Interest.* The initial grid extensions, considered as Priority Rural Electrification Projects (PREPs), required 100% public funding as opposed to the private equity contributions as envisaged at appraisal, though some private sector financing was mobilized for renewable energy investments linked to independent grid systems. The PREPs did not attract sufficient private sector investor interest due to a number of factors. The initial call for proposals attracted only a small number of credible international firms. Subsequently, even the short-listed firms pulled out. The reasons for the lack of interest could be attributed to several factors including: (a) reduced generation due to low hydrological condition which led to a reliance on more costly thermal generation. These events happened during the bidding period and contributed to an increase in the perceived risks, especially in terms of a reduced customer base and sales volumes; (b) lack of awareness of the business potential of energy investments and availability of financial equity; (c) limited technical and business skills of the local firms while government agencies did not have the capacity to promote the PPP approach; and (d) difficulties in raising the equity, in particular mini hydro-power plants did not move faster because of a lack of equity and affordable capital for local developers in addition to a lack of capacity to develop and evaluate projects on the part of lending institutions.
- (ii) *Lack of Capacity* in financial, procurement, management, and technical skills across the board on the part of the Borrower affected implementation in the first few years of the project. This lack of capacity should have been anticipated at appraisal and steps taken to strengthen these skill shortages.
- (iii) *Delays in Establishing a PCU.* The need for a project coordination unit was not considered necessary during project design. However, the lack of a focal point made it difficult to move the project forward and bring the stakeholders together. The Project Coordination Unit (PCU) was established two years later in July 2004 but it still took about 6-8 months for the new PCU to establish itself and take control.
- (iv) *Disagreements between the MOH on One Side, and the MEMD and the Bank* on the other side, on the kind of energy packages suitable for different types of health centers created a delay in implementing the component.
- (v) *Procurement Delays.* The implementation of cross-sectoral components was adversely affected mainly due to procurement delays and the relative novelty of sectors such as education and agriculture working with energy and private sector agencies. The local agencies were also not fully aware of the WB procedures and at times resisted it. Delays also caused cost over runs as prices for equipment and services had increased over time.

- (vi) *Implementation of the Education Subcomponent was adversely affected by:* (a) lack of capacity and manpower in MOES; (b) delays in developing the prototype design, selecting the consultant, and securing a Letter of Credit for the supplier.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

M&E Design. The M&E arrangements were implicitly divided into three parts, with budget allocations directly (e.g. for MOFPED and PCU) or indirectly (e.g. through TA for implementing institutions) specified in the PAD:

- (i) Standard project level monitoring (PCU)
- (ii) Sectoral monitoring in the areas of health, education, water, ICT, agriculture (respective agencies)
- (iii) Impact on poverty (Poverty Monitoring unit of MOFPED)

Performance indicators for the ten year program as well as for the project activities in the energy sector and ICT sector were developed during project preparation. However, the indicators as given in the PAD, could not easily be monitored. Consequently, during the MTR, a detailed results monitoring system was put in place, which included baselines, standard indicators as well as cross-sectoral indicators involving MOH, MOES, and MAIIF. In addition, the Ministry of Finance carried out baseline surveys for the program impact evaluation.

M&E Implementation. Data for key performance indicators were collected by the individual implementing agencies. These data were closely monitored and the actual figures were compared with the target values by these agencies. Once it was established, the PCU coordinated with the implementing agencies in consolidating the data and prepared quarterly reports on a regular basis.

M&E Utilization. Appropriate data collected from the implementation agencies were evaluated and used for decision-making on project activities. Data were also used in making decisions such as reallocation of funds from matching grants and the Bank was able to modify implementation as deemed necessary and project concepts based on these indicators. For example, based on the successful performance of UCC, more resources were made available for ICT activities. Similarly, as the project was not able to mobilize adequate private sector equity, in order to encourage private sector participation for grid extensions, it was decided that the government would fund line construction and the lines would be operated and maintained by the private sector. Likewise, financial monitoring reports (FMRs) focused on the level of disbursements and assessed the progress of each of the components, and resources were reallocated according to the needs.

2.4 Safeguard and Fiduciary Compliance

There were no significant deviations or waivers from the Bank safeguards and fiduciary policies and procedures during the implementation of the project.

2.5 Post-completion Operation/Next Phase

Transition Arrangements. The transition arrangements for moving to the next phase appear to be adequate and procedures adopted in the ERT-II (which was approved by the Board in April 2009) were based on the experience gained during implementation of the ERT-I and include:

- (i) *Technical.* An electrification framework for agencies has been developed and prototype designs, which can be replicated, are already in place. IREMP has been mapped out. Minimum performance standards have been developed for solar systems and they are already in place. Renewable Energy Policy has also come into effect, which would facilitate removing barriers for using solar systems by the consumers.
- (ii) *Institutional.* Necessary institutions such as the Electricity Regulatory Authority (ERA), REA and other institutions are already in place, though they still require additional strengthening. A strengthened PCU will continue its primary responsibility of coordination among various implementation agencies, while the implementation responsibility will lie with each of the agencies, such as the Ministries of Health and Education.
- (iii) *Financial.* Under the present credit market conditions in Uganda, rural electrification is not viable for the private sector investors. However, a Credit Support Facility (CSF) has already been set up as a second tier mechanism. The Uganda Energy Credit Capitalization Agency is also in place but will only become operational under Phase II.
- (iv) *Budgeting.* Counterpart funding is expected to be adequate. For example, the government has already allocated US\$7 million for transition arrangements between the closing of ERT-I and the startup of ERT-II. The contracts for Institutional Solar systems (Health and Schools) include a maintenance contract for five years, financed by the respective beneficiary institutions.
- (v) *Staffing.* Extensive capacity building was carried out in Phase I. While there are still many gaps, the respective institutions are in the process of hiring additional support. In addition, it is expected that capacity building will continue under ERT II as required. The government has initiated the process of recruitment of additional staff.

Monitoring and Evaluation. The PCU will continue to have the primary responsibility for tracking the project's key performance indicators, using data from the agencies and other project stakeholders. The Poverty Monitoring Unit of the Ministry of Finance, which assessed the overall poverty impact of the rural electrification schemes, has been transformed into the Budget Monitoring and Accountability Unit, which focuses on infrastructure (energy, roads), social services (health, education, and water), agriculture,

and industrialization. This new unit is well-positioned to lead monitoring and evaluation, while the PCU continues to track key project level performance indicators.

List of Performance Indicators. The following set of monitoring and evaluation indicators has been developed and they will be used as part of the MEMD's operations:

- (i) Increased access to energy, as measured by the percentage of rural population with access to electricity in project areas (rural electrification rate).
- (ii) Increased Access to ICT Services, as measured by the percentage of the geographical area with access to modern ICT services.
- (iii) Megawatts of additional power generation from renewable sources.
- (iv) Tons of CO₂ emissions reduced/avoided as a result of the project.

These indicators are appropriate for the follow-up project particularly because they will measure outputs that directly relate to the program objectives.

Future Impact Evaluation. It will be important to conduct an impact evaluation during the MTR of ERT-II, in order to assess the impact of the project on: (i) social services, including assessing the performance of health facilities and staff retention in rural health centers; (ii) grid extension's impact on business enterprises and household income; and (iii) increase in electrical connections.

Follow-on Project. ERT-I being the first phase of 3-phased APL, there will be follow-on phases, namely ERT-II and ERT-III. ERT-II was approved by the Board in April 2009 and became effective November 25, 2009. In addition, GoU has provided bridge financing to ensure continuity of activities between the ERT I closure and ERT II effectiveness.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

The main development objective of the long-term program-namely, to develop Uganda's rural energy and Information and Communication Technologies (ICT) sectors in order to bring about a significant improvement in the productivity of rural enterprises as well as the quality of life of rural households-is still critical to Uganda's social and economic development. The GOU remains committed to infrastructure provision as an important instrument for rural development. Since rural areas still have very low access to modern energy services and ICTs, the government is giving priority to new investment in rural areas. Further, the GEF's higher level objective of mitigating Uganda's greenhouse gas emissions continues to be relevant because of continuing global concerns in this area.

3.2 Achievement of Project Development Objectives

Rating: Moderately Satisfactory.

The project was partially successful in achieving its Phase I objective, namely, putting in place a functioning conducive environment and related capacity for commercially oriented, sustainable service delivery of rural/renewable energy and ICTs. The details of the project's achievements are discussed below, against the key performance indicators for Phase I as described in the PAD.

(i) *Establishment of a Regulatory System for Rural Electrification, Satisfactory Working of REA, REB, and REF*

Under Phase I of the ERT Program, progress was made in establishing an institutional, policy, and regulatory framework for future investment in rural and renewable energy. **REA** is evolving into a key institution for planning and managing the government's rural electrification program. While REA has developed capacity in key areas, it still requires further strengthening. It also lacks autonomy to carry out its functions since it comes under the Ministry of Energy and the Chairman of its Board is the Permanent Secretary (PS) for the Ministry. **REB** is established and performing its responsibilities as legally prescribed. For REB to be effective, however, it also needs to be at 'arms length' from the government, so that it can make decisions based on agreed financial and socio-economic criteria. Currently, there are no clear criteria for the selection of rural electrification projects. **REF** is operational and has been capitalized by a number of donor sources (World Bank, SIDA and Japanese Government), government budget, and the transmission levy. Overall, by Phase I closing in mid-2009, a framework for promoting rural electrification had been established and key institutions were operational. However, these institutions still lacked capacity in important areas.

(ii) *A Workable Financial Intermediation Mechanism for Rural Electrification*

- A number of banking institutions financed investments in Phase I. For example, the East African Development Bank-financed Kakira Sugar Works and the West Nile Rural Electrification Company (WENRICO) were financed through the BoU re-finance facility.
- Demand for solar finance was low. Refinance for solar PV included funds provided to three microfinance deposit-taking institutions (MDIs). Uganda Microfinance Limited (UML) received US\$297,000 for the provision of micro-credit to rural customers acquiring solar home systems. Commercial Microfinance Limited (CML) received US\$297,000 for the provision of working capital loans to solar vendors. PostBank received US\$425,000 to provide wholesale funds to savings and credit cooperative societies (SACCOs). Thus far, out of the \$1.02 million disbursed to these three agencies, the amount utilized for loans are 17%, 55%, and 70% respectively, reflecting low demand.

- The refinancing facility provided critical long term finance, which allowed participating financial institutions to extend the loan tenure, without which they would have been unwilling to participate. Currently, there is limited supply of long-term development finance (for terms beyond five years). Though a ‘workable financial intermediation mechanism for rural electrification is in place’ it has been dependent on the longer term finance provided by IDA, GEF and other donors. The refinancing facility is not being extended into Phase 2. However, there is still concern on the part of lenders due to the perceived credit risk, especially lengthy implementation periods of rural investments.

(iii) *Satisfactory Functioning of Two Independent Grid Rural Electrification Operations.*

- Overall, independent grid systems have not made the expected progress due to financial, sub-contracting and management difficulties within the sponsoring companies. By project end in February 2009, the project targets had only been partially met.
- The West Nile Electrification project, sponsored by WENRECO, was one of two sub-projects planned to be supported under the ERT. Under ERT 1, the plan envisaged the construction of a 3.5MW hydro power plant at Nyagak. The hydropower plant is still under construction and unlikely to be commissioned before the end of 2010. This hydro plant was intended to supply the entire West Nile region, replacing the HFO plant.
- The other independent grid sub-project was upgrading the power facilities for Kisiizi hospital (one of Uganda’s important rural health centers) from 60 kW to 300 kW. After a number of technical difficulties, this sub-project was commissioned in February 2009 and connections to an estimated 300 customers are underway.

(iv) *Satisfactory Functioning of 80 Percent of the Energy Systems Provided to Water Facilities, Health Clinics, Schools, and Agriculture-linked Users.*

The end project target value for this indicator has been substantively met as documented below.

- **Ministry of Water and Environment.** 20 solar water pumping systems, with a capacity of 195,960 watt peaks, have been installed and are in operation in 14 districts country wide and in three different regions. The installation of solar panels helped provide water supply to communities.

Ministry of Health. Standard solar energy packages were developed and designed for various sizes of medical buildings and staff houses in different Health Centers. Some 79 Solar DC vaccine fridges were supplied to Health Centers (HC); 261 staff houses received stand alone solar PV energy packages for lighting and operation of radio and TV/VCR; and 220 medical buildings received

stand alone solar PV energy packages for lighting and capacity to operate a microscope. Overall, the energy situation has been improved in twelve districts. Eight HCs received centralized solar PV diesel generator hybrid energy systems to provide lighting and capacity to operate microscopes and ultrasound scanners. Capacity has been developed at the MOH in the design of institutional solar energy systems for health facilities. Capacity has also been developed at the MOH to oversee the implementation of the standard energy packages in HCs using private companies to supply, install and provide maintenance services. The HCs have also experienced an increase in patients using their services at night. The impact evaluation, scheduled for next year will document the performance during post-installation period, in addition to the performance of the maintenance contract.

- **Ministry of Education and Sports.** Some 94 of the 129 educational institutions packaged under Phase 1 have been electrified using solar systems. As this sub-component made progress only in the last six months of the project, it has yet to have a significant impact on education services.
- **Ministry of Agriculture.** The agricultural sector has been a primary beneficiary of the project. Agricultural and agro-based enterprises, such as honey processing, milk cooling and maize processing, have had access to electricity supplied under the project and benefited from it. In addition, the Kayoza tea factory, companies growing and exporting flowers, and fish landing sites are examples of agricultural activities which benefited from the project. At the same time, the targeting of marginal agricultural consumers remains problematic and unclear whether it is truly cost effective.

(v) ***15MW of Renewable Energy Power Generation Facilities Constructed or Under Construction (GEO Indicator)***

Considerable progress was made under Phase I in commissioning grid connected power generation from renewable energy sources (bagasse and small hydro) though not all of this new generation was project funded. The bulk of the energy was sold to the Uganda Electricity Transmission Company (UETCL). This indicator has been exceeded. Details of specific renewable energy investments are:

- The Kakira Sugar Works Cogeneration Project is now commissioned and is generating up to 22 MW and exporting 12 MW to the grid, representing an expansion of power generating capacity by approximately 14-15 MW.
- In general, small hydro power projects are progressing fairly well, though not all have been project funded. Mpanga (18 MW) and Bugoye (13 MW) are under construction and scheduled to be commissioned by end of 2009; Buseruka (9 MW) has started construction. Three more small hydro sites, with a total capacity of 20 MW, are also scheduled to start construction before end 2009.

(vi) ***320,000 Cumulative Watt-peak Sales of Solar PV Systems to Households and Institutions. (GEO Indicator)***

- The first phase of ERT supported installations of over 1,300,000 watt peaks in the private sector through matching grants and subsidies channeled through the Private Sector Foundation. However, this achievement needs to be qualified since, despite the target being exceeded, this is largely attributable to the fact that many solar systems purchased were for community related services and benefitted from having a secure source of funding. The response from Solar Home System (SHS) consumers is still low and is below the Phase I target.

(vii) ***Solar Home System Price Reductions of about 20% from June 2000 Baseline have been achieved i.e., End-phase 1 price of about \$14/Wp compared to about \$20/Wp in June 2000(GEO Indicator)***

- A price reduction of closer to 20% more accurately reflects the current international market conditions in 2009. The average cost has varied between US\$12-17 per Wp, depending upon type of system (SHS or institutional). At MTR, the cost had in fact fallen to \$14 but costs have since increased due to strong international demand for PV systems.

(viii) ***Finalization and Implementation of First Phase of Long-term Renewable Energy Capacity Building Strategy and Action Plan Including Financing of Recurrent Cost of Renewable Energy Projects and Institutional Arrangements. (GEO Indicator)***

- A long-term renewable energy capacity building strategy and action plan was finalized in April 2007. Capacity building has been strengthened through on-job training of personnel. Initial capacity building in the public sector (e.g. REA, ERA, MEMD) has been completed. Capacity building in the private sector is ongoing; initial investments are ongoing or complete; and a pipeline of renewable energy projects, mostly mini-hydro, is growing.

(ix) ***Phase 1 Coverage Objectives for Rural Telephony, Internet Points of Presence and Rural Telecenters have been Satisfactorily Achieved.***

- One public payphone (PP) has been provided for every 2,500 inhabitants in the 154 sub counties (1,533 PP), exceeding the target of one public access point for every 5,000 inhabitants.
- 32 Internet Points of Presence (POP) have been installed in district capitals. Additional, dedicated bandwidth has been added between Kampala and rural areas.
- 20 smaller and more efficient multipurpose communication telecenters (MCP) were installed and are all operational; the initial target was 7 large MCPs. Also, 20 postal telecenters have been set up by Posta Uganda and have been connected to the internet.

(x) *Collection of at least 80% of the Telecommunications Universal Service Levy Revenues that are billable by the End of Phase 1.*

- The collection rate has been exceeded, reaching more than 95% since December 2007.

3.3 Efficiency

The broad-based, project design, comprising a diverse number of rural electrification and ICT investments, did not lend itself to conventional economic and financial analyses. For this reason, the PAD did not attempt to undertake a summary project analysis. However, despite uncertainties because of the lack of any past experience with rural electrification in Uganda, the PAD highlighted the expected higher economic benefits in comparison with the financial revenues. In addition, the economic analysis emphasized the likely indirect benefits that would be derived from rural electrification investments in sectors such as health, agriculture, small and medium enterprise development, education, and water.

In evaluating the different project outcomes, the overall project is considered efficient based on the following considerations:

- (i) The project has helped put in place regulatory, planning, and funding mechanisms for rural electrification. A culture has also been developed to partner with the private sector to develop projects for the common good.
- (ii) Independent grid rural electrification operations have started to function, which will benefit many customers for accessing electricity.
- (iii) Installation of solar panels, especially in community centers, has helped in providing power supply for improved service delivery, and contributed in: (i) improving access to clean and safe water; (ii) increased usage of portable water supply services; (iii) reducing cost of energy for water pumping; (iv) reducing walking distances for collecting water; and (v) saving time, especially for women.
- (iv) Standard solar energy packages installed in medical buildings and Health Centers have resulted in offering improved quality and availability of health services in rural areas.
- (v) The agricultural sector has also benefited significantly from the project. For example, agricultural and agro-based enterprises such as honey processing and maize processing have benefited from access to electricity supplied under the project.
- (vi) For the ICT investments, improved service availability in payphones in rural areas, in Internet access, and in reduced cost for telephone calls, which have been

achieved through competitively bid subsidies, are examples of the benefits accrued to the rural population.

3.4 Justification of Overall Outcome Rating

Rating: *Moderately Satisfactory*

As discussed in the preceding paragraphs, Phase I had a clear strategic relevance to the Bank's country assistance strategy by directly supporting Uganda's economic transformation and poverty reduction strategy described in the Government's Poverty Reduction Strategy Paper (PRSP).

In terms of achievement of the project development objective for Phase I, a number of policy and institutional steps were taken, aimed at putting in place an environment for commercially oriented, sustainable service delivery of rural/renewable energy and ICTs. These steps include: (i) approval of a Renewable Energy Policy; (ii) the main rural electrification institutions i.e. REA, REB and REF, have each been established and are operational; (iii) the ICT component has made solid progress in extending both telephone and internet service to rural areas while reducing costs and generating increased public revenue; and (iv) long term funding has been made available through IDA and GEF funding to different financing institutions in Uganda and enabled a number of different rural energy investments, including some off-grid renewable energy schemes, to move ahead.

Offsetting these positive achievements has been the limited private sector participation so far in rural energy investments. Phase I was designed to be private sector led, especially grid extension investments. In practice, the bulk of grid extensions had to be undertaken with scarce public funds because private equity did not materialize. Local investors lacked experience and access to funding while potential foreign investors have shown little interest. As the government observed following the completion of Phase I, the 'demand driven, private sector led model was found to be premature for the Ugandan economy while government has still a big role to play in extending services to the people'. Prospects, therefore, for significant private sector participation in ERT II are not promising.

Other 'start up' difficulties in Phase I have been the low demand for solar home systems and extensive technical, contracting, and implementation difficulties in bringing on stream a number of mini-hydro schemes. The nominal achievement of some indicators e.g. cumulative peak sales of PV systems conceals some of the ongoing practical problems to increasing demand. These difficulties will need to be addressed in ERT II.

In contrast to rural energy, ICT-related investments have made positive progress in Phase I as shown by achievement of the key indicators. Overall, despite difficulties in attracting private equity and bringing on stream renewable energy schemes, there has been sufficient policy and institutional progress under Phase I in establishing an operational

framework in the country for future rural energy investment to justify an overall outcome of ‘Moderately Satisfactory’

3.5 Overarching Themes, Other Outcomes and Impacts

Poverty Impacts, Gender Aspects, and Social Development

The Beneficiary Surveys conducted by the Ministry of Finance in 2008, together with anecdotal evidence collected from interviews with beneficiaries, have demonstrated the project’s impact on poverty, gender, and social development.

Poverty Alleviation. Households have reported higher income because of an improvement in business and employment opportunities resulting from the project. Some households have reported that they could get their family members employed as welders, could operate businesses of charging mobile phones and other businesses, such as selling cold drinks, all because of the availability of electricity. Further, more people have now regular power supply which is enabling them to use power for productive means, including agro processing, fish processing and small industrial activities.

Gender Aspects. Anecdotal evidence indicates that because of easier access to potable water as a result of electrification, women in some project target areas now spend less time collecting water. This makes it easier for them to use this time for other productive activities. In addition, availability of clean water is helping to lower incidences of malaria and water born diseases. Many women have also been taking up business enterprises and/or extending their business hours after dark. Access to ICTs has also created new opportunities for women since most public phone service providers and students in POP training centers are women. In addition, more women are reported attending pre-natal clinics and coming to have deliveries at the health centers due to the availability of improved quality of lighting.

Social Development. The project has resulted in both direct and indirect benefits for individual households and for communities. These include improved health services in some rural areas resulting from a more secure environment in hospitals because of lighting. The expansion of ICT facilities has also increased the use of television, mobile phones and the internet.

Institutional Change/Strengthening

As discussed in 3.2 (i) above, important progress was made in establishing an institutional and policy framework for future investment in rural and renewable energy.

- (i) **REA** has evolved into a key institution for planning and managing government’s rural electrification program. **REB** is established and is performing its roles as prescribed by the statutory instrument. **REF** is operational and has been capitalized by a number of different sources

- (ii) **Geographical Information System (GIS) laboratory**, which provides mainly data on the renewable energy sources in Uganda, has been established.
- (iii) **Business Development Support.** (BUDS-ERT) was set up under the supervision of the Board of Directors of the Private Sector Foundation Uganda (PSFU). It provides business and market development services to entrepreneurs, micro-enterprises and SMEs, investors, finance organizations, NGOs and CBOs and other private entities to address skills and information barriers to rural electrification and ICT business opportunities. Several feasibility studies were supported though only a few reached financial closure (FC). This is attributed to several factors, such as: (i) lack of capacity of the sponsors to reach FC, with some failing to raise equity; (ii) lack of local capacity to carry out detailed feasibility studies; and (iii) lack of clarity on the subsidy criteria and standard templates to use in preparation of the feasibility studies. In addition, there seems to have been little appreciation of the need to remove barriers to private sector participation in renewable energy development. REA is now focusing on providing solar subsidies to end users instead of supporting the establishment of a vibrant solar market.
- (iv) **UCC and ICTs.** The ICT component enabled UCC to successfully plan and oversee provision of access to telephone services in un-served and under-served rural areas using an output based aid (OBA) approach. The use of OBA to stimulate investment in project target areas resulted in coverage of far more communities than originally anticipated.

Sector Policy Developments

- (i) **Rural Electrification Strategy and Plan.** A framework for promoting rural electrification is now operational.
- (ii) **An Indicative Rural Electrification Master Plan (IREMP) was completed**, but only focused on priority investments, targeting the connection of 500,000 consumers in 10 years. Thus, the IREMP and the associated planning tools still need to be refined to enable detailed technical analysis and identification of the cost and capacity requirements for a consolidated roll-out plan.
- (iii) **A Renewable Energy Policy** was launched in November 2007. The main aspects of this policy include feed-in tariffs and standardized PPAs to enable promotion of private sector investment in rural electrification. The preparation of a standardized PPA has enabled conclusion of the several mini-hydro transactions. However, experience to date shows that the feed in tariffs still need to be reviewed.

Other Unintended Outcomes and Impacts (positive or negative)

Positive:

- (i) In development planning, energy is added as an important factor in investment strategy. Participating sectors (e.g. health, education, water) are also mainstreaming energy into their priorities and activities.
- (ii) The Project has generated interest outside the scope of its target activities. For example, some NGOs have expressed their willingness to cost share in order to be connected to electricity.
- (iii) The project has helped in removing initial apprehensions for using renewable energy. For example, negative perception on using solar panels to pump water supply has been removed because of the project.
- (iv) There is an increase in patients seeking help at nights at Health Centers since they now have electricity.
- (v) Because of the availability of cheaper solar energy, schools have started demanding more solar panels and become less interested in using paraffin and firewood to meet their energy needs.

Negative:

- 1) Theft has become an issue with solar PV systems. Often, security guards have to be hired to protect modules, often at a high cost.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

The following findings derive from the work of the MOF Poverty Monitoring Unit, which was tasked through the project to assess the poverty impacts. The MOF work assessed impacts in West Nile and Kisiizi regions. In the West Nile region, a power system has been operating for several years, offering a comparison with selected control sites. For Kisiizi, however, a power system was not operational during Phase I.

(i) Impact of ERT on Enterprises

- *Enterprise Migration into Grid Areas:* The ERT program has stimulated the migration of enterprises into the grid areas for Paidha, a 20,000 population municipality in the West Nile region, as well as into the planned grid areas for Kisiizi micro hydro project.
- *Development of Electricity Dependant Enterprises:* In both Paidha and Kisiizi ERT sites, enterprises have been developed that can only operate in a sustainable way if there is electricity. These include: internet access points; video halls;

telephone charging businesses; photocopying services and other similar businesses.

- *Improved Use of ICT in Enterprises:* In the period from 2006 to 2008, ERT has contributed to an increase in the use of ICTs by enterprises in previously unserved or under-served areas.

(ii) Impact of ERT on Households

It is still too early to assess the impact of ERT I on households. This will be assessed more fully under ERT II. The following are some preliminary findings:

- *ICT Facilities* - Access to ICT facilities is one of the key impacts of the ERT project to date.
- *Income* - Cash income is higher for electrified households in Paidha as compared to households in the control site.
- *Crop Yield and Agro-processing* - The increase in crop yield has been relatively small. The impact on agro-processing needs to be assessed during the next phase.
- *Water and Sanitation Facilities* - Access to safe drinking water and sanitation facilities has not significantly changed since the baseline.
- *Health* – Overall, the health situation has improved in both the control site and in Paidha since the baseline survey.

(iii) Impact of ERT on Health Service Providers

The survey reveals a relatively important impact of ERT on health service provision in the Paidha ERT site. Facilities with electricity are observed to offer improved services, where patients have lighting in wards, the hospital environment is relatively safe, services are faster, and record keeping is computerized.

(iv) Impact of ERT on Education Service Providers

The survey did not reveal a significant impact of ERT on education services. However, the solar systems installed under ERT I only became operational shortly before project closure.

(v) Impact of ERT on the PV Industry and on Key Beneficiaries

The ERT program seems, at least to some extent, to have benefited the key target group, PV companies. In general, more efforts should be invested in making the

application procedure for sales based performance grants shorter and less bureaucratic. (Annex 5)

4. Assessment of Risk to Development Outcome

Rating: *Substantial*

The overall risk assessment is rated as Substantial for the following considerations:

Limited Private Sector Participation. There has been limited private sector participation so far in the ERT program. Phase I was designed to be private sector led, especially grid extension investments. In practice, the bulk of grid extensions had to be undertaken with scarce public funds because private equity did not materialize. Moreover, while local investors lack experience and access to funding, potential foreign investors have shown little interest. Consequently, prospects for attracting significant amounts of private sector financing in ERT II and later phases are not promising because of the perceived high costs and continuing high risks associated with rural energy investment. Much of the funding will need to be provided by government, whose funding is constrained and is likely to limit the scope of future rural energy investment if private sector capital is not forthcoming. While government can provide certain incentives to attract private participation in rural energy investment, it does not control all the external factors that also influence private sector investment. Hence, it will require a sustained focus of the government in ERT II to attract private capital to areas of its rural investment program.

Developing a market for Solar Home Systems (SHS). The pace of expansion of Solar PV companies in rural areas under ERT I was below expectations, especially in individual households, due largely to insufficient business and technical capacity together with the high capital costs of SHS and inadequate financing terms. In addition to incentives targeted to potential SHS consumers, other incentives are required to encourage the companies to accelerate investments in rural market infrastructure for sales, and after sales service. These problems are not uncommon in establishing a market for SHS and have been successfully addressed in Asian developing countries. It remains to be seen, however, whether this will be achieved in Uganda.

Need for Strengthened Institutional Capacity. Despite extensive investment in training and capacity building under ERT I, the capacity of MEMD and other key sector Ministries and agencies involved in rural electrification investments still needs to be strengthened. Otherwise, it will constrain the effectiveness of the government's rural transformation program.

Independence of Sector Regulator. Political interference in the decisions of the regulatory agency could affect its independence which, in turn, could erode the confidence of the private sector. Mitigation measure includes strengthening the capacity of the regulator through continued support under ERT II as well as close vigilance by Bank supervision teams.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

Rating: *Moderately Satisfactory*

The Bank's performance in the identification, preparation, and appraisal of the project was judged to be Moderately Satisfactory. At the concept stage, the Bank played an important leadership role in promoting a program for rural transformation that had direct relevance to Uganda's poverty reduction strategy. The integration of rural energy, renewable energy, and ICT components into the design were positive features that would later bring tangible benefits to rural communities under ERT I. During preparation and appraisal, the Bank took into account technical, financial, economic, and fiduciary concerns, including procurement and financial management aspects. A number of alternatives were also considered for the project design. Project preparation was carried out with an adequate number of specialists who provided the technical skill mix necessary to address sector concerns and project design issues. The Bank provided adequate resources, in terms of staff weeks and budget, to ensure quality preparation and appraisal work. Finally, the Bank maintained a good working relationship with the Borrower during preparation and appraisal.

Despite these positive aspects, there were two shortcomings during appraisal which became increasingly evident during the implementation of Phase I. *First*, the project was designed as a demand driven, private sector led rural transformation program in which private sector investment, supported by 'smart subsidies', would help finance the government's rural energy investment program. Private sector financing did not materialize while the appraisal report lacked a thorough assessment of the prospects, and the constraints, for mobilizing private sector capital from either local or foreign investors. *Second*, there was a lack of an in-depth institutional assessment of government capacity to undertake an ambitious rural transformation program. While the project provided for capacity building, the limited absorptive capacity of public sector institutions has constrained progress under Phase I. Moreover, the project was not ready for implementation at entry which imposed additional pressures on government capacity and resulted in less than a 10% disbursement by the time of the MTR. Finally, in a country prone to severe load shedding because of its vulnerability to drought conditions, there was no acknowledgement in the risk section of the potential consequences of high oil prices on private sector interest in rural energy investment, even recognizing such a risk is not immediately mitigated.

Quality of Supervision

Rating: *Satisfactory*.

The Bank's performance during the implementation of the project was considered satisfactory. Sufficient budget and staff resources were allocated, and the project was intensively supervised and closely monitored. There were also experienced local staff

members on the team with a good knowledge of Uganda's rural sector. This included a Power Engineer, as well as procurement, financial management, environmental, and social experts, led by an engaged Country Manager and Country Director.

However, the supervision team inherited a project that was not ready for implementation at entry and where a number of key government positions had still to be filled. The MTR in October 2004 was used to discuss with government areas which needed to be strengthened to turn around a faltering implementation performance. Disbursements slowly picked up but the project still required a 30 month extension of the original closing date involving two extensions; more than 50% of Credit disbursements took place in the final two years. The team was generally responsive to government's concerns and issues, despite some criticism from government of lengthy procurement delays and micro management of the operational details.

With the exception of the final ISR, the 15 Implementation Status Reports (ISRs), including 6 initial PSRs (until end 2004), realistically rated the performance of the project both in terms of achievement of development objectives and project implementation difficulties. The final ISR, in which DO and IP ratings were upgraded from MS/MS to S/S, on the basis of credible progress in the final 12 months towards meeting a number of the key indicators as well as improvements in implementation performance. However, it did not warrant a satisfactory (S) rating overall for a project that had not met all of its original targets and was completed more than 30 months behind the original schedule.

Justification of Rating for Overall Bank Performance

Rating: Moderately *Satisfactory*.

The overall Bank Performance is rated as Moderately Satisfactory due primarily to the shortcomings noted in 5.1 (a) above. These shortcomings had an adverse impact on implementation, especially during the initial years, and required an important change in the source of financing –from a concept that had been based on a private sector led model, to one in which much more government funding was needed to finance the extension of energy services to rural areas of the country.

Government Performance

Rating: *Satisfactory*.

Government commitment to the main development objective was strong from the outset. The ERT operation had a close link to the government's poverty reduction strategy and investment in rural energy, including ICT services, was a priority investment area for the government. There were four strong indications of borrower commitment. *First*, the government amended the draft Electricity Act to reflect the Bank's views about the policy framework for commercially-oriented rural electrification; *Second*, there was a one-day workshop in June 1999 (hosted by the MEMD, the MOLG, the ULAA, and the World Bank) to enable key stakeholders to discuss the principles and approach underlying this project. *Third*, in June 2000, the Minister of Finance organized and presided over a

meeting of bilateral donors to encourage them to support this project. *Fourth*, the project received strong support from key cross-sectoral ministries including Agriculture, Health, and Uganda Communications Commission, which had made the project a part of their mainstream activities.

The government was also committed to renewable energy development. In November 1999, it took the significant first step in the passage of private power legislation that would set the stage for rapid development of additional power resources. Further, in Uganda, key measures related to power sector reform, such as a new Electricity Act, had already been enacted, and they provided a level playing field for renewable energy. The strong government commitment to the promotion of rural access to ICT was clear from the inclusion of the Rural Communications Development Fund (RCDF) in the 1997 Uganda Communications Act, and in the considerable progress that had already been made towards the establishment of the RCDF.

Follow through on its commitment to the project during implementation was uneven, particularly in taking steps quickly to strengthen the capacity of key implementing agencies. In fact, a general lack of capacity on the part of line Ministries adversely affected implementation in the first few years of the project. Nevertheless, the MOFPED collaborated closely with the Bank during implementation in conducting a baseline survey as well as some broad based and in-depth surveys.

Implementing Agency or Agencies Performance

Rating: ***Moderately Satisfactory***.

PCU. The performance of the PCU during the implementation of the project was ***Moderately Satisfactory***. The main role of the PCU was to provide coordination and cross-sector support on implementation issues, contract management, and procurement. The PCU concentrated first on learning about the variety of technologies and approaches they could promote to implement the project and developed capacities internally. This was followed by bringing together the different Ministries such as Health, Education, and Agriculture to show the potential of integrating energy into their service delivery process. However, as the PCU was focused more on implementing the MEMD component, it did not put adequate effort into coordination and support to other agencies.

The PCU submitted all required quarterly and annual reports more or less in a timely manner. These reports were informative, and provided valuable feedback on how the implementation was progressing covering all project activities. The status of performance indicators were incorporated in all progress reports and served as valuable input to Bank supervision mission reports. The financial management system, including accounting, controls, auditing and reporting, was adequate and satisfied the Bank's financial management requirements. While FM was centralized at MEMD, REA coordinated the other line ministries in FM data gathering and reporting. Audits had greatly improved, with REA following up recommendations for system improvements. Finally, procurement packages were mostly complex and the results were mixed, with

each implementing agency responsible for its own procurement. The overall the procurement performance of the project was satisfactory.

Other Agencies. Several agencies, including REA, MEMD, UCC, BOU, PSF, and various line ministries were involved in project implementation. As the performance of these agencies varied, depending on their capacities, their overall performance is rated ***Moderately Satisfactory***.

Certain ministries and agencies like the Ministries of Water and Health took responsibility and moved to develop their own energy related capacity, while the Ministries of Education and Agriculture were not as successful. There were various reasons for this situation: Ministries of Water and Health had a committed staff and enthusiastic persons and created an energy team who took on the responsibility to create their own internal capacity for the area of energy. In contrast, Education Ministry only hired a dedicated person to handle the energy area recently. This caused project delays. Likewise, Agriculture Ministry had no internal policy in place and there was poor direction.

Justification of Rating for Overall Borrower Performance

Rating: ***Moderately Satisfactory***

The overall Borrower performance is rated as Moderately Satisfactory. This was a complex project with many government agencies involved. Commitment of the government to the project objectives was strong. However, there was mixed performance during implementation of the key implementing entities in resolving capacity constraints, which resulted in a lengthy implementation period.

6. Lessons Learned

Assess Potential for Private Sector Participation

A clear lesson emerging from Phase I of the ERT is the need to undertake a careful assessment of the potential for private sector investment in rural energy/ renewable energy, including identifying barriers, needed incentives, and/or risk mitigation measures to enhance this potential. Participation of the private sector in Phase I in renewable energy power generation for sale to the grid was satisfactory but was poor in access projects via main-grid extension, the project's largest investment component. The international private sector did not show interest in the latter, while participation of the local private sector was much more limited than anticipated due to low capacity, scarcity of equity, and a high perceived risk. An assessment of private sector potential during preparation would have identified many of these constraints and led to a modified project design in terms of the balance between private sector funded and publically funded investments in rural energy.

Balancing Project Design with Institutional Capacity

Project design needs to take into account existing capacities of all ministries and public agencies involved in implementation, including at the community level; training and capacity building also need to be provided to operate and maintain projects. The ERT program involved several components in energy alone, with many government agencies involved in implementation. A reduced project scope that took more into account existing limitations in government implementation capacity would have helped reduce the extensive implementation delays in Phase I.

Improving Supervision Performance

Having a field-based member in the Bank's supervision team, speaking the local language with a detailed knowledge of the country's rural areas, is effective and helpful in project implementation, especially for dealing with issues on a real-time basis. It is also helpful in ensuring that the Bank team has a close relationship with the many stakeholders in a project of this kind. The complex procurement packages required seasoned Bank project procurement staff to be in place during project preparation rather than later in the project implementation period. In addition, more flexibility is required in the procurement of PPP contracts and use of commercial practice by the private sector in such projects. It is also important for the PCU to discuss with the relevant agencies to avoid delays associated with: (i) confirmation of Letter of Credits (LOCs); (ii) customs clearance; and (iii) the need for testing by the Uganda National Bureau of Standards, so that the requirements are streamlined and the implementation is not adversely affected. These delays contributed to the slow delivery of Phase 1.

Need for long term Financing for Rural Energy Investments

Currently, there is limited supply of long-term development finance (on terms beyond five years), due to the mismatch between the requirements of long-term lending, and the time profile of commercial banks liabilities. This constraint needs to be rectified. Uganda also needs to develop further strategies to attract more foreign investment for rural energy.

Developing a rural market for Solar Home Systems (SHS)

Experience in developing countries in Asia as well as in Latin America has shown that strong technical supervision, quality assurance and due diligence for solar panels, accessories, and power inverters are critical for the success of renewable energy activities such as SHS. Likewise, capacity building and training in installations and O&M service of renewable energy/water systems- especially of engineers, technicians, operators /attendants of pumping stations and local communities -are equally important. Slowness in anticipating and preparing for these capacity needs has been responsible for the low demand for SHS under Phase I, particularly in households.

ICT projects

Given the success of the ICT component in Phase I, it is worth considering the following options in subsequent phases of the ERT program: (i) assisting local ISPs and content providers in provision of affordable access and relevant information to rural communities; (ii) providing major health clinics and facilities with local area networks and access to internet for enhanced service delivery and information access/dissemination; and (iii) exploring content delivery mechanisms to increase educational opportunities in rural areas. Success in ICT has demonstrated that developing and satisfying a rural demand for communications systems is easier than for energy services.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

Borrower/Implementing Agencies

The Borrower did not comment of the ICR because of the limited time available once the ICR was completed on December 15, 2009. However, the Borrower did provide a detailed evaluation report on the project, agency by agency, including aspects of Bank performance, which is described in Annex 7. This section provides the main observations made by the Ministry of Energy and Mineral Development (MEMD), the lead sector agency overseeing Energy Sector Development, which had the main oversight responsibility for ERT 1. Its specific responsibilities under the project included: formulation of policy, strategy and planning for rural energy, establishing an institutional framework for rural electrification promotion and development, overall coordination of the program, monitoring and evaluation, and capacity building.

Implementation Performance

The REF, REB and REA were established within one year of project commencement. Key staff of REA was in place within two years. Once in place, REA quickly took on the fast track projects namely Kakira, Kisiizi, and Nyagak (Mini Hydro) as well as the management of the IREMP and PREPS. The absence of a coordinated approach to implementation led to the appointment of a Coordination Manager and the establishment of a Coordination Unit. Several workshops were and messages were carried in the electronic and print media regarding the new approach to rural electrification. Consultancies and Technical Assistance supported the creation of a Renewable Energy Database, the promotion of gasifier technology, the promotion of energy efficiency in small and medium enterprises (SMEs), the development of an Indicative Rural Electrification Master Plan, the review of the ERT Project and the Rural Electrification Framework and Institutions. A GIS lab has been established in the Ministry and data from it was used in developing the Renewable Energy Policy, which was launched in November 2007. Capacity Building was achieved through various short and long courses both locally and internationally.

Operational Experience/ Lessons Learned

- i) The establishment of REA as the dedicated agency, has facilitated the expansion of rural electrification investments;
- i) Multi -sectoral programmes require a well staffed coordination office to carry out the functions of coordination monitoring, reporting;
- ii) The private sector did not show as much interest as anticipated, because of high risks, low level of equity, and inadequate business plans. It was necessary to change the mode of implementation to a situation whereby, Government invests and the private sector can thereafter manage.
- iii) There is considerable interest in rural energy and rural electrification in the districts. However, there is currently no representation at the district level.

- iv) As a result of capacity building and training, there has been increased interest, enthusiasm and an improved work ethic in the Ministry. Some staff have even been promoted.
- v) Energy efficiency in SMEs, gasifier and biogas technology, has considerable expansion.
- vi) The promotion of CFLs reduced the peak load by about 20MW and an additional 10MW can be attributed to sensitisation of consumers in the use of CFLs.

Outputs

- i) A framework for promoting rural electrification has been established and is now operational.
- ii) The Coordination Office was established and supported project implementation throughout the project life.
- iii) The consultancy for the review of the ERT and Rural Electrification framework and institutions recommended a shift in policy from private sector led to public sector led, with investments in infrastructure and supported by the private sector in the management of the schemes.
- iv) An Indicative Rural Electrification Master Plan was finalized and is being implemented by REA.
- v) As a result of the ERT promotion, recommendations were made for the establishment of district representation of the Energy Sector.
- vi) Technology demonstration sites were established and are now operational to improve energy efficiency in SMEs. Training in these technologies has been conducted and a national training mechanism is being packaged.
- vii) 560,000 CFLs have been distributed and Government is in the process of rolling out this exercise to other districts besides Kampala. Some 20MW of power was salvaged from the demand side.
- viii) A GIS laboratory, which contains mainly data on the renewable energy sources in Uganda especially the supply side, was established.
- ix) The Renewable Energy Policy was launched in November 2007 and 1000 copies of this policy were printed and have been distributed to the different stakeholders. The Policy is also posted on the MEMD website.
- x) The draft National Implementation Plan for Biogas has been developed.
- xi) An improved, skilled, well trained and highly motivated work force is available to promote sector development.

Performance of the Bank during Implementation

The Bank initially took long to respond to requests for No Objection and was sometimes quite rigid in their outlook. This improved later on, especially when the Kampala Office was strengthened and better channels of communication were availed.

Cofinanciers

NA

(Other Partners and Stakeholders

The main report and results from a Stakeholder Workshop are described in Annex 6.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)			
Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Component 1. Main grid related power distribution and generation	45.55	154.11	338%
Component 2: Independent grid systems.	26.14	15.03	57%
Component 3: Solar PV systems	10.80	4.54	42%
Component 4: Cross-sectoral linkages	12.44	8.46	68%
Component 5: Energy Sector capacity building, technical assistance and training	15.88	15.54	98%
Component 6: ICT Sector	12.50	6.53	52%
Total Baseline Cost	123.31	204.21	166%
Physical Contingencies	0.00	0.00	0.00
Price Contingencies	0.00	0.00	0.00
Total Project Costs	123.31	204.21	166%
Project Preparation Fund	0.00	0.00	.00
Front-end fee IBRD	0.00	0.00	.00
Total Financing Required	123.31	204.21	166%

Note: Costs under funding sources other than World Bank exceeded the estimated appraisal figures and under the “Main grid related power distribution and generation component” because of the following reasons: (i) approved and published Renewable Energy Policy, which has a favorable feed in tariff was attractive for private investors; (ii) shortage of electricity in Uganda provided a market for Small Hydro Power investments, which feed in to the main grid; and (iii) Mini Hydro Investment feeding into the Main grid proved a good investment for the private Investors.

(b) Financing

(b) Financing			
Source of Funds	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower	7.20	10.00	139%
IDA	49.10	56.91	116%
Foreign Sources (Unidentified)	2.50	21.55	862%

Bilateral Agencies (Unidentified)	6.90	18.29	265%
Foreign Commercial Sources (Unidentified)	45.49	86.10	189%
GEF	12.12	11.35	94%
TOTAL	123.31	204.2	166%

(a) Original and Reallocated Amounts of IDA Credit Proceeds by Category			
Category	Amount of the Credit allocated (in SDR eq.)	Revised allocation (in SDR eq.)	% of expenditures to be financed
(1) Sub loans	1,118,0000	8,284,824	90% of amounts disbursed
(2) Grants for:			
(a) ICT Subproject	3,510,000	4,186,769	87% of grant amount ²
(b) Rural Electrification	5,580,000		100% of amounts disbursed
(i) Subprojects financed through REA	3,790,000	1,1922,715	
(ii) Other Subprojects			
(3) Consulting Services, training and audit fees for:			100% of foreign expenditures and 90% of local expenditures
(a) Direct Services:			
(i) Participating Ministries	2,110,000	2,562,620	
(ii) PSF	650,000	397,374	
(iii) UCC	360,000	676,160	
(iv) REA	2,320,000	1,524,587	
(b) PSF Matching Grants	530,000	627,334	50%
(4) Good			
(a) REA	110,000	223,721	
(b) PSF	70,000	51,228	
© Participating Ministries	3,340,000	5,207,698	

² Please note that the ICT component was initially estimated at US\$5.5 million and later increased to US\$12 million, mainly due to the more than anticipated demand for this component. US\$10.5 million was covered by International Development Association (IDA) credit and the rest by government counterpart funds.

(5) Operating Costs			90%
(a) REA	413,000	1,190,962	
(b) PSF	55,000	212,393	
© MEMD	430,000	1,155,211	
(d) BOU	70,000	76,404	
(6) Unallocated	3,782,000		
TOTAL	38,300,000	38,300,000	

(b) Original and Reallocated Amounts of GEF Trust Fund Grant			
Category	Amount of the Credit allocated (in SDR eq.)	Revised allocation (in SDR eq.)	% of expenditures to be financed
(1) Goods			100% of foreign expenditures and 90% of local expenditures
(a) Health and Education energy packages:	110,000	1,720,576	
(b) PSF	40,000	295,008	
(2) Grants	4,910,000	4,391,467	100% of amounts disbursed
(3) Consultant Services:			100% of foreign expenditures and 90% of local expenditures
(i) Participating Ministries	2,600,000	1,852,699	
(ii) PSF	700,000	91,1180	
(4) Operating Costs (PSF)	160,000	329,070	100% of foreign expenditures and 90% of local expenditures
(5) Unallocated	980,000		
TOTAL	9,500,000	9,500,000	

Annex 2. Outputs by Component

Component 1. Main grid related power distribution and generation

i) Priority Rural Electrification Projects

Construction of the *Mbarara – Kyabirukwa – Kikagati – Ntungamo line with a tee off to Kabuyanda and Mirama Hill* grid extension project is complete. This is a 33KV, 150 km grid extension project currently being operated by UEB. The intention is that it would be operated (O/M) by a private concession using a prepaid metering system

Construction of the *Kyotera – Mutukula line with a tee off to Kasensero* project is complete. This is a 33KV, 87Km grid extension project. The intention is that it would be operated by a private O/M concession using a prepaid metering system.

ii) Kilembe Investments Limited

Construction of lines to supply electricity to the rural areas of Kasese District and surrounding areas, covering 68km of HV and 52km of LV is complete. It is operated by Kilembe investment limited, a private concessionaire, and the connection of 2000 customers is underway.

iii) Community Projects

This included construction of grid extensions to supply more than 20 communities near, or within, the existing grid. The completed schemes have been handed over to Umeme for operation under the same terms and conditions of the existing concession obligations.

iv) Power Generation -

Kakira cogeneration plant using Bagasse was upgraded and is now supplying the grid with 12 MW. A number of mini hydro power schemes are either ongoing or at various stages of construction. Some of the ongoing schemes include: Mpanga (18 MW) and Bugoye (13 MW). Buseruka (9 MW) has started construction; Kikagati (10 MW) and Ishasha (5 MW) started construction in early 2009

Component 2: Independent grid systems.

- i) Upgrading of the Kisiizi hospital power project from 60kw to 300kw is complete. This project will electrify the Nyarushanje community in Rukungiri District and connections of an estimated 300 customers are underway.

The construction of a 3.5MW Hydro power plant at Nyagak is in progress. This plant will supply the West Nile region, replacing a 1.5MW HFO thermal plant, which is supplying over 2800 customers in the West Nile Region of the country. The evacuation network and the power house are complete and works on the dam, channel and penstock sections respectively stand at approximately 60% completion.

Component 3: Solar PV systems

The first phase of the ERT programme supported installations of over 1,300,000 watt peaks in the private sector through matching grants and subsidies channeled through the Private Sector Foundation and Rural Electrification Agency.

Component 4: Cross-sectoral linkages

- i) 512 solar systems with a capacity of 117,140 watt peaks have been installed and are in operation in health centers across the country. This has improved service delivery in the Health sector.
- ii) 20 solar water pumping systems, with a capacity of 195,960 watt peaks, have been installed and are in operation in 14 districts country wide. This least cost energy solution has improved water supply services in small towns and rural growth centers country wide.
- iii) To date, 94 of the 129 Educational institutions packaged under the Phase 1 have been electrified using solar systems. A total of 58,875 watt peaks will be installed in 10 districts across the country. This will directly improve the quality of Education in these institutions.

Component 5: Energy Sector capacity building, technical assistance and training

- i) A regulatory framework was put in place to promote rural electrification. This includes the Rural Electrification Board, the Rural Electrification Agency and the Credit Support Facility.
- ii) The Renewable Energy Policy was developed to guide the development of the sector and attract private sector investment.
- iii) The Indicative Rural Electrification Master Plan was developed. This will be used as a basis for rural electrification during the second phase.
- iv) Technology demonstration sites have been established to improve efficiency in Small and Medium Enterprises (SME's) and to promote biomass gasification technology. A plan to upscale these activities has been developed.
- v) A GIS laboratory was established which contains data on renewable energy sources in Uganda. a capacity building plan was also developed and is being implemented.
- vi) Quarterly stakeholders' workshops were conducted as a management tool. Regional workshops were conducted countrywide and local government district workshops were conducted at grass root level.
- vii) Staff from the Ministry of Energy and other participating agencies were trained in various energy related skills, ICT, procurement, finance and general management skills.

- viii) The review of the ERT and the Rural Electrification framework recommended a change in policy whereby Government should invest in infrastructure and private sector carries out operation.

Component 6: ICT Sector

- i) Infrastructure expansion of the telephone network in 154 originally under served sub counties was completed and 1,534 Community Information Centers deployed and operationalised. To date, there is one public payphone for every 2,500 inhabitants in the 154 sub counties
- ii) 32 internet points of presence were installed and are operational in 32 District Head Quarters.
- iii) 16 multipurpose communication telecenters were installed and are all operational.
- iv) 20 postal telecenters have been set up by Posta Uganda and have been connected to the internet

Annex 3. Economic and Financial Analysis
(including assumptions in the analysis)

See Section 3.3, Efficiency

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Arun Sanghvi	Lead Energy Specialist	AFTEG	Team Leader
Rob Schware	Lead Informatics Specialist	AFTPS	Informatics
Malcolm Cosgrove-Davies	Senior Energy Specialist	AFTEG	Energy
Subodh Mathur	Senior Economist	AFTEG	Consultant
Sten Bergman	Senior Power Engineer	AFTEG	Power Engineering
Trine Refsbaek	Junior Professional Officer	AFTEG	Cross-sector Expert
Vivien Foster	Economist	LAC-LCR	Telecoms Expert
Philip Gowers	Lead Health Specialist	AFTHD	Health
Peter Okwero	Health Specialist	AFTHD	Health
Joseph Kizito	Financial Management Specialist	AFTFM	Financial Management
Arne Dalfelt	Sr. Environmental Specialist	AFTEN	Environmental Safeguards
Kristine Ivardotter	Sr. Social Development Specialist	AFTES	Social Safeguards
Modupe Adebawale	Sr. Financial Management Specialist	LOAAF	Financial Management
Aberra Zerabruk	Senior Counsel	LEGAF	Legal
Rogati Kayani	Senior Procurement Specialist	AFTPC	Procurement
Karl Jechoutek	Advisor (through PCD)		Quality Assurance Team
William Steel	Sr. Advisor, Micro-finance and SMEs	AFTPS	Quality Assurance Team
Ernie Terrado	Principal Renewable Energy Specialist	LCSFE	Quality Assurance Team
Louis Pouliquen	ex-Bank Director of Infrastructure, Consultant		Quality Assurance Team
Peter Scherer	ex-Bank Division Chief for Telecoms and Energy		Quality Assurance Team
Jonathan Brown	Operations Adviser, (AFTQK/ACT Africa) Chair	AFTQK	Quality Enhancement Review
Nwanze Okidegbe	Adviser	RDV	Quality Enhancement Review
Onno Ruhl (AFTPS)	Lead Private Sector Development Specialist	AFTPS	Quality Enhancement Review
Richard Stem	Former World Bank Vice President and Director of Energy Department		Quality Enhancement Review

Wolfgang Mostert	Rural Electrification Policy & Strategy, Institutional Framework, Rural Electrification Fund Specialist		International Consultant
James Finucane	Rural Business and Solar Market Development and Financial Intermediation Specialist		International Consultant
Michael Bess	East African Renewable Energy Economist and Planner		International Consultant
Robert Chronowski	Grid-Connected Renewable Energy Program Development Specialist		International Consultant
Patrick Barugahare	Lawyer		Local Consultant
Luka Abe	Capacity Building		Local Consultant
Herbert Dusabe	Lawyer		Local Consultant
Geoffrey Kitakule	Financial Analyst/Modeler		Local Consultant
Raima Oyenyin	Language Program Assistant	AFTEG	Administrative and Client Support
Supervision/ICR			
Arun Sanghvi	Lead Energy Specialist	AFTEG	Team Leader
Malcolm Cosgrove-Davies	Senior Energy Specialist	AFTEG	Energy
Peter Smith/Rob Schware	Lead Informatics Specialist	AFTPS	Informatics
Trine Refsbaek	Junior Professional Officer	AFTEG	Cross-sector Expert
Paul Baringanire	Power Engineer	AFTEG	Power Engineering
Howard Bariira Centenary	Procurement Specialist	AFTPC	Procurement
Richard Olowo	Senior Procurement Specialist	AFTPC	Procurement
Marjorie Mpundu	Counsel	LEGAF	Legal
Edith Mwenda	Senior Counsel	LEGAF	Legal
Luis Schwarz	Sr. Finance Officer	CTRFC	Financial Management
Patrick Piker Umah Tete	Sr. Financial Management Specialist	AFTFM	Financial Management
Subodh Mathur	Senior Economist	AFTEG	Consultant
Mary Bitekerezo	Sr. Social Development Specialist	AFTCS	Social Safeguards
Mavis Ampah	Sr. ICT Policy Specialist	CITPO	ICT
Martin Fodor	Sr. Environmental Specialist	AFTEN	Environment
Richard Hosier	Sr. Environmental Specialist	ENVGC	GEF
Paul Kamuchwezi	Financial Management Specialist	AFTFM	Financial Management
Bobak Rezaian	Sr. Energy Specialist	AFTEG	ICT and Energy
Peter Silarszky	Senior Economist	CITPO	ICT/Economics
Kameel Virjee	Financial Specialist	ETWAF	Finance
Wolfgang Mostert	Rural Electrification Policy		International

	& Strategy, Institutional Framework, Rural Electrification Fund Specialist		Consultant
Janine Speakman	Operations Analyst	AFTEG	Operations
Agnes Kaye	Program Assistant	AFMUG	Administrative and Client Support
Anta Loum Lo	Language Program Assistant	AFTEG	Administrative and Client Support
Raima Oyeneyin	Language Program Assistant	AFTEG	Administrative and Client Support

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY2000	17	216
FY2001	13	180
FY2002	15	149
Total:	45	551
Supervision/ICR		
FY2002	5	70
FY2003	30	219
FY2004	26	207
FY2005	34	223
FY2006	45	202
FY2007	44	285
FY2008	21	115
FY2009	22	122
Total:	227	1343

Annex 5. Beneficiary Survey Results³

The purpose of the survey (M&E activity) was to identify and measure the impact of the ERT project interventions in terms of rural transformation, i.e., improvements in quality of life and increases in incomes. The M&E concretely measured how communities benefit from increased access to energy, as well as the degree to which positive (or negative) changes are a result of the ERT (and not other extraneous factors), with a view to improving the design of the later phases of ERT program.

The immediate objective of the M&E, namely to establish and operate a monitoring and evaluation program for the Energy for Rural Transformation Programme, which can allow for adjusting and implementing properly the following phases of the ERT programme, was achieved. The M&E program was established, and the 5 main M&E reports, along with the 8 issues papers and the 11 videos from the surveyed sites are demonstrating the impact to date of the ERT program and provide recommendations for adjusting and implementing properly the next phases of the ERT programme. The findings are available on the M&E Knowledge Sharing Portal.

Monitoring was performed via in-depth and broad based surveys in the two selected project areas and one control site. These surveys are providing detailed assessments of the impacts of: mini-grids, grid extensions and PV systems in the communities, households and institutions where they are installed.

Impact of ERT on Enterprises

The period between the years 2006 and 2008 is very short to assess the impact of ERT, but nevertheless there are some aspects regarding enterprises upon which ERT has had direct impact and these are:

Enterprise migration into grid areas: The ERT program has stimulated the migration of enterprises into the grid areas for Paidha and for Kisiizi into the planned grid areas. The main drive reported for the migration (93%) was economic in nature. Of those that had migrated to Paidha, 11% had done so in the last 2 years prior to the survey. Similarly in Kisiizi, there is a noticeable clustering of enterprises along the proposed grid areas.

Spring-up of electricity dependant enterprises: Both in Paidha and Kisiizi ERT sites, enterprises have sprung up that can only operate in a sustainable way if there is electricity: These include: internet access points; video halls; telephone charging businesses; photocopying services and other similar businesses.

Increased usage of electric energy: The ERT program has brought about appreciation of importance of energy in enterprises. This is evident in Paidha with about 89% of the enterprise owners ranking electricity as important or very important in relation to the available energy sources, while only 18% of enterprise owners in Sironko (the control site)

³ Note: Beneficiary Surveys were carried out by independent consultants hired by the Ministry of Finance.

rank electricity as important or very important. The appreciation of the importance of electricity in Paidha is further confirmed by increased usage of electricity in enterprises that has almost doubled from 28% in the year 2006 to 53% in the year 2008.

Improved use of ICT in enterprises: In the period from 2006 to 2008, ERT has brought about an increase in enterprise use of ICT. In Paidha, 79% of enterprise owners use a telephone up to five times a day while in Sironko only 16% do the same. Telephone access is higher in Paidha with about 81% of enterprise owners accessing a phone in their houses, while in Sironko only about 30% of enterprise owners have access to phones in their houses.

Impact of ERT on Households

The ERT Programme has already led to improvements for households in the area. Especially, use of ICT has been stimulated, giving people access to more information and consequently improving quality of life.

Perceived Impact - Households have high expectations regarding improved energy sources and the impact it can have on their livelihood. While the households only experience limited impact of energy access in the control site there is general consensus in Paidha that the grid power has resulted in both direct and indirect impact for the individual households and general community. These include services such as better quality of saloon services, better quality of entertainment particularly with video halls and a secure environment in hospitals because of light.

ICT facilities - Access to ICT facilities is one of the key impacts of ERT projects till date. The findings showed that the households' access to and use of ICT has improved considerably since the baseline. In Paidha, 44.9% of the households have access to ICT facilities compared to 29.6% of the households in Sironko where there are no ERT projects. The unique ICT facilities enjoyed include television, mobile phones and internet.

Income - Cash income is higher for households in Paidha compared to households in the control site. In Paidha, households reported an improvement in business and employment opportunities since the introduction of ERT. Some households reported that they could get their members employed as welders, could operate businesses such as charging mobile phones or selling cold drinks- all because of availability of electricity. In contrast, it was found that a higher proportion of households are operating SMEs in the control site compared to households in Paidha. Common for both sites is that, although the households are still poor, the income level has increased since the baseline.

Land ownership and the amount of land - Land ownership and the amount of land owned at household level is an important indicator of households' wealth and well-being. The survey findings show that the percentage of households with sufficient land is higher in Paidha compared to the control site. However, for both sites there is still a considerable amount of households, which do not have sufficient land for agricultural purposes.

Crop yield and agro-processing - The increase in crop yield has been relatively small since the baseline, which indicates that households have not been able to use electricity to improve their agricultural production. As for agro-processing, costs have increased both in

ERT sites and the control site. Although there were no notable differences in terms of agro-processing unit costs between control and ERT sites, the households in Paidha had a choice of either using grid powered plants or diesel powered ones.

Water and sanitation facilities - Access to safe drinking water and sanitation facilities has not significantly changed since the baseline. Whereas it would be expected in the ERT sites for the local population to benefit from access to piped water because of presence of grid power, this has not been the case.

Health – Overall, the health situation has improved in both the control site and in Paidha since the baseline. In Paidha, it is generally agreed that the quality of health service has improved since the introduction of electricity but other factors such as limited skilled personnel, medicine etc. affects the quality of the health service.

Education - One of the assumptions in the ERT program is that the establishment of power would provide school children with the opportunity to do homework at night. The survey findings do not support this assumption as a higher percentage of school children do homework during the night in the control site compared to Paidha, where there is electricity.

Household well-being analysis - The households in the control site found that there had been a decline in their well-being, while in Paidha and Kisiizi the well-being of the households was generally consistent to what was expressed at the baseline.

Impact of ERT on Health service providers

The survey reveals a relatively important impact of ERT on health service provision in the Paidha ERT site. Facilities with electricity are observed to offer improved services, where patients have light in wards, the hospital environment is relatively safe, and services are faster where record keeping is computerized. However, the impact remains somehow overshadowed by the many other challenges that health facilities face i.e.

1. Lack of adequate and qualified staff
2. Lack of sufficient funds for capital and operational expenditure and
3. Lack of adequate drugs
4. Lack of space / beds and other equipments

Impact of ERT on Education service providers

In all the sites, the survey did not reveal any significant impact of ERT on education services. The survey revealed that whereas ERT has ‘perceived’ importance to education, the **primary requirements** of education institutions fall outside ERT and they include the following:

- Class room space
- Qualified teachers
- Textbooks
- Sufficient accommodation

- More financial resources for capital expenditure and operational expenditure of the institutions

Staff retention: There is not as yet any evidence of the wanted impact of rural electrification on staff retention in educational institutions. There are no major differences between the control site and ERT sites, or any significant development since the baseline. So few schools are connected to the grid and so few staff has grid access, that grid access cannot be seen to have had any impact, at least so far.

School enrolment: Generally, school enrolment is about the same in the two sites. Traditions and religion have significant impact on the school enrolment, leading to some variances between the three sites.

Student performance has slightly improved since the baseline, in both control and ERT sites. Some of the education institutions connected to the grid in the Paidha ERT site did not show any significant improvement in their performance as compared to those that were not connected to the grid.

ICT related courses: The survey results showed that no school had introduced ICT related courses into the school curriculum. The subjects being taught when the baseline was conducted have not changed. This means that despite access to grid power and other improved energy sources, the benefits related to ICT have not been reaped. As was found for most institutions, there are still challenges with grid power connections and acquisition of hardware and software needed to start ICT subject/courses.

Access to improved energy sources is highly relevant for the provision of educational services of good quality; this is recognised by respondents both in the ERT sites as well as in the control site. The access to electricity will first and foremost provide a possibility to enhance the provision of educational courses, but also provide lighting, allowing students to have sufficient light in the class rooms as well as to read at night.

Nevertheless, it is seen that also a considerable number of other factors have impact on the **quality of educational services**, including the acquisition and storage of adequate and up-to-date scholastic materials, incl. text books, transport for staff and students, sanitation, and support from parents and communities. This applies equally to the control site as well as to the ERT sites. Energy is important to education institutions but is not the most basic need for these institutions.

As for **funding** at local levels, funding from communities and parents is insufficient, so other measures are being introduced to enhance quality. Among those mentioned are more effective teaching programs – including extra lessons, frequent assessments of pupils and teachers, central resource centres for instructional materials, and extended use of local languages.

Impact of ERT on the PV Industry and on key beneficiaries

The ERT programme seems – at least to some extent - to have benefited the key target group, PV companies. In general more efforts should be invested in making the application procedure for sales based performance grants shorter and less bureaucratic.

There is a need for giving higher priority to the final beneficiaries, households, institutions and enterprises. The intentions of the ERT programme are good but the results may be improved by focusing directly on the end users.

The ERT programme has the potential to produce both short and long term positive effects. At present moment, there are indications that the programme contributes positively to rural transformation through this reduction in fuel costs, which can be used to finance personal needs as well as increased use of ICT, which facilitate improved quality of life through improved communication and entertainment.

Annex 6. Stakeholder Workshop Report and Results

Excerpts from:

MINISTRY OF ENERGY AND MINERAL DEVELOPMENT

ENERGY FOR RURAL TRANSFORMATION PROGRAMME

**OBJECTIVE ORIENTED PARTICIPATORY PROJECT PLANNING (OOPPS)
WORKSHOP REPORT HELD AT IMPERIAL RESORT HOTEL, ENTEBBE-
UGANDA**

11th -12th July 2007

EXECUTIVE SUMMARY

This is an external performance assessment for Phase I and proposal for Phase II of the components of Energy for Rural Transformation Programme (ERT) in Uganda. The programme is being implemented by the Government of Uganda (GOU) under the Ministry of Energy and Mineral Development (MEMD). The exercise was sanctioned by the MEMD to a Consultant, and undertaken in July 2007 using, the methodologies of documentary review and holding an OOPPS workshop. A cross section of the main stakeholders from the implementing institutions participated in the OOPPS workshop.

ERT is a private sector led ten-year multi-sectoral programme developed by GOU with IDA/GEF support. The overall goal of ERT is to increase rural electricity access from 1% to 10% by the year 2012. The Programme was built on strong linkages among key production and human resource sectors including Agriculture, Health, Water, Education and Local Governments. ERT employs several delivery mechanisms that include grid extensions, decentralized mini grids, solar PVs and the development of other renewable energy resources.

The overall objective of the Consultancy was to assess the performance of the components of ERT; point out any lessons learnt in Phase I, as well make recommendations and proposals for the implementation of Phase II. Findings of the study are also aimed at providing inputs into the rural electrification review consultancy soon to be launched.

Relative to the phase one and objectives targets and time Phase I aimed at “*Development of requisite framework and limited investment*”, in the rural energy sector. Using Phase I targets as a baseline, the ERT Programme has performed to a commendable level. The achievements are of two dimensions: (1) Institutionally, “*Establishment of a regulatory system for rural electrification, satisfactory working of Rural Electricity Board (REB), Rural Electrification Agency (REA); and Rural Electrification Fund* (2) in service delivery, it has contributed to the reduction of the solar home system price from US\$20 to US\$12 – 17, and an increase in of power generation and the availability of electricity to the population” by about three (3) percent.

The following constraints have been experienced during the implementation of Phase I so far. On the supply side, institutional and procedural requirements largely delay timely implementation of program activities. On the demand side, lack of affordability of the rural poor to pay for the energy services and limited investment in infrastructure remains a major constraint in transforming lives of the rural poor.

To achieve the core objective of ERT Phase II of “*Increased access to energy and ICT focusing on increased productive use of energy, enhancement of social services and improved quality of life*” requires strengthening the Rural Electrification Agency and implementation of other strategies to increase access to energy by the rural poor. This also requires enhancing the multi-sectoral approach already in place.

CHAPTER ONE: INTRODUCTION

1.1: INTRODUCTION

This is an ‘Objective Oriented Participatory Programming Systems (OOPPS) report on the ‘Energy for Rural Transformation (ERT) Project of Government of Uganda (GoU) under the Ministry of Energy and Mineral Development (MEMD). Phase I of the project has been under implementation since 2002 and this assignment was commissioned by MEMD in preparation for the implementation of Phase II. As part of this OOPPS assignment, a participatory workshop was facilitated from 11th –12th July 2007 at Imperial Resort Beach Hotel in Entebbe, Uganda. Representatives from ERT key stakeholders participated in the workshop; a list of people who attended is attached as Annex One.

This report is divided into the following sections:

- Overview of ERT
- Objectives of the Performance Assessment
- Methodology used in the Performance Assessment
- Assessment of Performance of Phase I of ERT
- Conclusions
- Proposals for ERT Phase II

1.2: OVERVIEW OF ERT

ERT is a ten-year private-sector led multi-sectoral project developed by GOU with IDA/GEF support. The overall goal is to increase rural electricity access from 1% to 10% by the year 2012, through a number of delivery mechanisms, which include grid extensions, decentralized mini grids, solar PVs and development of other renewable energy resources. Being multi-sectoral, the project is built on strong linkages with key production and human resource sectors namely Agriculture, Health, Water, Education and Local Governments. The scope of work under each sector is described in Annex Two.

The project implementation was broken down into three phases purposely to allow learning as succinctly put in an appraisal of the project by Associate Professor of Energy and Director of Renewable Energy Dr. Daniel M. Kammen of University of California, Berkeley

“An important feature of the project that must be preserved is the slow and steady development, learning, and reflexive analysis that the new social, institutional, and educational components require. Overly rapid growth in funding can do as much to harm a fledgling institution as can neglect. Mechanisms are also required to integrate and to recognize the pervasive nature of the informal rural economy, and the degree to which interventions have implications – sometimes delayed – across society. In a project of this scale there has been a tendency in the past to accelerate the process based on signs of technical progress that in fact disguises or ignores needed social support and adaptation time.” (Kammen, 2000)

In line with the need to learn and allow for reflexive analysis, the ERT was broken down into three phases. Phase I was basically meant to be ‘throat clearing’ process with an overall objective to “Develop requisite framework and limited investment” for the take-off in Phase II and the specific objectives are:

1. To put in place a functioning conducive environment and related capacity for commercially oriented sustainable service delivery of rural renewable energy and information, communication technologies (ICTs)
2. To build in-country capacity, for renewable energy investments

As already mentioned, implementation of Phase I of the ERT comes to an end next year in August 2008. The OOPPS assignment was to reflect on lessons that can be used in the planning and implementation of Phase II, as detailed in the Terms of Reference (TORs) below.

1.3: OVERALL OBJECTIVE OF THE OOPPS CONSULTANCY

The overall objective of the consultancy was to assess the performance of the components of ERT; point out any lessons learnt in the Phase I and make recommendations and proposals for the implementation of Phase II. The assignment also aimed at providing inputs into the rural electrification review consultancy, planned to take place before Phase I is completed.

1.4: SPECIFIC OBJECTIVES

Specifically, the Consultancy was to apply the concept of OOPPS to:

1. Assess the performance of Phase I of ERT in terms of :
 - a. The level of achievement realized; and
 - b. The level of non-performance
2. Establish the factors for the existing level of performance or non-performance by:
 - a. Explaining the actual enabling and constraining factors including actors;
 - b. Considering institutional factors-formal and informal in the wider sense
3. Establish solutions to address the identified constraints

1.5. METHODOLOGY

The general methodology was participatory in nature. The Client provided an opportunity for pre-assignment meetings, which allowed for mutual agreement of what was needed to undertake the assignment. During these meetings, the objectives of the assignment, who and number to invite, venue, and duration of the OOPPS workshop were agreed upon.

During the OOPPS workshop, participants were given opportunity to share their expectations of the assignment and confirm objectives of the OOPPS workshop. There was a good opportunity for experiential learning through small group discussions and plenary sessions. An atmosphere of honest self-assessment with regard to the performance in each component of the project was fostered and this helped come up with the recommendations for the remaining period of Phase I and issues to address in planning for Phase II.

1.5.1: REVIEW OF DOCUMENTS

The MEMD provided the Project Appraisal Documents of November 2001, the Development Credit Agreement, the ERT Mid Term Review *Aide Mémoire*, ERT Quarterly Reports and other Project related documents. The Consultant reviewed selected documents related to energy sector management knowledge and practices around the world. The OOPPS workshop included presentation of a paper reviewing the performance of ERT during Phase 1, the Consultant's overview on OOPPS highlighting the latest thinking in public sector management, brainstorming sessions, group presentations and consensus building on issues during plenary discussions. Members of the discussion groups were carefully selected to balance representatives from various ERT components.

1.5.2: OOPPS WORKSHOP

The strategy employed for the workshop was to locate OOPPS in the general rubric of Results Based Management (RBM) which was meant to focus participants to assess achievement of ERT not in terms of activities but results. RBM was explained as a set of methods and techniques to facilitate efficiency, effectiveness, transparency and accountability. Its history runs through similar ideas like Management By Objectives (MBO), Performance Management (PM), Results Oriented Management (ROM) and more recently Output-Based Aid (OBA) in the AID industry. It was further explained that many *public sector* reforms have been inspired by *results-based thinking* which tends to be clearer in the *private sector* and less in the public sector.

A discussion of RBM provided a powerful prelude to the application of OOPPS to ERT. Participants were able to agree the definition of RBM, a process that involves "defining realistic expected results, monitoring progress towards the achievement of expected results, integrating lessons learned into management decisions and reporting on performance". A detailed account of the presentation is attached as Annex Three.

A discussion of RBM was preceded by a presentation by the Coordination Manager, ERT Programme of the Status Report, which provided an opportunity to participants to get clarification on the extent of implementation of Phase I project activities. Coupled with the understanding gained on what OOPPS is, the workshop engaged in discussion of the following questions:

Discussion Questions:

1. What level of achievement has been realized?
2. What is the level of non performance (challenges)?
3. Why that level of performance or non performance? i.e.

- a) What are the actual enabling and constraining factors or actors?
 - b) What are the institutional factors that are formal and informal in the wider sense?
4. What lessons have been learnt from Phase I implementation so far?
 5. What solutions/ recommendations can be identified for the way forward particularly concerning implementation of Phase II?

The above questions, particularly question five (5) were discussed in the overall context of GOU efforts to eradicate poverty as articulated in the Poverty Eradication Action Plan (PEAP), 2004/5-2007/8.

1.5.3: ENERGY AND THE PEAP

Pillar Two of the PEAP aims at “Enhancing production, Competitiveness and incomes”. Energy supply is seen as critical to the realisation of this aim. Electric power in particular, is essential to the development of modern manufacturing and services. It also plays an important role in rural development, supporting activities such as wet coffee processing, fish handling at landing sites, mining and processing of various minerals. The access to power reduces the drudgery of rural livelihoods, especially benefiting women and girls (for instance by reducing the need to collect fuel wood) and in enabling rural amenities such as medical clinics and educational facilities to function more efficiently.

Evidence from recent survey shows, that there are significant returns to rural electrification in reducing poverty. The presence of electricity in a village increases households’ consumption by about 10%. Government’s strategy regulates the costs by subsidising the investment rather than financing it outright. The benefits come mainly in the form of increased employment and agricultural marketing opportunities in rural areas, though the extended hours of work and increased access to social services.

As noted above, the status quo is that the majority of households’ everyday energy needs are met by fuelwood and charcoal. Although electricity is crucial for economic transformation, the lives of most poor people are currently affected negatively by their access to the more traditional energy sources. Evidence further suggests that the supply situation of energy to the rural poor is deteriorating as the forests and woodlands are receding increasing the distances walked to collect fuel wood. It is certain that this is increasing the burden on women’s time, with negative effects on their economic and domestic activities as well as the quality of their lives. Cooperation is therefore needed between the Forestry sub sector in the Environment and Natural Resources Sector

The answers generated to the discussion questions outlined in Section 1.5.2 are presented in the next chapter on ‘Findings’.

CHAPTER TWO: FINDINGS

2.1: ASSESSMENT OF PERFORMANCE OF ERT PHASE I

In Section 1.5, the methodology used to assess the Phase I of the ERT was laid out and in this chapter findings are presented.

In order to assess the achievements of Phase I of ERT, it was necessary for participants to revisit the performance indicators (targets) that were identified during the design of the project. Harmonisation with modifications of the indicators was undertaken during the Mid-Term Review. After discussions in select groups, the plenary session received and considered groups' presentations and through consensus, agreed on the performance level for each target.

2.2. PERFORMANCE RATINGS

While the design of Phase I of the programme, had carefully selected indicators, the indicators were not further defined to include a time frame, which would have enabled identification of clear targets. The plan did not produce a detailed schedule probably because it was meant to allow learning, without the rigidities of tight schedules.

The following are the key performance indicators;

- 1. Establishment of a regulatory system for rural electrification, satisfactory working of REB, REA and REF*
- 2. A workable financial intermediation mechanism for rural electrification is in place*
- 3. Satisfactory functioning of two independent grid rural electrification operations has been achieved*
- 4. Satisfactory functioning of 80% of the energy systems provided to agriculture-linked users, health clinics, schools and water facilities has been achieved*
- 5. 15 MW of renewable energy power generation facilities constructed or under construction*
- 6. 320,000 cumulative Watt-peak sales of Solar PV systems to households and institutions has been achieved*
- 7. Solar home system price reduction of 30% from June 2000 baseline has been achieved (i.e. End-Phase I price of about US \$14Wp compared to about US \$20Wp in June 2000)*
- 8. Finalization and implementation of first phase of long term renewable energy capacity building strategy and action plan, including financing of recurrent costs of renewable energy projects and institutional arrangements has been achieved.*
- 9. Phase I coverage objectives for rural telephony, internet points of presence and rural tele-centres has .been satisfactorily achieved*

10. Collection of at least 80% of the telecommunications universal service levy revenues that are billable by the end of phase One has been achieved

Table 1, gives a summary of ratings under each indicator and identified explanations for high or low achievement as the case was.

Table 1: PLENARY ASSESSMENT OF PERFORMANCE INDICATORS OF ERT PHASE I

ITEM	PERFORMANCE INDICATOR	Rating out of (100 %)	REMARKS
1.	Establishment of a regulatory system for rural electrification, satisfactory working of REB, REA and REF	75	<ul style="list-style-type: none"> ▪ ERA, REB, REA, and REF are fully established and are supported by technical assistance provided by various consultants and development partners. A Renewable Energy Policy was also put in place to guide Investors. <p>However,</p> <ul style="list-style-type: none"> ▪ The Concession Model earlier used lacked the World Bank guidelines to operationalise it and was reviewed to incorporate the guidelines. ▪ The Electricity Act 1999 does not clearly spell out the roles of different agencies in the Energy Sector and its review is necessary. ▪ The autonomy of REA is not fully realized and this has an effect on decision making. ▪ The Wheeling System is not yet in place ▪ Devolution of regulation to Local Government has not yet been achieved due to limited capacity levels to receive and implement this function at the Local Governments
2	A workable financial intermediation mechanism for rural electrification is in place	70	<ul style="list-style-type: none"> ▪ The Rural Electrification Fund (REF) is in place and functioning and has provided subsidies for first track projects. ▪ The Rural Electrification Board was established in 2003 to manage the Rural Electrification Fund ▪ The Re-financing facility is in place in Bank of Uganda and funds are disbursed. ▪ A Credit Support Facility is to be established. <p>However,</p> <ul style="list-style-type: none"> ▪ The Credit Support Facility (CSF) is still at start up level; <p>There is no secretariat and mechanisms of the facility are not yet well appreciated.</p>
3.	Satisfactory	100	<ul style="list-style-type: none"> ▪ WENRECO power plant is in operation, with 19 hours of supply and is better than the present

ITEM	PERFORMANCE INDICATOR	Rating out of (100 %)	REMARKS
	functioning of two independent grid rural electrification operations has been achieved		<p>main grid supply in terms of power reliability and lower tariffs.</p> <ul style="list-style-type: none"> ▪ Kisiizi independent grid is under construction. ▪ Kalangala and Ngoma independent grids are complete and functional. <p>However,</p> <ul style="list-style-type: none"> ▪ Problems of high connection fees and the slow progress on the Nyagak Mini Hydropower plant remain a constraint. This is attributed to low capacity of the private sector to participate in the implementation of the power projects. Power generation from the Nyagak Hydropower plant is expected to commence in June 2008 (before the end of ERT Phase I) <p>Tenders for the distribution network are already in place</p>
4	Satisfactory functioning of 80% of the energy systems provided to agriculture-linked users, health clinics, schools and water facilities has been achieved	No adequate information for rating	<ul style="list-style-type: none"> ▪ Some agricultural projects have been connected and by end of Phase I, 12 Projects will have been connected. Some projects are to be connected under the PREPS and others separately ▪ The Health and Water Components are on course and it is envisaged that the target will be met by the end of Phase I. This is because adequate studies existed before the start of programme, which built on the existing sector frameworks and institutional capacity. <p>However,</p> <ul style="list-style-type: none"> ▪ The unclear institutional roles, between PSFU and REA constrained the timely implementation of electricity for agricultural investments ▪ The subsidy criteria had to be tailored to the unique characteristics of the agricultural sector constrains the project. ▪ The procedural constraints (technical specifications of the Health Packages) experienced with the World Bank caused significant delay in implementation of project activities. ▪ Deficient institutional and technical capacity ▪ Limited project preparation ▪ Failure to generate consensus on the Education Tender Documents by both Government and World Bank. ▪ Lack of early provision for investments the Project Implementation Plan for the Agricultural

ITEM	PERFORMANCE INDICATOR	Rating out of (100 %)	REMARKS
			<p>Component.</p> <ul style="list-style-type: none"> ▪ Late inclusion of water investment components for implementation. The Water Investments components came on board later after the mid-term review for implementation. Despite this, all the planned 15 centres would be completed by the end of Phase I.
5	15 MW of renewable energy power generation facilities constructed or under construction	100	<ul style="list-style-type: none"> ▪ Kakira 12 MW ▪ WENRECO 3.5 MW ▪ Kisiizi 0.3 MW ▪ Total 15.8MW ▪ Other power stations planned for construction include Kikagati and Ishasha and are envisaged to provide 10 MW and 5 MW, respectively.
6	320,000 cumulative watt-peak sales of solar PV systems to households and institutions has been achieved	100	<p>This component has done well, because of</p> <ul style="list-style-type: none"> ▪ shortage of power on the grid ▪ They built on existing studies and experience of UPPPRE. ▪ Institutional arrangements were already in place and an enabling policy framework e.g. tax incentives.
7	Solar home system price reduction of 30% from June 2000 baseline has been achieved (i.e. End-phase 1 price of about \$14Wp compared to about	90	<ul style="list-style-type: none"> ▪ Price per watt peak reduced from US\$20 to US\$12 –US\$17. ▪ Global technology advancement has increased supply in relation to the demand ▪ PSFU incentives have attracted more participation and competition. <p>However</p> <ul style="list-style-type: none"> ▪ Given the ever fluctuating price of the US\$ in relation to the Uganda Shilling, the reduction price per watt peak, cannot be attributed to only the solar PV marketing.

ITEM	PERFORMANCE INDICATOR	Rating out of (100 %)	REMARKS
	\$20Wp in June 2000)		
8	Finalization and implementation of first phase of long term renewable energy capacity building strategy and action plan, including financing of recurrent costs of renewable energy projects and institutional arrangements has been achieved.	No sufficient basis for rating	<ul style="list-style-type: none"> ▪ The enabling Renewable Energy Policy was approved by Cabinet ▪ Included in the Policy is the Standardized Feed-in Tariffs and a Standardised Power Purchase Agreement ▪ The Renewable Energy Database has been established ▪ The Renewable Energy Investment Study has been finalised
9	Phase I coverage objectives for rural telephony, internet points of presence and rural telecentres has been satisfactorily achieved	90%	<ul style="list-style-type: none"> ▪ Institutional Capacity already existed ▪ Initiative was complementary to already existing framework ▪ Private sector capacity was already established ▪ Enabling Policy already in place ▪ However, ▪ There is no sufficient database, upon which to measure progress.
10	Collection of at	100%	<ul style="list-style-type: none"> ▪ An enabling policy and competition in the industry already existed.

ITEM	PERFORMANCE INDICATOR	Rating out of (100 %)	REMARKS
	least 80% of the telecommunications Universal Service Levy revenues that are billable by the end of Phase I has been achieved		

2.3: INSTITUTIONAL FACTORS-FORMAL AND INFORMAL AFFECTING THE PROJECT

Successful implementation of projects also depends on the existing institutional within which, organisations functions and activities are undertaken. The institutions are categorised under formal and informal rules. Formal rules are -the laws, regulations, administrative procedures that are written or codified to guide decision making and implementation of organisational activities. Informal rules are mainly non-codified, which also guide the behaviour of the actors. Participants pointed out a number of formal and informal rules that could have governed and indeed continue to affect the behaviour of stakeholders of the ERT Project. These are summarised in Boxes One and Two.

BOX ONE: FORMAL RULES GOVERNING THE ERT PHASE I

- a) Investments in Energy Sector by GOU have to be tendered to the private sector.
- b) The constitutional provision on energy and the Electricity Act 1999
- c) Statutory instruments establishing REA, REB, REF
- d) Government mandate to provide people's energy needs
- e) Procurement regulations for private sector using subsidy.
- f) Follow up on decisions in World Bank *Aide Memoire*.
- g) Capacity building.
- h) Approval of Business Plan by REB.
- i) Code of procedures for REB
- j) REA Human Resources Manual
- k) Government of Uganda, Standing Orders.
- l) Agreements between REB and other bodies/contracts
- m) Application of PPDA Rules even leading to delays increased costs of raw materials and variation of the overall cost of the projects
- n) Request for *No Objection* from World Bank.
- o) The Renewable Energy Policy for Uganda 2007
- p) The Energy Policy for Uganda 2002
- q) Development Credit Agreement and Project Agreements
- r) Providing support to private sector
- s) Accountability to Parliament
- t) Grant feasibility must not be exceeded (US\$50,000)
- u) Rural Electrification Strategy and Plan
- v) Environment and Social Safeguards Framework
- w) Conditions for loan schemes imposed by the lending institutions
- x) The PSF Grant Facility Rules
- y) The Concession provisions

BOX TWO: INFORMAL RULES GOVERNING THE ERT PHASE I

- a) Regular phone calls to superiors.
- b) Occasional gifts to superiors.
- c) Regular walks into subordinate officers' work places to keep them cooperative.
- d) Agreement on an issue before formally communicating it.
- e) Good relationship between MAAIF, REA, and PSFU for agricultural projects.
- f) Good relationships between Coordination Unit and implementation agencies.
- g) Object oriented solutions focusing on local problems.
- h) Holding stakeholders' discussions, continuous revision of plans and involvement of political actors in project activities
- i) Respect of the bureaucratic hierarchy: *Not to contradict your boss especially openly, and not to overstep your mark*
- j) The reputation of the Ministry and Agency enhances rapport among stakeholders.
- k) Respect for other people's opinions.
- l) Mutual trust among stakeholders.
- m) Good listening skills.
- n) Problem solving approach instead of the blame culture.
- o) Get people's views *before* the meeting.
- p) Conflict of interest between agencies, which may have lead to diversion of pursuing objectives in some instances.
- q) Responsibility for reallocation from one component to another sometimes done without involvement of agencies.
- r) A shared social evening.
- s) Respect for traditions and beliefs.
- t) Follow-up telephone calls.

It was observed that informal rules are difficult to change and quite often they take precedent over the formal rules, whether explicitly or tacitly. It was suggested that where formal rules i.e. appropriate policies or legal provisions are lacking, they should identified so that they can be enacted. Where the formal rules exist they should be enforced.

2.4: UNRESOLVED ISSUES:

The following issues were raised and due to limited time and mandate of participants were noted as outstanding issues. They are:

- a) On the key issues of project development, should Government carry out the infrastructure development and then tender it out to the private sector for operation or should we continue with the current model, where private sector initiates projects and Government gives subsidies or a careful mixture as appropriate?
- b) The lack of autonomy of REA sometimes delays decision making and implementation of some activities.
- c) The need for more banks yet to come on board in lending towards energy projects

- d) The Credit Support Facility (CSF) is not yet operational.
- e) There is need for integrated planning in the Energy Sector.
- f) ERT procurements sometimes take long, because of lack of in house capacity and differing responses from the World Bank.
- g) Consultants should be procured by the beneficiary institutions
- h) The roles of the different stakeholders during implementation need to be well defined.
- i) The issue of affordability of the energy services needs to be addressed.

2.5: CONCLUSIONS

In light of the assessments and observations made, the consultant makes the following conclusions can be made:

- a) Investment from the private sector has been slow to respond to opportunities presented by the ERT. A more detailed study is necessary to determine what the real cause might be.
- b) Relative to the Phase I targets and time, the ERT Programme implementation has reached a commendable level of performance. On the supply side, Institutional procedural requirements largely delay timely implementation of Program activities. On the demand side, limited affordability by the rural poor to pay for the energy services remain a major constraint in transforming lives of the rural poor. The RESP or other strategies to increase access of energy by the rural poor can play a major role in transforming the lives of the rural poor through the existing multi-sectoral approach.
- c) During the course of the OOPPS workshop, it was noted that the MEMD was about to undertake a process to produce an Energy Sector Strategic Investment Plan. A strategic plan can potentially change the project environment and therefore any recommendations for implementation of Phase II are only tentative subject to the outcome of the strategic planning process

In light of the lessons learnt in the implementation of Phase I, and the problems identified, solutions were proposed to enhance the pace and quality of implementation during Phase II of the ERT. The next chapter concerns proposals for performance improvement in Phase II.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

Borrower's Evaluation Report

1.0 MINISTRY OF ENERGY AND MINERAL DEVELOPMENT (MEMD)

Objectives

Ministry of Energy and Mineral Development is the Lead Agency overseeing Energy Sector Development. Its responsibilities under the project include: formulation of policy, strategy and planning for rural energy, establishing an institutional framework for rural electrification promotion and development, market enabler, overall coordination of the programme, monitoring and evaluation and capacity building

Implementation

The REF, REB and REA were established within one year of project commencement. The key staffs of REA were in place within two years. Once in place, REA quickly took on the fast track projects namely Kakira, Kisiizi, and Nyagak Mini Hydro as well as the management of the IREMP and PREPS.

The absence of a coordinated approach to implementation led to the appointment of a Coordination Manager and the establishment of a Coordination Unit. Several workshops were held up country and messages were carried in the electronic and print media regarding the new approach to rural electrification.

Consultancies and Technical Assistance supported the creation of a Renewable Energy Database, the promotion of gasifier technology, the promotion of energy efficiency in small and medium enterprises (SMEs), the development of an Indicative Rural Electrification Master Plan, the review of the ERT Project and the Rural Electrification Framework and Institutions.

A GIS lab has been established in the Ministry and data from it was used in developing the Renewable Energy Policy, which was launched in November 2007. Capacity Building was achieved through various short and long courses both locally and internationally.

Energy efficiency in SMEs, CFLs, Gasifier Technology have been promoted

Operational Experience/ Lessons Learned

- ii) The establishment of REA as the dedicated agency, has facilitated the expansion of rural electrification investments
- vii) Multi -sectoral programmes require a well staffed coordination office to carry out the functions of coordination monitoring, reporting

- viii) The private sector did not show as much interest as anticipated, because of the high risks involved, the low level of equity and inadequate business plans. It was necessary to change the mode of implementation to a situation whereby, Government invests and the private sector can thereafter manage.
- ix) There is considerable interest in rural energy and rural electrification in the districts, however, there is currently no representation at the district level. It is therefore necessary to plan for district representation in rural energy.
- x) As a result of capacity building and training, there has been increased interest, enthusiasm and an improved work ethic in the Ministry. Some staff have even been promoted.
- xi) Energy efficiency in SMEs, gasifier technology, biogas technology has considerable potential for expansion.
- xii) The promotion of CFLs reduced the peak load by about 20MW and an additional 10MW can be attributed to sensitisation of consumers in the use of CFLs. This provided a very low cost per MW.

Outputs

- xii) A framework for promoting rural electrification has been established and is now operational.
- xiii) The Coordination Office was established and supported project implementation throughout the project life.
- xiv) The consultancy for the review of the ERT and Rural Electrification framework and institutions recommended a shift in policy from private sector led, to public sector led with investments in infrastructure and supported by the private sector in the management of the schemes.
- xv) An Indicative Rural Electrification Master Plan was finalized and is being implemented by Rural Electrification Agency.
- xvi) As a result of the ERT promotion recommendations were made for the establishment of district representation of the Energy Sector.
- xvii) Technology demonstration sites were established and are now operational to improve energy efficiency in SME's. Training in these technologies has been conducted and a national training mechanism is being packaged.
- xviii) 560,000 CFLs have been distributed and Government is in the process of rolling out this exercise to other districts besides Kampala. 20MW of power salvaged from the demand side.
- xix) A GIS laboratory, which contains mainly data on the renewable energy sources in Uganda especially the supply side, was established.
- xx) The Renewable Energy Policy was launched in November 2007 and 1000 copies of this policy were printed and have been distributed to the different stakeholders. The Policy is also posted on the MEMD website.

- xxi) The draft National Implementation Plan for Biogas has been developed.
- xxii) An improved, skilled, well trained and highly motivated work force is available to promote sector development.

1.7 Performance of the Bank during Implementation

The Bank initially took long to respond to requests for No Objection and were sometimes quite rigid in their outlook. This improved later on, especially when the Kampala Office was strengthened and better channels of communication were availed

2.0 RURAL ELECTRIFICATION AGENCY

Specific Project Objectives for REA

- i) To establish a sound institutional framework and mechanisms to manage the Rural Electrification Fund (REF) and promote private sector led, commercially oriented service delivery of rural/renewable energy services.
- ii) To establish the REF and efficient mechanisms for accessing it by project developers.
- iii) To promote and facilitate the development of independent grids for remote communities.
- iv) To assist grid extension investments, with emphasis on connecting agricultural investments and community services.
- v) To promote and facilitate private sector investments in renewable energy power generation.

Project Design

The project design was based on a commercially oriented, private sector led approach. The implementation strategy adopted, therefore, was in line with the dictates of this model. The following account outlines the performance of the various components of the strategy during the course of implementation:

2.2.2 Enabling Regulatory Framework

- i) ERA has been well equipped to issue permits and licences for project developers and new network operators. However, there has been no visible diligent enforcement of licence conditions in some cases as exhibited by the apparent tolerance of WENRECo's breach of the conditions. This can be understood from the perspective of the desire to hand hold WENRECo as the first example of a private project developer in a purely rural electrification environment.
- ii) Projects with generation capacity of up to 500 KW have enjoyed light handed regulation. For example, Kisiizi (0.3 MW), financed under ERT, Kalangala (0.25

MW) and Ngoma (0.06 MW) (both financed by GOU) received “License Exemption Certificates” from ERA.

Cost Recovery and Cost-based Tariffs

- i) The independent grids of West Nile and Kisiizi were given subsidies on the basis of their business plans to achieve full return on investment and recover all costs from the tariffs.
- ii) The bids submitted by private operators of the two GOU financed concessions (leases) and the one financed under ERT had their business plans reflecting full O&M cost-based tariffs. However, these tariffs are subject to regulatory review on a yearly basis during operation.
- iii) The new concessions are charged the same bulk tariff by UETCL as that charged to Umeme.
- iv) All the concessions are charged the same wheeling tariff by Umeme.

Subsidy Funding

- i) The initial projects of Kakira, West Nile and Kisiizi were designed on the basis of a mix of equity, commercial loan and subsidy. However, it was found necessary to increase the subsidies considerably (West Nile and Kisiizi) in the course of implementation. The figures, in excess of 70% of total investment costs, have revealed the problems of private sector investment in rural electrification.
- ii) Private sector investments in PREPs, i.e greenfield grid extension projects, failed to materialize. Infrastructure development was done with 100% public financing.
- iii) Community schemes were designed on cost share basis with the community contributing 30% of low voltage costs, including connection costs, with the REF subsidizing up to 70%. The connection rates have been very low mainly because of the inability of the communities to marshal their part of the costs.

Implementation

The major activities of REA were in the following areas:

- i) Main grid related power distribution and generation
- ii) Independent grid systems
- iii) Grid extension, especially the PREPs.
- iv) Establishment of a functional Rural Electrification Agency
- v) Assessment of subsidy applications by private sector developers and recommending to REB on subsidy disbursements.

ERT Design. The design diverted from the conventional model of public sector led rural electrification and opted for the private-sector led, commercially-oriented rural electrification. This approach assumed that (i) targeted efficient subsidies would take into account affordability and equity considerations; (ii) investment decisions were to be made on a commercial basis; and (iii) provision of output-based aid would be balanced against a need to facilitate financial closure of private sector projects.

The demand driven, private sector led model was found to be premature for the Ugandan economy. Government still has a big role to play in extending services to the people. This was evident from low participation of the private sector in distribution projects. This calls for an adjustment in approach to Phase II from that initially envisaged in Phase I. However, the principle that RE should be demand driven has been maintained – meaning that priority should be given to projects which show the greatest demand. This has been the basis upon which the IREMP has been drawn up.

Policy Framework. The Rural Electrification Strategy and Plan was designed without a comprehensive baseline study to dictate the kind of paradigm shift that guided the design of the ERT. This resulted into a lot of wasted time during implementation (e.g. the PREPs), partly contributing to the need to extend the implementation period (more than 2 years) and ultimately affecting the meeting of connection targets.

Future policy frameworks and projects need to be designed on the basis of exhaustive baseline studies.

Power Shortage Effects. Constraints created by power shortage in the grid, coupled with delays in implementation, contributed to slow progress in rural electrification, especially as the Government's annual budgets for the energy sector were focused on subsidizing thermal generation. Therefore, the target of 10% electricity access (or at least 400,000 consumers connected) by 2010 was impossible to achieve.

Therefore, REA recommends that the targets be recast putting into consideration the effects of delayed implementation of ERT and other planning parameters. In REA's own Strategic Plan, the timing for meeting the targets as provided for in the RESP has been put at 2012.

Connection Subsidies. Distribution projects which REA implemented and commissioned during ERT Phase I (Kanungu, Kibale, Kalangala, Ngoma and other rural electrification schemes – all financed by GOU) demonstrated that extension of electricity to a community does not translate into connections because of high upfront connection costs. Consumer penetration was very low, rendering the young concessions unviable. This brought into focus the need for consumer targeted subsidies to achieve critical masses of consumers in the initial years of a concession to make it commercially viable

REA recommends that Phase II targets coverage of connection costs, or a large part of them. For example the RE programme funded by SIDA, which is under implementation under REA, is subsidizing initial connections such that consumers pay only Ughsh 50,000

Procurement Issues.

Most actors experienced delays in receiving no objections from the World Bank which are supposed to be obtained within 2 weeks of submission. These delays contributed a lot to the slow delivery of Phase 1. They should be addressed in Phase 2.

While it is recognized that there is no short cut to following procurement procedures, GOU and the World Bank should work out a way of ensuring that the various units handling an issue under procurement stick by the stipulated time guidelines.

Institutional Issues

The institutional design to handle private sector investments and agricultural enterprises, involving REA, PSFU and MAAIF (for agricultural enterprises), proved cumbersome.

There is a need to designate a central unit for coordinating private sector investments in rural electrification and renewable energy generation and assist them to get any necessary consent from other Government institutions. REA can ably play this role.

Outputs

REA's outputs are best described by achievements against performance indicators given in the PAD as triggers for Phase II

Establishment of satisfactorily working of REB, REA and REF

- i) REB and REA fully established and are performing their roles as prescribed by the statutory instrument. The REF is operational and has been capitalized by a number of donor sources (World Bank, Sida and Japanese Government), Government budget and the Transmission Levy.
- ii) REA's capacity has been enhanced by technical assistance provided by Sida Technical Assistance, working with various other consultants and training.
- iii) Sida TA has helped REA to develop a number of project management and administrative tools, which include: project cycle guideline; financial feasibility assessment model; monitoring and evaluation manual; database management; framework for rural electric cooperatives; human resource manual; and staff performance appraisal procedure.
- iv) REA has taken charge of the overall Government rural electrification programme financed by various development partners and Government. REA has taken projects financed by the World Bank, Sida, Japanese Government and the

Government of Uganda through planning, procurement of consultants and contractors, implementation, to commissioning.

- v) Although the REF has not functioned as a basket, development partners have been willing to make their contributions targeting “ring-fenced” project PACKAGES]
- vi) The IREMP was completed and submitted to the Ministry of Energy and Mineral Development for publication
- vii) REA has reviewed subsidy applications from WENRECO, Kakira, Kisizi, Kilembe Investments Limited, over 10 agricultural investments and over 50 community schemes and made recommendations to REB. Apart from 8 agricultural investments, the rest were approved for subsidy award
- viii) Three of the First Phase PREPs are under implementation and due to be commissioned by end of the ERT phase I, albeit the change in implementation approach from

A workable financial intermediation mechanism for rural electrification

- i) Rural Electrification Fund (REF) is in place and functioning. The three “fast” track projects (WENRECO, Kakira and Kisiizi), Kilembe Investments Ltd and a number of communities have benefited

Although the REF has not functioned as a basket, development partners have been willing to make their contributions targeting “ring-fenced” project packages
The Re-financing facility is in place and has benefited REA’s projects – Kakira and WERECO

Satisfactory functioning of two independent grid rural electrification operations

- i) WENRECO power HFO Plant of 1.5MW is in operation, though supply problems have emerged due to the poor financial position of the company, arising from the delay in completing the Nyagak Hydro Project.
- ii) The 3.5 MW Nyagak Hydro Project has delayed construction. Commissioning won’t meet the closing date for closure of ERT I. Government and WENRECO are working together to have it completed and commissioned by end of 2009
- iii) Kisizi power station (upgraded from 60 KW to 300 KW) is completing construction and will be commissioned before end of February, 2009

Renewable energy projects

- i) The following projects with a total of 33.3 MW have either been commissioned or are still under construction:
 - Kakira 22 MW (Commissioned)
 - Wenreco 3.5 MW (Under construction)

- Kisizi 0.3 MW (To commission February 2009)
- Kinyara 7.5 MW (Construction completed)

ii) Other power stations under construction include:

- Mpanga – 18 MW
- Buseruka - 9 MW
- Bugoye - 13 MW

iii) Projects in the pipeline, expected to start construction in 2009:

- Ishasha - 5 MW
- Kikagati - 10 MW
- Waki - 5 MW

Solar PV promotion

REA has put in place a PVTMA framework, which provides for micro credits and consumer subsidies for PV installations. Implementation started in September 2008 and to date approximately 30 KW of installations have been made.

Evaluation of Bank Performance

- i) The World Bank's initial inflexibility to change delivery models that had been noted as constraints to implementation contributed to ERT'S failure to meet targets in time. In REA's case, this was particularly evident in the disagreements during the preparation of the PREPs and opposition to the promotion of the PV credit and consumer subsidy based approach (eventually called PVTMA).
- ii) The delays in giving no objections, especially in procurements delayed implementation start up as well as the overall implementation process.
- iii) The World Bank showed tendencies of micro management of projects, without due regard to established Government oversight structures.
- iv) Part of the West Nile delay issues arose from "wrong" initial demand projections carried out by World Bank engaged consultants during the development of the ERT. Due to this scenario, WENRECO had to carry out a fresh study to establish a "more realistic" demand. By the time they were done with the process, including negotiations for new subsidies before they could conclude the procurement of the contractor, more than two years had elapsed.
- v) The World Bank, towards the end of ERT I, showed some level of flexibility by allowing changes in the implementation modalities and agreeing to extensions of the project so that it could deliver on its objectives.

3.0 BANK OF UGANDA

1.0 Introduction. Pursuant to the signing of the Development Credit Agreement (DCA) between the Government of Uganda (GoU) and the International Development Association (IDA), and the Project Agreement between IDA and Bank of Uganda (BOU), the Energy for Rural Transformation Refinance Fund (ERTRF) was established at Bank of Uganda under the Energy for Rural Transformation (ERT) Project.

Implementation of ERTRF was undertaken in the period July 2002- February 2009. However, the Project closure terms provided for a grace period of up to 30th June 2009 in which to effect eligible expenditures entered into prior to the closing date.

2.0 Objectives of ERTRF

The objectives of ERTRF were:

- (i) To facilitate investment in commercially oriented rural electrification subprojects; and;
- (ii) To develop the needed financial intermediation mechanism for provision of term finance for rural electrification and renewable energy development in Uganda.

3.0 Design. ERTRF amounted to SDR 8,284,824 (approx. US \$ 12.8 million) and was administered by BOU through Participating Financial Institutions (PFIs).

3.1 The terms and conditions of the Fund were:

- PFIs were responsible for appraisal of the investment projects and overseeing their implementation;
- Loans to the subprojects were denominated in Uganda Shillings;
- The ERTRF was a refinance facility, meaning that a PFI had to first disburse its own funds and subsequently submit expenditure documents/letters of credit to BOU for reimbursement under approved subloans;
- Eligible refinance to a PFI under any one loan application was up to 90%;
- PFIs were availed funds at the weighted average term deposit rate prevailing at the time of sanctioning the refinance;
- Maturities of loans and their grace periods were up to 15 years and 5 years respectively. These periods were on a matched maturity basis between BOU and the PFI on one hand, and the PFI and final borrower on the other;
- ERTRF refinance was up to 75% of total project cost for any given subproject;
- BOU was responsible for reviewing PFI's loan applications against the terms and conditions of the Fund, processing and disbursing refinance requests, and monitoring of funded subprojects;
- The minimum threshold for contracts requiring prior review of the World Bank was US \$ 250,000.

4.0 Implementation

4.1 Refinance for mini grids (grid connected and stand alones)

Two first track sub-projects accessed funding totaling US \$ 11,465,000 through PFIs. The sub-projects included a co-generation plant and a mini-hydro.

The table below summarizes key characteristics of the loans offered to the subprojects.

Project	Lender	Amount refinanced (USD)	Tenor of loan	Base interest rate (From BOU to PFI)	Lender margin	Fixed/ floating
Kakira Sugar Works Ltd	East African Development Bank (EADB)	7.730 m	10 years, including 3 years grace period	7.58% p.a.	3%	Floating
West Nile Rural Electrification Company (WENRECO)	Barclays Bank Uganda Ltd	3.735 m	15 years, including 3 years grace period	7.12% p.a.	2%	Fixed
TOTAL		11.465 m				

4.2 Refinance for solar PV

At the mid term review of the ERT Project in October 2004, it was agreed that ERTRF should be extended to provide funding to Micro Finance Deposit-taking Institutions (MDIs) to provide consumer financing for solar acquisition. The aim was to facilitate purchase of solar PV products by rural households.

It was envisaged that this would address the issue of affordability in the solar market development.

Refinance for solar PV as an activity thus commenced in the third quarter of 2006, and included funds provided to three Microfinance deposit taking institutions as detailed below:

- US \$297,000 equivalent to UGX 495,683,883 to Uganda Microfinance Limited (UML)- now Equity Bank Uganda Limited. The refinance was disbursed in two installments: US \$ 50,000 on 11 August 2006 and US \$ 247,000 on 16 July 2008.

UML designed a loan product for solar based on a leasing model, and as at 31st March 2009, had extended loans valued at UGX 86.148 million.

- US \$425,000 equivalent to UGX 837,789,000 to Post Bank Uganda (PBU), all disbursed in February 2009.

The PBU solar loan product has two windows; individual loans to households, and consumer financing through linkages with Savings and Credit Cooperative Societies (SACCOS). As at 31st March 2009, PBU had considered and approved solar loan applications from both SACCOS and individual households valued at UGX 590.26 million (UGX 447.06 million for individuals and UGX 143.20 million for SACCOS).

- US \$ 297,000 equivalent to UGX 522,731,110 to Commercial Microfinance Limited (CML), now Global Trust Bank Uganda Limited. The refinance was disbursed in two installments: US \$ 50,000 on 14 November 2006 and US \$ 247,000 on 28 February 2007.

CML does not have a loan product for final consumers, but a working capital loan product for solar vendors. CML had by 31st March 2009 provided working capital finance to three customers, all with repeat loans cumulatively amounting to UGX 285 million. Uptake of the loans is low, due to lack of sufficient collateral among the small scale solar companies. On the other hand, the larger companies are self financing and are not utilizing the loan product.

The tenor of the refinance from BOU to the MDIs is was years, whilst the loans provided by the MDIs have short term tenor of up to 3 years. This mismatch has been justified on the assumption that the funds being made available to the MDIs are rolled over a number of times during the refinance period.

The table below summarizes key characteristics of the loans offered to the MDIs

MDI/Credit Institution	Amount refinanced (USD)	Tenor of loan	Base interest rate, (From BOU to PFI)	Rate to final borrowers
Uganda Microfinance Limited (UML)	0.297 m	10 years	7.40% p.a. fixed	30% p.a.
Commercial Microfinance Limited (CML)	0.297 m	10 years	7.19% p.a. fixed	15% flat rate
Post Bank Uganda (PBU)	0.425 m	10 years	8.42% p.a. fixed	24% p.a (individual loans), 16% p.a whole sale of funds to SACCOS
TOTAL	1.019			

5.0 Lessons learnt

5.1 Refinance for mini grids (grid connected and stand alones)

1. Efficiency and scale of refinance

The refinance facility allowed the PFIs to extend the loan tenor. This addressed the issue of the mismatch between the requirements of long-term lending, and the time profile of commercial banks liabilities, which are dominated by savings and checking accounts (depositor's funds), which can only be prudently lent short term.

The refinance facility did not, however, leverage mobilization of private sector resources in the energy sector. This is because the loan facilities were refinanced up to 90%, with refinance constituting the bulk of the loan amount. The refinance facility did not therefore mobilize a significant proportion of private sector funding required in the sector.

2. Credit risk issues

The refinance facility addressed (primarily) long term liquidity risks. However, the PFIs lent to projects with very well known sponsors (and in the case of WENRECO required some indication of sponsor support through a Letter of Comfort from its parent company (IPS), who had a pre-existing banking relationship with Barclay Bank). This is an indication that there is some reticence on the part of lenders, due to the perceived credit risk, especially around the implementation phase of the project.

3. Information asymmetry

The project packaging by the sponsors does not provide sufficient comfort to lenders to enable them to make credit decisions.

5.2 Refinance for solar PV

1. The demand for solar finance

The demand for solar finance as it is offered is quite low. So far, UML has originated loans to 104 customers at a total value of UGX 86.148 million. CML has provided working capital finance to three customers, with a cumulative value of UGX 285 million.

On the other hand, the PBU loan Product appears to be more promising. Refinance of US 425,000 was disbursed to the institution in February 2009, and by the end of March 2009, they had considered and approved solar loan applications from both SACCOS and individual households valued at UGX 590.26 million (UGX 447.06 million for individuals and UGX 143.20 million for SACCOS).

The low demand at UML and CML is likely to be a function of the products which are on offer, with short loan tenor and high interest rate. This is unlikely to be addressing the affordability issues that originally justified the refinance product.

2. Use of funds raised from the refinance facility

Given the considerable mismatch between the tenor of the refinance and the tenor of facilities offered by the MDIs, it is possible that the considerable liquidity made available by the refinance facility is being used to finance non-solar lending. The on-lending agreements between the MDIs and the BOU should have ensured that funds made available through the refinance facility are ring-fenced for solar lending.

6.0 Outputs

The following are the outputs of the refinance facility:

1. A cogeneration subproject selling 12.00 MW of electricity on 24/d basis to the main grid financed;
2. An independent grid to generate and distribute 3.5 MW financed;
3. Total value of UGX 676.41 loans originated to households, and working capital finance amounting to UGX 285 million to three solar companies,
4. Participation of the financial sector in financial intermediation for renewable energy. Barclays Bank Uganda and East African Development Bank (EADB), as well as three MDIs came on board under the refinance facility. EADB is now financing other renewable energy projects using own funds.

7.0 Outcomes

Renewable energy generation

Financial intermediation structure for renewable energy projects

8.0 Evaluation of World Bank performance

The BOU enjoyed a cordial working relationship with the World Bank. Project implementation issues were sorted out in a timely manner. In this regard, the BOU management therefore wishes to thank the World Bank for their continued support, and looks forward to continued cooperation between the two institutions.

4.0 MINISTRY OF HEALTH

Outputs

- Standard solar energy packages were developed and designed for various sizes of medical buildings and staff houses for HCII, III and IV including detailed technical specifications and bills of quantities (BoQs).

- 8HCIV, 68HCIII and 79HCII received solar PV energy packages totalling 117.14 kWp of installed capacity:
- 79No. Solar DC vaccine fridges for HCIII & HCIV.
- 261No. Staff houses received stand alone solar PV energy packages for lighting and operation of radio and TV/VCR.
- 220No. Medical buildings received stand alone solar PV energy packages for lighting and capacity to operate a microscope.
- 8No. HCIV received centralised solar PV Diesel Generator Hybrid energy systems to provide lighting and capacity to operate microscope and ultrasound scanner.
- Monitoring and Evaluation framework for the ERT Programme –Health Component was developed including specific output and impact indicators.
- Some capacity was developed at the MoH in the design and specification of professional institutional solar energy systems for health facilities.
- Tailor made User manual was prepared for the ERT Programme solar energy packages for HCII, III & IV.
- Capacity was developed at the MoH to oversee the implementation of the standard energy packages in HCs using private companies to supply, install and provide maintenance services.

Operational Experience/ Lessons Learned

The following experiences are considered important lessons learnt:

- i. It is important for any institution receiving Technical Assistance (TA) to have some basic clue what they want rather than rely and take on any solutions offered by a Consultant. In house Technical capacity is therefore critical in ensuring that the institution gets the best out of the TA.
- ii. Technical specifications may not exhaustively define the performance, quality and installation standards required. For the MoH, a Blue Print Process (BPP) was incorporated in the Supply and Installation Contract to install one prototype HC with all the different designs. This was used to agree on the quality of workmanship and to iron out any other installation issues. Provision of samples of equipment for testing prior to placing final equipment orders is also important to ensure that its performance is satisfactory.

5.0 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Outputs

- One PP for every 2,500 inhabitants in the 154 sub counties (1,533 PP)
- Internet PoPs located at 32 district headquarters
- 20 MCTs
- 20 Postal Telecentres

Operational Experience/ Lessons Learned

During the course of project implementation, not much awareness of ICTs was carried out and it is likely that majority of the population may not be aware of the benefits. The impact assessment study will assist to establish whether this is so. If it found to be so, then awareness of benefits of ICTs will be necessary to be carried out for phase 2 investments.

Also learnt is that implementation of the projects was smoother within sectors that were buoyant i.e. telecommunications compared to less buoyant sectors like postal.

6.0 PRIVATE SECTOR FOUNDATION UGANDA

Outputs

- Communication strategy developed and implemented. Five special annual fora held
- US\$800,000 in financial and technical assistance provided to 40 enterprises operating energy and ICT businesses, including 13 potential power generating and distribution companies
- US\$65,000 provided to Uganda National Bureau of Standards to adopt and gazette solar pv standards
- US\$68,000 provided to Makerere University Faculty of Technology to investigate the introduction of low cost electricity transmission technology and to train Certified Energy managers and auditors.
- Financial and technical support provided to investigate the possibility of setting up a Credit Support Facility (CSF) - long-term finance at moderate cos
- US\$15,000 provided to PostBank (U) Ltd to develop and implement a solar loan product.
- Financial and technical support provided to investigate and implement the options for increased profitable use of electricity (productive energy use) in the West Nile region.
- Approximately US\$ 1,100,000 provided to 20 solar vendors to operate solar systems dealerships
- Financial and technical assistance provided to train about 300 solar technicians who are providing services in solar system installation, maintenance and quality assurance.

Operational Experience/ Lessons Learned

- The current scope of BUDS-ERT support is considered inadequate as project developers need support beyond feasibility studies
- Phase 1 was designed to be private sector led in the provision of commercially oriented electricity and ICTs in the rural areas. The methodology has not yet born fruits due to a number of factors both at firm and macro levels
- In addition to BDS, a sales based performance grant intervention was necessary to improve capacities and confidence in the consumer, business and financial sectors, and to increase affordability
- The availability of electricity from the WENRECO mini grid did not automatically result in increased uptake and an increase in income generating activities

- None of the feasibility studies supported by BUDS-ERT progressed to the stage of developing telecentres. It is recommended that in order to obtain value for money, support should be provided for Uganda Communications Commission pre-approved projects.
- Meetings and workshops were found to be the most effective communication methods for provision of information to potential private sector participants in the RE sector business

7.0 MINISTRY OF EDUCATION AND SPORTS

Outputs

Installation is taking place MoES .

Operational Experience/ Lessons Learned

Having not implemented most of the ERT activities in the Education Sector, there is not much experience. However, there are a few Lessons learned from the few field activities that have so far been undertaken regarding ERT Education Component. These include;

- i. The Education Institutions are willing and eager to receive the solar packages
- ii. The initial cost of installing the Solar PVs is so high and may not be afforded by the Education Institutions.
- iii. The Institutions are willing to meet the maintenance costs such as replacement of broken bulbs.
- iv. It is envisaged to improve on the quality of Education particularly in Science and ICT
- v. It would be desirable to have only two (2) Solar design packages for the two categories of schools (i.e. bigger and small schools).

8.0 MINISTRY OF FINANCE, PLANNING AND ECONOMIC DEVELOPMENT

Outputs

The outputs as planned for this component have been achieved. All the baseline reports were produced and the draft reports for the broad-based and in-depth surveys have been produced.

Operational Experience/ Lessons Learned

- The validity of findings could even have been much better if the number of sites were 5 and above.
- Measuring the rural transformation process necessitates fast and effective implementation of all the ERT Project components
- The use of findings would be further enhanced if adequate resources are earmarked to publishing the various reports and well planned dissemination processes targeting specific audiences.

- There is need for better coordination of Management Information Systems for the various institutions involved in ERT implementation to enhance learning and improvement in decision making at all levels.
- Close supervision of the consultants undertaking the various surveys has been instrumental in ensuring quality and timely outputs.

9.0 WATER COMPONENT

Outputs

- Energy needs assessment in the Water Sector prepared.
- Energy Options Document for water supply prepared
- Energy Guidelines and Design Manual
- Energy – Water Supply Users Manuals were prepared
- Financial Model for Selection and O&M performance analysis of Energy Systems for WSS was prepared.
- Districts, town councils and Private Operators in pilot districts trained in technical planning, design, installation and operation & maintenance of energy packages for WSS;
- M&E indicators developed, performance assessments done.
- Study tours and Exchange Visits of pilot districts to South Western Towns Water & Sanitation Project to demonstrate use of solar powered systems conducted.
- Information Dissemination Workshops were held on Energy Packages for Water Supply Users' Manuals.
- Executed implementation of designed energy packages for water supply schemes for 15 pilot Small Towns and Rural Growth Centres.

Operational Experience/ Lessons Learned

- Prudent, robust and site specific designs pre-requisite to minimise modifications during execution.
- Realistic and achievable investment and procurement planning necessary
- Strong technical supervision, quality assurance and due diligence for solar panels, accessories and power inverters critical.
- Capacity building and training in installations and O&M service of renewable energy/water systems especially engineers, technicians, operators /attendants of pumping stations and local authorities is important.
- Systems operations automation optimises utilisations of renewable energy-water systems and enhances efficiency.
- Provision of tools, spares, operators' manuals/hand-books to trained skills staff necessary for renewable energy-water systems.
- Monitoring & Evaluation during implementation should largely be part of component's activities. M&E consultants should be engaged for entire ERT program not each component.

10.0 MINISTRY OF AGRICULTURE, ANIMAL INDUSTRY AND FISHERIES

Outcomes

- Increased stakeholder awareness
- Implementation capacity enhancement – more understanding of programme implementation which is better for the second phase
- Some energy investments have come on board and with the PREPS realized many agriculture investments will benefit.
- Increased Private Sector awareness and response

Operational Experience/ Lessons Learned

- Earmark a specific budget for agricultural investments
- Simple and applicable subsidy criteria
- Scale down the role of consultants
- Decentralize major decision making to MAAIF with only making consultations e.g. to PSFU, REA, MEMD only as appropriate.
- Coordination office requires strengthening which could partly reduce the role of consultants

11.0 MINISTRY OF LOCAL GOVERNMENT (MoLG)

Outcomes

- Local Governments are now ware of the ERT and are supportive of efforts geared at increasing access to energy in the rural areas
- Some LGs such as Kasese and Kanungu have attempted to invest in the ERT
- West Nile districts have increased connections and productive uses of energy
- There is a lot of demand for more information on solar especially the rural LGs
- LGs now demand energy to power their ICT systems

Operational Experience/ Lessons Learned

- The LGs can promote ERT investments and can cooperate with Private Investors in fostering development
- LGs lack funds to invest in ERT projects
- Rural LGs prefer to have solar especially where the main grid is far and may take some time to be accessed
- Creation of new districts need to be reached with the ERT information
- Lack of energy focused structure a focal point officer for energy at the LGs leaves a vacuum and should be addressed
- There is need to strengthen the coordination component at the MoLG to enhance coordination efforts of the MEMD under the ERT for rural focused investments.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Annex 9. List of Supporting Documents

- Project Implementation Plan
- Project Appraisal Document for Uganda: Energy for Rural Transformation Project (ERT) dated November 14, 2001 (Report No: 23195-UG)
- Aide Memoires, Back-to-Office Reports, and Implementation Status Reports.
- Project Progress Reports.
- Project Appraisal Document for Uganda: Second Energy for Rural Transformation Project (ERT-II) dated March 13, 2009 (Report No: 47183-UG)
- Borrower's Evaluation Report dated February 2009
- Impact Evaluation Reports, Ministry of Finance, dated January 2009
- Quality Enhancement Review, August 2001.

*including electronic files

Annex 10: Additional Information (for GEF purposes)

1 Analysis of attainment of global environmental objectives

Achievements. Some of the achievements of the project are: (i) ERA is operational and well equipped to issue permits and licenses for project developers and new network operators. It has approved several electrification transactions; (ii) REA, REB, and REF were established by Statutory Instrument; (iii) Several banks are financing investments in Phase I; (iv) Refinance for solar PV included funds provided to three microfinance deposit-taking institutions (MDIs); (v) WENRCO's HFO Plant of 1.5MW is in operation and upgrading of the Kisizi hospital power project from 60 KW to 300 KW is complete. This project will electrify the Nyarushanje community in Rukungiri District and connections of an estimated 300 customers are underway; (vi) Solar water pumping systems with a capacity of 195,960 watt peaks have been installed and are in operation in 14 districts country wide in three regions, namely, West Nile, Northeast and Western regions; however, this achievement needs to be qualified since, despite the target being exceeded, this is largely attributable to the fact that many solar systems purchased were for community related services and benefitted from having a secure source of funding. The response from Solar Home System (SHS) consumers is still low and is below the Phase I target. (vii) Health centers with electricity are offering improved services; and (viii) Agricultural sector has been a primary beneficiary of the project. Overall, by Phase I closing in mid-2009, a framework for promoting renewable energy had been established and key institutions were operational. However, these institutions still lacked capacity in important areas.

Effective partnership arrangements were established for implementation of the project with relevant stakeholders involved in the country/region.

Lessons learned. During preparation, the project design took into account lessons learned from Asian Rural electrification programs, and also from the Bank's solar home systems projects. For example, it considered the lesson that: (i) adequate after-sales service, including consumer education in proper maintenance and operating procedures, is important for consumer satisfaction, minimizing maintenance costs and enhancing overall system reliability; and (ii) consumer credit is key to expanding the market beyond cash sales.

Logical framework was used during implementation as a management and M&E tool.

For additional information and analysis, please refer to sections 3.2 (Outcome/achievement of objective) and Annex 2 (Outputs by components) of this document.

2 Country ownership and drivenness

At project preparation, there were four strong indications of borrower commitment and ownership. *First*, the government amended the draft Electricity Act to reflect the Bank's views about the policy framework for commercially-oriented rural electrification, and the Electricity Act of 1999, as passed, includes most of these changes. This was a clear indication that the government was committed to this demand-driven, private sector led rural electrification program. *Second*, there was a one-day workshop on June 25, 1999 in Entebbe, hosted by the MEMD, the MOLG, the ULAA, and the World Bank. The purpose of the workshop was to enable key stakeholders to discuss the principles and approach underlying this project. *Third*, in June 2000, the Minister of Finance organized and presided over a meeting of bilateral donors to encourage them to support this project. This meeting included participants from the UCC and a number of the cross-sectorally linked line ministries. *Fourth*, the project had received strong support from key cross-sectoral ministries including Agriculture, Health, and Uganda Communications Commission, which had made this project a part of their mainstream activities.

The government was also committed to renewable energy development. In November 1999, it took the significant first step in the passage of private power legislation that would set the stage for rapid development of additional power resources. Further, in Uganda, key measures related to power sector reform, such as a new Electricity Act, had already been enacted, and they provided a level playing field for renewable energy. The strong government commitment to the promotion of rural access to ICT was clear from the inclusion of the Rural Communications Development Fund (RCDF) in the 1997 Uganda Communications Act, and in the considerable progress that had already been made towards the establishment of the RCDF.

The government consistently maintained its commitment throughout the implementation. There was a good deal of enthusiasm on the part of government to proceed with the project.

3 Stakeholder participation and public involvement (including gender)

The project was characterized by a strong participatory approach from the outset. During field trips, the Bank missions and the government met with the primary beneficiaries (rural households, SMEs, health and education facilities, energy service providers, and renewable energy small scale power generators) and discussed the main elements of the project with them in public meetings, and taken account of their interests and concerns in preparing the project concept.

Apart from direct meetings at the individual level, there were also discussions with representatives of the beneficiaries. In addition to the MEMD, the project team worked closely with a number of other agencies: the Ministries of Local Government (MOLG) and MOH, the Uganda Local Authorities Association (ULAA), Uganda Renewable Energy Association, and Action Aid, a non-governmental organization (NGO). All of them had contributed to project design.

4 Replication approach/potential

Areas which have replication potential include the following:

- *Refinance for solar PV.* Funds provided to microfinance, deposit-taking institutions for the provision of microcredit to rural customers would enable them to acquire solar home systems.
- *Business Development Support (BUDS-ERT).* This approach would provide business and market development services to entrepreneurs, micro-enterprises and SMEs, investors, finance organizations, NGOs and CBOs and other private entities to address skills and information barriers that constrain their response to rural electrification and ICT business opportunities in selected areas.

5 Monitoring and evaluation

M&E design. Performance indicators for the ten year program as well as for the project in the energy sector and ICT sector were developed during project preparation. However, these Impact Indicators as given in the PAD were judged to be too high level to be practically monitorable. Consequently, after the MTR, a detailed results monitoring system was put in place, which included standard indicators as well as cross-sector indicators involving MOH, Ministry of Education and the Ministry of Agriculture.

M&E implementation. Data for key performance indicators were collected by the individual implementing agencies. These data were closely monitored and the actual figures were compared with the target values by these agencies. PCU coordinated with the implementing agencies in consolidating the data and prepared quarterly reports on a regular basis.

M&E utilization. Appropriate data collected from the implementation agencies were evaluated and used for decision-making on project activities. Data were also used in making decisions such as reallocation of funds from matching grants and the Bank was able to modify implementation as deemed necessary and project concepts based on these indicators. For example, based on the successful performance of UCC, more resources were made available for ICT activities. Similarly, as the project was not able to mobilize adequate private sector equity, in order to encourage private sector participation for grid extensions, it was decided that the government would fund line connections and the lines would be operated and maintained by the private sector. Likewise, financial monitoring reports (FMRs) focused on the level of disbursements and assessed the progress of each of the components, and resources were reallocated according to the needs.

6. Cost Effectiveness

The project did not lend itself to conventional economic and financial analyses as it was not a typical single investment project. However, the project outcome is deemed efficient based on the following outcomes:

- The project has enabled the regulatory mechanisms and ERA as well as the REA to become active. They have also developed a culture to partner with the private sector to develop projects for the common good.
- Independent grid rural electrification operations have started functioning, which would benefit many customers for accessing electricity.
- Installation of solar panels has helped in restoring power supply to communities, and contributed in: (i) improving access to clean and safe water and which would lead to better health and productivity of people; (ii) increased usage of portable water supply services; (iii) reducing cost of energy for water pumping; (iv) reducing walking distances for collecting water; and (v) saving time especially for women who can use this time for more productive uses.
- Standard solar energy packages installed in medical buildings and Health Centers have resulted in offering improved health services, and positive impact on decreasing diseases such as Measles, Polio and Typhoid.
- Agricultural sector has benefited significantly from the project. For example, agricultural and agro-based enterprises such as honey processing and maize processing have benefited from access to electricity supplied under the project.
- Improved services in payphones, Internet access, and reduced cost for telephone calls, are examples of the benefits accrued to the rural population from the project.

7. Financial Planning/Costs

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)
Component 1. Main grid related power distribution and generation	45.55	154.11
Component 2: Independent grid systems.	26.14	15.03
Component 3: Solar PV systems	10.80	4.54
Component 4: Cross-sectoral linkages	12.44	8.46
Component 5: Energy Sector capacity building, technical assistance and training	15.88	15.54
Component 6: ICT Sector	12.50	6.53
Total Project Costs	123.31	204.21

MAP: IBRD # 36780 and 36816

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