Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD914

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR97.9 MILLION
(US$135 MILLION EQUIVALENT)

AND A

PROPOSED GRANT FROM THE GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US$8.2 MILLION

TO THE

REPUBLIC OF UGANDA

FOR AN

ENERGY FOR RURAL TRANSFORMATION PROJECT
IN SUPPORT OF THE THIRD PHASE OF THE

ENERGY FOR RURAL TRANSFORMATION PROGRAM

May 14, 2015

Energy and Extractives Global Practice
Africa

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2015)

Currency Unit	=	Ugandan Shilling
US$1	=	USh 2,972
US$1	=	SDR 0.72

FISCAL YEAR

July 1 – June 30

ABBREVIATIONS AND ACRONYMS

AFD	Agence Française de Développement
APL	Adaptable Program Loan
BECS	Bundibugyo Energy Cooperative Society
BoU	Bank of Uganda
BST	Bulk Supply Tariff
CAS	Country Assistance Strategies
CDM	Clean Development Mechanism
CDOs	Community Development Officers
CEOs	Chief Executive Officers
CER	Certified Emission Reduction
Ci-Dev	Carbon Initiative for Development
CSF	Credit Support Facility
DEOs	District Environment Officers
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
ERA	Electricity Regulatory Authority
ERPA	Emission Reduction Purchase Agreement
ERT	Energy for Rural Transformation
ESDP	Electricity Sector Development Project
ESIA	Environmental and Social Impact Assessment
ESMAP	Energy Sector Management Assistance Program
ESMF	Environmental and Social Management Framework
ESMPs	Environmental and Social Management Plans
FESL	Ferdsult Engineering Services Limited
FI	Financial Intermediary
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GEO	Global Environment Objective
GHG	Greenhouse Gas
GIS	Geographical Information System
GM	General Manager
GoU	Government of Uganda
GPOBA	Global Partnership for Output-Based Aid

GRS	Grievance Redress Service
HC	Health Centers
IA	Implementing Agency
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICT	Information and Communications Technology
ICEIDA	Icelandic International Development Agency
IFC	International Finance Corporation
IFMIS	Integrated Financial Management Information System
IFR	Interim Financial Report
IDA	International Development Association
IMF	International Monetary Fund
IPP	Independent Power Producer
IREMP	Indicative Rural Electrification Master Plan
KfW	Kreditanstalt für Wiederaufbau
KIL	Kilembe Investments Limited
KPIs	Key Performance Indicator
KRECS	Kyegegwa Rural Electric Cooperative Society
LoC	Line of Credit
LV	Low Voltage
M&E	Monitoring and Evaluation
MEMD	Ministry of Energy and Mineral Development
MoESTS	Ministry of Education, Science, Technology and Sports
MoFPED	Ministry of Finance, Planning and Economic Development
MoH	Ministry of Health
MoLG	Ministry of Local Government
MoWE	Ministry of Water and Environment
MT	Magnetotellurics
NCB	National Competitive Bidding
NEMA	National Environment Management Authority
NPV	Net Present Value
O&M	Operations and Maintenance
OPEC	Organization of the Petroleum Exporting Countries
OPM	Office of the Prime Minister
PACMECS	Pader-Abim Community Multipurpose Electricity Cooperative Society
PCU	Project Coordinating Unit
PDO	Project Development Objective
PFIs	Participating Financial Institutions
PFM	Public Financial Management
PPDA	Procurement and Disposal of Public Assets
PS	Permanent Secretary
PSFU	Private Sector Foundation of Uganda
PV	Photovoltaics
PVTMA	Photovoltaic Targeted Market Approach
RAP	Resettlement Action Plan
REA	Rural Electrification Agency

REB	Rural Electrification Board
REF	Rural Electrification Fund
RESP	Rural Electrification Strategy and Plan
RPF	Resettlement Policy Framework
SE4ALL	Sustainable Energy for All
SHS	Solar Home System
SP	Service Provider
ST	Service Territory
TA	Technical Assistance
UBOS	Uganda Bureau of Statistics
UECCC	Uganda Energy Credit Capitalization Company
UEGCL	Uganda Electricity Generation Company Limited
UETCL	Uganda Electricity Transmission Company Limited
UEDCL	Uganda Electricity Distribution Company Limited
UNBS	Uganda National Bureau of Standards
USh	Ugandan Shillings
WACC	Weighted Average Capital Cost
WENRECO	West Nile Rural Electrification Company Limited
WTP	Willingness to Pay

Regional Vice President:	Makhtar Diop
Country Director:	Philippe Dongier
Senior Global Practice Director:	Anita Marangoly George
Practice Manager:	Lucio Monari
Task Team Leaders:	Mitsunori Motohashi
	Mbuso Gwafila

UGANDA
Energy for Rural Transformation III (P133312)

TABLE OF CONTENTS

PAD DATA SHEET

Uganda

Uganda Energy for Rural Transformation III (P133312)

PROJECT APPRAISAL DOCUMENT

AFRICA

GEEDR

Report No.: PAD914

Basic Information			
Project ID P133312	EA Category B - Partial Assessment		Team Leader(s) Mitsunori Motohashi, Mbuso Gwafila
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [X] Series of Projects [ ]		
Project Implementation Start Date 05-Jun-2015	Project Implementation End Date 31-Dec-2020		
Expected Effectiveness Date 15-Jan-2016	Expected Closing Date 31-Dec-2020		
Joint IFC No			GEF Focal Area Multi-focal area
Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Lucio Monari	Anita Marangoly George	Philippe Dongier	Makhtar Diop

Borrower: Government of Republic of Uganda, Ministry of Finance, Planning and Economic Development					
Responsible Agency: Ministry of Energy & Mineral Development/ Rural Electrification Agency					
Contact:	Dr. Fred Kabagambe-Kaliisa		Title:	Permanent Secretary	
Telephone No.:	256-414-234733		Email:	psmend@energy.go.ug	

Project Financing Data(in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[X]	Grant	[ ]	Other

Total Project Cost:	176.40	Total Bank Financing:	135.00
Financing Gap:	0.00		

Financing Source	**Amount**
BORROWER/RECIPIENT	33.20
International Development Association (IDA)	135.00
Global Environment Facility (GEF)	8.20
Total	176.40

Expected Disbursements (in USD Million)

Fiscal Year	2016	2017	2018	2019	2020	2021
Annual	6.75	13.50	27.00	40.50	33.75	13.50
Cumulative	6.75	20.25	47.25	87.75	121.50	135.00
Annual (GEF)	1.23	1.64	2.46	2.05	0.82	0.00
Cumulative	1.23	2.87	5.33	7.38	8.20	8.20

Institutional Data

Practice Area / Cross Cutting Solution Area

Energy & Extractives

Cross Cutting Areas

[ ] Climate Change

[ ] Fragile, Conflict & Violence

[ ] Gender

[ ] Jobs

[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	**Sector**	**%**	**Adaptation Co-benefits %**	**Mitigation Co-benefits %**
Energy and mining	Other Renewable Energy	100		
Total		100		

☑ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Rural development	Rural services and infrastructure	100
Total		100

Project Development Objective(s)

The Project Development Objective is to increase access to electricity in rural areas of Uganda.

.

Global Environmental Objective(s)

The Global Environmental Objective is to increase access to electricity in rural areas of Uganda and reduce greenhouse gas emissions.

Components

Component Name	Cost (USD Millions)
On-grid Energy Access	144.60
Off-grid Energy Access	25.00
Institutional Strengthening and Impacts Monitoring	5.60
Contingency	1.20

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Substantial
9. Other	
OVERALL	Substantial

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [X]
Does the project require any waivers of Bank policies?	Yes [ ]	No [X]
Have these been approved by Bank management?	Yes [ ]	No [ ]

Is approval for any policy waiver sought from the Board?	Yes [ ]	No [ ]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36	**X**	
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Adoption of Policy		31-Mar-2016	

Description of Covenant

The Recipient, through MEMD, shall no later than March 31, 2016, adopt a policy on public financing of electricity connection costs for household consumers.

Conditions

Source of Fund	**Name**	**Type**
IDA	Execution of Subsidiary Agreement	Effectiveness

Description of Condition

The PSFU Subsidiary Agreement and UECCC Subsidiary Agreement, respectively, have been executed on behalf of the Recipient and the PSFU or UECCC, respectively.

Source of Fund	**Name**	**Type**
IDA	Execution of GEF Grant Agreement	Effectiveness

Description of Condition

The Global Environment Facility Grant Agreement has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Recipient to make withdrawals under it (other than the effectiveness of the Financing Agreement) have been fulfilled.

Source of Fund	**Name**	**Type**
IDA	Adoption of operational manual	Effectiveness

Description of Condition

The Recipient has prepared and adopted the Operational Manual, in accordance with the provisions of Section I.C.1 of Schedule 2 to the Financing Agreement.		
Source of Fund	**Name**	**Type**
IDA	Procurement capacity strengthening	Effectiveness
Description of Condition		
The Recipient, through REA, has: (i) appointed a procurement officer with qualifications, terms of reference and experience satisfactory to the Association; and (ii) established an operational procurement and contract management and monitoring system, in form and substance satisfactory to the Association.		
Source of Fund	**Name**	**Type**
IDA	Amendment of Lease Agreement	Disbursement
Description of Condition		
No withdrawal shall be made under Category (1)(a), unless and until the Recipient, through REA: (i) has amended an existing Lease Agreement with a participating Service Provider or entered into an Implementation Agreement with a participating Service Provider or entered into a new Lease Agreement with a participating Service Provider, prior to the commencement of activities under Part 1(a) of the Project in the respective Service Territory, in accordance with the provisions of Section I.A.2(b) of Schedule 2 to the Financing Agreement; and (ii) has submitted to the Association, either an interim license (in lieu of an amended license) or a license for distribution and sale of electricity for said participating Service Provider, prior to the commencement of activities under said Part 1(a) of the Project in the respective Service Territory.		
Source of Fund	**Name**	**Type**
IDA	Financial Intermediation	Disbursement
Description of Condition		
No withdrawal shall be made under Category (2)(a), unless and until the Recipient, through UECCC: (i) has executed a Participation Agreement with at least one (1) PFI, in accordance with the provisions of Section I.F.2 of Schedule 2 to the Financing Agreement; and (ii) has appointed a treasury officer, a transaction officer and a risk officer, all in accordance with the provisions of Section III of Schedule 2 to the Financing Agreement.		
Source of Fund	**Name**	**Type**
IDA	Utilization of GEF proceeds	Disbursement
Description of Condition		
No withdrawal shall be made under Category (5), unless and until the Recipient, through MEMD, has fully utilized or committed the proceeds of the Global Environment Facility Grant allocated from time to time to said Category 5.		

Team Composition

Bank Staff

Name	Role	Title	Unit
Mitsunori Motohashi	Team Leader (ADM Responsible)	Senior Energy Specialist	GEEDR

Mbuso Gwafila	Team Leader	Senior Energy Specialist	GEEDR
Howard Bariira Centenary	Procurement Specialist	Senior Procurement Specialist	GGODR
Paul Kato Kamuchwezi	Financial Management Specialist	Financial Management Specialist	GGODR
Vladislav Vucetic	Team Member	Lead Energy Specialist	GEEDR
Janine A. Speakman	Team Member	Operations Analyst	GEEDR
Bassem Abou Nehme	Team Member	E T Consultant	GEEDR
Sudeshna Ghosh Banerjee	Team Member	Senior Economist	GEEDR
Jenny Maria Hasselsten	Team Member	Energy Specialist	GEEDR
Richard H. Hosier	Team Member	Senior Energy Specialist	GEEDR
Kabir Malik	Team Member	Young Professional	GEEDR
Constance Nekessa-Ouma	Safeguards Specialist	Social Development Specialist	GSURR
Damalie Evalyne Nyanja	Team Member	Team Assistant	AFMUG
Chita Azuanuka Oje	Team Member	Program Assistant	GEEDR
Herbert Oule	Safeguards Specialist	Environmental Specialist	GENDR
Allison Berg	Senior Operations Officer	Senior Operations Officer	GEEDR
Zubair K.M. Sadeque	Team Member	Senior Energy Specialist	GEEDR
Rachel K. Sebudde	Team Member	Senior Economist	GMFDR
Nuyi Tao	Team Member	Senior Carbon Finance Specialist	GCCCF
David Vilar Ferrenbach	Team Member	Energy Specialist	GEEDR
Murat Arslaner	Team Member	Financial Sector Specialist	GFMDR
Christine M. Makori	Counsel	Senior Counsel	LEGAM
Mazhar Farid	Team Member	Legal Analyst	LEGAM
Mary C.K Bitekerezo	Safeguards Specialist	Senior Social Development Specialist	GSURR
Barbara Kasura Magezi Ndamira	Senior Public Sector Specialist	Senior Public Sector Specialist	GGODR

Christiaan Johannes Nieuwoudt	Finance Officer	Finance Officer	WFALA
Barbara Katusabe	Team Assistant	Team Assistant	AFMUG

Non-Bank Staff

Name	Title	City
Ernesto Terrado	Off-grid Energy Consultant	
Chrisantha Ratnayake	Power Engineering Consultant	
Joe Oteng-Adjei	Consultant	

.

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

I. STRATEGIC CONTEXT

A. Country Context

1. **Over the past two decades, Uganda has made significant progress on the twin goals of reducing poverty and boosting shared prosperity.** The proportion of households living in poverty more than halved from 1993 to 2013. The proportion of households living under the national poverty line declined from 56.4 percent in 1993 to 19.5 percent in 2013. Annual consumption growth of the bottom 40 percent has averaged around three percent over the 20-year period from 1993 to 2013, which is higher than most countries in the region. However, in relative terms, consumption growth of the bottom 40 percent has been slower than the consumption growth of the top 60 percent. As a result, inequality measured by the Gini index, albeit low by regional standards, increased from 0.36 in 1993 to 0.40 in 2013. Moreover, nearly 43.3 percent of Ugandans are still insecure non-poor, defined as those living above the poverty line but living on less than twice the poverty line value. Between 2005 and 2009, two out of three Ugandans who were lifted out of poverty fell back into poverty.

2. **Uganda has sustained one of the world's fastest economic growth rates over the last two decades despite its geographical disadvantages and numerous exogenous economic shocks.** Since 1987, Uganda has experienced a sustained period of high growth, averaging over six percent a year, largely explained by the combination of macroeconomic stability, post-conflict rebound, and pro-market reforms. This growth trickled down to the poorest households, contributing to the decline in poverty. Even though the rate of economic expansion decelerated from an average of 7.6 percent per year during FY2006-10 to 5.5 percent from FY2011-14, because of external factors, inconsistent fiscal and monetary policies, and a slowdown in the efforts by the government to implement further reforms, the responsiveness of poverty reduction to economic growth appears to have increased in recent years. This has helped offset to some extent the negative impact of lower economic expansion on the poor.

3. **Sectoral shifts accompanied the economic growth over the past two decades.** According to recently rebased Gross Domestic Product (GDP) numbers,[1] the service sector contributes the most value addition and agriculture's contribution has been declining. Between 1990 and 2014, agriculture's contribution to GDP fell from 55 percent to 25 percent. The contribution of services increased from 31 percent to 46 percent, with telecommunications and wholesale and retail trade contributing the most. The boom in construction raised the contribution of that sector to 13 percent while manufacturing played a smaller role. Industrial sector growth has been helped with better availability of electricity at lower prices and activity arising from public sector road construction.

4. **A key factor in the structure of medium-term growth is the continued structural transformation toward more productive activities.** This future industrial sector growth will be bolstered by the indirect economic expansion that will follow the development of oil reserves in Uganda as well as the availability of affordable electricity as an input into industrial production. Agriculture also remains important, not only because it employs almost three-quarters of the labor force but because of its potential for quick gains through enhanced productivity and agribusiness, which has been the fastest growing business sector over the past decade. Spatially, Uganda's

[1] Uganda changed the basis for calculating its GDP by changing the GDP base period from 2002 to FY2009/10 and adjusting the structure of GDP to reflect new activities that have not been captured appropriately as the economy grows.

urbanization is accelerating with the urban population growing at an average annual rate of 6.8 percent between 2002 and 2014; a greater proportion of future economic activity can be expected to be in urban areas, including the central and the eastern regions, which will continue to attract people from rural areas.

5. **Electricity will remain critical for Uganda to attain the growth trajectory and socio-economic transformation through better access to education and health care, improved quality of life at household level, better efficiency and service delivery from enterprises, and improved personal security**. At an average annual growth rate of about 3.4 percent (sixth highest in the world), Uganda's population has increased rapidly, from about 26 million in 2002 to around 36 million in 2013. However, the overall household access to electricity is one of the lowest in Africa: about 14 percent at the national level and about seven percent in rural areas.[2] Limited access to electricity and the high cost of electricity services has affected delivery of social services, constrained the development of small-scale industrial and commercial enterprises, and adversely affected the larger-scale industrial and commercial investments in the country[3]. The recent increase in electricity generation through the commissioning of the Bujagali Hydropower Plant in 2012 and the continued strengthening of the transmission and distribution network have lowered the cost of electricity and has improved power supply reliability in the country. However, with the fast-growing demand for electricity—about nine percent per annum—Uganda will need to harness its abundant natural resources more efficiently to provide reliable, cost-effective electricity to support its fast growing economy and improve the social welfare of its citizens.

6. **The Government of Uganda (GoU) aims at transforming Uganda from an agrarian society to a modern and prosperous country within 30 years**. Although sectoral shifts have occurred and urbanization is increasing, Uganda remains a predominantly rural country, and poverty rates are much higher in rural areas: nearly 84 percent of the Ugandan population lived in rural areas in 2013, making it one of the least urban countries on the continent. The GoU has articulated Uganda's Vision 2040, which lays out broad policy directives and includes a target of increasing access to electricity to 80 percent by 2040. In this context, access to electricity across the country remains a national priority, and the National Development Plan of Uganda for the period FY11-15 focuses on increasing access and usage of electricity by investing in least cost power generation, promotion of renewable energy and energy efficiency in addition to strengthening and expanding the transmission and distribution infrastructure.

B. Sectoral and Institutional Context

Sector Background

7. **Major electricity sector reforms have redefined the role of the government in the electricity sector as enabler for private investments in the sector.** The GoU approved a power sector reform strategy in 1999 that called for developing Uganda's hydro power resources through independent power producers (IPPs) and adopting a commercially-oriented approach to increase power access and improve performance. The main functions of the government became to (i) create an enabling environment for private investment in the sector by leveling the playing field for private sector participants; (ii) establish a regulatory framework that supported private sector

[2] Uganda Bureau of Statistics (UBOS), Energy for Rural Transformation Survey 2012.
[3] World Bank Enterprise Survey 2013.

development; (iii) facilitate the setting of cost reflective tariffs; and (iv) develop a transparent subsidy transfer and financing mechanism.

8. **As a consequence, Uganda has progressively advanced in restructuring the sector and has established a number of new entities.** To implement the power sector reform strategy, the GoU passed the 1999 Electricity Act and established an independent Electricity Regulatory Authority (ERA) in 2000 to regulate all sector activities. The Government also unbundled the vertically integrated Uganda Electricity Board, which had been established in 1948, into power generation, transmission, and distribution companies in 2001. A Rural Electrification Board (REB) was established in 2001 to oversee the implementation of rural electrification activities. REB is chaired by the Permanent Secretary (PS) of the Ministry of Energy and Mineral Development (MEMD), and the Rural Electrification Agency (REA) is the secretariat to the REB to support the day-to-day operations.

9. **The unbundled electricity sector adopted the "single buyer" model where the transmission operator is the sole buyer and wholesaler of electricity while the private sector plays significant roles in power generation and distribution.** Most of the fixed assets along the electricity supply chain are owned by three public enterprises: the Uganda Electricity Generation Company Limited (UEGCL) for power generation, the Uganda Electricity Transmission Company Limited (UETCL) for power transmission, and the Uganda Electricity Distribution Company Limited (UEDCL) for power distribution. The UETCL is the single off-taker of electricity from the government-owned generation companies, IPPs, and Small Private Power Producers (SPPPs) that are connected to the main electricity network. In turn, the UETCL sells electricity to the distribution companies at the Bulk Supply Tariff (BST), which is in principle uniformly applied to the distribution companies (with marginal difference in adjustment formula). To introduce private sector efficiencies into management and operation, the UEGCL's Kira and Nalubaale hydropower plants were leased to Eskom (Uganda) Limited in 2002, and the UEDCL's distribution assets in the major load centers were leased to Umeme Limited (Umeme)[4] in 2005. All other distribution assets in the non-Umeme concession areas covering some parts of the country were constructed by the REA and contracted out to seven other electricity distribution Service Providers (SPs) for operations and maintenance (O&M) on a commercial basis. Currently, there is no provision in the tariff to cater for the recovery of depreciation expenses of the distribution lines owned by public companies. However, there are some revenue sources not directly linked to the depreciation of assets: in the case of the UETCL, instead of depreciation, the ERA provides for repayment of loan principal and a small allowance for investments to be funded from internal resources; for the UEDCL, part of the expenses are recovered from lease fees from Umeme; and the retail tariff provides for a transmission levy equivalent to five percent of the power purchase cost by the UETCL that is transferred to the REA. Umeme's investment is reflected in the tariff.

10. **Significant results have been achieved under the current configuration.** Electricity demand has grown at an annual average of nine percent since 2005. Peak domestic demand in 2014 was 508 MW. The country has been relatively successful in attracting private investment in the sector to meet the demand. Installed power generation capacity increased from about 300 MW in 2002 to 852 MW through private investment, including Bujagali (hydro, 250MW) commissioned in August 2012 and other two standby Heavy Fuel Oil plants. The transmission

[4] Uganda's largest distribution company managing over 25,000 km of electricity distribution assets covering 90 percent of the national grid including major load centers.

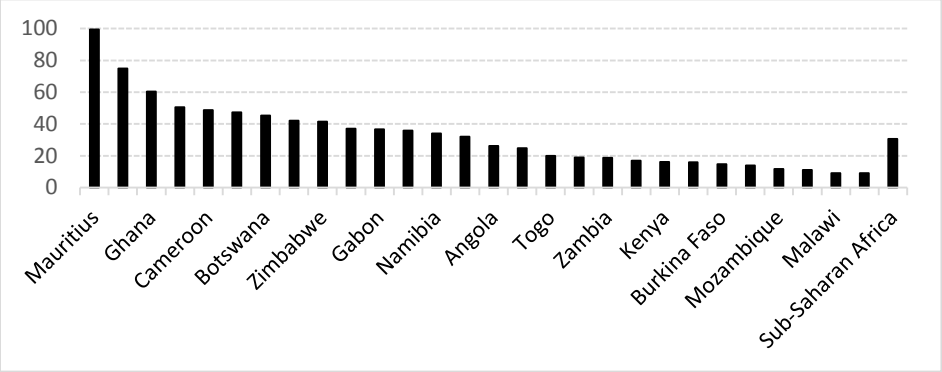
network has expanded from 1,165 km in 2003 to 1,627 km in 2014. Transmission losses were 3.4 percent in 2014. In the distribution sub-sector, energy purchase from the UETCL in 2014 totaled 3,171 GWh of which Umeme accounted for over 93 percent (2,950 GWh) and 221 GWh were purchased by the other SPs combined. After years of inadequate maintenance and under-investment that caused the distribution network to deteriorate and electricity losses to reach nearly 40 percent in 2005, losses in the Umeme service areas were reduced to 21.3 percent in 2014 and the bills collection rate improved from 80 percent to 100 percent. The number of customers connected to the national grid has increased at over 50,000 per annum since 2009, and reached 613,000 in 2013.

11. **Several tariff adjustments and associated revisions to the tariff-setting formula have considerably improved the sector's financial viability.** The retail tariffs are set by the ERA based on revenue requirements of the generation, transmission, and distribution companies and the terms of various contracts with the private generation and distribution companies. The basic principle is that the sector is expected to be financially viable provided that each generation, transmission, and distribution company meets the performance targets specified in the respective licenses. There have been several adjustments to the retail tariff in the past, including an average increase of 48 percent in January 2012, when the GoU phased out the subsidy that had kept the retail tariff below the costs. The ERA approved a multi-year tariff with quarterly automatic adjustments for fluctuations in fuel costs, exchange rates, and inflation in 2014. The key subsidy element in the supply chain is the UETCL's capacity payments for stand-by thermal power plants, which amounted to US$23 million in 2014, and was funded by the Government.

Sector Challenges

12. **Access to electricity in Uganda remains low both by global and regional standards, and it is constraining the achievement of national social and economic development objectives** (Figure 1). The overall access to electricity is estimated at approximately 14 percent nationally and only seven percent in rural areas. As a consequence, Uganda has a low per capita electricity consumption which, at 80 kWh/year, is far below its peers, Kenya at 155 kWh/year and Ghana at 300 kWh/year, and is not comparable to industrialized economies such as South Africa at 4,694 kWh/year, or the Republic of Korea at 8,502 kWh/year. This is constraining the effort to accelerate economic development and improve people's livelihoods, as exemplified by the country's low performance of service delivery in health and education, which limits the achievement of national socio-economic objectives.

Figure 1: Access to Electricity (% of Population, 2011)



Source: IEA World Energy Outlook 2011.

13. **The set-up of the electricity distribution sub-sector remains complex.** The country is divided into 14 Service Territories (STs) that are operated by eight SPs (Table 1), including the Umeme service footprint. UETCL supplies electricity to the electricity distribution SPs at a BST. Most electricity distribution assets are owned by the public sector except in the West Nile region where the current isolated network (distribution and generation) is owned by a private SP (West Nile Rural Electrification Company [WENRECO]). In the main grid covering the remaining STs, Umeme operates the distribution assets owned by the UEDCL, which extends over 90 percent of the main grid including major load centers. Most new distribution lines are constructed and owned by the REA and are operated by the remaining SPs (see Table 1). In the STs without designated SPs, the UEDCL acts as an SP of last resort in the interim. As the Umeme network intersects every ST except West Nile, electricity wheeling arrangements are in place between Umeme and other SPs. Accordingly, there are two SPs (Umeme and another assigned SP) operating in most of the STs. This increases the need to coordinate network planning, O&M, and service quality (details in Annex 2).

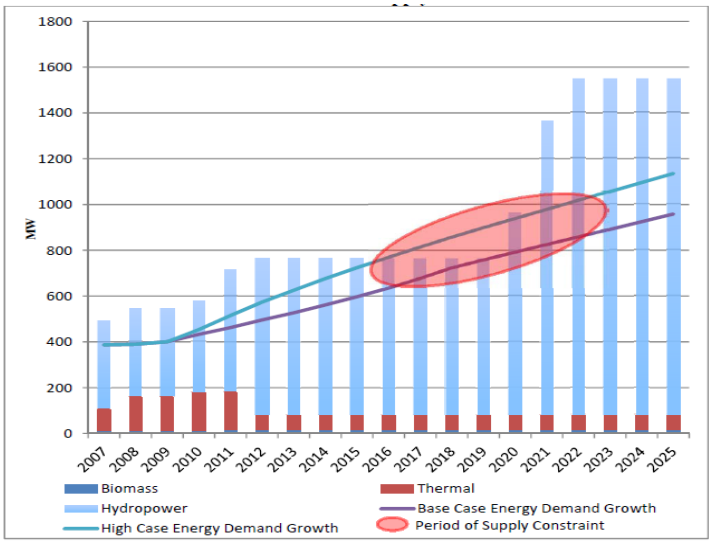
14. **Past efforts in accelerating access to electricity encountered a number of challenges.** Between 2001 and 2012, the rural electrification program was based on the First Rural Electrification Strategy and Plan (RESP-1), which aimed to increase access to electricity in rural areas from one percent in 2001 to 10 percent by 2010. However, the outcome of RESP-1 was not satisfactory, and access to electricity in rural areas at the end of 2010 was less than four percent. The under-performance was attributed to: (i) the unclear roles and responsibilities of the different agencies involved in expanding access; (ii) the limitation in expanding the service network under the initial concessions; (iii) insufficient incentives for the private SPs to increase access particularly amongst the rural poor; (iv) weak capitalization of some SPs and their inadequate managerial and operating expertise; (v) affordability constraints relating to internal house wiring costs and service connections charge (on average US$200 per connection); (vi) inadequate efforts to sensitize rural households about the benefits of electricity usage and to mobilize them to prepare and apply for service connections; and (vii) ineffectual delivery mechanisms for the off-grid solar photovoltaic (PV) program. These issues are described further below (para 20).

Table 1: List of Service Providers

Service Providers	Organizational Type	Distribution Assets Owned by	Operational since	Number of Customers (Q4 2014)	Service Territories
BECS	Private (cooperative)	REA	2009	4,013	Rwenzori
FESL	Private	REA	2007	17,642	South Western
					North Western
					Southern
KIL	Private	REA	2009	6,450	Western
KRECS	Private (Cooperative)	REA	2013	1,461	Central
PACMECS	Private (Cooperative)	REA	2009	1,842	Northern
UEDCL	Public	REA	2001	6,091	Eastern
					North Western
					Central North
					Mid-Western
					North Eastern
Umeme Limited	Private	UEDCL	2005	651,000	Umeme ST
WENRECO	Private	WENRECO	2003	6,278	West Nile

15. **Significant investment is required at every level of the electricity supply chain to secure adequate and reliable supply of electricity.** At the current pace of growth, demand for electricity is expected to surpass the current available generation capacity by 2016 (Figure 2). The generation capacity shortfall is expected to remain until one of the planned large hydropower plants is commissioned. As an additional effort to avoid power shortages and reliance on expensive thermal power plants, the GoU through the Global Energy Transfer Feed-in-Tariff (GET FiT) program is also promoting the development of small private power producers that can be commissioned faster and could be developed simultaneously without imposing financial and managerial burden on the GoU.

Figure 2: Demand Supply Balance

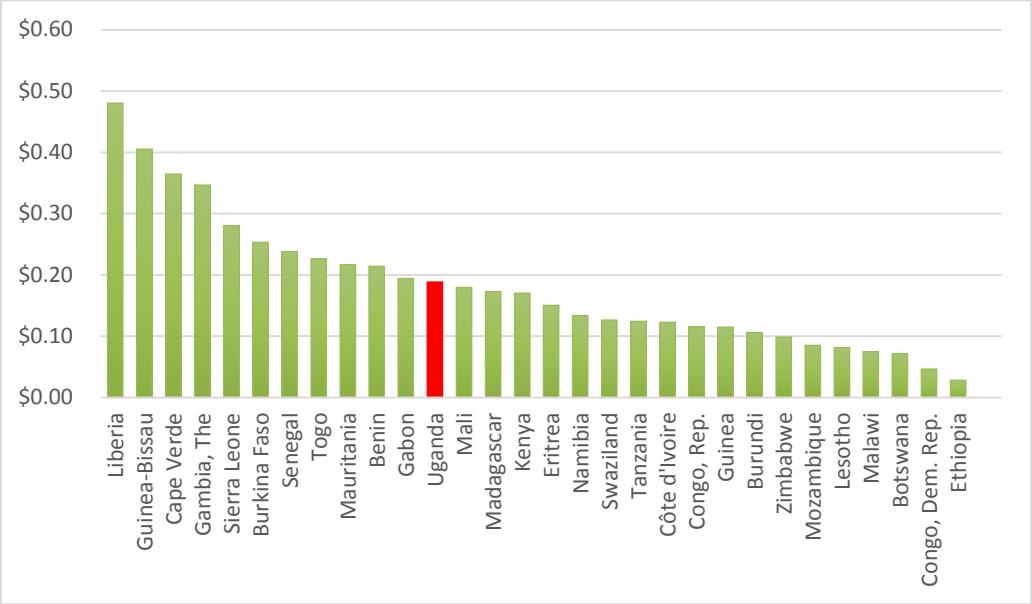


Source: UETCL

16. **Recovering the full cost of electricity supply while maintaining financial viability and expanding access remains a key challenge.** Uganda experienced seven droughts between 1991 and 2000, and the persistent drought between 2003 and 2009 reduced the available capacity of the existing hydropower plants, which prompted increased reliance on emergency thermal generation.

As a result, the average cost of power purchased by the UETCL increased from US$0.10 per kWh in 2009 to US$0.15 per kWh in 2011. As the retail tariff was not adjusted until January 2012, the volatility restricted the financial position of UETCL. As of February 2015, the weighted average retail tariff is US$0.14/kWh (by comparison, the tariff is US$0.03 in Ethiopia, US$0.12 in Tanzania, and US$0.17 in Kenya). The increased level of electricity tariff over the years has also put household budgets under pressure. The impact evaluation carried out for the Energy for Rural Transformation (ERT-1) program reveals that some districts experienced a decline in access due to high electricity tariffs. Reducing the cost of electricity supply therefore remains an important policy priority. In this context, low-cost technology for electrification, improved efficiency across the electricity supply chain, continuation of the cost recovery tariff policy, and some policy instruments to protect the poorer segments of consumers need to be pursued.

Figure 3: Reported Average Electricity Tariff



Source: World Bank. Forthcoming "Power Sector Subsidies in Africa Study."

Strategies to Address Sector Challenges

17. **The GoU is addressing these sector challenges through the following measures:** (i) reviewing the results of the power sector reform and designing its next phase; (ii) adopting an implementation framework for distribution and rural electrification, accompanied by a reorganization of the distribution segment (STs and SPs); and (iii) concomitantly expanding the generation and transmission infrastructure.

Reviewing the results of the power sector reform

18. **A review of the sector reform and current institutional set-up for electricity access will be undertaken by the GoU.** As part of sector dialogue and a technical assistance (TA) under the ongoing Electricity Sector Development Project (ESDP, P119737), the Bank is supporting the Government's initiative to review and take stock of the sector reform experience. The objective of the review is to evaluate the current sector policy, regulatory set up, human resources and financial constraints. Based on this review, recommendations will be made to: (i) improve the sector

performance and operational efficiency; (ii) attract and sustain adequate investments; (iii) increase access to electricity; and (iv) improve the reliability and security of electricity supply. The new electrification model under the proposed project will provide incentives for the REA to collaborate with the SPs to expand access and support strengthening of the regulatory aspects. Its implementation would generate empirical information to be used for the review. In addition, the Bank will be engaged in conducting a thorough financial analysis of the UETCL, the off-taker and lynchpin of the sector's financial viability, to enhance resilience of the sector to external shocks such as hydrological and foreign exchange risks.

Increasing access to electricity in rural areas

19. **The GoU formulated a new rural electrification strategy in 2013.** The Second Rural Electrification Strategy and Plan (RESP-2) covers the period 2013-2022 and sets a policy guideline that mandates the REA to increase electricity access in rural households from an estimated seven percent in 2012 to 26 percent by 2022. The World Bank Group has been supporting Uganda in increasing access to electricity through concession arrangements of the public electricity distribution infrastructure, including the International Finance Corporation's (IFC) equity investment for Umeme, and through the ERT program. The Bank also provided assistance in preparing the RESP-2 [5] through a study financed by the United Kingdom Department for International Development.

20. **RESP-2 endeavors to address some of the access challenges (as described in paragraph 14)** in the following manner:

(i) **Roles and responsibilities for program implementation, investment, and O&M are being defined.** Under RESP-2, planning and management of rural electrification are centralized under the REA (the ST arrangements are described in para 13). The Lease Agreements between the REA and SPs[6] define the ST areas, establish the rights and obligations of the REA and the SPs, and include monitorable performance targets (with appropriate penalty and bonus clauses) to be evaluated each year. Moreover, the REA enters into Maintenance and Operations contracts with the UEDCL for the management of distribution networks in their STs.

(ii) **Concessions are now expanded to cover the entire country.** In contrast with the concessions based on individual distribution lines under RESP-1, all potential customers now fall under an ST under RESP-2. As the Umeme network intersects every ST except West Nile, electricity wheeling arrangements are in place between Umeme and other SPs. The interface between the Umeme footprint and other SPs needs coordination between the SPs operating in the contiguous areas. A map of the STs created through RESP-2 is in Annex 9.

(iii) **Incentive for private SPs to increase access is taken into consideration**. In the past, private SPs who operated distribution lines on concessions had limited incentives to connect households. In the case of Umeme: (i) customer connection is not part of the

[5] Initially, this was for the period 2010-2020; subsequently, as the RESP-1 period was extended until 2012, the implementation period of RESP-2 was set at 2013-2022. RESP-2 is available on REA's website: http://rea.or.ug/phocadownload/rural%20electrification%20strategy%20and%20plan%202013-2022.pdf

[6] The Lease Agreements with three SPs (KIL, BECS, and PACMECS) were concluded. The Lease Agreements with the remaining two SPs (FESL, and KRECS) will be completed by December 2015. For Umeme and WENRECO, REA will conclude Implementation Agreements as UEDCL will be the asset owner.

Key Performance Indicator (KPI) under their existing concession license; (ii) there is a cap on capital and O&M expenditures to cushion their impacts on the retail tariff, which discourages the company from investing in new connections including low consumption households; and (iii) there was the removal of the "growth factor" from the KPI, which allowed the company to retain revenues exceeding the previous year's sales. The project addresses these issues by: (a) establishing customer connection targets for households under the project (the project will not finance connections for commercial and industrial customers, which will be financed by Umeme's regular arrangements); and (b) distinguishing capital expenditures and O&M expenses for project-related activities from the existing revenue requirement for tariff calculation. In the case of other SPs operating outside the Umeme footprint, the incentives for connection under RESP-2 include: flexibility in planning the network expansion within their STs through master plans, which would give them the opportunity to connect new customers; increases in areas of operation, which would allow for an enlarged customer base; adequate tariff to cover operating costs; and additional bonuses in case connection targets under the Lease Agreements with the REA are exceeded. Moreover, the cost pressure from serving the areas with relatively low electricity consumption is absorbed by the REA's publicly-funded investment in expanding the distribution lines.

(iv) **Capital and capacity requirements of the SPs will be strengthened.** The SPs have varying degrees of experience and implementation capacity, ranging from the well-established distribution utility to cooperatives that are relatively new to the electricity supply business. The REA has established a department dedicated to the SPs' development, which will be staffed with relevant skills to support capacity building efforts targeting the SPs. Depending on the capacity needs of the SPs, the REA will plan and provide appropriate support mechanisms, including TA and in-kind contributions and leasing of equipment during the early stage of implementation, which would also mitigate the SPs' constraints in financing their working capital needs. The project will support strengthening of the SPs' implementation capacity during the initial years.

(v) **Affordability of connection costs will be addressed.** A consumer financing arrangement for household connections will be established to ensure affordability of connection. Under the proposed scheme, the GoU will pre-finance the cost of connections and basic house wiring installations, such as ready boards[7] and earthing for those who cannot afford house wiring themselves. Consumers are expected to pay back in installments over a certain period, in conjunction with their energy purchases. The interest-free repayment will be collected by participating SPs for onward remittance to a REA-managed revolving fund that will continue to fund connections beyond the closing of the project. This financing arrangement will help remove affordability barriers for household connections by: (i) limiting the upward pressure on retail tariffs as the connection costs will not be part of the capital expenditures to be

[7] A ready board is a pre-manufactured distribution board that acts as a termination for the incoming electricity supply from utility. It consists of a built-in switch, socket outlet, light bulb, and/or a meter. The use of a ready board can dispense with the need for internal house wiring, and thereby provide a lower cost wiring option for low income households. It also provides uniform technical and safety standards for connection of new households which facilitate the inspection by the utility during installation phase.

recovered through the tariff; (ii) improving affordability of connection and wiring costs by allowing installment payments; and (iii) allowing a standardized treatment of connection charges across the STs irrespective of funding sources. The financial mechanism will initially be applied to no-pole connections, due to budget constraints, with a possibility of future extension to more than one-pole connections. The proposed mechanism will accommodate contributions for connection works from the GoU and development partners.

(vi) **Consumer sensitization and mobilization programs will be continued under the project**. The REA has initiated, under the on-going ERT-2 project, consumer sensitization and mobilization programs to help prospective electricity consumers acquire electricity connections. This is done through consultants commissioned to proactively disseminate information about benefits of electricity access, connection application processes, and house wiring and testing. Additionally, the consultants will help consumers complete connection application forms and submit them to the SPs. These sensitization and mobilization activities will be continued under the proposed project.

(vii) **A market-driven approach will be implemented to scale-up energy access through off-grid technologies.** In the last three to four years, several companies have emerged, including in Africa, India, and Latin America that have amassed over 150,000 Solar Home System (SHS) customers with affordable rent-to-own or fee-for-service plans. The emergence of this new breed of companies may be attributed to: (i) the drop in international solar PV module prices, a trend that continues;[8] (ii) advancements in pico solar, LED, and "super-efficient" appliance technologies; [9] and (iii) widespread acceptance and usage of "mobile money" financial transactions. These companies are working capital-intensive businesses and maintain significant amounts of inventory and receivables. Their scale-up is therefore constrained by access to working capital financing. In Uganda, the REA is implementing the PV Targeted Market Approach (PVTMA) mechanism under the on-going ERT-2 project. The PVTMA scheme has experienced several implementation problems that have limited the pace of installation of SHS. It is also estimated that about 80 percent of the SHSs installed took place outside the PVTMA scheme.[10] A Solar PV Options Study undertaken by the REA in 2014 recommended that the proposed project focus on enforcement of product standards and working capital support for solar companies to scale-up off-grid access.

21. **Key features of RESP-2 in contrast with RESP-1 are summarized in Table 2.** Broadly, these relate to differences in overall planning functions, access strategy, implementation responsibility, financing strategy, and the level of ambition to implement connections.

[8] Module prices in 2014 at about US$2.50 per Wp are half of what they were in 2008.
[9] Initiatives such as the Clean Energy Ministerial with its Global LEAP Outstanding off-grid Appliance Awards have pushed the efficiency of DC appliances, including LED TVs, to unprecedented levels.
[10] Estimates in the Solar PV Market Assessment Study (2014) and Solar PV Options Study (2015).

Table 2: Comparison of targets and achievements for RESP-1 and RESP-2

Attribute	RESP-1		RESP-2
Planning	Decentralized and private sector led		Centralized and public sector led in partnership with private SPs
Concessions	Concessions granted for the areas within "1 km footprints" of individual lines		Concessions granted to SPs for STs covering the entire country
Implementation responsibility	Private companies, nongovernmental organizations, local authorities and communities		REA and SPs
Financing	Private sector aided by subsidies to reduce up-front costs and increase affordability		Public sector financing of capital expenditure with O&M as well as financing for densification undertaken by the private sector
Achievements:	Planned	Actual	Planned
Period	2001-2010	2001-2010-2012	2013-2022
Target	1% - 10%	1% - 4% - 6%	7% -26%
No. of on-grid connections	220,000	183,000	1,276,500
No. of off-grid connections	80,000	7,881	138,500

22. **A large investment is required to implement RESP-2, and the Bank can support and catalyze additional resources.** RESP-2 requires a total investment of approximately US$1 billion to achieve its target connections over 10 years. The GoU remains the largest financier of the program, with an indicative commitment of about US$500 million from its internal resources (transmission levy and national budget). To meet the financing gap, the GoU is in discussions with other development partners. For actual funding, there is approximately US$10 million in annual flows from transmission levy, and the latest Medium Term Expenditure Framework (FY2014-19) allocates approximately US$100 million for rural electrification from the Consolidated Fund (national budget). Several development partners have expressed interest in providing financing under the ERT umbrella, and the proposed project can provide a model for the Government to mobilize additional resources. Coordination among the development partners is maintained by the MEMD through the Energy and Mineral Sector Working Group. The development partners' committed contributions are as shown in Annex 2.

Expanding the electricity supply infrastructure

23. **The GoU is developing transmission interconnections with neighboring countries and diversifying the national energy-mix to enhance resilience of the power sector to external shocks.** The GoU is diversifying the generation mix by promoting renewable energy projects, such as small hydro and co-generation. Moreover, it is also planning to build a strong interconnected national grid with links to neighboring countries to (i) ensure reliability and security of supply and (ii) increase potential for electricity trade between East African Community countries. The UETCL has a 30 MW non-firm Power Purchase Agreement (PPA) with Kenya to purchase electricity for the next five years. A 220 kV transmission line between Kenya and Uganda is under implementation and scheduled to be commissioned in 2015, while the 220 kV line between Uganda and Rwanda will be completed by December 2016. In parallel, Uganda is pursuing interconnections with Eastern Democratic Republic of Congo and South Sudan.

24. **Investment in renewable energy and pursuing improvements in energy efficiency measures are underway.** Currently, out of the 800 MW of installed generation capacity, 630 MW

is based on large hydropower plants, 100 MW is based on liquid fuel-run thermal power plants (maintained mostly on a stand-by mode), and the remaining includes small hydro power and cogeneration. Due to international treaties and hydrological restrictions, only 470 MW of capacity is available from large hydropower plants. The current recorded peak demand is 540 MW. At the current estimated annual demand growth of close to nine percent, generation shortages are expected to return in 2016 and continue until new hydroelectric generation facilities are commissioned. In the interim, the GoU is promoting the development of small hydro power plants and other renewable energy resources (such as solar PV, geothermal, and biomass) by the private sector. More recently, IDA approved a guarantee operation[11] to support the development of small hydro power plants by the private sector with a total capacity between 120 and 150 MW. In addition, energy efficiency measures are pursued in the country, including the time-of-use electricity pricing, installation of solar water heaters, and power factor correction equipment among commercial and industrial electricity users.

25. **The national transmission network system is also being extended and reinforced to evacuate power from generation plants and to accommodate additional demand.** The UETCL is responsible for the planning and operation of the transmission network. Transmission investments are articulated in the Grid Development Plan, a strategic document that directs and guides the overall planning and development of the backbone transmission network. The plan identifies and prioritizes transmission investments mainly for the: (i) evacuation of power from new generation projects; (ii) provision of requisite transmission capacity to meet the projected national load growth; (iii) reduction of technical losses; and (iv) facilitation of energy exchanges with neighboring countries. The UETCL is strengthening the national transmission network system to evacuate power to the load centers and ensure reliability of supply. While IDA is financing the implementation[12] of the 137 km, 220 kV Kawanda-Masaka transmission line (including associated substations), and preparatory studies (feasibility and safeguard studies) for the 132 kV Lira-Gulu-Nebbi-Arua transmission line for a possible future IDA funding, other development partners are actively engaged in supporting the development of various segments of the country's transmission network.

Rationale for Bank Involvement

26. **Public sector involvement is key to facilitate rural access.** It is not uncommon to see rural electrification activities requiring public financial support because they are not financially viable on their own as in this case. In sparsely populated rural areas, revenues from households are often insufficient to recover the capital expenditures especially during initial years. The results of economic and financial analyses of on-grid electrification under the proposed project similarly suggest that the activities in rural electrification, while economically viable, are not financially viable when capital expenditures are included. However, the revenues from electricity sales are sufficient to recover the operating expenses. For this reason, it is important for the public sector to engage in rural electrification.

27. **The Bank has been a major strategic partner in Uganda's electricity sector development.** Since the 1980s, the Bank has supported Uganda's power sector reforms including the restructuring of the Uganda Electricity Board, implementation of policy measures to improve financial viability of the sector, and contribution to major power investments, such as the Bujagali

[11] Renewable Energy Development Program in Uganda (P133318), approved on March 18, 2014.
[12] ESDP (P119737) approved on June 30, 2011.

Hydropower Plant and the expansion of key transmission networks. With its focus on rural transformation and increased access to electricity in rural areas, the ERT program that started in 2001 has been a major element of this partnership.

28. **The ERT Program supports the establishment of a long-term platform for scaling-up electricity access.** In November 2001, the Bank approved the ERT program as a three-phase Adaptable Program Loan (APL). The purpose of the ERT program was to develop Uganda's energy and information and communication technologies (ICT) sectors so that they make a significant contribution in bringing about rural transformation. These sectors were expected to facilitate increased productivity of enterprises and enhance the quality of life of households. ERT-1 primarily supported the creation of electricity sector entities, such as the ERA and REF, and capacity development of the implementing agencies (IAs). Building on the institutional framework developed under ERT-1, the on-going ERT-2 supports the expansion of necessary infrastructure into rural areas. The additional financing for ERT-2 (ERT-2 AF) supports activities by providing connection materials and consumer sensitization and mobilization. ERT-2 is also supplemented by the Global Partnership on Output Based Aid (GPOBA), a results-based subsidy mechanism for the poor household that cannot afford the connection charges. Moreover, through the Uganda Accelerated Rural Electrification Project implemented in conjunction with ERT-2, the Bank has supported the GoU to articulate RESP-2.

29. **The proposed project will build on earlier engagements and facilitate the implementation of RESP-2.** The GoU requested the Bank's continued support in accelerating rural access and helping mobilize additional resources required to achieve the goals specified in RESP-2. The project will continue to support the Government's access goals in a timely manner, and will ultimately contribute towards helping the Government reach the developmental goals of Uganda's Vision 2040.

C. Higher Level Objectives to which the Project Contributes

30. **The proposed project is highly relevant to Uganda's national development strategy and priorities.** Uganda is aiming to increase electricity access in rural areas from seven percent as of 2013 to 26 percent by 2022. This is in line with the access targets for Uganda's Vision 2040. The proposed project will primarily facilitate the implementation of RESP-2 and establish a long-term platform for access enhancement. The GoU remains firmly committed to infrastructure development as a key element of its rural development strategy.

31. **The proposed project supports the World Bank Group's twin goals of poverty eradication and promotion of shared prosperity. It is also fully aligned with the priorities set under the Country Assistance Strategy (CAS) for the period FY11-15,[13] which emphasizes transformational operations and related investments.** The project will help reduce poverty and promote shared prosperity by providing people with access to electricity in rural Uganda. Moreover, the CAS places particular emphasis on infrastructure development, agricultural poverty, and access to markets and skills development. Its Outcome No. 2.1 aims at reducing the unmet demand for electricity and increasing access to electricity for the rural population, including through grid extensions and the harnessing of renewable energy resources (on-grid and off-grid).

[13] Report No. 54187-UG.

32. **The proposed project aims to demonstrate a platform that would facilitate the Government to accelerate electricity access, and thereby contributes to the primary objectives of the SE4ALL initiative**[14] **of attaining universal access to modern energy services, improving energy efficiency, and increasing the share of renewable energy.** Moreover, it is aligned to the higher-level objectives of the World Bank Group Energy Sector Directions Paper,[15] which adopts tailored approaches to support client countries in securing affordable, reliable, and sustainable energy supply needed to end poverty and promote shared prosperity. Furthermore, the proposed project contributes to the higher-level objective of the Global Environment Facility (GEF) to mitigate Uganda's greenhouse gas emissions (GHG).

II. PROJECT DEVELOPMENT OBJECTIVE(S)/GLOBAL ENVIRONMENT OBJECTIVE(S)

A. Project Development Objective (PDO)

33. The Project Development Objective (PDO) is to increase access to electricity in rural areas of Uganda.

B. Global Environmental Objective (GEO)

34. The Global Environmental Objective (GEO) is to increase access to electricity in rural areas of Uganda and reduce greenhouse gas emissions.

C. Project Beneficiaries

35. The primary beneficiaries of the project are the rural households and enterprises who would benefit from on-grid and off-grid electricity delivery services. At the project level, under its on-grid energy access component, the proposed project will finance a total of about 150,000 on-grid connections. This implies a total of about 850,000 persons as beneficiaries, or about 2.5 percent of the current population.[16]

36. Under the off-grid energy access component, solar energy systems will be installed in about 100 schools, 276 health centers, and 15 water pumping stations, all in rural areas. Assuming an average of 610 beneficiary students in each of these rural schools, 23,300 patients benefiting from each of these rural health centers, and 6,100 people from each of these rural water pumping stations, the total project beneficiaries under the off-grid energy component is estimated at over 6.5 million. The beneficiaries for the financial intermediary activities through the Uganda Energy Credit Capitalization Company (UECCC) will be households and solar companies through Participating Financial Institutions (PFIs) who will benefit from the financial facility. The beneficiaries from this activity are estimated to be about 171,000.

37. Table 3 provides a summary of the expected number of beneficiaries during implementation of the proposed project.

[14] See: http://www.se4all.org/. See also Annex 2.
[15] *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector*. July 9, 2013.
[16] Using an average of 5.7 people per rural household, refer to the UBOS report on ERT Survey 2012.

Table 3: Expected Number of Beneficiaries

Activity	Number of Connections/ Installations	Total Number of Beneficiaries	Percent of Female Beneficiaries
Grid Connection	150,000	850,000	50
Financial Intermediation Activities	30,000	171,000	50
Institutional Solar PV	Health Centers – 276	6,430,000	50
	Water Pumping Stations – 15	91,000	50
	Schools – 100	61,000	50
Total		7,603,000	50

D. PDO and GEO Level Results Indicators

38. The PDO and GEO results indicators are:

(i) Direct project beneficiaries (number of people)

(ii) Number of people provided with access to electricity under the project by household connections- (number of people)
- People provided with access to electricity under the project by household connections – Grid (number of people)
- People provided with access to electricity under the project by household connections – Off-grid – Only renewable sources (number of people)

(iii) Tons of CO_2 emission reduced/avoided under the project.

39. The intermediate indicators are:

(i) Total length of distribution lines constructed under the project (km).
(ii) Number of on-grid household connections made under the project (number of connections).
(iii) Number of off-grid household installations made under the project (number of installations)
(iv) National standards for pico PV systems adopted by the Uganda National Bureau of Standards (UNBS) (adopted)
(v) National standards for SHS adopted by the UNBS (adopted)
(vi) Number of rural schools with solar PV systems installed (number) and total installed capacity (kWp).
(vii) Number of rural health centers with solar PV systems installed (number) and total installed capacity (kWp).
(viii) Number of rural water pumping stations with solar PV systems installed (number) and total installed capacity (kWp).
(ix) Number of pico and micro hydro power generation projects completed (number).
(x) Amount of credit and guarantee extended to the PFIs (cumulative, US$ million equivalent).
(xi) Amount of credit extended to project beneficiaries by the PFIs (cumulative, US$ million equivalent).
(xii) Completion of a preparatory study for geothermal development (completion).
(xiii) Completion of the impact evaluation for ERT-2 (completion).
(xiv) Completion of a systematic review of the new electrification model (completion)

III. PROJECT DESCRIPTION

A. Project Components

40. The proposed project is designed in line with the 2001 description of the ERT program as approved by the Bank and the GEF Council with some adjustments to reflect current country and sector circumstances and building on achievements and lessons learned under the previous operations in the series. A brief description of the proposed project components is presented below. Details are included in Annex 2.

Component 1: On-grid Energy Access (US$144.6 million: US$115 million equivalent IDA, US$29.6 million GoU)

41. This component covers on-grid investments to be implemented by the REA.

- **1-1. Grid Extension and Associated Connections (US$99.2 million: US$80 million equivalent IDA, US$19.2 million GoU)**. This sub-component includes the construction of 21 distribution grid extension projects that span over 1,800 km and associated connections. These lines have been identified as priority investment for expanding rural access by the Government and were selected based on the Indicative Rural Electrification Master Plan (IREMP) prepared in 2009, which employed surveys and consultations to identify lines that would serve areas with high economic development and access potential. The list of distribution lines is indicative and it may change during project implementation. The feasibility studies, Environmental and Social Impact Assessments (ESIAs), and Resettlement Action Plans (RAPs) for the 21 lines have already commenced with funding from the GoU and the on-going ERT-2 project. The feasibility studies for the first two lines were reviewed and found satisfactory by the Bank. It is expected that the remaining preparatory studies will be completed by early 2016. The project will fund household connections and basic wiring methods (ready boards) associated with the sub-component to alleviate consumer affordability barriers. Household consumers whose connection and internal wiring costs are prefunded by the project will be required to repay, in installments, the full costs over a period agreed with the GoU/REA. The project will not fund last-mile connections for commercial and industrial customers.

- **1-2. Grid Intensification and Associated Connections (US$29.5 million: US$25 million equivalent IDA, US$4.5 million GoU)**. This sub-component includes short extensions to the medium voltage (MV) and low voltage (LV) network and associated connections to potential customers who are relatively close to the existing grid. The implementation of the sub-component will be through: (i) turnkey contracts for both extensions and connections implemented by the REA on behalf of the SPs; and (ii) framework contracts between the REA and SPs allowing the SPs to identify, package, and implement extensions and connections in their respective networks.

- **1-3. Household Connections from Existing Lines (US$10 million: US$5 million equivalent IDA, US$5 million GoU)**. This sub-component will finance "last-mile" connections and basic low-cost internal wiring for household consumers along the existing distribution network, not covered under sub-components 1-1 and 1-2. Both sub-components 1-1 and 1-2 will extend the LV network and utility poles to reach potential customers. This sub-component, in contrast, will finance customers within the "no pole connections" distance (i.e., within 35 meters that can be covered by service connection cables) from the existing network. The REA and the SPs

will ensure that the connections to be supported under this sub-component will not duplicate other existing support schemes, such as OBA.

- **1-4. Implementation Support for On-grid Energy Access (US$5.9 million: US$5 million equivalent IDA, US$0.9 million GoU)**. This sub-component will support the implementation of on-grid energy access activities. It includes planning, coordination, and implementation support for the REA, construction supervision, consumer sensitization and mobilization, independent verification of connections, and capacity development for the REA to strengthen its oversight roles in rural electrification. Some of the support provided to the REA will also support the initial capacity building needs for the SPs to accelerate access scale-up.

Component 2: Off-grid Energy Access (US$25 million: US$14.3 million equivalent IDA, US$8.2 million GEF, US$2.5 million GoU)

42. This component covers off-grid energy access, including the installation of solar PV systems for public institutions in rural areas; business development support; provision of credit facilities to enhance electricity access; and quality standards enforcement support. This component will finance necessary consultancy services, capacity building activities, and operations costs. The component will be implemented by several IAs—Ministry of Health (MoH), Ministry of Water and Environment (MoWE), Ministry of Education, Science, Technology and Sports (MoESTS), the Private Sector Foundation Uganda (PSFU), and UECCC—under the coordination of the Project Coordination Unit (PCU) within the MEMD.

- **2-1. Institutional Solar PV Systems (US$11 million: US$1.8 million equivalent IDA, US$8.2 million GEF, US$1 million GoU).** This sub-component will support provision of solar PV systems for post-primary schools, health clinics, and water stations in rural growth centers. MoH, MoWE, and MoESTS will be the executing agencies.

- **2-2. Business Development Support for Rural Access (US$1.5 million equivalent IDA).** This sub-component includes the following activities: (i) business development support for private contractors, electricians, and wiremen; (ii) promotion of organization and self-regulation among the solar business; and (iii) provision of electricity for isolated areas through pico-hydro schemes. The PSFU will implement this component and will facilitate the activities in rural areas to foster community-based schemes to expand access.

- **2-3. Financial Intermediation for Rural Access (US$11.5 million: US$10 million equivalent IDA, US$1.5 million GoU)**. This sub-component will provide line of credit and guarantee instruments through the UECCC to the PFIs to facilitate consumer financing needs and working capital for solar businesses supporting off-grid access. It also includes TA to strengthen the UECCC,[17] the IA of this sub-component. UECCC is expected to provide a solar refinance facility and a working capital support facility to the PFIs for on-lending. The working capital support primarily targets the solar companies providing consumer financing through pay-as-you-go or similar arrangements. The consumer refinance primarily targets end users

[17] TA will be provided to the UECCC in the following areas: (i) product enhancement and pricing; (ii) appraisal and risk assessment of solar companies; (iii) risk management; (iv) process and procedures for its operations; and (v) information systems.

who purchase solar systems on a cash basis. The UECCC will make sure that the working capital financing and solar refinancing will not be provided for the same beneficiaries. A partial risk guarantee instrument will also be designed to be offered to the PFIs to partially cover their credit risk related to their lending to solar companies. To ensure compliance with the eligibility criteria, a due diligence assessment of the UECCC has been conducted during project preparation and is summarized in Annex 8.

- **2-4. Quality Assurance for Solar Market Development (US$1 million equivalent IDA).** This sub-component aims to promote quality assurance and awareness of solar products so as to enable the market for affordable, high-quality PV products in rural areas. Support provided to complement market activities will be in the form of: (i) public awareness campaigns to inform consumers of the benefits of solar lighting products and to educate consumers on the characteristics of good quality products; and (ii) strengthening of the UNBS and the National Quality Assurance framework[18] for PV systems to curtail the inflow of cheap, low quality systems. The component is aligned with the approach of the Bank Group's Lighting Africa program. This sub-component will be implemented by the REA in collaboration with the UNBS.

Component 3: Institutional Strengthening and Impacts Monitoring (US$5.6 million: US$4.5 million equivalent IDA, US$1.1 million GoU)

43. This component will finance TA and capacity development required to accelerate electricity access. It will also support the Government to carry out an impact monitoring and evaluation of ERT-2. TA provided under this component will finance the necessary consultancy services, capacity building activities, and operations costs. This component will be implemented by the MEMD, in collaboration with the ERA, and the Ministry of Finance, Planning and Economic Development (MoFPED).

- **3-1. Institutional Strengthening (US$4.6 million: US$3.8 million equivalent IDA, US$0.8 million GoU).** This activity will support institutional strengthening, regulatory enhancement, studies, and capacity development in relation to rural access undertaken by the MEMD and ERA. Indicative areas include design and construction guidelines for distribution network infrastructure; enhancement of regulation for electrical installations; cost of service study; consumer affordability study; geothermal development; systematic review of the new electrification model; project coordination and monitoring and evaluation (M&E); and impacts monitoring. Systematic review of the project implementation will address examination of various aspects of the implementation arrangements including, among others, on-the ground process of consumer applications, connection works, functioning of the proposed financing mechanisms, implementation capacity of the SPs, the planning and coordination role of the REA, and contractual management by the REA and SPs. This sub-component will also support preparatory studies to review existing geothermal-related information, legal, regulatory, and institutional framework, and procurement of equipment for geothermal investigations as recommended by the aforementioned studies.

[18] Support will be provided to the UNBS for; i) technical review and the adoption of national standards for SHS and lanterns; ii) review and strengthening of quality assurance framework and procedures; iii) capacity need assessment and training of the UNBS staff; and iv) providing the UNBS lab with appropriate testing equipment.

- **3-2. Impacts Monitoring (US$1 million: US$0.7 million equivalent IDA, US$0.3 million GoU).** This sub-component will support impact evaluation of ERT-2 and will be implemented by the MoFPED. In addition, the MoFPED will track the impact of electrification investments to establish contributions to changes in income at household and enterprise levels, employment at household, enterprise and community levels and changes in access to social services in project areas - mainly health, post-primary education and safe water.

B. Project Financing

44. The project will be funded by: (i) an IDA credit of SDR97.9 million (US$135 million equivalent); (ii) GEF grant of US$8.2 million; and (iii) GoU counterpart funding of US$33.2 million equivalent. Advance Contracting and Retroactive Financing shall apply for this project for the On-grid Energy Access component (Components 1-1, 1-2, and 1-3) and the Institutional Solar PV Systems component (Component 2-1). An aggregate amount not to exceed US$20 million from the IDA credit (for Components 1-1, 1-2, 1-3, and 2-3) and US$1.6 million from the GEF Grant (for Components 2-1) may be made for payments after July 1, 2015. To be eligible for financing, the procurements shall follow the financing agreement and the procurement plan.

Project Cost and Financing

45. **Proposed IDA credit**: Financing support from IDA is SDR97.9 million (US$135 million equivalent). The amount will be used for financing the project components described above. Part of the ERT-2 financing is being used for carrying out the preparatory studies for the proposed project. However, there is no duplication of funding between ERT-2 and ERT-3 activities during implementation. In addition, the Energy Sector Management Assistance Program (ESMAP) and the Carbon Initiative for Development (Ci-Dev) are providing additional support. [19, 20]

46. **Proposed GEF grant**: Based on a decision of the GEF Council (endorsement of December 11, 2001), an amount of US$8.2 million will be made available by the GEF in support of project activities related to increasing electricity access and energy efficiency measures. The GEF is also co-financing the IDA-funded ERT-2. The GEF triggers (as revised during processing of ERT-2

[19] ESMAP is providing support through a number of activities under the Africa Renewable Energy Access Program. Lighting Africa is supporting essential studies for the off-grid component including: (i) a market survey for solar systems "Solar PV Market Assessment Study"; and (ii) Solar PV Options Study to determine the most suitable arrangements for installation of SHS. Additional resources may be provided from Lighting Africa in support of preparation and implementation of the off-grid component. Moreover, the Africa On-Grid Access Team is financing overall capacity development program for the SPs with weak implementation capacity. As a first phase of this initiative, a short term assignment was initiated to assess and support four SPs in the areas of inventory management, financial accounting, and customer relations including billing.

[20] The proposed project qualifies for support from the Ci-Dev, which is a result-based financing instrument that makes payment against certified emission reduction (CER) issued under the Clean Development Mechanism. The Ci-Dev trust fund will make performance-based payments for the CERs that result from increasing access to clean and renewable energy sources under the proposed project. The Ci-Dev endorsed the proposed project into its pipeline in February 2014 and can support the rural electrification program under RESP-2 until 2024, which is after the expected completion of the proposed project. Payments from the Ci-Dev are subject to satisfactory completion of monitoring and verification. The Ci-Dev will also provide TA funding to support the REA to develop a Geographical Information System (GIS)-based web-enabled monitoring system that tracks the connection progress made by the SPs and qualified solar vendors. This monitoring system will aggregate and update household connection information from the SPs and solar vendors' business system on a real-time basis and will therefore ensure timely report and analysis of the SPs' performance as well as provide useful feedback on connection planning.

AF) pertaining to CO_2 emission reduction have been met. Under the proposed project, GEF financing will be used to support Component 2-1 (Institutional Solar PV Systems), as outlined above.

47. A summary of project cost estimates by components is provided in Table 4.

Table 4: Summary Project Costs by Components

Components	Estimated Cost	Financing		
		IDA	GEF	GoU
Component 1: On-grid Energy Access				
1-1 Grid Extension and Associated Connections	99.2	80.0	-	19.2
1-2 Grid Intensification and Associated Connections	29.5	25.0	-	4.5
1-3 Household Connection from Existing Lines	10.0	5.0	-	5.0
1-4 Implementation Support for On-grid Energy Access	5.9	5.0	-	0.9
Sub-Total	**144.6**	**115.0**	**-**	**29.6**
Component 2: Off-grid Energy Access				
2-1 Institutional Solar PV Systems	11.0	1.8	8.2	1.0
2-2 Business Development Support for Rural Access	1.5	1.5	-	-
2-3 Financial Intermediation for Rural Access	11.5	10.0	-	1.5
2-4 Quality Assurance for Solar Market Development	1.0	1.0	-	-
Sub-Total	**25.0**	**14.3**	**8.2**	**2.5**
Component 3: Institutional Strengthening and Impacts Monitoring				
3-1 Institutional Strengthening	4.6	3.8	-	0.8
3-2 Impacts Monitoring	1.0	0.7	-	0.3
Sub-Total	**5.6**	**4.5**	**-**	**1.1**
Contingency*	**1.2**	**1.2**	**-**	**-**
TOTAL	**176.4**	**135.0**	**8.2**	**33.2**

* A contingency (unallocated funds) has been provided to cater for differences in actual contract prices and estimated project infrastructure costs/budgets.

48. The proposed project is a stand-alone Investment Project Financing, rather than an APL[21] as the APL instrument has been superseded. It builds on the earlier ERT program aimed at increasing access to electricity in rural areas of Uganda. Relevant lessons from the earlier project implementation have been extracted and incorporated in the project design (paras 52-57). A programmatic approach was initially adopted in view of the need to engage with electricity sector stakeholders over the long term to create an environment for private sector participation. The long-term engagement was aimed at building institutional capacity, creating and testing viable service delivery models, and subsequently expanding access to energy for poor rural communities in a sustainable manner. The first phase of the program (ERT-1) covered the period 2001 through 2009 and was followed by a second phase of the program (ERT-2) that initially covered the period from 2009 through 2013, but has been extended until 2016. While the implementation period of ERT-2 and ERT-3 will overlap, funding will remain dedicated to the respective components and activities

[21] Although the project is no longer an APL, all the triggers for the phase 3 were substantially met with the exception of ERT-2 connection targets (129,000). This is attributable to the factors described in para 20, and will be addressed under the proposed project.

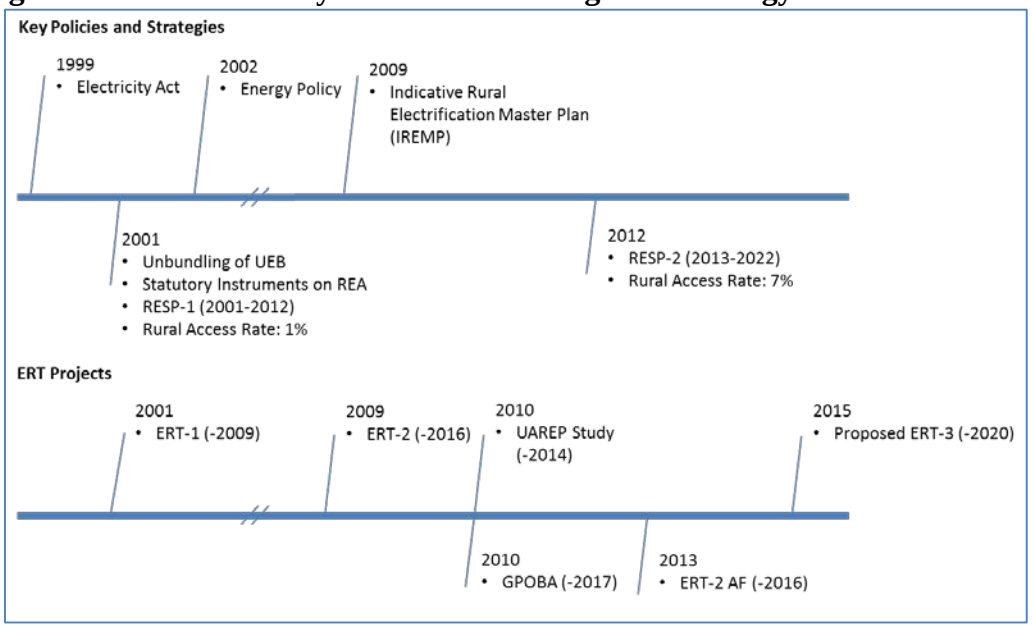
as described in each project document. The ERT-2 funds are already committed and largely disbursed.

49. The total program amount initially approved was US$165.15 million equivalent from IDA, of which the first phase (ERT-1) was US$49.15 million equivalent, and the second phase (ERT-2) was US$75 million equivalent. The remaining US$41 million equivalent was earmarked for ERT-3. To meet the connection targets of ERT-2, an additional financing for ERT-2 (ERT-2 AF) was approved in the amount of US$12 million equivalent on May 22, 2013. To support the Government to achieve targets stipulated in RESP-2, the IDA allocation for the proposed project is US$135 million equivalent.

50. Parallel financing in the amount of US$22.9 million equivalent has also been provided from several other agencies, including the GPOBA (US$5.5 million), Kreditanstalt fur Wiederaufbau (KfW) (Euro 5 million), the European Union (EU) (Euro 3.95 million), and the GoU (US$4 million). More recently, the Agence Française de Développement (AFD) approved financing of about US$45 million equivalent toward electricity access and TA.

51. The development of the rural electrification program has several key milestones and activities that were accomplished over the last 14 years. Figure 4 shows the sequence of various related activities including RESP-1 (2001-2012), ERT-1 (2001-2009), ERT-2 (2009-2016), the OBA (2013-2017), RESP-2 (2013-2022), ERT-2 AF (2013-2016), and the proposed ERT-3 (2015-2020). Building on the institutional framework developed under RESP-1 and ERT-1, ERT-2 continues to increase access to electricity primarily by supporting the expansion of necessary infrastructure to rural areas. The ERT-2 AF and the GPOBA supplement to ERT-2 provided connection materials and results-based connection subsidies for the poor to enhance access to electricity. RESP-2 proposes new implementation models for rural electrification. The proposed ERT-3 will support the GoU to implement the new arrangements for electricity access and mobilize additional resources required to achieve the connection targets.

Figure 4: Timeline of Key Activities in the Ugandan Energy Access Sub-Sector



C. Lessons Learned and Reflected in the Project Design

52. RESP-2 incorporates lessons learned from the earlier implementation of RESP-1 (described in para 20). Moreover, the Bank has been engaging in policy discussion with the GoU, building on lessons extracted from good practices. In February 2015, the Bank co-hosted with the GoU a policy workshop on electrification, which examined planning, technical, financing, regulatory, and institutional aspects of electricity access to accelerate the achievement of universal access in Uganda. The experiences of countries with successful rural electrification, including Ghana, Peru, and Vietnam, were presented to inform the discussion. The proposed design incorporates the key outcomes of the workshop. The project also builds on the implementation experience of ERT-1, for which an impact evaluation was completed in June 2011, and ERT-2 currently under implementation. Some of the key lessons are discussed in the paragraphs below.

53. **Affordability barriers will be alleviated through a public financing mechanism**. Accelerating connections requires overcoming demand-side affordability constraints. This is also a key barrier that was identified in the ERT-1 impact evaluation. Similar to many other countries in Sub-Saharan Africa, connection charges and internal wiring costs are key impediments for rural households to access electricity. Many of the successful cases of rural electrification have relied on governments funding upfront connection costs, with part of the connection costs being recouped through retail tariff and/or public finance, and with new customers paying discounted or in some cases no connection fees at all. Based on the lessons learned elsewhere, the GoU has agreed to establish a public financing mechanism that will fund connection and basic house wiring costs. These costs will be repaid over an agreed period at no interest.

54. **Policy measures are needed to incentivize private concessionaires to expand electricity access.** In the past, private SPs who operated concessioned distribution lines had limited incentives to connect households. The proposed project takes into consideration their incentives by: (i) the REA absorbing the cost of serving the areas with relatively low electricity consumption by providing capital for expanding distribution lines; (ii) establishing customer connection targets for households under the project for the SPs (the project will not finance connections for commercial and industrial customers, which will be financed by Umeme's regular arrangements); (iii) allowing separate capital expenditures and O&M expenses for project-related activities from the existing revenue requirement for tariff calculation for the SPs; (iv) introducing flexibility in planning the network expansion by the SPs within their STs through master plans, which would give them the opportunity to connect new customers; (v) increasing areas of operation which allows for an enlarged customer base; and (vi) adding bonuses when the SPs exceed connection targets under the Lease Agreements with the REA. In addition, the ERA will ensure that an adequate tariff will be approved for the SPs to cover operating costs.

55. **Mechanisms for increasing access to off-grid electricity should be aligned to and implemented in partnership with the existing market platforms**. For off-grid electrification, implementation of the SHS under ERT-2 through the PVTMA model had a less than satisfactory outcome. So far, during 2009-2014, under ERT-2, about 14,000 SHS have been installed against a target of 20,000, on a generously subsidized basis. The pace of implementation was constrained by major problems related to inadequacies with the subsidy mechanism and with the verification process of the PVTMA (ineffective targeting of lower-income households, fraudulent practices in the verification, and slow pace of verification), coupled with general constraints within the nascent sub-sector. Based on the Solar PV Options Study that examined key constraints in the solar PV market as well as various alternative delivery models, the project will focus on enforcement of

product standards and working capital support for solar companies. These areas are identified as key barriers for solar companies to penetrate the market and sustain their operations.

56. **Implementation arrangements and project design should be simplified to the extent possible.** Under overall coordination by the PCU, the implementation of ERT-2 is being carried out by 11 agencies: seven line ministries and four agencies.[22] While the implementation arrangements for the on-grid electrification managed by the REA and the TA managed by the MEMD/MoFPED are relatively straightforward, some complexities arose with the off-grid electrification activities. The GoU has addressed the issue by reducing the number of off-grid components by three and limiting the total number of IAs to eight: five line ministries and three agencies. The selection is based on the past project implementation performance and the expected contribution towards the achievement of the access goals. While the number of IAs is still large, the remaining agencies have strengthened their implementation capacity over the course of the program and have demonstrated solid results. The solar PV systems installed for the post-primary schools supported under the on-going ERT-2 encountered sustainability challenges. However, the MoESTS has strengthened project oversight and taken remedial measures. Moreover, the PCU for the project as a whole has been strengthened over the course of implementation and will be the Bank's key counterpart for the activities managed by the line ministries and agencies. Therefore, on a day-to-day basis, the Bank will be interacting mostly with the PCU and REA. The simplification is expected to lead to improved coordination and monitoring of project activities as well as smoother project implementation.

57. **To mitigate risks of implementation delays, preparatory studies are front-loaded.** Delays in the selection of consultants and procurement of goods and services have adversely affected project implementation of the on-going activities supported under ERT-2. To minimize potential delays under the scaled-up activities to be supported under the proposed project, necessary preparatory studies, including feasibility studies, ESIAs, and RAPs are being prepared upfront. The bidding documents for the first three distribution lines to be supported under component 1-1 are expected to be ready before project effectiveness.

IV. IMPLEMENTATION

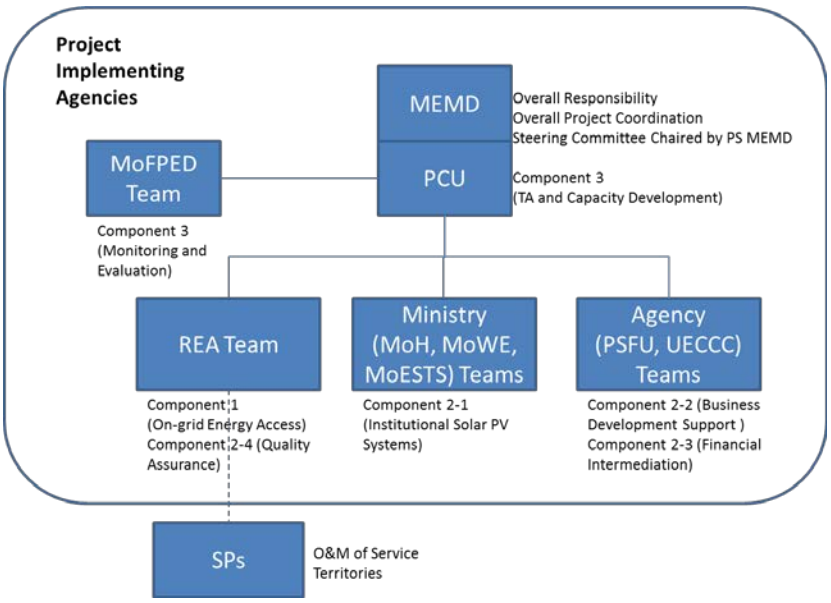
A. Institutional and Implementation Arrangements

58. Project implementation will be carried out by five line ministries (MoH, MoWE, MoESTS, MoFPED, and MEMD), and three agencies (REA, PSFU and UECCC). The PCU for ERT-2 will continue to coordinate and monitor the overall implementation of project activities including all safeguard and fiduciary aspects. The PCU has been strengthened and will coordinate procurement and implementation of activities undertaken by the MEMD, MoH, MoWE, MoESTS, MoFPED, PSFU, and UECCC. The Bank will mainly interact with the PCU and REA on a day-to-day basis. The implementation arrangements are discussed briefly below and in more detail in Annexes 2 and 3.

[22] The line ministries include the MoFPED, MoWE, MoESTS, Ministry of Local Government (MoLG), MoH, Ministry of Agriculture Animal Industries and Fisheries, and MEMD. Other agencies include the REA, Uganda Communication Commission, PSFU, and UECCC.

59. Several coordination mechanisms are incorporated in the project design. First, a Steering Committee, chaired by the PS of the MEMD, will meet every six months to discuss plans, implementation progress, and challenges in relation to the entire project activities including on-grid connection activities. The Steering Committee will comprise all IAs and stakeholders. The PCU will act as the secretariat to the Committee. The terms of reference of the Steering Committee will be stipulated in the Operating Manual. Second, the PCU will be responsible for oversight of all project components. Third, regular meetings, chaired by REA, will be held on sub-topics, including on-grid energy access activities (REA, SPs) and off-grid energy access activities (REA, UNBS, UECCC, and PSFU).

Figure 5: Project Implementation Arrangements



60. **Component 1 (On-grid Energy Access)** will be implemented mostly by the REA. Sub-Components 1-1, 1-2, 1-3, and 1-4 will involve extending the distribution network infrastructure to serve selected rural areas, intensifying the existing grid (adding existing LV lines, poles, and transformers), facilitating last mile connections to the grid (service drop to households), and providing necessary implementation support for the REA and SPs. The REA will coordinate all the activities under this component.

61. For the grid extension, the REA will identify priority lines in accordance with the master plans (the IREMP and new master plans in each ST), and manage turnkey contracts for the extension of the distribution network infrastructure in close coordination with the SPs. The IREMP identified priority projects based on the potential for expanding access to electricity and for supporting economic development. In the areas that require coordination between Umeme and other SPs, including network planning, O&M, and service quality, the REA will facilitate coordination among the concerned SPs.

62. For the grid intensification and household connections, the REA will review the proposed areas for electrification to be submitted by the SPs. The SPs, assisted by consultants funded by the project for consumer sensitization and mobilization, will identify target areas and households for expanding access in their master plans to be agreed with the REA. As the SPs' levels of experience in the utility business vary significantly, the implementation arrangements will be kept flexible, and the modality for grid intensification and connections will take into consideration: (i) the implementation capacity of the SPs; and (ii) the SPs' preference. For those SPs that have the capacity to implement the proposed activities, the SPs can either: (a) undertake the activities themselves; or (b) directly manage the procurement of turnkey contracts. In either case, the REA will verify the connections and physical installation of the equipment. For those SPs that have

relatively less experience in procurement and installation, the REA will manage turnkey connection contracts for connection activities to take place in their respective STs (this arrangement is similar to the grid extension). The approach to be taken for each SP will be determined by the REA, in consultation with the Bank, after the SPs' technical, financial and procurement capacity to carry out such activities is assessed. Performance of the different approaches to connection will be reviewed and calibrated as appropriate as part of the systematic review of project implementation.

63. **Component 2 (Off-grid Energy Access)** consists of several sub-components that will be implemented by various IAs. Implementation of solar PV systems for rural public institutions (schools, health centers, and water pumping stations) will be carried out by the respective line ministries (MoESTS, MoH, and MoWE) in close coordination with the PCU. The PSFU will facilitate business development support for electricians, organization of solar companies' associations, and the development of three pico and three micro hydro power plants through the private sector. The UECCC will provide financial instruments to the financial institutions to facilitate access to finance to consumers and suppliers for off-grid electricity services.

64. REA will implement Sub-Component 2-4 (Market Development for SHSs) in close cooperation with the UNBS. In an effort to accelerate access to modern energy service in rural areas, this sub-component will support complementary market activities such as: (i) public awareness campaigns; (ii) quality standards adoption; and (iii) quality standards enforcement.

65. **Component 3 (Institutional Strengthening and Impacts Monitoring)** will be implemented by the MEMD and MoFPED. MEMD, in close coordination with the ERA, will manage Sub-Component 3.1, carrying out studies and institutional strengthening. The MoFPED will continue with its evaluation and information dissemination activities under Sub-Component 3.2.

Implementation Capacity

66. **Sector-wide Coordination and Planning**. Achieving the scaled-up access targets would require, among others, coordination of activities to be undertaken by multiple stakeholders in fostering investment and operations across the electricity supply chain. Accordingly, sector planning, financing, and overall management will need to be coordinated further. To foster sector-wide coordination, the MEMD will regularly coordinate activities to be undertaken by all the relevant agencies in rural electrification through coordination meetings.

67. **REA's Capacity Strengthening**. The REA has continuously been strengthening its capacity to deliver access to electricity through such measures as increasing the number of engineers and their field presence and enhancing internal quality control systems. To facilitate the achievement of the connection targets under RESP-2, however, REA's implementation capacity will need to be strengthened further. This includes: (i) strengthening REA's contract management capacity (Lease Agreements with the SPs as well as works and supply contracts with contractors); (ii) supporting a consultancy for establishing standardized internal procedures for REA's distribution network construction management; and (iii) enhancing accountability through public disclosure of investment plans and implementation status. On the safeguards management, an additional social development specialist was recruited and REA's environment section is adequately staffed with two Environmental Specialists. However, REA's Environmental and Social Management System (ESMS) needs to be developed/established and strengthened. This will entail, among others, development of institutional protocols and work procedures for

environmental management, health and safety practices, waste and hazardous materials management, and stakeholder engagement. Capacity building of the REA/SPs for building a GIS platform will be addressed through an appropriate consultancy service financed under a TA program of the Ci-Dev.[23] The AFD-financed project (para 50) will have funds allocated for capacity building activities, which will be implemented in close coordination with IDA.

68. **SPs' Capacity**. There are eight SPs in the country: BECS, FESL, KIL, KRECS, PACMECS, UEDCL, Umeme, and WENRECO (para 13). Umeme, the largest SP in the country, has been operational since 2005 and manages over 25,000 km of electricity distribution assets covering major load centers in the country. The company's performance has been strong, especially on its KPIs (loss reduction and higher revenue collection). WENRECO, owned by an international foundation, has been operating the independent grid in West Nile since 2003. For other smaller private SPs, a Bank-funded consultant has assessed the capacity development needs of four SPs (BECS, FESL, KIL, and PACMECS) in the areas of inventory and stores management, accounting systems, billing, and customer relations to effectively manage their operations. The KRECS is the newest SP that started operations in 2013. A due diligence and capacity development needs assessment will be conducted for the KRECS, UEDCL, and WENRECO, and capacity development plans for the smaller SPs (BECS, FESL, KIL, KRECS, PACMECS, UEDCL, and WENRECO) will be prepared by September 2015. The UEDCL, the public SP of last resort, maintains implementation capacity through retention of technical staff on a contractual basis. In case some of its STs are given on concession to a third party, its staff can potentially be transferred to the concession. The REA has established the ST Development Operations Unit to facilitate operations by the SPs in their respective STs, and a unit manager was appointed. Moreover, as mentioned above, the REA and IDA will verify and confirm the technical, financial, and procurement capacity of the SPs to carry out connection activities before the connection works are implemented. A summary of the SPs' organizational background is provided in Annex 2.

B. Results Monitoring and Evaluation

69. Over the years, the PCU and MoFPED have developed adequate capacity to undertake M&E and impact evaluation of the project activities. All M&E activities will continue to be carried out by the PCU, which will also be responsible for tracking the project's indicators, using data from the IAs and stakeholders. The Budget Monitoring and Accountability Unit of the MoFPED will lead monitoring and impact evaluation. As the proposed electrification model for ERT-3 contains various new elements, the capacity of the PCU and REA for M&E will need to be strengthened further. TA provided under component 3 will support project M&E. Furthermore, component 1-4 will strengthen the REA's planning and coordination roles that includes, among others, the capacity to enhance monitoring of results achieved, the SPs' performance, and resource management.

70. To ensure that the implementation of the new model for electricity access is on the right track, and inform necessary adjustments at the mid-term, the project will include TA for systematically reviewing the implementation progress and performance of the new electrification model. The review will examine various aspects of the implementation arrangements including, among others, on-the ground process of consumer applications, connection works, functioning of

[23] See Annex 2 (Box in pp. 70-71).

the proposed financing mechanisms, implementation capacity of SPs, the planning and coordination role of the REA, and contractual management by the REA and SPs.

C. Sustainability

71. The Government is fully committed to rural electrification and there is broad support for accelerating the achievement of universal access. The issue of sustainability mainly relates to the on-grid service connections, SHS installations, and solar PV systems for rural public institutions.

72. **Demand-side sustainability of the on-grid connections**: Limited ability of rural households to make timely payments for the connection charges and upfront cost of house internal wiring has constrained the uptake of electricity connections. Moreover, current connection procedures can be cumbersome[24] and present a considerable burden for new customers to be connected. To address these demand-side issues, a consumer mobilization campaign[25] has been initiated to help inform future and existing consumers on the benefits of electricity use and help overcome some of the transaction barriers that new consumers may face, such as facilitating internal house wiring, filling out application forms, and understanding usage costs. This would allow the SPs to proactively reach out to potential customers and to connect new consumers in larger batches rather than individually. The proposed consumer financing scheme will help address the affordability barriers. This scheme will be described fully in a Cabinet Memorandum, which is expected to be submitted to the Cabinet by December 2015. As this will be a key element to address consumer's affordability barriers for electricity connection: (i) the MEMD will submit a letter of commitment to the Bank, confirming that the policy on public financing of electricity connection costs for household consumers will be approved by the Government; and (ii) submission of the approved policy will be a dated covenant to be achieved before March 31, 2016.

73. **Supply-side sustainability of the on-grid connections**: To ensure that the investment in distribution network expansion, intensification, and household connections is made sustainable, and O&M are continued, several elements will need to be in place, including: coherent planning and coordination to be undertaken by the REA in all activities undertaken across the country; financial commitment of the GoU to expand the network infrastructure; and strong implementation capacity of all entities concerned, especially the REA, ERA, and SPs. To help the Government strengthen these areas, the project includes TA specifically targeted at the REA, ERA, and SPs in planning and coordination as well as project implementation capacity. Moreover, the project will help mobilize additional financial resources from other development partners (see Annex 2). Finally, the project includes TA for systematically reviewing the implementation of the activities supported to inform any adjustments in project design that may be required in the course of implementation.

74. **Sustainability of tariffs and financial viability of SPs**: To ensure the sustainability of the rural electrification program, tariffs need to be set at least at the level that recovers operating costs,

[24] The current application processes broadly follow the following steps: (i) applicant submits application to a nearby SP office together with (a) completion of wiring certificate by a certified wireman, (b) passport photograph, (c) proof of ownership such as a land title, tenancy agreement and photo of landlord, and (d) no objection letter from neighbor where line is crossing; (ii) the applicant invites the commercial officer of the SP to the site to prepare a site sketch map; (iii) the applicant is given an invoice and pays inspection fee; (iv) installation inspector visits premises to test installation; (iv) if accepted, the applicant pays connection fees (if not, the applicant has to make another payment for inspection until accepted); and (v) once connection fees are paid, connection works are scheduled.

[25] Financed under ERT-2.

while ensuring that customers are able to pay for the cost of connections and electricity consumption. For cost of connections, ERT-3 proposes arrangements that would make the connection-related costs affordable. For the tariffs structure, the existing tariff caters for the low income households by cross-subsidizing the tariff for consumption of the first 15 kWh per month. Electricity Distribution and Sales Licenses issued by the ERA include the BST, approved distribution retail tariffs for domestic and commercial consumers, approved distribution loss targets, and applicable wheeling charges. In principle, approved tariffs should recover costs as long as the SPs are meeting performance targets. Tariff proposals are reviewed by the ERA, taking into consideration the individual operating costs of each SP including system operating and administrative expenses, approved capital expenditure recovery through a depreciation allowance, financing costs, and/or an established rate of return on capital invested corresponding to the investments made by the SPs. The Implementation Agreements to be concluded between the REA and SPs will stipulate technical, financial, fiduciary, and safeguards (environmental and social) management capabilities of the SPs to enter into implementation arrangements, and will be submitted to IDA.

75. **Sustainability of off-grid SHSs**: The pace of installation required by the new target can only be sustained if the installed systems are properly maintained and customer satisfaction remains high. Recent advances in PV technology reduced the level of effort required for maintenance. For example, efficient plug and play pico solar PV systems require much less maintenance than the classical SHS. Integrated controller designs will allow continuous monitoring of system condition, and enable diagnosis and routine maintenance to be carried out remotely. In addition, ERT-3 provides working capital loans for pre-qualified solar companies that are extending credits for SHSs to households, to encourage a shift to lease-to-own, pay-as-you-go, and fee-for-service business models. These models should increase the affordability and create a long term relationship between solar companies and their customers, strengthening solar companies' efforts to carry out maintenance and customer support and remove risks from consumers for defective equipment, installation, and/or collection of resultant waste materials for disposal or recycling.

76. **Sustainability of off-grid institutional solar systems:** Close monitoring of the ongoing activities under ERT-2 has revealed some shortcomings that compromise the sustainability of investments made in institutional solar PV systems. These include: (i) inadequate duration of maintenance contracts that only run until the fifth year of operation; (ii) technical faults and damages arising from adverse weather incidents and vandalism; and (iii) insufficient budgetary allocations to cater for the replacement of batteries to ensure full life usage of the systems installed. To address these issues, the MEMD, in coordination with the other line ministries (MoWE, MoESTS, and MoH), has agreed to allocate budget to cover the cost of maintenance, repair, and replacement of system parts and/or collection of resultant waste materials for disposal or recycling beyond the first five years of operation. As vandalism was a particular concern for the solar systems installed at post-primary schools, the MoESTS issued a Ministerial Circular that underlined headmasters' responsibilities for maintaining the solar systems installed and indicated that if the systems are found to be not properly functional, administrative sanctions will be applied. In addition, the MoESTS has developed a preventive plan of action to curb vandalism, which includes: (i) establishment of security committees composed of teachers and students to monitor the security of systems; (ii) increased security at night; (iii) welding of lockable cages for the internal components to prevent ease of access; and (iv) increased sensitization of students and communities on the protection of the solar systems. The MoESTS's component will be

implemented on a smaller scale than under ERT-2, and randomized monitoring of post-primary schools will be strengthened.

V. KEY RISKS AND MITIGATION MEASURES

Risk Ratings Summary Table

Table 5: Systematic Operations Risk Rating Table

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	Moderate
8. Stakeholders	Substantial
9. Other	
OVERALL	Substantial

Overall Risk Rating Explanation

77. The overall risk rating for the project is **Substantial**. The key risks associated with the project are, among others: (i) political interference in investment decisions; (ii) the risk of fraudulent practices involving procurement of goods and services as well as verification of works performed; (iii) macroeconomic shocks, such as the risk of inflation and foreign exchange fluctuations; (iv) risks associated with implementation of new models for electricity access; (v) financial viability and sustainability of the sector; (vi) supply shortages of electricity, and (vii) delays in compensation for resettlement.

78. Descriptions and key mitigation measures for the aforementioned risks are as follows:

(i) *Political and Governance risk*. Persistent challenges with public financial management (PFM) hinder the effective delivery of large infrastructure projects and service delivery. The 2012 Public Expenditure and Financial Accountability Assessment showed little improvement since 2008 and some deterioration in areas such as budget credibility and control. Uganda's performance is strongest in comprehensive and open budget, public access to fiscal information, transparency of tax payers' obligations, maintaining good accounting, and the high quality and scope of external audit. However, PFM systems requires strengthening in budget credibility, budget execution controls (particularly payroll), procurement compliance, and legislative scrutiny of external audit reports. The Government has been implementing a number of reform measures to strengthen PFM, including, among others, the recently-enacted Public Finance Act, Anti-Money Laundering Act, strengthening of the Public Procurement and Disposal of Assets Act, and the implementation of the Treasury Single Account. Moreover, there is a risk that political pressure may be exerted to direct distribution line extensions, intensification, and connections. The project will support investment in accordance with the IREMP, which is based on technical assessment, stakeholder consultations, and master plans to be

prepared for each ST and will take into consideration technical, economic, financial, social, and environmental factors. RESP-2 envisions that REA will eventually evolve into a more autonomous legal entity, which would allow it to own assets, enter into public-private partnership arrangements as needed, and generate revenue streams. This will be discussed as part of the review of power sector reforms currently underway.

(ii) *Fraud and corruption risk*. Under the on-going ERT-2, there were isolated cases of fraudulent practices and abuse of subsidies involving the independent verification agencies and some solar companies. These cases were internally detected by REA and addressed. The proposed design will discontinue support of the subsidy scheme. The Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and revised in January 2011, will apply to this project. The measures identified in the financial management and procurement assessments will be implemented. The PSFU, which is the IA for Component 2-2 has in the recent past also experienced governance challenges. Investigation by the World Bank's Integrity Unit (INT) in 2012-2013 found evidence of fraudulent practices during procurement processes under IDA-financed Private Sector Competitiveness Project (PSCP) II project. However these have been dealt with through sanctioning of responsible project staff and streamlining of accountability procedures in the organization. The PSFU Board now has stronger oversight over project activities.

(iii) *Macroeconomic shocks*. The Bank and IMF are in discussion with the GoU on the need to adhere to prudent fiscal management and monetary policies. The medium term macroeconomic framework supported by both the IMF and World Bank provides for maintenance of sustainable fiscal deficits. To accommodate inflation, fuel, and foreign exchange rate fluctuations, the automatic tariff adjustment mechanisms will be implemented by the ERA.

(iv) *New Implementation Model*. The proposed implementation arrangements under RESP-2 are new to the country. Even though, as described earlier, necessary measures to minimize the risks are taken during project preparation, there are residual risks that will be addressed during project implementation. These include: (a) the proposed financing mechanism for connection costs may not function as originally envisaged; (b) implementation capacity of relatively new SPs may take longer than planned; (c) incentives for the SPs to connect customers may be insufficient; (d) the institutional set-up may change as a result of the sector review and/or changes in management of key stakeholders; and (e) regulatory decisions by the ERA may be delayed. For these reasons, the project includes TA for systematically reviewing the new electrification model. This will inform the change of design as needed not later than the first 24 months of project implementation.

(v) *Financial viability of the sector*. The Bank will assess sectoral financial viability and risk under the ESDP (P119737) and will pursue appropriate risk mitigation measures. As described in para 9, the recovery of depreciation of transmission and distribution assets owned by the UETCL, UEDCL, and REA is only partially allowed through levies and tariffs. The financial analysis will examine sustainability of the current arrangements.

(vi) *Supply shortage*. The generation capacity shortfall may occur by 2016 and is expected to remain until one of the planned large hydropower plants is commissioned (para 15). The GoU is promoting the development of small private power plants. Moreover, the off-grid

electrification undertaken in parallel would mitigate the risk of on-grid electricity supply shortage.

(vii) *Resettlement and compensation:* Necessary measures have been undertaken during the project preparation to implement social safeguards measures in time, including: increasing the GoU/REA commitment to financing and compliance; making it easier for the PAPs without bank accounts to receive compensation payments; reaching an agreement with the Borrower on reporting requirements; preparing the safeguards instruments; preparing two action plans; and hiring of social safeguards specialist. To ensure that the measures are implemented, the Bank will strengthen monitoring of this aspect during implementation.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

Economic Analysis

79. Overall, the project is economically viable with an Economic Internal Rate of Return (EIRR) of 38 percent and a Net Present Value (NPV) of US$231 million. The project is robust to credible changes in parameters, such as cost and benefit movements as well as delays in implementation of connections. The framework for evaluating the project's economic returns is a standard cost-benefit analysis. The benefits under Component 1 include consumer surplus that households derive by shifting from a low quality kerosene or bio-mass lighting to electricity services, which is estimated at US$0.68 per kWh for on-grid connections. Benefits under Component 2 are the benefits from off-grid PV installations – for households, post-primary schools, health centers and water facilities gaining access to electricity supply. The costs include the economic project costs and O&M costs under Components 1 and 2, connections costs incurred by the households, the generation cost of the additional electricity served to newly grid-connected households, and the O&M costs of the solar panels. Estimates for the NPV[26] and EIRR are included in Table 6 below, and further details are included in Annex 5.

Table 6: EIRR and NPV for the proposed Project

Overall Project	EIRR: 38% NPV: US$231 million Benefit-Cost Ratio**:** 2.2
Component 1 (On-grid Connections)	EIRR:39% NPV: US$227 million
Component 2 (Off-grid Institutional & HH PV)	EIRR: 20% NPV: US$3.3 million

80. The expected net GHG impact of the project from increased access to renewable energy has been calculated at approximately four million tCO_2e during the lifetime of the project.[27]

[26] The discount rate used is 10 percent.

[27] This figure does not account for the net emissions attributable to the right-of-way land clearance for the construction of distribution lines under component 1. As the lines are mostly to be built along road reserves, this impact is likely to be small.

Financial Analysis

81. **Project Financial Analysis**. The results of the financial analysis show that the on-grid investments under Component 1 of the proposed project almost breaks even during the lifetime of the assets (30 years). The estimated financial NPV is -US$4.32 million with an associated FIRR of 0.47 percent. As mentioned above (para 26), it is not uncommon to see rural electrification activities requiring public financial support. The results of financial analysis suggest that the activities in rural electrification, albeit being economically viable, are not financially viable when capital expenditures are included. However, the revenues from electricity sales are sufficient to recover the operating expenses. The public sector investment in the distribution networks supported under the project would help overcome the financial barriers.

	FIRR	NPV ($ million)
On-grid (Component 1: On-grid Energy Access)	0.47%	(4.32)

82. **Financial Analyses of SPs**. Even though the SPs are not directly implementing the project, their financial viability has an impact on the achievement and sustainability of the PDO. The SPs need to be able to continue to process connection requests and provide O&M of the distribution network in their respective STs. Financial analysis of the largest SP was conducted on the basis of audited financial statements and is available in the project files. Financial analyses of other SPs will be conducted by the team as part of due diligence before commencing activities in their STs during project implementation.

B. Technical

83. The proposed project includes MV and associated LV electricity distribution networks to be implemented in accordance with the existing distribution network standards and technical requirements prevailing in Uganda. These standard and technical requirements are based on international standards adapted for local conditions. Distribution installations for 33 kV networks and below are based on proven technologies and standard, off-the-shelf technologies and equipment. Therefore, they pose low technical risks. However, to assist the adoption of low cost technologies to the sector, the project will support design and construction guidelines for distribution infrastructure (Component 3-1).

84. To lower the cost of connections, the ERA has reviewed and approved the use of more appropriately sized connection cables for different customer categories. The approved connection standards are (i) three-phase connection using a 16 mm^2 cable for all end users on requesting a three phase supply; (ii) single-phase 16 mm^2 connection for high load single phase household and commercial enterprises; (iii) single phase 10 mm^2 service connection cable for low load 240V single phase customers with internal house wiring; and (iv) single phase 10 mm^2 connection cable for all customers using ready boards.

85. The proposed project will also finance the scale-up of fixed solar systems for rural households and enterprises (SHS), and in rural institutions such as health centers and water pumping stations. Quality standards for SHS were developed during ERT-1 by the UNBS, with support from PSFU. Under ERT-3, the REA will work with the UNBS to review and update the SHS standards as well as introduce standards for small solar appliances, such as lanterns. In addition, support will be provided to the UNBS in their efforts to enforce the standards. These activities will be supported under sub-component 1-5 of ERT-3 and by the Lighting Africa

Program. For institutional solar systems, quality of products and workmanship will be ensured through close monitoring and supervision of installation works.

C. Financial Management

86. The project's financial management transactions will be managed within the existing set-up of ERT-2. The overall accountability is with the Permanent Secretary, MEMD and the general manager (GM) and chief executive officers (CEOs) for the other IAs (REA, PSFU, and UECCC). MEMD will be the coordinating agency for participating ministries. The institutions' accounting departments are adequately staffed with principal accountants as Head (for the ministries) and finance directors (for other institutions), senior accountants, accountants and several accounts assistants. For the ministries, the principal accountants report to the undersecretaries who also report to the permanent secretaries while for the other institutions the finance directors report to the CEOs. The participating institutions have accounting policies and procedures that will be used for the project. The institutions are computerized with various accounting packages and the ministries are also computerized with the Integrated Financial Management Information System (IFMIS). The institutions have internal audit units comprising heads of internal audit and internal auditors who will include the project activities in their work plan. The project's financial statements will be audited separately at the REA, PSFU, UECCC and MEMD in accordance with statutory requirements, and suitable terms of reference acceptable to IDA. To ensure that the project is effectively implemented, the institutions will ensure that appropriate staffing arrangements are maintained throughout the life of the project. The MEMD will issue accountability instructions for the implementation of the Institutional Solar PV systems component, which will stipulate the respective roles and responsibilities of the line ministries and arrangements for implementation and reporting of the activities carried out by each line ministry.

D. Procurement

87. Procurement under the project will be conducted by the REA for Component 1, the REA, MoESTS, MoH, MoWE and the PSFU for Component 2, and the MEMD for Component 3. Procurement will follow the Guidelines: Procurement under IBRD Loans and IDA Credits dated January 2011 (revised July 2014) and Guidelines: Selection and Employment of Consultants by World Bank Borrowers dated January 2011 (revised July 2014) and the provisions of the Legal Agreements. The majority of procurement will be conducted by the REA in Component 1 while the ministries will conduct relatively small value of procurement mainly for solar energy packages. The Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006 and Revised in January 2011, will apply to this project.

88. The markets for the different procurements are now well developed and satisfactory competition exists among providers both locally and internationally for the grid extensions and distribution networks construction and internationally for the solar energy packages. Market testing will be conducted for turnkey connection contractors to assess the viability of the SPs using these to accelerate connection where their own capacity is weak. The project provides for alternative options in the event that this is not successful.

89. The main risks to procurement under the REA are: (i) delayed procurement and contract implementation due to inadequate number of technical staff to handle increased volume of procurement and contract administration; (ii) weaknesses in procurement planning resulting in inappropriate packaging of contracts, high prices and delayed implementation of the project; (iii)

collusion resulting in reduced competition and higher prices; and (iv) inadequate contract management resulting in in delayed implementation and potential loss of value. These risks will be mitigated by: (i) hiring additional procurement and technical staff to support procurement and contract management and complementing these with design and supervision consultants; (ii) strengthening procurement planning in the REA through training and overall planning improvements; (iii) removing restrictions to the number of lots that bidders may bid for and thereby enabling higher competition; (iv) implementing a red flag contract management system and tracking of unit rates for key inputs; and (v) where possible consolidating and procuring centrally the connection and intensification contractors for service territories.

90. Under Subcomponent 1-2, the REA will utilize the capacity of SPs with sufficient experience to design schemes, package them, procure contractors competitively and supervise implementation. Under Subcomponent 1-3, the SPs with sufficient experience will carry out connections and will be paid at the established regulated rates. For SPs with insufficient capacity, the REA will support them with procurement and augment their implementation capacity. The REA will consolidate their needs and procure contractors for implementation of the intensification schemes and connections together with associated TA. Procurement in the participating ministries will follow the arrangements already established in these agencies on existing IDA-financed projects. Capacity has already been built under these agencies and this will be sufficient to conduct the relatively small procurement.

E. Social

91. The proposed project will result in limited land acquisition for construction of distribution lines, with potential to affect the livelihoods and access to common assets and resources along the distribution corridors. This triggers OP 4.12 Involuntary Resettlements. Since the exact location and routing (alignments) of all the distribution lines had not been identified yet during project identification, a Resettlement Policy Framework (RPF) was prepared in a consultative manner and disclosed in-country on July 29, 2014 and at the Bank InfoShop on September 8, 2014. The RPF includes detailed guidelines for developing and implementing subsequent RAPs for each of the sub-projects/lines. The RAPs for the first two lines/lots of the Kiganda Mile 16 and Ruhumba-Kashwa distribution lines have been completed, cleared by the Bank, and disclosed both in-country on March 23, 2015, and at the InfoShop on March 27, 2015. Subsequently, all compensation will be fully paid before commencement of the subproject works. The GoU has committed a total of US$5 million as counterpart funding for implementation of the RAPs.

92. **RPF**. The RPF includes: (i) an assessment of the regulatory and institutional framework for land acquisition and compensation in Uganda; (ii) likely categories of affected assets and parties, as well as the scope of impacts; (iii) a gap analysis and a compensation framework consistent with OP 4.12 and the national legislation; (iv) measures to assist vulnerable groups; (v) a consultation framework to enable the participation of affected populations in the preparation of specific resettlement plans; (vi) an institutional framework to implement the RPF; (vii) a grievance redress mechanism; and (viii) M&E framework and budget. The RPF is complemented by an Environmental and Social Management Framework (ESMF) under which other social impacts resulting from construction-related activities will be addressed.

93. **Monitoring**. The Government will submit Project Quarterly Progress Reports as part of project M&E requirements, which will include monitoring of resettlement implementation progress and supervision plan and other social issues including stakeholders (communities, SPs

and local government) engagement, assessing adequacy of the local grievance redress system and gender mainstreaming covered in the ESMF. The Government will prepare a separate report on resettlement to be annexed to the aide-memoire.

94. **Grievance Redress:** The RPF (and the ESMF) define guidelines for establishing a project-level grievance redress mechanism to manage any complaints that may arise during project implementation. Grievance management will aim at providing a two-way channel for the project to receive and respond to grievances from the PAPs, stakeholders, or other interested parties.

95. **Gender Mainstreaming**. The proposed project will increase access to electricity to various groups of people through on-grid and off-grid connections. Inclusion of both men and women in the entire process including consultations at various stages of preparation and implementation of the ESIAs and RAPs has been recommended in the RPF and ESMF to ensure that all community stakeholders are informed and benefits are shared in an equitable manner. The ESMF and RPF provide guidance on improving gender mainstreaming and poverty alleviation through the implementation of the proposed project. In preparing the quarterly progress reports, the IAs will include an assessment of the extent of gender mainstreaming. Gender analysis will also be an integral part of implementation and M&E of all project activities.

96. In conjunction with the proposed project, the Bank will provide TA to help the MEMD and REA develop gender strategies for the project in collaboration with their respective gender focal points. The TA will support REA's M&E team in devising monitoring arrangements for access gained specifically by female-headed households. The pattern of electricity access by the gender of household heads will also be captured in the Impact Evaluation proposed to be supported under the project. Appropriate indicators to monitor the progress on access to electricity by the gender of household heads will be discussed by the Government and the Bank during project implementation, and measures will be identified to ensure that female-headed households are not disadvantaged for electricity access.

97. **Institutional Capacity to Handle Social Safeguards.** The project will include compensation for land use and affected assets for Component 1 to be implemented by the REA. In order to strengthen its internal capacity to implement and coordinate all social aspects included in the ESMF, RPF, and the RAPs, the REA recruited one social development specialist during project preparation. To strengthen the capacity of the safeguards unit, the recruited specialist will work very closely with the Way-Leave officers, the environmental specialists, and the MEMD environmental and social development Officer. Where the need arises in the course of project implementation, the REA would hire short-term consultants as appropriate. The MEMD will coordinate the overall implementation of the entire project, including the monitoring and reporting of safeguards compliance. The safeguards officer recruited at the MEMD (under financing from the on-going ESDP, P119737) will ensure necessary oversight for social due diligence and safeguard compliance for the proposed project. The MEMD in coordination with the REA and other beneficiary agencies will establish a RAP and other social issues monitoring and tracking system, which will be the basis of reporting in the quarterly progress reports.

F. Environment

98. The proposed project will support interventions designed to increase access to electricity and is expected to have positive overall environmental impact through promoting renewable energy development and energy efficiency measures. Based on the generic environmental aspects, impacts of the proposed subprojects will be of small scale, localized, and hence short-term in nature. These impacts can be readily mitigated through implementation of applicable mitigation measures that will be proposed. The project is therefore assigned Environmental Assessment Category B.

99. The project is expected to be implemented in selected areas across the country. All project components have environmental aspects that will be addressed through proper environmental assessment. The salient physical characteristics are prominent in the power-distribution lines construction sub-component, which will involve excavations and earthworks, vegetation clearance of both grass and trees, formation of murram bands for pole structures in wetland areas, creation of wetland access paths, establishment of equipment storage areas, land take, displacement of land-users and thus associated compensation. Other aspects relate to the management of residual waste from the solar PV systems, once they reach the end of their life time. Component 2 includes, among other things, the development of three pico hydropower plants (5 kW each) and three micro hydropower plants (16 kW, 20 kW and 45 kW). These are all community-based initiatives and will require construction of weirs. Implementation of these will be coordinated by the PSFU with financing to be shared with private developers – in this case, the user communities. Component 3 includes preparatory studies for the development of other renewable energy resources such as geothermal energy.

100. **Policies**. The following Environmental Safeguard Policies are triggered: (i) OP 4.01 - Environmental Assessment because of the likely localized environmental impacts listed above; (ii) OP 4.04 Natural Habitats because of the likely impacts on natural habitats such as wetlands, and forests; (iii) OP 4.11 - Physical Cultural Resources because of the associated civil works that may have an impact on un-known and known physical cultural resources; and (iv) OP 4.36 - Forests because of the possibility of power lines passing through forested areas.

101. **ESMF**. To manage any likely environmental and social impacts of the proposed project, an ESMF was prepared and disclosed in-Country on July 29, 2014 and at the InfoShop on September 8, 2014. ESIAs for the first two power distribution lines of Kiganda Mile 16 and Ruhumba-Kashwa have been prepared, reviewed, cleared by the Bank and disclosed in country on March 23, 2015 and at the InfoShop on March 27, 2015. The ESMF took into consideration the implementation lessons of the predecessor projects, building in mechanisms to continuously improve the processes of identifying environmental and social impacts of planned activities, planning and implementing mitigation measures, and monitoring and reporting. Consultations with the various stakeholders were adequately conducted and this facilitated the project design. The ESMF provides step-by-step guidance on how to identify and assess potential adverse environmental and social impacts from project activities, and how to plan, implement and monitor measures to mitigate them. Site specific ESIAs shall be undertaken for the remaining 19 lines and Environmental and Social Management Plans (ESMPs) developed during project implementation.

102. **Institutional Capacity to Handle Environmental Safeguards**. The World Bank Environmental, Health and Safety Guidelines, and Electric Power Transmission Distribution guidelines and applicable Ugandan laws such as the Occupational Health and Safety Act, shall be

used to guide implementation of all related environmental health and safety aspects of the project. Currently, there is adequate environmental safeguards human capacity at the IAs to oversee implementation of the ESMF. The REA has two environmental safeguards officers to lead the implementation of the ESMF/ESIA and associated environmental requirements of their project component. The National Environment Management Authority (NEMA) and the ERA will play their respective regulatory roles and their capacity is deemed adequate for institutional set up. In addition, the respective project beneficiary/host district local governments will be involved in monitoring implementation of the environmental and social aspects of the project through their District Environment Officers (DEOs) and the Community Development Officers (CDOs). The participation of the DEOs and CDOs shall be facilitated by the project. However, the Environmental and Social Management System (ESMS) needs to be developed or established and strengthened. This would entail, among others, development of institutional protocols and work procedures for environmental management, health and safety practices, waste and hazardous materials management, stakeholder engagement, and management of RAP implementation process.

G. Citizen Engagement and Beneficiary Feedback

103. The project incorporates beneficiary feedback mechanisms. To ensure that household connections will be implemented effectively, the consumer mobilization consultancy will help inform future and existing consumers on the benefits of electricity use and help them overcome some of the transaction barriers that new consumers may face, such as facilitating internal house wiring, filling out application forms, and understanding usage costs. Their feedback will inform on-the-ground household connection activities to be undertaken. Moreover, the impact evaluation component will seek beneficiaries' views on how the ERT-2 activities impacted their lives. The information to be collected will be used to inform and improve the electrification model. Appropriate indicators to capture the citizen engagement and beneficiary feedback will be discussed by the Government and the Bank during project implementation.

H. World Bank Grievance Redress

104. Communities and individuals who believe that they are adversely affected by a Bank-supported project may submit complaints to existing project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's corporate GRS, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank Inspection Panel, please visit www.inspectionpanel.org.

ANNEX 1: RESULTS FRAMEWORK AND MONITORING
Uganda: Energy for Rural Transformation III (P133312) and GEF Energy for Rural Transformation III (P146876)

Project Development Objective(s)

PDO Statement

The project development objectives (PDO) is to increase access to electricity in rural areas of Uganda.

Global Environmental Objective(s)

The Global Environmental Objective is to increase access to electricity in rural areas of Uganda and reduce greenhouse gas emissions.

Project Development Objective Indicators

PDO Level Results Indicators	Core	Unit of Measure	Baseline (FY)	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1 (FY16)	YR 2 (FY17)	YR 3 (FY18)	YR 4 (FY19)	YR 5 (FY20)	YR 6 (FY21)				
Indicator One: Direct project beneficiaries (Number) (Core)	☒	Number	0.00	100,000	1,000,000	7,100,000	7,400,000	7,600,000	7,600,000	Quarterly	Progress Report	MEMD/REA	Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program; families that have a new piped water connection). Please note that this indicator

													requires supplemental information. Supplemental Value: Female beneficiaries (percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.
Female beneficiaries (Percentage – Sub-Type: Supplemental) (Core)		Percentage	50.00	50.00	50.00	50.00	50.00	50.00	50.00	Quarterly	Progress Report		Based on the assessment and definition of direct project beneficiaries
Indicator Two: People provided with access to electricity by household connections (Number) (Core)	☒	Number	0.00	101,000	274,000	570,000	887,000	1,021,000	1,021,000	Quarterly	Progress Report		This indicator measures the number of people that have received an electricity connection under the project via new connections aimed at connecting households.

													The baseline value for this indicator is expected to be zero.
People provided with access to electricity by household connections – Grid (Number – Sub-Type: Breakdown) (Core)		Number	0.00	71,000	214,000	470,000	737,000	850,000	850,000	Quarterly	Progress Report		
People provided with electricity by household connections – Off-grid/mini-grid – Only renewable sources (Number – Sub-Type: Breakdown) (Core)		Number	0.00	30,000	60,000	100,000	150,000	171,000	171,000	Quarterly	Progress Report		

Global Environmental Indicators

PDO Level Results Indicators	Core	Unit of Measure	Baseline (FY)	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1 (FY16)	YR 2 (FY17)	YR 3 (FY18)	YR 4 (FY19)	YR 5 (FY20)	YR 6 (FY21))				
Tons of CO_2 emission reduced/avoided as a result of the project (tCO_2)		tCO_2	0	0	120,000	240,000	360,000	480,000	600,000	Quarterly	Progress Report		

Intermediate Results Indicators

PDO Level Results Indicators	Core	Unit of Measure	Baseline (FY)	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1 (FY16)	YR 2 (FY17)	YR 3 (FY18)	YR 4 (FY19)	YR 5 (FY20)	YR 6 (FY21)				
Component One: On-grid Energy Access													

Indicator One: Total length of distribution lines constructed under the project (Kilometers)		Kilometers	0.00	0	230	500	1,000	1,850	1,850	Quarterly	Progress Report	MEMD/REA	
Indicator Two: Number of on-grid household connections made under the project (number)		Number	0	12,000	37,000	82,000	129,000	150,000	150,000	Quarterly	Progress Report	MEMD/REA	
Indicator Three: Number of off-grid household solar system installations made under the project (number)		Number	0	5,000	10,000	17,000	26,000	30,000	30,000	Quarterly	Progress Report	MEMD/REA	
Component Two: Off-grid Energy Access													
Indicator Four: National standards for Pico PV Systems adopted by UNBS		Yes/No	No	No	Yes	Yes	Yes	Yes	Yes	Quarterly	Progress Report	REA/UNBS	
Indicator Five: National standards for Solar Lanterns adopted by UNBS		Yes/No	No	No	No	Yes	Yes	Yes	Yes	Quarterly	Progress Report	REA/UNBS	
Indicator Six: Number of rural schools with solar PV systems installed		Number	0.00	0	50	100	100	100	100	Quarterly	Progress Report	PCU/MoES	
Indicator Seven: Total installed capacity of solar PV systems installed at rural schools		kWp	0	0	85	169	169	169	169	Quarterly	Progress Report	PCU/MoES	
Indicator Eight: Number of rural health centers with solar PV systems installed		Number	0.00	0	30	276	276	276	276	Quarterly	Progress Report	MoH	
Indicator Nine: Total installed capacity of solar PV		kWp	0	0	27	250	250	250	250	Quarterly	Progress Report	MoH	

systems installed at rural health centers													
Indicator Ten: Number of rural water pumping stations with solar PV systems installed and total installed capacity		Number	0.00	0	0	15	15	15	15	Quarterly	Progress Report	MoWE	
Indicator Eleven: Total installed capacity of solar PV systems installed at rural water pumping stations		kWp	0	0	0	200	200	200	200	Quarterly	Progress Report	MoWE	
Indicator Twelve: Number of pico and micro hydro power generation projects completed.		Number	0	0	0	0	2	4	6	Quarterly	Progress Report	PSFU	
Indicator Thirteen: Amount of credit and guarantee extended to Participating Financial Institutions (cumulative)		US$ million	0	1.5	3.0	5.0	7.5	8.5	8.5	Quarterly	Progress Report	UECCC	
Indicator Fourteen: Amount of credit and guarantee extended to project beneficiaries by Participating Financial Institutions (cumulative US$ million equivalent)		US$ million	0	1.5	3.0	5.0	7.5	8.5	8.5	Quarterly	Progress Report	UECCC	
Component Three: Institutional Strengthening and Impacts Monitoring													
Indicator Fifteen: Completion of a preparatory study		Text	Not completed	Not completed	Completed	Completed	Completed	Completed	Completed	Once	Geothermal Study	MEMD	

for geothermal development													
Indicator Sixteen: Completion of the impact evaluation for ERT-2	☐	Text	Not completed	Not completed	Not completed	Completed	Completed	Completed	Completed	Once	Impact Evaluation Report	MoFPED	
Indicator Seventeen: Completion of a systematic review of the new electrification model		Text	Not completed	Not completed	Completed	Completed	Completed	Completed	Completed	Once	Electrification review study	MEMD	

ANNEX 2: DETAILED PROJECT DESCRIPTION

Uganda: Energy for Rural Transformation III and GEF Energy for Rural Transformation

A. Background of the ERT Program

1. The long-term objective of the rural electrification program is to develop and increase access to modern forms of energy in rural Uganda and thereby facilitate improvements in the productivity of rural enterprises and the quality of life of rural households. In 2001, Uganda did not have sufficient capacity nor an appropriate institutional framework for commercially oriented rural electrification and renewable energy development as envisaged in the Program. The ERT program was formulated to address these issues through long-term engagement and to create a conducive regulatory environment for private sector participation. The design of Phases I and II of the program thus focused on introducing a private sector-led commercially-oriented rural electrification expansion plan.

2. The ERT APL was approved by IDA in 2001. The GEF Council also approved the ERT as a vehicle of its first Strategic Partnership. As a result, the ERT program was established as a series of three projects with financing plans that were subsequently revised because of increase in demand as shown in the Table 1 below:

Table 1: Phased Financing of the Program

APL Phase	IDA Allocation (US$ mil)		GEF allocation (US $ mil)	Total (US$ mil)
	Original	Revised/Proposed		
APL 1 (ERT)	49.15	49.15	12.12	61.27
APL2 (ERT-2)	45.00	75.00	9.00	84.00
APL 2 (ERT-2 AF)	-	12.00	-	12.00
ERT-3 (IPF)	71.00	135.00	8.20	143.2
	165.15	271.15	29.32	300.47

3. The first phase of the Program was designed to start small for investment, while building the necessary capacity and the institutional framework on the assumption that the pace of investment would pick up during the subsequent phases (ERT-2 and ERT-3). ERT-1 supported the creation of electricity sector entities: the ERA and the Rural Electrification Fund (REF); and also helped develop capacity at supporting institutions such as the MEMD, REA, and REB. The objective was to create an enabling institutional environment for private sector investment in the Ugandan energy sector.

4. The design of project activities underwent several changes during the earlier phases to incorporate lessons learned from implementation and to respond to the evolving policy context. Under ERT-1, two years into the project, the MEMD engaged a project coordinator, who had acted as a focal point for project oversight and supervision, maintained a consolidated project tracking system, and addressed project implementation challenges as they arose. Moreover, responding to the power crises in Uganda, GEF funds were used to finance the purchase and distribution of energy efficient lighting that helped reduce demand on the Ugandan electricity system.

5. Subsequently, during the design of ERT-2, the GoU adopted a more commercially oriented approach and intended to play the role of a market enabler and promulgated RESP-1 (2001-2010). The main elements of the policy platform that supported implementation of this strategy were: (i) a level playing fields for private sector participants; (ii) an enabling regulatory framework; (iii)

cost recovery and cost reflective tariffs; and (iv) well-targeted subsidies. However, during early stages of ERT-2, it became evident that there was little appetite from private sponsors to accept the risks associated with investment in rural electrification. The main reasons for the unsatisfactory performance during RESP-1 have been attributed to: (i) the unclear roles and responsibilities of the different agencies responsible for increasing access; (ii) the limitation for expanding services under the initial concessions; (iii) insufficient incentives for the SPs to increase access particularly amongst the rural poor; (iv) the underestimation of the initial capitalization requirements of the SPs and their slow development of managerial and operational expertise; (v) high cost of internal house wiring and service connections (on average US$200 per connection), and the requirement for consumers to pay the connections charges upfront; (vi) the absence of any organized efforts to mobilize and sensitize rural households about the benefits of electricity usage; and (vii) ineffectual delivery mechanisms for the solar PV programs.

B. Rural Electrification Strategy and Plan 2013-2011 (RESP-2)

6. To address the above issues, the GoU articulated RESP-2, which was approved by the Cabinet in July 2013. RESP-2 envisages to address the key access barriers identified, and ultimately pave the way for reaching the development goals of Uganda's Vision 2040 and the SE4ALL initiative (Box below). RESP-2 takes into account the lessons learned from implementation of RESP-1 and analysis of other constraints that resulted in unsatisfactory access levels. Essentially, the policy adjustment measures for increasing connections include the following:

(i) **Roles and responsibilities for program implementation, investment, and O&M are being defined.** Under RESP-2, planning and management of rural electrification are centralized under the REA. The Lease Agreements between the REA and SPs[28] define the ST areas, establishes the rights and obligations of the REA and the SPs, and include monitorable performance targets (with appropriate penalty and bonus clauses) to be evaluated each year. Moreover, the REA enters into Maintenance and Operations contracts with the UEDCL for the management of distribution networks in in their STs.

(ii) **Concessions are now expanded to cover the entire country.** In contrast with the concessions based on individual distribution lines under RESP-1, all potential customers now fall under an ST under RESP-2. As the Umeme network intersects every ST except West Nile, electricity wheeling arrangements are in place between Umeme and other SPs. The interface between the Umeme footprint and other SPs needs coordination between the SPs operating in the contiguous areas. A map of the STs created through RESP-2 is in Annex 9.

(iii) **Incentives for private SPs to increase access is taken into consideration**. In the past, private SPs who operated distribution lines on concessions had limited incentives to connect households. In the case of Umeme: (i) customer connection is not part of the KPI under their existing concession license; (ii) there is a cap on capital expenditures to cushion their impacts on the retail tariff, which discourages the company from investing in new connections; (iii) there is a cap on Umeme's O&M expenditures that

[28] The Lease Agreements with three SPs (KIL, BECS, and PACMECS) were concluded. The Lease Agreements with the remaining two SPs (FESL, and KRECS) will be completed by December 2015. For Umeme and WENRECO, the REA will conclude Implementation Agreements as the UEDCL will be the asset owner.

discourages the company from connecting low consumption households; and (iv) the removal of the "growth factor," which allowed the company to retain revenues exceeding the previous year's sales. The project addresses these issues by: (a) establishing customer connection targets for households under the project (project will not finance connections for commercial and industrial customers, which will be financed by Umeme's regular arrangements); and (b) distinguishing capital expenditures and O&M expenses for project-related activities from the existing revenue requirement for tariff calculation. In the case of other SPs operating outside the Umeme footprint, the incentives for connection under RESP-2 include: flexibility in planning the network expansion within their STs through master plans, which would give them the opportunity to connect new customers; increases in areas of operation which would allow enlarged customer base; adequate tariff to cover operating costs; and additional bonuses in case they exceed connection targets under the Lease Agreements with the REA. Moreover, the cost pressure from serving the areas with relatively low electricity consumption is absorbed by the REA's publicly-funded investment in expanding the distribution lines.

(iv) **Capital and capacity requirements of the SPs will be strengthened.** The SPs have varying degrees of experience and implementation capacity, ranging from the well-established distribution utility to cooperatives that are relatively new to the electricity supply business. The REA has established a department dedicated to the SPs' development, which will be staffed with utility experts. Depending on the capacity needs of the SPs, the REA will plan and provide appropriate support mechanisms, including TA and in-kind contributions and leasing of equipment during the early stage of implementation, which would also mitigate the working capital constraints of the SPs. The project will support strengthening of SPs' implementation capacity during the initial years.

(v) **Affordability of connection costs will be addressed.** A consumer financing arrangement for household connections will be established to ensure affordability of connection. Under the proposed scheme, the GoU will pre-finance cost of connections and consumers are expected to pay back the cost of connection (and ready board and earthing for those who cannot afford house wiring themselves). It will fund the connection costs, including service drops (electric meters, service connection cable, and accessories) and ready boards[29] in case customers cannot afford internal house wiring costs. Households who opt for this financing scheme will be required to repay these costs over a period not exceeding 60 months through deductions from their energy purchases. The interest-free repayment will be collected by participating SPs for onward remittance to a REA-managed revolving fund that will continue to fund connections beyond the closing of the Project. This financing arrangement will help remove affordability barriers for household connections by: (i) limiting the upward pressure on retail tariffs as the connection costs will not be part of the capital

[29] A ready board is a pre-manufactured distribution board that acts as a termination for the incoming electricity supply from utility. It consists of a built-in switch, socket outlet, light bulb, and/or a meter. The use of a ready board can dispense with the need for internal house wiring, and thereby provide a lower cost wiring option for low income households. It also provides uniform technical and safety standards for connection of new households, which facilitate inspection by the utility during installation phase.

expenditures to be recovered through the tariff; (ii) improving affordability of connection and wiring costs by allowing installment payments; and (iii) allowing a standardized treatment of connection charges across the STs irrespective of funding sources. The financial mechanism will initially be applied to no-pole connections, due to budget constraints, with a possibility of future extension to more than one-pole connections. The proposed mechanism will accommodate contributions for connection works from the GoU and development partners.

(vi) **Consumer sensitization and mobilization programs are being implemented and will be continued under the project.** The REA has initiated, under the on-going ERT-2 project, consumer sensitization and mobilization programs to help prospective electricity consumers acquire electricity connections. This is done through consultants commissioned to proactively disseminate information about benefits of electricity supply, connection application processes, and house wiring and testing. Additionally, the consultants will help consumers complete connection application forms and submit them to the SPs. These sensitization and mobilization activities will be continued under the proposed project.

(vii) **A market-driven approach to off-grid energy access is emerging that can scale-up energy services for off-grid customers.** In the last three to four years, several companies have emerged in Africa, India, and Latin America and quickly amassed over 150,000 SHSs customers with affordable rent-to-own or fee-for-service plans. The emergence of this new breed of companies may be attributed to three recent developments, which they appear to have taken full advantage of: (i) the drop in international module prices, which continues;[30] (ii) advances in pico solar, LED and "super-efficient" appliances;[31] and (iii) the widespread growth of "mobile money" financial transactions. These companies are working capital-intensive businesses, and maintain significant amounts of inventory and receivables. Their scale-up is therefore constrained by access to working capital financing. In Uganda, despite the recent gains made by REA with the PVTMA mechanism under the on-going ERT-2 project, several implementation problems limited the pace of installation of SHSs. It is estimated that about 80 percent of the market growth took place outside the PVTMA scheme.[32] A Solar PV Options Study undertaken by the REA in 2014 recommended that the proposed project should focus on enforcement of product standards and working capital support for solar companies to scale-up off-grid access.

[30] Module prices in 2014 at about US$2.50 per Wp are half of what they were in 2008.
[31] Initiatives such as the Clean Energy Ministerial with its Global LEAP Outstanding off-grid Appliance Awards have pushed the efficiency of DC appliances, including LED TVs, to unprecedented levels.
[32] Estimates in the Solar PV Market Assessment Study (2014) and Solar PV Options Study (2015).

Sustainable Energy for All (SE4ALL) in Uganda

The SE4ALL initiative was launched in 2010 by the United Nations (UN) Secretary General to achieve three inter-related goals by 2030: (i) universal access to modern energy services; (ii) doubling the rate of improvement in energy efficiency; and (iii) doubling the share of renewable energy in the global energy mix.

Uganda's overall energy policy complements the objectives under the SE4ALL initiative and aims at meeting the energy needs of the population for socioeconomic development in an environmentally sustainable manner. The country is in the process of finalizing the Action Agenda to achieve the following national targets corresponding to each of the goals under the SE4ALL: (i) 98 percent of population with electricity access; (ii) 99 percent of population with access to modern cooking solutions; (iii) 3.5 percent per year improvement in energy intensity; (iv) 90 percent share of renewable energy in final power consumption; and (v) 36 percent share of renewable energy in thermal energy consumption.

Based on the rapid assessment and gap analysis and stakeholder consultation the Action Agenda prioritizes access acceleration though grid and distributed solutions, especially for the bottom of the pyramid (e.g., community solar kiosks, SHSs, and mini grids), clean cooking solutions, sustainable fuels (e.g., green charcoal initiative), improved planning and investment in renewable energy, and strengthening institutional framework for energy efficiency.

Uganda's SE4ALL Secretariat will lead the implementation of the Action Agenda in three phases – transition (2014-2018), consolidation (2018-2022), acceleration (2022-2030). During the first phase, the existing approach and all interventions in the energy sector will be adapted and aligned with the SE4ALL framework. Consolidation in the second phase will involve implementation of an updated Action Agenda to meet targets using approach framework put in place in the previous phase. Adapting to lessons learned under the mid-term review undertaken in the consolidation phase, the third phase will accelerate successful strategies and processes to achieve targets under each of the three SE4ALL objectives.

To meet the universal access to modern energy services the GoU will need to accelerate the rate of new connections, which is currently over 60,000 per year, to over 500,000 per year from now to 2030. The corresponding estimated cost for Uganda to offer universal electricity access is approximately US$5 billion.

C. **RESP-2 Implementation**

7. Implementation of RESP-2 is expected to cost close to US$1 billion. According to the initial plan, the GoU is the largest financier of the program by committing about US$487 million from its internal resources (transmission levy and national budget). The latest Medium Term Expenditure Framework (FY2014-19) allocates approximately US$100 million for rural electrification from the Consolidated Fund (national budget). To meet the financing gap, the GoU is in discussions with development partners. Several development partners have expressed interest in providing financing under the ERT umbrella, and the proposed project can support the Government in catalyzing additional resources. Coordination among the development partners is maintained through the EMDPG, which meets on a monthly basis.

Table 2: RESP-2 Financing Plan (2013-2022)

Funding Source	Initial Plan	Updated Projection (April 2015)
	US$ Mn	US$ Mn
GoU - 5% Transmission Levy	329	329
GoU - Consolidated Fund (National Budget)	158	42
IDA - World Bank	112	153
GEF - World Bank	11	8
United States Agency for International Development (USAID)	10	0
Japan International Cooperation Agency (JICA)	14	10
African Development Bank (AfDB)	10	100
Kuwait Fund for Arab Economic Development	20	0
Government of Norway	72	40
Saudi Fund for Development	31	11
Arab Bank for Economic Development in Africa (BADEA)	79	25
Islamic Development Bank	40	131
Government of China	20	0
French Development Agency (AFD)	10	45
Organization for the Petroleum Exporting Countries (OPEC)	20	25
Germany - KfW	18	15
EU	0	21
Repayments from ST concessionaires	0	0
Any surplus income from operations of the ERA	0	0
Total	954	955

8. The REA is the primary agency responsible for implementing and achieving RESP-2 targets. Implementation of RESP-2 will need to be closely coordinated with other sector stakeholders, including the MEMD, ERA, and SPs.

9. **Distribution sub-sector.** The country is divided into 14 STs that are operated by eight SPs, including the Umeme service footprint. UETCL supplies electricity to the electricity distribution SPs at a BST. Most electricity distribution assets are owned by the public sector except in the West Nile region where the current isolated network (distribution and generation) is owned by a private SP (WENRECO[33]). In the main grid covering the remaining STs, Umeme operates the distribution assets owned by the UEDCL, which extends to over 90 percent of the main grid including major load centers. Most new distribution lines are constructed and owned by the REA and are operated by the remaining SPs.[34] In the STs without designated SPs, the UEDCL acts as an SP of last resort in the interim. The UEDCL therefore has a dual role to act as the asset owner for the Umeme footprint and to operate the areas without assigned SPs on an interim basis. As the Umeme network intersects every ST except West Nile, electricity wheeling arrangements are in place between Umeme and other SPs. Accordingly, there are two SPs (Umeme and another SP assigned)

[33] WENRECO: West Nile Rural Electrification Company.
[34] BECS, FESL, KIL, KRECS, and PACMECS.

operating in most of the STs. This increases the need to coordinate network planning, O&M, and service quality (Box below).

Coordination Needs for SPs Operating in a Contiguous Area

According to the ST arrangements under RESP-2, most of the new development within an ST consists of a large number of scattered extensions, in the order of 20 to 50, each consisting of a small length (approximately 10 to 20 km). In such an arrangement, there is a need to strengthen coordination between the main SP and the peripheral service provider. The REA is expected to strengthen its planning and coordination role to address the need for coordination briefly summarized below. The project will provide TA to support the REA perform such roles.

Operational issues: The peripheral SP is dependent on the network of the main SP. For any load shedding the main SP could cut off the peripheral SP lines. Moreover, if the voltage falls with increasing load over the years on the main SP lines, the peripheral SP has no recourse. Operating the network, including simple meter reading can pose a challenge for the peripheral SP as it has a scattered number of small systems spread out over the entire area. How it will set up consumer service centers, 'trouble call' operations, or maintenance depots remains a major logistical challenge and, if done properly, will involve costs many times more than if these lines belonged to the main SP.

Costs: Each connection point will require equipment for connecting and disconnecting the new lines and equipment for billing meters at every interface point. These are substantial costs.

Network planning issues: The peripheral SP cannot plan independently for any network strengthening to meet future loads. It is also difficult for the peripheral SP to plan for any future extensions from other network points of the main SP lines. The bulk of the MV network belongs to the main SP and it is the main SP who can effectively plan any distribution network development.

Clash of interests: In situations like this there is a possibility of clash of interests between the main SP and peripheral SP. The main SP may build lines in parallel and some distance away from that of the peripheral SP and try to feed any new large loads which may come up in the future.

Legal and regulatory issues: There is a question as to whether the main SP can be forced to provide supply at each such point to the peripheral SP. For creating new distribution service providers the logical principle is that they have access to at least one grid substation supply point and a sufficiently large supply area to be able to plan an independent self-sustaining network.

Table 3: Service Territories and Service Providers

Service Providers	In Operation since	Selection	Service Territories	No. of Staff	No. of Customers	Energy Sold (MWh)	Energy Losses (%)	Distribution Lines (33/11kV) (km)	Low Voltage Lines (km)
Bundibugyo Energy Cooperative Society (BECS)	2009	Cooperative, directly appointed	Rwenzori	14	4,013	1,480	17%	138	64
Ferdsult Engineering Services Limited (FESL)	2007	Concession, competitively selected	South Western	11	17,642	3,492	27%	273	210
			North Western	20		6,028	30%	2,563	n.a.
			Southern	15		3,905	25%	1,507	n.a.
Kilembe Investments Limited (KIL)	2009	Concession, PPP	Western	17	6,450	2,799	23%	130	185
Kyegegwa Rural Electric Cooperative Society (KRECS)	2013	Cooperative, directly appointed	Central	13	1,461	n.a.	n.a.	155	n.a.
Pader-Abim Community Multipurpose Electric Cooperative Society Limited (PACMECS)	2009	Cooperative, directly appointed	Northern	10	1,842	1,250	37%	156	55
Uganda Electricity Distribution Company Limited (UEDCL)	2001	Public & interim SP	Eastern	n.a.	6,091	n.a.	n.a.	n.a.	n.a.
			North North Western	n.a.		839	11%	n.a.	n.a.
			Central North	n.a.		598	55%	n.a.	n.a.
			Mid-Western	n.a.		n.a.	n.a.	n.a.	n.a.
			North Eastern	n.a.		1,112	27%	n.a.	n.a.
Umeme Limited	2005	Concession, competitively selected	Umeme ST	1,375	651,000	2,118,000	24%	11,184	15,018
West Nile Rural Electrification Company (WENRECO)	2003	Concession, PPP	West Nile	n.a.	6,278	n.a.	n.a.	n.a.	n.a.

10. **REA's Status**. The 1999 Electricity Act stipulates that the Government promote, support, and provide rural electrification programs through public and private sector participation. It mandates the MEMD to prepare a sustainable and coordinated RESP. The Act also mandates the MEMD to establish the REF and through statutory instrument make regulations for the management of the Fund. With support from the ERT-1, the REA was established under the statutory instrument (Establishment and Management of the REF) in 2001 and the first RESP covered the period between 2001 and 2010. The REA has evolved into a key institution for planning and management of the rural electrification program. In January 2009, the REA completed the IREMP, which was aligned to the Power Sector Investment Plan, and identified priority investments for rural electrification. The IREMP will be replaced and an appropriate master planning process will be followed to support achievement of the GoU's electrification goals.

11. To accelerate the pace of connection to electricity services for rural households, RESP-2 plans to reconstitute the REA into a more autonomous, specialized government authority under the overall supervision of the MEMD. Article 5.1.2 of RESP-2 states that "[…] the Statutory Instrument pertaining to the formulation of the REA will be amended to reconstitute the REA as an autonomous authority of the Government […]". Its Board (the REB) will assume enhanced fiduciary authority and responsibility for directing the REA program and will be responsible for supervising REA management. The REF will be a consolidated repository for all government-sponsored rural electrification investment financing. In accordance with RESP-2, the GoU plans that the REA will eventually evolve into a legal entity, which would allow it to own assets, to enter into public-private partnership arrangements as needed, and to generate revenue streams. This will be discussed as part of the review of power sector reforms currently underway.

12. **Asset Ownership**. Over the past 10 years, the GoU has invested significant amounts for the development of rural electrification infrastructure. This included construction of distribution lines (33 kV and below), sub-stations, network intensification and expansion. The ERA and REA maintain that all assets built by the REA in the Umeme ST and the West Nile ST are reflected in the UEDCL's books of accounts. This is in accordance with the Lease and Assignment Agreement between the UEDCL and Umeme. All new distribution network assets constructed by the REA within the West Nile area will be transferred to the UEDCL upon completion. All other assets built in other STs are owned by the REB and included in the REF's books of accounts as fixed assets.

13. **Consumer Connections in the Umeme ST**. Over the past years, Umeme has increased its annual connection rate from around 2,000-6,000 per year in the period between 2006 and 2008 to over 50,000 per year since 2009 (61,000 in 2013 and about 76,000 in 2014). For the company to scale-up its connection efforts, there are several challenges to overcome: (i) electrification rate (or customer connection) is not a the KPI under their existing concession license; (ii) there is a cap on capital and O&M expenditures (as Umeme makes a rate of return on the investment made (net of depreciation)) to cushion their impacts on the retail tariff; and (iii) the decision by the ERA to abolish the "growth factor," which would otherwise have provided some incentive for increasing sales. The project will address this issue by (a) agreeing on a customer connection targets, (b) ring fencing capital expenditures and O&M expenses from the revenue requirement in the tariff calculation, (c) reviving the growth factor, and (d) agreeing on connection targets consisting of a mixture of commercial and household customers.

14. **Essential Implementation Arrangements.** The long-term sustainability of the new approach requires the formalization of SPs roles and responsibilities in the expanded area of operation, conclusion of the essential implementation arrangements, and improvement of their financial viability.

- **Electricity Distribution and Sales Licenses**. Distribution Licenses are provided by the ERA under the provisions of the 1999 Electricity Act. Licenses stipulate licensee obligations, including operation of the distribution network, distribution network facilities, access and connection to distribution network facilities, electricity metering, accounting and reporting, distribution and retail sale tariff, and service cost calculation methodology. Tariffs applied for distribution network are stipulated in a license and connection and other charges are also attached. Business Plans, tariff proposals, connection and other charges, and Lease Agreements therefore constitute an integral part for its approval. All the eight existing SPs (BECS, FESL, KIL, KRECS, PACMECS, UEDCL, Umeme, and WENRECO) have distribution licenses for the current institutional arrangements. Their licenses will need to be amended to cover the new expanded networks.
- **Tariff Proposals**. Electricity Distribution and Sales Licenses include the BST, approved distribution retail sales tariffs for domestic and commercial consumers, approved distribution loss targets, and applicable wheeling losses. In principle, approved tariffs should recover costs, and proposals are reviewed by the ERA, taking into consideration the individual operating costs of each SP including system operating and administrative expenses, approved capital expenditure recovery through a depreciation allowance, financing costs, and/or an established rate of return on capital invested corresponding to the investments made by the SPs. Due considerations are given to regional parity.
- **Lease Agreements**. Lease Agreements are ten-year contracts signed between REA and SPs. They stipulate the obligations of the SPs in relation to the REA to provide electricity services within the assigned ST and to manage the power system. The SPs are expected to manage and connect the pre-agreed number of consumers. The SPs are expected to pay Lease Fees for the use of assets owned by the REA. On the other hand, the REA hands over its assets within the designated ST to an SP assigned for the ST. The REA also monitors the annual performance of the SPs and penalties are imposed for non-performance. The SPs are expected to manage assets entrusted to it, provide O&M services, manage repairs and extensions to the systems, charge and collect fees and tariffs for services provided, and maintain records. Three Lease Agreements are concluded (BECS, KIL, and PACMECS).
- **UEDCL Management and Operation Agreements**. In the STs where SPs are not yet assigned, the UEDCL will manage and operate the distribution of networks on an interim basis. The agreements stipulate the rights and obligations of the UEDCL to manage and maintain REA-owned distribution networks. The areas include (i) Eastern, (ii) North North Western, (iii) Central North, (iv) Mid-Western, and (v) North Eastern. To date, all five agreements have been conclude, and four distribution licenses from the ERA have been issued. The remaining license (Eastern) is expected by June 2015.
- **Umeme Implementation Agreement**. Umeme currently has Lease and Assignment Agreement with the UEDCL to manage the distribution networks owned by the UEDCL on its behalf. For the assets owned by the REA, a separate Implementation Agreement will

be concluded between the REA and Umeme to stipulate terms and conditions as well as rights and obligations of each party.

- **Other Agreements**. Other than these agreements, the SPs will enter into, among others, energy sales agreements with the UETCL for sales and purchase of electricity, and wheeling agreements with Umeme for wheeling arrangements using Umeme-managed distribution networks.

D. Project Description

Component 1: On-grid Energy Access (US$144.6 million: US$115 million equivalent IDA, US$29.6 million GoU)

15. This component covers on-grid investments to be implemented by the REA. On-grid investments will finance all on-grid activities, including grid system expansion/intensification and on-grid household connections. This component will be mostly implemented by the REA.

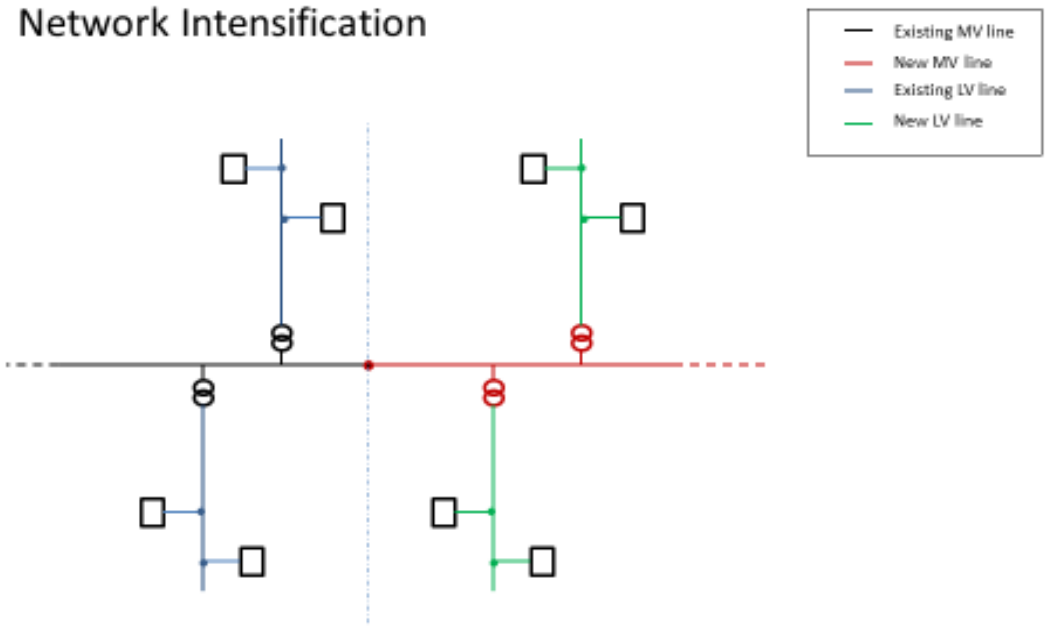
1-1. Grid Extension and Associated Connections (US$99.2 million: US$80 million equivalent IDA, US$19.2 million GoU). This sub-component includes the construction of 21 distribution grid extension projects that span over 1,800 km (Table 4 below) and associated connections. These lines have been identified by the Government as priority investment for expanding rural access and were selected based on the IREMP prepared in 2009, which employed surveys and consultations to identify lines that would serve areas with high economic development and access potential. The list of distribution lines is indicative and it may change during project implementation. Implementation of the feasibility studies, ESIAs, and RAPs for the 21 lines has already commenced with funding from the GoU and the on-going ERT-2 project. The project will fund household connections and basic wiring methods (ready boards) associated with the sub-component to alleviate consumer affordability barriers. Household consumers whose connection and internal wiring costs are prefunded by the project will be required to repay, in installments, the full costs over a period agreed with the GoU/REA. The project will not fund last-mile connections for commercial and industrial customers.

Table 4: Proposed Grid Extension projects

Service Providers	Service Territories	New Distribution Lines under ERT-3	Length (km)	DL Constr. Cost (US$M)	Target Connection in ST under ERT-3	Total Cost per Connection (US$/#)
Bundibugyo Energy Cooperative Society (BECS)	Rwenzori	Karugutu-Ntoroko	**55.0**	**1.7**	6,765	1,272.8
Ferdsult Engineering Services Limited (FESL)	South Western	Rukungiri-Bugangari-Mirama-Rweshama	**80.0**	**2.8**	9,840	573.0
	North Western	Mubende-Kyabayanga-Karuguza-Nyamarunda-Kitoro -Kateete	134.0	6.2	2,680	2,401.9
		Kiyagara-Bwizi-Ntara-Bwensamba	87.5	3.4	1,750	2,062.3
		Sub-total	**221.5**	**9.6**	4,430	2,267.7
	Southern	Mitemula-Nakiyaga-Kyanamukaka-Baale Landing site	125.0	5.9	2,500	2,459.2
		Rukoni-Bugamba-Ngugu	30.0	1.3	3,300	437.9
		Sub-total	**155.0**	**7.2**	**5,800**	1,770.9
Kilembe Investments Limited (KIL)	Western	-				
Kyegegwa Rural Electric Cooperative Society	Central	Kiganda-Mile 16-Kibyamirizi	109.0	5.7	2,178	2,712.1
Pader-Abim Community Multipurpose Electric Cooperative Society Limited (PACMECS)	Northern	-				
Umeme Limited	Umeme ST	Kyabadaza-Maseruka-Kinoni-Mamba	123.0	5.5	2,091	2,726.0
		Nakifuma-Nagojje, Walusibi-Katogo-Mbaliga -Namele &	72.0	4.1	1,187	3,564.4
		Wanale-Budwale	50.0	1.9	4,400	454.5
		Bufuja-Butenga-Butaleja	50.0	1.9	4,400	454.5
		Bubiita-Bukalasi-Mayoka	50.0	1.9	4,400	454.5
		Sub-total	**345.0**	**15.2**	**16,478**	966.8
West Nile Rural Electrification Company (WENRECO)	West Nile	Wandi-Yumbe-Moyo	304.3	11.3	3,634	3,274.9
		Onduparika-Odramachaku-Abiria	41.5	1.8	1,456	1,278.2
		Sub-total	**345.8**	**13.1**	**5,090**	4,035.6
Uganda Electricity Distribution Company Limited (UEDCL)	Eastern	Kibaale-Namutumba-Mazuba	82.0	3.2	7,216	467.2
		Busitema-Busia	40.0	1.5	3,520	454.5
		Kabowa-Lumuli-Jinja	35.0	1.3	3,080	454.5
		Sub-total	**157.0**	**6.1**	**13,816**	675.5
	North North Western	-				
	Central North	Dokolo-Tirir-Otuboi-Acuna	111.0	4.7	4,207	1,177.6
		Ngeta-Ayala-Aler-Alito-Ogur	103.0	5.1	3,904	1,351.9
		Sub-total	**214.0**	**9.8**	**8,111**	1,626.6
	Mid-Western	Ruhamba - Kashwa with T-off to Rwebishuri	123.0	5.0	13,530	385.0
		Kagongo-Rwenshuri-Rwenkooba	54.0	2.5	5,907	442.0
		Sub-total	**177.0**	**7.5**	**19,437**	554.7
	North Eastern	-				
			1,859.3	**78.7**	**91,945**	1,379.5

1-2. Grid Intensification and Associated Connections (US$29.5 million: US$25 million equivalent IDA, US$4.5 million GoU). This sub-component includes short extensions to the MV and LV network to reach potential customers who are relatively close to the existing grid and associated connections. Implementation of the sub-component will be in two ways: (i) turnkey contracts for both extensions and connections implemented by the REA on behalf of the SPs, and (ii) framework contracts between the REA and SPs allowing the SPs to identify, package, and implement extensions and connections in their respective networks.

Figure 1: System Intensification



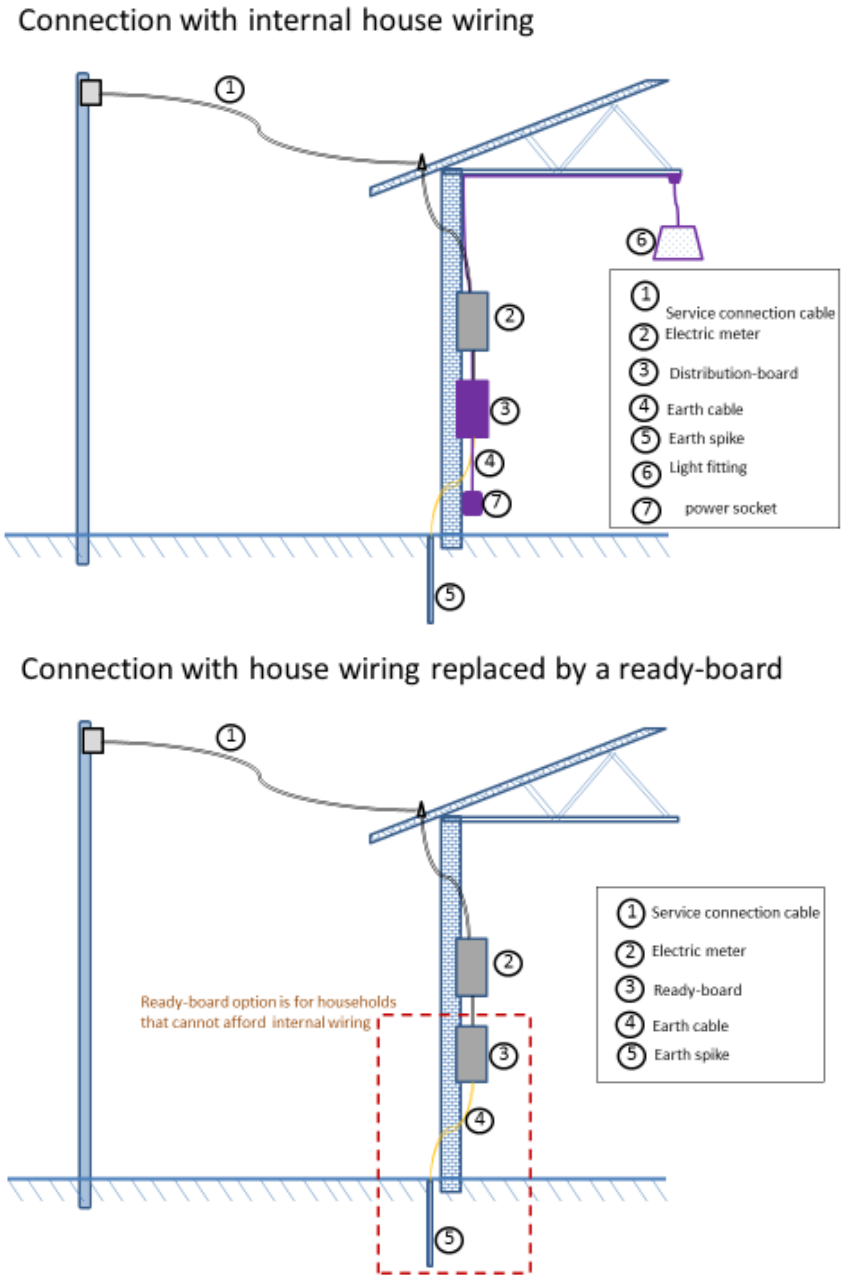
Network intensification involves short grid extensions in areas with existing electricity networks to enhance network coverage and reach.

1-3. Household Connections from Existing Lines (US$10 million: US$5 million equivalent IDA, US$5 million GoU). This sub-component will finance "last-mile" connections and basic low-cost internal wiring for household consumers not covered under sub-components 1-1 and 1-2. Both sub-components 1-1 and 1-2 will extend LV network and utility poles to reach potential customers. This sub-component, in contrast, will finance customers within the "no pole connections" distance (i.e. within 35 meters that can be covered by service connection cables) from the existing network. The REA and the SPs will ensure that the connections to be supported under this sub-component will not duplicate other existing support schemes, such as OBA.

The SPs will identify target households for no-pole connections in their master plans to be agreed with the REA. In the Umeme footprint, Umeme will identify no-pole connections within its footprint, and will implement household connections. Outside Umeme, the REA will manage turnkey contracts to implement connection activities. In either case, the REA will verify the connections and physical installation of the equipment. The approach to be taken for each SP will

be determined by REA, in consultation with the Bank, after the SPs' technical, financial and procurement capacity to carry out such activities is assessed in the Implementation Agreements.

Figure 2: Household Connection with Internal Wiring or Ready Board



To ensure affordability of connection charges for consumers, the GoU will pre-finance the cost of connections. Consumers are expected to pay back the connection charges (and ready board and earthing for those who cannot afford house wiring themselves) over a period. Key design parameters are as follows:

- **Ownership**. The ownership of assets up to service drop, meters, and ready boards remains with the GoU.

- **Scope**. The financing arrangements will be applied initially to no-pole connections. In case households prefer ready boards in lieu of house wiring, this could also be financed under the scheme.
- **Repayment Period**. Consumers are expected to repay the connection fees over a period of up to 60 months.
- **Credit Risk Management**. Credit risk will be assumed by the GoU.
- **Collection**. For efficient handling of the repayment collection, management information systems will need to be installed for the REA and SPs to handle billing and collection of the connection fees.
- **Cost Reduction**. Cost reduction measures for connection will be pursued, including: community-based consumer mobilization; low-cost technology standards for connection; and batch-based procurement of connection materials.
- **Connection Cost Financing Policy**. It is expected that the proposed consumer financing scheme will be described as a policy. It was agreed that (a) the Recipient, through MEMD, will submit a letter of commitment to the Association by October 1, 2015, confirming that the policy on public financing of electricity connection costs for household consumers will be approved by the Government; and (b) the Recipient, through MEMD, will submit to the Association by March 31, 2016, the policy on public financing of electricity connection costs for household consumers (the submission under (b) will be a dated covenant).

This financing arrangement will help remove affordability barriers for household connections by: (i) limiting the upward pressure on retail tariffs as the connection costs will not be part of the capital expenditures to be recovered through the tariff; (ii) improving affordability of connection and wiring costs by allowing installment payments; and (iii) allowing a standardized treatment of connection charges across the STs irrespective of funding sources. The proposed mechanism will accommodate contributions for connection works from the GoU and development partners.

1-4. Implementation Support for On-grid Energy Access (US$5.9 million: US$5 million equivalent IDA, US$0.9 million GoU). This sub-component will support implementation of the on-grid energy access activities. It includes planning, coordination, and implementation support for the REA, construction supervision, consumer sensitization and mobilization, independent verification of connections, and capacity development for the REA to strengthen its oversight roles in rural electrification. Some of the support provided to the REA will also support the initial capacity building needs for the SPs to accelerate electricity access. A provisional list of activities is given below:

- **Planning, Coordination, and Implementation Support (US$1.9 million: US$1 million equivalent IDA, US$0.9 million GoU):** This sub-component will help the REA plan and coordinate rural electrification activities undertaken by various stakeholders; manage implementation of the proposed grid extension, intensification, and connection; and manage the connection cost financing arrangements. Consulting services, works, and necessary equipment will be procured.
- **Construction Supervision (US$3 million equivalent IDA):** This sub-component will allow the REA to hire consulting services (owner's engineers) to supervise construction works supported under the project.

- **Consumer Sensitization and Mobilization (US$500,000 equivalent IDA):** This sub-component will help inform future and existing consumers on the benefits of electricity use and help overcome some of the transaction barriers that new consumers may face such as facilitating internal house wiring, filling up application forms and understanding usage costs. This will allow the SPs to proactively reach out to the potential customers and to connect new consumers in larger batches rather than individually.
- **Independent Verification of Connections (US$500,000 equivalent IDA):** The independent verification will be undertaken for household connections undertaken by the contractors hired by the REA and/or the SPs to ensure target beneficiaries have access to electricity while ensuring quality.

Component 2: Off-grid Energy Access (US$25 million: US$14.3 million equivalent IDA, US$8.2 million GEF, US$2.5 million GoU).

16. This component covers off-grid energy access, including the installation of solar PV systems for public institutions in rural areas; business development support; provision of credit facilities to enhance electricity access; and quality standards enforcement support. This component will finance necessary consultancy services, capacity building activities, and operations costs. The component will be implemented by several IAs—MoH, MoWE, MoESTS, PSFU, and UECCC—under the coordination of the PCU.

2-1. Institutional PV Solar PV Systems (US$11 million: US$1.8 million equivalent IDA, US$8.2 million GEF, US$1 million GoU). This sub-component will comprise the provision of solar PV systems to public institutions including health centers and schools in remote rural areas, and to water pumping stations in rural growth centers. The sub-component builds on the arrangements and achievement under ERT-2.[35] The criteria for selecting the health centers, schools and water pumping stations will be the same as that followed under the ERT-2, and will be done by respective line ministries. Thereafter, the beneficiary institutions will be confirmed only after mapping the selected sites with REA's grid extension plans. Detailed proposals will be prepared by the IAs for IDA's review and approval before start of the procurement process. Brief details are discussed below:

Health Sector (US$5.1 million: US$0.8 million equivalent IDA, US$4 million GEF, US$0.3 million GoU): The objective of the health component is to improve delivery of health services in rural health centers through increased access to modern energy by installing solar PV systems at 276 rural health centers including staff quarters, serving 5.5 million potential beneficiaries. The total installed capacity is estimated as 250 kWp. The target is to cover all Health Centers IV (HCIV) not connected to the grid and at least 50 percent of the HCIII and HCII in 23 districts.[36] The emphasis on HCIV and HCIII is meant to enable the beneficiary district development capacity to achieve the target for the Millennium Development Goal no. 4 (reduce child mortality), no. 5

[35] Achievements under ERT-2 include provision of access to modern energy through installation of solar energy packages in 522 health centers, serving 8,6 million beneficiaries, 560 post-primary education institutions including 60 computer laboratories (serving 123,000 students), and 29 water pumping stations (serving 190,450 consumers) . The total installed capacity under ERT-2 was 1.6 MW.

[36] Health Centers (HC) categorization: HCII: Preventive, promotive and outpatient curative health services, outreach care (including immunization) and emergency deliveries; HCIII: Preventive, promotive, outpatient curative, maternity, inpatient health services and laboratory services; and HCIV: Preventive, promotive, outpatient curative, maternity, inpatient health services, emergency surgery, blood transfusion and laboratory services.

(improve maternal health), and no. 6 (combat HIV/AIDS, malaria and other diseases). The selection of HCs will be based on the Needs Assessment Study currently being carried out by the MoH. To ensure sustainability of the investments made, care will be taken to address the issues described earlier. The MoH has agreed to allocate budget to cover the cost of maintenance, repair, and replacement of system parts beyond the first five years of operation As in ERT-2, procurement and implementation of the solar PV systems will be carried out by the MoH. Necessary TA, capacity building activities and operation costs will be included.

Water Sector (US$3.7 million: US$0.6 million equivalent IDA, US$2.7 million GEF, US$0.4 million GoU): The objective of the water component is to assist the MoWE improve the water services, in particular for the rural growth centers and small towns, by providing the least cost energy solutions to the communities where water schemes have been or are to be installed. The main benefit will be all year-round guaranteed water supplies to rural communities at affordable tariffs based on the reduction in O&M costs[37] of energy packages that will be used to power water supply systems. Other benefits include: increased water supply coverage, reduced investment, cleaner environment and improved sanitation and health. The scope of the component will be to install 15 solar PV water pumping systems with a total installed capacity of 201 kWp, serving approximately 75,000 consumers. The selection of sites will be based on the Needs Assessment Study with finances to be made available through savings under ERT-2. To ensure sustainability of the investments made, care will be taken to address the issues described earlier. The MoWE has agreed to allocate budget to cover the cost of maintenance, repair, and replacement of system parts beyond the first five years of operation. As in ERT-2, procurement and implementation of the solar PV systems will be carried out by the MoWE. Necessary TA, capacity building and operation cost will be included.

Education Sector (US$2.2 million: US$0.4 million equivalent IDA, US$1.5 million GEF, US$0.3 million GoU): The objective of the education component is to facilitate the improvement of education services in rural areas by providing access to energy to 100 post-primary schools including staff quarters, serving approximately 36,000 students and 6,000 teachers. The installed PV systems will have a total installed capacity of 169 kWp and will allow for evening classes, study groups and ICT teaching, improved security and make it easier to attract and retain qualified teachers in rural communities. The selection of schools will be based on the Needs Assessment Study with finances to be made available through savings under ERT-2. To ensure sustainability of the investments made, care will be taken to address the issues described earlier. The MoESTS has agreed to allocate budget to cover the cost of maintenance, repair, and replacement of system parts beyond the first five years of operation and has developed a preventive plan of action to curb vandalism, which includes: (i) establishment of security committees composed of teachers and students to monitor the security of systems; (ii) increased security at night; (iii) welding of lockable cages for the internal components to prevent ease of access; and (iv) increased sanitization of students and community on the protection of the solar systems. As in ERT-2, procurement and implementation of the solar PV systems will be carried out by the MoESTS. Necessary TA, capacity building activities and operation cost will be included.

2-2. Business Development Support for Rural Access (US$1.5 million equivalent IDA): The proposed activities to be supported under the project include: (i) capacity building for private contractors, electricians, and wiremen; (ii) promotion of organization and self-regulation among

[37] Under ERT-2 reduction in O&M costs resulted in reduced water fee by 40-60 percent.

the solar business; and (iii) provision of electricity for isolated areas through pico/micro-hydro schemes.

Business Development Support to Wiremen, Technicians and Contractors (US$350,000 equivalent IDA): The activities will support field assessment of the business development support and training needs of wiremen, technicians, and contractors; and provide business and financial management training, mentoring and coaching, and market intelligence for the prospective private enterprises.

Organisation and self-regulation of Solar PV Vendors (US$150,000 equivalent IDA): The activities will help strengthen a solar PV association through support for strategic and corporate planning, operationalization of the association's secretariat, and capacity building for the Board and management.

Community-based power generation for access (US$850,000 equivalent IDA): Under the proposed project, the PSFU will focus its support on development of pico and micro hydro projects that have a positive impact and will improve the livelihood of the communities where they are to be developed. A mapping of pico/micro potential will be carried out and cost share support will be provided to eligible projects and project developers for the development of one pico and five micro hydro power projects. All of these are weir structures using Impulse turbines. Details of potential sites are included in Table 5.

Table 5: List of Identified Pico and Micro Hydro Sites

Proposed site	Type	kW	Community Served (households)	No. of Beneficiaries	Distance from Grid
River Kitabona, Kitabona village, Kasese District	Micro	130	250	1,500	9 km
River Tochi, Awiti & Bardyel villages, Gulu District	Micro	26	300	1,800	13 km
Munyanyange stream, Bikone Village, Kasese District	Pico	3	300	1,800	3 km
River Mukimiri, Hamabare Trading Center, Kabarole District	Micro	9.5	100	600	5 km
River Nabuyonga, Bugahene & Rwaso villages, Mbale District	Micro	49	300	1,800	4 km
River Kitegana, Nyambuku Village, Kasese District	Micro	41	150	850	3 km

Operating Expenses (US$150,000 equivalent IDA): The project consultants' fees, and other direct costs required to implement the proposed activities will be covered under the project.

2-3. Financial Intermediation for Rural Access (US$11.5 million: US$10 million equivalent IDA, US$1.5 million GoU). This sub-component will provide demand-side and supply-side financing necessary to facilitate consumers' connection to electricity.

The UECCC was established during implementation of ERT-1 but, due to lack of seed capital, it only became operational during implementation of ERT-2 when an allocation of investments and TA including capacity building and operation cost totaling US$6.6 million was provided. So far, the UECCC been engaging the financial sector through various financial instruments including a solar refinance facility for the PFIs and a risk guarantee instrument which is being negotiated. With the mandate to promote targeted financial solutions towards the electricity sector, the UECCC has attracted funding from other development partners.

The primary focus of the proposed facility under ERT-3 will be to help develop the market for well-performing off-grid solar companies to access the formal financial sector to increase their rate of connections to rural households. Funds extended under the facility will help foster a working relationship between the commercial banking sector and solar companies. The facility is proposed to be extended in the form of a concessional Line of Credit (LoC) from the UECCC to the PFIs with an accompanying repayment guarantee instrument that will cover part of the risk exposures of sub-loans to be assumed by the UECCC at a declining ratio over time. In this way, government funding will help leverage private debt financing into the solar sector. Solar companies benefiting under this component will be eligible based on the soundness of the business models and quality assurance standards. In addition, TA will be provided to the PFIs to develop capacity and tools suitable to solar sector engagements.

LoC and Partial Guarantees (US$8.5 million equivalent IDA): Under the proposed project, US$8.5 million will be allocated for enhancing the existing financial initiative it is piloting in the areas of off-grid energy access.

- **Solar Refinance Facility**. This scheme extends refinancing to participating microfinance institutions/banks for on-lending to financial beneficiaries acquiring solar systems. The UECCC provides concessional financing to the microfinance institutions/banks who will pass on concessional financial terms to the end-users. This scheme primarily targets consumers purchasing solar systems on cash -basis.
- **Working Capital Loans to Solar Companies.** The UECCC will provide solar refinance facility to the PFIs for on-lending to solar companies and partial risk guarantee to the PFIs for covering their credit risk related to their lending to solar companies. The UECCC will provide concessional financing to the PFIs who will pass on concessional financial terms to the solar companies to help augment the growth in affordable access to solar PV electricity in rural un-electrified areas. This scheme primarily targets solar companies providing consumer financing schemes, such as pay-as-you-go arrangements.

Product Development for the UECCC and PFIs (US$3 million: US$1.5 million equivalent IDA, US$1.5 million GoU): Additional resources will be allocated for TA to strengthen UECCC and the PFIs in the following areas: (i) product enhancement and pricing; (ii) appraisal and risk assessment of solar companies; (iii) risk management; (iv) process and procedures for its operations; and (v) information systems.

To ensure compliance with the eligibility criteria, a due diligence assessment of the UECCC has been conducted during the project preparation for ERT-3 (Annex 8). A revised Operational Manual for the financing facility and eligibility criteria for the PFIs and solar companies will be prepared

by the UECCC before Effectiveness. The proposed instrument and terms will be assessed periodically and adjusted as necessary to achieve the aim of increasing access to affordable finance for on and off-grid connections.

2-4 Quality Assurance for Solar Market Development (US$1 million equivalent IDA). This sub-component will support activities to enhance the market for affordable, high quality off-grid lighting solutions in rural areas.

Based on the recommendations and in an effort to accelerate access to modern energy services in rural areas, ERT-3 will expand the program nationwide and address the identified constraints on a national rather than program level to catalyze the markets for modern off-grid lighting solutions, and encourage the uptake of those off-grid lighting products and services by the end users. The proposed activities in support of solar market development and indicative budget are as follows:

Public awareness campaign (US$350,000 equivalent IDA): This activity aims to inform consumers of the benefits of solar lighting products and to inform them on the characteristics of good quality products.

Support in Adoption of Quality Standards for Pico Solar Products and SHSs (US$100,000 equivalent IDA): This activity aims to support the UNBS in adopting national quality standards to be applied for pico solar products and SHSs.

Review of UNBS Quality Assurance Framework and International Accreditation Support (US$150,000 equivalent IDA): This activity aims to review UNBS's quality assurance enforcement procedures and support the UNBS in adopting international accreditation in relevant areas, such as ISO17025.

Procurement of Laboratory Testing Equipment (US$350,000 equivalent IDA): This activity aims to help equip the UNBS with necessary testing equipment to ensure quality standards of solar products in Uganda.

Training of UNBS Staff (US$50,000 equivalent IDA): This activity aims to strengthen UNBS staff to perform quality assurance for solar market development.

Barriers for Scaling-up the Installation of SHSs

The PVTMA mechanism in ERT-2 has installed about 14,000 SHS, against the target of 20,000. Despite the recent gains made by REA with the PVTMA, several implementation problems still limit the pace of installation of SHS under the program. These problems mainly lie with inadequacies in the subsidy mechanism, such as insufficient targeting of lower income households, and in the verification process, such as allegations of fraudulent practices in verification and the slow pace of verification, resulting in significantly delayed payments to some solar companies and negative impacts on their operations.[38] In addition to the problems specific to the PVTMA, general constraints within the sub-sector are also slowing down the growth of the market, such as: (i) low ability of potential customers to pay for SHS, coupled with lack of adequate expertise and of interest among the financial institutions to develop affordable solar PV loan products for end-users; (ii) inadequate access to working capital for solar companies, which limits their ability to provide consumer credits; (iii) lack of trust in the technology due to inadequate maintenance and after sales service provided by solar companies, as well as inflow of cheap, low quality solar products; and (iv) lack of product awareness.[39] The almost five-fold increase in the installation rate required per year to achieve the new SHS targets suggests that the current PVTMA model would no longer suffice and that new approaches are needed in ERT-3. The main recommendations for strengthening of the Ugandan market for off-grid lighting solutions coming from the completed Solar PV Market Assessment Study and the Solar PV Options Study are: (i) provision of working capital to solar companies; (ii) incentivizing of a shift to business models providing consumer credit to increase affordability and after-sales service; (iii) strengthening of quality control and enforcement at the national level; and (iv) government-run awareness campaign around solar products, product availability, financing options and quality issues.

Component 3: Institutional Strengthening and Impacts Monitoring (US$5.6 million: US$4.5 million equivalent IDA, US$1.1 million GoU).

17. This component will finance institutional strengthening activities and impact evaluation to expand energy access. It also supports various studies, including preparatory studies for the development of geothermal energy, cost of service study, regulatory measures for electrical installations, and consumer affordability study. The MEMD will be responsible for all necessary procurement and implementation of the following activities under the component in collaboration with the ERA.

3-1. Institutional Strengthening (US$4.6 million: US$3.8 million equivalent IDA, US$0.8 million GoU).

This activity will support TA, studies, and capacity development in relation to rural access. Indicative areas include review of construction and technical standards for distribution network infrastructure and connection, assessment of consumer's affordability for energy including connection fees, and feasibility studies for priority projects. A systematic review of the project implementation will be undertaken that includes examination of various aspects of the implementation arrangements and, among others, on-the ground process of consumer applications, connection works, functioning of the proposed financing mechanisms, implementation capacity of the SPs, the planning and coordination role of the REA, and contractual management by the REA and SPs.

[38] Problems identified in the recently completed *Solar PV Options Study*

[39] Constraints identified in the 2015 *Solar Market Assessment Study*.

In addition, the sub-component supports preliminary works for geothermal development. The following activities will be included under this component. Based on the ongoing discussions with the Icelandic International Development Agency (ICEIDA) (WB-ICEIDA Compact), technical studies to advance the level of preparedness for geothermal energy development will be carried out by ICEIDA. Brief details of the activities in relation to geothermal energy development are highlighted below (box).

The indicative list of institutional strengthening activities and technical studies proposed under the component is as follows:

Design and Construction Guidelines for Distribution Infrastructure (US$500,000 equivalent IDA): The activity aims to support the ERA in preparing national design and construction guidelines for distribution network. The outcome of the activity will include: (i) standard construction drawings for distribution infrastructure; (ii) specifications and requirements for different technologies appropriate for different categories of customers (e.g. urban/peri-urban/rural; high-cost/low-cost) including low-cost options for rural electrification for low income households; and (iii) standard equipment and materials to be used for the construction of distribution infrastructure.

Enhancement of Regulation for Electrical Installations (US$200,000 equivalent IDA): The activity aims to increase the number of qualified and certified wiremen and companies to meet the growing number of new connections in the country and electrical skill development of certified wiremen/contractors. It will help review the current licensing requirements for wiremen, and develop curriculum and technical support to mitigate shortage of qualified wiremen.

Cost of Service Study (US$700,000 equivalent IDA): This activity aims to conduct an examination of the revenue requirements for the electricity industry, determine the allocated cost of providing service to each class of customers, and design new service electricity rates.

Consumer Affordability Study (US$300,000 equivalent IDA): This activity aims to establish consumers' willingness- and affordability-to-pay for electricity services including the cost of connection. This would inform the electricity tariff design, and the proposed connection cost financing scheme.

Geothermal Development Support (US$700,000 equivalent IDA): This sub-component consists of several background and preparatory studies and financing of needed equipment as mentioned below: (i) review of existing geothermal related information to be funded by the proposed project; (ii) review of the existing legal and regulatory regime and recommendations on the way forward in relation to institutional development for an appropriate legal/regulatory framework; and (iii) based on recommendations of the above study on review of existing geothermal related information, provisions are included under this sub-component for financing of equipment to carry out Magnetotellurics (MT) and Transient Electromagnetic (TEM) surveys. MT surveys can be used to locate higher conductivity associated with geothermal reservoirs at a depth of 2-5 km. Once these activities are completed, the ICEIDA is expected to support technical studies related to further reconnaissance/pre-drilling investigations and capacity building.

Systematic Review of New Electrification Model (US$300,000 equivalent IDA): To ensure that the implementation of the new model for electricity access is on the right track, and to inform necessary adjustments at mid-term, this activity will systematically review the project implementation progress and performance. The review will examine various aspects of the

implementation arrangements including, among others, on-the ground process of consumer applications, connection works, functioning of the proposed financing mechanisms, implementation capacity of the SPs, the planning and coordination role of the REA, and contractual management by the REA and SPs.

Project Coordination, M&E (US$1.9 million: US$1.1 million equivalent IDA, US$0.8 million GoU): This activity helps the PCU coordinate all the project components supported under the project, monitor and evaluate the progress and results achieved, and take necessary adjustments during project implementation.

Geothermal Development in Uganda

Background: Current estimates indicate the presence of about 30 geothermal sites in Uganda that can be studied and explored for further development. Eight licenses have been issued to IPPs to explore seven geothermal areas.[40] So far, not much progress has been made in the development of these sites. Of the seven areas, the status of development of the four more promising fields is shown in the table below.

Status of development of Geothermal sites

Name of Field and Concession Owner(s)	Remarks, Timelines
Katwe (Cozumel Energy Ltd, and Katwe Geothermal Power Project Ltd.)	MTs survey needs to be done especially in area north of formerly explored area to locate higher conductive zones associated with geothermal reservoirs.
Kibiro (Moberg Finance Co.)	A new location of low magnetic anomaly was found and presumed to be associated with a geothermal reservoir, compared to findings from the Iceland Geosurvey (ISOR) from 2008. Airborne magnetic surveys have been done and interpreted. Ground magnetic, gravity surveys and geological mappings have been undertaken by the MEMD.
Panyimur (Pawakom Ltd.)	In readiness for MT and TEM soundings, airborne magnetic data have been processed and interpreted.
Buranga (Gids Consult Ltd), closest to the Congo-Rwandan border and therefore an option for a regional project	Available data include gravity and magnetic data from Petroleum Exploration and Production Department, but future exploration should focus on new areas discovered with geothermal surface manifestations.

The table above indicates a significant amount of pre-drilling exploration work/studies will need to be done by the developers for upstream activities. This has not happened yet and there is thus a need for new initiatives. In parallel, with the work described above, the GoU took the necessary initiative of completing several preliminary activities. Airborne magnetic survey for two of these areas (Panyimur and Kibiro) has been completed and analysis of the data gathered yielded encouraging results. In these areas, it is now clear that the center of the geothermal reservoir is located about 10-15 km away from the surface manifestations (hot springs), where earlier experts believed the center was located.

Legal Framework: Currently there is no specific or comprehensive legal framework for geothermal energy development and all existing activities are carried out using the Mining Act 2003. Regulating existing exploration programs under the Mining Act 2003 is challenging as private investors perceive it to lack legal and business security, which might reduce investor interest in the sector. To address the above, it is recommended that a separate "Geothermal Department" be established within the MEMD and an accompanying "Geothermal Act" be introduced in the near future. In this context, the GoU expects to receive assistance from USAID and the African Union Commission (AUC). The GoU has requested support for development of their geothermal potential from both the World Bank and the Government of Iceland.

[40] (i) Katwe; (ii) Kibiro; (iii) Panyimur; (iv) Buranga; (v) Rwagimba; (vi) Kanungu; and (vii) Obongi-Yumbe.

Key Issues: Based on the discussions with the GoU and private developers (license holders), the current constraints to geothermal energy development are as listed:

- Most of the existing concessions and exploration licenses are due to expire during 2014;
- To justify renewal of individual licenses, the GoU (MEMD) will need to verify whether the licensees have fulfilled their working and expenditure commitments;
- Studies on the areas have been carried out at different points of time using different technologies; these have yielded varying degrees of information and technical accuracy. There has not been a coherent effort to develop the sites which depends on the technical competence and availability of finances with the developers. As such, there is a need to ensure that the initial studies are completed for all 30 sites providing a similar level of technical details and accuracy. In the future, this could be accomplished within the context of the WB-Iceland Compact;
- IPPs/developers face different constraints for the exploration and development of geothermal potential within their respective concession areas. These range from inadequate technical expertise to insufficient financial capacity. With several prospective areas licensed out, the GoU is constrained from carrying out further investigation in these areas to confirm the best sites;
- The GoU, assisted by the WB-Iceland Compact, needs to identify three to four geothermal sites that need detailed pre-drilling exploration. This will form the basis for the development of the initial phase of geothermal energy; and
- The development of selected fields and estimate funding needed, based on the information that is currently available, for two to three complete 10 MW power plants, is around US$100-150 million over the next six years.

3-2. Impact Monitoring (US$1 million: US$0.7 million equivalent IDA, US$0.3 million GoU): Continuing the practice undertaken under ERT-1, the proposed project will finance an impact evaluation of the ERT-2 to be carried out by the MoFPED. In addition, the MoFPED will track the impact of electrification investments to establish contributions to changes in income at household and enterprise levels, employment at household, enterprise and community levels and changes in access to social services in project areas - mainly health, post-primary education and safe water.

18. Procurement and implementation of all the activities under this component will be carried out by the MEMD and MoFPED.

Carbon Initiative for Development (Ci-Dev)

As connecting households to the grid would eventually lead to emission reductions due to replacement of mostly fossil-based lighting, possibilities are being explored to use other market-based instruments such as carbon finance, or other results-based finance instruments based on GHG emission reductions to improve the sustainability of providing access to modern energy services. Ci-Dev, a trust fund which makes payments based on avoided GHG emissions and for which the Bank acts as trustee, has endorsed this project into its pipeline as of February 2014.

The Ci-Dev aims at supporting innovative and transformational energy access projects in the least developed countries that are yet to benefit from the Clean Development Mechanism (CDM). Because the number of CERs is determined by the progress on rural electrification which needs to be monitored and verified by an independent third party, the flow of carbon revenue will effectively strengthen monitoring and maintenance arrangement of the proposed Project and ensure long-term sustainability of on-grid connection and off-grid system installations. Completion of all preparatory work and approval (including signing of the Emission Reduction Purchase Agreement [ERPA]) is expected by July 2015. Discussions are ongoing with Ci-Dev in financing specific capacity building measures for the REA/SPs through its TA program.

For on-grid connection, the annual household electricity consumption is estimated at 456kWh/year. The corresponding emission reduction depends on the generation-mix for grid electricity. As the grid system in Uganda is predominantly hydro based, the emissions reduction factor is 0.51 tCO_2e/year for each household connected.[41] For off-grid SHS, the emission reduction factor is based on rated watt-peak capacity (panel size) and availability (proportion of hours of operation per day). Using a default availability of 12 percent, this gives a CO_2 reduction factor of 0.14 tCO_2e/year (for a 20Wp panel) and 0.41 tCO_2e/year (for an 80Wp panel) per household. Carbon credits generated from connections, achieved through grid-extension, can provide additional resources and strengthen the public finance mechanism that is under discussion to scale up connections.

The proposed project will take a Program of Activity approach to aggregate small number of CERs achieved at household level. A Coordination and Managing Entity is needed to bring private sector implementation partners (SPs and solar vendors) into the emission reduction program. The REA is best positioned to take this Coordination and Managing Entity's role. From a legal point of view, an ERPA will be signed between Ci-Dev and REA, and sub-agreements between the REA and the implementation partners will need to be signed to define and transfer emission reduction rights to the REA, confirm Monitoring, Reporting and Verification responsibilities, and establish carbon revenue sharing arrangement between the REA and the SPs. Preparation of CDM documentation is funded by the Ci-Dev while the REA will provide the necessary program information.

At program level, the total emission reductions for a particular reporting year are determined by the annual electricity consumption of connected households, number of solar systems cumulatively installed and still operational, and the composition of solar systems in terms of its rated peak capacity. The Ci-Dev is working closely with the REA to estimate the emission reductions that can be purchased during the period 2015-2024.

Implementation of the off-grid rural electrification program faced barriers including high upfront capital costs for SHS, low customer awareness and the perceived high product risk and short warranty periods. Recognizing that carbon finance has a limited role in reducing high upfront capital cost as it can only come after the SHS are installed, the REA has proposed to pool a certain portion of carbon revenue payment at the program level to: (i) strengthen marketing, awareness campaigns, and customer education, (ii) extend warranty of solar systems to a minimum of three years to boost customers' confidence in SHS, and (iii) strengthen monitoring and reporting. Depending on the model finally chosen for implementation of the SHS, the remaining funds could be distributed to the participating solar system providers to strengthen their marketing campaigns, provide appropriate incentives to carry out required monitoring work, and improve their general financial standing. Consultations will also be carried out with the REA/SPs to identify the exact carbon revenue sharing ratio and the critical areas that carbon revenue should be shared between the REA and the SPs.

ANNEX 3: IMPLEMENTATION ARRANGEMENTS
Uganda: Energy for Rural Transformation III (P133312) & GEF Energy for Rural Transformation III (P146876)

A. Project Institutional and Implementation Arrangements

1. MEMD will have the overall responsibility for implementation of the project. On behalf of MEMD, the PCU will assume the role of implementation coordination including monitoring implementation progress of all components. Project implementation will be carried out by five line ministries (MoESTS, MoH, MoWE, MoFPED, and MEMD), and three agencies (REA, PSFU, and UECCC). The number of IAs has been reduced from the original 11 under the ERT-2 project to eight under the proposed ERT-3 project. The PCU has been strengthened and will coordinate procurement and implementation of activities undertaken, in particular, by MEMD, MoESTS, MoH, MoWE, MoFPED, PSFU, and UECCC. The Bank will mainly interact with the PCU and REA for implementation support.

2. **Coordination Mechanisms**. Several coordination mechanisms are incorporated in the project design:

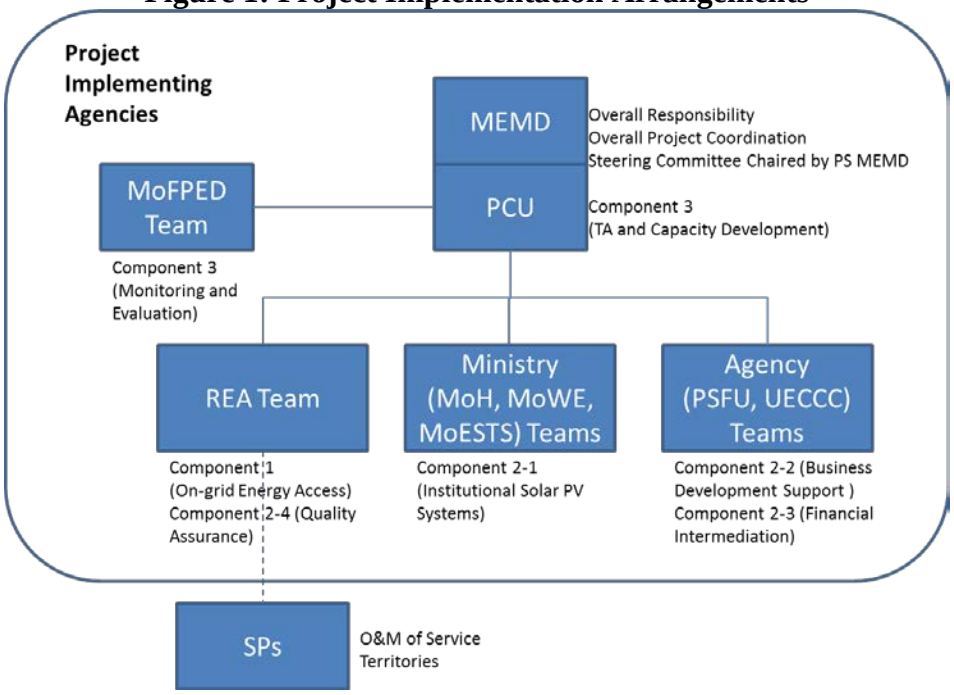
(i) Steering Committee. This will be chaired by the Permanent Secretary of the MEMD and will meet every six months to discuss plans, implementation progress, and challenges in relation to the entire project activities including on-grid connection activities. The Steering Committee will comprise all IAs and stakeholders. The PCU will act as a secretariat to the Committee. ToR for the Steering Committee will be stipulated in the Operating Manual.

(ii) Quarterly PCU Meeting. The PCU will organize a meeting at least once every quarter to monitor implementation progress and challenges on a regular basis. The meeting will cover all of the project components to be supported under the project, with particular emphasis on the activities undertaken by the line ministries, and will be attended by all the IAs (MEMD, REA, MoFPED, MoWE, MoESTS, MoH, UECCC, and PSFU).

(iii) Regular meetings, chaired by REA, will be held on sub-topics, including on-grid energy access activities (REA and SPs) and off-grid energy access activities (REA, UNBS, UECCC, and PSFU).

[41] The emission reduction factor is calculated based on the default factor according to the AMS-III BB methodology under the CDM project guidelines. It assumes 10 percent thermal generation for peak load. The corresponding factor for a grid system based on 100 percent hydro is 0.83 tCO_2e/year/household.

Figure 1: Project Implementation Arrangements



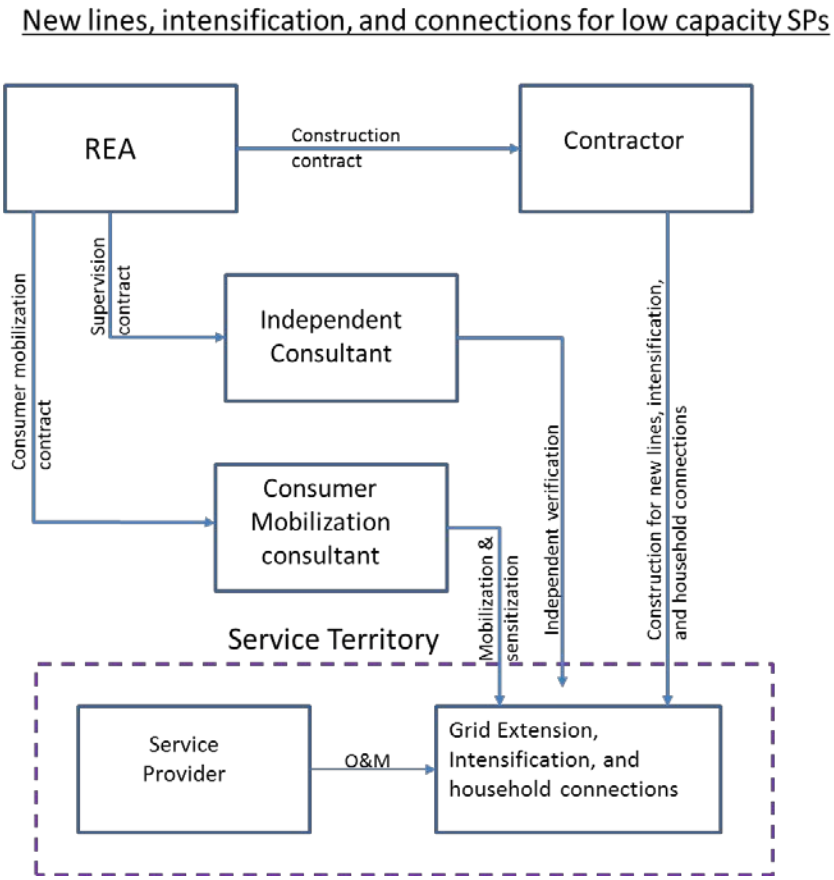
3. **Component 1 (On-grid Energy Access)** will be implemented mostly by the REA. The REA will play a key role in planning and coordinating the activities under Component 1.

4. For grid extension, the REA has identified priority lines for investment in accordance with the current IREMP and will procure and manage construction contracts for extension of new distribution lines, distribution network intensification, and service connections. In cases of strong implementation capacity, the SPs will enter into framework agreements with the REA for implementation of connections at the regulated connection tariff. Mobilization of connection applications will be done by a Consumer Mobilization Consultant, hired by the REA, in conjunction with the SPs. In the areas that require coordination between Umeme and the other SPs, including the network planning, O&M, and service quality, the REA will facilitate coordination among the concerned SPs.

5. For the grid intensification and household connection, the REA will review the proposed areas for electrification to be submitted by the SPs. The SPs, assisted by consultants funded by the project for consumer sensitization and mobilization, managed by the REA, will identify target areas and households for expanding access in their master plans to be agreed with the REA. As the SPs' levels of experience in the utility business vary significantly, the implementation arrangements will be kept flexible, and the modality for grid intensification and connection will take into consideration: (i) the implementation capacity of the SPs; and (ii) the SPs' preference. For those SPs that have the capacity to implement the proposed activities, the SPs can either: (a) undertake the activities themselves; or (b) manage directly the procurement of turnkey contracts. In either case, the REA will verify the connections and physical installation of the equipment. For those SPs that have relatively less experience in procurement and installation, the REA will manage turnkey connection contracts for connection activities to take place in their respective areas. The approach to be taken for each SP will be determined by the REA, in consultation with

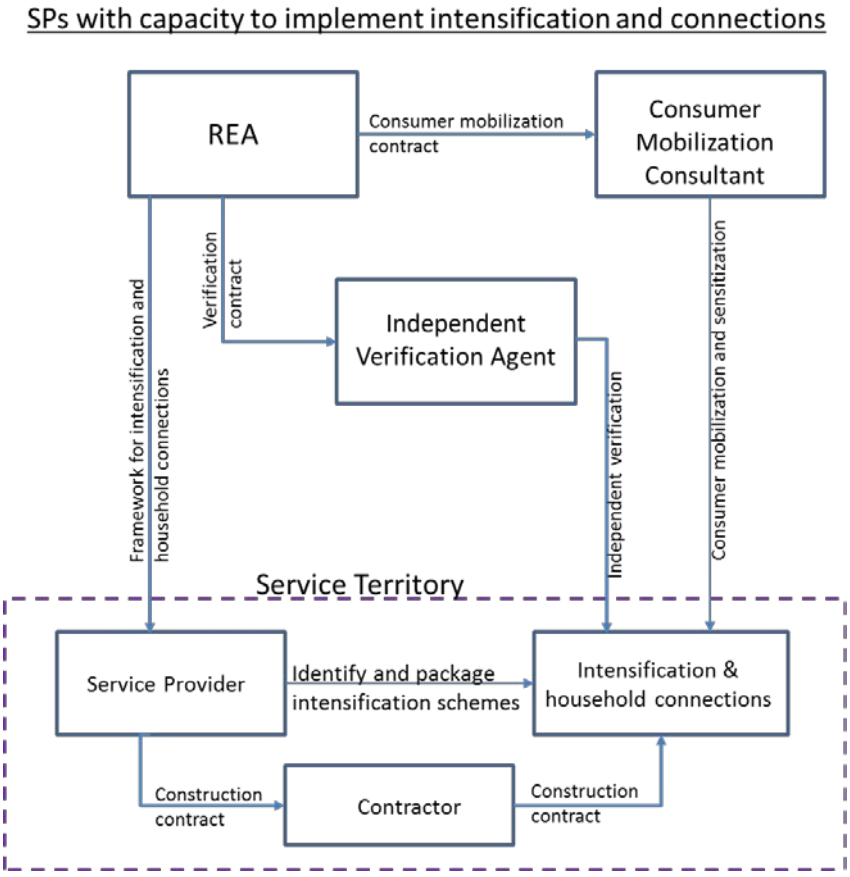
the Bank, after the SPs' technical, financial and procurement capacity to carry out such activities is assessed. This will be agreed in the Implementation Agreements[42] between the REA and the SPs. Performance of the different approaches to connection will be reviewed and calibrated as appropriate as part of the systematic review of project implementation. The schematic diagrams of different approaches, depending on the SPs' capacity, are attached below.

Figures 2: REA Turnkey Model for Grid Extension, Intensification, and Connections



[42] The Lease Agreements and the Implementation Agreements are used interchangeably to denote the legal agreements that stipulate implementation arrangements between the REA and the SPs. The Lease Agreements with three SPs (KIL, BECS, and PACMECS) were concluded. The Lease Agreements with the remaining two SPs (FESL, and KRECS) will be completed by December 2015. For Umeme and WENRECO, REA will conclude Implementation Agreements as UEDCL will be the asset owner.

Figure 3: Service Provider Model for Grid Intensification and Connections



6. The REA will also implement Sub-component 1-4 to support the above on-grid access activities. The sub-component includes planning, coordination, and implementation support for the REA, construction supervision, consumer sensitization and mobilization, independent verification of connections, and capacity development for the REA to strengthen its oversight roles in rural electrification. Some of the support provided to the REA will also support the initial capacity building needs for the SPs to accelerate access scale-up.

7. **Component 2 (Off-grid Energy Access)** consists of several sub-components that will be implemented by various IAs. Sub-component 2-1 (Institutional Solar PV Systems) will be implemented by the line ministries (MoESTS, MoH and MoWE) in close coordination with the PCU/REA. Sub-component 2-2 (Business Development Support for Rural Access) will be implemented by the PSFU. Sub-component 2-3 (Financial Intermediation for Rural Access) will be implemented by the UECCC. The REA will implement Sub-component 2-4 (Quality Assurance for Solar Market Development), in close cooperation with the UNBS.

8. **Component 3 (Institutional Strengthening and Impacts Monitoring)** will be implemented by the MEMD and MoFPED. Sub-component 3-1 managed by the MEMD will comprise of activities related to institutional strengthening, including overall coordination of project activities, carrying out studies related to development of geothermal energy, enhancing

regulatory aspects related to energy access; and systemic review of the project implementation. The MoFPED will manage sub-component 3-2 on impacts monitoring.

9. **Submission of Operational Manuals satisfactory to IDA, from REA, MoFPED, MoH, MoWE, MoESTS, MEMD, PSFU and UECCC will be a condition of effectiveness.**

10. Through implementation of ERT-2, all the above agencies have sufficiently demonstrated the required capacity to implement their respective components. As the proposed electrification model is new, however, institutional capacity of some sector entities will need to be strengthened further. Some specific capacity constraints along with their mitigation measures are addressed separately in the sections below.

Capacity Development

11. **Sector-wide Coordination and Planning**. Achieving the scaled-up access targets would require, among others, coordination of activities to be undertaken by multiple stakeholders in fostering investment and operations across the electricity supply chain. With the adoption of a ST-based approach, for example, regulatory decisions by the ERA will need to be synchronized with the decisions taken by the other key sector players such as the UETCL and REA pertaining to (i) planning, expansion, and operation of the backbone national grid; and (ii) planning, investment, and operation of distribution networks in rural, peri-urban, and urban areas. Accordingly, sector planning, financing, and overall management will need to be coordinated further. To foster sector-wide coordination, the MEMD will regularly coordinate activities to be undertaken by all the relevant agencies in rural electrification through coordination meetings. Moreover, to strengthen implementation capacity of all the entities concerned, the REA and MEMD will prepare a consolidated sector-wide capacity development plan, which will serve as a basis for a capacity development component to be supported under the project. This will include, among others, developing national distribution network design and construction guidelines.

12. **REA's Capacity Strengthening**. The REA has continuously been strengthening its capacity to deliver access to electricity through such measures as increasing the number of engineers and their field presence, improving site offices, enhancing internal quality control systems, and preparing a rural electrification construction manual. To facilitate achievement of the connection targets of RESP-2, however, the REA's implementation capacity will need to be strengthened further. Some of the measures to be implemented include: (i) strengthening the REA's contract management; (ii) consultancy for standardizing procedures (consolidating various documents to produce the construction manual and the national standards and specification for the distribution network); and (iii) enhancing accountability through public disclosure of investment plans and implementation status. On the safeguards management, an additional social development specialist was recruited. Capacity building of the REA and SPs for building a GIS platform will be addressed through an appropriate consultancy service financed under a TA program of the Ci-Dev. The AFD-financed project will have funds allocated for capacity building activities, which will be implemented in close coordination with IDA.

Area	Measure / Action	Timing
Strengthening Project design and implementation	Preparation and adoption of a rural electrification design and construction manual to guide design of projects and supervision of implementation. This shall include preparation of national construction and design guidelines for the distribution network	During implementation
Enhancing accountability through public disclosure	REA shall publish at least twice a year its investment plans and implementation status for all projects in the press and on its website and other relevant media	Throughout implementation

13. **SPs' Capacity**. While the REA will continue with development of the rural electrification infrastructure, the SPs will be contracted by the REA for O&M of distribution networks in their respective STs. For this reason, REA's contractual management will be important to ensure satisfactory performance of the on-grid activities. Umeme, the largest SP in the country, has been commercially operational since 2005 and is managing over 25,000 km of electricity distribution assets covering the major load centers in the country. The company's performance has been strong, especially on its KPIs (loss reduction and higher revenue collection). WENRECO, owned by an international foundation, has been operating the independent grid in West Nile since 2003. For other smaller private SPs, a Bank-funded consultant has assessed the capacity development needs of four SPs (BECS, FESL, KIL, and PACMECS) in the areas of inventory and stores management, accounting systems, and billing and customer relations to effectively manage their operations. The KRECS is the newest SP that started operations in 2013. A capacity development needs assessment will be conducted for the KRECS, UEDCL, and WENRECO to decide on the appropriate implementation model. This will be incorporated in the Implementation Agreements to be concluded between the REA and the SPs before commencement of disbursement. The UEDCL, the public SP of last resort, retains implementation capacity through retention of technical staff on a contractual basis. In case some of its STs are concessioned to a third party, its staff can potentially be transferred to the concession. The REA has established the ST Development Operations Unit to facilitate operations by the SPs in their respective STs, and a unit manager was appointed. Moreover, as mentioned above, the REA and IDA will verify and confirm the technical, financial, and procurement capacity of the SPs to carry out connection activities before the connection works are implemented. A summary of the SPs' organizational background is provided in Annex 2.

14. **M&E Management**. Over the years, the PCU and MoFPED have developed adequate capacity to undertake M&E and impact evaluation of the project activities. This will continue under the proposed project and all M&E activities, including tracking of key performance indicators, will continue to be carried out by the PCU, using data from the IAs and stakeholders. The Budget Monitoring and Accountability Unit under the MoFPED, which focuses on infrastructure (energy and roads), social services (health, education and water), agriculture, and industrialization, will lead monitoring and impact evaluation.

15. To coordinate and strengthen the M&E activities, an appropriate data base management system will be set up within the REA. The institutional solar PV systems will be implemented by the respective line ministries (MoESTS, MoH, and MoWE) and under close coordination with the

REA to avoid installation of solar PV systems within areas planned for grid coverage by the REA. The MoFPED will play its overarching role of monitoring and impact evaluation.

16. Moreover, as the proposed electrification model is new, the capacity of the REA in particular for M&E will be strengthened further. Even though the SPs are not the IAs of the project, they would influence performance of the project by handling connection aspects and sustaining the development impacts through O&M of networks within their respective STs. For this reason, the REA will closely supervise the SPs' performance in accordance with the rights and obligations stipulated in the lease agreements concluded with them.

B. Financial Management, Disbursements and Procurement

Financial Management

17. This section summarizes the FM arrangements for the proposed Project to be implemented by eight direct participating institutions, that is, the PSFU, REA, UECCC, MEMD, MoFPED, MoESTS, MoH, and MoWE. To meet the fiduciary requirements, FM capacity assessments of all IAs needed to be carried out. The objective of the assessment is to determine: (a) whether the participating institutions have the adequate FM arrangements to ensure that project funds will be used for the purposes intended in an efficient and economical way; (b) project financial reports will be prepared in an accurate, reliable and timely manner; and (c) the entities' assets will be safeguarded. The FM assessment was carried out in accordance with the Financial Management Practices Manual issued by the Financial Management Sector Board.

18. The above ministries, departments and agencies are currently implementing ERT-2 (US$75 million) and ERT-2 Additional Financing (US$12 million) together with GEF-funded ERT-2 (US$9 million) with similar rural electrification activities and various consultancies and studies. Due to the number of agencies involved and current experience in implementing various Bank projects, the conclusion of the FM assessment is that the FM arrangements for the project have an overall residual Substantial risk rating. The major fiduciary risk is associated with line ministries regarding internal controls over the use of operating funds. The proposed action plan to be implemented by the IAs to strengthen the FM arrangements is appended below

19. The project's FM transactions will be managed within the existing set-up in the participating institutions of which the overall accounting officers are the PSs, for the ministries while the GM and CEOs are responsible for the other institutions. The institutions' accounting departments are adequately staffed with principal accountants as head (for the ministries) and finance directors (for other institutions), senior accountants, accountants and several accounts assistants. For the ministries, the principal accountants report to the undersecretaries who also report to the PSs while for the other institutions the finance directors report to the CEOs. The participating institutions have accounting policies and procedures that will be used for the project. The institutions are computerized with various accounting packages and the ministries are also computerized with the IFMIS. The institutions have internal audit units comprising of heads of internal audit and internal auditors who will include the project activities in their work plan. The project's financial statements will be audited in accordance with statutory requirements, and suitable terms of reference acceptable to IDA will be developed. To ensure that the project is

effectively implemented, the institutions will ensure that appropriate staffing arrangements are maintained throughout the life of the project.

20. The conclusion of the FM assessment is that the overall implementing institutions' FM arrangements have a substantial risk but with reasonable systems to control, record and report on project activities.

Country Issues

21. The Public Expenditure and Financial Accountability Reports of 2012 indicate that the Government has carried out key reforms including public service reform, decentralization and public financial management. The National Development Plan provides the overarching strategy for all GoU reforms. The public service reforms aim to improve services delivery by promoting modern management practices into Uganda's public service and providing proper incentives and equipping the public servants. Decentralization is meant to improve the delivery services provided by the local governments by bringing the service provider closer to the citizens and empowering them as stakeholders in the decision making process and to monitoring the services that are provided to them.

22. The Office of the Prime Minister (OPM) coordinates all the GoU programs and the ministries, departments, and agencies activities and carries out an annual performance management assessment to ensure that they are achieving their agreed objectives and outputs. The PFM reforms support and benefit all the other GoU reforms because they provide the means of ensuring that the resources are allocated to the various reforms in a cost effective and transparent manner. The PFM reforms cover the whole of the budgeting cycle functions: budget preparation, budget execution and oversight and scrutiny.

23. The reforms have been pursued since the early 1990s and are continuing. The current reforms build on past achievements and are currently concentrating on: improving the credibility of the budget; ensuring that PFM legislation is complied with; and ensuring that audit recommendations are implemented. The GoU is carrying out the PFM reforms with the support of several donors. The more notable reforms include the new Public Finance Management Act, the upgrade of the IFMIS, and many other initiatives that are being supported by the Financial Management and Accountability Program in the implementation of the PFM reform strategy. The Program is supported by a number of development partners including the World Bank that form the Public Financial Management Donor Group. Cases of fraud in the central government during FY 2011 and 2012 especially in the OPM and the Ministry of Public Service have exposed weaknesses in the PFM system mainly arising out of collusion among individual officers in the ministries. The Government has put in place remedial measures through the High Level PFM Action plan with reforms to address these weaknesses and restore confidence in the systems. The GoU is in the process of rolling out of an Integrated Management Information System (IFMS) and its implementation of the Treasury Single Account (TSA). These proposed banking arrangements will be reviewed as the IFMIS and TSA reforms are extended. The Disbursement Letter will be amended to adapt the appropriate funds flow information as required.

Risk Assessment and Mitigation

24. The objectives of the project's FM system are:

- to ensure that funds are used only for their intended purposes in an efficient and economical way;
- to ensure that funds are properly managed and flow smoothly, adequately, regularly and predictably in order to meet the objectives of the project;
- to enable the preparation of accurate and timely financial reports;
- to enable project management to monitor the efficient implementation of the project; and
- to safeguard the project assets and resources.

25. The table below identifies the key risks that the project management may face in achieving these objectives and provides a basis for determining how management should address these risks.

Financial Management Risk Assessment Matrix

Risk	Risk Rating	Risk Mitigating Measures Incorporated into Project Design	Risk rating after mitigation	Condition of Negotiations, Effectiveness (Y/N)
Inherent Risk				
■**Country Level:** The 2005 and 2012 Public Expenditure and Financial Accountability reports identified weaknesses in government PFM systems. Enforcement of Procurement rules is still weak. Governance issues including the scandals in the OPM and the Ministry of Public Service is still presenting a major challenge.	H	Weaknesses in accounting capacity, budget classification, payroll rules and procurement compliance are being mitigated under a government PFM reform program called Financial Management and Accountability Program. The High Level Matrix agreed between development partners and Government is being implemented to address the governance issues.	S	N
■**Entity Level:** Line ministries involved could delay in submitting relevant reports due to weak capacity. The July 2013 FM in-depth review report identifies major weaknesses in FM across participating ministries.	H	PCU is in place at MEMD to coordinate all line ministries' activities for prompt reporting.	S	N
■**Project Level:** It is a complex project implemented by eight participating institutions including ministries, private sector, and autonomous organizations and hence difficult to monitor.	S	However this will be mitigated by Accountability Instructions issued under ERT-2 and to be applied to ERT-3 spelling out duties and responsibilities together with staff specifically assigned to the project. The Energy department in the parent ministry will liaise with the REA to ensure proper coordination.	M	N
		Overall Inherent Risk	**Substantial**	

Risk	Risk Rating	Risk Mitigating Measures Incorporated into Project Design	Risk rating after mitigation	Condition of Negotiations, Effectiveness (Y/N)
Control Risk				
■**Budgeting and Accounting-**				
Although all Bank funded projects are captured under the annual National budget, the government accounting system does not fully record project transactions	S	ERT-3 accounts will be prepared by the MEMD in liaison with line ministries using the accounting software. The REA and PSFU are using accounting software. Line ministries with low level of transactions will consolidate through the coordination unit. Accounting systems are satisfactory in all the other participating institutions. All donor-funded projects will be migrated to the IFMIS.	M	N
■Internal Control: Inability to follow up reported internal control weaknesses. FM in-depth review reports identify major weaknesses in FM across participating ministries.	H	The participating institutions have qualified and experienced internal auditors who will include the project in their work plan to ensure that the internal audit unit carries out its role within the project. The Government has improved this function. Pre-approved annual work plans to be followed.	**S**	N
■Financial Reporting: Financial Information may be late and unreliable for purposes of preparation of required reports.	**S**	The participating institutions use unaudited Interim Financial Reports (IFRs) under ERT-2 that will be continued under ERT 3. Current reporting is satisfactory.	**M**	N
■External Audit: There could be late submissions of reports and lack of follow up on audit issues.	**M**	There has been a good record on audit submissions and action plans to resolve issues raised in the reports by the Office of Auditor General.	**L**	N
	H	**Overall Risk Rating**	**Substantial**	

H – High S – Substantial M – Moderate L – Low

26. The overall residual risk is assessed as Substantial and supervision missions will monitor progress in implementing mitigation measures.

Strengths of the Project Implementing Units:

27. The project FM is strengthened by the following salient features:

- The accounting personnel within the participating institutions are adequately qualified and experienced.
- The project under the ministries will use the Treasury Accounting Instructions issued under the Public Finance Management Act 2015 as its accounting policies and procedures. Major implementing units have functioning accounting software for purposes of this project.

- Budgeting arrangements are adequate.
- External and internal auditing arrangements are adequate.
- Funds flow arrangements are adequate and participating institutions have adequate financial reporting requirements with developed formats for IFRs that have been agreed with the Bank under ERT-2.

28. The project FM is weakened by the following salient feature:

- The participating ministries have internal weaknesses regarding the use of operating budget/costs leading to ineligible expenses. All such costs will be pre-approved by the task team to mitigate these risks.

Institutional and Implementation Arrangements

29. The structure and budget of the coordination unit will be part of the MEMD as a main streamed activity. The MEMD will be responsible for reporting and coordinating line ministries' activities implementing this project. The Project will require four designated accounts. These will be held by: the MEMD, PSFU, REA, and UECCC while the designated account under the MEMD will cover the participating line ministries. The other line ministries will access advances from the MEMD following the well-crafted accountability instructions currently in place under ERT-2.

30. The PSs of the ministries, and the CEOs of other institutions will be the Accounting Officers for the project, assuming the overall responsibility for accounting for the project funds.

31. Detailed FM arrangements for the main participating entities are as follows:

32. **Budgeting**: Individual departments are involved in the budgeting process. Finance Department provides the necessary support during the budget preparation process. Agencies' budget procedures are followed while developing budgets. Senior management reviews budgets and submits them to the Board for approval. The government ministries' planning and budgeting procedures are documented in the government's Treasury Accounting Instructions and are followed. These arrangements have been found to be adequate. There is also a planning unit that is responsible for budgeting in each ministry. All other departments are involved in the budgeting process. The capacity of the accounting staff to fulfill budgeting needs of the project is adequate.

33. **Accounting**: The REA, UECCC and PSFU will maintain similar books of accounts to those of other current IDA-funded projects. The books of accounts to be maintained specifically for the proposed Project should thus be set up and should include: a Cash Book, ledgers, journal vouchers, a fixed asset register and a contracts register. There is a list of accounts codes (Chart of Accounts) that allows project costs to be directly related to specific work activities and outputs of the project.

34. **Staffing Arrangements**: The REA, UECCC and PSFU are adequately staffed with qualified and experienced accounting staff. The function is headed by the finance director of the PSFU who reports to the executive director while finance managers head the departments at the REA and UECCC with an accountant and assistant accountant in each agency. The staff are qualified and experienced. To maintain a strong coordination function at the MEMD, the current

staffing arrangement at the MEMD will effectively be maintained for prompt reporting by line ministries.

35. **Information Systems**: the REA and PSFU use Sun Systems computerized accounting software while the MEMD and UECCC use Pastel computerized accounting software. These packages are capable of producing project financial reports instantly and will be used to produce reports for this project. The users are also well trained to use the software. The system also safeguards the confidentiality, integrity and availability of data. Line ministries will keep basic records which will be consolidated at the MEMD.

36. **Internal Controls and Audit**: the REA, UECCC and PSFU have financial management manuals that describe the accounting system while ministries will follow the Treasury Accounting Instructions issued under the Public Finance Management Act 2015 which describes the accounting system i.e. major transaction cycles of the project, funds flow processes, the accounting records, supporting documents, computer files and specific accounts in the financial statements involved in the processing of transactions; the list of accounting codes used to group transactions (chart of accounts); the accounting processes from the initiation of a transaction to its inclusion in the financial statements; authorization procedures for transactions; the financial reporting process used to prepare the financial statements, including significant accounting estimates and disclosures; financial and accounting policies for the Project; budgeting procedures; financial forecasting procedures; and procurement and contract administration monitoring procedures.

37. The three agencies have qualified and experienced internal auditors. The Internal Auditor reports to the executive director/CEO and the Board. The internal auditor issues reports based on their review of the internal control system of the organization and management takes action on the recommendations. Line ministries have internal audit units headed by either a Principal or Assistant Commissioner depending on size who reports to the PS and the Commissioner Internal Audit in the MoFPED also receives copies of internal audit reports. The qualification and experience of the internal auditors are adequate. In order to ensure that the project is effectively implemented, the implementing institutions will ensure that appropriate staffing arrangements are maintained throughout the life of the project.

38. **Bank Accounts**: Designated Bank accounts will be maintained by the following four agreed entities: REA, PSFU, UECCC and MEMD for purposes of implementing the project. The coordinating agency – MEMD's Designated Account will serve the participating ministries (ministries in charge of finance, health, education, and water).

- **Designated Account:** Denominated in US dollars, disbursements from the IDA Credit and the GEF Grant will be deposited in this account.
- **Project Account:** This will be denominated in local currency. Counterpart funds and transfers from the Designated Account (for payment of transactions in local currency) will be deposited in this account in accordance with project objectives.

These bank accounts shall be opened at the Bank of Uganda (BoU) in accordance with the Financing Agreement.

Disbursements

39. The signatories for the project and Payment processing, in the case of the ministries, will be in accordance with the Treasury Accounting Instructions. As for other institutions it will be the CEOs as principal signatories and Finance Directors or other authorized officers as per respective FM manuals.

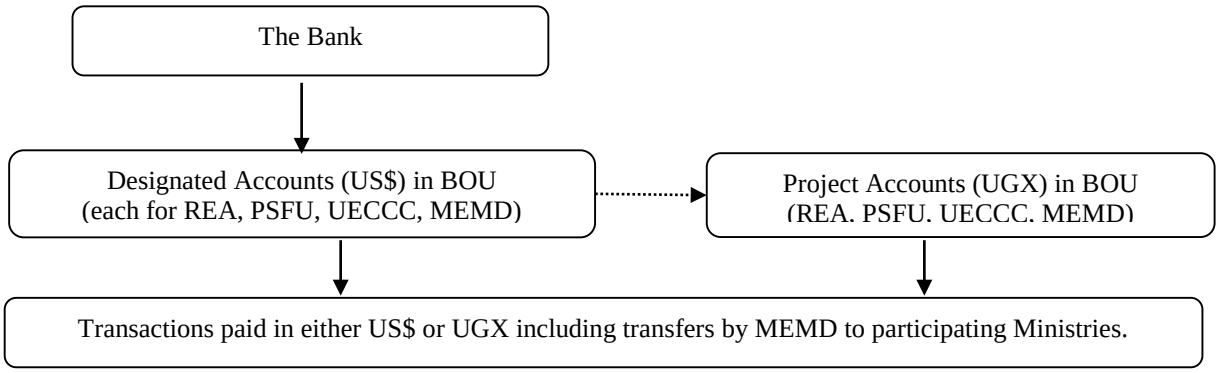
Flow of Funds

40. The participating institutions will use the report-based disbursement method. Funds flow arrangements for the project (through the two bank accounts mentioned above) will be as follows:

41. The institutions will prepare a six monthly cash flow forecast for the project based on the work plan and submit the Withdrawal Application to the Bank after the effectiveness of the project. Subsequent withdrawal applications should be submitted quarterly with the IFRs within 45 days after the end of the quarter. The quarterly periods follow the calendar year quarters hence the IFRs should be prepared as of the end of March, June, September and December. The Bank will make an advance disbursement from the proceeds of the Credit/Grant based on the cash flow forecast by depositing into a Borrower-operated Designated Account held at the BoU denominated in United States Dollars.

42. Funds can be transferred from ERT-3 designated account to the project Account denominated in Uganda Shillings to make payments in Uganda Shillings. The project expenditure can be paid from either the designated account or the project account. In the case of the MEMD, these will include transfers to other implementing units under the terms of the Accountability Instructions issued by the coordination agency.

ERT III Funds Flow Chart (Specific for each Designated Account)



Disbursement Arrangements

43. The implementing institutions have established effective FM and accounting systems, which will facilitate the use of report based disbursement where cash flow forecasts based on work plans are submitted for a period of six months every quarterly period along with the IFRs. The IFRs will be submitted for disbursement on a quarterly basis. In compliance with the report based guidelines, the project will be expected to, (a) sustain a satisfactory FM rating during project supervision; (b) submit IFRs consistent with the agreed format and content within 45 days of the end of each reporting period. The institutions will be expected to submit within six months after

effectiveness a six months cash flow forecast based on its work plan using the report based method of disbursement to the Bank for disbursement. The Bank will then deposit funds into the Designated Account and these funds will be used by the Borrower to finance the Bank's share of program expenditures under the proposed Credit/Grant.

44. Upon effectiveness, the institutions will have the following disbursement methods during implementation for the different components: advances, reimbursements, direct payments and special commitments. If ineligible expenditures are found to have been made from the Designated Account, the Borrower will be obligated to refund the same. If the designated account remains inactive for more than six months, the Borrower may be requested to refund to the Bank amounts advanced to the Designated Account. The Bank will have the right, as reflected in the Financing Agreement, to suspend disbursement of the Funds if reporting requirements are not complied with.

Financial Reporting Arrangements

45. Each of the institutions-- REA, PSFU, UECCC and MEMD-- will use formats of the periodic financial monitoring reports similar to the current formats as agreed under ERT-2 which provide quality and timely information to the project management, IAs, and various stakeholders monitoring the project's performance.

46. The following quarterly IFRs will be produced by the institutions;

(a) A statement of Sources and Uses of Funds for the reported quarter and cumulative period (from project inception) reconciled to opening and closing bank balances; and
(b) A statement of uses of funds (expenditure) by project activity/component comparing actual expenditure against the budget, with explanations for significant variances for both the quarter and cumulative period.

47. In addition to the above IFRs, the institutions will also have to submit to the Bank the following information in order to support report-based disbursement:

- Designated Account (DA) Activity Statement.
- DA Bank Statements.
- Summary Statement of DA Expenditures for Contracts subject to Prior Review.

48. The annual financial statements should be prepared in accordance with International Public Sector Accounting Standards (which inter alia includes the application of the cash basis of recognition of transactions) for ministries and International Financial Reporting Standards, for the others.

49. These Financial Statements will comprise:

- A **Statement of Sources and Uses of Funds/Cash Receipts and Payments** which recognizes all cash receipts, cash payments and cash balances controlled by the entity.
- A **Statement of Affairs/ Balance Sheet** as at the end of the financial year showing all the assets and liabilities of the project.
- The **Accounting Policies Adopted and Explanatory Notes**. Examples of this information include a summary of fixed assets by category of assets, and a summary of Statement of Expenditure Withdrawal Schedule, listing individual withdrawal applications; and

- A **Management Assertion** that IDA and GEF funds have been expended in accordance with the intended purposes as specified in the relevant Legal Agreements.

External Auditing

50. Each of the institutions REA, PSFU, UECCC and MEMD will be independently audited. The Auditor General is primarily responsible for the auditing of all government projects. Usually, the audit may be subcontracted to a firm of private auditors, with the final report being issued by the Auditor General, based on the tests carried out by the subcontracted firm. The private firms to be sub-contracted should be among those that have been short listed by the Bank, following a review of audit firms in Uganda. In case the audit is subcontracted to a firm of private auditors, IDA funding may be used to pay the cost of the audit. The audits are done in accordance with International Standards on Auditing. Each of the implementing institutions will submit an audit report to the Bank within six months after the end of each financial year. Current audit terms of reference developed under ERT-2 will be used for the proposed Project while the scope for the MEMD will cover the participating line ministries.

51. The audit reports that will be required to be submitted by the implementing institutions and the due dates for submission are:

Audit Report	Due Date
1) ERT 3 audited project Financial Statements for each REA, PSFU, UECCC and MEMD.	Submitted within **six** months after the end of each financial year i.e. by 31st December given that the accounts will be prepared for the year ending30th June.

Financial Management Action Plan

52. The action plan below indicates the actions to be taken for the project to strengthen its financial management system and the dates by which they are due to be completed by.

Action	Date Due	Responsibility
Opening the designated bank account in the central bank acceptable to IDA and communicating the details of the bank account and account signatories to IDA.	After Board approval	The implementing institutions
Issuance of updated Accounting Instructions on use of funds.	After Board approval	REA/MEMD

Conclusion of the Financial Management Assessment

53. The implementing institutions' FM arrangements assesses the FM risk as substantial and indicates that although the project satisfy the Bank's minimum requirements under OP/BP10.02, there remain improvements to be effected for the system to be more adequate to provide, with reasonable assurance, accurate and timely information on the status of the Project as required by the Bank. The recommended improvements are detailed in the Financial Management Action Plan above and risk mitigation table. There will be two planned supervision missions every year given the risk rating.

Procurement

Procuring Agencies and Scope of Procurement under the Project

54. Procurement under the project will be conducted by the following agencies for the different components:

Component	Agency Responsible for Procurement	Summary of Major Procurements Expected
Component 1 – On-grid Energy Access	REA Selected SPs	1. Electricity Grid Extensions and intensification 2. Design and supervision of grid extensions 3. TA to strengthen the SPs 4. Contractors for conducting electricity connections and intensification 5. Connection materials
Component 2 –Off-grid Energy Access	MoWE, MoH, MoESTS, PSFU, UECCC, REA	1. Solar energy systems for water pumping, lighting in schools and for health centers 2. Consultancy services for design and supervision of installation of solar systems
Component 3 – Institutional Strengthening and Impacts Monitoring	MEMD	1. Feasibility studies for small power plants and other TA

Applicable Guidelines

55. Procurement under the project will follow the Guidelines: Procurement under IBRD Loans and IDA Credits dated January 2011 (revised July 2014) and Guidelines: Selection and Employment of Consultants by World Bank Borrowers dated January 2011 (revised July 2014).

Use of National Procurement System

56. All contracts procured at the national level following National Competitive Bidding (NCB) and other lower procurement procedures such as Shopping, may follow the national public procurement law (the Procurement and Disposal of Public Assets Authority [PPDA) Act, 2003) and attendant regulations. These procedures have been reviewed by the Bank and found to be acceptable, except for the following provisions, which will not be applicable under this project:

i. **Paragraphs 50, 59(A) and 59(B) of the Act on Application of Domestic Preference under NCB.** Domestic Preference shall only be applied under International Competitive Bidding (ICB).

ii. **Paragraph 90(2) of the Act on Charging of fees for dealing with bidder complaints at procuring entity level**. The procuring entities shall not be allowed to charge fees for dealing with complaints.

iii. **Section 88A on Selection of Consultants**: The procedures for Selection of Consultants under the PPDA Act shall not apply. Only the Bank's guidelines shall apply for selection of all Consultants under the project.

iv. Ineligibility shall in addition to firms suspended by the PPDA extend to firms debarred or suspended by IDA.

v. Paragraph 6 (1) (b) of the 4th schedule of the PPDA Act restricting contract amendments to an aggregate amount of 25 percent of the original contract amount.

vi. Regulation 48 requiring the rejection of a bid submitted by a bidder who did not obtain the bidding document directly from the procuring and disposing entity shall not apply.

vii. Regulation 53 (9) Restricting the use of bid securing declarations to restricted domestic bidding and quotations procurement. The declaration may also applied for NCB.

57. Procurement processing under the proposed Project shall, in addition to the World Bank guidelines, comply with the national approval system except where the two conflict, when the Bank Guidelines will take precedence. Specifically, the Contracts Committees shall perform their oversight functions at every key procurement stage as required by the PPDA Act, and contracts shall be subjected to the Solicitor General's clearance where applicable.

58. Procedure for Shopping: Shopping shall follow the Request for Quotation (RFQ) procedures as defined in the PPDA Act and attendant regulations. These procedures have been reviewed by the Bank and found to be satisfactory subject to the exceptions under para (iii) above.

59. Advance Contracting and Retroactive Financing shall apply for this project. To be eligible for financing, the procurements shall follow the arrangements in the financing and grant agreements and the procurement plan.

Procurement Thresholds to be applied in the Procurement Plan

Expenditure Category	Contract Value Threshold (US$)	Procurement Method	Contracts Subject to Prior Review (US$)
1. Works	US$10,000,000 and above Below US$10,000,000 Below US$100,000	ICB NCB Shopping	All contracts As specified in the procurement plan None
2. Goods and Non-consulting Services	US$1,000,000 and above Below US$1,000,000 Below US$50,000	ICB NCB Shopping	All contracts As specified in the procurement plan None
3. Consulting Services[43] and Training	With firms above US$300,000	QCBS Individual	All contracts All Contracts

[43] A shortlist of consultants for services estimated to cost less than US$300,000 equivalent per contract may consist entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Expenditure Category	Contract Value Threshold (US$)	Procurement Method	Contracts Subject to Prior Review (US$)
	With individuals above US$100,000 With firms up to US$300,000 With Individuals up to US$100,000	Qualifications/Other Individual	 As specified in the procurement plan Only for project Staff
4. All types of contracts	All contracts	Sole source / direct contracting and terms of reference	As specified in the procurement plan

Note: QCBS – Quality and Cost Based Selection

Procurement Arrangements, Risks, and Mitigation Measures

60. **Grid Extensions (US$99.2 million):** These extensions shall be procured and implemented by the REA which has developed the experience under ERT-1 and ERT-2 to implement the regulations. The main risks that arise are delays in procurement and contract implementation as detailed below under the REA assessment. Major delays arise in the selection of design consultants that precede the works. In this case the design of the extensions shall be conducted and financed under the predecessor, ERT-2.

61. The market for the construction of lines is now well developed with many bidders participating when opportunities are published. The REA now receives on average over 10 bids under competitive bidding. There is also a growing local participation with many emerging contractors that started to implement grid extensions under ERT-2. The packaging will, however, need to be done in a manner that does not lock out growing local providers especially with regard to the sizes of contracts. At the same time the contract sizes should be large enough to benefit from economies of scale given that most of the materials are imported and small contracts increase the unit costs. In this regard grid extension contracts should generally be above US$2 million. The grid extensions shall follow competitive bidding.

62. To strengthen management of contracts, supervision of construction shall be done by consultancy firms overseen by the Projects Department in the REA.

63. **Grid Intensification (US$29.5 million)**: Grid intensification shall be implemented by the REA through the respective SPs. Umeme will be the main SP given their current network coverage. The REA shall, under this component, procure Umeme through single source selection to design, procure contractors and supervise construction of the schemes. Umeme in turn shall design the schemes and procure turnkey contractors to implement the intensification schemes and also supervise construction. Procurement of the contractors shall be aggregated to the extent possible and be subjected to competitive bidding. It is expected that each scheme shall be at least US$2 million and the designs, feasibility studies and bidding documents shall be subject to REAs review. Upon REA's approval Umeme shall commence procurement which shall be subject to prior review. The schemes will be added to the procurement plan upon design.

64. **Household Connections (US$10 million)**: Implementation is to be done by the SPs but may be outsourced to contractors depending on the SP technical and procurement capacity. This may be through labor and transport contractors with materials centrally provided or through

turnkey labor and materials contracts as will be piloted by Umeme in the first year of implementation. Whichever model is adopted, payment for the connection will be output based with the SP paid the regulated no pole connection cost for each connection. SP payments to providers where the service is outsourced shall be fixed based on pre-agreed fixed unit costs with providers who will be prequalified based on their technical and managerial capabilities.

65. **Institutional Solar Systems**: Most of the solar packages are imported and there has been a high level of bidder response under competitive bidding. The IAs have also developed the experience in implementing these packages.

Procurement Plan

66. All IAs have prepared procurement plans and below is a summary of contracts subject to international competition:

Component 1

Consulting Services

Ref No	Description of Assignment	Estimated Cost (US$)	Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date
1	Consultancy Services for Construction Supervision of the ERT 3 Grid Extension Projects in Package 1: Lot 3: Wandi-Yumbe-Moyo and Onduparika-Odramachu-Abiria: (345.8km)	345,800	QCBS	Prior	14-Sep-15
2	Consultancy Services for Review of Engineering Designs & Preparation of Bidding Documents for works package 2: Lot 1: Kibaale - Kikalu, Namalemba - Nakalama & Namutumba - Mazuba, Lot 2: Kabowa - Lumuli - Budima (Jinja), Busitema - Busia (Busia) & Lot 3: Bubiita - Bukalasi & Mayoka (Bududa), Wanale – Budwale and environs (Mbale), Nampologoma, Namulo, Bufuja, Manyamye, Butenga and environs (Butaleja) (307km) Procurement combined with supervision(153,500 on ERT II & 307,000 on ERT III)	307,000	QCBS	Prior	5-Sep-15
3	Consultancy Services for Review of Engineering Designs & Preparation of Bidding Documents for: works package 3 Lot 1: Kyabadaza - Masankwa, Nyanama, Mpenja - Maseruka, Kiriri - Kasasa, Mpenja - Nsambwe - Kononi - Mamba - Mauki & Lot 2: Nakifuma - Nagojje, Walusibi - Katogo - Mbaliga - Namele & Nakasajja - Kyampisi with tee-off Kasawo-Luwero and lot 3: Mitemula - Nakiyaga - Nkuke - Kyanamukaka with tee-offs Nkule - Ketengesa ,Bukeri - Namirembe & Baale Landing sites, Kyanamukaka - Butamo (320Km) procurement combined with supervision (226,850 on ERT II & 319,700 on ERT III)	319,700	QCBS	Prior	5-Sep-15
4	Consultancy Services for Review of Engineering Designs & Preparation of Bidding Documents for works package 4: Lot 1: Mubende - Kyabayanga - Ngangi with tee-off Kahirimbara, Kibaale - Kikwaya & Karuguza SS, Kibonge, Buronzi, Katete, Nyamarunda, Kitoro & Kabale Pri Sch & Lot 2: Kiyagara – Bwizi, Biguri – Ntonwa, Ntara - Bwensamba (222km) Procurement combined with supervision (153,100 on ERT II & 221,500) on ERT III)	221,500	QCBS	Prior	18-Sep-15

Consulting Services

Ref No	Description of Assignment	Estimated Cost (US$)	Selection Method	Review by Bank (Prior/Post)	Expected Proposals Submission Date
5	Consultancy Services for Review of Engineering Designs & Preparation of Bidding Documents for works package 5: Lot 1 Rukoni (Mail 36) - Rwoho - Ngugo - Bugamba, Bugangari - Rwenshama with tee-off to Mirama Sub county, Lot 2: Karugutu - Ntoroko including Semiliki Safari Lodge & Lot 3: Kagongo - Rweshuri with tee-off Kigalama & Nyansimbo - Rwenkoobwa (219km) Procurement combined with supervision (153,100 on ERT II & 218,700 on ERT III)	218,700	QCBS	Prior	18-Sep-15
6	Consultancy Services for Construction Supervision of the Grid Extension Projects works package 6 in: Lot 1: Ngeta - Ayala - Alito - Ogur - Apala - Aloi - Adwari - Patongo & Lot 2 Dokolo - Agwata HCIII, Aceng - Dokolo - Atur, Dokolo - Apapai - Tiriri & Otuboi - Orungo - Acuna (214km)	214,000	QCBS	Prior	18-Sep-15
7	Services for review, quality assurance checks and construction supervision of the various 33kV grid intensification/densification schemes including LV reticulations in all STs	1,000,000	QCBS	Prior	3-Sep-15
8	Framework agreement for design and project management of densification schemes in Umeme ST	600,000	SSS	Prior	3-Sep-15
9	Services of consultant to develop and roll out consumer education, awareness and marketing strategy of the solar PV programme	300,000	QCBS	Prior	14-Nov-15

Goods, Works and Non-Consulting Services

Package No	Lot No	Contract (Description)	Estimated Cost (US$)	Procurement Method	P-Q and Domestic Preference	Review by Bank (Prior/Post)	Expected Bid Opening Date
1	Lot 1	Construction of 33kV grid extensions including LV reticulations in Lot 1: Kiganda -Mile 16 with tee-off Katabalanga & Kibyamirizi (109km)	5,688,800	ICB	Post / No	Prior	23-Nov-15
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Lot 2: Ruhumba - Kashwa with tee-off Rwebishuri (123km)	4,963,800	ICB	Post / No	Prior	23-Nov-15

Goods, Works and Non-Consulting Services

Package No	Lot No	Contract (Description)	Estimated Cost (US$)	Procurement Method	P-Q and Domestic Preference	Review by Bank (Prior/Post)	Expected Bid Opening Date
	Lot 3	Construction of 33kV grid extensions including LV reticulations in Lot 3 Wandi-Yumbe-Moyo and Onduparika-Odramachu-Abiria: (345.8km)	13,070,400	ICB	Post / No	Prior	17-Dec-15
2	Lot 1	Construction of 33kV grid extensions including LV reticulations in Kibaale - Kikalu, Namalemba - Nakalama & Namutumba - Mazuba (82Km)	2,850,000	ICB	Post / No	Prior	11-Jul-16
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Kabowa - Lumuli - Budima (Jinja), Busitema - Busia (Busia), (75Km)	2,850,000	ICB	Post / No	Prior	11-Jul-16
	Lot 3	Construction of 33kV grid extensions including LV reticulations in Bubiita - Bukalasi & Mayoka (Bududa), Wanale – Budwale and environs (Mbale), Nampologoma, Namulo, Bufuja, Manyamye, Butenga and environs (Butaleja) (150Km)	5,700,000	ICB	Post / No	Prior	11-Jul-16
3	Lot 1	Construction of 33kV grid extensions including LV reticulations in Kyabadaza - Masankwa, Nyanama, Mpenja - Maseruka, Kiriri - Kasasa, Mpenja - Nsambwe - Kononi - Mamba - Mauki (123km)	5,454,400	ICB	Post / No	Prior	11-Jul-16
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Nakifuma - Nagojje, Walusibi - Katogo - Mbaliga - Namele & Nakasajja - Kyampisi with tee-off Kasawo - Luwero (71.7)	4,087,600	ICB	Post / No	Prior	11-Jul-16

Goods, Works and Non-Consulting Services

Package No	Lot No	Contract (Description)	Estimated Cost (US$)	Procurement Method	P-Q and Domestic Preference	Review by Bank (Prior/Post)	Expected Bid Opening Date
	Lot 3	Construction of 33kV grid extensions including LV reticulations in Mitemula - Nakiyaga - Nkuke - Kyanamukaka with tee-offs Nkule - Ketengesa ,Bukeri - Namirembe & Baale Landing sites, Kyanamukaka - Butamo (125km)	5,897,600	ICB	Post / No	Prior	24-Sep-16
4	Lot 1	Construction of 33kV grid extensions including LV reticulations in Mubende - Kyabayanga - Ngangi with tee-off Kahirimbara, Kibaale - Kikwaya & Karuguza SS, Kibonge, Buronzi, Katete, Nyamarunda, Kitoro & Kabale Pri Sch (134km)	6,169,200	ICB	Post / No	Prior	24-Sep-16
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Kiyagara – Bwizi, Biguri – Ntonwa, Ntara - Bwensamba (87.5km)	3,433,800	ICB	Post / No	Prior	24-Sep-16
5	Lot 1	Construction of 33kV grid extensions including LV reticulations in Rukoni (Mail 36) - Rwoho - Ngugo - Bugamba and Bugangari - Rwenshama with tee-off to Mirama Sub county (110km)	4,125,400	ICB	Post / No	Prior	24-Sep-16
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Karugutu - Ntoroko including Semiliki Safari Lodge (55km)	1,745,400	ICB	Post / No	Prior	24-Sep-16
	Lot 3	Construction of 33kV grid extensions including LV reticulations in Kagongo - Rweshuri with tee-off Kigalama & Nyansimbo - Rwenkoobwa (53.7km)	2,504,000	ICB	Post / No	Prior	24-Sep-16

Goods, Works and Non-Consulting Services

Package No	Lot No	Contract (Description)	Estimated Cost (US$)	Procurement Method	P-Q and Domestic Preference	Review by Bank (Prior/Post)	Expected Bid Opening Date
6	Lot 1	Construction of 33kV grid extensions including LV reticulations in Ngeta - Ayala - Alito - Ogur - Apala - Aloi - Adwari - Patongo (103km)	5,071,800	ICB	Post / No	Prior	24-Sep-16
	Lot 2	Construction of 33kV grid extensions including LV reticulations in Dokolo - Agwata HCIII, Aceng - Dokolo - Atur, Dokolo - Apapai - Tiriri & Otuboi - Orungo - Acuna (111km)	4,731,800	ICB	Post / No	Prior	24-Sep-16
7	Lot 1	Services for Independent Verification Agent under ERT III: Lot 1- Umeme connections, Lot 2 - Connections by other utilities	400,000	ICB	Post / No	Prior	11-Sep-15

Components 2 and 3

Agency	Package / Lot No	Contract (Description)	Estimated Cost (US$)	Procurement Method	P-Q and Domestic Preference	Review by Bank (Prior/Post)	Expected Bid Opening Date
MoESTS	1	Procurement of works for Supply, installation and maintenance of Energy Packages for 250 Post Primary Education Institutions	1,650,000	ICB	Post / No	Prior	7-May-2016
MoH	1	Procurement of works supply and installation of solar energy packages for 276 Health centers in 23 Districts in Batch 1&2	4,500,000	ICB	Post / No	Prior	10-Feb-2016
MOWE	1	Procurement of works for Supply & Installation maintenance of Energy Packages for Water Supply Schemes in Small Towns and Rural Growth Centers (20schemes)	3,000,000	ICB	Post / No	Prior	10 – July 2016

Procurement Risks and Mitigation Measures

67. Overall the capacity of the IAs has been strengthened under the predecessor projects as all of the participating agencies were involved in the earlier phases of the program. The assessment of the major individual agencies is provided below

REA

68. The REA will conduct most of the procurement under the project. Within the REA, the procurement shall be conducted by the Procurement and Disposal Unit which is staffed with 4 procurement staff. The technical departments from the ERT and Projects Development and Management will provide support on the technical aspects. The REA's capacity has been strengthened under ERT-2 with training for participating departments and the Contracts Committee. There is improvement in the capacity for procurement and contract management. However, the following risks remain, based on the Procurement Capacity Assessment conducted in March 2014:

(a) Delayed implementation due to capacity constraint on the REA's procurement and contract management capacity arising from high volume of procurement from the multiple donor projects.
(b) Weak procurement planning resulting in inappropriate packaging of contracts, high prices and delayed implementation of the project. Procurement plans by the REA are prepared almost at the end of the year and are therefore not effective. This is more recently being addressed with plans prepared in advance.
(c) Delayed procurement and contract implementation due to lack of adequate procurement and technical staff to support procurement and contract administration.
(d) Delays in procurement exacerbated by lack of an effective system for monitoring procurement progress and timely remedial action.
(e) Risk of collusion resulting in reduced competition and higher prices: Restriction of the number of contracts that a bidder may be awarded or that they may bid for results in collusion between the bidders and potentially higher prices.
(f) High level of contract variations arising from incomplete needs assessments and designs.
(g) Inadequate contract management resulting in delayed implementation and potential loss of value. Several contracts are extended beyond the contractual completion period and yet several bidders are considered non responsive at bid evaluation for failure to propose completion within the contractual completion period.
(h) Inadequate capacity among the SPs to manage and account inventories of connection materials received.

69. The assessment concluded that the overall procurement risk of the REA is Substantial and the proposed risk mitigation measures are summarized below in addition to other institutional development measures indicated above:

Risk	Action	Timeframe	Responsibility
Weak procurement planning	• Conduct training for the REA in Procurement Planning • Establish arrangements for ensuring that procurement plans are prepared within 2 months from the commencement of the financial year and updated quarterly as required. This will include internal audit review to ensure compliance • Procurement plan to be prepared and agreed before project appraisal	Prior to negotiations (completed) Additional training for REA will be organized by July 2015.	REA / WB
Delayed procurement and contract implementation	• The REA shall have a procurement officer to be responsible for procurement under the project • In addition, consultants to be hired to support REA in supervising construction with more attention paid to adequacy of resident clerks of works • The REA shall establish the procurement and contract monitoring system with regular reporting to management including measures to address emerging delays	By Effectiveness Throughout implementation By effectiveness	REA
Collusion resulting in reduced competition and higher prices	No restrictions to be applied to the number of contracts that bidders can bid for under the project. Similarly, contracts to be awarded shall only be restricted by the qualifications of the specific bidders relative to the qualification requirements of the individual contracts The REA to establish a system for tracking the cost of the key inputs for grid extensions and connection materials	Throughout implementation	REA
Inadequate contract management resulting in delayed implementation and potential loss of value	Establish system for Contract management and monitoring jointly between the procurement and user departments with Procurement Unit responsible for collating and reporting on contract monitoring. This will include consistent application of	Throughout implementation	REA

Risk	Action	Timeframe	Responsibility
	appropriate remedies under the contract in cases of delays		
Inadequate internal controls with limited risk based audit by the Internal Audit department	Internal Audit to conduct risk based audit including coverage of procurement and contract management.	Semi-annually	REA
Inadequate capacity among the SPs to manage and account inventories of connection materials received	The REA to hire consultant to assess the gaps among service providers and support them to establish inventory management systems	Ongoing with implementation expected during the project	REA

MoESTS

70. Procurement under the Ministry will be conducted by the MoESTS. Specifically the Project Implementation Unit established for implementation of IDA projects and staffed with Procurement Specialists shall conduct procurement under the project. The assessment of the MoESTS concluded that the overall procurement risk of the MoESTS is Moderate based both on the Ministry capacity and the limited volume of procurement under the project. The proposed risk mitigation measures are summarized below:

Risk	Action	Timeframe	Responsibility
Insufficient staffing within the Ministry to handle the volume of procurement with the additional project procurement	Procurement Specialist to be hired under for the IDA Projects PCU will also support procurement for ERT III	March 2015 (completed)	MoESTS
Delay to project processing and implementation due to lack of proper planning and non-adherence to procurement plan	Conduct training for the Ministry staff in procurement planning Establish system for regular review and reporting of the timeliness of procurement with possible independent review by Internal Audit department	July 2015	MoESTS and World Bank MoESTS Internal Audit
Inadequate contract management with limited reporting and monitoring of contract performance and major delays in payment leading to delayed implementation and poor quality	Establish contract management and monitoring system in the Ministry	July 2015	MoESTS
Inadequate specialized technical staff to support procurement and contract management	The Ministry has now Designated an Electrical Engineer to be responsible for implementation of the Project	completed	MoESTS

MoH, MEMD, MoWE, and UECCC

71. Procurement under these agencies will be fairly limited and will follow the same arrangements as being adopted for existing World Bank-supported projects. Capacity has already been strengthened under these projects and also from ERT-2 and relatively adequate capacity exists to conduct procurement. The detailed arrangements will be specified in the operational manual. The overall risk for these agencies is Moderate.

PSFU

72. Procurement will be conducted by the PSFU mainly for consultants. The Procurement Unit of the PSFU has been strengthened with the recruitment of a Procurement Specialist and the establishment of a Project Contracts Committee under the Competitiveness and Enterprise Development Project. Procurement will be conducted by the same team, supported by PCU's procurement officer, and follow the same arrangements. The risk to procurement is Significant.

SPs

An assessment of SPs with capacity for procurement was conducted and the risk mitigation measures were agreed. A copy of the assessment and mitigation measures is available in the project files.

M&E

73. To ensure that the implementation of the new model for electricity access is on the right track, and to inform necessary adjustments midway, the project will include a TA for systematically reviewing the project implementation progress and performance. The reviewer will examine various aspects of the implementation arrangements, including, among others: on-the ground process of consumer applications, connection works, functioning of the proposed financing mechanisms, implementation capacity of the SPs, the planning and coordination role of the REA, contractual management by the REA and SPs.

74. Under the proposed project, the M&E arrangement of all rural electrification activities to be undertaken by the PCU on behalf of the MEMD who will provide regular reporting and liaison with the Bank for all financial, procurement, fiduciary, safeguard and project implementation matters. Evaluation of the project will be done by the MoFPED.

ANNEX 4: IMPLEMENTATION SUPPORT PLAN
UGANDA: Energy for Rural Transformation III (P133312) and GEF Energy for Rural Transformation III (P146876)

Strategy and Approach for Implementation Support

1. The strategy for implementation support has been developed taking cognizance of the nature of the project and its risk profile. The aim of the strategy is to provide flexible, efficient, and risk-focused implementation support to the client. Furthermore, implementation of the Project will be guided by the policy provisions and strategic directives of RESP-2. The MEMD acting through the PCU will act as the central coordinating and monitoring agency for the project.

2. The project will be implemented by eight different institutions: Under Component 1, the REA will be responsible for implementation of the On-grid Energy Access component, which includes on-grid and off-grid activities. Under Component 2, the beneficiary line ministries – MoESTS, MoWE and MoH – will be responsible for implementation of the institutional solar PV systems for water pumping and health facilities. As in the ERT-2, the PSFU supports the development of private sector led investments in pico and micro hydro power development. All support from the PSFU will be on a cost sharing basis. The UECCC will continue with financing activities aimed towards increasing access to electricity. Under Component 3, the MEMD will implement the TA and associate equipment purchase activities as well as capacity development for the concerned sector entities.

3. The project requires strengthened Bank supervision during implementation. During the early stage of project implementation, the main focus of the project supervision will be (i) ensuring that the financing mechanism will be established in time; (ii) ensuring that the connection activities will be undertaken in time and adjusting the modality as appropriate in a timely manner; (iii) making sure that the REA will closely monitor the performance of the relatively new private SPs and develop adequate implementation capacity; and (iv) making sure that the REA will be able to handle the large volume of procurement and contracts for implementing Component 1. Additional support and calibrating the delivery models may become necessary as appropriate.

4. **Distribution STs and SPs**: The promulgation of RESP-2 brought about the "service territory" model for distribution and retail of electricity in Uganda. Fourteen distribution areas or STs have been established of which five are currently without long term SPs. In the interim, while long-term service providers are being procured, the UEDCL will manage these five STs as interim operators under Management and Operations contract with REA. The remaining nine STs are operated and managed by six SPs under agreements with the REA.

5. **Procurement:** Implementation support for procurement will include: (i) capacity building and TA to the IAs by providing detailed guidance and training to the IA staff; (ii) reviewing and commenting on all procurement documents before they are finalized; (iii) giving guidance on the Bank's Procurement Guidelines to IA procurement specialists and relevant project teams; and (iv) monitoring procurement progress against agreed procurement plans; Procurement plans will be updated as necessary to reflect project needs and developments on the ground.

6. **FM:** The Bank will continue to review the project's FM system including, but not limited to, accounting, reporting and internal controls. It was determined that the controls risk is *moderate.* The Bank team will also work with the REA to assist all the IAs in improving FM and reporting.

7. **Environmental and social safeguards:** Compliance with the Bank's environmental and social safeguard requirements will be the responsibility of all IAs. The MEMD, REA and the other IAs have adequate experience and capacity related to the Bank's social and environmental safeguards based on implementation of previous Bank projects, including the ongoing ERT-2 project. The Bank's task team will provide guidance to the IAs to address issues as they arise on a need by need basis. The MEMD and REA will ensure that all relevant participatory processes embedded within the Ugandan legislation including the ESIA, ESMP, RPF, RAP and other relevant project documents are followed.

8. **Other issues:** The Banks's task team will be selected from across various relevant sector units to ensure effective, efficient and timely implementation support to client IAs.

Implementation Support Plan

9. Project implementation support will build upon experience from ERT-1 and ERT-2. The Uganda Country Office has a locally based Energy Specialist who will be available for day-to-day implementation support activities, with support from headquarters. In addition, field based procurement, FM, social, and environmental specialists will provide regular fiduciary and safeguard support to the project team and IAs.

10. **Technical inputs:** Technical knowledge of MV and LV distribution installations is necessary to supervise the preparation, procurement and implementation phases of the project. The project includes sufficient consulting support to the REA and other IAs for design and packaging, implementation supervision and independent verification of completed works. This will ensure that correct procedures and standards for specifying and quantifying project materials and activities are followed at design and construction stages. The Bank's task team and the IAs will conduct regular field visits to inspect and familiarize with the construction status and condition of project sites throughout the project duration.

11. **Fiduciary requirements and inputs:** The Bank's task team will help the REA and other IAs identify capacity building needs to strengthen FM and procurement capacity. Regular FM and procurement supervision will provide timely advice on budget planning and streamlining of procurement processes. The PCU/REA will be responsible for compilation of annual project financial statements for independent external auditing. Project financial statements will be audited by an independent auditor acceptable to the Bank.

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Procurement of consultancy services for project designs, preparation of tender documents, and solicitation and evaluation of bids. Implementation of environmental and social safeguard studies – EIAs, and RAPs as required. Development and improvement to FM/Procurement systems Development of SPs' implementation capacity Handling of contracts for REA's lines extension	Technical and Procurement Safeguards Financial Management and Procurement Technical Technical and Procurement	US$180,000	Close collaboration and coordination with partners is necessary to ensure smooth implementation of these front-end project activities.
12-48 months	Technical implementation support Social and environmental safeguard implementation support M&E implementation support FM and procurement implementation support	Senior Financial Analyst, Senior Energy Specialist, and Power Engineer Social Safeguard Specialist and Environmental Specialist M&E Specialist FM Specialist and Procurement Specialist	US$660,000	Close collaboration and coordination with partners is necessary to ensure smooth implementation of project activities.
Other				

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Task Team Leader Senior Energy Specialist Social Safeguard Specialist Environmental Specialist Procurement Specialist Financial Management Specialist	9-12 weeks for each team member	2 per annum Locally based Locally based Locally based Locally based	These estimates will be adjusted annually and will depend on project progress and required implementation support to client agencies.

Partners

Name	Institution/Country	Role
GEF	IBRD	Co-financier

ANNEX 5: ECONOMIC AND FINANCIAL ANALYSES
UGANDA: Energy for Rural Transformation III (P133312) and GEF Energy for Rural Transformation III (P146876)

Economic Analysis

I. Background on Energy Use and Affordability

1. **Uganda's electrification rate at 14 percent is lower than average for Sub-Saharan Africa at 32 percent.** Despite having high rates of GDP growth over the past two decades, Uganda's electricity sector has struggled to provide reliable, cost effective electricity supply and has continuously lagged behind the demands of its growing economy. According to data from the 2012 UBOS nationally representative survey,[44] only 14 percent of the households were connected to the electricity grid – 7 percent of rural households and 52 percent of urban households. Grid access is largely concentrated in and around Kampala, with the lowest access in the north-eastern part of the country. There is considerable variation in grid access across regions within Uganda, ranging from 1percent in West Nile and North East relative to 65 percent in Kampala (Table 1).

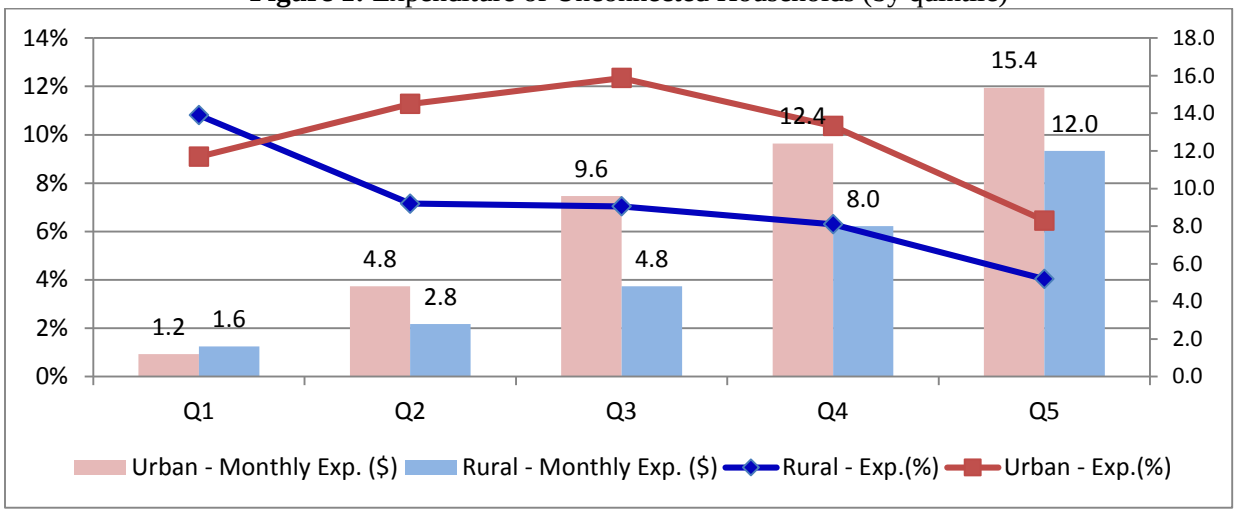
Table 1: Grid Access by Region

Grid Access Rates	Overall (%)	Urban (%)	Rural (%)
National Access Rate	**14**	**52**	**7**
KAMPALA	65	65	-
WAKISO	37	60	29
CENTRAL 1	15	36	12
CENTRAL 2	11	44	6
CENTRAL 3	17	57	11
NEAR EAST	14	44	8
FAR EAST 1	15	40	10
FAR EAST 2	9	46	6
MID EAST	5	45	3
NORTH 1	2	27	1
NORTH 2	3	37	-
NORTH EAST	1	16	-
WEST NILE	1	14	1
SOUTH WEST 1	10	40	7
SOUTH WEST 2	7	43	3
MID WEST 1	8	29	5
MID WEST 2	6	74	4

2. **Low electrification rates imply that the majority of households have to rely on other sources particularly paraffin to meet their lighting needs**. They also spend between 10-12 percent of their household budget on these fuels. Households in higher quintiles report higher absolute amounts spent on paraffin but it forms a lower proportion of their total expenditure. Unconnected urban and rural households in the lowest expenditure quintile report spending US$1.2 and US$1.6 per month respectively. In contrast, unconnected households in the top quintile spend US$15 per month in urban areas and US$12 per month in rural areas. The pattern in expenditure is similar for grid-connected households; however their total expenditure is slightly higher than unconnected households for most categories—both in terms of proportion and absolute amount spent.

[44] The survey includes information on energy expenditure and use on about 10,000 households spread across 17 regions in Uganda.

Figure 1: Expenditure of Unconnected Households (by quintile)



3. **Unconnected households pay multiple times lower than electrified households and the difference is particularly stark in rural areas.** However, WTP of unconnected households is similar between rural and urban households. The UBOS survey includes a direct question to respondents that elicits their household's WTP for grid access. While such a question is likely to be subject to various response and framing biases – most likely a downward response bias – it may provide an indicative range of the average WTP of the households currently without access – which ranges from US$2 in the poorest quintile to US$6 in the richest quintile.

Table 2: Median Monthly Values (US$)

	WTP	Last Bill Paid	Lighting Expenditure	
			Connected	Unconnected
Total	**4.0**	**8.0**	**14.4**	**4.0**
Rural	4.0	8.0	13.9	3.8
Urban	4.0	8.0	15.0	10.0
Q1	2.0	6.0	3.2	1.6
Q2	2.8	6.0	6.0	2.9
Q3	4.0	6.0	7.4	5.3
Q4	4.0	6.0	12.8	8.0
Q5	6.0	8.0	18.0	12.0

Note: WTP is only elicited for unconnected households and the last bill paid is only populated for grid connected households.

4. **Affordability of subsistence consumption is a concern.** With the prevalent tariff structure in Uganda,[45] a "subsistence" level of consumption of 30 kWh per month for a household would cost a little over US$5.[46] This amount is lower than the median electricity expenditure per

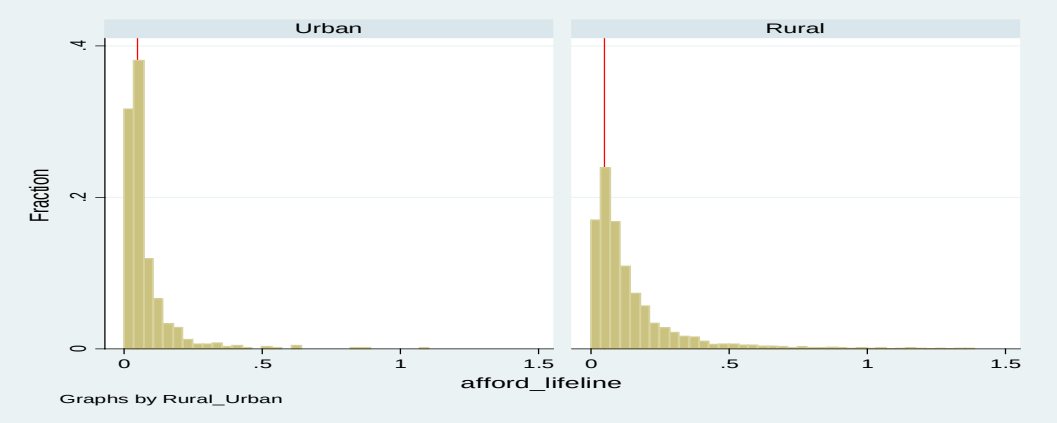
[45] The first 15 units are charged at USh150 per kWh (roughly 6 cents) and the next units at USh 520.6 per kWh (about 21 cents) and a monthly fixed charge of 3,360.

[46] As a reference, the use of two 15W Compact Fluorescent Lamp (CFL) bulbs running for 4 hours a day will consume 3.6 kWh per month; a 100 W TV (3 hours) uses 9 kWh per month; a 100 W fan (6 hours) uses 18 kWh per month for a total of 30.6 kWh per month.

month by all except the bottom quintile of connected households. Unconnected households, except the bottom two quintiles, also report spending above US$5 a month on household electricity[47]. This suggests that the expected monthly payment for grid electricity is affordable to roughly half of the unconnected households in Uganda.

5. However, if an affordability threshold of five percent of monthly expenditure on electricity is considered, then lifeline consumption level is affordable for only 27 percent of unconnected rural households and 47 percent of unconnected urban households. A visual examination of the distribution of electricity expenditure proportions for unconnected households shows that the distribution for rural households is more skewed to the right – lifeline consumption represents more than the five percent threshold for a greater number of households in rural areas than in urban areas, expectedly.

Figure 2: Histogram of Proportion of Expenditure on Electricity



Note: The red line represents the 5 percent lifeline consumption threshold.

II. Cost Benefit Analysis

6. The GoU has set out an ambitious plan to raise the access to modern electricity services under RESP-2. In doing this, the GoU recognizes the critical role that electricity can play in spurring economic growth and improving livelihoods in rural areas. Not only is electricity a critical input into the economic growth process, but access also directly improves household welfare. For example, the use of electrical appliances may increase labor productivity; better quality lighting can increase study time; business operating times can be extended beyond daylight hours, improved lighting can increase women's safety/mobility and increase economic empowerment; and a reduction in fossil fuel use inside the home can reduce the incidence of respiratory illness and deliver global environmental benefits from GHG offset.

7. The economic analysis of expanding electricity to households and institutions is based on a standard cost-benefit framework to arrive at an NPV and EIRR. The economic analysis is performed for Component 1 which includes the rural on-grid infrastructure investments; and for Component 2 which includes off-grid investments for SHSs and the installation of solar PV systems at rural institutions – schools, health centers and water pumping stations.

[47] The bottom quartile of grid-connected households have a median spending of approximately US$3 per month. With the given tariff structure this would allow about 20 kWh per month.

8. The capital costs considered in the analysis are project costs associated with distribution grid extension for 21 lines, grid intensification and solar systems installation for rural institutions – amounting to US$117 million after netting out contingencies (10 percent). Associated O & M costs are also accounted for. Other costs associated with on-grid access are the cost of service drop (US$210), and the cost of generation of the additional electricity needed to supply the new connections: estimated to be US$0.12 per kWh. For the household solar PV systems, the costs incurred by the customers are included. The largest market share in the household PV sector is held by companies offering a pay-as-you-go model, with installment payments from 12 months to 36 months. The analysis conservatively assumes full payment within one year.[48]

9. The methodology used to calculate the benefit from new grid connections uses an estimate of consumer surplus[49] derived from a comparison of average consumption basket before and after grid connection along the demand curve. Unconnected households using paraffin lanterns and paying for mobile phone charging are assumed to have an average electricity consumption of 1.8 kWh per month at a price of US$3.7 per kWh (implying a monthly expenditure of about US$6.8). Households connecting to the grid are assumed to have an average consumption of 38kWh/month at a price of US$0.15 per kWh for grid connected households. This gives two points on the demand curve from which the consumer surplus may be derived. Assuming a constant elasticity of demand gives an estimate consumer surplus (the area under the curve between the two points) of US$0.68 per kWh (equivalent to US$26/month at the assumed consumption level). Similar calculations for households acquiring solar PV systems gives a consumer surplus of US$3 per kWh (equivalent to roughly US$9 per month). Note that the (per kWh) surplus is much higher for households connecting to solar PV. This may be explained, in theory, due to very high initial valuation consumers place on the first few units of electricity and results directly from the assumed shape of the downward-sloping demand curve.

Table 3: Key Assumptions for the Economic Analysis

Variable	Unit	Value	Comments
Household Grid Connections	number	172,897	Existing lines and from intensification and extension of lines.
Average Grid Consumption	kWh/month	38	
Estimated Consumer Surplus (on-grid)	US$/kWh	0.68	
Average Cost of Generation	US$/kWh	0.12	
Cost of grid connection	US$/connection	210	
Household solar PV	Number	30,000	
Average system size and cost	Wp / US$	13 / 238	Calculation based on estimated market shares of 4 largest companies in Uganda
Battery replacement	Cost(%)/5yrs	33%	
Institutional PV Systems			
MoESTS PV installed	Number	100	Average size: 1690 Wp (15% load factor)
MoH PV installed	Number	276	Average size: 905 Wp (15% load factor)

[48] As the analysis is in annual time steps, it cannot easily distinguish between full upfront cash sales and 12-month installment payments.

[49] Technically, the calculations also include the producer surplus, which is a transfer from electricity consumers to the producers. The economic cost of the additional electricity supply is separately included in the costs.

Variable	Unit	Value	Comments
MoW PV installed	Number	15	Average size: 13400 Wp (15% load factor)
Battery Replacement	US$/Wp/5yrs	5	
O & M	US$/WP/year	0.18	Starting after first 5 years of operation
Other			
CO2 value	US$/tCO2	9	As per CiDev purchase price
Paraffin liters consumed	Lts/HH/month	3.6	Average of 3 lamps per household consuming 1.2lts each
Contingencies in capex allocation	%	10	

10. The estimated NPV of the on-grid component (Component 1) is US$227 million (99 percent of the aggregate NPV of the project)[50] and the NPV of the off-grid component (Component 2) is US$3.3 million (with a 20 percent EIRR). Comparing the estimated benefits from new grid and off-grid connections, and institutional solar PV installation[51] against the costs incurred shows that the project is economically viable with an EIRR of 38 percent and an NPV of US$231 million.[52]

Table 4: NPV and EIRR

Overall Project	EIRR: 38% NPV: US$231 million Benefit-Cost Ratio**:** 2.2
Component 1 (On-grid - Connections)	EIRR: 39% NPV: US$227 million
Component 2 (Off-grid Institutional & HH PV)	EIRR: 20% NPV: US$3.3 million

11. A sensitivity analysis reveals that the economic viability of the project is robust to credible changes in the underlying parameters. A switching value analysis for total project costs and benefits and sensitivity to delays in connection and failure to achieve connection and energy efficiency targets was performed. The results show that the EIRR for the project remains at 10 percent or above until a 54 percent reduction in total benefits or a 360 percent increase in project costs (or more than a three-fold increase). The economic viability is also preserved under a scenario of delays or underachievement of grid connections and energy efficiency investments.

[50] Cost allocation to Component 1 is roughly 83 percent of the project cost, not accounting for Component 3 (TA).
[51] The benefits for institutional solar systems for post-primary schools, HCs and water facilities are conservatively estimated at the avoided cost of generation from diesel. The true social benefits at newly electrified facilities will result from difficult to measure impacts including increased study time, use of cold storage and modern equipment for better health care delivery, and access to piped water.
[52] Using the standard 10 percent discount rate.

Table 5: Sensitivity Analysis

Scenario	EIRR or Switch Value (so NPV = 0)
Decrease in Overall Benefits	Switching value at 46% of original benefits
Increase in Project Cost	Switching Value at 360% increase
Lower Average Monthly Consumption (Grid Connected)	
15 kWh/month	**EIRR**: 22%, **NPV**: US$103 million
30 kWh/month	**EIRR**: 32%, **NPV**: US$190 million
Scenarios in delays in implementation	
Scenario 1 : Yearly Connection: 2-yr delay in start of connections	**EIRR**: 25% , **NPV**: US$172 million
Scenario 2 : Only 50% of connections achieved [year-on-year reduction]	**EIRR**: 20% , **NPV**: US$76 million
Scenario 3: Excluding GHG reduction benefits	**EIRR**: 36% , **NPV**: US$221 million

12. The expected net GHG impact of the project from increased access to renewable energy has been calculated at approximately 4 million tCO_2e during the lifetime of the project.[53]

Financial Analysis

Project Financial Analysis

13. It is not uncommon to see rural electrification activities requiring public financial support because they are not financially viable on their own as in this case. In sparsely populated rural areas, revenues from households are often insufficient to recover the capital expenditures especially during initial years. The results of the economic analysis in the previous section and the financial analysis of on-grid electrification under the proposed project suggest that the activities in rural electrification, while economically viable, are not financially viable when capital expenditures are included. However, the revenues from electricity sales are sufficient to recover the operating expenses. For this reason, it is important for the public sector to engage in rural electrification. In this context, the proposed project will build on the Bank's early engagement and support the establishment of a long-term platform for scaling-up electricity access and the implementation of RESP-2.

14. The section presents an analysis of project financial flows and returns. The assessment of the financial flows focusses on the investment component of the project – on-grid investments under Component 1: On-grid Energy Access. This component covers the investment in the expansion and intensification of the distribution network and household connections. Apart from these, the other project components are either supportive or public good expenditures which are not expected to directly generate financial revenues within the boundaries of the project.

Financial Flows

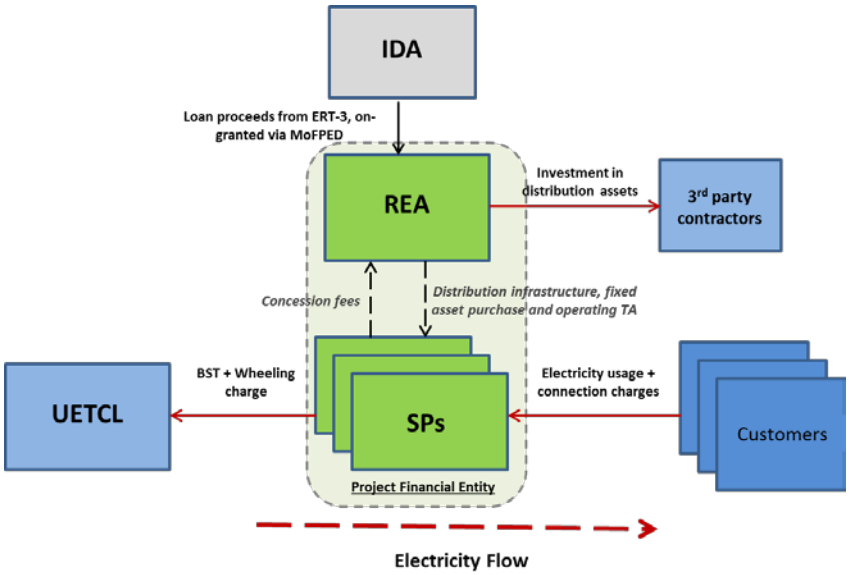
15. Under Component 1, the REA is the main IA that will carry out grid expansion works employing EPC contracts. IDA loan funds under ERT-3 received by the MoFPED will be on-

[53] This figure does not account for the net emissions attributable to the right-of-way land clearance for the construction of distribution lines under Component 1. As the lines are mostly to be built along road reserves, this impact is likely to be small.

granted to the REA to finance the investment in distribution assets.[54] The on-grant implies that the REA will not be liable for any repayments or interest charges to the MoFPED. In each ST, the SPs will manage the distribution assets and will pay a concession fee or lease payment to the asset owner – the REA, or in the case of Umeme, the UEDCL.

16. Individual SPs are responsible for operating and maintaining the distribution assets. The SPs will incur operating costs, including the costs of connecting end-consumers and the purchase of electricity from the UETCL at the BST along with any associated wheeling charges. Revenues generated from customer payments for new connections[55] and electricity use will cover the costs of operation and electricity purchase for the SPs. In addition, REA's investment costs are also expected to be partly offset through lease payments from the SPs to the REA. A profit should be captured by the SPs to incentivize them on delivering on time.

17. The diagram below shows the overall flow of funds associated with the main expenditure and revenue transfers between entities.



Financial Analysis

18. The financial analysis presented in this section evaluates the net financial returns for on-grid investments under Component 1: Rural Energy Infrastructure and Connection. While the project must have positive net economic returns for it to be a viable investment of scarce public resources, it is not expected to generate positive net financial returns within the boundaries of the project. Regardless, it is still informative to evaluate the net financial costs of the proposed project.

19. For the purposes of the analysis, the implementing entities of the component – the REA and the SPs – can be considered as a single financial entity. The analysis thus calculates returns by evaluating financial inflows and outflows from the "project financial entity" (the green boxes within the dotted line in the above diagram). Thus flow of funds between the REA and the SPs

[54] In addition to the IDA loan, US$10 million in GoU counterpart funding will also be on-granted.
[55] Implementation of physical connections will be contracted out to third party contractors with costs incurred either by the REA or the SPs.

such as the concession fee paid by the SP to the REA, or the wheeling charges paid by one SP to another, are merely transfers within the boundaries of the entity and need not be accounted for in the financial analysis.

20. Expenditure consists of three different flows: (i) investment in distribution infrastructure implemented by third party contractors,[56] (ii) expenditure incurred on service drop construction for households, and (iii) purchase of electricity from the UETCL at the BST.[57] This generates two revenue flow categories from end-consumers: (i) payment of connections charges, and (ii) payment for electricity usage. These revenues flow directly to the SPs (with a portion being transferred to REA as concession fee).

21. ***Project costs***: The investment costs are estimated as the cost allocation under Component 1 – US$120 million. This allocation will cover construction of 21 distribution lines and household connections along these (US$85 million), grid intensification along with household connections (US$25 million) and household connections on pre-existing lines (US$10 million). The additional costs incurred by service providers are the costs incurred on materials and labor in constructing the service drop to households (assumed at US$210 per connection) and the purchase of electricity from the UETCL at the BST (US$0.07 per kWh). The latter is adjusted for distribution losses of 24 percent, based on the losses of the largest distribution utility Umeme. While these losses are projected to decrease to as low as 15 percent by 2018 based on the tariff parameters agreed upon between Umeme and the regulator, the reduction in losses would be automatically reflected in a lower tariff to consumer. The same goes for the BST whereby retail tariff would be adjusted should there be variations in theBST. For simplification, the team has resorted to using constant retail tariff, distribution losses and BSTs through the life of the project.

Year	Annual connections assumed	Assumed Expenditure Disbursement (US$ million)
2016	8,095	12
2017	16,190	24
2018	51,869	36
2019	61,064	30
2020	35,679	18
	172,897	120.0

22. ***Financing*****:** The investments will be financed by IDA credits with a fixed service charge of 0.75 percent, a 38-year tenure and a six-year grace period. No commitment fees are incurred by the Borrower.

23. ***Impact on UMEME:*** It is important to highlight that the project's assets will not be added to the asset base of UMEME and thus the private operator will not be achieving the contractual return of 20 percent on these investments. The business model of these investments is that UMEME in

[56] For the purpose of the financial analysis it does not matter whether REA or the SPs implement the contract for construction.

[57] It could be argued that general operating expenses of SPs (and REA) should also be included. However, for accuracy only the increment in expenditure on account of the project would need to be estimated. As this is neither straightforward to do, nor is it likely to be significant relative to other expenditures already accounted for, it is not considered in the analysis.

theory would capture some kind of fee for managing the assets provided the lease payments to the REA are well quantified.

24. ***Project revenues:*** The revenues for the project are the payments for connection charges (US$210 per connection) and monthly electricity use (calculated at the equivalent tariff for the assumed average monthly use). Further, the REA is expected to pre-finance the connection costs for new connections, with consumers being allowed to pay the associated charges in monthly installment over a period of up to 60 months.[58]

25. Based on the above information, the results of the financial analysis show that the on-grid investments under Component 1 of the proposed project almost achieves breakeven during the lifetime of the assets. The estimated financial NPV is -US$4.32 million with an associated FIRR of 0.47 percent (compared to the WACC of 0.75 percent).

	FIRR	NPV ($ million)
On-grid (Component 1: Rural Energy Infrastructure and Connections)	0.47%	($4.32)

26. **Sensitivity Analysis**: To test the sensitivity to the results to the underlying assumptions switching values were estimated for each of the parameters relating to household consumption, consumption growth, tariffs, connection charges and costs and distribution losses. As the baseline results were very close to breakeven, marginal changes in baseline parameters are adequate for the project to breakeven. The results from the switching value analysis confirm this. The results show that a slight increase in average annual consumption (of 18kWh per household) or an increase in the margin between connection costs and charges of US$26, is enough to achieve break even with a zero NPV.

Assumed Parameters	Baseline Value	Switching Value
WACC	0.75%	-
Yearly HH Consumption (kWh/year) (Base Year)	456	474
Retail tariff ($/kWh)	0.154	0.156
Bulk Supply tariff ($/kWh)	0.072	0.070
Annual consumption growth factor	0.0%	0.02%
Connection Charge	210	236
Service Drop Cost	210	184
Installments (Years)	2	n.d. (<0)
Distribution Losses	24%	22%

27. **Installment Payment Scenarios**: As mentioned earlier, for reasons of affordability it is proposed that the US$210 connection charge could be payable in monthly installments over a period of 24 to 60 months. The baseline analysis is based on the case of 24 month installment payments. Results calculated allowing for payment over 60 months shows a marginal decline in

[58] The baseline results assume 24 months payback period, with equal installments.

the financial NPV to approximately - US$4.7 million (FIRR 0.45 percent), roughly a four percent decline.

Financial Analysis of SPs

28. Even though the SPs are not directly implementing the project, their financial viability will impact the achievement and sustainability of the PDOs. Unless the SPs can continue to process connection requests and provide O&M of the distribution network in their respective STs. Financial analysis of Umeme was conducted on the basis of audited financial statements and the findings are presented in the project file.

ANNEX 6: SAFEGUARDS
UGANDA: Energy for Rural Transformation III (P133312) and GEF Energy for Rural Transformation III (P146876)

1. The proposed project will support interventions designed to increase access to electricity in rural areas of Uganda. The project is expected to have positive overall environmental impact through promoting renewable energy generation and energy efficiency. Based on the generic environmental aspects the proposed subprojects, impacts of the project will be of small scale, localized and of short-term nature. These impacts can be readily mitigated through implementation of applicable mitigation measures that will be proposed through the ESIAs and ESMPs developed with guidance in the ESMF and RPF. The project is therefore assigned Environmental Assessment **Category B** because of the limited adverse environmental and social impacts.

2. The project is expected to be implemented in selected areas across the country. The salient physical characteristics are prominent in the LV power-line construction sub-components (Component 1), which shall involve excavations and earthworks, vegetation clearance of both grass and trees, formation of murram bunds for pole structures in wetland areas, creation of wetland access paths, establishment of equipment storage areas, land take and displacement of land-uses and thus associated compensation. Under Component 2, environmental aspects relate to the management of residual waste from the solar PV systems, once they reach the end of their life in schools and health centers where they are installed and used. Component 2 includes development of three pico hydro (3x5 kW) and three micro-hydro (16 kW, 20 kW and 45 kW) power generation facilities. Under Component 3 the project will support and provide funds for the development of geothermal energy.

3. The following Environmental and Social Safeguard Policies were triggered: **OP 4.01** Environmental Assessment because of the likely localized environmental impacts listed above; **OP 4.04** Natural Habitats because of the likely impacts on natural habitats such as wetlands, rivers, and forests, **OP 4.11** Physical Cultural Resources because of the associated civil works that may impact on un-known and known Physical Cultural Resources, and **OP 4.36** Forests because of the possibility of power lines passing through forested areas, **OP 4.12** Involuntary Resettlement because the project may involve land take and displacement of land-uses, limiting access and livelihoods. A summary of safeguard policies triggered is provided in Table 1 below:

Table 1: Summary of safeguard policies triggered

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	**Yes**	Triggered because the program will support investments with potential negative environmental and social impacts arising mostly from the construction of the 33/11 kV power distribution lines. The specific locations of all the physical components have not yet been determined and therefore an ESMF has been prepared, consulted upon and disclosed before appraisal. Once specific project sites have been identified, site specific ESIAs and ESMPs shall be

		prepared. However, ESIAs for the first two lines of Kiganda Mile 16 and Ruhumba – Kashwa whose feasibility has been completed have been prepared and disclosed prior to appraisal.
Natural Habitats OP/BP 4.04	**Yes**	Triggered because some power lines may pass through and affect natural habitats such as forests, and wetlands. Any likely impacts shall be assessed and addressed through the guidance provided in the ESMF, specific ESIAs and ESMPs.
Forests OP/BP 4.36	**Yes**	Triggered because some power lines may pass through forest areas with a potential of causing negative impacts. Any likely impacts shall be assessed and addressed through guidance provided in the ESMF, specific ESIAs and ESMPs.
Pest Management OP 4.09	**No**	Not triggered because the project will not involve use of pesticides.
Physical Cultural Resources OP/BP 4.11	**Yes**	Triggered because of the civil and earthworks during construction of the power lines which may affect known or un-known Physical Cultural Resources. A chance finds procedure has been developed as part of the ESMF.
Indigenous Peoples OP/BP 4.10	**No**	The project does not fall under any Indigenous People's areas.
Involuntary Resettlement OP/BP 4.12	**Yes**	Triggered because the project will involve land take and displacement of land-uses, limiting access and livelihoods. An RPF was prepared and disclosed on July 29, 2014 in-country and on September 8, 2014 at the InfoShop. This will guide preparation of the RAPs for distribution lines when specific locations are known. Two RAPs for Kiganda Mile 16 and Ruhumba – Kashwa have been prepared in a consultative process and have been disclosed prior to appraisal. RAPs for all other lines will be prepared during implementation but will need to be disclosed prior to start of line construction works.
Safety of Dams OP/BP 4.37	**No**	This Policy is not triggered because the project will not involve construction of a dam or involve interaction with a dam under construction. However,

		Component 2 includes inter alia: the development of three pico hydros (5 kW each) and three micros (16 kW, 20 kW and 45 kW) hydropower plants and will require construction of weirs. The Environmental, Health and Safety impacts of Pico and Micro HPPs are minimal and insignificant to warrant trigger of this policy. The Pico & Micro HPPs shall be screened and if necessary, an ESMP will be developed to guide their implementation.
Projects on International Waterways OP/BP 7.50	**No**	This Policy is not triggered because the project will not affect international waterways.
Projects in Disputed Areas OP/BP 7.60	**No**	This policy is not triggered because the project will not be implemented in disputed areas.

4. To manage any likely environmental and social impacts of the proposed project, an ESMF was prepared and disclosed in-Country on July 29, 2014 and at the InfoShop on September 8, 2014. ESIAs for the first two lines of Kiganda Mile 16 and Ruhumba – Kashwa have been prepared in a consultative manner, reviewed, cleared by the Bank and disclosed in country on March 23, 2015 and at the InfoShop on March 27, 2015. The ESMF provides a step-by-step guidance on how to identify potential adverse environmental and social impacts from project activities, and how to plan, implement and monitor measures to mitigate them. The ESMF took into consideration the implementation lessons of the predecessor projects, in-building mechanisms to continuously improve the processes of identifying environmental and social impacts of planned activities, planning and implementing mitigation measures, monitoring and reporting. Consultations with the various stakeholders were adequately conducted and this informed project design. Consistent with best practice in developing ESMFs, ESIAs, and general ERT-3 project development, consultations were held with relevant stakeholders. The stakeholders consulted included District Local Government Officials (District Environment Officers, District Production Officers, District Engineers, Chief Administrative Officers, District Planners and District Engineers, officials from MEMD, MoWE, NEMA, MoH, Uganda National Roads Authority (UNRA), National Forestry Authority (NFA), Uganda Wildlife Authority (UWA), and local communities among others.

5. To mitigate the social impacts associated with land access and other assets a Resettlement Policy Framework (RPF) consistent with the national and Bank standards was prepared and disclosed in-country on July 29, 2014 and at the InfoShop on September 8, 2014. The RPF sets out the guidelines for the RAPs to be prepared for any subproject that triggers the Involuntary Resettlement Policy. The RPF was prepared alongside the ESMF that sets out guidelines to mitigate any other project related social impacts. In addition, two RAPs and ESIAs for the first two distribution lines (Kiganda Mile 16 and Ruhumba – Kashwa) were prepared and disclosed in-country on March 23, 2015 and at the InfoShop on March 27, 2015.

6. Prior to the start of any construction work, sub-projects and site specific ESIAs, ESMPs and RAPs guided by the provisions in the ESMF and RPF respectively, shall be developed, cleared by IDA and disclosed both in-country and at the InfoShop. During the implementation period, the MEMD in collaboration with the REA and other beneficiary IAs will undertake a study to assess extent of gender mainstreaming and inclusion in energy access for poverty reduction and empowerment as well as the contribution of the proposed Project on poverty alleviation in the areas of operation during the first year of implementation. As elaborated in the ESMF and RPF, gender analysis will also be an integral part of M&E of the project activities.

7. In terms of capacity for environmental management, the MEMD, REA, MWE, MoH have capacity to implement environmental aspects of the project while other agencies have inadequate safeguards capacity to effectively implement the ESMF requirements. The MoESTS is in the process of establishing a PCU under another Bank supported project (Skills Development Project and Global Partnership for Education), which will include a safeguards officer. The safeguards officer will be expected to support all Bank funded projects.

8. However, on social aspects, all IAs have inadequate capacity to effectively handle social issues. Accordingly, the REA recruited a social development specialist to ensure appropriate implementation of social aspects of its component; this will be done in close collaboration with the Wayleaves Unit at the REA. The MEMD and PCU will undertake overall coordination of the implementation of environmental and social safeguards aspects of the projects, including gender aspects, in close collaboration with the IAs. In addition, the MoESTS will be recruiting a safeguards specialist to take care of all the environmental and social issues on Bank-financed projects.

9. Designated key personnel responsible for implementing the environmental and social safeguard requirements from these agencies will be required to attend training on ESMF implementation and land acquisition to be organized by the MEMD in close collaboration with the Bank. In addition, for internal capacity building, the safeguard officers will learn from each other especially from the MEMD and REA safeguards officers.

10. Environmental and social monitoring will be undertaken to check the effectiveness and relevance of the implementation of the proposed mitigation measures. Overall, the MEMD/PCU and the IAs will have the lead role in monitoring sub-projects to ensure that their various environmental and social obligations are met. The DEOs in conjunction with the District Community Development Officers will also monitor the implementation of environmental and social mitigation measures. NEMA and the ERA may also undertake regulatory inspections to ascertain the compliance status of the project. Suitable project monitoring indicators will be developed by the IAs based on the mitigation measures and the ESMPs or RAPs. At the end of each subproject construction phase, environmental and social issues shall be part of Certification of Compliance for the completion of works issued by the IAs. Environmental and social issues shall be signed off by IAs' safeguards officers.

11. The proposed institutional management of environmental and social safeguard aspects are summarized in Table 2 below:

Table 2: Institutional arrangements to manage safeguard aspects

Institution	Responsibility and Safeguards Capacity for ESMF Implementation
MEMD/PCU	The MEMD is the lead agency for all energy projects in Uganda. The Project will be housed in the MEMD and overall coordination will continue to be carried out by the existing PCU for ERT-2. It will be responsible for environmental and social planning, coordination, M&E, and the implementation of all activities of the Project in consultation with the other IAs while closely relating with the Bank. **Responsibility** • Overall PCU for the Project. • PCU shall be responsible for oversight role and the implementation of mitigation measures and general compliance of the project with any permits, licenses and Approval Conditions and related regulations and standards on environment. • Report on matters of resolving complaints and grievances regarding the project activities by stakeholders. • Component 3 will finance studies of other renewable energy resources such as geothermal energy, and will be implemented by the MEMD. • Exploring additional generation from geothermal sources. **Capacity** – the MEMD does have in-house capacity in terms of qualified staff to implement this ESMF. Under ESDP financing, MEMD has recruited a Safeguard Officer who will be responsible for coordination and support to all environmental aspects of the proposed Project.
REA	The REA is the lead government institution for implementation of rural transformation energy projects. **Responsibility** • The REA will take lead in implementation of Component 1. • Report on implementation of environmental and social aspects, including resolution of complaints and grievances regarding the project activities by the stakeholders. **Capacity** – the REA has an Environmental Unit with two environmental specialists who have sufficient training and experience in environmental and social issues and can effectively coordinate and provide expert advice to contractors on how to effectively implement the required safeguards under ERT-3. A wayleaves unit also works hand in hand with environmental unit during RAP process. In addition, the REA recruited a social development specialist in the financial year (2014/15) to fully address all social issues including compensation and resettlement including vulnerability issues projects including ERT-3. The staff will work in close collaboration with Environment and wayleaves staff in the REA. The safeguards specialists will train and guide the DEOs and CDOs at the district level on management of environmental social aspects including issues of vulnerable groups. They will be facilitated by the REA to implement and monitor the project on ground.
UECCC	**Responsibility – the** UECCC provides TA and new financing options to facilitate access to electricity. The UECCC will utilize their portion of funds to facilitate local commercial finance by providing credit enhancement products such as partial risk guarantees, and other refinance facilities. This is under Component 2.

Institution	Responsibility and Safeguards Capacity for ESMF Implementation
ERA	**Responsibility -** The primary duties of the ERA include licensing, tariff setting, development and enforcement of performance and safety standards. The ERA will ensure that, the operations and costing of energy from the planned project will be in accordance with its set laws, standards and tariffs.
NEMA	**Responsibility** – review and approve EIAs and Project Briefs as well as monitoring project implementation in accordance with the National Environment Act Cap.153 and the respective regulations. **Capacity** – NEMA has adequate capacity to monitor the ERT-3 through its Department of Environmental Monitoring and Compliance in addition to the District Environment Officers in the respective project areas that will be able to report any cases of noncompliance. Although NEMA has no social scientists, NEMA Environmental Inspectors capture social issues/complaints during their inspections where feasible. Overall, NEMA captures both environmental and social issues either through the mandatory annual compliance audits or through routine monitoring and inspection. The DEOs who are gazetted Environmental Inspectors also carry out environmental monitoring of the projects in their respective districts. Therefore, there is need for close coordination between the DEOs and CDOs to fully integrate social issues into monitoring and supervision of the project.
MoFPED	**Responsibilities** – overarching role of impact monitoring for the ERT-3. **Capacity** – No environmental and social technical capacity to implement this ESMF but it is important to note that the MoFPED will not be directly involved in technical implementation of the project on ground hence no need for environmental and social safeguards capacity for the ERT-3, will come in case of administrative and financial bottlenecks.
MoH	**Responsibility** – implement solar PV systems for health centers (Under Component -2) in collaboration with the MEMD/PCU **Capacity** – The MoH has the Environmental Health Division which could be engaged for purposes of implementing the ESMF requirements. However, it has been recommended that the supplier will have to cater for end-of-life issues through procurement process or follow guidance provided by NEMA. Key personnel from the MoH will be required to attend training workshops on ESMF implementation to be organized by MEMD/PCU. In addition, they will have to seek advice from MEMD/PCU's Safeguard Officer on all environmental and social issues of the Project that may arise.
MoWE	**Responsibility** – the MoWE will implement solar PV systems as well as grid extensions for water pumping stations in collaboration with the MEMD/PCU. **Capacity** – the MoWE does have in-house capacity in terms of qualified staff to implement this ESMF.
MoESTS	**Responsibility** – In terms of providing PV systems to schools, the MoESTS has demonstrated satisfactory implementation capacity and will carry out these installations. **Capacity** – the MoESTS does not have an Environmental Unit or the necessary expertize to ensure safe handling and disposal of waste associated with solar PV materials. However, it has been recommended that the supplier will have to cater

Institution	Responsibility and Safeguards Capacity for ESMF Implementation
	for end-of-life issues. Key personnel from the MoESTS will be required to attend training workshops on ESMF implementation to be organized by the MEMD/PCU. In addition, they will have to seek advice from the MEMD/PCU's safeguard officer on all environmental and social issues of the Project that may arise.
PSFU	**Responsibility** – the PSFU will continue with their successful investment components such as micro and pico hydropower development. **Capacity** – the PSFU does not have an Environmental Unit or the necessary expertize to implement this ESMF. However, environmental specialist to be recruited under Competitiveness Enterprise Development Project will be required to support ERT-3 activities under the PSFU. Key personnel from the PSFU will be required to attend training workshops on ESMF implementation to be organized by the MEMD/PCU. In addition, they will have to seek advice from the MEMD/PCU's safeguard officer on all environmental and social issues of the Project that may arise.
LGs	**Responsibility** – Work with the MEMD/PCU to implement the project within their respective jurisdictions. **Capacity** – Every district has a designated DEO whose responsibility is to monitor all environmental affairs of the district including compliance of activities within their jurisdiction. In addition, every district has a CDO who is responsible for mobilizing communities to participate in projects as well as coordinating and reporting on the social impact of projects (positive and negative) on the communities. District Land Tribunals are also in place for some of the project districts to handle land related issues of the Project. However, the districts will require facilitation to monitor project implementation as provided for in the ESMF budget. The participation of Local Governments is critical in sub-projects of power distribution lines.
Contractors	**Responsibility** – Actual implementation of the project on the ground including installations. The Contractor on his part will also be responsible for planning, implementing and reporting on mitigation measures during the execution of the project works. **Capacity** – The Contractors are unknown at this point. However, the selection criteria will include past environmental and social performance as well as adequacy of contractor's staff to effectively put mitigations in place. Contractors shall be required to develop Contractor's ESMP as part of the Bidding process.
World Bank	The Bank will be responsible for review and clearance of ESIAs/Project Briefs as well as offering implementation support supervision to the project's environmental and social performance through missions. The Bank will also be responsible for reviewing regular monitoring reports and officially disclosing the ESIAs on its website. Technical guidance may also be provided by the Bank to the GoU/MEMD/PCU and the IAs as needed from time to time.

ANNEX 7: GLOBAL ENVIRONMENTAL FACILITY
UGANDA: Energy for Rural Transformation III (P133312) and GEF Energy for Rural Transformation III (P146876)

Introduction

1. The proposed project is the third and final phase of the Energy for Rural Transformation (ERT) program for Uganda. The purpose of the long-term program was to develop Uganda's rural energy and ICT sectors, so that they can make a significant contribution to rural transformation in Uganda. The GEF contribution of US$30 million, aligned with IDA funding, was to be implemented in three phases. A commitment to the long-term was envisioned to guarantee the sustainability and acceleration of the global environmental benefits delivered under the program. The stages were designed to take the process from initial, piloting and market building activities to a mature, stable market for renewable energy in rural areas that can be self-sustained once the program ends.

2. The project forms an integral part of the second phase of RESP-2 which will cover the period of 2013-2022. RESP-2 provides the main framework for Uganda to advance towards meeting the objectives set forth under the SE4ALL initiative. The proposed project will provide support, among others, to the access objective of SE4ALL.

Background of Earlier Phases

3. ERT-1 and ERT-2 were successful in building institutional capacity in the Ugandan electricity sector and stimulating the expansion in renewables in the energy mix, both grid- and off-grid. Building on the institutional framework and learnings resulting from the first two phases, ERT-3, will help scale up activities to increase electricity access through on-grid electricity connections and greater market penetration by solar PV systems.

4. In Phase I, the GEF contribution of US$12 million focused on establishing a clear and manageable regulatory framework for small-scale renewable energy producers and supporting the procurement and adoption of solar PV in institutional productive-use applications in rural Uganda. Despite some delays encountered in Phase I, it was successful in establishing a favorable policy and regulatory environment; stimulating private investments in small-scale renewable electricity being supplied to the grid (15.85 MW installed); and providing PV-based electricity to schools, water supply systems, and clinics. Some household and business sales were also achieved and the cumulative Wp of solar installed exceeded 500 kWp. The achievement of these results satisfied the results triggers established at the time of program definition, allowing the project to move ahead into the ERT-2 stage.

5. Moving into Phase II, the GEF contribution of US$9 million supported market deepening of renewables through the continued growth of the small-scale, privately-implemented renewable power sector; more institutional PV connections for schools, health centers, water supply systems, and businesses for stand-alone power; and sales to households of solar PV systems. Despite some challenges encountered with the business model of delivering SHSs, the project has continued the scale-up and exceeded the triggers established for moving to Phase III of the ERT Program.

6. The Bank continues to provide support to the ERT program through its use of IDA resources. The first and second phases of ERT were allocated US$49.15 million and US$75 million, respectively in IDA resources. Subsequently, an Additional Financing ERT-2 for US$12 million was approved on May 22, 2013. For the proposed Project, the GEF contribution of US$8.2 million will be matched to the IDA contribution of another US$135 million. The Bank is maintaining its strong commitment to the Uganda ERT Program.

Achievements of ERT-2

7. ERT-2 had built upon the foundation laid during ERT-1 to support an increased penetration of renewables in the Ugandan energy-mix. Activities under the project included a scale-up of both institutional and household electrification using off-grid solar PV panels. It also funded on-grid renewable capacity in the form of small hydro power plants. There was also new ground laid in the form of energy efficiency investments and promotion of solar water heaters targeting the private sector in Uganda. These activities delivered a cost-effective reduction in the emissions intensity of private sector operations in Uganda.

8. Achievements under ERT-2 met the GEF targets ("triggers") envisioned during the preparation of the project. The ERT-2 PAD listed the development of 25 MW of on-grid renewable capacity and the installation of 1 MWp of solar PV capacity as the target achievements in order to move to the next stage under the GEF component of the project.

9. For the on-grid small renewable projects, the market in Uganda has continued to develop with approximately 46.5 MW of small hydro projects being connected to the grid during the ERT-2 lifetime (see table below). In addition, PSFU initiated support for electrical load management making use of solar water heaters for households and commercial enterprises that resulted in reduced load requirements (3.92 MW) and considerable electricity savings (3.6 GWh per year). Additionally, the PSFU provided a cost-effective assistance to local industries to utilize power-factor correction equipment, reducing reactive power in the system and accounting for a reduction of load requirements from industry valued at a figure roughly equivalent to US$54,545 per MW (compared to US$3 million per MW to build new capacity). Together, these two initiatives are equivalent to reduced load of 13.9 MW or roughly a 30.5 GWh per year reduction in grid-based electricity demand. Thus, the on-grid components under ERT-2 accounted for GHG reductions associated with a total capacity of 60.4 MW.

Table 1: Small Renewable Capacity Installed during the Duration of ERT 2 (On-grid)

Small Hydro	Date of Commissioning	Capacity (MW)
Kabalega	2012	9
Mpanga	2011	18
Ishasha	2011	6.5
Mubuku-II (Bugoye)	2009	13
Total		**46.5**

10. For the rural interventions, the solar PV installations for households were last measured at approximately 10,000 (about half of the number projected in the ERT-2 PAD). However, since the size of the panels sold on average was larger than expected, the associated installed capacity is almost equal to the projection. Installation of institutional PV systems kept pace with the

projections under each of the categories of health, water, education, and local government and is likely to achieve the set projected targets by program end. In total, the installed capacity of solar equipment stands at 1.76 MW, approaching the projected achievement of 2.1 MW. The corresponding cumulative CO_2 emissions achieved under the project are estimated at 1.67 million tons of CO_2-eq over the lifetime of the equipment, nearly doubling the CO_2 target adopted for the project of 860,484 tons of CO_2eq.

Table 2: GHG Benefits Achieved under ERT -2

	Number of Installations		Capacity Installed		Lifetime CO_2 emission reduction	
	Projected	**Actual**	**Projected**	**Actual**	**Projected**	**Actual**
On-grid			(MW)	(MW)	(tCO_2)	(tCO_2)
Small Hydro/Renewable Energy Efficiency and	-	-	25	46.5	825,000	1,500,641
Solar Water Heaters (PSFU)	-	-	NA	13.9		140,811
Off-grid						
Solar Home Systems	20,000	10,016	0.60	0.59	18,700	18,304
Non-Govt. systems	1000	2011	0.47	0.33	4,834	3,841
Health Systems (MoH)	464	367	0.39	0.25	4,474	2,834
Water systems	29	29	0.39	0.39	4,527	4,502
Education (MoESTS)	560	400	0.26	0.18	2,949	2,107
Local Govt (MoLG)	66	66		0.02		263
Total On-Grid			25.00	60.42	825,000	1,641,452
Total Off-Grid			2.10	1.76	35,484	31,851
Grand Total			**27.10**	**62.18**	**860,484**	**1,673,303**

Note: Assumptions for calculations – It is assumed that solar panels offset kerosene use with emission intensity of 0.8 tCO_2/MWh; household systems operate roughly 7.8 hours and day (30 percent) and institutional systems 2.6 hours/day (11percent); solar water heaters operate 3 hours a day; for power factor correction calculations, industries operate machinery 10 hours a day for 270 day/year; grid emission intensity is 0.307 tCO_2/MWh.

Rationale for GEF Support

11. The original concept presented at the time of the program's approval considered Phase III to build on successes of the previous stages and to begin the process of scaling-up renewable energy investments in rural areas. It is intended to provide support to the market for renewable energy in Uganda that is at a crucial stage of development. Support under the proposed project, including that from GEF funds, will play a critical role in solidifying the groundwork laid during the previous two phases and help mature the renewables market towards self-sustainability.

Anticipated Results for ERT -3

12. The project is consistent with the objectives under the SE4ALL framework of increasing access to electricity in rural areas; increasing the penetration of renewable energy; and improving the efficiency of energy use. Under the ERT-3, GEF funds will be dedicated towards the installation of solar PV systems at rural post-primary schools, HCs, and water pumping stations. The economic benefits delivered include increasing potential study time into evening hours, improved education quality from computers, access to reliable water supply, and delivery of

modern health services relying on electrical equipment and cold storage. In addition, the GHG benefits accrue to these projects from the offset of diesel power generation that in some cases already exists (and will be replaced/reduced) or in some cases would be the alternative power source. The projected installation of institutional PV systems is: 100 at post-primary schools, 276 at HCs, and 15 at water pumping stations. The total expected GHG reduction over the assume 20-year equipment life is estimated to be approximately 19,200 tCO_2e from an estimated installed capacity of 620 kWp.[59] The slight scaling down of the component under ERT3, compared to ERT2, represents the shift towards sustainability of renewable energy installation activities at rural institutions. Individual line ministries are being encouraged to mainstream renewable energy service in their budget allocations. In line with this, MEMD has formally committed US$1.35 million to line ministries to cover the five year maintenance cycle for systems installed under the ERT program.

Table 3: Anticipated Achievements under ERT -3

	Number installed	Average Capacity (kWp)	CO_2 reduction (tCO_2e) per year	CO_2 reduction (tCO_2e) lifetime (30yrs)
Off-grid				
Health systems (MoH)	276	0.905	433.3	8,666
Water systems (MoW)	15	13.40	269.9	5,397
Education systems (MoESTS)	100	1.69	260.0215.4	5,200
Grand Total		**620**	**963**	**19,263**

Note: Assumptions used for the calculation of CO_2 reductions are the following: (i) institutional systems are able to deliver max output for 3.6 hrs/day (equivalent to a 15% load factor); (ii) emissions intensity factors are derived as per AMS-III BB methodology under the CDM project guidelines – 1.57 tCO_2/system (MoH), 17.99 tCO_2/system (MoW), and 2.6 tCO_2/system (MoESTS).

[59] The reason why the tCO_2 figure is marginally different for the economic analysis is that the economic analysis considers only the GHG reduction achieved during the life of the project, not accounting for installations taking place at different stages during the lifetime of the project. The figures here assume a 20-year product life regardless of installation date.

ANNEX 8: FINANCIAL INTERMEDIARY ASSESSMENT

Compliance with Bank Policy on Financial Intermediary Lending

1. The project design is fully compliant with Bank operations policy on financial intermediary lending.

Summary of "Uganda – Review of Financial Sector" (Forthcoming)[60]

2. Compared to other countries in Sub-Saharan Africa and the world, financial intermediation remains low in Uganda. In 2012, domestic credit to private sector as percent of GDP in Uganda was 16 percent. In 2013, this indicator even declined to 15.5 percent. In many other developing countries, including Uganda's regional neighbors, private credit as percent of GDP is much higher than Uganda.

3. The recently conducted Enterprise Survey in Uganda (2013) identified electricity, and access to finance among the top business environment constraints for businesses in the country.[61] Very few Ugandan firms have a bank loan/LoC compared to all countries, and even Sub-Saharan Africa: only 9.8 percent in Uganda compared to 24 percent in Sub-Saharan Africa and 36.5 percent worldwide. The value of collateral required for a loan is slightly lower than the world average, but the proportion of loans requiring collateral is higher. As a result, very few firms in Uganda use bank loans to finance investments (eight percent in Uganda compared to 27 percent worldwide). Similarly, the Financial Sector Assessment Program 2011 update revealed that private enterprises in Uganda have limited access to financial services. Credit remains concentrated in the corporate sector and financing facilities for micro, small, and medium enterprises are inadequate. The update did indicate that financial development has somewhat accelerated and competition in the banking sector has improved in the recent years, but efficiency gains are yet to materialize.

4. Some of the main challenges for enterprises in Uganda with accessing credit include (i) high cost of financing, (ii) high collateral requirements, and (iii) lack of long term finance. In the current scenario, these barriers stem primarily from the scarce financial sector skills, information asymmetries, and very limited sources for raising long-term capital such as pension funds. Addressing these challenges could provide a significant boost to private sector development in Uganda.

High cost of financing

5. One of the major barriers is the high cost of financing in Uganda compared to other countries in the region and the world. Countries in Africa generally have quite high interest rates, and the high cost of financing creates a significant obstacle to enterprise growth and operation. According to the World Economic Forum (WEF) Global Competitiveness Report 2014-15, Uganda ranks 121 (out of 144 countries) by affordability of financial services. In comparison, Kenya and Rwanda rank 64 and 56, respectively. Uganda's interest rate spreads in 2012 were the highest in the East African Community after Burundi. This is a sign of significant inefficiency of Uganda's banking system compared to those of other countries in the East African Community, such as Rwanda, Kenya and Tanzania.

[60] The "Uganda – Review of Financial Sector" ESW is being undertaken by the Finance and Markets Global Practice at the World Bank (P151852).

[61] The others constraints identified are practices of the informal sector, tax rates, and business licenses and permits

6. This is mainly attributable to high overheads and profits for the financial sector. These factors on average accounted for more than 75 percent of the spread values in Uganda during the period of 2009-2014. High overheads can be explained by high salaries for financial sector professionals in Uganda because of the scarcity of qualified professionals, high costs of expansion, especially in rural areas, high costs of due diligence in the environment where information is very scarce and not sufficiently reliable, as well as inefficiency in a number of smaller banks which are not able to take advantage of the economies of scale. High profits are driven by high risk premium which is charged by financial institutions to compensate for the high risk of lending.

High collateral requirements

7. Financial institutions in Uganda demand collateral from most of the borrowers in order to compensate for the high risk of lending in an environment where information is scarce and unreliable. Financial infrastructure (e.g., a credit information bureau) in Uganda is currently not sufficiently developed, which results in higher risk aversion of lenders.

Lack of long-term finance

8. Lack of long-term funding in Uganda's financial system is explained by the fact that banks are funded predominantly by consumer deposits which are mostly short-term. In this regard, the availability of long-term finance in Uganda could be improved though credit lines from development institutions, pension system reform, and capital markets development. Better deposit mobilization and extension of the maturity of the deposit base can also be achieved with overall improved trust in the banking system.

Role for Development Partners

9. Development institutions can play a critical role in improving access to finance of key sectors by reducing financing cost, risk sharing with financial intermediaries and extending loan tenures. Short- to medium-term support by development institutions must be in parallel to long-term support to the development of financial sector infrastructure and sourcing of longer-term financing capital.

10. Lines of credit and risk guarantees from development institutions can be provided to specific banks for on-lending to enterprises. The purpose of these lines of credit is to increase the availability of medium- to long-term finance, as well as promote development in specific sectors (e.g., SME finance). Such credit lines are already successfully provided by a number of development institutions in Uganda, including the European Investment Bank (EIB) and AFD. The EIB, through its Private Enterprise Finance Facility, is most notable in this field for granting credit lines to banks in Uganda for on-lending to SMEs, including agriculture[62]. Since 2010, the EIB has provided credit lines to six banks and two MDIs totaling 81 million EUROs. Credit lines range from 5 million EUROs minimum to 50 million EUROs maximum per bank for three to ten year tenures. Credit lines allow the recipient banks to make loans in local as well foreign currencies. There is also the multi-donor aBiTrust Ltd. initiative that offers both lines of credit and loan guarantees to regulated and non-regulated financial institutions for on-lending to agribusinesses in the maize, coffee, oilseeds, pulses, horticulture and dairy sectors. Phase 1 funding, which ended in 2013, consisted of US$57 million. Phase II, focusing on the same areas, increased its funding to US$ 94 million for 2014-2018 period. aBiTrust also offers a 50 percent

[62] Other important players providing credit lines to banks include: FMO, IFC, NorFund, CDC, Proparco and OPEC. We note that obtaining consolidated data to compare lines of credit across donors is very difficult.

guarantee on loans outstanding to small and medium agribusinesses. As of 2014, aBiTrust is guaranteeing a loan portfolio outstanding of UGX 57.6 billion for 14 financial institutions with a claims payout rate of less than one percent.

Justification for UECCC component

11. The government program to increase electricity access relies on accelerating connections through both on-grid and off-grid sources. The private sector has shown keen interest in the off-grid space in Uganda and the recent growth in sales of solar companies has increased interest amongst other companies operating in the region to enter the market. Given the constraints imposed by high upfront costs of equipment and installation, currently the most successful models have been those that defer payback over the course of a year or more, e.g. a pay as you go, fee for service, or lease payment model. Though the model improves affordability for the consumers, the time wedge between the costs incurred on systems and the recovery from consumers creates pressure on the working capital of solar companies facing growing demand. The solar companies thus require working capital loans to grow the business and increase the rate of connections. The PV options study interviewed a host of solar companies and sector stakeholders and identified working capital constraints as a one of the key barriers limiting the growth of most solar product suppliers and retailers.

12. Access to finance for the small-scale solar companies has been prohibitively expensive, in line with the general experience of SMEs in Uganda. The review of Uganda's financial sector being conducted by the Bank highlights that the primary factors behind the low access to finance by firms are: high interest rate spreads, large collateral requirements and short loan tenures (see above for a brief summary of the relevant findings from the report). In addition to the usual barriers faced by SMEs, the formal financial institutions have been hesitant to deal with the relatively nascent solar sector due to inadequate in-house technical knowledge of the solar sector and associated technologies in use. These knowledge gaps are compounded by the multiplicity of solar companies in the market with differing business models and different levels of proficiency; inadequate quality controls for solar products creating reputational and credit risk for banks.

13. On account of these factors, the UECCC is uniquely placed in the financial sector given its association with the MEMD and its history of involvement with the ERT projects over the past years. As such, the UECCC has a relatively deep working knowledge of the energy sector and the associated technology. Further, the proposed LoC and guarantee instruments to be offered by the UECCC are in line with the recommendations in the report for short-term donor intervention in priority sectors. A similar approach adopted by different donors in the agricultural sector is highlighted in the report summarized above. Loans provided by the UECCC to participating FIs for on-lending to solar companies are intended to improve loan affordability and increase tenures; while the guarantee, aims to reduce collateral requirement and through sharing the risk. In the short-term, the concessional LoC and guarantee will together remove the barriers to access for finance for solar companies and allow the solar market to keep pace with growing demand. In the longer term, the small amount of funds under the component relative to the needs of companies in the solar sector (and commercial bank portfolios) will not be sufficient to maintain the required growth rates.[63] However, it is expected that commercial banks, after establishing a working

[63] As a corollary to this, the concessional instruments are unlikely to distort financial markets in any significant manner.

relationship with the solar sector, will gain deeper know-how about the sector and be able to offer more affordable loans. At the same time, solar companies too will be better established with a wider customer base and longer track record, thereby reducing the risk perception of the loan.[64]

Recommendations from Due Diligence on UECCC

14. This section will separately focus on the selection of the UECCC as a wholesaler and on the selection of the PFIs as retailers.

15. The UECCC was incorporated during implementation of ERT-1 but, due to lack of seed capital, it only became operational during implementation of ERT-2 to support the renewable energy sector. Under the ERT-2 program, the UECCC developed several financial instruments that include partial risk guarantees for cost over-runs and solar refinance facility to PFIs for on-lending to final beneficiaries. Under the ERT-3 program, the UECCC is expected to provide solar refinance facility to the PFIs for on-lending to both end users and solar companies, partial risk guarantee to the PFIs for covering their credit risk related to their lending to solar companies, and the Connection Loan Refinance Facility to the PFIs for on-lending to end users connecting to the grid. To ensure compliance with the eligibility criteria, a due diligence assessment of the UECCC has been conducted during the project preparation for ERT-3.[65]

16. Based on the due-diligence results, the UECCC's eligibility has been confirmed, subject to its agreement to implement an Institutional Development Plan, including a set of time-bound monitorable performance indicators and regular review of progress, to address weaknesses in the following areas: (i) product enhancement and pricing; (ii) appraisal and risk assessment of solar companies; (iii) risk management; (iv) process and procedures for its operations; and (v) information systems.

17. Except for the information systems component, the UECCC needs to implement the Plan fully before any funds are provisioned to the UECCC under the ERT-3. The launches of the line of refinancing facility and partial guarantee schemes are subject to no objection from the Bank.

18. The legal document ensures that the UECCC will follow the Institutional Development Plan, which identifies the most critical areas which need to be improved in order to allow the UECCC to launch the guarantee facility. The Plan can be modified upon the approval of the Bank. The Bank will provide a TA to the UECCC to address the identified gaps and implement the Institutional Development Plan on a needs basis and will monitor progress to this end.

19. The UECCC will also ascertain that:

- Annual financial reports will be prepared according to the Generally Accepted Accounting Standards without major breaches, unless the local authorities requires otherwise;

- The reports will be audited within a year after the closure of the accounts and the original audited reports would be sent to the Bank; and

[64] This of course, would be also be conditional on structural improvements to the financial sector, such as those identified in the financial sector overview.
[65] A due diligence assessment of the UECCC has been conducted by the Bank in February 2015.

- The UECCC will benchmark with the BoU's regulations with regards to the classification of loans, financial guarantees, and provisioning.

20. The UECCC will be required to provide an on-going proof of compliance with the above listed compliance criteria – every quarter by its management, and annually by auditor's certification.

21. UECCC's continued participation in the partial guarantee facility will be subject to satisfactory implementation of agreed Institutional Development Plan.

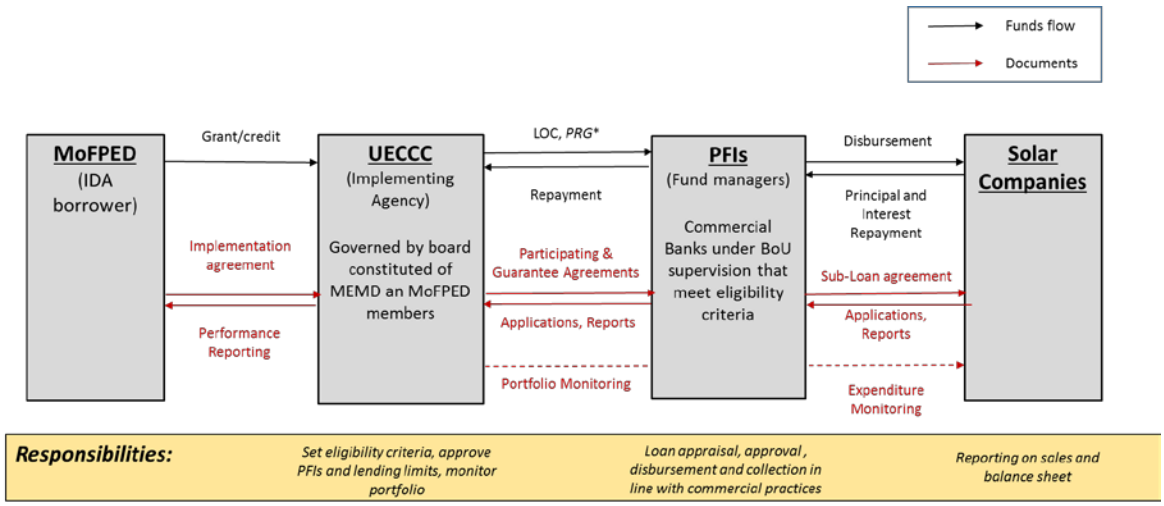
Suggested Implementation Arrangements

22. The UECCC can achieve its objective to facilitate lending to solar companies by risk-sharing through a partial guarantee instead of direct lending to solar companies. One of the main reasons for the commercial banks' not providing enough lending to solar companies is related to the fact that solar companies do not have enough collateral for getting loans. By offering the partial guarantee facility, the UECCC can make it easier for commercial banks to accept the lending portfolio of solar companies as collateral. Indeed, during the due-diligence mission, a potential PFI stated that it would provide lending to solar companies if the UECCC provides partial guarantee.

23. Based on the PFI level of interest and fit to the program – the following implementation arrangements are planned: the UECCC will act as wholesale financier for the PFIs, which will then on-lend to the beneficiaries. The PFIs can purchase guarantees, on a standalone basis or in combination with an LoC, on fee from the UECCC to partially cover their credit risk against solar companies. The refinancing facility targets both end users and solar companies. The UECCC and PFIs would be jointly responsible for implementing the program using the defined operating guidelines including fiduciary management, reporting and other requirements as needed.

24. This flow of refinancing is applicable after execution of an LoC and guarantee agreement with a PFI.

Figure 1: Flow of Refinancing and Guarantee



** PRG will be developed by UECCC with the help of TA. In the interim, stand alone LOC may be provided*

Financial Intermediaries – description, selection and eligibility

25. This section will separately focus on the selection of the UECCC as a wholesaler and on the selection of the participating financial intermediaries as retailers.

UECCC

26. *Managerial Autonomy and Governance:* The UECCC is wholly owned by the GoU and held under the stewardship of the MEMD. The board of directors of UECCC has the ultimate responsibility for the decisions made by the UECCC and the management of the CSF. In addition to the Managing Director, the UECCC Board includes five non-executive directors and a company secretary. Currently two members hold banking sector experience. The other non-executive Board members represent the MoFPED, MEMD and the PSFU. The Board meets at least once a quarter or on a need basis. Selected members of the Board and the UECCC Management make up the Investment Committee. The Finance (Investment) Committee, chaired by a non-executive director, meets at least once a quarter or on a need basis. The Board has the authority to appoint a Managing Director and a management team, who are responsible to the Board for the day-to-day management of the business of UECCC. The current Managing Director worked at the BOU in various capacities before joining the UECCC. If the UECCC's volume of partial guarantee facility expands, the UECCC's Board should be strengthened by the GoU with new members who have banking and/or risk management expertise. As a temporary solution, the UECCC should hire an advisor who can provide training and give advice to the Board on a regular basis on the products and risks involved in them.

27. *Supervision:* The UECCC is currently not supervised by the BoU since it does not collect deposits from the public. The oversight role of the Company is vested in the Board who report to the Company shareholders (MoFPED and MEMD). The Auditor performs annual financial audits of the Company's performance and submits the report to the Parliament of Uganda for review by the public Accounts Committee of Parliament.

28. *External Audit:* The UECCC's annual financial reports of 2014 are audited by a private audit company on behalf of the Office of the Auditor General. The auditor has confirmed that the special accounts statements and notes fairly present in all materials aspects of the account operations in accordance with the basis of accounting and in conformity with the Bank reporting guidelines and terms and conditions.

29. *Internal Audit Process:* The UECCC has a Board Audit Committee which is in charge of overseeing the adequacy of UECCC's systems of internal control, risk management, the effectiveness of internal audit activities, the accuracy of financial information used by and distributed outside the UECCC and the results of the reviews conducted by external auditors or other authorities. Once the UECCC starts its guarantee scheme, it is suggested that the internal auditor perform audits with all operational and non-operational units, including risk management, on an annual basis. The Board should put in place a robust process to implement the recommendation of the auditor.

30. *Risk Management Process:* The UECCC's current business model does not require a dedicated risk officer in charge of risk management. However, if the UECCC wants to launch the partial guarantee facility, it needs to have a dedicated risk officer. The officer should be independent from the operations and directly report to the Board Audit Committee. It is suggested that the risk officer reviews the whole loan portfolio on an annual basis, apart from assessing credit

risk and other risks on an annual basis. There should be a rigorous risk management process in place to implement the recommendations of the risk officer. The UECCC should also establish risk limits for banks and clients based on the risk assessment of them.

31. *Human Resource Process:* Currently the UECCC has 18 staff, most of them working for the support functions. To be able to successfully implement the guarantee scheme, the UECCC needs to hire new officers and/or provide training to the current officers on loan appraisal, credit risk assessment, loan structuring, asset-liability management and pricing, as well as risk management.

32. *IT and MIS:* The UECCC's current accounting software is not suitable for the guarantee facility. Since initially the UECCC is not expected to have so many transactions, it is not recommended to upgrade its accounting software in the short term. However, if the number of transactions increases to a critical point, the UECCC needs to consider upgrading its accounting software for ensuring the integrity of its operations. Currently the UECCC's MIS system is not robust enough to inform the management about the performance of its transactions since monitoring and analyzing the transactions are performed manually. The UECCC should improve its external (from participating financial intermediaries to UECCC) and internal (from operational and non-operational units to management and the Board) reports. If the business volume increases, UECCC needs to invest in upgrades as appropriate. The Finance Department should be strengthened by a staff who can work on analyzing all information generated within and outside the UECCC as well as do the pricing of its refinancing and guarantee products.

33. *Profitability:* According to the audited financial statements, the UECCC expenditures were US$1.2 million while its incomes from its operations were US$25,000. The UECCC covered the difference through its grant incomes from the Bank and GoU. The success of the new program requires the UECCC to come up with a plan which clearly articulates how operational expenses would be covered in the medium and long term.

34. *Capital Adequacy:* As an administrator of the Uganda Energy Capitalization Trust, the UECCC funds its operations via capital and accumulated reserves, both recorded under Equity, amounting to US$2.7 million as of the end of 2014, which includes the grants disbursed by the Bank.

35. *Portfolio Quality:* So far, the UECCC has developed and distributed several lending products as of the end of 2014, including a small portion of the grants made available by the Bank. The UECCC has US$1,627,000 on the ERT-2I Project Special Accounts at the BoU yet to be disbursed. So far, the UECCC has not had any defaults from its refinancing and partial guarantee products. Launching the partial guarantee facility will require the UECCC adopt a provisioning policy since the UECCC will cover the credit risk of solar companies under the guarantee facility.

Participating PFIs

36. The Bank will aid the UECCC in conducting the due diligence of the potential PFIs for their eligibility in the new lending program. Final approval of eligibility will be done by the Bank.

37. Upon approval, the UECCC will enter into a participating agreement (PA) with the PFIs. The PA will include, among others, details on eligibility criteria, loan and guarantee terms offered to PFIs, roles and responsibilities and reporting requirements. All interested financial institutions (FI) should be assessed against the following principles as a minimum**:**

- **Licensing:** The FI must be *duly licensed* and ideally at least two years in operation.
- **Governance/Management:** FI's owners should be "*fit and proper*". It must have qualified and experienced management, adequate organization and institutional capacity for its specific risk profile.
- **Compliance with national regulations:** The FI must be in "*good standing*" with its supervisory authority (i.e., it should meet all prudential and other applicable laws and regulations) and remain in compliance at all times.
- **Business Policies:** The FI should have well defined policies and written procedures for *management of all types of financial risks* (liquidity, credit, currency, interest rate and market risk, as well as risks associated with balance sheet and income statement structures).
- **Operational Capacity**: the FI should demonstrate appropriate operational capacity, including capacity and staffing.
- **Financial Soundness:**
    - The FI must maintain *capital adequacy* prescribed by prudential regulations.
    - The FI must have *adequate liquidity*.
    - The FI must have *positive profitability and acceptable risk profile*. It must maintain the value of its capital4.
    - The FI must classify its assets and off-balance-sheet credit risk exposures (at least four times per year) and make adequate provisions. It must have *adequate portfolio quality*. The FI should not have more than 10% of criticized assets (i.e., classified as substandard, doubtful and loss).
    - The FI should have a sufficiently high level of *portfolio quality*, in particular for lending activities in areas related to the financial intermediary financing (and taking into account rescheduled/reprogrammed loans).
- **Audit and Internal Controls:** The FI must have *adequate internal audits and controls* for its specific risk profile.
- **Information Systems:** The FI must have *adequate management information systems*.

On-lending terms from UECCC to PFIs:

- **Interest rate.** Based on the due diligence conducted on the PFIs, the interest rates from the UECCC to PFIs should be determined by the UECCC, considering its cost of funds, and accounting for administering costs and credit risk.
- **Maturity**. Loans from the UECCC to PFIs will have maturities of maximum 5 years.
- **Allocation of the loan amount to PFIs**: The loan amount will initially be credit capped for the PFIs based on their financial strength and perceived absorptive capacity. But loans will be provided on a first come first serve basis, until the PFI achieves its credit cap.
- **On-lending arrangements**. The UECCC would disburse the loan to the PFIs once the PFIs have approved loans to solar companies. Once the allocated amount was drawn down, the PFI would be free to recycle the loan as long as it utilizes the funds, in conformity with ERT-3.
- **Arrangements for Closing of the Line.** Once the loan amount is paid back to the UECCC, the UECCC could choose at that point to select additional PFIs or to award the amount to the best performing of the initially chosen PFIs.

- **Changes in on-lending terms**. The terms can be changed upon the approval of the Bank.

Partial guarantee terms from UECCC to PFIs:

- **Fee.** Based on the due diligence conducted on the beneficiaries, the UECCC should charge an appropriate fee, no less than one percent. The UECCC should develop a pricing methodology which takes into account the funding cost, operational expense, expected default rate, and recovery in determining its fees for the sustainability of its operations.
- **Maturity**. Financial guarantee from the UECCC to the PFIs will have maturities of maximum five years.
- **Coverage**. The UECCC will determine the coverage ratio in each case. This requires the UECCC to have proper risk assessment and pricing in place. The coverage ratio should be reviewed and approved by the Bank two years after the launch of the facility.
- **Leverage ratio.** The maximum limit of guarantee outstanding should not be more than four times of the size of the facility.
- **Provisions.** The UECCC should provide two percent provisions each year against its guarantees, until the accumulated provisions reach at 25 percent of the guarantee portfolio.
- **Conditions for Payment.** The UECCC will pay claim to the PFI when the legal proceedings are initiated against the borrower.
- **Changes in partial guarantee terms.** The terms can be changed upon the approval of the Bank.

On-lending terms from PFIs to final beneficiaries:

- **Interest rate.** The PFIs will be free to set their own on-lending rates. The PFIs will bear the full risk of the loss.
- **Loan amount**. The maximum loan size will be less than US$1,500,000. Any loan bigger than that amount is subject to approval from the Bank. Inflexible collateral requirements may result in loan amounts being reduced due to inadequate collateral. The lending limits should be set on an individual basis by each PFI, considering market conditions and the PFI's institutional and operational capacity.
- **Maturity**. Loans from the PFIs to end users will have maturities of maximum five years.
- **Changes in on-lending terms.** The terms can be changed upon the approval of the Bank.
- **Eligibility criteria.** The UECCC will determine eligibility criteria for solar companies. The PFIs will approve loans to end users based on credit appraisal system of a particular PFI.

Monitoring arrangements

Monitoring of UECCC

38. The UECCC will be expected to inform the Project Steering Committee once a year and to report to the Bank on the program's progress on a quarterly basis. During project implementation regular reviews, which include, among others, (i) capital adequacy, profitability; and asset quality, (ii) compliance with provisioning and loan classification rules of the BoU; (iii) corporate governance and risk management; and (iv) utilization of the Bank credit and its performance will be carried out.

39. Specifically the following indicators will be regularly monitored (The UECCC needs to benchmark with the regulations of BoU in the calculations of the ratios):

Table 1: Indicators for the refinancing facility

Indicator	Requirement
Exposures to single borrower relative to Equity (allocated for this facility)	At most 35%
Exposures to group of related borrowers relative to Equity (allocated for this facility)	At most 35%
NPLs to Equity (allocated for this facility)	At most 25%
Provisioning for NPLs	100%

Table 2: Indicators for the partial guarantee facility

Indicator	Requirement
Exposures (50% conversion factor for guarantees) to single borrower relative to Equity (allocated for this facility)	At most 35%
Exposures (guarantees with 50% conversion factor) to group of related borrowers relative to Equity (allocated for this facility)	At most 35%
NPLs to Equity (allocated for this facility)	At most 25%
Provisioning for NPLs	100%
Leverage ratio (Guarantees to Equity (allocated for this facility))	Maximum 4 times

40. The UECCC will also ascertain that:

- Annual financial reports will be prepared according to the Generally Accepted Accounting Standards without major breaches;
- The reports will be audited within six months after the closure of the accounts and the original audited reports would be sent to the Bank;
- The Bank will comply with BoU's regulations on the loan classification and provisioning; and

41. The UECCC will be required to provide an on-going proof of compliance with the listed compliance criteria – every quarter by its management, and annually by the auditor's certification.

42. The monitoring indicators and compliance criteria can be changed upon the approval of the Bank.

Monitoring of PFIs

43. The performance of the PFIs will be evaluated based on the following: (i) number of loans provided through the ERT-3 LoC; (ii) average loan size; (iii) total amount disbursed; (iv) collection rate through a report on portfolio aging; (v) portfolio at risk greater than 30 days.

44. Loan agreements with the PFIs will contain covenants requiring the PFIs to maintain acceptable financial performance (see table below).

Table 3: Indicators for the PFIs

Indicator	Requirement
Liquid assets (as defined by BoU) to total assets	At least 20% (or decided by the BoU)
Capital adequacy ratio (as defined by BoU)	At least 12%
Single credit exposure limit (as defined by BoU)	At most 25% of capital
Aggregate credit exposure to related parties (as defined by BoU)	At most 25% of capital
NPL ratio (as defined by BoU)	At most 8%
Net income after tax (as defined by BoU)	Positive net income in at least two of the last three years

45. Non-compliant PFIs will have their access to the LoC suspended, and ultimately terminated. If satisfactory corrective action is not taken, the PFIs will be subject to a substantial penalty. Additionally, the independent external auditors of the PFIs will be required as part of each PFI's annual statutory audit to confirm outstanding loan balances with the UECCC.

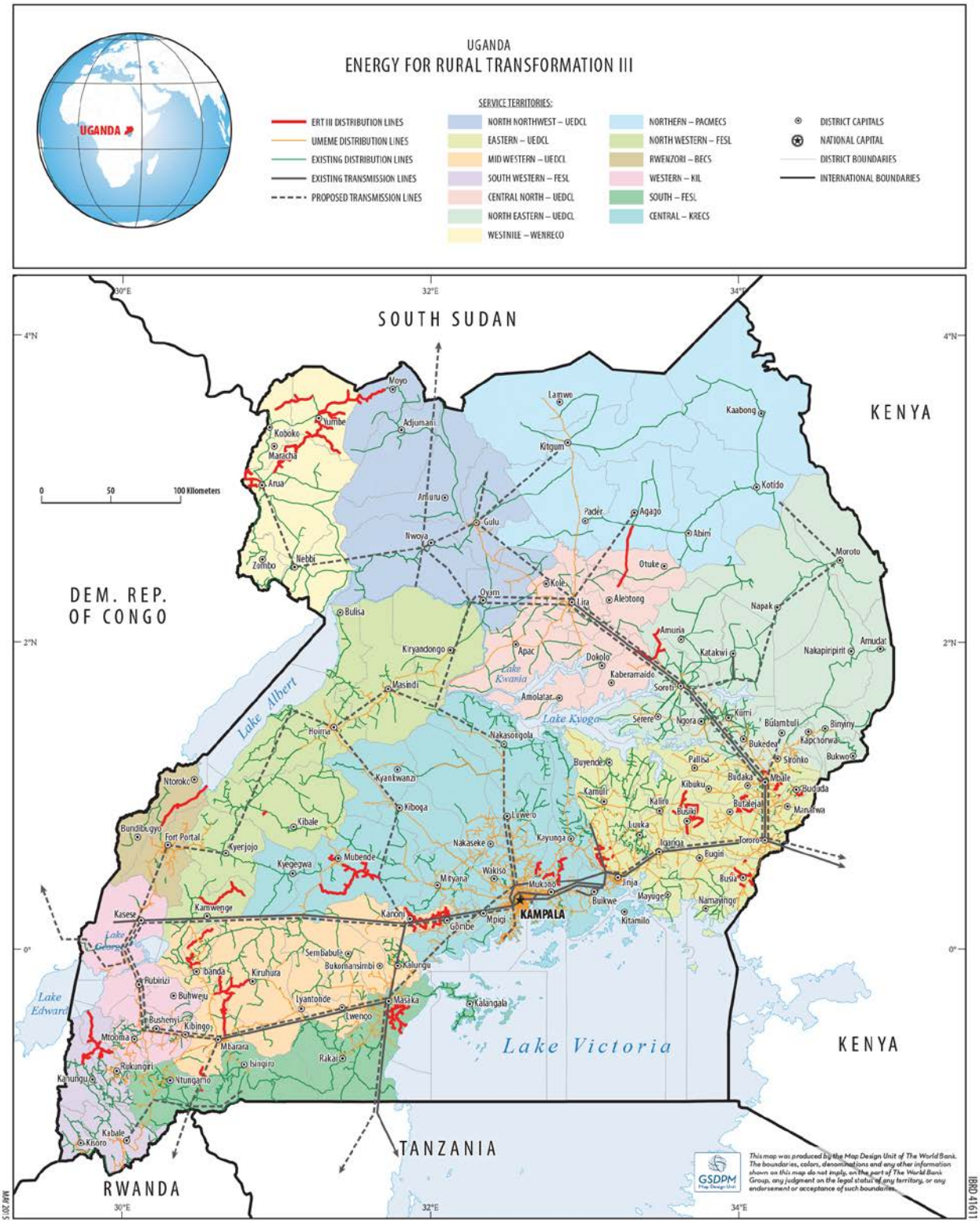
46. The UECCC will have the responsibility of supervising and monitoring the credit line implementation progress. The UECCC will monitor the PFIs by the receipt of monthly loan portfolio schedules and supplemental information on loan performance. After the draw down period reports will be quarterly. The UECCC will also receive audited financial statements from the PFIs annually with a certification by the auditor of the PFI's activity financed through ERT-3. In addition, the UECCC staff will be expected to visit the PFIs and interview their management on a periodic basis. Should a PFI prove unable to on-lend its allocation within 6 months from the first loan draw down, the UECCC would be free to allocate the remaining amount to the other PFIs. The UECCC and the Bank, during loan supervision, would have access to the books of the PFI, upon reasonable notice, to do ex-post review of the portfolio under the loan.

47. The monitoring indicators and compliance criteria can be changed upon the approval of the Bank.

Table 4: Institutional Development Plan

Actions		Timeline*	Responsibility
ORGANIZATIONAL STRUCTURE and STAFFING			
1	Update the proposal (partial guarantee and refinancing) for the new program, incorporating the revised schemes, TA needs, as well as lessons why some instruments under ERT-2 were not utilized, and others did not perform to expectation. A section on the projection of ERT-3 project specific operational expenses and incomes with some control measures for operational expenses.	June 2015	UECCC
2	Approve the new business model and enhancing the organization chart (creating treasury position under Finance, creating two transaction officers and one investment officer position under Transaction, and creating a risk officer position under the Audit Committee(or training current staff for these roles)	June 2015	UECCC
3	Submit the hiring program and cost estimates and discuss financing options	June 2015	UECCC & WB
4	Hire new staff and/or train current staff (on product enhancement and pricing, relationship management of end users and companies, investment assessment, risk management)	July 2015	UECCC
5	Appointment of an advisor to the Board on risk management	July 2015	UECCC
PROCEDURES			
6	Submit the revised CSF design and Operations Manual for ERT-3	September 2015	TA- Consultant to help UECCC
7	Establish investment policies and risk limits	September 2015	TA- Consultant to help UECCC
8	Update investment process and procedures (CSFM)	September 2015	TA- Consultant to help UECCC
9	Establish eligibility criteria for solar companies (including product quality) under particular guarantee schemes	September 2015	
10	Draft the guarantee agreement	September 2015	TA- Consultant to help UECCC
11	Establish risk management process and procedures	October 2015	TA- Consultant to help UECCC
12	Update internal audit and control procedures	October 2015	TA- Consultant to help UECCC
13	Update the Finance Manual	October 2015	TA- Consultant to help UECCC
PREPARATION			
14	Undertake product refinement and pricing	November 2015	TA- Consultant to help UECCC
15	Sign guarantee agreements with the PFIs	November 2015	
16	Undertake project appraisal and risk assessment	November 2015	TA- Consultant to help UECCC
IT (depending on the volume of the partial guarantees, on a need basis)			
17	Develop a guarantee module	December 2015	UECCC
18	Develop an M&E system	December 2015	UECCC

ANNEX 9: MAP


UGANDA
ENERGY FOR RURAL TRANSFORMATION III
UGANDA
SERVICE TERRITORIES:
ERT III DISTRIBUTION LINES
UMEME DISTRIBUTION LINES
EXISTING DISTRIBUTION LINES
EXISTING TRANSMISSION LINES
PROPOSED TRANSMISSION LINES
NORTH NORTHWEST – UEDCL
EASTERN – UEDCL
MID WESTERN – UEDCL
SOUTH WESTERN – FESL
CENTRAL NORTH – UEDCL
NORTH EASTERN – UEDCL
WESTNILE – WENRECO
NORTHERN – PACMECS
NORTH WESTERN – FESL
RWENZORI – BECS
WESTERN – KIL
SOUTH – FESL
CENTRAL – KRECS
DISTRICT CAPITALS
NATIONAL CAPITAL
DISTRICT BOUNDARIES
INTERNATIONAL BOUNDARIES
SOUTH SUDAN
KENYA
DEM. REP. OF CONGO
TANZANIA
RWANDA
Lake Albert
Lake Kwania
Lake Kyoga
Lake Victoria
Lake Edward
Lake George
KAMPALA
0 50 100 Kilometers
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.
IBRD 41611