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Report No: PAD730

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR XX MILLION
(US\$250 MILLION EQUIVALENT)

PROPOSED SCF-SREP GRANT IN THE AMOUNT OF US\$7.5 MILLION

AND A

PROPOSED GUARANTEE

IN AN AMOUNT EQUIVALENT TO US\$200 MILLION

TO THE

REPUBLIC OF KENYA

FOR AN

ELECTRICITY MODERNIZATION PROJECT

{RVP/CD CLEARANCE DATE - SAME AS ON MOP}

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CURRENCY EQUIVALENTS

(Exchange Rate Effective {Date})

Currency Unit =
= US\$1
US\$ = SDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AMI	Advanced Metering Technologies
CEO/MD	Chief Executive Officer/Managing Director
CPS	Country Partnership Strategy
EIRR	Economic Internal Rate of Return
EMP	Environmental Management Plan
ERC	Energy Regulatory Commission
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FIRR	Financial Internal Rate of Return
FM	Financial Management
FMR	Financial Management Report
FMS	Financial Management Specialist
GDC	Geothermal Development Company
GNI	Gross National Income
GoK	Government of Kenya
GWh	Gigawatt hour
IFR	Interim Financial Report
IPP	Independent Power Producer
ISDS	Integrated Safeguards Data Sheet
KenGen	Kenya Electricity Generating Company Limited
KEMP	Kenya Electricity Modernization Project
KETRACO	Kenya Electricity Transmission Company Limited
KPLC	The Kenya Power & Lighting Company Limited (“Kenya Power”)
KSh	Kenyan Shilling
kWh	Kilowatt Hours
LCPDP	Least Cost Power Development Plan
LV	Low Voltage
LLM	Live-Line Maintenance
M&E	Monitoring and Evaluation

MCC	Metering Control Centers
MDM	Meter Data Management
MIS	Management Information System
MoEP	Ministry of Energy and Petroleum
MV	Medium Voltage
MW	Megawatt
NCB	National Competitive Bidding
NPV	Net Present Value
O&M	Operations and Maintenance
PIM	Project Implementation Manual
PIU	Project Implementing Unit
PPA	Power Purchase Agreement
PPP	Public Private Partnerships
RAP	Resettlement Action Plan
REA	Rural Electrification Authority
RPF	Resettlement Policy Framework
RPP	Revenue Protection Program
RTU	Remote Terminal Unit
SAIDI	System Average Interruption Duration Index
SCADA	Supervisory Control and Data Acquisition
SoE	Statement of Expense
T&D	Transmission and Distribution
VMG	Vulnerable and Marginalized Groups
VMGF	Vulnerable and Marginalized Groups Framework
US\$	United States Dollar

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KENYA
Electricity Modernization Project

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PAD DATA SHEET

Kenya

KE Electricity Modernization Project (P120014)

PROJECT APPRAISAL DOCUMENT

AFRICA

GEEDR

Report No.: PAD730

Basic Information			
Project ID P120014	EA Category B - Partial Assessment	Team Leader Kyran O'Sullivan	
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints []		
	Financial Intermediaries [Guarantee]		
	Series of Projects []		
Project Implementation Start Date April 1, 2015	Project Implementation End Date December 31, 2019		
Expected Effectiveness Date June 30, 2015	Expected Closing Date June 30, 2020		
Joint IFC No	Joint Level		
Practice Managers Lucio Monari Pankaj Gupta	Senior Global Practice Director Anita M. George	Country Director Diarietou Gaye	Regional Vice President Makhtar Diop
Borrower: Republic of Kenya The National Treasury Treasury Building P. O. Box 30007-00100 Nairobi, Kenya Tel: 254 (20) 2252299 Fax: 254 (20) 2240045			
Responsible Agencies: Ministry of Energy and Petroleum			
Contact:	Eng. Joseph Njoroge	Title:	Principal Secretary
Telephone No.:	254 20 2250680	Email:	ps@energymin.go.ke
The Kenya Power and Lighting Company			
Contact:	Dr. Ben Chumo	Title:	Managing Director and CEO
Telephone No.:	254 20 3747865	Email:	bchumo@kplc.co.ke

Rural Electrification Authority						
Contact:	Eng. Ng'ang'a Munyu			Title:	Managing Director and CEO	
Telephone No.:	254-20-2341400			Email:	ngangamunyu@rea.co.ke	
Project Financing Data(in USD Million)						
<input type="checkbox"/> Loan	<input type="checkbox"/> IDA Grant	<input checked="" type="checkbox"/> Guarantee				
<input checked="" type="checkbox"/> Credit	<input checked="" type="checkbox"/> Grant	<input type="checkbox"/> Other				
Total Project Cost:	757.5		Total Bank Financing:	457.5		
Financing Gap:						
Financing Source				Amount		
BORROWER/RECIPIENT				0.0		
International Development Association (IDA)				250.0		
IDA Guarantee				¹ 500.0		
Scaling-up Renewable Energy Program (SREP)				7.5		
Total				757.5		
Expected Disbursements (in USD Million) of IDA Credit and Grant						
Fiscal Year	2015	2016	2017	2018	2019	2020
Annual		50	100	50	50	7.5
Cumulative		50	150	200	250	257.5
Institutional Data						
Practice Area / Cross Cutting Solution Area						
Energy & Extractives						
Cross Cutting Areas						
<input type="checkbox"/>	Climate Change					
<input type="checkbox"/>	Fragile, Conflict & Violence					
<input type="checkbox"/>	Gender					
<input type="checkbox"/>	Jobs					
<input checked="" type="checkbox"/>	Public Private Partnership					
Sectors / Climate Change						
Sector (Maximum 5 and total percent must equal 100)						

¹ US\$500 million is the amount of commercial debt expected to be raised with the support of a US\$200 million IDA Guarantee.

Major Sector	Sector	percent	Adaptation Co-benefits percent	Mitigation Co-benefits percent
Energy and mining	Transmission and Distribution of Electricity	90		
Energy and mining	Other Renewable Energy	10		
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 percent must equal 100)

Major theme	Theme	Percent
Financial and private sector development	Infrastructure services for private sector development	25
Rural Development	Rural Services and Infrastructure	25
Urban Development	Urban Services and Housing for the Poor	25
Financial and Private Sector Development	Regulation and Competition Policy	25
Total		100

Proposed Development Objective(s)

The proposed project development objectives (PDOs) are: (a) to increase access to electricity; (b) to improve reliability of electricity service; and (c) to strengthen KPLC's financial situation.

Component Name	Cost (US\$ Millions)
Component A: Improvement in Service Delivery and Reliability.	50.00
Component B: Revenue Protection Program (RPP)	40.00
Component C: Electrification Program	160.00
Component D: Technical Assistance and Capacity Building	7.50
IDA Guarantee	200.00

Systematic Operations Risk- Rating Tool (SORT)		
Risk Category	Rating	
1. Political and Governance	Substantial	
2. Macroeconomic	Moderate	
3. Sector Strategies and Policies	Moderate	
4. Technical Design of Project or Program	Moderate	
5. Institutional Capacity for Implementation and Sustainability	Substantial	
6. Fiduciary	Moderate	
7. Environment and Social	Moderate	
8. Stakeholders	Moderate	
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 [x]
Is approval for any policy waiver sought from the Board?	Yes []	No [x]
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 To be updated when legal documents are available			
Name	Recurrent	Due Date	Frequency
The Kenya Power and Lighting Company Limited's (KPLC) Financial Strategy		Not later than six months after project effectiveness.	Dated Covenant
KPLC has adopted a financial strategy that will strengthen its balance sheet and manage its capital investment program in a sustainable manner.			
Description of Covenant			
Dated Covenant in Financing Agreement [To be completed at Appraisal]			
Conditions			
Name			Type
Draft Procurement Plan			Negotiations
Description of Condition IDA has received a draft procurement plan for the first 18 months of the Project.			
Name			Type
Conditions Precedent to the Effectiveness			Effectiveness
Description of Condition The Subsidiary Agreements on behalf of the Recipient and KPLC and the Recipient and REA respectively have been executed, and legal opinions related thereto have been furnished to the Association.			
Name			Type
Implementation Teams			Effectiveness
Description of Condition KPLC and REA have taken the actions required to strengthen the PIU Implementation Teams under terms of reference and with staff in numbers and with qualifications satisfactory to IDA.			
Name			Type
KPLC and the Rural Electrification Authority (REA) Project Implementation Manuals			Effectiveness
Description of Condition KPLC and REA have adopted final Project Implementation Manuals in form and substance satisfactory to IDA.			
Name			Type
Transaction Adviser			Disbursement Condition
Description of Condition REA has appointed a Transaction Adviser for the Implementation of Component C2.			Prior to disbursement of Component C2
Name			Type
REA Board Audit Committee			Disbursement Condition

Description of Condition REA has reconstituted its Board Audit Committee.			Prior to disbursement in Component C2		
Team Composition					
Bank Staff					
Name	Title	Specialization	Unit		
Kyran O'Sullivan	Senior Energy Specialist	Co-Team Lead	GEEDR		
Clara Alvarez	Senior Infrastructure Finance Specialist	Co-Team Lead	GEEDR		
Laurencia Njagi	Senior Energy Specialist	Energy Specialist	GEEDR		
Zayra Romo	Senior Energy Specialist	Energy Specialist	GEEDR		
Pedro Antmann	Lead Energy Specialist	Energy Specialist	GEEDR		
Kishor Uprety	Senior Counsel	Counsel	LEGAM		
Noreen Beg	Senior Environmental Specialist	Environmental Specialist	GENDR		
Gibwa Kajubi	Senior Social Development Specialist	Social Development Specialist	GURDR		
Efrem Fitwi	Senior Procurement Specialist	Procurement Specialist	GGODR		
Josphine Kabura Kamau	Financial Management Specialist	Financial Management Specialist	GGODR		
Lucy Kang'arua	Program Assistant	Operations	AFCE2		
Mitsunori Motohashi	Senior Energy Specialist	Energy Specialist	GEEDR		
Panos Vlahakis	Senior Operations Officer	Energy Specialist	CAFSB		
Christiaan Johannes Nieuwoudt	Finance Officer	Finance Specialist	CTRLA		
Samuel Macharia	Finance Analyst	Finance Specialist	CTRLA		
Wendy Ayres	Senior Economist	Impact Evaluation	GURDR		
Aidan Coville	Economist	Impact Evaluation	DECIE		
Neil Ashar	Senior Counsel	Guarantees	LEGSO		
Prajakta Ajit Chitre	ET Consultant	Financial Analyst	GEEDR		
Non Bank Staff					
Name		Title	City		
Locations					
Country	First Administrative	Location	Planned	Actual	Comments

	Division				
Components A and B Improvement in Service Quality and Revenue Protection Program					
Kenya		Country Wide			
Component C-1 Peri-Urban Electrification					
Kenya	Nairobi Region	Ruai, Kamulu, Kitengela, Machakos, Kiserian, Ngong, juja, Ruiru			
Kenya	Coast Region	Kisauni, Kiembeni, Shanzu, Mtwapa, Likoni, Jomvu, Mikindani and Voi			
Kenya	Western Region	Kondele, Nyamsaria, Busia, Siaya, Homabay, Kakamega Kericho and Kisii			
Kenya	Central Rift	Subukia, Bahati, Lanet, Naivasha, Nyahururu and Narok			
Kenya	Northern Rift	Eldoret Town, Kitale, Kapsabet, Kabaranet and Iten			
Kenya	Mt. Kenya	Nyeri Town, Embu, Meru, Nanyuki, Isiolo and Kutus			
Kenya	North Eastern	Garissa Town, Thika and Kitui			
Component C-2. Off-grid Electrification					
Kenya	Siaya Homa Bay Homa Bay Kwale Tana River Kilifi	Mageta Ngodhe Takawiri Shimoni Island Chardende Kadaina Island			

I. STRATEGIC CONTEXT

A. Country Context

1. **As Africa's newest lower-middle income country, Kenya faces both development opportunities and challenges.** At a time of major social and economic transitions, the conditions for attaining better living standards are increasingly within reach for a majority of Kenyans. In the past twenty years, the economy has gone from one that was shrinking to an economy growing at nearly five percent per year. Kenya crossed the lower middle-income threshold in 2012 and GNI per capita is currently US\$1,160. But economic growth, while solid on average, has been volatile and has yet to take-off at the high, sustained rates needed to reduce poverty rates as the economy has experienced various shocks (e.g., political instability and drought). The rate of poverty reduction has not kept pace with economic growth: the poverty rate is estimated to have decreased from 46 percent in 2005/6 to 38 percent in 2012. Inactivity rates among the youth stand at 9.6 percent, compared to a national average of 8.5 percent. Inequality stands at 47.7 percent. Kenya's latent potential to develop rapidly can be sparked by its dynamic private sector, fueled by its expanding skilled youthful population, and leveraged through its pivotal role within East Africa and further afield. Sound macroeconomic policy, the peaceful electoral transition and the new Constitution provide a strong foundation for economic development. The recent successful and oversubscribed US\$2 billion Eurobond issue demonstrates Kenya's potential to raise resources to finance development and signaled confidence in the economy by international investors. However, this US\$2 billion will be mainly used for road and water infrastructure and falls far short of the investment amounts to improve electricity supply and for electricity access.

2. **Vision 2030, Kenya's long-term development strategy, targets expanded infrastructure access as a key element in achieving higher levels of economic growth.** Vision 2030 targets an average annual economic growth rate of 10 percent throughout 2030. This high expected economic growth will require modern, efficient infrastructure facilities to expand the productive sectors of the economy and improve access to markets. The upgrade of the infrastructure platform calls for rehabilitating the road network, upgrading the railways, improving urban public transport, and expanding access to electricity and safe water. In an effort to improve equity of opportunity, the overall program gives a special emphasis to expanding the access of the rural and urban poor to basic services such as electricity, water, and sanitation.

3. **Kenya's dynamic private sector faces serious infrastructure constraints.** Electricity supply and transport need to be improved if Kenya is to maximize its potential for private sector-led growth. Kenya's vibrant private sector is a major source of economic growth, driven by expanding services in telecommunications and transport. Kenya benefits from its geographical location that is favorable to trade, with the port of Mombasa serving as the most important gateway for imports to the East African Community (EAC) countries, South Sudan and eastern Democratic Republic of Congo. Considering that affordable and reliable electricity supply is an essential underpinning of Kenya's competitiveness, investment in the transmission and distribution (T&D) infrastructure, along with efficiency in operations and maintenance, remain critical for the country.

4. **Higher levels of electricity service reliability and quality are necessary for stronger economic growth and increased competitiveness.** Currently, poor quality and reliability of service imposes high costs on business (including the capital cost of self-generation and loss of production). Enterprises experience frequent electricity service interruption and many have self-power generation on their premises in order to meet their electricity needs.

5. **Approximately 35 percent of the population has access to electricity.** This is above the average of 28.5 percent for Sub-Saharan Africa, but inconsistent with the socio-economic condition of the country, the largest economy in East Africa and one of the most developed in Sub-Saharan Africa. Accelerating the pace of electrification in line with the government's target of 70 percent electrification by 2018 can contribute to eliminating extreme poverty and achieving shared prosperity.

II. SECTORAL AND INSTITUTIONAL CONTEXT

6. **Since 1997, the Kenya power sector has undergone two generations of reforms and achieved considerable progress.** The sector operates on commercial principles supported by transparent financial relationships between the sector utilities. Electricity retail tariffs are cost reflective and the public sector power utilities Kenya Electricity Generating Company (KenGen, the majority government-owned electricity generating company) and the Kenya Power and Lighting Company (KPLC, the majority government-owned electricity distribution company) are both listed on the stock market, do not receive government subsidies, and are required to make profits and pay dividends. A major electrification drive in the past four years has more than doubled the number of households with electricity connections; 430,000 households were connected to grid electricity in 2014 and the target for 2015 is 700,000. The grid has been extended to the majority of market centers and the connection of all secondary schools to the electricity grid is due to be completed by 2016.

7. **Governance of the sector is anchored by the Energy Policy 2004 and Energy Act 2006.** The Energy Policy, 2004 and Energy Act, 2006 strengthened the institutional and regulatory framework set up in late 1990s. The sector, once vertically integrated, is unbundled with separate generation, transmission and distribution companies. A semi-autonomous regulatory agency, the Energy Regulatory Commission (ERC), formulates, enforces and reviews regulations, codes and standards for the energy sector and reviews and adjusts electric power tariffs and tariff structures. A special-purpose public company, Geothermal Development Corporation (GDC), carries out geothermal field development. The Rural Electrification Authority (REA) constructs electricity infrastructure to connect rural centers, schools and other public facilities, which are further supplied by KPLC, which also connects households in proximity to the REA-constructed infrastructure when households make applications for that purpose.

8. **There is strong private sector presence in the sector.** Independent power producers (IPPs) have mobilized over US\$1 billion of private investment in six power generation plants that total 483 MW of capacity and produce about 23 percent of the electricity supply, while five other IPPs investments of about US\$1.2 billion have reached financial close and power generation plants with a total capacity of 541MW are under development.

9. **The Ministry of Energy and Petroleum (MoEP) has responsibility for energy policy and administers a system of performance contracts with the public sector entities.** The government has a target of 70 percent electrification by 2018 and universal access by 2020. Government policies for electricity access and other policies such as those for expansion of generation, transmission and distribution infrastructure are translated into targets in the annual performance contracts between MoEP and all the public operating entities Kenya Transmission Company (KETRACO), KenGen, KPLC, GDC and REA.

10. **The Energy Regulatory Commission (ERC) is responsible for the periodical review of the electricity tariffs as well as approval of power purchase agreements and issuance of licenses.** Transparent and stable regulation is critical to sustain the sector's commercial viability. The tariff mechanism, including its provisions for pass-through to customers of currency fluctuation, inflation and fuel costs, is based on cost recovery principles and ensures that both public and private sector financed investments in the sector remain viable. Generally, the ERC has been diligent in carrying out its mandate of approving power purchase agreements and issuing licenses for regulated activities. The periodical tariff review however has been a challenging process which has faced delays and interference. The tariff review scheduled for 2011 was not performed on time and was instead completed in November 2013 resulting in a revised retail tariff schedule for the three year period 2014-16.

11. **KPLC, as the sole purchaser of all electricity produced, is the cornerstone of the electricity sector in Kenya.** KPLC is the single buyer and the sole distribution company for all power produced in the country. As such, it is the source of all the revenues of KenGen and all the existing and future IPPs. The private sector presence in electricity generation is fully supported by take-or-pay power purchase agreements signed with KPLC. Maintaining cost recovery retail tariffs is critical for the short and long-term financial sustainability of KPLC and the power producers (including KenGen and all IPPs).

12. **Striking a balance in increasing access to electricity for urban and rural areas in the most cost-effective manner is a national priority.** In line with the provision of the draft energy bill that commits government to provide affordable energy services in all areas of the country, the government is revisiting the current models to meet its statutory obligation with the preparation of a National Electrification Strategy (NES). Extension of grid from currently underutilized infrastructure (medium to low voltage transformers) to connect households in the nearby areas seems the most cost-effective option. In order to provide a balance in the provision of electricity in all regions of Kenya, new approaches will be tested, in particular transitory solutions through off-grid electrification (mini grids and individual systems).

13. **Kenya has embarked on a third generation of reform.** The 2014 draft Energy Policy and Energy Bill align the policy and regulatory framework of the sector with the 2010 Constitution (which came into force in May 2013) and its provision for greater accountability. Some of the key provisions include: (i) establishment of an obligation on the part of the national government and county governments to provide affordable energy services to all areas; (ii) sharing of roles of electricity planning, development, services and regulation between the national government and county governments in line with the devolved system of government under the 2010 Constitution; (iii) creation of a committee to advise the national government on

licensing of renewable energy natural resources, including a requirement that the licensing has to follow an open competitive process; (iv) open access over transmission and distribution networks; and (v) periodic review of the electricity market with a view to enhancing competition.

14. Strengthening KPLC's management capacity and corporate governance is an integral part of the new reform. In 2014, KPLC has implemented a business and organizational restructuring aimed at aligning its corporate strategy to the government's policies and improving its performance. The exercise includes, in particular, the review of the current corporate strategy, and the implementation of a more efficient organization structure with a lower number of General Managers reporting directly to the Chief Executive Officer (CEO). Appointment of senior management positions has been through a competitive process (incumbent members reapplied for their positions and in some cases were not selected) facilitated by an external management consultant. The restructuring has strengthened the institutional capacity in, among others, implementation of new projects and in transmission and distribution system operations. The government plans to strengthen the governance capacity and effectiveness of KPLC's Board by ensuring that the Board includes at least three experienced independent directors nominated by the leading private institutional shareholders in the Company.

Sector Challenges

15. The three overarching objectives of the government are to secure adequate electricity supply at least cost, to increase electricity access and to provide efficient and reliable electricity services. The enabling environment to realize these objectives is not yet fully in place. The capacity of the sector entities is generally strong (for example in policy making, technical and regulatory aspects). However, in practice, the mandates of the sector entities need to be better implemented and funding/financing sources need to be defined and treated as a critical component of planning. For example, the policy making role of MoEP and the technical role of the sector entities in planning and execution of infrastructure investment projects could be better demarcated, including a clear definition of who is responsible for identifying and/or providing funding. Furthermore, the capacity of the MoEP is limited in coordinating the many technical assistance activities (mostly donor funded) aimed at improving planning and implementation of the sector investments in generation, transmission, distribution and electrification. As a result, technical assistance activities in the sector are sometimes duplicated.

16. Governance in the public sector entities may be strengthened for greater accountability and improved efficiency. The capacity of KPLC's Board in providing strategic leadership and oversight to the Company including driving a performance culture and holding management to account for results has been weak. Until December 2014, all directors in the Board were nominated by the government and consequently, the Board's ability to balance the sometimes conflicting policies of the government and the company's financial integrity and long term sustainability was limited. KPLC has in the past undertaken investments in support of the government's electrification program which were detrimental to its financial sustainability. Improvements in key operational areas like reduction in system losses between 2007 and 2011 have not been sustained in subsequent years. Sound corporate governance therefore, plays a crucial role in KPLC's operational and financial performance.

A. Ensuring Security of Electricity Supply at Least Cost

17. **The policy and institutional arrangements are not optimal for planning and procurement of new supply.** The current planning approach does not ensure identification of the set of generation projects that are optimum from a country perspective and that would readily attract private sector participation through a competitive process and that would be bankable. The planning process can be enhanced through the adoption of more realistic assumptions on the future evolution and profile of demand, and robust pre-feasibility of prospective projects. Private sector participation in prospective projects can be secured at lower cost through better procurement processes including through competitive bidding.

18. **Kenya is endowed with large renewable energy resources of wind, geothermal and hydropower.** However, developing renewable energy resources in the country poses a number of challenges. Geothermal sites take many years to develop from their initial exploration to steam potential confirmation. Some of the best wind resources are located at considerable distance from the load centers requiring long and costly transmission lines. There are not large hydropower resources remaining to be exploited in Kenya. Agreeing compensation for land acquisition for construction of power infrastructure is frequently a lengthy process that has led to considerable delays in construction of most new generation projects and transmission lines.

19. **Very large private sector investment will need to be mobilized to ensure adequate supply after 2018.** Despite the difficulties cited above, the available capacity until 2017 is expected to be sufficient to meet demand. A total of 1,500 MW committed capacity expansion (currently under construction or recently reached financially close) will increase installed capacity to 3,253 MW by 2017 (Table 1). A risk to the adequacy of supply in the short term will remain the variable hydro conditions of the hydropower generation on the Tana River. This risk is expected to be mitigated with a re-balanced fuel mix that will include increased geothermal power generation. Investment amounts in the range of US\$5-8 billion for generation alone will be required to ensure adequate supply between 2018 and 2025.

Table 1: Electricity Demand and Installed Capacity 2013-2017

	2012/13 (actual)	2013/2014	2016/17
KPLC Energy Purchase GWh	8,087	8,839	10,685
KPLC Energy Sales GWh	6,581	7,244	9,008
Peak Demand MW	1,354	1,468	1,743
Installed Capacity MW	1,765	1,885	3,253
Hydropower Installed Capacity MW	816	816	816

Source: KPLC

B. Ensuring reliable electricity service

20. **The distribution system is weak and electricity supply to the 2.7 million electricity consumers is unreliable.** The distribution system is overstretched and overloaded due to past underinvestment, load growth and the recent extension of the network to connect new households without corresponding investment to strengthen the backbone transmission and

distribution networks. Frequent breakdowns and long duration of interruptions also result from inadequate preventive maintenance and weak accountability structures.

C. Ensuring Electricity Access to all Kenyan Households

21. **The electrification strategy until now has not incorporated key design and implementation features of successful electrification programs resulting in high costs and inefficiencies.** The one-time fee charged by KPLC for household to be connected to the grid is set at KShs. 35,000 (US\$410 equivalent) and this fee cannot be afforded by most households, especially those in rural areas, and are insufficient to cover total costs of investments incurred to extend low-voltage networks from existing transformers and connect new users (approximately US\$1,000/per connection). The result is that in rural areas the network constructed by either KPLC or REA is underutilized as most households forgo making application for connection even when the network is in their close proximity. As households in any given area make individual applications to be connected and since KPLC connects households in a given area over an extended time period, the cost of connecting individual households does not capture economies of scale. International good practices point to the economies of scale that can be achieved when all households in a given area are connected at once. International good practices also suggest that network construction costs can be reduced significantly when appropriate technologies and design are applied. In most successful experiences, it is not required that new electricity customers pay for the investment to extend the network into new areas. An alternative is to set an affordable contribution for electrification (i.e. an electrification charge) that is levied on all electricity consumers countrywide together with their monthly electricity bills. The institutional setting of the electrification charge in Kenya needs to be strengthened, by creating a special-purpose ring-fenced electrification fund to receive all the proceedings from the electrification charge and other financial resources.

22. **The investment needs for electrification should be met by the government and not by KPLC in line with the international practice of successful electrification programs.** KPLC has shouldered the financial burden of implementing the aggressive electrification targets set by government in the past three years and this has eroded its financial position. Since 2011, KPLC has implemented a fast paced and high capital consuming investment program (over US\$300 million/year) intended to increase connectivity in the country and improve coverage, capacity and quality of the distribution network to adapt to the country's development needs. This investment activity was financed entirely with KPLC's resources – cash from operations and debt, and although highly beneficial for the country, the result of this effort has been a material deterioration of KPLC's financial position as reflected in a substantial debt increase, lack of liquidity, difficulties to honor its payment obligations and restrictions to continue investing. The situation was exacerbated by a delay in carrying out the scheduled tariff review in 2011. The review was eventually completed in November 2013 and took effect from December 2013.

23. **Substantial investments will be required in the distribution network in order to ensure achievement of good standards of service quality.** Between 2014-2018 an estimated amount of US\$2.1 billion is needed to be invested in the expansion and reinforcement of 66kV, 33kV, bulk supply points, 11kV and low voltage systems, including reactive power

compensators in order to meet forecasted demand and improve the quality of electricity service. Financing the investments in system reinforcement and upgrade to ensure adequate service to existing customers will require long term financial planning by KPLC and optimization of funding sources including access to lower cost commercial financing. Additional investment of exceeding US\$3 billion will be required to meet access (connection) targets. Expansion of the network to meet electrification targets will need to be funded with a combination of a tariff levy on all customers, county government contribution, concessional funding of development partners and national government contribution.

24. **Electrification through mini-grids is suitable in areas where connection to the national system is not envisaged in the short and medium term.** The Kenya off-grid program to electrify remote centers has been running since early 1980s. Currently, there are 14 isolated mini-grids supplied by diesel power stations operated and maintained by KPLC. Presently, mini-grids are developed by REA and their operations are handed over to KPLC. Current regulations issued by ERC govern only mini-grid and electricity access work of KPLC and REA.

Strategies to Address Sectoral Issues

25. **The government plans to implement comprehensive policy and legislative reforms in the management and governance of state corporations (including KPLC), with a view to improving their performance and contribution to national development.** The reforms are articulated in the draft Policy on Management of Government Owned Entities, 2014 and the draft Government Owned Entities Bill, 2014. Some of the key provisions include: requirement for state corporations to be self-sustaining and profitable, transparent and competitive appointment of directors and CEOs, enshrinement of directors' duties and liabilities into law and integration of constitutional provisions on national values. Eligibility for appointment as directors will include both professional and experience threshold as set out in the law and also ethical and integrity requirements. Once enacted into law, the Government Owned Enterprises Bill will apply to all state corporations and will provide a sound legal framework for their governance and management.

26. **Improving the Corporate Governance at KPLC.** Sound corporate governance is crucial for transformation of KPLC's operational and financial performance in a sustainable manner. By virtue of being partially privately owned and listed at the Nairobi Securities Exchange, KPLC complies with capital markets laws on public reporting, disclosures and accountability to shareholders, which, coupled with an active media, results in transparency in the management and governance of the Company. KPLC also has sound corporate governance structures and instruments (it has adopted the Capital Markets Authority Guidelines on Corporate Governance, a Board Manual, Board Charter and Code of Conduct for Directors) that outline important arrangements including: director's duties, code of conduct, and liability; separation of Board and management roles; rights of shareholders; and balance in board composition. The government plans to strengthen the governance capacity and effectiveness of KPLC's Board by ensuring that the Board includes at least three experienced independent directors nominated by the leading private institutional shareholders in the Company. The independent directors will bring objectivity to the Board in balancing KPLC's commercial interests and the policy interests of the government as the majority shareholder.

27. **In order to ensure adequate supply after 2020, there is an urgent need to carry out systematic planning and to put in place a robust framework for competitive procurement of new capacity.** A least cost power development planning process is in place, but it needs to be enhanced to ensure that reliable plans are produced based on sound technical parameters. Projects that can demonstrate their viability under credible assumptions are more likely to move forward. A competitive procurement of new capacity is likely to be the most efficient means of securing supply although unsolicited generation projects may also be considered if subjected to proper due diligence.

28. **The Government has recognized the scale of the financing challenge in developing new generation capacity and has solicited private participation.** The government envisages a multipronged sector financing strategy that includes tapping local capital markets, Kenyan diaspora, bond investors as well as global investors from a variety of public private and concessional sources. In its 5,000MW expansion program, about 70 percent of the investment in power generation capacity is expected from the private sector through IPPs. All large electricity generation projects (i.e., all those not coming under feed-in-tariff policy) will continue to require long-term PPAs with KPLC in order to raise the necessary debt financing to reach financial close. These PPAs in turn will continue to require credit support from the government and guarantee instruments. Risk perceptions will need to be monitored carefully and the factors that lead to higher risk assessments managed. These include, for example, issues around land acquisition, including compensation of project affected persons.

29. **The government has initiated the preparation of a National Electrification Strategy (NES) based on global best practices.** The government recognizes that the electrification strategy in place since 2004 is not sustainable. It has initiated the preparation of a NES with the objective to achieve universal access meeting applicable standards on quality in a sustainable manner in the shortest possible time. The government sponsored and hosted a national workshop in September 2014 to discuss the precepts of the Strategy and consensus was reached on the main areas that the Strategy will define: (i) determination by the government of priorities in terms of electrification and a clear definition of the institutional arrangements (roles of the national and local governments, electrification agencies, service utilities and other stakeholders); (ii) planning and effective execution of all investments needed to actually connect new users (in particular individual drops), including the definition of the most cost-effective technical design and construction; (iii) levels of service quality; and (iv) financing schemes to ensure sustainability of the electrification programs (contributions from donors, multilateral agencies, national budget and electricity consumers through specific charges, including strengthening of the existing arrangements through creation of a “special purpose” electrification fund to “ring-fence” contributions from all sources, etc.). A working group has been established to prepare the strategy under the leadership of MoEP and comprising REA, KPLC and ERC.

30. **The NES will incorporate appropriate design and implementation arrangements for off-grid areas.** Alternative models are being tested. They include the following:

- Mini-grids developed using a Public-Private Partnership (PPP) model where REA invests in land, distribution network and basic support infrastructure, and the private sector invests in and operates the mini-grid system, and sells power to KPLC under a PPA.

KPLC would be responsible for retail distribution of electricity and may enter into a service agreement with a private operator for maintenance of the facilities.

- For remote communities where there is little productive load, (anchor loads) stand-alone pico-solar, solar home systems (SHS) and solar micro-grids electricity services are likely to be the least-cost option.

31. **KPLC is developing a financial strategy to guide future investment decisions.** KPLC has engaged a financial advisor to perform an assessment of its current and projected financial situation; identify financial needs on the basis of various scenarios of investment, revenues and expenses, including contractual obligations under signed and planned Power Purchase Agreements (PPAs); and develop a financial strategy for the Company, including identification of financing options available to support investments. The financial advisor will also assess the capacity of KPLC's finance department and recommend resources required to implement the financial strategy and support the company's business objectives. The findings and recommendations of the Financial Adviser are expected to be available in the first quarter of 2015.

32. **Strengthening the financial situation of KPLC.** The company's investment targets ought to be coupled with sound financial planning and associated financial indicators. KPLC's management is committed to adopt a formal corporate investment and financing plan which will enable the company to ascertain the amount of new investment that can be prudently afforded on an annual basis and the required funding sources. Due observance of the corporate plan and the associated investment decisions will be measured through performance and financial indicators/covenants intended to maintain KPLC's indebtedness, debt repayment capabilities, liquidity and profitability at prudent levels so as to ensure the long-term financial sustainability of the company and of the sector.

Ongoing actions to implement these strategies for the power sector

33. **MoEP, with the assistance of donors, is strengthening the generation and transmission expansion planning process.** A number of important studies are underway that will inform system planning. These include a Generation Least Cost Analysis; a Renewable Integration Study; a System Operation Gap Analysis; a Grid Code Review; and a Power Generation and Transmission Master Plan.

34. **Tendering of new generation is ongoing.** In addition to generation and transmission infrastructure investments for which construction is ongoing, tendering of additional generation projects to be implemented under PPP arrangements is underway. KenGen also intends to source concessional financing for a number of public financed generation projects (wind and geothermal). Resource development is being carried out for wind, geothermal and fossil fuel resources (coal and natural gas) that are potential resources for power generation.

35. **KPLC has invested over US\$2 billion since 2005 to expand, reinforce and upgrade the distribution system and to improve the quality of supply.** These investments include new connections, the construction / upgrade of substations and power lines, the automation of part of

the system including installation of a Supervisory Control and Data Acquisition (SCADA) system, and supply and installation of prepaid meters. Most of the projects have been completed. The investments implemented between 2005 and 2011 were financed with a combination of cash from operations, loans from donors and equity injected by KPLC shareholders in 2010 through a rights issue. The investments implemented from 2011 to 2014, which amounted to approximately US\$1 billion, were funded with commercial debt and cash from operations. However, there are still several critical investments to be implemented in order to improve the reliability of the system, such as protection systems, automation of medium voltage lines and advance metering investments. The total investment program of KPLC for the period 2014-2018 is approximately US\$2.1 billion. The IDA share of this is US\$90 million through the proposed Project. The total investment required for the government's electrification program is US\$3 billion, of which the IDA contribution is US\$157.5 million.

36. The Kenya Investment Plan for Scaling Up Renewable Energy Projects (SREP) was endorsed by the SREP Subcommittee in August 2011. It supports implementation of hybrid mini-grid systems, with renewable sources, for electrification in rural areas where grid extension is unlikely to be viable in short and medium term. The SREP subcommittee approved funding of US\$7.5 million to support such an approach.

Rationale for Bank Involvement

37. The Bank has been in the forefront in supporting Kenya's efforts to reform its power sector and establish efficient commercial operations; thus, it is uniquely positioned to provide technical assistance on policy institutional, organization and regulatory aspects. The Bank's energy portfolio in Kenya, including recently closed and ongoing operations, spans all energy sub-sectors, from generation, to transmission and distribution, to regional power trade. Risk mitigation by the WBG has been instrumental in attracting some of the major IPPs and mobilizing private investment in the power sector. The proposed Project is well aligned with this vast and diversified portfolio and complements well some of the ongoing operations, notably the KEEP and the Kenya Private Sector Support Program jointly supported by IDA, IFC and MIGA.

38. The electrification component of the project will mainstream a sustainable national electrification strategy. Bank knowledge of global good practice in the design of electrification programs has been critical in effecting policy changes that will ensure sustainability of the electrification program in Kenya. The design of the Project has benefited from extensive knowledge sharing that is reflected in the buy-in of sector leaders and policy makers to a new approach to electrification that will be the basis of the National Electrification Strategy being prepared. The new approach (reflected in the design of the electrification component) includes reforming the regime of charges for new connections that were set at unaffordable levels for poor and medium income households. The government will adopt a policy for connection charges that will ensure that all households will be connected in the areas to be electrified. Furthermore, the new approach will not require that KPLC takes the financial burden of the capital investments as was the case until now, which led to the erosion of KPLC's financial situation. Instead, the Project will apply new funding options such as government budget, loans/grants provided by development partners, and other non-commercial sources. Finally, the procurement strategy based on separate equipment and works contracts (rather than

turnkey EPC contracting) will ensure cost savings to underpin sustainability of the electrification program.

39. **Bank involvement will help advance utility reform and operational efficiency.** Bank knowledge has influenced the design of the Service Delivery and Revenue Protection components of the Project. Furthermore, policy dialogue during preparation of the Project has influenced measures to improve corporate governance in KPLC as well as the 2013 retail tariff review.

40. **The Project, including through an IDA Guarantee, will provide a comprehensive financial solution to the financing and investments needs of KPLC.** Due to the nature of KPLC's investments, which provide low return and require long amortization periods, and KPLC's constrained financial situation, it is critical for KPLC to restructure its commercial debt in order to reduce its financing costs, which tripled between 2012 and 2014. As of June 2014, KPLC had over US\$800 million of financial debt, of which nearly US\$500 million are commercial loans. These commercial loans cost over US\$100 million per year in debt service (interest and principal) and more than half of them (approximately US\$370 million) will mature within the next five years. The terms of these loans are reflective of KPLC's eroded financial condition and credit quality. While the loan terms are reflective of standard market conditions for this type and quality of borrower, they are not affordable in the short and medium term, nor suitable for KPLC's growth needs.

41. **With the proposed IDA Guarantee, KPLC would be able to obtain better terms on new commercial loans.** The Project supports KPLC's debt restructuring by providing a US\$200 million IDA Guarantee to debt payments by KPLC thereby enhancing KPLC's credit quality and enabling it to raise approximately US\$500 million of new commercial debt with lower interest rates and longer tenors than those currently available to it. The result of KPLC's debt restructuring will be a significant reduction of the Company's overall financing costs with the respective liquidity benefits and the rescheduling and extension of the amortization periods. Restructuring will enable the continued implementation of much needed investments by KPLC, and importantly, a reduction of the cost recovery requirements from KPLC customers through the tariffs.

42. **The proposed IDA Guarantee would enable significant leveraging of IDA resources.** The application of a US\$200 million IDA Guarantee to mobilize approximately US\$500 million of commercial debt results in a leverage ratio of 2.5x which is not only substantial but also fully reflective of IDA's and the World Bank Group strategies for optimization of resources and mobilization of private capital.

43. **The design of the project takes advantage of the strengths of the World Bank Group (WBG) and complements the engagements of IFC and MIGA in the sector.** The IDA and IFC teams closely collaborate in ongoing energy sector dialogue and in particular on issues pertaining to KPLC financial situation and strategies to improve its financial sustainability. IDA takes a lead role in the overall sector dialogue and due diligence with regard to the power sector's financial situation. IDA is providing critical credit enhancement and risk mitigation through guarantees to IPPs. IFC is playing a leading role in ensuring the bankability of projects

from a lender perspective, for example in the case of the Kipeto wind project. IFC approved a US\$50 million senior loan to KPLC in 2012 with the objective of increasing coverage of electricity in the fast growing peri-urban as well as rural areas; reduction in commercial and technical losses; and improving quality of service. The IFC investment is complementary to the US\$95 million investment in the distribution network through the IDA loan for the Kenya Electricity Expansion Project (KEEP, P103037) approved in 2012. MIGA has provided risk mitigation in the form of termination guarantees to three private generation projects. In designing the present Project, expertise from across the WBG has been mobilized in the areas of financial restructuring of KPLC's financial liabilities with commercial lenders and in design of electrification programs. With the proposed Project IDA would pave the way for a financially stronger KPLC, which would be expected to reduce its reliance on IDA support over time, and instead be progressively in a position to apply more commercially driven instruments in the future. One of those instruments would be MIGA's product for foreign financiers Non-Honoring of Sovereign Financial Obligations (NHSFO) which is not at this time sought due to KPLC's perceived low credit quality and implied credit rating below BB-.

44. **IFC intends to propose a new US\$50 million IFC A loan to KPLC as part of a wider syndicated facility that it would arrange in 2015.** Subject to credit and board approvals, the IFC syndicated facility may be used to provide financing to fund KPLC capital expenditure and could conceivably be partially used also to refinance existing debt.

45. **Other development partners are actively involved in the power sector and in supporting the electrification program of the government.** The AfDB approved a loan of US\$133 million equivalent for electricity access in rural areas that is part of the electrification program in November 2014. Both the AFD and JICA are also preparing loans to support the electrification program.

C. Higher Level Objectives to which the Project Contributes

46. The proposed Project will support the Country Partnership Strategy (CPS) for FY14-18 (Report No. 88940) objective of removing infrastructure bottlenecks as a key area for unleashing the country's growth potential (Outcome 1.2). The CPS notes that adequate and reliable supply of affordable electricity is key to economic growth, security and delivery of social services. The technical assistance activities proposed are aligned with the CPS theme of transmitting global knowledge. The training and transfer of power planning models will enhance system-planning capability within MoEP, ERC and the KPLC. The assistance will also provide a solid foundation for decisions on the future economic development of the power system.

47. Furthermore, the Project is in line with the higher-level objectives of the WBG Energy Sector Directions Paper², which emphasizes focus on sector planning (the Project supports a new approach to electrification planning) and improvement in the institutional environment. The Project supports the SREP in Low Income Countries, and its aims to develop renewable energies to effectively contribute to poverty reduction and sustainable development.

² *Toward a Sustainable Energy Future for All: Directions for the World Bank Group's Energy Sector, July 9, 2013.*

48. The proposed Project is designed to strengthen KPLC's financial position and set the Company on the path to financial sustainability so that KPLC is able to implement the necessary infrastructure investments and offer strong and reliable off-take commitments to private investors in new power generation capacity. As the cornerstone of the energy sector in Kenya, KPLC's long-term financial sustainability is essential for the stability and continued growth of the sector, which in turn affects the economy as a whole. A financially strong KPLC will have a positive impact on the energy sector and will contribute to the creation of an appropriate environment for economic growth and increased private investment.

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

A. PDO

49. The proposed project development objectives (PDOs) are: (a) to increase access to electricity; (b) to improve reliability of electricity service; and (c) to strengthen KPLC's financial situation.

B. Project Beneficiaries

50. Beneficiaries include households that will be connected to the electricity network for the first time and whose use of electricity will replace kerosene and other fuels for lighting and will enable productive activities.

51. A second group of beneficiaries will be existing electricity consumers, including business customers of KPLC for whom the quality and reliability of electricity service will improve. Improved reliability of electricity service is especially important for businesses. When electricity grid service is interrupted they incur the additional cost of electricity supply from standby generators or suffer loss of sales.

52. KPLC will be a beneficiary through the restructuring of its commercial debt that will restore its liquidity, strengthen its financial situation and set it on the path to financial sustainability. As a consequence, the Project is expected to benefit the entire energy sector as KPLC is the cornerstone of it, and its financial strength and sustainability is essential to support the operations of KenGen and all IPPs.

C. PDO Level Results Indicators

53. The achievement of development objectives will be assessed using the following key outcome indicators.

Access:

- People provided with access to electricity by household connections (core)
- Total number of new connections

Reliability of supply:

- Average outage duration for customers served (System Average Interruption Duration Index – SAIDI)

KPLC financial strength:

- Current ratio
- Financial self-sufficiency (core)

IV. PROJECT DESCRIPTION

54. The Project is composed of three financing instruments: an IDA credit of US\$250 million; a SCF-SREP grant in the amount of US\$7.5 million (fully blended with IDA); and an IDA Guarantee of US\$200 million that will support KPLC in raising about US\$500 million of long-term financing. The Project description references the IDA credit and grant together and subsequently the IDA Guarantee.

55. The IDA credit and SREP grant together support four components that are each aimed at: (i) improving service delivery and reliability; (ii) implementing a revenue protection program for sustainable loss reduction in electricity supply; (iii) connecting households based on a sustainable approach to electrification that incorporates proven international practices from countries that have rapidly increased access to electricity; and (iv) institutional development, capacity building and project implementation support.

Component A: Improvement in Service Delivery and Reliability (estimated cost US\$50 million IDA Credit)

56. *Sub-component A1 (approximately US\$10 million): Upgrade of the Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS).* The objective of this sub-component is to enhance flexibility in operations and allow a more efficient management of the distribution network. This component will finance upgrades of the SCADA/EMS by incorporating key existing substations into the system.

57. *Sub-component A2 (approximately US\$20 million): Distribution system enhanced flexibility.* To reduce duration of system interruptions, KPLC is also implementing various actions to automate and enhance the operational flexibility of the distribution network (in particular at the medium voltage level). The component aims at achieving 90 percent automation of the networks in Nairobi by installing a total of 1,000 load break switches in assets operating at 11, 50 and 66 kV, with associated RTU's and communications features enabling remote control and operations.

58. *Sub-component A3 (approximately US\$20 million): Enhance maintenance practices to improve the quality in electricity supply.* In order to further reduce interruptions in electricity service, KPLC will implement live-line maintenance (LLM). The component will finance specific equipment, tools and intensive training of staff in charge of the works.

Component B: Revenue Protection Program (RPP) (estimated cost US\$40 million IDA Credit)

59. The main objective of the RPP is to permanently protect KPLC's revenues from sales to the segment of large and medium customers, ensuring that all users in that "high value" segment are systematically billed according to their accurately metered full consumption. This component will finance implementation by KPLC of a RPP, based on the application of advanced metering infrastructure (AMI), and the adoption of organizational arrangements (creation of one or more metering control centers (MCCs)) aimed at optimizing the systematic use of the information provided by the metering system and undertake consistent corrective field action as needed. The component will include: (i) creation of the MCCs and investments in infrastructure needed to operate them; (ii) incorporation of a state-of-the-art Meter Data Management software and training of staff of the integrated metering centers in its proper use; and (iii) supply and installation of AMI for the 4,300 high and medium voltage users and 40,000 large low voltage customers, and incorporation of those customers to the respective MCCs.

60. This component will be complemented by technical assistance, under Component D, to address the commercial aspects of KPLC and the monitoring and enforcement role of the regulator.

Component C: Electrification Program (estimated cost US\$160 million: IDA Credit for US\$152.5 million and SREP grant for US\$7.5 million)

61. This component will support the government's objective of 70 percent household connectivity by 2018 by providing concessional financing for the connection of new households and thus introducing a more cost-effective and suitable source of funding for investments of this nature. Payment of a connection fee will not be a pre-requisite for households to be connected. However, households will be required to pay a connection charge. The amount of this charge (which may be in the form of monthly payments) will be based on household affordability so that no household remains unconnected due to inability to pay the charge.

62. *Sub-component C1: Peri-urban electrification (approximately US\$150 million).* This sub-component that will be implemented by KPLC will finance the design, materials and construction works required to electrify all households and businesses in selected high density peri-urban areas located close to existing electricity networks. KPLC has selected approximately 40 peri-urban areas in seven geographical regions, which is expected to connect 125,000 households. The areas were selected based on population density and their location close to existing electricity networks, in order to maximize the number of connections in a given area. KPLC's proposal of areas has been reviewed and endorsed by the government. This sub-component introduces new implementation arrangements (e.g., clearer responsibilities for each implementing agency and enhanced supervision arrangements) and new procurement arrangements (e.g., procurement of main equipment in bulk and independent contracts for construction and installation) to maximize the resources available and efficiently implement the project with the expectation to reduce cost and reach more customers.

63. *Sub-component C2: Off-grid electrification (approximately US\$10 million: IDA Credit US\$2.5 million and SREP grant US\$7.5 million).* This sub-component will be implemented by REA and will support the implementation of off-grid electrification solutions in areas whose connection to the national grid is financially not viable in the short and medium term. Electrification of those areas will be implemented through mini-grids supplied preferably by hybrid generation systems, combining renewable resources (solar or wind) and thermal units running on diesel. This sub-component will test a PPP approach. The selection of project areas is based on the number of potential users and their demand, supported by an ongoing market sounding, a demand survey and pre-feasibility studies being carried out by REA. Typically, the schemes will be implemented in villages of 150-400 prospective users and approximate demand of 250-500kVA. This sub-component will be supported by IFC data collection and regulatory analysis for mini-grids. In addition to this Project, IFC will also be financing stand-alone solar PV and micro-grids to reach consumers in remote areas that neither the national grid nor mini-grids will cover in the medium term.

Component D: Technical Assistance and Capacity Building (estimated cost US\$7.5 million IDA Credit)

64. This component will finance consultancy services, feasibility studies for new investments, training actions and other activities to support, among others:

- (i) *Preparation of the National Electrification Strategy (NES)* (approximately US\$0.5 million). The objective of the NES is to achieve universal access to electricity services meeting applicable standards on quality on a sustainable manner in the shortest possible time and optimizing allocation of resources from a country's perspective. This activity will be implemented by MoEP.
- (ii) *Detailed national technical specifications and standardization* (approximately US\$1 million). This assistance will support the technical and economic optimization of the design and construction of electricity networks needed to supply new users located in currently not served areas, meeting applicable standards on service quality. This will result in the addition of new standardized construction units to those currently applied by KPLC and REA. This activity will be implemented by MoEP.
- (iii) *Regulations for enforcing quality on electricity service delivery* (approximately US\$0.5 million). Assistance to ERC to implement a regime on service quality, based on systematic monitoring of key parameters through direct access of the records of the information systems used by KPLC. This will also be combined with assessments on KPLC for attention of customers' complaints and KPLC commercial systems. This activity will be implemented by MoEP through ERC.
- (iv) *Project preparation support for feasibility studies for new investment projects as required and project monitoring and evaluation* (approximately US\$3.5 million). This will finance consultancy services to support the implementation and monitoring and evaluation of the Project as well as feasibility studies and other activities to support sector development including GIS mapping. This activity will be implemented by KPLC.

- (v) *Training and capacity building* (approximate cost US\$2 million). This will finance training and capacity building and communications for the sector entities, including MoEP, KPLC, REA and ERC.

IDA Guarantee: Mobilization of commercial financing for KPLC to restructure its commercial debt obligations (US\$200 million IDA Guarantee)

65. The Project will provide a US\$200 million IDA Guarantee to enhance KPLC's credit quality and enable the Company to raise approximately US\$500 million of new commercial debt with lower interest rates and longer tenors than those currently available to it. This new debt will be used to restructure/replace a substantial portion of KPLC's existing commercial loans. KPLC's existing commercial debt has interest rates ranging between four and six percent for tenors of three to five years on average. IDA guaranteed new commercial debt is expected to reduce interest rates below 6 percent for extended tenors of eight years or more. The result of this operation would be a significant reduction of KPLC's financing costs, creation of savings that will provide the Company with liquidity it currently does not have, and enabling KPLC to continue investing in the quality and coverage of its services and the development of the country's power system.

66. The appraisal of the IDA Guarantee requires a comprehensive assessment of the financial situation and prospects of KPLC, including detailed financial projections under various scenarios of demand, commitments under PPAs, retail tariff and financing costs. It will also require an assessment of the financing options available to KPLC in the commercial market in order to determine the most appropriate structure for the Guarantee.

67. The proposed IDA Guarantee may take the form of direct debt service support, first loss guarantee and/or principal repayment guarantee at the end of the extended tenor. The structure will be defined during the appraisal period in order to better respond to prevailing market conditions, and determined on the basis of financing proposals to be delivered by commercial banks and optimize the leveraging capabilities of the proposed IDA support. Financial close of the IDA Guaranteed commercial financing is expected within two to four months after Board approval of the IDA Guarantee.

A. Project Financing

Financing Instruments

68. The Project is an Investment Project Financing. Its financing structure will include three financing instruments: (i) an IDA Credit in an amount of US\$250 million, (ii) SREP grant financing of US\$7.5 million, and (iii) an IDA Guarantee in an amount of up to US\$200 million.

69. Proposed IDA Credit and SREP grant: the proposed US\$250 million IDA Credit and US\$7.5 million SREP grant will be used to finance infrastructure investments implemented by KPLC and REA, and technical assistance and training activities implemented by KPLC, REA, ERC and MoEP.

70. Proposed IDA Guarantee: the proposed US\$200 million IDA Guarantee will be used to enhance the credit quality of KPLC and enable the Company to raise commercial financing in an amount of approximately US\$500 million in terms and conditions (interest rate and tenor) that are significantly better than those currently available to it. This financing will not be used for new investments. It will be used to replace/restructure existing commercial debt.

Project Cost and Financing

71. The total Project cost is estimated at US\$757.5 million. Costs in the table include price contingency for each of the components.

Table 2: Breakdown of Project Cost and Financing by Component (US\$ million)

Project Financing	Project Cost	IBRD or IDA Financing	Other Financing (SREP)
IDA CREDIT			
A. Improvements in Service Delivery and Reliability	50	50	0
B. Revenue Protection Program (RPP)	40	40	
C. Electrification Program	160	152.5	7.5
D. Technical Assistance and Capacity Building	7.5	7.5	
IDA Guarantee	500	200	
Total Financing	*757.5	450	7.5
Front-End Fees			
Total Financing Required			
* US\$500 million is the amount of commercial debt expected to be raised with the support of a US\$200 million IDA Guarantee.			
Note: Counterpart contribution in the form of costs incurred by KPLC and REA for staffing and operation of the PIUs is estimated at US\$4 million over the five year implementation period of the Project. It includes, for example, costs incurred for design of peri-urban and off-grid electrification schemes in Components C1 and C2 and supervision of works contracts.			

Proposed IDA Guarantee Structure

72. The proposed IDA Guarantee may take the form of direct debt service support, first loss guarantee and/or principal repayment guarantee at the end of the extended tenor. The structure will be defined during the appraisal period in order to better respond to prevailing market conditions and optimize the leveraging capabilities of the proposed IDA support.

73. Regardless of the final structure, the IDA Guarantee will be applied to guarantee payments of debt service (principal and interest) by KPLC to the commercial lenders. In the

event that KPLC fails to make a payment under the commercial loans, subject to the cure periods provided under the loan agreement(s), the lender(s) will have recourse to the IDA Guarantee. IDA will be obliged to pay to the claimant the amounts due and not paid by KPLC within the period stipulated in the Guarantee Agreement (TBC).

74. As per the terms of the Indemnity Agreement to be signed between IDA and the Government of Kenya (GoK), a payment by IDA to a lender under the IDA Guarantee will trigger the obligation of the GoK to repay IDA. Repayment shall be made upon demand by IDA or as IDA may otherwise direct.

Other Terms and Conditions of the IDA Guarantee

75. The IDA Guarantee would be issued for a maximum term equal to the tenor of the guaranteed loans, which is not expected to exceed 15 years. In accordance with the pricing policy for IDA Guarantees, the lender(s) will pay a Guarantee Fee of 75 basis points per annum calculated over the amount of the Guarantee for the given year and payable from the date and as a condition to effectiveness of the IDA Guarantee. Annex 9 includes the Term Sheet and summary description of the Terms and Conditions of the IDA Guarantee.

Financing Terms

76. The Bank will provide the IDA Credit to the Recipient at standard IDA terms, with a maturity of XX (TBC) years, including YY (TBC) years of grace. Out of the US\$250 million Credit, the Recipient will on-lend US\$90 million (related to components A and B) to KPLC under a Subsidiary Loan Agreement.

77. With respect to the US\$150 million related to peri-urban electrification (Component C1) and the US\$3.5 million related to Project preparation support for feasibility studies for new investment projects as required and project monitoring and evaluation (Component D (iv)) these amounts will be on-granted to KPLC under a Subsidiary Grant Agreement. The US\$2.5 million IDA Credit for the off-grid electrification (Component C2) will be on-granted to REA under a Subsidiary Grant Agreement along with the US\$7.5 million SREP Grant. In its Request letter to the Bank, the National Treasury has confirmed that the amounts of the IDA Credit for the electrification program components C1 and C2 will be on-granted to KPLC and REA.

78. The proposed terms take into consideration the following:

- (i) The guiding principle that, as a commercial company, KPLC should not take the financial burden associated with investments of a purely development nature, such as new connections, which are not financially viable.
- (ii) KPLC's long-term financial sustainability is a priority for the continued development of the energy sector in Kenya.
- (iii) Any credit, interest payments, service charge or repayment arrangement will affect the underlying assumption of the Project of improving KPLC's financial position.

B. Lessons Learned Reflected in the Project Design

79. **The combined use of IDA Credits and IDA Guarantees is a most efficient way to apply IDA resources.** IDA Credits are an ideal instrument to finance investments that are not attractive or suitable for the private sector and thus ideally suited to support the GoK and KPLC in the implementation of the national electrification program and the service quality enhancement investments. IDA Guarantees provide strong credit support to state owned enterprises in general, and to KPLC in particular, while requiring minimal IDA allocation. In this case, the IDA Guarantee will provide credit support to attract commercial lenders and avoid the use of any direct support from the GoK with the associated fiscal benefits and optimization of limited government resources.

80. **International best practice has been incorporated in the design of the electrification component.** International experience, in countries such as Vietnam and Peru that have reached near universal rates of electrification, has demonstrated the importance of (i) optimizing procurement arrangements and carrying out all construction works including users' connections; (ii) not requiring households to pay any connection fee (if there is a policy that new users should make a contribution to the electrification program on connection, the connection fee should be set at a level that is affordable for all households); (iii) collecting the rural electrification charge from all users; and (iv) optimizing the design and implementation arrangements for electrification of rural areas and defining optimum construction units for electrification of rural areas. By incorporating these international experiences, the proposed Project - through the investment component and through the support for a new national electrification strategy - will contribute to sustainability of the electrification program.

81. Programs such as those in Vietnam and Peru led to a transformational impact in these countries due to their innovative and customized solutions in rural settings. Facilitated by IDA, Kenya will continue to benefit from international experience during the design and implementation of its National Electrification Strategy (NES). Development of the NES will be supported under the Project (Component D).

82. The off-grid component takes into account experience from WBG supported mini-grid off-grid projects, in particular how the private sector can participate as an operator.

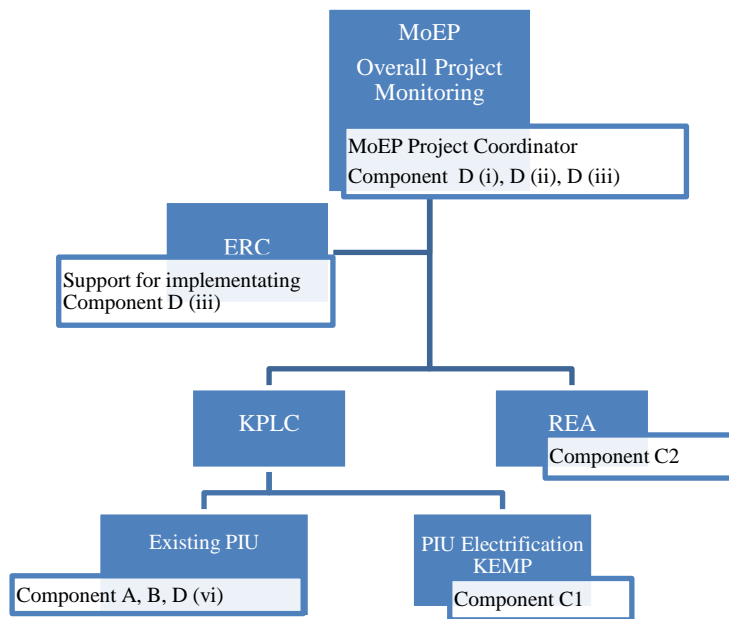
83. **Advance procurement and packaging for the investment component will avoid delay in implementation.** KPLC has identified project areas and begun the preparation of bidding documents for investment components, and KPLC and ERC have prepared Requests for Proposals for the consultancies in the technical assistance component. The electrification program (Component C) will be implemented through separate design, goods and works contracts rather than through a turnkey (EPC) approach. The EPC approach where one contractor is responsible for design, supply and installation has resulted in inefficiencies in previous distribution projects implemented by KPLC. The proposed approach is expected to promote strong competition for supply of the main materials of poles, conductor and transformers resulting in lower prices. Since KPLC can immediately begin the design of the network in the areas to be electrified the time for implementation will be shortened. The capacity of the project implementation unit (PIU) to carry out the designs will be enhanced by outside consultants.

84. **New arrangements in place following KPLC’s organizational reform in 2014 will greatly improve the efficient implementation of the Project.** The newly created post of General Manager, Infrastructure Development, who is responsible for PIUs, will report to KPLC’s CEO/Managing Director. Given the importance of the national electrification program, a dedicated PIU will be created in KPLC for implementation of the grid related investments in the program.

V. IMPLEMENTATION

85. The components of the project will be independently implemented. MoEP will be responsible for the overall monitoring of project progress and will consolidate the progress reports from each implementing agency, KPLC and REA. MoEP will also be responsible for Components D (i), D (ii), D (iii) and training for MoEP and ERC staff under D (v). KPLC will be responsible for the implementation of Components A, B, C1, D (iv), training for KPLC staff under D (v) and the implementation of the IDA Guarantee. REA will be responsible for the implementation of Component C2 and training of REA staff under D (v). Figure 1 represents the arrangements for implementation for KEMP.

Figure 1. Project Implementation Arrangements



86. The existing project implementation unit (Existing PIU) at KPLC that is implementing investments under the ongoing IDA financed Electricity Expansion project (KEEP, P103037) will be responsible for implementation of Components A, B and D (iv). The Existing PIU is headed by a Chief Engineer who reports to the Manager Infrastructure Development. KPLC will appoint a Manager Electrification for the electrification program financed by various donors. There will be separate PIUs for each donor financed project. The PIU for Component C1 (KEMP Electrification) will be headed by a Chief Engineer who will report to the Manager Electrification. Both the Manager Electrification and the Manager Infrastructure Development will report to the General Manager Infrastructure who reports to the CEO/Managing Director.

The Existing PIU has personnel responsible for design and engineering; procurement and stores management; accounting; installation services (substations and lines); and substation land and way leaves acquisition. The Electrification Program PIU will have dedicated personnel for procurement, financial management, accounting, stores management, engineering, and works supervision. The IDA Guarantee will be implemented by the Finance Department which has already implemented three IDA Partial Risk Guarantees to support IPPs in the past 3 years.

87. REA's capacity to implement Component C2 will require strengthening. REA will deploy existing staff and recruit specialized staff to the PIU for the implementation of the Project. The PIU is already in place - it is implementing the rural electricity component in the IDA financed Electricity Expansion Project. The REA's Project Coordinator reports to the CEO. The unit will be supported by a Transaction Adviser (individual consultants) that will provide all the specialized expertise in the areas of structured finance, design of competitive processes for selection of private entities in public private partnership arrangements, contract negotiations with private parties, project supervision, etc.

A. Results Monitoring and Evaluation

88. The overall Project monitoring and evaluation will be carried out at MoEP, by the MoEP Project Coordinator who will consolidate the information from the executing agencies, KPLC and REA.

89. Within KPLC, an (M&E) Officer in the Infrastructure Development Division of KPLC will prepare a monthly progress report for discussion by KPLC's senior management and, on a periodic basis, by KPLC's Board. KPLC's General Manager, Infrastructure Development, to whom the PIU Project Coordinators/Leaders reports, is ultimately accountable for ensuring that reports are prepared for components A, B, C1, D (ii) and D (iv).

90. REA will be responsible for reporting on sub-component C2. The PIU in REA will be supported by the M&E Officer for the implementation of this sub-component.

91. The Project will support the strengthening of ERC's existing monitoring and evaluation system for assessment of electricity users' satisfaction with the service provided by KPLC. In addition to its core task of systematic monitoring of service quality and enforcement of applicable standards and penalties, the regulator of a monopolistic service has the obligation to periodically evaluate the satisfaction of the users with that service. This is carried out through specific surveys aimed at getting answers on the main dimensions of customers' satisfaction. The Project will support ERC to improve existing approaches, making proper use of comprehensive experience in other emerging countries in the design of surveys, together with local expertise in their effective execution.

92. Annex 1 presents the Project's results framework, which defines specific outcomes and results to be monitored. In addition to regular monitoring and reporting on the agreed Project indicators, activities to be monitored include the timely, efficient, and transparent supervision of procurement and contract management; monitoring of construction and commissioning of the distribution and electrification works; effective implementation of any Environmental Management Plans and Resettlement Management Plans; and studies and training activities.

B. Sustainability

93. **The government and all political groups in Kenya are committed to rapid electrification.** The goal of universal access to electricity is articulated in all major national policy documents. The Manifesto of the Jubilee Government, Kenya's Vision 2030, the Second Medium Term Development Plan and other government policy statements articulate clearly and unequivocally the goal of universal electrification and improving electricity service delivery. These goals are shared across the political spectrum making it likely that these national goals would be unaffected by any political developments. The goals are fully supported by a broad base of civil society and this underpins the political will to implement and sustain the project's activities.

94. **Industry and households are vocal in demanding improved delivery of service and are likely to fully support the Project objectives of improving service reliability.** Businesses and households experience frequent power outages that are often of many hours duration. As a result, the great majority of middle-income households as well as businesses maintain back-up systems, generators or uninterruptible power supply, and poor households resort to flashlights or kerosene based lamps. There is growing pressure from consumers, including their representative bodies like Consumers Federation of Kenya and Kenya Association of Manufacturers, supported by a new law on consumer protection to improve the quality of power supply. This pressure will help sustain the Project activities, including planned investments by KPLC in automation and improved customer care, as well as the regulatory measures supported by the Project to monitor and enforce service delivery.

95. **Project beneficiaries will be spread across the country helping to sustain broad-based support for Project activities.** The investments to improve delivery of reliable electricity service will be focused in economic growth poles around the country thus benefiting businesses in all regions. The Component C1, for peri-urban electrification, will be implemented in approximately 40 peri-urban areas in seven geographical regions (c.f. Data Sheet). The areas will be firmed up during design of the low voltage networks to serve clusters within the areas. Component C2 (off-grid electrification) will be implemented in approximately 6 villages in a number of regions. Care has been taken that all regions of the country are represented in the selection of areas to ensure broad-based support of civil society for Project activities.

96. **The robustness of the regulatory regime and in particular the predictability of the tariff setting regime to set electricity prices at cost recovery levels is essential to the sustainability of Project activities.** The three-year tariff review regime has been in place since 2008. The principles of full cost recovery (i.e., fuel and foreign exchange costs are passed through to customers) have been sustained even during eras of high fuel prices and changes in government. The retail tariff setting regime whereby KPLC makes application to the regulator to fix tariffs based on KPLC's committed PPAs and capital expenditure is essential to KPLC's financial viability. The sustainability and the future development of the energy sector are anchored in the stability, transparency and objectivity of the regulation, the regulator and the tariff regime. The reliability and objectivity of the tariff review process encountered some political interference in 2012/13 during a general election period (the 2011 tariff adjustment was postponed and only effected in November of 2013). However, the necessity to maintain the tariff

review process as defined in the regulatory regime has not been ever challenged to the extent that the process would be dispensed with and this gives confidence that the commitment to cost recovery tariffs will be sustained.

VI. KEY RISKS AND MITIGATION MEASURES

A. Overall Risk Rating Explanation

97. This Project has been assessed to have an overall implementation risk of *Substantial* mainly due to governance risks in KPLC and challenges in KPLC's and REA's implementation capacity which could impair their ability to implement, deliver and monitor the Project effectively and ensure sustainability of the Project's initiatives.

98. The key risks that might affect the Project and mitigation measures are discussed below:

99. **Corporate Governance:** Weak corporate governance and inadequate senior management capacity in KPLC and REA may delay Project implementation or may derail the objective of KPLC financial strengthening. The weakness in governance also opens opportunities for the risk of corruption and fraud in procurement. However a number of considerations mitigate these risks. In the case of KPLC they include the following. KPLC has sound corporate governance instruments and structures that include an internal audit function and Board audit committee. Its listing at the Nairobi Securities Exchange obliges it to comply with regulations on higher accountability to shareholders and public reporting and disclosures. The government plans to strengthen the governance capacity and effectiveness of KPLC's Board by ensuring that the Board includes at least three two experienced independent directors nominated by the leading private institutional shareholders in the Company. Furthermore, the organizational and business restructuring exercise being implemented by KPLC is expected to strengthen management capacity and improve efficiency. KPLC has structures and programs to manage corruption and fraud risks. These include a strong internal audit function that carries out regular audits to assess the adequacy of internal systems and controls and, complimented by the Company's security function, investigates cases of fraud, corruption and theft. KPLC also has an Ethics and Risks function that manages implementation of the ethics and integrity program that targets to eliminate corruption and other unethical conduct. KPLC has a stated zero tolerance policy on corruption and carries out annual surveys to determine the corruption index including identification of processes most prone to corruption. Both the internal audit function and the Risks and Ethics function report to the Board through the Audit Committee. The capacity of the dedicated PIUs in KPLC and REA will be strengthened and will include dedicated specialists in procurement and financial management whose terms of reference and qualifications will be reviewed by the Bank. The Bank will also continue its regular supervision of the implementing entities' procurement and financial management practices

100. **Institutional Capacity for Implementation and Sustainability:** KPLC is implementing large capital investment in distribution system expansion and upgrade, which is financed by several donors and commercial banks and by own resources. As a result, the capacity of the KPLC Existing PIU which is handling these projects is stretched and may not be able to adequately manage the Project. REA presently does not have capacity for implementation of Component C2. **Mitigation:** The Existing PIU of KPLC will be strengthened to undertake

activities under Components A and B while a dedicated Electrification Program PIU will be established with dedicated teams for donor electrification financed electrification projects. The capacity of REA will be strengthened through a Transaction Adviser, who will provide REA with the expertise for implementation of Component C2 as well as training and capacity building for staff in REA's PIU.

101. **Anti-Corruption Guidelines:** 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.

VII. APPRAISAL SUMMARY

102. *Project development impact.* The primary beneficiaries of the Project will be current and new electricity customers in the areas covered by the Project who will gain access to electricity and/or enjoy more reliable electricity services. Lack of electricity access at household level exacerbates poverty conditions and is a major cause of exclusion and inequality within the country. Without electricity, children cannot study at night; home-based businesses cannot grow; nearly 70 percent of Kenya's population is forced to rely on polluting and expensive energy alternatives for meeting their basic household needs. The uneven coverage of electricity services also exacerbates disparities in terms of socio-economic status and growth opportunities among the country's regions and between urban and rural areas. Investments under Component C will raise access to electricity in high density areas close to the existing electricity networks operated by KPLC as well as by supporting the spread of off- and mini-grid approaches in remote rural areas. The project will directly increase country-wide electrification by about 1.2 percent. Investments under Component A promise to significantly improve service reliability levels and reduce un-served demand to the benefit of existing customers. In addition, the revenue protection program envisaged under Component B will reduce energy consumption by medium and large customers since they will adapt their demand to their ability to pay when they receive bills reflecting actual consumption. This will in turn reduce KPLC's expenditures related to electricity purchases that were part of the commercial losses (unmetered).

103. *Public versus private investment.* The electrification program is best financed through public investment. Expanding electricity access is recognized as a key social goal and a main element in attaining the Vision 2030. As the electrification program has progressed, the barrier of a high connection fee that prevents prospective customers from connecting to electricity services has become more evident. The connection fee is prohibitive to most of the unconnected population. Nonetheless, the current fee is insufficient to cover the connection costs borne by KPLC, which have risen exponentially in the past years imposing an unsustainable burden on the company's finances. Under the electrification component of the project, funds will be on-granted to KPLC and REA and the connection charge will be set at affordable level.

104. *Bank Value-Added.* As described above Bank value added through the project components and Guarantee is through mainstreaming a sustainable national electrification strategy; support for utility efficiency improvement and in providing a comprehensive financial solution to the financing and investments needs of KPLC.

A. Economic and Financial Analysis

Economic Analysis

105. A traditional cost-benefit analysis has been carried out to assess the economic viability of the Project. A detailed economic analysis is presented in Annex 7.

106. **Economic Internal Rate of Return (EIRR) and Net Present value (NPV) of investments. The NPV and the economic rate of return (ERR) for the Project as a whole are satisfactory at US\$181.6 million and 19.6 percent respectively.** The disaggregation of results by Project components shows that returns are very high for Components A and B. In particular, the revenue protection program envisaged under Component B, with an ERR above 29 percent, is the most beneficial. Sensitivity analysis described in Annex 7 shows that the Project remains robust in the face of unfavorable conditions that may affect project implementation as well as changes in the main assumptions used by the analysis.

Financial Analysis (Project)

107. **The Financial Internal Rate of Return (FIRR) and Financial NPV of Project investments in the base case scenario are satisfactory at 51.9 percent and US\$408 million respectively.** High financial return of the Project is explained by the very high NPV of revenue protection activities (under Component B), combined with the financing of access expansion (Component C), which will be passed on as grant to KPLC, and is expected to have a small positive NPV for KPLC (incremental revenue from new customers slightly in excess of incremental operating costs).

108. The overall FIRR and NPV of the Project activities would remain robust under all sensitivity scenarios considered. The least favorable is the scenario under which revenue protection activities manage to reduce distribution losses by only one percent instead of the three percent assumed in the base case scenario. In this case, the overall project FIRR would be 22.2 percent and the NPV US\$95 million.

Financial Analysis of KPLC

109. This financial analysis was performed on the basis of KPLC's audited financial statements for the fiscal years ended on June 30 of 2011, 2012, 2013 and 2014. Financial projections were prepared by a consultant in its capacity as financial advisor to KPLC.

110. KPLC is majority owned and controlled by the GoK through a 50.1 percent direct equity interest. The balance of the Company's shares is owned by private parties, either directly or through nominees. KPLC's shares are listed at the Nairobi Securities Exchange. Private investors do not have representation in the Board.

111. The main business activity of the Company is the distribution and retail sale of electricity to consumers in Kenya. KPLC operates as a commercial company aiming for full cost recovery through a regulated tariff structure. The company does not receive any subsidies and their revenues are fully dependent on the regulated tariff and electricity sales/market demand. Costs

associated with fuel and foreign exchange are passed through and recovered from customers. The following table summarizes KPLC's financial highlights for the period from July 1, 2010 to June 30, 2014.

Financial & Operational Highlights							
<i>KSh million - unless otherwise indicated</i>	2010/11	2011/12	YoY % var	2012/13	YoY % var	2013/14	YoY % var
Number of Customers ('000)	1,753	2,039	16%	2,331	14%	2,728	17%
Electricity Sales	42,486	45,008	6%	47,916	6%	62,597	31%
Units Purchased (GWh)	6,895	7,197	4%	7,562	5%	8,254	9%
Power Purchase Cost (ex-fuel)	20,214	21,080	4%	24,761	17%	30,659	24%
Fuel Costs	26,151	42,789	64%	32,297	-25%	38,973	21%
F/x cost	3,425	6,094	78%	5,120	-16%	3,008	-41%
EBITDA	10,517	14,286	36%	14,655	3%	20,892	43%
Finance Cost	415	1,216	193%	2,495	105%	4,009	61%
Profit	4,220	4,617	9%	3,446	-25%	6,456	87%
Total Assets	121,171	134,132	11%	184,213	37%	220,109	19%
Total Debt (incl. overdrafts)	39,514	29,452		57,837		73,676	
Total Liabilities	89,085	78,257	-12%	120,974	55%	147,222	22%
CAPEX	24,714	25,950	5%	42,631	64%	26,651	-37%

112. KPLC's customer base increased by over 55 percent during the period 2010-2014 as a result of the substantial investments in new connections. Notably, electricity sales and GWh purchased increased by 47 and 20 percent, respectively, during the same period. The co-relationship of these figures reflects the high share of domestic and small commercial customers in KPLC's total customer base (greater than 90 percent), and the fact that they contribute less than 60 percent of revenues. Fuel costs display significant year on year variation which is mostly attributable to annual changes in fuel mix resulting from variable hydrology. In years with poor hydrology such as 2011/12 and 2013/14 power generation relied heavily on thermal plants, consequently the fuel cost escalated substantially. The meaningful increase in Electricity Sales and EBITDA between 2012/12 and 2013/14 is the result of the combined effect of the retail tariff adjustment effective from December 2013 and the increase in volumes sold during the year.

113. Finance Costs (Interest on Loans) multiplied during the period, increasing from the equivalent of US\$5 million in 2010/11 to US\$45 million in 2013/14: a nearly nine-fold increase in four fiscal years. This change reflects the substantial increase in KPLC's debt during the same period: from the equivalent of US\$288 million in 2010/11 to US\$828 million in 2013/14. The incremental debt was applied to finance approximately 75 percent of a large Capital Investment program associated mostly with new connections and to a lesser extent with service improvement investments such as expansion and upgrading of the distribution network. These investments required expenditures equivalent to US\$291 million in 2010/11, US\$305 million in 2011/12, US\$500 million in 2012/13 and US\$300 million in 2013/14. The investments in new connections placed a particularly heavy burden on KPLC as connection fees paid by new customers were insufficient to pay for connection costs forcing KPLC into a situation where the Company subsidized 70 percent of connection costs equivalent to US\$700,000 per customer.

114. Due to the unplanned and accelerated pace of the investments related to new connections, KPLC was unable to secure long-term concessional funding and instead had to resort to medium and short term Commercial Loans and Bank Overdrafts creating a situation of Asset-to-Liability mismatch. The Company's debt profile changed with increased interest rates and shorter tenors which reflect prevailing commercial market conditions as well as the progressively weaker financial condition of the company. Currently, KPLC's annual Debt Service stands at approximately US\$130 million, which constitutes more than 50 percent of the Company's Cash from Operations. Debt maturities for the next 5 years amount to an aggregate of US\$494 million, of which over US\$400 million relate to short and medium-term commercial debt.

115. KPLC's indebtedness level, although high, is still acceptable: Net Leverage of 50 percent and Debt to EBITDA of 3 times. However, KPLC's ability to generate cash to repay their debt as due while implementing service improvement investments is a matter of concern. Due to the development nature of their investments these do not produce an immediate and proportional revenue increase, and instead demand prolonged amortization periods. Furthermore, KPLC's cash reserves were fully depleted in order to fund the accelerated investment program. As of June 2014 KPLC had returned to positive cash levels, however the Company is still facing difficulties to meet its ongoing payment obligations on a timely basis and continues supporting itself with Bank Overdrafts (US\$40 million as June 2014) to make up for the cash gaps. In addition, the Company requires funds to implement essential investments associated with improvement in the quality and the reliability of the service as well as critical system upgrades and expansions. In the past, these investments have required approximately US\$200 million per year.

Financial Ratios

116. The increase in KPLC's total debt, the use of short-term debt to finance long-term investments, the size of the investment program vis-à-vis the Company's cash generation capacity and the subsidization of connections, has resulted in a significant erosion of KPLC's liquidity position and a negative evolution of the Company's financial ratios during the past four fiscal years as illustrated in the table below.

Ratios	2010/11	2011/12	2012/13	2013/14
Debt/EBITDA (x)	1.55	1.92	3.70	3.08
EBITDA/Interest (x)	25.34	11.75	5.87	5.21
CFO/Debt	60%	45%	28%	26%
FOCF/Debt	-41%	-43%	-46%	-10%
Net Debt/Net Debt+Equity	25%	38%	52%	50%

117. KPLC is currently in compliance with the Current Ratio and in breach of the Debt Service Coverage Ratio and the Self Financing Ratios under the Project Agreement for the Kenya Electricity Expansion Project (KEEP).

IDA Ratios	Requirement	2013/14
DSCR	>1.2x	0.55
Current Ratio	>1.0x	1.03
Self Financing Ratio	>25%	-25%

Conclusion

118. KPLC's financial structure has changed significantly in the past four years. The Company's balance sheet has grown on the back of substantial investments (approximately US\$1.4 billion), however the fast investment pace does not reconcile with KPLC's moderate revenue growth. The funding structure whereby long-term assets were financed with short and medium-term loans and development investments were financed with commercial funds resulted in the erosion of KPLC's financial position and placed its financial integrity in jeopardy. This investment and financing strategy is not suitable for the Company and is not sustainable going forward.

119. KPLC is in urgent need of a comprehensive overhaul of its financing structure and strategy. A refinancing/restructuring of KPLC's commercial debt is essential in order to extend and reschedule maturities and to reduce interest rates to match the company's debt servicing capacity. Going forward, KPLC's incremental investments should be subject to strict planning and decision making focused on service needs and affordability independent from Government policies, and without threatening the company's financial sustainability. Furthermore, investments associated with access to electricity (i.e., new connections) which placed a heavy burden on KPLC in the past and created the current liquidity constraints, should no longer be financed with KPLC's resources but instead with separate funds raised by the GoK, while KPLC should only be in charge of technical implementation.

120. KPLC's financial advisor is currently performing the assessment of the Company's financing needs and developing the respective financing and action plan. This work is expected to be completed during appraisal. The team will review this work and incorporate the financial projections and the action plan as soon as they become available.

B. Technical Analysis

121. The proposed Project includes works and equipment related to: (a) Improvement in Service Delivery and Reliability, (b) Revenue Protection Program, (c) Electrification Program, and (d) Technical Assistance. The Project presents no unusual construction and operational challenges; they are well known and proven in Kenya. However, this Project introduces new implementation and procurement arrangements to maximize the resources available and efficiently implement the Project. The proposed arrangements are based on the lessons learned from Bank financed projects implemented by KPLC.

122. Component A: will finance investments for equipment and works related to (i) updating and automatizing existing substations, incorporating automation system in the distribution network to integrate to the SCADA, (ii) automatizing protection systems with the installation of line isolators /disconnections to be able to operate them remotely, and (iii) purchase of equipment and training for a live-line maintenance. KPLC has comprehensive experience in the use of the equipment and application of the technologies involved in construction and operation of automation system for distribution networks, as well as in the use of SCADA systems for supervision and control. The preliminary design of the projects to be included in this component was carried out by KPLC.

123. Component B: will finance the advanced metering technologies. KPLC is familiar with the installation and operation of such technology since KPLC has similar equipment installed in some targeted customers. For Component A and B, KPLC will be further supported by international consultants to assist with preparation of technical design and implementation.

124. Component C: will finance goods and works related to the extension of medium and low voltage lines, including the connection of new customers. KPLC has extensive experience in the technical and operational aspects related to the construction and operation of electricity distribution infrastructure. Under this component, KPLC will also be supported by a specialized engineering firm responsible for preparing technical specifications, bill of quantities, construction drawings and bid documentation. REA will be supported through technical assistance and by a Transaction Adviser to implement Component C2.

125. Component D: does not represent any major technological challenge for KPLC and MoEP. A dedicated unit with KPLC staff will carry out the implementation of the Project in order to increase ownership and accountability of the Project. Additionally, the unit will be supported by full time external expertise to be paired with KPLC staff to ensure quality and timely delivery in critical activities such as procurement and technical design. This will also serve as a capacity building while implementing the Project.

C. Financial Management

126. The Bank's financial management (FM) team conducted a financial management assessment of MoEP, REA and KPLC, the entities implementing the investment components of the Project. MoEP, KPLC and REA are currently implementing components of the ongoing KEEP and MoEP and KPLC have also implemented components of the Energy Sector Recovery Project (ESRP) that closed on September 30, 2013. MoEP is also implementing the Kenya Petroleum Technical Assistance Project (KEPTAP). There are no overdue audit reports. However, MoEP's ESRP audit report for fiscal year ending June 30, 2013 was qualified on differences between the General Ledger and the Statement of receipts and payments. MoEP responded to the Auditor General queries and the Auditor General cleared the issues. The financial management residual risk rating for all the entities is assessed as Moderate.

127. **FM Arrangements:** The FM arrangements for this Project are included in Annex 3. The FM action plan outlines the mitigating measures which, if implemented, would strengthen the financial management arrangements. These include: training of accountants and internal auditors and reconstitution of the REA Audit Committee. The proposed FM arrangements, as discussed in Annex 3, will meet the minimum requirements for financial management under OP/BP 10.00.

128. The guarantee component of the Project does not involve any financial management due diligence on the part of IDA since the guarantee will be used to restructure KPLC's existing debt.

D. Procurement

129. The guarantee component of the Project does not involve any procurement review due diligence on the part of IDA since the guarantee will be used to restructure KPLC's debt. The guarantee will not finance new investments.

130. Procurement for the proposed Project has been carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" published by the Bank in January 2011 (revised July 2014) and the World Bank's "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers," published by the Bank in January 2011 (revised July 2014). Further, 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 shall apply to the Project. The procurement activities for the proposed Project will be coordinated by the MoEP and implemented by MoEP, KPLC (PIU) and REA. MoEP is currently coordinating two Bank Funded Projects (KEEP and KEPTA) apart from the Eastern Electricity. The head of Supply Chain Management has been assigned to oversee the procurement activities of KEMP using his organization and staff. KPLC will establish one PIU for the Electrification Program and hire one procurement specialist. REA will use the current PIU which is implementing KEEP but will need to hire one additional procurement staff to facilitate the procurement activities of KEMP.

131. The procurement risk associated with the project is Substantial. Risk mitigation measures include: (i) hiring / assigning one procurement each for KPLC and REA who are proficient in Bank funded procurement activities; (ii) training new and current staff in basic Bank procurement procedures; (iii) ensuring a clear linkage between Project objectives and the procurement plan through appropriate support to staff, training and tools in preparing and monitoring of the procurement plan; (iv) the procurement planning process taking into account the steps and associated timeframe for GoK's own process of approval; and (v) establishment of a contract monitoring system.

E. Social (including Safeguards)

132. By connecting people to electricity in peri-urban and rural areas the Project will promote economic growth and equity. The electrification program component will provide electricity to low-income groups of people that previously would not have been connected. Improved reliability of electricity service will lower costs for businesses across the country. With increased access to electricity and improved reliability, the Project will improve security through lighting; provide opportunities for the development of small businesses; thereby improving overall quality of life.

133. All infrastructure investments in Component A (Improvement in Service Delivery and Reliability) and Component B (Revenue Protection) will be at existing electricity network infrastructure (i.e. at existing KPLC substations and lines). There will be no land acquisition and no involuntary resettlement for these components.

134. The sub-projects described under Component C1 (peri-urban electrification program) will be carried out in approximately 40 peri-urban areas where the existing electricity network will be extended. The medium voltage (MV) and low voltage (LV) lines that will be constructed will be on existing rights of way. The MV and LV lines do not require land acquisition and/or involuntary resettlement of households as would HV transmission lines.

135. The project will trigger OP 4.12 (Involuntary Resettlement) in the case of sub-component C2 as this component will require land acquisition for mini-grid generation facilities. Since not all sub-project sites in Component C2 can be identified in advance, a Resettlement Policy Framework (RPF) has been prepared that will be disclosed prior to project appraisal. Based on the RPF guidance, each subproject will be screened, and if RAPs are found to be necessary, these will be prepared, cleared, disclosed and implemented prior to the commencement of civil works, in accordance with World Bank OP 4.12. REA has a good track record with regard to implementation of the social safeguards including under the KEEP project.

136. The project will trigger Operational Policy OP 4.10 (Indigenous Peoples) for sub-component C2. An initial screening indicates that there may be groups that meet the O.P. 4.10 criteria in Western Kenya (Sengwer, Ogiek) and the Coast (Boni, Watta). The ESMF and RPF for Component C2 will include: (i) screening to determine presence of Vulnerable and Marginalized Groups (VMG, Indigenous Peoples per OP 4.10 criteria) in the project areas and, if present, (ii) measures to ensure they benefit from the project activities. In such cases, and when the Bank's screening indicates that VMGs are likely to be present in, or have collective attachment to, the project area, the borrower will prepare a Vulnerable and Marginalised Groups Framework (VMGF). A VMGF³ is developed when a proposed project design is not yet finalized.

137. The sub-projects in sub-component C1 will be located in peri-urban areas, and so groups meeting criteria of indigenous groups will not be affected.

F. Environment (including Safeguards)

138. The Project will have positive environmental impacts. The electrification program in the project that will connect people in mainly low-income households will displace kerosene lighting that these households currently use. Greater reliability of electricity service will displace small diesel generators used by businesses.

139. **The Project is proposed as category B Partial Assessment.** There are no significant and/or irreversible adverse environmental issues anticipated from the investment sub-components to be financed under the Project. The bulk of the works will be in existing right of ways. Civil works will lead to relatively minor air and water pollution during the construction phases and, once the works are completed, limited loss of non-critical animal and plant habitats. Sub-component C2 (off-grid electrification using renewable energy) will have low to moderate negative impacts on the environment, depending on their locations. These will be assessed through a screening process and appropriate mitigation measures will be proposed.

³ The VMGF is the equivalent of an Indigenous Peoples Plan.

140. Safeguard OP 4.01, Environmental Assessment; OP 4.04, Natural Habitats; OP 4.11, Physical Cultural Resources; OP 4.10, Indigenous People, and OP 4.12, Involuntary Resettlement, will be triggered.

141. The localized, social impacts of the various sub-projects that will make up these components will be determined by the screening process for environmental and social impacts, which are included in the draft ESMFs and RPFs that have been prepared for Components C1 and C2 that will be disclosed prior to appraisal. They will utilize the following evaluative tools:

- The Environmental and Social Screening Form, which will help identify potential adverse environmental and social impacts.
- The Environmental and Social Checklist, which will outline simple environmental mitigation measures (a simplified EMP) for sub-projects not requiring a full ESIA report.
- A summary of the Bank's safeguard policies to ensure they are taken into account during the sub-project planning stage.

142. If the detailed screening determines that any land acquisition requires involuntary resettlement, KPLC will prepare a RAP, defining the persons affected, the assets involved and the mitigation measures necessary to comply with OP 4.12.

143. Given the peri-urban and rural locations of the majority of the sub-projects, impact on natural habitats is expected to be minimal. Although there will be a need for replacement of trees that will be removed along the right of way, no natural forest will be affected. OP 4.11 is triggered as a precaution, although the sub-projects are not expected to traverse areas of cultural or historical importance. Chance find procedures will be included in contracts and in the environmental documents.

144. Consultations with local stakeholders (including Kenya Association of Residents Associations) and agencies including Kenya Wildlife Service, Kenya Urban Roads Authority, Kenya Rural Roads Authority and, if necessary, Kenya Forestry Service, Water Services Boards and the Water Resources Management Authority, will be undertaken during the preparation of the environmental documents. Minutes of stakeholder meetings, including measures proposed to address grievances, should be included as an Annex to the EIAs/EMPs.

145. The performance of the environmental department in KPLC (Safety Health and Environment department) in preparing environmental documentation and RAPs, and monitoring EMPs and RAPs for World Bank funded projects has been reviewed and capacity enhancement measures recommended. These measures will be implemented prior to appraisal.

146. The environmental and social performance of REA will be closely monitored. EIAs/EMPs submitted by REA will require site-specific information. Scheduling of compensation payments will be closely monitored to ensure that, in the majority of cases, compensation is paid prior to the start of civil works.

Disclosure

Project Component	Policy Instrument	Date Disclosed
A1. Upgrade of the Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS). A2. Distribution system enhanced flexibility.	Environmental and Social Management Plan (ESMP)	TBC
C1. Peri-urban electrification	Environmental and Social Management Framework (ESMF)	TBC
C2: Off-grid electrification	Environmental and Social Management Framework (ESMF) Resettlement Policy Framework (RPF) Vulnerable and Marginalized Framework (VMGF)	TBC

147. The ESMF for the peri-urban investment works, which KPLC will manage, was disclosed to the public on [enter date]. Consultations were held on [enter date]. The ESMF is also available at the offices of Kenya Power in Nairobi, and it has been posted on the KPLC website and was disclosed through the Bank's InfoShop on [enter date].

148. The ESMF for the off-grid investment works, which REA will manage, was disclosed to the public on [enter date]. Consultations were held on [enter date]. The ESMF is also available at the offices of REA in Nairobi, and it has been posted on the REA website and was disclosed through the Bank's InfoShop on [enter date].

G. Other Safeguards Policies Triggered (if required)

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

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.

Annex 1: Results Framework and Monitoring

Country: Kenya

Project Name: Kenya Electricity Modernization Project (P120014)

Results Framework

Project Development Objectives

PDO Statement

The proposed project development objectives (PDOs) are: (a) to increase access to electricity; (b) to improve reliability of electricity service; and (c) to strengthen KPLC's financial situation.

These results are at

Project Development Objective Indicators

PDO Level Results Indicators	Core	Unit of Measure	Baseline (FY2013/14)	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1 (FY2014/15)	YR 2 (FY2015/16)	YR 3 (FY2016/17)	YR 4 (FY2017/18)	YR 5 (FY2018/19)	YR 6 (FY2019/20)				
Indicator One: People provided with access to electricity by household connection (Number) Core [50]% is female	☒	Number	0		0	123,750	371,250	618,750	618,750	Annual	KPLC	KPLC Customer database	The number of people that have received an electricity connection under the project
People provided with access to electricity under the project by household		Number	0	0	0	0	0	9,000	13,500	Annual	KPLC	KPLC Customer database	People connected by KPLC through mini-grids constructed by REA and

connections – Off- grid/mini-grid only (renewable sources) (Cumulative)													private sector
Indicator Two: Total number of new non-residential connections (Cumulative)	<input type="checkbox"/>	Number	0	0	0	250	750	1,250	1,250	Annual	KPLC	KPLC Customer Database	Total number of new customers connected by KPLC.
Indicator Three: Average outage duration for customers served (hours)	<input type="checkbox"/>	System Average Interruption Duration Index – SAIDI	12	12	8	8	7	6	6	Monthly	KPLC/ERC utility database (IMS)	KPLC	Average outage duration in hours for customers served by KPLC.
Indicator Four: KPLC Commercial losses		Percentage	6.7%	6.7%	6.7%	5.7%	4.7%	3.7%	3.7%	Annually	KPLC/ERC utility data base (IMS)	KPLC	Commercial losses reduced from 6.7% to 3.7%.
Indicator Five: KPLC's Current ratio	<input type="checkbox"/>	Ratio	1	>1	>1	>1	>1	>1	>1	Annually	KPLC	KPLC	
Indicator Six: KPLC's Financial self-sufficiency ratio (core) ⁴		Ratio								Annually	KPLC	KPLC	

Intermediate Results Indicators

PDO Level Results Indicators	Core	Unit of Measure	Baseline (FY2013/14)	Cumulative Target Values						Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1 (FY2014/15)	YR 2 (FY2015/16)	YR 3 (FY2016/17)	YR 4 (FY2017/18)	YR 5 (FY2018/19)	YR 6 (FY2019/20)				

⁴ Values will be determined based on the analysis of the KPLC Financial Adviser PWC expected to be available in January 2015.

Component A: Improvement in Service Delivery and Reliability													
Automation of the Nairobi distribution network in the project areas completed		Yes/No	No	No	No	Yes	Yes	Yes	Yes	Annually	KPLC utility database	KPLC	System installed and in operation
Upgrade of the SCADA/EMS covering the project area completed		Yes/No	No	No	No	Yes	Yes	Yes	Yes	Annually	KPLC utility database	KPLC	System installed and in operation.
Component B: Revenue Protection Program													
Establishment of a modern meter control center with satellites.		Yes/No	No	No	No	Yes	Yes	Yes	Yes	Annually	KPLC utility database	KPLC	System installed and in operation.
Installation of AMI meters. (Cumulative)		Number	4,300	4,300	4,300	24,300	34,300	44,300	44,300	Annually	KPLC utility database	KPLC	Meters installed.
Component C: Electrification Program													
Distribution lines constructed or rehabilitated under the project (Cumulative)	<input checked="" type="checkbox"/>	km	0	0	0	1,000	1,500	2,000	3,500	Annually	KPLC utility database	KPLC	Distribution lines constructed by KPLC
Distribution transformers installed (Cumulative)		Number	0	0	0	1,000	1,500	2,000	3,500	Annually	KPLC utility database	KPLC	Transformers installed by KPLC
Mini grids constructed with public-private participation (Cumulative)		Number	0	0	0	0	0	6	9	Annually	REA	REA	Mini-Grid constructed by REA and the Private Sector
Annual RE electricity output from mini-grids constructed		MWh/yr	0	0	0	0	0	828	1,242	Annually	REA	REA	Annual RE electricity generated from mini-grids

with public-private participation													
Component D: Technical Assistance and Capacity Building													
National Electrification strategy adopted.		Yes/No	No	No	Yes	-	-	-	-		MoEP report	MoEP	
Implementation by ERC of a regime on service quality.		Yes/No	No	No	Yes	-	-	-	-		ERC annual report	ERC	
IDA Guarantee													
Private capital mobilized.		USD million	0	0	400	-	-	-	-		KPLC reports	KPLC	At least \$400 million commercial debt will be raised by KPLC using the IDA Guarantee.
Reduction in interest rate of commercial loans		Percentage	>7.5%	<7.5%	<6%	<6%	<6%	<6%	<6%	Annually	Annual Financial Statement	KPLC	TBC by Financial Adviser January 2015
Debt to EBITDA		Number	3.8	TBC	TBC	TBC	TBC	TBC	TBC	Annually	Annual Financial Statement	KPLC	Ratio Times) TBC by Financial Adviser January 2015
EBITDA to interest		Number	5.21	TBC	TBC	TBC	TBC	TBC	TBC	Annually	Annual Financial Statement	KPLC	Ratio Times) TBC by Financial Adviser January 2015
Cash from operation to debt		Percentage	26%	TBC	TBC	TBC	TBC	TBC	TBC	Annually	Annual Financial Statement	KPLC	TBC by Financial Adviser January 2015
Free operational cash flow to debt		Percentage	-10%	TBC	TBC	TBC	TBC	TBC	TBC	Annually	Annual Financial Statement	KPLC	TBC by Financial Adviser January 2015

Annex 2: Detailed Project Description
KENYA: Electricity Modernization Project

PROJECT DESCRIPTION

1. The financing structure for the Project will include three financing instruments: (i) an IDA Credit in an amount of US\$250 million, (ii) SREP financing of US\$7.5 million, and (iii) an IDA Guarantee in an amount of up to US\$200 million.

2. The IDA credit has four components: (i) improvements in service delivery and reliability; (ii) implementation of a revenue protection program (RPP) for sustainable loss reduction in electricity supply; (iii) connect households based on a sustainable approach to electrification that incorporates proven international practices from countries that have rapidly increased access to electricity; (iv) institutional development, capacity building and Project implementation support. The IDA Guarantee will mobilize commercial financing for KPLC to restructure a portion of its commercial debt obligations.

IDA Credit

Component A: Improvements in service delivery and reliability (estimated cost US\$50 million).

3. KPLC recognizes the service quality challenges in the existing system and a five-year investment plan has been prepared aiming at improving the network reliability. KPLC commissioned a number of planning studies and network diagnosis studies to identify the key actions and investments to address the service quality challenges. The design of this component is based on the Distribution Master Plan study commissioned by KPLC.

4. The objective of this component is to support the modernization and automation of the medium and low voltage distribution network to increase reliability and improve service delivery. Distribution automation is beneficial in day-to-day operation and maintenance of the distribution system. Through remote and automated controls, major benefits from distribution system can include proactive problem detection and faster response to system emergencies (higher reliability), meeting required quality of service and achieving faster electricity supply restoration time (customer satisfaction), strategic decision making during real time operation with reductions in equipment damage (cost reductions and increased revenues). This component is combined with key regulation technical assistance financed under component D to maximize the benefits of automation.

5. This component comprises the following specific investments:

Sub-component A1. Upgrade of the Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS) (estimated cost US\$10 million).

6. This sub-component will provide financing for upgrading the SCADA/EMS by incorporating key existing substations to the system and installing additional switchgear in

medium voltage distribution networks to enhance flexibility in operations and allow a more efficient management. KPLC operates a total of 161 transmission and distribution substations, with more than 100 of them currently being monitored and managed with the current SCADA system. The Project will provide funds for inclusion of 51 additional substations thus bringing the total coverage to about 90 percent of the network. The scope will include provision of remote terminal units (RTUs) and associated communication and substation adaptation works.

Sub-component A2. Distribution System Enhanced Flexibility (estimated cost US\$20 million).

7. KPLC is also implementing various actions to automate and enhance the operational flexibility of the distribution network (in particular at the medium voltage level), in an effort to reduce duration of system interruptions. An initial phase is currently being implemented, focusing on the Mombasa network and only a small part of the Nairobi network (just 200 out of 1,200 line isolators/disconnectors having been changed with load breaker switches with remote operation features). The component aims at achieving 90 percent automation of the networks in Nairobi by installing a total of 1,000 load break switches in assets operating at 11, 50 and 66 kV, with associated RTU`s and communications features enabling remote control and operations.

Sub-component A3. Enhanced maintenance practices to improve quality in electricity supply (estimated cost US\$20 million).

8. In order to further reduce interruptions in electricity supply, KPLC will implement live-line maintenance (LLM). This requires specific equipment, tools and intensive training of staff in charge of the reestablishing the electricity service. The component will finance the full implementation of the approach as per the best practices available in the market, comprising all supplies and services (in particular training) needed for its sustainable application in conditions of maximum safety.

Component B: Revenue protection program (RPP) (estimated cost US\$40 million)

9. This component will finance implementation by KPLC of a revenue protection program(RPP), based on the application of advanced metering infrastructure (AMI), and the adoption of organizational arrangements (creation of one or more metering control centers (MCCs)) aimed to optimize the systematic use of the information provided by the metering system and undertake consistent corrective field action as needed. This component is combined with key regulation technical assistance financed under component D to address the commercial aspects of KPLC and the monitoring and enforcement role of the regulator.

10. The main objective of the RPP is to protect KPLC’s revenues from sales to large and medium customers, ensuring that all users in that “high value” segment are systematically billed according to their accurately metered full consumption.

11. The “ABC or Pareto effect” in the composition of the market served by KPLC is impressive in quantitative terms: less than two percent of the total number of customers (4,300 supplied in medium and high voltage and 40,000 in low voltage with current monthly consumption above 1,000 kWh) represent 72 percent (56 and 16 percent, respectively) of total kWh currently billed. Sustainable protection of the revenues generated by consumers in that

“high value” segment becomes a key task for KPLC’s operational and financial sustainability. This starts by ensuring permanent billing of all the large customers according to their actual fully metered consumption (“0 non-technical losses”).

12. Relevant experiences in several developing countries show that the sustainable recovery and protection of the revenues generated by the large customers can be achieved by managing their consumption (metering, reading and billing) through “advanced metering infrastructure (AMI)”. This refers to the installation at each customer’s premises of consumption metering systems including communication devices that make possible to periodically transmit their records to remote points where they are systematically analyzed, processed and monitored by staff of organizational units (Metering Control Centers (MCCs) created for that specific purpose, with the support of software packages (“Meter Data Management (MDM)”) designed to monitor, timely detect and correct any eventual irregular condition in electricity use.

13. At present KPLC has incorporated one-way communication (also known as automated meter reading or AMR) to remotely record consumption of most of its 4,300 large customers supplied in high and medium voltage. However, the company has not implemented the MCCs as permanent organizational units responsible for revenue protection. Besides, the MDM currently used needs to be replaced by a new software package specifically designed to enable systematic effective monitoring of consumption for the purpose of revenue protection. Thus, the RPP to be developed by KPLC should include: (i) creation of the MCCs and investments in infrastructure needed to operate them; (ii) incorporation of a state-of-the-art MDM designed for the specific purpose of revenue protection and training of staff of the IMCs in its proper use; (iii) supply and installation of AMI for the 4,300 high and medium voltage users and at least 40,000 large low voltage customers (small and medium enterprises with monthly consumption in the 500-7,000 kWh interval), and incorporation of those customers to the respective MCCs.

14. The proposed RPP includes tools for the systematic gathering, storing, processing, analyzing and monitoring of information on consumption and loads in key substations and targeted customers, as well as two-way communication between the control centers and targeted customers. The adoption of this AMI technology will contribute to reduce commercial losses, increasing the accuracy of billing, avoiding loss of revenue and enabling the load profiling of electricity consumers to improve load forecasting.

15. The RPP refers to the installation at each customer’s premises of metering systems for electricity use including communication devices for remote recording and monitoring consumption data. This makes possible to periodically transmit their records to remote points, where such data are systematically analyzed, processed and monitored by staff of MCCs designed for that specific purpose, with the support of MDM. This makes possible to timely detect and correct any eventual irregular condition in electricity use.

16. Commercial losses in KPLC are about 6.7 percent of its total energy purchases. As implementation of the RPP will protect on a permanent manner 72 percent of total current KPLC’s sales and make possible to eliminate the commercial losses associated with the targeted large consumers, it is expected to have a significant impact on the sustainable reduction of the company’s total commercial losses.

Component C: Electrification Program (Estimated cost US\$160 million)

17. The government's electricity access program is implemented by KPLC and REA. KPLC operates the national electricity grid and isolated grid connected users, and supplies most electricity consumers (households and businesses). REA carries out all the works required to connect to electricity services the public facilities. Access has increased rapidly from 23 percent in July 2009 to 35 percent in June 2014.

18. Despite these impressive achievements, access of 35 percent is inconsistent with the socio-economic condition of the country, the largest economy in East Africa and one of the most developed in Sub-Saharan Africa.

19. Several factors explain that the electrification program as currently designed is not sustainable. On the one hand, efforts in recent years have been focused on extending the distribution networks to reach public facilities (mainly schools, health centers and police stations), but without taking into consideration households located close to the new grids. This is an extremely expensive and inefficient approach that results in underutilized infrastructure (several lines and power transformers in peri-urban and rural areas are operating at very low load), while households nearby them remain un-electrified. Additionally, households interested in being electrified are requested to pay a fee of Ksh. 35,000 (US\$410) for the construction of low voltage networks and individual connections needed for that purpose, which are assets owned by the national distribution company KPLC. This has become an insurmountable barrier to electrification, as requested payments are incompatible with affordability of most un-electrified households.

20. Even in mature power systems (close to universal access) in developed and high middle income emerging countries, in which tariff revenues of distribution companies include investments costs (capex) in replacement of all assets owned by those utilities, those costs are socialized among all users (at least those supplied in the same voltage level). In all successful electrification experiences worldwide all investments are financed through out-of-tariff resources, in general provided by a special-purpose and ring-fenced national electrification fund. New users are connected without any upfront payment if their individual drops are owned by the electric utility, or requested to pay for their drops (in monthly installments through two to three years) only if they own them. Some countries (Peru) have adopted hybrid approaches, with users in urban areas owning their connections and paying around US\$100 in installments for them, while predominantly low-income users in rural areas are waived from any connection fee, and the individual connections are owned by the service utility. In most of those good experiences, all electricity users contribute to the national electrification fund through permanent tariff charges (until universal access is achieved) paid together with their consumption bills.

21. There is no compensation mechanism for new connections available to KPLC, which must absorb the difference between the connection cost and the connection fee and finance it with commercial loans, thus KPLC's indebtedness level has increased substantially. In terms of implementation arrangements, economies of scale are lost in the piecemeal approach that connects each individual household once individual applications are made.

22. The Government of Kenya (GoK) acknowledges that the current approach is incompatible with its ambitious electrification targets, and has decided to design and implement a National Electrification Strategy (NES) whose objective is to achieve universal access to electricity services meeting applicable standards on quality on a sustainable manner in the shortest possible time and optimizing allocation of resources from a country's perspective. Preparation of the NES will be financed under Component D of the project. While preparing the NES, this component will support the government's objective of 70 percent household connectivity by 2018 by providing financing for the connection of new households in a more cost-effective manner based on household affordability.

Sub-component C1. Peri-urban electrification (estimated cost US\$150 million).

23. This component will finance the design, materials and construction works required to electrify all households and businesses in some high density areas (measured through the ratio of prospective users/km²) located close to existing electricity networks. In these geographic areas the project would "sweep" the areas under the installed MV lines by adding transformers, LV network (and possibly occasionally some MV). Those areas will be defined by the government, based on proposals to be submitted by KPLC including estimated investments and number of users to be connected.

24. The investments will support (i) construction of about 3,000 km MV lines; (ii) installation of 3,500 distribution transformers; (iii) construction of about 3,300 km of low voltage lines, and service cable and material for connection of new customers to grid supply.

25. It is estimated that these will connect about 125,000 new customers to grid supply based on approximately average unit cost per customer connection of US\$1,200 (Ksh. 100,000 under this program). This component will optimize technical designs and procurement arrangements to carry out all construction works (including users' connections) to connect the highest possible number of users in peri-urban areas (not far from existing networks) in the most cost-effective manner. Additionally, this sub-component will introduce new implementation arrangements to connect at once a set of new customers in a specific area aiming at avoiding the piecemeal approach that connects each individual household once individual applications are made.

26. By increasing the number of new customers, this component is expected to contribute to an increase in the financial contribution collected through the Rural Electrification Charge, which will become the main source of funds of the national electrification program. Once a critical mass of consumers (around 60-70 percent electrification rate) is achieved, the program will become self-sustaining. The use of soft financing from development partners is required to reach the critical mass as soon as possible.

Sub-component C2. Off-grid electrification (estimated cost US\$10 million in IDA Credit and SREP Grant).

27. This sub-component would finance green-field mini-grid investments in the remote areas unreachable by the national grid in the next decade or so.

28. This sub-component will support the implementation of off-grid electrification solutions in villages in rural areas where connection to the national grid is economically unviable in the short and medium term. Electrification of these villages will be through mini-grids, combining renewable resources (solar or wind) and thermal units. This sub-component will pilot Public-Private-Partnership (PPP) arrangements. The hybrid generation system will be implemented by an Independent Power Producer (IPP) with a Purchase Power Agreement (PPA) with KPLC. The IPP will invest in the fuel-based generation component and SREP and IDA funding will finance the supply and installation of the renewable generation facilities and the mini-grid distribution network. The construction of the distribution infrastructure will be implemented by REA and new users will become KPLC's customers. To ensure sustainability of provision of electricity services to users connected to the mini-grid, a contract between KPLC and a local company providing operation (network and commercial) and maintenance services will be signed. Fees charged by the services contractors will be passed through in KPLC's allowed tariff revenues set by ERC. The selection of project areas is based on the number of potential users and their demand. Communities with 150-400 prospective users and approximate demand of 250-500kVA have been identified.

29. The above sub-component is complementary to the Stand Alone Solar PV and Micro Grids IFC managed program with SREP funding. This program would address the barriers for commercial dissemination of stand-alone PV and micro-grid products and services for customers in remote areas.

Component D: Technical Assistance and Capacity Building (estimated cost US\$7.5 million)

30. This component will finance consultancy services, training actions and other activities to support, among others:

- (i) *Preparation of the National Electrification Strategy (NES)* (estimated cost US\$0.5 million). The NES' objective is to achieve universal access to electricity services meeting applicable standards on quality on a sustainable manner in the shortest possible time and optimizing allocation of resources from a country's perspective. The NES will address the following aspects: (i) determination by the government of priorities in terms of electrification; clear definition of institutional arrangements (roles of the national and local governments, electrification agencies, service utilities and other stakeholders); (ii) planning and effective execution of all investments needed to actually connect new users (in particular individual drops to connect households), including the definition of the most cost-effective technical design and construction; (iii) definition of levels of service quality; and (iv) financing schemes to ensure sustainability of the electrification programs (contributions from donors, multilateral agencies, national budget and wealthy electricity consumers through specific tariff charges; creation of a "special purpose" electrification fund to collect contributions from all sources, etc.).
- (ii) *Detail national technical specifications and standardization* (estimated cost US\$1.0 million). This assistance will support the technical and economic optimization of the

design and construction of electricity networks needed to supply new users located in currently not served areas, meeting applicable standards on service quality. This should result in the adoption of additional standardized construction templates to those currently employed by KPLC and REA to achieve low cost electrification and improve quality and reliability of supplies. This will include low-cost technical solutions depending on the characteristics of the demand.

- (iii) *Regulations for enforcing quality on electricity service delivery* (estimated cost US\$0.5 million). Assistance to ERC in the definition and implementation for processing in real time monitoring of quality of electricity supply and customer service by KPLC and enforcement of standards and related penalties. Regulators should be able to actually monitor service quality by getting direct real time access to the records of the management information systems (MIS) used by the service utilities to support operations in the electricity supply and commercial areas. In the case of KPLC, the company uses state-of-art MIS to carry out commercial functions (commercial Management System; CMS) and attend customers' complains due to outages and other incidents in electricity supply (Incidents Management System; IMS). Those MIS enable efficient and accountable execution of operations, and, at the same time, make possible to effectively record and monitor the quality of technical and commercial services provided to each individual user.

KPLC is currently carrying out actions aimed at updating and improving the reliability of the information in the databases of the MIS (customers for the CMS and electricity networks assets and their links with points of electricity supply for the IMS). Those actions include the incorporation of a Geographic Information System (GIS) and the execution of field campaigns to get the coordinates in that system of customers' premises and electricity network assets. It is expected that performance of KPLC in commercial functions and attention of incidents in electricity supply will improve significantly, as the reliable databases will make possible to make full use of the functionalities of the MIS. By allowing the ERC to have real time access to key records of the MIS operated by KPLC related to parameters characterizing service quality, the Regulator will be able to effectively monitor those parameters and enforce the applicable regime.

Assistance to ERC under this sub-component will comprise organizational arrangements, implementation of direct real time access to records of MIS operated by KPLC, training of staff in the use of the MIS to collect the data needed to measure and monitor service quality, design and application of surveys and other actions needed to verify accuracy of those data, procedures to attend users' complains and to enforce applicable regimes on service quality

- (iv) *Project implementation support, preparation of feasibility studies for new investment projects as required and project monitoring and evaluation.* (estimated cost US\$3.5 million). This will finance consultancy services, training actions, GIS mapping and other activities to support the implementation of the project, including monitoring and evaluation, as well as feasibility studies required. This component will be combined

with an assessment on the processes currently carried out by KPLC for attention of customers' complaints due to quality in electricity supply and the commercial functions of KPLC.

- (v) *Training and capacity building* (estimated cost US\$2.0 million). This will finance training, communications and capacity building for the sector entities including MoEP, ERC, KPLC, and REA.

IDA Guarantee - Mobilization of commercial financing for KPLC to restructure its existing commercial debt obligations

31. In the last three years KPLC implemented a fast paced and high capital consuming investment program (over US\$300 million/year) intended to increase connectivity in the country and improve coverage, capacity and quality of the distribution network to adapt to the country's development needs. This investment activity was financed entirely with KPLC's resources – cash from operations and debt -, and although highly beneficial for the country, the result of this effort is a material deterioration of KPLC's financial position represented in substantial increase in debt, lack of liquidity, difficulty to honor its payment obligations when and as due, and inability to continue investing.

32. Due to the nature of KPLC's investments which provide low return and require long amortization periods, and KPLC's constrained financial situation, it is critical for KPLC to restructure its commercial debt in order to reduce its financing costs, which tripled between 2012 and 2014. As of June 2014, KPLC had over US\$800 million of financial debt of which nearly US\$500 million are commercial loans. These commercial loans cost over US\$100 million/year in debt service (interest and principal) and more than half of them (approx. US\$370 million) will mature within the next five years. The terms of these loans are reflective of KPLC's eroded financial condition and credit quality and standard market conditions for this type and quality of borrower, but are not affordable in the short and medium term, nor suitable for KPLC's growth needs. Without an IDA Guarantee, KPLC would not be able to obtain better terms.

33. The project will provide a US\$200 million IDA Guarantee to raise approximately US\$500 million of new commercial debt with lower interest rates and extended maturity periods than those currently available to KPLC. This new debt will be used to restructure and replace KPLC's existing commercial loans and thus reduce financing costs, create savings that will provide the company with liquidity and enable KPLC to continue investing in the quality and coverage of its services and the development of the country. The restructuring of KPLC's commercial debt is likely to be in the form of a syndicated commercial loan with local and foreign currency tranches. Alternatively it could take the form of a bond issue. The result of this debt restructuring would be the significant reduction of the Company's overall financing costs with the respective liquidity benefits, the rescheduling and extension of the amortization periods, the restoration of KPLC's financial strength as the foundation for long term sustainability, the continued implementation of much needed investments by KPLC, and, more importantly, a reduction of the cost recovery requirements from KPLC customers through the tariffs.

Proposed IDA Guarantee Structure

34. The proposed IDA Guarantee may take the form of direct debt service support, first loss guarantee and/or principal repayment guarantee at the end of the extended tenor. The structure will be defined during the appraisal period in order to better respond to prevailing market conditions and optimize the leveraging capabilities of the proposed IDA support.

35. Regardless of the final structure the IDA Guarantee will be applied to guarantee payments of debt service (principal and interest) by KPLC to the commercial lenders. In the event that KPLC fails to make a payment under the commercial loans, subject to the cure periods provided under the loan agreement(s), the lender(s) will have recourse to the IDA Guarantee. IDA will be obliged to pay to the claimant the amounts due and not paid by KPLC within the period stipulated in the Guarantee Agreement (TBC).

36. As per the terms of the Indemnity Agreement to be signed between IDA and the GoK, a payment by IDA to a lender under the IDA Guarantee will trigger the obligation of the GoK to repay IDA. Repayment shall be made upon demand by IDA or as IDA may otherwise direct.

Other Terms and Conditions of the IDA Guarantee

37. The IDA Guarantee would be issued for a maximum term equal to the tenor of the guaranteed loans, which is not expected to exceed 15 years. In accordance with the pricing policy for IDA Guarantees, the lender(s) will pay a Guarantee Fee of 75 basis points per annum calculated over the amount of the Guarantee for the given year and payable from the date and as a condition to effectiveness of the IDA Guarantee. Please refer to Annex 9 (IDA Guarantee Term Sheet) for a summary description of the Terms and Conditions of the IDA Guarantee.

Value Added of the IDA Guarantee

38. KPLC is the cornerstone of the energy sector in Kenya. The company's financial situation has eroded significantly in the last 3 years. It is essential for the sector that KPLC's financial strength is restored on a sustainable basis. For this purpose KPLC must restructure its existing commercial debt to achieve affordable terms and conditions.

39. The IDA Guarantee is essential to enhance KPLC's credit quality and enable it to secure a successful restructuring of its commercial loans. In turn, the financial strengthening of KPLC is critical to enable the company to access new loans in the future and continue implementing its investment program.

40. The total project cost is presented in Table 1.

Table 1: Project Costs

Project Financing	Project cost	IBRD or IDA Financing	Other financing (SREP and KCIC)
IDA CREDIT			
A. Improvements in Service Delivery and Reliability	50	50	0
A.1 Upgrade of the Supervisory Control and Data Acquisition/Energy Management System (SCADA/EMS)	10	10	
A.2 Distribution system enhanced flexibility	20	20	
A.3 Enhanced maintenance practices to improve quality in electricity supply	20	20	
B. Revenue Protection Program (RPP)	40	40	
C. Electrification Program	160	152.5	7.5
C.1 Peri-urban electrification	150	150	
C.2 Off-grid electrification	10	2.5	7.5
D. Technical assistance and capacity building	7.5	7.5	0
IDA Guarantee	500	200	
Total Financing	757.5⁵	450	7.50

⁵ US\$500 million is the amount of commercial debt expected to be raised with the support of a US\$200 million IDA Guarantee.

Annex 3: Implementation Arrangements
KENYA: Electricity Modernization Project

Project Institutional and Implementation Arrangements

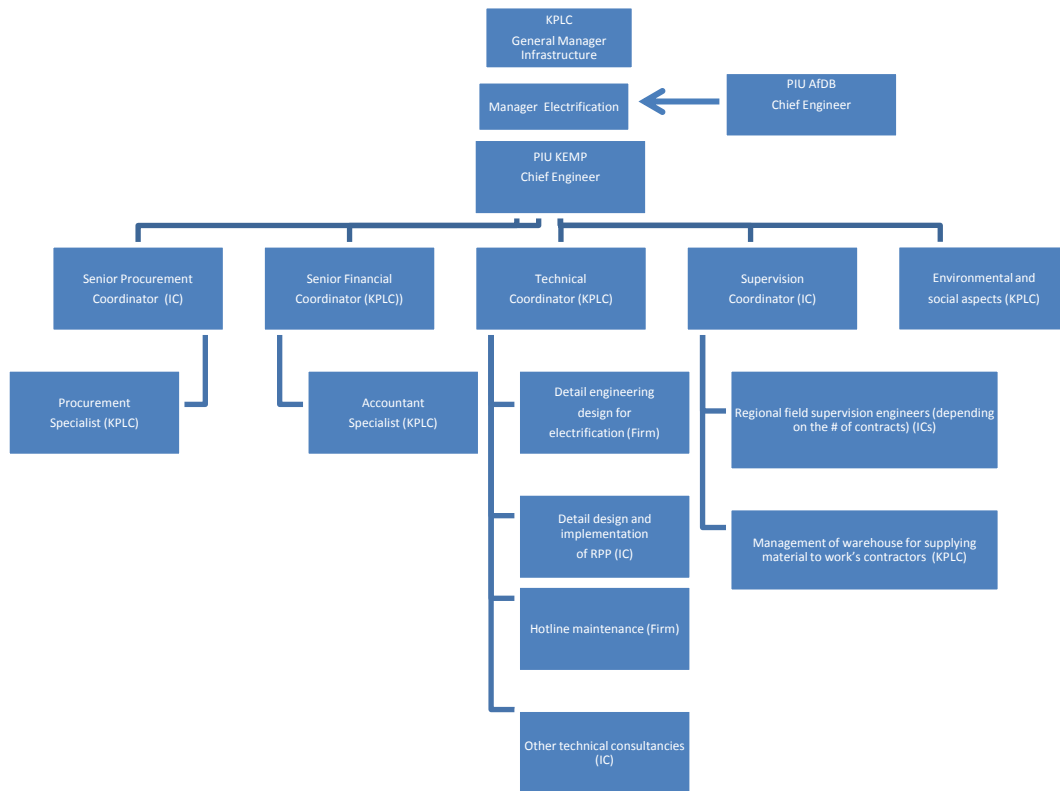
1. **The Ministry of Energy and Petroleum (MoEP)** will be responsible for overall coordination of the Project and consolidate the information related to Project implementation. The Kenya Power and Lighting Company (KPLC) will be responsible for the implementation of Component A, B, C1 and Components D (i) and D (iv). Rural Electrification Authority (REA) will be responsible for the implementation of Components C2. MoEP will be responsible for D (ii) and D (iii).
2. MOEP will be responsible for overall coordination and oversight of the Project, including, (i) definition of areas to be electrified based on technical and policy development priorities; (ii) consolidating information from implementing agencies; (iii) monitoring the implementation of the Project; and (iv) evaluating the Project. MoEP will hire, on a competitive basis, a Project Coordinator to consolidate the information prepared by the implementing agencies and will report to the Principal Secretary, MoEP.
3. REA an agency of government under the MOEP will implement Component C2 of the Project. Its mandate under the draft Energy bill is proposed to be expanded to include promotion and development of renewable energy resources (excluding large scale). REA will be supported by a Technical Advisory Service (Consultant) for implementation of component C2 of the Project. The US\$2.5 million IDA Credit for the off-grid electrification (Component C2) will be on-granted to REA under a Subsidiary Grant Agreement along with the US\$7.5 million SREP Grant.
4. **KPLC** will have the responsibilities of project owner for Components A, B and C1, including: (i) project preparation; (ii) appraising and approving sub-projects, organizing the management and implementation of programs/projects; (iii) ensuring adequate and capable management resources; (iv) conducting appraisal and approval of technical design, total cost estimates and cost estimates of subprojects; (v) negotiating, signing and supervising the implementation of contracts; (vi) implementation of safeguards activities; (vii) substation land and way leaves acquisition (if required); and (viii) signing the on-lending and on-granting agreements with National Treasury for the credit and grant, and repaying credit proceeds.
5. **KPLC's Project Implementation Units (PIUs).** The existing project implementation unit (Existing PIU) at KPLC that is implementing investments under the ongoing IDA financed Electricity Expansion project (KEEP), will be strengthened in order to undertake activities under Components A and B. The Existing PIU is headed by a Chief Engineer who reports to the Manager Infrastructure Development. KPLC will appoint a Manager Electrification for the electrification program financed by various donors. There will be separate PIUs for each donor financed electrification project. The PIU for Component C1 (KEMP Electrification) will be headed by a Chief Engineer who will report to the Manager Electrification. Both the Manager Electrification and the Manager Infrastructure Development will report to the General Manager Infrastructure who reports to the CEO/Managing Director. The existing PIU has personnel

responsible for design and engineering; procurement and stores management; accounting; installation services (substations and lines); and substation land and way leaves acquisition.

6. The Electrification Program PIU team for KEMP will be composed of KPLC staff and Individual Consultants (IC) to carry out the day-to-day activities of project implementation. Additionally, the PIU-KEMP team will be supported by some technical consultants for the technical design of sub-components. In order to ensure successful implementation of the project, KPLC will appoint senior staff to the PIU-KEMP Team for the following positions as indicated in Figure 1:

- Financial management
- Technical management
- Environmental and Social management
- Procurement management
- Materials management

2: KPLC PIU KEMP Team for Component C2



7. Based on the lessons learned under the implementation of World Bank projects, new procurement and supervision arrangements are included in the design of the Project, particularly for the implementation of Component C1 for electrification program. Regarding the procurement aspects, KPLC will conduct the procurement of design, goods, and installation works through

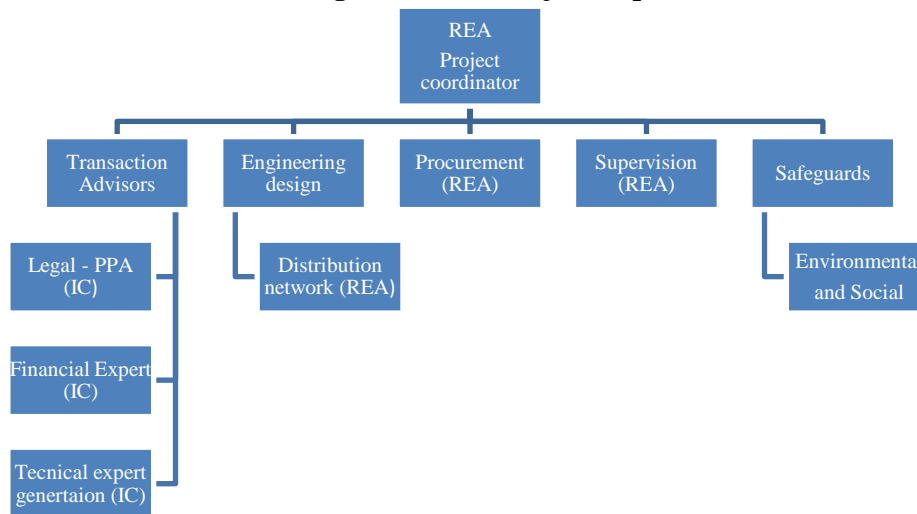
separate contracts rather than through a turnkey (EPC) approach. This is a typical arrangement conducted by capable distribution companies for the connection of low voltage customers. The proposed approach can result in strong competition for supply of the main materials of poles, conductors and transformers resulting in lower prices. Since KPLC can immediately begin the design of the network in the areas to be electrified the time for implementation will be shortened. The capacity of the PIU to carry out the designs will be enhanced by external consultants

8. The supervision of detailed engineering design and execution of construction works will be strengthened as well. KPLC will appoint an individual consultant with high experience in design of medium and low voltage distribution networks following applicable international norms and the company’s own standards, to supervise the detailed engineering designs to be carried out by the external consultancy firm. Supervision of execution of construction works will be strengthened through appointment of one field supervision engineer for each of the Lots for works and installation contracts, as well as a supervision coordinator that will report directly to the PIU Coordinator. The field engineers will be responsible for the progress reports as well as the recommendation to KPLC’s regional planning unit for signing the approval of works.

9. REA’s capacity to implement Component C2 will be strengthened through deployment of existing specialized staff REA to the existing PIU of the IDA financed KEEP. These will include the following additional staff (a legal specialist, procurement specialist, environment & social specialist and renewable energy engineer). The unit will be supported by a transaction adviser (consultant firm) that will provide all the specialized expertise in the areas of structured finance, design of competitive processes for selection of private entities in public private partnership arrangements, contract negotiations with private parties, project supervision, etc.

10. Figure 2 illustrates the implementation arrangements for this component.

Figure 2: REA Project Implementation



11. The responsibilities of REA, KPLC, ERC and the private sector in Sub-component C2 are as follows:

REA

- In coordination with MOEP, select communities to be served by the mini-grids
- In coordination with KPLC and ERC, prepare technical specifications of the mini-grid systems
- Ensure availability of land required for the generation module of the mini-grid system and facilitate the environmental permits
- Prepare the Mini-grid Power Purchase Agreements, together with KPLC
- Finance, design and build the distribution networks and ensure that the maximum number of consumers is connected. This will be financed with IDA and SREP funds.
- In coordination with KPLC and ERC, prepare operation and maintenance service contract and once approved by KPLC, conduct the tendering process of the contract to be signed by KPLC
- Make payments to the selected IPP for the capital cost of the renewable energy component of the generation facility as set in the PPP agreement. This will be financed by SREP and will be used to buy down the capital cost of renewable component.

ERC

- Approve Mini-grid Power Purchase Agreements.
- Recognize the PPA costs and the operation and maintenance contractor charges to be recovered in the retail tariff.
- Issue licenses for mini-grid private sector power suppliers and (if necessary) the operations and maintenance services contractors.

KPLC

- Sign the PPAs with the IPPs (mini-grid private sector power suppliers).
- Sign the operation and maintenance service contract at least for the initial period of operation e.g. 3-5 years, which may be extended as needed.
- Make payments under the PPA and the operation and maintenance services contract.

IPP

- Invest in the non-renewable component of the hybrid generation facilities and meet obligations set in PPA.

12. Regarding the procurement aspects, REA will tender the IPP contract for the generation component of the mini-grid. The private sector power supplier will be selected competitively (e.g., based on offering the lowest levelized cost of electricity, subject to meeting other performance requirements). The investor will receive performance based grants for the renewable generation capacity installed to make the projects financially viable.

13. The arrangements for the distribution network will be conducted by REA. This includes the design and procurement of goods, and installation works through separate contracts rather than through a turnkey (EPC) approach. The proposed approach has been already implemented by REA under the KEEP project.

Financial Management Arrangements

14. The Bank's financial management team conducted a financial management assessment of MoEP, REA and KPLC, the entities implementing the Project. MoEP, REA and KPLC are currently implementing components of the KEEP and MoEP and KPLC have also implemented the ESRP that closed on September 30, 2013. MoEP is also implementing the Kenya Petroleum Technical Assistance Project (KEPTAP).

15. The objective of the financial management assessment was to determine whether the financial management arrangements (a) are capable of correctly and completely recording all transactions and balances relating to the project; (b) facilitate the preparation of regular, accurate, reliable and timely financial statements; (c) safeguard the project's entity assets; and (d) are subject to auditing arrangements acceptable to the Bank. The assessment complied with the Financial Management Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010.

16. The following are the financial management arrangements for the Project.

Budgeting Arrangements

17. KPLC: There are qualified staff who undertake budgeting and monitoring. Projects' budgeting is spearheaded by the Chief Accountant, Projects. Financial management procedures in regard to budgeting are documented under the Budget and Budgetary Control Manual and are considered adequate. SAP system is used for budgeting and budgeting follows a bottom up approach. After KPLC's Board approval, the budget is forwarded to the MoEP and then to the National Treasury for approval and is consolidated under the MoEP Printed Estimates. Though KPLC forwards the entire company budget to the MoEP, it is only the donor funded budget that is included in the Government printed estimates.

18. Budget monitoring at KPLC is done primarily through the SAP system which has a budgetary control module. In addition, KPLC has a Planning and Efficiency monitoring unit that monitors the extent of implementation of key projects and the level of budget absorption for each manager. The budget monitoring system at KPLC is therefore satisfactory.

19. MoEP: The staff in both the planning and the finance departments of MoEP was assessed as adequate in terms of qualifications, numbers and experience. The budgeting process follows the GoK procedures titled; Government Financial Regulations and Procedures. These regulations are currently undergoing a review following the enactment of the PFM Act 2012. The budget preparation process is spearheaded by the Principal Secretary upon receiving a circular from National Treasury requiring all ministries to prepare their budgets within a set ceiling. Budgetary estimates are prepared by all the departments and projects, consolidated and submitted to National Treasury. The estimates are then included in the Ministry's printed estimates in line with the government budgeting system. The budget is prepared in Hyperion (budgetary module) or in excel and uploaded into the Hyperion of the Integrated Financial Management System (IFMIS). The budgeting process is deemed adequate.

20. Budget monitoring at MoEP is done through the Vote Book Report, which is printed from the IFMIS system and it assesses costs incurred against budget. This will be done on a monthly basis as well as quarterly when submitting the unaudited Interim Financial Reports to the Bank.

21. REA: The budget preparation process at REA begins when budgetary estimates are prepared by all departments and submitted to the Finance Department, where they are consolidated and submitted to the Budget Committee for review before submission to the Board for approval. By January 31, the approved budget is submitted to the Ministry of Energy and Petroleum for consolidation with the Ministry's Budget. This budget is submitted to the National Treasury for inclusion in the printed estimates

22. REA's budget monitoring is done as payment approvals are made. The SAP system used by REA also has a budgetary control mechanism which flags out any expenditure for which there is no budgetary allocation. Budgetary line items whose allocated amounts are about to be exhausted are also flagged out by the system.

Accounting Arrangements

Staffing

23. KPLC: The staff is qualified and experienced to manage the project's financial activities. The team is led by the Chief Accountant, Projects, who is supported by two Project Accountants.

24. MoEP: The Head of Accounting Unit is responsible for ensuring that, the processing of project's related payments, recording, accounting and reporting of these activities is properly done. The Head of Accounting Unit is in charge of the MoEP's External Resources Section. The accountants are all seconded from National Treasury and report to the Head of Accounting Unit.

25. REA's project's books of account are maintained by a Project Accountant who reports to the Chief Accountant. She is currently handling the ongoing KEEP. She is suitably qualified to oversee and undertake the Project's financial activities.

26. Most of the accountants have attended the ICT Based Financial Management and Disbursement courses jointly organized by the World Bank and the Kenya School of Government. In the MoEP, efforts are being put in place to revamp the external resources section (ERS) to ensure that all the accountants within the ERS can process projects transactions and do the financial reporting rather than designating one accountant to handle projects.

Accounting Records and Information Accounting System

27. KPLC: The Company uses the SAP system of accounting. The system is able to capture expenditures and generate reports and this is adequate for accounting and financial reporting purposes. The SAP has however been having challenges every time it is upgraded in form of interface differences especially between the financial module and the revenue collection module. However, management has overcome this challenge by ensuring that there are regular

reconciliations between the two systems. The system is therefore considered adequate for purposes of recording and processing project activities.

28. MoEP will use IFMIS and MoEP will ensure that the budget is itemized in IFMIS to ensure that all transactions are done within IFMIS and that customized reports can be printed from IFMIS. Currently, for the ongoing project (KEEP) in MoEP, manual cash books and imprest registers are maintained due to underutilization of IFMIS-KEEP is reflected as one line item in IFMIS. Project payments will be made using the Government Payment System – G-pay which is linked to IFMIS. G-Pay will soon be replaced with T24 internet banking.

29. REA uses SAP to maintain the books of account. The system is highly integrated to include all of REA's key functions such as Finance, Human Resources, Procurement and Construction. The system also generates comprehensive financial statements and the project accountant is fully versant in using it. The system is considered adequate to handle KEMP.

Internal Control and Internal Auditing Arrangements

Internal Auditing

30. KPLC has a large internal audit department comprising of 40 qualified and experienced staff. The department is divided into three units which include Technical Audit, General Audit and Investigations and Systems Audit. The general audit is the largest unit as it includes the Finance Auditors, Fraud and Investigations as well as Procurement Auditors. The Risk Management unit of KPLC is a separate department which works closely with the internal auditors by providing them with key risks used in preparing the Audit Plan at the beginning of the fiscal year. The audit department activities are automated and the department uses Team Mate to undertake all its audit activities.

31. KPLC Audit Committee comprises of five Board members. They include four non-executive members as well as the Senior Representative from the Principal Secretary's office at MoEP. The committee meets every quarter to review issues noted during the quarterly audits and track the implementation of the audit recommendations.

32. MoEP has an internal audit department with adequate qualifications and experience. The internal auditors are seconded to the ministry by the Internal Auditor General, National Treasury. They undertake field visits as well as reviews of critical account balances, key controls and key activities. These are scheduled in a risk-based annual work plan that is prepared prior to the beginning of every year.

33. REA's internal audit department comprises of technical and non-technical (or finance) staff. The technical unit of the department has two engineers whose role is to ensure that the Authority complies with the set quality standards. The non-technical unit has three auditors whose role is to review the financial activities of the departments and special projects of the Authority. The financial auditors are qualified and experienced. The internal audit reviews are guided by a risk based audit plan which is prepared at the beginning of every year. In addition to targeting high risk areas, the audit plan also takes into consideration areas not previously reviewed as well as any feedback or complaints received from other affiliate entities such as KPLC.

34. KPLC, REA and MoEP internal audit departments will be expected to incorporate the audit of KEMP in their annual work plan.

35. MoEP has a Ministerial Audit Committee which is supposed to meet on a quarterly basis. Their key role is to oversee the adequacy of the internal control mechanisms instituted by the MoEP by reviewing the audit issues raised by the Internal and External Auditors and monitoring the implementation of these issues. By doing this, they enhance oversight, governance, accountability and transparency within the Ministry. Following the enactment of the Public Financial Management (PFM) Act 2012, the audit committee composition and functions should be as prescribed in the regulations. The regulations have not been finalized and they are bound to affect the ministry's audit committee composition.

36. REA's Audit Committee has been dormant for the last fourteen months. This has been waiting the reconstitution of the Board. Usually, the committee has three members from the private sector, an alternate to the PS Treasury, the MoEP Chief Finance Officer and the REA CEO. However, the term of two of the three private sector committee ended in June 2013, thereby immobilizing the activities of the committee.

Internal Control Systems

37. KPLC has adequate financial management manual titled "Norms and Procedures manual" documenting the internal control systems to be used under the project. The manual is considered adequate as it has policies and procedures pertinent to the project such as cash management, work in progress, contracts management, payments processing and managing suppliers.

38. MoEP uses the government financial guidelines titled "Government Financial Regulations and Procedures". These guidelines cover several financial management policies and procedures including budgeting procedures, cash management, inventory management procedures as well as preparation of financial statements. Though the procedures are sufficient- as they include critical controls that were pertinent to the project's operations- they are currently undergoing a review following the enactment of the PFM Act 2012.

39. MoEP's management of staff imprests is assessed as satisfactory. Staff imprests are issued to cater for travel and accommodation needs of the staff while away from their duty stations. An Imprest Warrant is prepared once an authorized memo outlining the purpose and duration of travel is submitted to the Accounts Office. Once the imprest warrant is reviewed, it is submitted to the cashier for payment.

40. REA uses a finance manual to govern its financing activities. The manual is titled "Finance Procedures and Instructions Manual". A review of the manual indicated that it covered critical financial management policies and procedures including budgeting procedures, cash management, management of capital expenditure, payments and disbursements as well as authorization limits. The manual is assessed as adequate.

41. Because the Project Account will be opened in the Central Bank, the Project will not maintain any cheque books and will rely wholly on RTGS funds transfer which is done through G-Pay. Monthly bank reconciliations are prepared by a Senior Clerical Officer and approved by the Principal Accountant. They are then submitted to the Treasury after approval. Bank reconciliations should be prepared and approved on a timely basis so that errors can be detected and corrected on a timely basis.

42. KPLC's bank reconciliations are prepared, reviewed and approved within KPLC's Treasury Section in the finance department. The reconciliations are done manually by the Treasury Accountant, reviewed by the Senior Treasury Accountant and approved by the Deputy Manager, Treasury or the Manager, Treasury. The reconciliations are prepared every month by the 12th day after the close of the month. The review of the bank reconciliation indicated that there were no material or long outstanding reconciling items.

43. Other Internal control issues raised in KPLC recent management letters from the external auditors include: differences between the revenue billing in Integrated Customer System (ICS) and the Integrated Finance System (IFS); high inventory balances that have been building up over the years either due to purchase of excess stock or obsolescence or slow movement of items.

Management of corruption and fraud risks in KPLC

44. KPLC has a policy of zero tolerance to corruption and has instituted a number of programs to combat and manage corruption and fraud risks, key of which are outlined below:

45. The annual performance contract between the Government and the board of directors of KPLC include a target on corruption prevention. This target, together with the necessary mitigation activities are cascaded down to the CEO and to relevant management team for implementation.

46. KPLC has an Integrity and Ethics department that is headed by the Chief Integrity & Ethics Officer. The mandate of the department is to manage the Company's ethics and integrity Program, that seeks to assist the Company eliminate the vice of corruption and other unethical conduct in the organization. The Department's functions include: (i) assisting the divisions of the Company to conduct corruption risks assessments, formulate mitigation measures and monitor their implementation; (ii) preparation of policies and guidelines to strengthen ethical culture- (policies which have been prepared and approved by KPLC Board include a Corruption Prevention Policy, Gift Policy and Code of Ethics); (iii) preparation of key corporate ethics and integrity risks register; and (iv) receiving reports on integrity and corruption and ensuring that the complaints are investigated. The Integrity & Ethics Department is required to report status of implementation of the ethics & integrity program to the corruption prevention steering committee (discussed below) and to the Audit Committee of the Board quarterly.

47. At the corporate level, there is a corruption prevention steering committee which is chaired by the Managing Director, while each division and business region has corruption prevention committees, which discuss implementation of their respective corruption prevention initiatives.

The Integrity & Ethics Department is supported by integrity champions based in all functions across the organization.

KPLC has an anonymous system of reporting corruption through emails or boxes located in its offices. The reported cases are forwarded to appropriate functions for investigations and action.

48. Through the Integrity & Ethics Department, KPLC conducts an annual integrity and corruption survey. The survey is carried out by external firms who in the past have included Transparency International (Kenya Chapter) and Ethics Institute of South Africa. The study shows among others, functions and most vulnerable to corruption/ fraud and makes appropriate recommendations to strengthen weaknesses. It also provides a corruption index which is used as the annual corporate score of the performance on the corruption prevention target.

49. The Internal Audit department of KPLC carries out regular audits to assess the adequacy of internal systems and controls and, investigates cases of fraud, corruption, theft and other unethical conduct. The Internal Audit function reports are submitted quarterly to the audit committee of the Board. Disciplinary action (which has included dismissals and prosecutions) is usually taken against staff found to have engaged in theft and fraudulent conduct.

50. The fight against corruption is significantly influenced by the governance environment and top leadership commitment. Overall, the effectiveness of KPLC's integrity and ethics program has been limited by a number of challenges that include: (i) lack of enough staff with experience to drive and implement the program; (ii) lack of strong leadership support (e.g. the corruption prevention committees rarely meets and adequate attention is not given to the anti- corruption agenda); and (iii) weakness of the Kenyan Ethics and Anti-Corruption Commission (EACC) in prosecuting cases of corruption.

51. For this reason, the planned strengthening corporate governance in KPLC through appointment of independent directors in the Board will enhance the capacity of the Board to strengthen controls environment including implementation of the ethics and integrity programs.

Funds Flow and Disbursement Arrangements

Banking Arrangements

52. IDA funds will be disbursed through four (04) segregated Designated Accounts (DAs) managed by National Treasury on behalf of (a) KPLC, which will have two DAs: one of the KPLC's DAs will exclusively finance eligible expenditure under component C1, and the other will finance eligible expenditures under Components A, B and D (iv) and training under D (v); (b) REA will have one DA to finance eligible expenditure under Component C2 and training under D (v); (c) MoEP will have one DA to finance eligible expenditure under Component D (i), D (ii) and D (iii) and training under D (v).

53. KPLC, REA and MoEP will also be required to each open Transaction (project) Accounts denominated in KSh in Central Bank of Kenya or commercial banks.

54. Funds will flow from the World Bank to the Designated Accounts and to the Transaction/Project Accounts using the government exchequer requests system where payments of the eligible project activities can be made. The Bank recommends that the Designated and Project Accounts be opened within one month after effectiveness and details of the USD account communicated to the Bank with the signatories.

55. The government is putting measures in place to ensure that funds flow delays experienced in the past are addressed. The measures include the use of Treasury Single Account and revamping of the external resources departments in the line ministries.

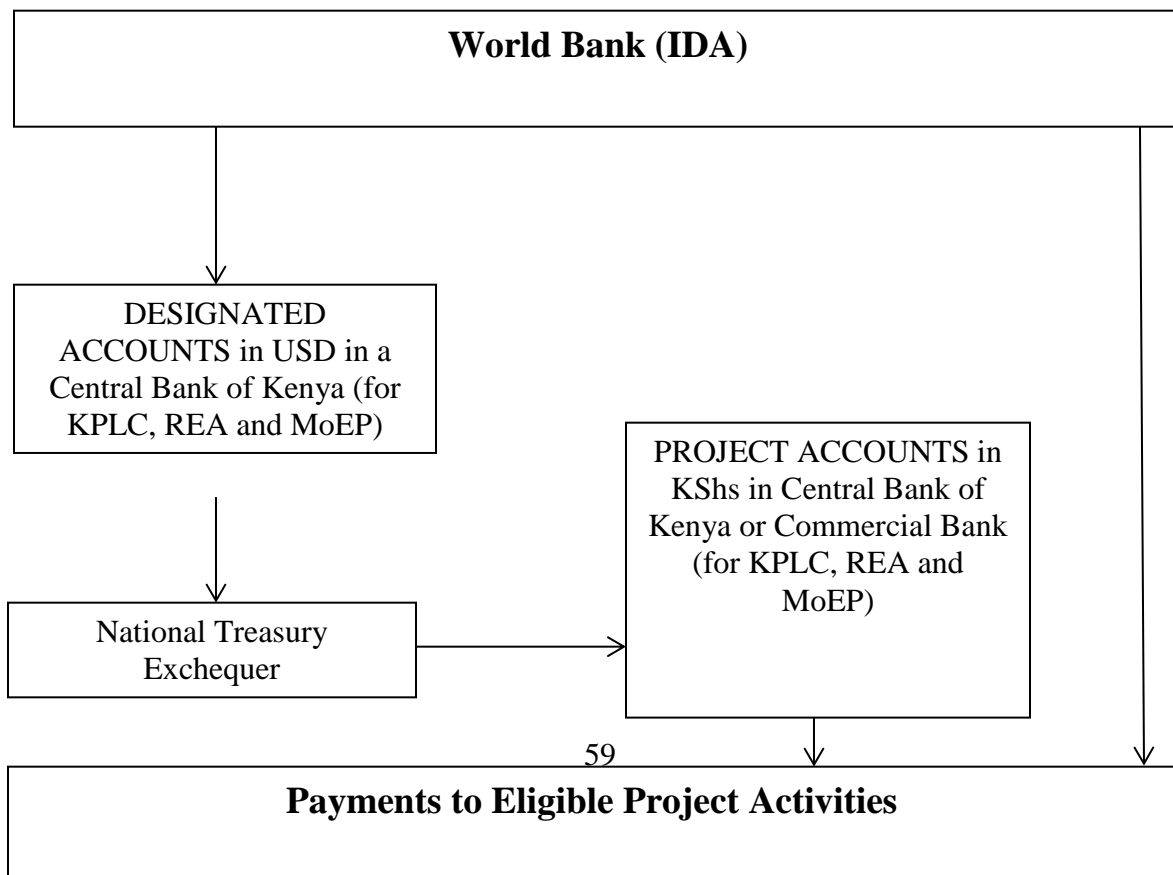
Funds Flow Arrangements

56. Funds flow arrangements for the project (through the bank accounts above) are as follows:

- KPLC, REA and MoEP will prepare an initial six-month cash flow forecast based on agreed work plans (IFRs?) and submit an electronic withdrawal application (WA) request to the Bank (IDA) through the National Treasury.
- IDA will process the withdrawal application and disburse funds to the Designated Accounts in US dollars.
- National Treasury will transfer funds from the Designated Accounts into the Project Account in local currency.
- Project eligible expenditure can be paid from the Project Accounts.

Funds Flow Chart

57. The figure below shows the Funds Flow for each of the implementing entities.



IDA Disbursement Methods

58. The Project will adopt the report based method of documentation for KPLC and REA and transaction based on the SoEs for MoEP. IDA will make the initial disbursement to the project after receiving an electronic withdrawal application with a six months cash flow forecast. This withdrawal application should be prepared within one month after project effectiveness. Thereafter, IDA will disburse into the respective Designated Account based on quarterly IFRs for KPLC and REA and SoEs for MoEP. For KPLC and REA, the IFR should provide actual expenditure for the preceding quarter (three months) and cash flow projections for the next 2 quarters (6 months). The KPLC and REA IFRs together with the Withdrawal Applications (WAs) will be reviewed by the Bank's Financial Management Specialist (FMS) and approved by the Task Team Leader (TTL) before the request for disbursement is processed by the Bank's Loan Department. For MoEP, the IFR should provide actual expenditure for the preceding quarter (3 months) and this amount will be reflected in a SoE and a WA that will be processed by the Bank's Loan department. The DA for MoEP will have a ceiling based on work plans or level of activity agreed with the client whereas the DAs for KPLC and REA will have no ceiling because it will be based on six months rolling cash flow forecasts. The Bank will process the electronic withdrawal application in Client Connection and deposit funds into the Designated Account. Funds will then be transferred from the Designated Accounts at National Treasury using the exchequer system into the project accounts and payments in relation to project eligible expenditures can be made from this account.

59. Other Methods: In addition, whenever needed the direct payment method of disbursement, involving direct payments to suppliers for works, goods and services upon the borrower's request, may also be used. Payments may also be made to a commercial bank for expenditures against pre-agreed special commitments. Reimbursements can also be made to the Designated Account where an implementing entity uses its own funds to finance eligible project activities. These payments will also be reported in quarterly IFRs. The IDA Disbursement Letter will stipulate the minimum application value for direct payment, reimbursements and special commitment procedures as well as detailed procedures to be complied with under these disbursement arrangements.

Financial Reporting Arrangements

60. KPLC, REA and MoEP will produce quarterly unaudited Interim Financial Reports (IFRs) for the designated account and the project account. KPLC has been producing satisfactory IFRs under the closed Energy Sector Recovery Project and KPLC and REA have been producing satisfactory IFRs under the ongoing Kenya Electricity Expansion Project and should have no difficulty developing the formats for this project. Since MoEP has been having challenges with report based IFRs due to turnover of accountants, they will use the SOE method of documentation. The IFRs are to be produced on a quarterly basis and submitted to the Bank within 45 days after the end of the calendar quarterly period. Two formats of IFRs will be agreed by negotiations.

61. The KPLC and REA IFRs submitted to the Bank will have a section on Financial Reporting and Disbursement containing the following:

Reporting Section includes:

- Statement of Sources and Uses of Funds; and
- Statement of Uses of Funds by Project Activity/Component.

Disbursement Section includes:

- Designated Account (DA) Activity Statement;
- Bank Statements for both the Designated and Project Account;
- Summary Statement of DA Expenditures for Contracts subject to Prior Review; and
- Summary Statement of DA Expenditures not subject to Prior Review.

62. The MoEP content of IFR will have the reporting section only. Reporting Section includes:

- Statement of Sources and Uses of Funds; and
- Statement of Uses of Funds by Project Activity/Component.

63. MoEP will also prepare the Project's annual accounts/financial statements within three months after the end of the accounting year in accordance with accounting standards acceptable to the Bank. The audited financial statements and management letter should be submitted to the Bank within six months after the end of the accounting year. In February 2014, the GoK established a Public Sector Accounting Standards Board, responsible for setting accounting standards to be observed in the public sector and has since promulgated International Public Sector Accounting Standards (IPSAS).

64. KPLC and REA will prepare institutional financial statements with adequate disclosures on the projects in accordance with International Financial Reporting Standards.

External Auditing Arrangements

65. The Auditor General of the Kenya National Audit Office (KENAO) is primarily responsible for auditing all government projects. Usually, the audit for KPLC is 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. 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 private external auditors have to be acceptable to the IDA. The audit will be done in accordance with the International Standards on Auditing or International Standards of Supreme Audit Institutions (ISSAI).

- (i) For the Designated Account and related Project Account, an audit report must be submitted to IDA within six months after the end of each financial year. The audit reports for the project may be consolidated into the entity accounts provided there are adequate notes disclosing the sources and uses of IDA funds and reconciliation of the Designated Account.

- (ii) KPLC and REA are currently implementing agencies of KEEP and do not have any overdue audit reports. Audit reports for FY2013 for KPLC were also submitted to the Bank in time but for REA they were submitted after the deadline. The external auditor (KENAO) issued an unqualified (clean) audit opinion on both of them.
- (iii) MoEP also has no overdue audit reports. The MoEP audit reports for ESRP cr. 4572 and Cr. 3958 for fiscal year ended June 30, 2013 received qualified audit reports as a result of combining the ledgers for Cr. 3958 and Cr. 4572. The issue has now been resolved and KENAO has expressed their satisfaction. The audit report for MoEP KEEP received an unqualified (clean) audit opinion.
- (iv) The Bank has shared the audit terms of reference with KENAO and this should be adequate for the audit of all the implementing entities of this project. The Bank encourages the disclosure of the project audit reports to the public in the spirit of being transparent.

66. The audit reports and Management Letter will be required to be submitted within six months after the end of each fiscal/financial year.

Table 1: Audit Reports and Due Dates

<i>Audit Report</i>	<i>Due Date</i>
MoEP Project Financial Statements i.e., KEMP Annual audited financial statements and Management Letter for the project (including reconciliation of the Designated Accounts with appropriate notes and disclosures) KPLC and REA Institutional Financial Statements Annual audited financial statements and Management Letter for the project (including reconciliation of the Designated Accounts with appropriate notes and disclosures on World Bank Financing)	Within six months after the end of each fiscal/financial year.
Partial Credit Guarantee	Semi-annual interim unaudited financial statements and quarterly summary reports to be delivered within 30 days of the end of the period.

Governance and Accountability issues

67. MoEP, REA and KPLC: The Kenya constitution 2010 has devoted chapter 6 on 'Leadership and Integrity' and the public entities are guided by the clauses in this chapter. The PFM Act 2012 has also emphasized on this. In this regard, the ministries/agencies are reviewing their policies on Governance and Anti-corruption. Their integrity assessment officers that are not yet trained by the Ethics and Anti-corruption Commission of Kenya are supposed to undergo the training. KPLC also has anti-corruption policies.

Financial Management Action Plan

68. The following actions need to be taken in order to enhance the financial management arrangements for the Project:

Table 2: Action Items for Financial Management Arrangements

Action	Date due by	Responsible
Agree on the format of IFRs	By Negotiations	MoEP, REA and KPLC
Training of MEP accountants in the External Resources departments as well as the Internal Auditors	During Implementation	MoEP
Reconstitution of Board Audit Committee	Prior to disbursement under Component C2	REA

Conclusion of the Assessment

69. The conclusion of the assessment is that overall residual risk rating is moderate hence the Project will have on-field supervision once a year. The conditions outlined in the FM action plan have to be implemented for the financial management arrangements to meet the minimum Bank's requirements under OP/BP 10.00.

Procurement

70. **General:** Procurement for the proposed Project would be carried out in accordance with the World Bank's "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 stipulated in the Financing Agreement. The various items under different expenditure categories are described below. For each contract to be financed by the Credit, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time-frame are agreed between the Borrower and the World Bank in the procurement plan. The procurement plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

“Guidelines on Preventing and Combating Fraud and Corruption in project financed by IBRD Loans and IDA Grants” dated October 15, 2006 (the Anti-Corruption Guidelines).

71. **Use of National Procurement Procedures:** All contracts other than those to be procured on the basis of ICB and consulting services shall follow the procedures set out in the Public Procurement and Disposal Act of 2005 (PPDA). The PPDA governs purchase of works, goods and services using public resources by the central government entities, local authorities, state corporations, education institutions, and other GoK institutions. Under the PPDA, the Public Procurement Oversight Authority (PPOA) has been established, in addition to the Public Procurement Directorate in the National Treasury. The PPDA sets out the rules and procedures of public procurement and provides a mechanism for enforcement of the law. The new Constitution has devolved most of the key functions of the central government to forty seven (47) counties. In this respect, the government has issued the Public Procurement and Disposal (County Government) Regulations, 2013, but these counties have not established strong procurement capacity. The government is in the process of revising the law to include provisions on counties and minorities. Procurement function is decentralized to individual procuring entities. The Public Procurement Authority (PPOA) has oversight and regulatory function including undertaking procurement reviews and audits. There is a Public Procurement Complaints Review and Appeals Board (Appeal Board) under the secretariat of PPOA that deals with complaints received from bidders or consulting firms.

72. However, some provisions of PPDA are not fully consistent with the World Bank procurement guidelines and consultant guidelines, and therefore these may not be applied for the implementation of this Project without modification. These provisions and their respective modifications are:

- (a) PPDA 55(2): instead, the tender submission date shall be set so as to allow a period of at least 30 days from the later of: (i) the date of advertisement, and (ii) the date of availability of the tender documents.
- (b) PPDA 4(2)(c): instead, Recipient’s government-owned enterprises shall be allowed to participate in the tendering only if they can establish that they are legally and financially autonomous, operate under commercial law and are an independent agency of the recipient’s government.
- (c) The Borrower shall use, or cause to be used, bidding documents and tender documents (containing, inter alia, draft contracts and conditions of contracts, including provisions on fraud and corruption, audit and publication of award) in form and substance satisfactory to the Association.
- (d) PPDA 61(4): instead, extension of tender validity shall be allowed once only, and for not more than thirty (30) days, unless otherwise previously agreed in writing by the Association.
- (e) PPDA 66(3)(b): instead, evaluation of tenders shall be based on quantifiable criteria expressed in monetary terms as defined in the tender documents. It shall not be based on a merit points system.
- (f) PPDA 39: instead, no domestic preference shall be used in the evaluation of tenders. Therefore, as a result of the non-application of PPDA 66(3)(b) and 39, contracts shall be awarded to qualified tenders having submitted the lowest evaluated substantially responsive tender.

- (g) PPDA 67: instead, notification of contract award shall constitute formation of the contract. No negotiation shall be carried out prior to contract award.
- (h) PPDA 91: instead, shopping procedure will apply for each low value contracts, in lieu of Direct Procurement, except as otherwise previously agreed in writing by the Association.
- (i) Regulations 47: instead, the two envelopes bid opening procedure shall not apply under NCB. The Bank's standard bidding documents for goods and works shall be used with appropriate modifications.

73. **Procurement of Works:** Works procured under this Project will include: Labor and Transport contracts by REA and Supply and Installation contracts under KPLC. Procurement will be done using the Bank's Standard Bidding Documents (SBD) for all International Competitive Bidding (ICB) and NCB contracts.

74. **Procurement of Goods:** Goods procured under this Project will include: Line isolators / disconnectors; Advance meters, Advance data management system and metering control centers; Conductor Cables; Distribution transformers; Customer Meters; Surge Diverters, Circuit breakers, Isolators, Air break switches and insulators; Wooden Poles etc.

75. Framework agreements may be used to implement some actions such as: (a) goods that can be procured off-the-shelf or are common use with standard specifications; (b) non-consulting services that are of a simple and non-complex nature and may be required from time to time by the same agency(ies) of the Borrower; or (c) small value contracts for works under emergency operations. Such arrangements should not restrict foreign competition and should be restricted to a maximum duration of three years. The nature and budget for such goods, including the circumstances and justification for its use; the particular approach and model to be adopted; the procedures for selection and award; and the terms and conditions of contracts will be defined and agreed between the Borrower and IDA prior to their inclusion in the updated annual procurement plan.

76. **Procurement of Non-Consulting Services:** Contracts under non-consulting services include, inter alia, Geographic mapping of current conditions in terms of existing networks and location of households. In the event that activities such as workshop venues, transport or IT services are identified, the type and budget for such services will be defined and agreed between the Borrower and IDA prior to their inclusion in the updated annual procurement plan.

77. **Selection of Consultants:** Consulting services to be procured under the Project include: hiring of firms to carry out studies, assessments designs, Supervision and related including but not limited to design and definition of implementation arrangements of the National Electrification Strategy, geographic mapping, engineering design of electrification and incorporation of hot-line maintenance etc. Hiring of Individual Consultants may include inter alia, Senior Procurement Specialist, Supervision Coordinator, Regional Field Supervision Engineers etc.

78. The GoK-owned universities and research institutions in the Borrower's country that are uniquely qualified on specialized tasks may participate with prior agreement between the

Borrower and the Bank at project preparation and disclosed in the project documents or participate as sub-consultants in competitive selections in association with private consultants. Contracts to be procured under these arrangements include monitoring and evaluation (M&E), public private partnerships, etc. The budget for such services will be defined and agreed between the Borrower and IDA prior to their inclusion in the updated annual procurement plan.

79. **Operating Costs:** These items will be procured using the Borrower national procurement and administrative procedures acceptable to the Bank. The Borrower will also pay for costs associated with any resettlement, land acquisition, compensation and relocation of services.

Assessment of the Agency's Capacity to Implement Procurement

80. A procurement capacity and risk assessment was carried out by the Bank on November 13 – 17, 2014 for the three IAs i.e., The (i) Ministry of Energy and Petroleum, (ii) the Kenya Power and Light Company (KPLC) and (iii) the Rural Electrification Authority (REA) to review the organizational structure for implementing the project and the interaction between the project's staff responsible for procurement duties and management of the ministry as well as the KPLC and REA. The key issues and risks concerning procurement for implementation of the project which include systemic weaknesses in the areas of: (i) accountability of procurement decisions; (ii) procurement record keeping; (iii) capacity of procurement staff; (iv) procurement planning; (v) procurement process administration, up to and including award of contracts; (vi) contract management; and (vii) procurement oversight were assessed.

The Ministry of Energy and Petroleum

81. MoEP will be responsible for overall coordination and oversight of the Project, including, (i) definition of areas to be electrified based on technical and policy development priorities; (ii) consolidating information from implementing agencies; (iii) monitoring the implementation of the Project; and (iv) evaluating the Project. The Ministry has assigned the Head of Procurement (who is also the Deputy Director of Supply Chain Management) to be responsible for procurement activities under KEMP. He possesses the necessary academic credentials with 21 years in procurement out of a total 34 years of professional work experience and will be assisted by 11 professional procurement staff that he manages. The head has some exposure on World Bank procurement procedures and it is suggested that he attends basic procurement training on Bank Procurement Guidelines in Nairobi or Regional Institutes like ESAMI to help him better manage KEMP. The ministry has adequate experience in implementing Bank supported projects and should be able to coordinate and manage procurement activities that concern the ministry under KEMP. Considering the limited experience of MoEP in international procurement using Bank Procurement Guidelines (lack of technical expertise pertinent to undertake procurement in Bank-supported projects, the overall risk assessment of the Ministry is **Substantial**.

The Kenya Power Limited Company (KPLC)

82. Much of the procurement activities under the Project will be carried out by KPLC. KPLC has a well-established Procurement Unit (PIU) which is successfully implementing the current Kenya Electricity Expansion Project. KPLC Procurement has adequate qualified procurement staff to run KEEP and may also provide support to the KEMP as appropriate. However since additional procurement activities are anticipated to be carried out under the Electrification Program of KEMP, apart from other professionals in different disciplines, the appointment of one additional qualified procurement officer well versed on World Bank Guidelines under KEMP is necessary. The overall procurement risk assessment to manage the funds under KEMP is therefore, **Moderate**.

83. **Rural Electrification Authority (REA)** an agency of government under the MOEP will implement Component C2 of KEMP and will be supported by a Technical Advisory Service (Consultant) for its implementation. Organizationally, the procurement function is run by a Procurement and Supplies Manager assisted by a Senior Procurement Officer, a Procurement Officer and two assistant Procurement Officers. Currently, the procurement staff is stretched and the additional procurement activities warrant the need for one additional procurement officer to support procurement activities under KEMP. The assessment revealed that training procurement staff of REA including the additional staff on procurement of Goods, Works and Selection of Consultants will be essential. Considering the limitations of REA procurement staff (limitations in staff knowledge and experience) in implementing World Bank financed using Bank Procurement Guidelines, the overall risk assessment is **Substantial**.

84. The three Implementing Agencies are expected to benefit from the professional support of the technical specialists within their technical departments in carrying out their procurement functions independently. The accumulated procurement experience in all the three implementing agencies in implementing Bank support projects combined with support from the Kenya Bank Country Office will put KEMP in a better position to achieve its objectives.

Overall Risk Assessment and mitigating Measures:

85. The assessment concluded that the overall procurement risk of KEMP is **Substantial**. The proposed risk mitigating measures are summarized below:

Risk	Action	Timeframe	Responsibility
Inadequate procurement capacity in KPLC Electrification PIU and REA PIU	Assign/Recruit at least one qualified Procurement Specialist (Individual Consultant) knowledgeable of Bank Procurement Guidelines.	By end of first three months after project effectiveness	Borrower
Inadequate practical experience in the application of Bank Procurement Guidelines.	(a) Conduct induction procurement training for the new procurement staff on Bank procurement procedures;	Induction training by Effectiveness; and	Bank
	(b) Develop and implement formal training program on Bank procurement procedures to	Formal training by regional training institutes by taking the	Borrower

	procurement staff with no prior training on same. (c) Align the preparation processes of procurement plans, work plans and budget estimates. (d) Establish separate effective tracking systems of (i) procurement plan implementation and (ii) processing of payments to contractors and suppliers.	earliest available slot. Continuous through the life of the Project. Continuous through the life of the Project	Borrower Borrower
National procurement procedures are not fully consistent with Bank procedures.	Financing Agreement must include the exception provisions.	By appraisal	IDA/Borrower

Procurement Plan

86. A consolidated draft Procurement Plan for the first 18 has been prepared and detailed below:

Prior Review Thresholds

87. Prior review and procurement method thresholds for the project are indicated in the table below.

Goods, Works and Non Consultancy Services

No.	Procurement Method	Threshold (US\$)	Prior/ Post/ Review of all contracts	Comments
	ICB Goods Works	$\geq 3,000,000$ $\geq 15,000,000$	Prior Prior	
	LIB (Goods)	$\geq 3,000,000$		
	NCB Goods Works	$< 3,000,000$ $< 15,000,000$	Prior Review Prior Review	Above 1.0 million Above 10 million Prior Review
1.	Shopping Goods Works	$< 100,000$ $< 200,000$	Post Review Post Review	
2.	Direct Contracting	≥ 100	Prior Review	Below 0.1 million Post Review

Selection of Consultant Services

No.	Selection Method	Prior Review Threshold (USD)	Comments
1.	Competitive Methods (Firms) (QCBS,QBS, FBS, LCS)	≥ 500,000	
2.	Single Source (Firms)	≥ 100,000	
3.	Individual Consultant Selection (ICS)	≥ 200,000	
4.	Consultant Qualification Selection	<300,000	The threshold for CQS is US\$ 300,000 as per the Guidelines.
5.	Single Source (ICS)	≥ 100,000	

Frequency of Procurement Supervision

88. In addition to the prior review supervision to be carried out from World Bank offices, there will be annual supervision missions to carry out post review of procurement actions.

E. Details of the Procurement Arrangements Involving International Competition

Goods, Works and Non-Consulting Services:

(a) List of goods and works contract packages to be procured following ICB in the first 18 months:

List of Contract Packages to be Procured Following ICB and Direct Contracting

Ref No.	Contract (Description)	Financier	Cost Estimate US\$ Million	Procurement method	P-Q	Domestic Preference (yes/no)	Review by Bank (prior/post)	Expected Bid-Opening Date
1.	Remote Terminal Units (RTUs) and associated communication equipment (KPLC)	IDA	TBC	ICB	No	No	Prior	August 2015
2.	Line isolators / disconnectors (KPLC)	IDA	TBC	ICB	No	No	Prior	August 2015
3.	Equipment and tools for live-line maintenance (KPLC)	IDA	TBC	ICB	No	No	Prior	December 2015
4.	Advance meters, advance data management system and metering control centers (KPLC)	IDA	TBC	ICB	No	No	Prior	December 2015
5.	Conductor Cables (KPLC)	IDA	TBC	ICB	No	No	Prior	August 2015
6.	Distribution transformers (KPLC)	IDA	TBC	ICB	No	No	Prior	August 2015
7.	Poles (KPLC)	IDA	TBC	ICB	No	No	Prior	August 2015

Ref No.	Contract (Description)	Financier	Cost Estimate US\$ Million	Procurement method	P-Q	Domestic Preference (yes/no)	Review by Bank (prior/post)	Expected Bid-Opening Date
8.	Customer Meters (KPLC)	IDA	TBC	ICB	No	No	Prior	January 2016
9.	Works, supply and installation contracts for new connections (KPLC)	IDA	TBC	ICB	No	No	Prior	October 2015
10.	REA Works (Labor and Transport)	IDA	TBC	NCB	No	YES	Post	February 2016
11.	Transformers (REA)	IDA	TBC	ICB	No	No	Prior	February 2016
12.	Surge Diverters, Circuit breakers, Isolators, Air break switches & Insulators (REA)	IDA	TBC	ICB	No	No	Prior	February 2016
13.	Wooden Poles (REA)	IDA	TBC	ICB	No	No	Prior	February 2016
14.	Conductors, Cables, Stay Wires, & Binding Wires (REA)	IDA	TBC	ICB	No	No	Prior	February 2016
15.	Steel Cross Arms, Channels, Tie Straps, Bolts & Nuts and Overhead line fittings (REA)	IDA	TBC	ICB	No	No	Prior	February 2016

List of Consulting Assignments with Short-List of International Firms

Ref. No.	Description of Assignment	Financier	Cost estimate US\$ Million	Selection Method	Review by Bank (Prior I Post)	Expected Proposals Submission Date
1.	Transaction Adviser for REA	IDA	0.50	QCBS	Prior	July 2015
2.	Design and definition of implementation arrangements of the National Electrification Strategy (MoEP)	IDA	0.35	QCBS	Post	August 2015
3.	Preparation of standard construction units for distribution networks in urban, per-urban and rural areas countrywide (MoEP)	IDA	0.6	QCBS	Prior	August 2015
4.	Detailed engineering design of electrification projects (KPLC)	IDA	0.8	QCBS	Prior	August 2015
5.	Live-line maintenance (KPLC)	IDA	0.29	ICB	Prior	August 2015

Non Consultancy Services

Ref. No.	Description of Assignment	Financier	Cost estimate US\$ million	Selection Method	Review by Bank (Prior I Post)	Expected Proposals Submission Date
1.	Geographic mapping of current condition in terms of existing networks and location of households still to be electrified (KPLC)	IDA	0.6	ICB	Prior	August 2015

List of Consulting Assignments with Individuals

Ref. No.	Description of Assignment	Financier	Cost estimate US\$ million	Selection Method	Review by Bank (Prior I Post)	Expected Proposals Submission Date
1.	Project Coordinator (MoEP)	IDA	0.30	ICS	Prior	April 2015
2.	Preparation of action plans for: (i) standardization of distribution networks in all areas (rural, peri-urban urban); (ii) geographic mapping of current condition in terms of existing networks and location of households still to be electrified (MoEP)	IDA	0.05	ICS	Post	February 2015
3.	Assistance to ERC in the definition and implementation of processes for real time monitoring of quality in electricity supply and customer service by KPLC and enforcement of standards and related penalties (MoEP)	IDA	0.10	ICS	Post	June 2015
4.	Assessment of processes currently carried out by KPLC for commercial functions (KPLC)	IDA	0.10	ICS	Post	July 2015
5.	Assessment of processes currently carried out by KPLC for attention of customers' complaints due to quality in electricity supply (KPLC)	IDA	0.10	ICS	Post	September 2015
6.	Support KPLC in the detailed design and implementation of the Revenue Protection Program (preparation of bidding documents, bid evaluation, supervision of implementation)	IDA	0.15	CQS	Post	March 2015

7.	Senior Procurement Specialist (KPLC)	IDA	0.29	CQS	Prior	March 2015
8.	Supervision Coordinator (KPLC)	IDA	0.29	CQS	Prior	December 2015
9.	Regional field supervision engineers (KPLC) x 6	IDA	0.10 x 6	ICS	Prior	January 2016

Safeguards Approach

89. The Project is proposed as category B (Partial Assessment). Resettlement and compensation is of a limited nature. Safeguard policies 4.01 (Environmental Assessment), 4.04 (Natural Habitats), 4.11 (Physical Cultural Resources) and 4.12 (Involuntary Resettlement), and 4.10 (Indigenous People) will be triggered.

90. There are no significant and/or irreversible adverse environmental issues anticipated from the investment sub-components to be financed under the Project, as these will all be located in peri-urban areas and in a limited number of villages in rural areas. Potential negative impacts are expected to be small-scale and site-specific and appropriate mitigation measures will be included to address these impacts.

91. ESMFs have been prepared for Components C1 and C2. The ESMFs contain an environmental social screening process, and includes environmental guidelines for contractors. If it is determined through the screening process that any sub-projects would require a full environmental assessment, NEMA approval will be sought before commencement of detailed design to ensure that good practices are included in the technical design. The ESMFs will serve as the environmental safeguards document in cases where a full environmental assessment is not deemed necessary based on the findings of the screening. The ESMFs also requires that all construction materials (in particular wooden poles treated with creosote) are sourced from firms that have undergone a satisfactory environmental impact assessment/audit and have received NEMA approval.

92. Consultations with local stakeholders (including Kenya Association of Residents) and agencies including Kenya Wildlife Service (KWS), Kenya Forest Service (KFS), Kenya Urban Roads Authority (KURA), and where necessary, Water Services Boards and the Water Resources Management Authority, will be undertaken during the preparation of the environmental documents, and minutes of stakeholder meetings, including measures proposed to address grievances, will be included as an Annex to the ESMFs.

93. Given the urban and peri-urban locations of the majority of the sub-projects in Component C1, impact on natural habitats is expected to be minimal. Although there may be a need for replacement of trees that may be removed along Rights of Ways (roads to settlements) no natural forest will be affected. Any trees removed from Rights of Way will be replaced. The mini-grid infrastructure in sub-component C2 will have low to moderate negative impacts on the environment, depending on locations and the nature of the investments. These impacts would result from the installation of solar panels (requiring a plan for disposal of batteries), and small wind turbines (which may have an impact on avifauna). A screening process will be followed to ensure that potential negative impacts can be appropriately mitigated, and that sub-projects are

not located in critical natural habitats including National Parks and Protected Areas. The impacts and relevant mitigation measures will be described in the Environmental and Social Management Framework (ESMF) for component C2 that has been prepared by the KPLC (under a service agreement with REA), and that will be disclosed prior to appraisal.

94. Nevertheless, to ensure that appropriate measures are taken to protect biodiversity, OP 4.04 (Natural Habitats) is also triggered, to ensure that appropriate mitigation measures are included in EMP and ESMFs. OP 4.11 (Physical Cultural Resources) is triggered as a precaution, although the sub-projects are not expected to traverse areas of cultural or historical importance. Chance find procedures will be included in contracts and EMPs and ESMFs.

95. **Borrower capacity in implementing safeguards.** A review was undertaken of EIAs prepared by KPLC for sub-stations and an underground distribution cable financed under the Kenya Energy Sector Recovery Project i.e. of electricity infrastructure of similar nature to those planned under the proposed Project. These EIAs were prepared as per Kenyan environmental regulations and the Environmental Framework documentation of the Bank that is used as a guideline in assessing environmental compliance and screening of sub-projects. The EIAs were generally of good quality. KPLC will need to ensure, as a standard practice, that timely and informed consultation with stakeholders should be undertaken early in the project preparation process, and adequately documented. Given that many of the sub-stations will be constructed in densely populated areas, noise measurements should be recorded to ensure that noise during construction and operation stays within an acceptable range. Any grievances from stakeholders should be recorded and responded to in a timely manner.

96. Based on experience to date, KPLC's and REA's Environment units have sufficient capacity to mitigate potential adverse environmental and social impacts. Their capacity to implement World Bank safeguard policies will be closely monitored, and any measures deemed necessary to strengthen this capacity will be implemented.

Annex 4: Implementation Support Plan
KENYA: Electricity Modernization Project

1. **Strategy and Approach for Implementation Support.** The strategy for implementation support has been developed on the basis of the nature of the Project and responds to complexities of the Project given the new approaches proposed for implementation. The objective is to ensure that the World Bank's resources and staff are sufficient to supervise and support implementation.

Implementation Support Plan

2. First phase. Technical implementation support will focus on ensuring timely establishment of the Electrification PIU at KPLC, and appropriate technical design of the Project components carried out. Additionally, the Bank support under this phase will focus on the procurement process for concluding the tendering of the major infrastructure packages. In this regard, Terms of Reference for the implementation unit positions at KPLC will be prepared by the client and will be reviewed by the Bank to ensure that tasks are appropriately defined and qualifications and experience are adequate to perform the key functions required for Project implementation. The Bank team will include HQ and country office-based staff and consultants. Specialized expertise will be mobilized as required.

3. Second phase. After the tendering process is finalized in the first phase, Bank team support will focus on monitoring the construction process, contracts management, disbursements, and effectiveness of capacity building and technical assistance activities. The Bank team will include HQ and country office-based staff and consultants, complemented with specialized expertise as required.

Main Areas of Supervision

4. Technical assistance and preparation of the National Electrification Strategy (NES). World Bank specialists will regularly participate in implementation support missions to assist the monitoring and progress of in the preparation of the NES as well as provide guidance as per government request.

Procurement and Technical Aspects

5. World Bank procurement specialists will regularly participate in implementation support missions to assist in monitoring procurement procedures and plans. The procurement plan will indicate those contracts which are subject to prior review. A set of procurement packages to be implemented during the first 18 months has been identified and included in the procurement plan. All other contracts will be subject to post-review. The Bank team will include a Bank staff engineer, complemented with specialized expertise, in depending on each component, in order to review technical specifications and proposals. During the second phase, it is expected to do field supervision of the construction sites. During the regular implementation support missions, the procurement plans will be updated at least once each year (or more often as required to reflect

the actual project implementation needs) and post-procurement reviews will be carried out at a minimum once annually. Procurement supervision will be conducted once a year.

Financial Management Aspects

6. Financial management supervision will start by assessing the progress of the project management unit staffing and reviewing the plan in place in order to execute disbursements following financial management guidance. This supervision will take place before contracts are awarded in case improvement measures need to take place before disbursement. The financial management supervision will also review quarterly progress and financial audits. In terms of resources, a country-office-based staff for eight weeks is expected to be required. FM supervision will be conducted once every year.

7. **Audit.** Internal control functions will be strengthened under the Project as detailed in Annex 3. The Bank's Project team will closely monitor financial management activities to identify in advance potential delays in the preparation of the financial and audit reports and undertake corrective measures. Project financial statements will be audited by an external auditor hired under the project under terms of reference acceptable to the Bank and with the approval of the Kenyan regulations.

Environmental and Social Aspects

8. Environmental safeguards support will include visits to Project areas and the monitoring of mitigation measures. During construction, monitoring is necessary to ensure compliance with environmental and social safeguards related to the infrastructure projects. It is expected that a field supervision mission in the second phase will need three weeks per year. In terms of resources, environmental and social specialists are expected to support the Project for eight weeks each.

Overall Support Implementation Needs

9. The Bank team should be composed of a mix of skills and experience for successful project implementation. The table below outlines the expected staff weeks and travel required to make sure the actions and schedule are appropriately resourced.

Time	Focus	Skills Needed	Resource estimate (US\$000)	Partner Role
First phase (approx. 18 months)	Establishment of the project implementation unit at KPLC and strengthening PIU's team Design of procurement documents Elaboration of ESIA and RAP (if required)	Engineering; procurement; financial management; environmental; and social and legal.	250	There is no cofinancing
Second phase (approx. 18-80 months)	Review of progress in construction and capacity building; review of sector technical and financial performance; procurement; monitoring and evaluation; safeguards; financial management; and EAPP development.	Engineering; sector regulatory and planning; M&E specialist; financial analyst; economist; environmental and social.	300	There is no cofinancing

Skills Needed	Number of Staff Weeks per year	Number of Trips per year
Team leader	8	2
Distribution engineer	6	2
Procurement specialist	6	0 - Field staff
Specialized technical experts	4	As required
Financial analyst	2	1
Legal	3	1 (initially)
Administrative support	3	0
Financial management specialist	5	0 – Field staff
Environmental specialist	4	2
Social specialist	3	2
Monitoring and evaluation expert	3	2

Annex 5: Kenya Power Sector

KENYA: Electricity Modernization Project

1. The Government of Kenya has made substantive progress in implementing the reform agenda in the energy sector. The objectives of the comprehensive reforms which commenced in 1997 were: (i) separation of commercial functions from policy setting, regulatory and coordinating functions; (ii) implementation of power projects on the basis of improved least cost investment planning; (iii) creating more competitive market conditions in electricity generation; and (iv) restructuring power companies and requiring them to operate on a commercial basis supported by a system of performance contracts and with transparent financial relationships. In 2004, the government formulated the National Energy Policy, Sessional Paper No. 4, 2004, that defines the vision for the sector and which has resulted in far-reaching energy sector institutional restructuring, legislation, and regulation. The government is in the process of preparing a new national energy policy and energy law, which when finalized will shape the next generation of sector reforms. Some of the reforms implemented are enumerated in Table 1 below.

Table 1: Status of Implementation of Reforms

Reform and objective	Status in 2014
Cost reflective tariffs for financial viability of the electricity sector and raise capital for system expansion	Electricity retail tariffs were structured according to long run marginal cost (LRMC). Adjustment of electricity tariffs to the equivalent of 75 percent of LRMC was achieved in October 1996 and further increases in 1999 and 2008 made the tariffs largely cost-reflective as at 2011/12.
Enactment of the Electric Power Act, 1997 to facilitate private sector participation in generation function, remove GOK regulatory role, provide prudential regulation and enhance stakeholder interests. Enactment of the Energy Act, 2006	The Electric Power Act, 1997 was enacted and became operational in January 1998, thereby repealing the previous laws, the Electric Power Act and Electric Supply Lines Act. Also in 1997 the Electricity Regulatory Board (ERB) was established to perform sub-sector regulation functions hitherto performed by MoEP. The Energy Act was promulgated in 2006 and replaced the Electric Power Act, 1996. It provided for the establishment of a single regulator for the energy sector, including petroleum. The Energy Regulatory Commission (ERC) and the Energy Tribunal to hear appeals arising from the decisions of the Commission were set up.
Unbundling of generation function from transmission and distribution functions	Generation was unbundled from transmission and distribution. The generation assets owned by different public bodies (TRDC, TARDA, GOK, & KPLC) were consolidated and transferred to KPC (now KenGen) and TRDC was wound up. The transmission assets owned by GOK and KPC were transferred to KPLC. KenGen was given the mandate of power generation while KPLC was given the mandate for transmission and distribution, including rural electrification.
Private Sector participation in power generation	Kenya procured the first two IPPs in 1996 under a 7 year PPA. Currently, there are 6 IPPs in operation providing a total of 483MW to the grid. KPLC has signed PPAs with other IPPs who are at various stages of developing power plants with a combined capacity of about 800MW expected to be commissioned between 2014-2018.
KPLC and KenGen commercial relation to be on market standard PPA	KPLC and KenGen entered into an interim PPA on 1st August 1999, and on market standard PPAs on July 2008, to a large extent, with similar terms as the IPPs.

Reform and objective	Status in 2014
Introduction of performance contracts for KPLC, KenGen and other sector entities	The government introduced performance contracting for state corporations (Performance Contracting) Regulations, 2004. This sets out annual performance targets for each state corporation.
Engagement of a management contractor for KPLC	As part of a GoK's Energy Sector Recovery Project (ESRP), KPLC was put on a Management Services Contract (MSC) for 2 years from 1st July 2006 to 30th June 2008. The goal of the MSC was to affect a comprehensive corporate recovery program aimed at improving operational efficiency, reducing system losses, reducing power outages, increasing electricity access through accelerated new connections, reducing voltage fluctuations, reducing time to restore service to customers after outages, and improving revenue collection.
Privatization of KenGen over time starting with an initial public offering (IPO) of 30 percent of its equity.	The IPO for 30 percent of KenGen stock took place on May 17, 2006 and attracted more than 270,000 shareholders.
Establishment of a State owned Geothermal Development Company (GDC)	The Geothermal Development Company (GDC) was established in 2008 to be in charge of geothermal resource assessments and sale of steam to future IPPs and KenGen for electricity generation.
Creation of a Rural Electrification Authority to accelerate the pace of rural electrification in the country.	The Rural Electrification Authority (REA) was established in 2007 and a rural electrification master-plan (REMP) was finalized in 2009.
Unbundling transmission function from distribution function.	The transmission company KETRACO was established in 2008. It will be responsible for new transmission assets. The existing transmission assets remained with KPLC.
Promoting privately or community owned vertically integrated entities either operating renewable energy power plants or hybrid systems, to coexist with licensed electricity distributors.	The most significant measure to promote private or community supply companies has been the Feed In Tariffs Policy on geothermal, solar, wind, biomass and small hydro of April 2010.

Table 2: Electricity Sector Key Performance Data for 2012-13 and 2013-14

Indicator	2012/13	2013/14
Installed capacity (MW)	1,765	1,885
Peak demand (MW)	1,350	1,463
Increase in number of electricity customers	2.3 million	2.7 million
Household electricity access	30%	35%
Number of new connected annually	292,337	436,000
Days Receivable for Customer Debt	38.2 days	35.7 days
Revenue Collection as % of Billing	97%	98%
Losses	18.6%	18.1%
Number of Low Voltage Breakdowns per 1,000 customers per month	7.54	9.6
Average Time to Connect New LV Customers After Payment (Days)	71	42

Power Supply and Demand Balance

2. Kenya's installed generation capacity as at June 30, 2014, stood at 1,885 MW and the maximum peak demand is 1,463 MW (excluding suppressed demand that is estimated at about 100 MW). There is occasional power rationing in West Kenya due to transmission line constraints to low voltage. In September 2013, the country rolled out a plan to develop about 5,000 MW+ by 2018, thereby increasing the installed capacity to about 6,700MW. However, the program was ambitious and so far, the procurement process of the large projects (1,920 MW coal, 800 MW LNG and GDC driven 1,000 MW geothermal) have suffered delays and cannot be completed by 2018. Currently, projects with a combined capacity 1,500MW are either under construction or at various stages of development.

3. A vigorous electrification program implemented in the last five years has seen electricity access increase from 23 percent in July 2009 to approximately 35 percent in June 2014. In FY14 alone, KPLC made 436,000 new connections and REA connected 12,500 facilities. The government's plan is to increase the electrification access rate to 70 percent by 2018

System Expansion Investment Plan

4. About US\$11.345 billion is required to be invested in the generation, transmission and distribution network between 2014- 2018 in order to secure adequacy of generation capacity and improve reliability of supply as shown in the following Tables:

Table 3: Generation Expansion 2014- 2018 (US\$ million)

	KENGEN	IPPs	KENGEN/IPPs	TOTAL
Geothermal	1,887.8	945.6	983.0	3,816.4
Wind	49.9	760.0	-	809.9
Co- Generation	-	34.7	-	34.7
Thermal	-	935.6	-	935.6
LNG	-	820.0	-	820.0
Coal	-	-	1,332.9	1,332.9
TOTAL	1,937.8	3,495.9	2,315.9	7,749.7

Source: Power Sector Medium Term Plan (moderate growth scenario project expansion costs) by LCPDP Committee

Table 9: Transmission expansion costs 2014-2018 (US\$ million)

	2014	2015	2016	2017	2018	Yearly Average
Expenditure for Transmission (US\$Million)						
Investment	450.01	452.9	601	778.95	479.19	552.41
Fixed O&M	11.25	11.32	15.026	19.48	11.98	13.81
Total	461.26	464.2	616.02	798.43	491.17	566.22

Source: Power Sector Medium Term Plan (moderate growth scenario project expansion costs) by LCPDP Committee

Table 10: Distribution expansion cost 2014-2018 (US\$ million)

	2014	2015	2016	2017	2018	Yearly Average
Expenditure for Distribution						
Investment (US\$ Million)	63	179	199	195	103	148
O&M (Additional due to these investments-3.5% of Capex)	2.21	6.27	6.97	6.83	3.61	5.18
Total	65.21	185.27	205.97	201.83	106.61	153.18

Source: Power Sector Medium Term Plan (moderate growth scenario project expansion costs) by LCPDP Committee

Planned Reforms in 2014 Energy Policy and Bill

5. The government has prepared a new national energy policy and energy law, which when approved by parliament, will shape the next generation of sector reforms. In 2010, Kenya promulgated a new Constitution which became operational in 2013. The Constitution of Kenya, 2010 significantly altered the governance structure of the country by introducing a devolved system of government (i.e., the National and the County Governments). The Constitution has apportioned functions and powers between the two levels of government and enhanced participation by the citizens in decision making processes.

6. The 2014 draft Energy Policy and Energy Bill seek to align the policy and regulatory framework of the sector with the 2010 Constitution. In particular, the Energy Bill recognizes citizens' entitlement to modern forms of energy and creates an obligation on the part of the national government and county governments to provide affordable energy services to all areas. The Energy Bill introduces more transparency in awarding concessions and licenses for exploitation of natural energy resources and establishing a committee to advise the national government on the licensing, which has to follow an open competitive process. Other key provisions of the 2014 draft Energy Policy and Bill include: (i) sharing of roles of electricity planning, development, services and regulation between the national government and county governments; (ii) provision of open access over transmission and distribution networks to eligible parties; and (iii) and requirement for a periodic review of the electricity market with a view to enhancing competition.

Annex 6: Economic and Financial Analysis (Project)

KENYA: Electricity Modernization Project

1. **Project development impact.** The primary beneficiaries of the Project will be current and new electricity customers in the areas covered by the Project who will gain access to electricity and/or enjoy more reliable electricity services. Lack of electricity access at household level exacerbates poverty conditions and is a major cause of exclusion and inequality within the country. Without electricity, children cannot study at night; home-based businesses – which are a main source of livelihoods especially among the poor – cannot grow; nearly 70 percent of Kenya’s population is forced to rely on polluting and expensive energy alternatives for meeting their basic household needs. The uneven coverage of electricity services also exacerbates disparities in terms of socio-economic status and growth opportunities among the country’s regions and between urban and rural areas.

2. Investments under Component C will raise access to electricity in high density areas close to the existing electricity networks operated by KPLC as well as by supporting the spread of off- and mini-grid approaches in remote rural areas. Investments under Component A promise to significantly improve service reliability levels and reduce un-served demand to the benefit of existing customers. In addition, the revenue protection program (RPP) envisaged under component B will enable large savings on electricity generation costs.

3. **Public versus private investment.** A substantial stake of KPLC (49.9 percent) is owned by private shareholders. Also, the company operates on a commercial basis; it has entered an annual performance contract with the government – which includes targets on new connections – and a market-standard PPA with KenGen with terms very similar to those applying to the PPAs with IPPs. Despite this clear market-orientation, which has inspired power sector reforms in the last two decades, the government has become very much aware of affordability issues that prevent prospective customers from hooking up to electricity services. The connection fee is prohibitive to most of the unconnected population. Nonetheless, the fee is insufficient to cover the connection costs borne by KPLC, which have risen exponentially in the past years imposing an unsustainable burden on the company’s finances. Expanding electricity access is recognized as a key social goal and a main element in attaining the Vision 2030. Accordingly, the government has set a target of 70 percent of household access by 2018 and universal access by 2020. Under these circumstances, the electrification program is best financed through public investment and will be supported by the Project, which will provide financing for the connection of new households.

Methodology and Assumptions

4. The economic viability of the Project is assessed based on a traditional cost-benefit analysis. The analysis is restricted to the Project activities that generate benefits for which an economic value – intended as welfare gain accruing to the society as a whole – can be clearly identified and measured. Component D is excluded because of the difficulty to value the outcomes of a technical assistance activity, which in this case include improvements in terms of institutional, organizational and regulatory capacity within the energy sector; more efficient

design and construction of electricity networks; better monitoring of service quality etc. Component E is also excluded because the benefits of the proposed IDA Guarantee are typically financial.

5. The analysis focuses on the more quantifiable benefits deriving from the Project. Specifically, two main sources of benefits have been identified:

- (a) Incremental electricity consumption resulting from the improvements in service delivery envisaged under component A and the electrification program envisaged under Component C; and
- (b) Energy cost savings resulting from reduced non-technical losses (NT) among large and medium customers as it is envisaged under Component B.

6. All main assumptions concerning electricity supply and demand are derived from the last KPLC Annual Report⁶ and summarized in Table 2 Annex 6. In particular, the available energy supply is estimated based on the total energy purchased by KPLC from all generation sources (including KenGen; IPPs; Emergency Power Producers – EPPs; and imports) as well as off-grid supply under the Government’s Rural Electrification Program. Similarly, total and monthly consumption of electricity, including by class of consumers, is derived from KPLC’s electricity sales statistics. Load growth is conservatively assumed at six percent per year – which is very much in line with the average demand growth over the last five years – as opposed to the more optimistic projections used by KPLC (seven percent in 2014 and 2015; eight percent in 2016 and 10 percent in 2017).

7. Benefits and costs are assessed separately for the relevant project components and results consolidated at the end to establish the economic rate of return (ERR) and the net present value (NPV) of the Project as whole.

8. The economic evaluation spans over a period of 20 years, in line with the typical economic life of electricity distribution infrastructure. Investment costs are assumed to be incurred over a maximum period of five years, although the disbursement schedule varies across project components. Costs exclude price contingencies and interest during construction, as it is by definition in the economic analysis. Operation and maintenance costs are assumed at a standard two percent per year of the cost of infrastructure procured under the Project. Both costs and benefits are estimated in economic terms at constant 2014 prices and set up as cash flows over the lifetime of infrastructure, including the construction and operation period. The net present value of benefits and costs is calculated using a discount rate of 10 percent.

Economic Analysis of Component A

9. A significant part of electricity demand remains unserved in Kenya because of power outages. The automation of the KPLC’s distribution network and the implementation of live-line management envisaged under Component A are intended to reduce response times in case of system interruptions and make service more reliable. Un-served demand is expected to decrease

⁶ The Kenya Power Annual Report and Financial Statements – Financial Year Ended 30 June, 2014.

significantly as outages become shorter. Specifically, given the coverage of interventions envisaged under component A, it is assumed that the average duration of interruptions – and accordingly un-served demand – will be reduced by at least 10 percent. Automation will target the network system in Nairobi, which is home to a primary growth pole in the country. Power outages in the urban and peri-urban areas of Nairobi impose big losses in terms of foregone production and large costs for running expensive self-generation. They increase the cost of doing business and frustrate firms’ productivity. As result, the economic value associated to reducing un-served electricity demand, intended as the cost of un-served energy to the economy, is huge in these areas. For the purpose of this analysis, and in the absence of better estimates, the cost of un-served energy to the economy is assumed at US\$0.84/KWh⁷, which is a rather conservative assumption given the locations involved and their growth potential.

10. Economic costs under this component comprise all investment and O&M costs associated with the installation and operation of automation and LLM equipment and technologies. Investments are assumed to start in FY16 and be completed by FY18 and benefits to materialize immediately thereafter.

Economic Analysis of Component B

11. The RPP envisaged under Component B is intended to reduce non-technical (NT) losses among large and medium customers. This group broadly corresponds to the combination of the “small commercial” and the “commercial and industrial” customer categories identified by KPLC and presented in Table 1. The two categories together account for more than 70 percent of total electricity sales; thus, protecting revenues from such a high-value segment is a top priority to KPLC.

12. The RPP is expected to bring NT losses attributable to large and medium customers – currently estimated at three percent out of the 6.7 percent for the system as whole – down to zero. As result, overall NT losses will be reduced to 3.7 percent. Two types of benefits can be associated to reducing NT losses. First, revenues from high-value customers will largely increase. This is primarily a financial benefit for KPLC and as such is not covered by this analysis. It would generate a welfare gain to the society at large – and therefore also translate into an economic benefit – if KPLC used the increased revenues to invest on improving and expanding electricity access, a circumstance that remains hypothetical at this stage. A second effect associated to lower NT losses is the reduced electricity demand by large and medium customers. As their bills increase, it is likely they will curtail their consumption, although not significantly – the demand from high-value customers, and especially from industrial customers, is notoriously not very elastic to price. The lower consumption will reduce the need for generation. The associated savings constitute the main economic benefit under this Project component. Their value is calculated based on the levelized cost of generation in Kenya, which is estimated at US\$0.12/kWh.

⁷ Derived from economic analysis of Kenya Electricity Expansion Project, 2010.

13. Economic costs include the investments for installation of AMI meters and of a meter control center, which are assumed to be incurred in two years starting from FY16, and the related operation and maintenance costs.

Economic Analysis of Component C

14. The analysis of this component focuses on the electrification of peri-urban areas to be implemented by KPLC.⁸

15. The electrification program is expected to add 125,000 residential connections to KPLC network. Approximately 50 percent of household members are expected to be female. New electricity users that will be connected under the program will experience welfare gains in many aspects, including long term social and economic benefits related to income opportunities, education, health, and general quality of life. The most commonly measured gain is the incremental consumer surplus (CS), which has two main components: (i) the avoided cost of alternative fuels for applications such as lighting and information/entertainment; and (ii) the value associated to having access to utilities that would not be available without electricity. The economic analysis assesses this variation in the CS based on the willingness to pay (WTP) for electricity of non-connected households.

16. In the absence of more updated analyses, the WTP has been derived from a socio-economic study carried out in 2008 as part of the Kenya's Rural Electrification Master Plan (REMP). Using a sample of 1,776 households, the study assessed an average monthly expenditure on electricity substitutes in the amount of US\$15. As result, the WTP for electricity on the part of non-connected households was estimated at US\$0.39/KWh. Although the proposed Project will concern different locations and probably customers with a different socio-economic profile compared to the households surveyed by the REMP, the WTP estimated by the study can be used with reasonable comfort for this analysis. The REMP findings are very much in line with those of a survey conducted by KPLC in 2006 over a sample of 800 households in peri-urban areas in preparation for the country's new connection policy. This estimated the WTP was US\$15 per month for households in regular peri-urban areas and US\$15.3 per month for households in slum areas.

17. An accurate economic analysis would require differentiating between the value attached to the amount of consumption through alternative fuels that is replaced with electricity and the value – generally lower – attached to any additional consumption that might be induced as a result of having access to electricity. In the absence of any better proxy, this analysis has used the same WTP for valuing both replaced and induced consumption. Indeed, households connected under the Project may also attribute the same utility to the two of them. Their energy consumption before being connected is presumably much lower than the average consumption of existing customers (86 kWh per month). Once connected, it may take a while before they reach the typical consumption levels of more mature customers. The analysis assumes that at least in

⁸ The off-grid electrification in rural areas is excluded for now since the exact scope, implementation modalities and locations covered by this sub-component remain to be defined.

the first few years their consumption will not exceed 50 KWh per month, the lowest bound in the residential customer segment. The induced consumption would account only for a little share of total consumption. Also, such a low consumption will not pose affordability issues. Most likely, new customers will have an electricity bill lower than what they used to pay for alternative energy sources.

18. Economic costs include the investments costs identified for installation of new connections, which are expected to be incurred over four years starting from FY16; the costs related to their operation and maintenance; as well the costs associated with serving the incremental electricity consumption, which is estimated based the levelized cost of generation.

Results

19. Based on the methodology and assumptions described above, the estimated ERR and the NPV of the Project as a whole are 19.6 percent and US\$181.6 million respectively (Table 2). As result, the Project is assessed to be economically viable.

Table 2: Summary of economic analysis

Base Case	NPV (US\$ million)	ERR (%)
Component A	45.9	20.4%
Component B	75.1	29.1%
Component C	60.6	15.7%
Project	181.6	19.6%

20. The disaggregation of results by project components shows that returns are very high for components A and B. In particular, the revenue protection program envisaged under component B is the most beneficial. Its ERR is very high (above 29 percent), which proves the great profitability of reducing NT losses among high-value customers. Component A is the second largest source of benefits, with an ERR above 20 percent and a NPV of US\$45.9 million. The ERR of the electrification program (close to 16 percent), although the lowest among project components, is very much in line with average rates of return of investments in distribution network expansion and/or rehabilitation. A detailed economic analysis is presented in Table 3.

Table 3: Economic analysis summary

Component A - Improvements in service		FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY35
Without project													
Electricity consumption	GWh/year	6,513	6,903	7,318	7,757	8,222	8,715	9,238	9,793	10,380	11,003	11,663	20,887
Unserviced demand due to service	GWh/year	100.4	106.4	112.8	119.5	126.7	134.3	142.4	150.9	160.0	169.6	179.7	321.9
With project													
Unserviced demand due to service	GWh/year	100.4	106.4	112.8	119.5	114.0	120.9	128.1	135.8	144.0	152.6	161.8	289.7
BENEFITS													
Reduced unserved demand	GWh/year	-	-	-	-	12.7	13.4	14.2	15.1	16.0	17.0	18.0	32.2
TOTAL BENEFITS	US\$	-	-	-	-	10.6	11.3	12.0	12.7	13.4	14.2	15.1	27.0
COSTS													
Capex	US\$ mil.	-	15.0	20.0	15.0	-							
O&M	US\$ mil.	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TOTAL COSTS	US\$ mil.	-	15.0	20.0	15.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
NET BENEFITS	US\$ mil.	-	(15.0)	(20.0)	(15.0)	9.6	10.3	11.0	11.7	12.4	13.2	14.1	26.0
Component B - Revenue Protection		FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY35
Without project													
Non-technical losses	%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%
Energy sent out	GWh/year	8,572	9,087	9,632	10,210	10,822	11,472	12,160	12,889	13,663	14,483	15,352	27,492
Non-technical losses	GWh/year	574.3	608.8	645.3	684.0	725.1	768.6	814.7	863.6	915.4	970.3	1,028.6	1,842.0
With project													
Energy sent out	GWh/year	8,572	9,087	9,632	10,210	10,822	11,472	12,160	12,889	13,663	14,483	15,352	27,492
Non-technical losses	%	6.7%	6.7%	6.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
Non-technical losses	GWh/year	574.3	608.8	645.3	377.8	400.4	424.4	449.9	476.9	505.5	535.9	568.0	1,017.2
Reduced technical losses	GWh/year	-	-	-	306.3	324.7	344.1	364.8	386.7	409.9	434.5	460.5	824.8
BENEFITS													
Saved energy costs	US\$	-	-	-	11.4	12.1	12.8	13.6	14.4	15.3	16.2	17.1	30.7
TOTAL BENEFITS	US\$	-	-	-	11.4	12.1	12.8	13.6	14.4	15.3	16.2	17.1	30.7
COSTS													
Capex	US\$ mil.	-	20.0	20.0	-	-							
O&M	US\$ mil.	-	-	-	-	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
TOTAL COSTS	US\$ mil.	-	20.0	20.0	-	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
NET BENEFITS	US\$ mil.	-	(20.0)	(20.0)	11.4	11.3	12.0	12.8	13.6	14.5	15.4	16.3	29.9
Component C - Electrification of households		FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY35
New connections	#	-	-	-	40,000	85,000	125,000	125,000	125,000	125,000	125,000	125,000	125,000
Total incremental consumption	GWh/year	-	-	-	24.0	51.0	75.0	79.5	84.3	89.3	94.7	100.4	179.7
BENEFITS													
Value of incremental consumption	US\$ mil.	0.0	0.0	0.0	10.5	22.4	32.9	34.9	37.0	39.2	41.5	44.0	78.9
COSTS													
Capex	US\$ mil.	0.0	30.0	45.0	45.0	30.0							
O&M	US\$ mil.	0.0	0.0	0.0	0.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Cost of providing incremental consumption	US\$ mil.	0.0	0.0	0.0	3.0	6.3	9.3	9.9	10.5	11.1	11.7	12.5	22.3
TOTAL COSTS	US\$ mil.	0.0	30.0	45.0	48.0	38.4	12.3	12.9	13.5	14.1	14.7	15.5	25.3
NET BENEFITS	US\$ mil.	0.0	-30.0	-45.0	-37.4	-16.0	20.6	22.0	23.5	25.1	26.8	28.6	53.6
AGGREGATE		FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY35
TOTAL NET BENEFITS	US\$ mil.	-	(65.00)	(85.00)	(41.05)	4.93	42.89	45.75	48.78	52.00	55.41	59.02	109.49

Source: Bank's team calculations

Sensitivity Analysis

21. A sensitivity analysis has assessed the robustness of the Project under less favorable conditions that may affect project implementation such as project cost overruns as well as changes in the main assumptions used by the analysis that may reduce the economic value of the Project.

22. Project costs overruns of 15 and 20 percent reduce the ERR of the Project to 17.1 and 16.4 percent respectively (Table 4). These are still satisfactory outcomes. A reduction of NT losses of two percentage points, as opposed to the three assumed in the base case scenario, makes the RPP envisaged under component B much less profitable. The ERR for this component drops to 20.5 percent; its NPV to US\$36.9 million, half than in the base case scenario. Nonetheless, the impact on the Project as whole is not significant; ERR and NPV decrease to 17.7 percent and US\$143.4 million respectively. Similarly, if the average duration of service interruptions envisaged under component A is reduced by eight percent – as opposed to the estimated 10 percent – the ERR and the NPV of the Project decrease only marginally to 18.7 percent and US\$163 million respectively. The viability of component A is more severely affected, although the ERR and the NPV remain high at 16.6 percent and US\$27.3 million respectively.

23. A further sensitivity analysis has assessed the impact of higher levels of electricity consumption among newly connected households. In particular, the analysis has assumed that new customers immediately start consuming the same amount of electricity as existing customers. If so, the ERR and NPV of component C would jump to 26.2 percent and US\$201.1 million respectively. The Project as a whole would become much more profitable; the ERR would increase to 25.5 percent, the NPV to US\$322.1 million.

Table 4: Sensitivity Analysis

ERR (%)	Component A	Component B	Component C	Project
<i>Base case</i>	20.4%	29.1%	15.7%	19.6%
Project cost overruns = + 15 percent	18.0%	25.9%	13.5%	17.1%
Project cost overruns = + 20 percent	17.3%	25.0%	12.8%	16.4%
NT reduction of 2%	20.4%	20.5%	15.7%	17.7%
Reduction of average duration of service interruptions of 8%	16.6%	29.1%	15.7%	18.7%
Average HH consumption once connected = 86 kWh/month	20.4%	29.1%	26.2%	25.5%
NPV (US\$ million)	Component A	Component B	Component C	Project
<i>Base case</i>	45.9	75.1	60.6	181.6
Project cost overruns = + 15 percent	38.8	69.2	40.4	148.4
Project cost overruns = + 20 percent	36.5	67.2	33.7	137.3
NT reduction of 2%	45.9	36.9	60.6	143.4
Reduction of average duration of service interruption of 8%	27.3	75.1	60.6	163.0
Average HH consumption once connected = 86 kWh/month	45.9	75.1	201.1	322.1

24. A switching value analysis has also been carried out to identify the variation in the main parameters considered above that would make the Project and selected components unviable (table 5). The ERR of the Project as a whole would drop below the hurdle rate of 10 percent if costs overruns nearly double (increase by 90 percent), which is highly unlikely. A reduction of the average duration of service interruption by only five percent would make component A

unviable and reduce the ERR and the NPV of the Project as a whole to 17.4 percent and US\$134.9 million. If NT losses are reduced by only one percentage point, component B would become unviable and the ERR and NPV of the Project would drop to 15.8 percent and US\$105.2 respectively.

Table 5: Switching Value Analysis

ERR (%)	Component A	Component B	Component C	Project
<i>Base case</i>	20.4%	29.1%	15.7%	19.6%
Project cost overruns = + 90 percent	10.5%	16.3%	6.3%	9.4%
NT reduction of 1%	20.4%	9.5%	15.7%	15.8%
Reduction of average duration of service interruptions of 5%	9.8%	29.1%	15.7%	17.4%
NPV (US\$ million)	Component A	Component B	Component C	Project
<i>Base case</i>	45.9	75.1	60.6	181.6
Project cost overruns = + 90 percent	3.2	39.5	(60.7)	(18)
NT reduction of 1%	45.9	(1.3)	60.6	105.2
Reduction of average duration of service interruptions of 5%	(0.8)	75.1	60.6	134.9

Financial Analysis

25. The project financial analysis is built on base case assumptions and sensitivity analysis scenarios which are strictly aligned with the economic analysis. However, the Project financial analysis takes a different perspective and considers the costs and benefits associated with Project activities from the perspective of the implementing entity. The objective is to assess and quantify the net impact of the Project on KPLC's financial position. With regard to costs (capital costs and operating expenditures), the costs assumptions used in the project financial analysis are shared with the project economic analysis. With regard to project benefits, the analysis considers the additional revenues accruing to KPLC as a result of the project. The implication is that the impact of the Project on consumer surplus (from additional access or increased reliability) is not considered in the benefits. On the contrary, increased revenue collection is accounted as project benefit for the financial analysis, whereas, in first instance, from the economic analysis perspective it is considered as a zero-sum transfer from consumers to the utility company.

26. Based on this methodology, the Financial Internal Rate of Return (FIRR) and Financial Net Present value (NPV, calculated for a 10 percent discount rate) of Project investments are satisfactory overall, and significantly higher than for the economic analysis. In the base case scenario, the financial NPV and FIRR of Project Investments are at US\$408 million and 51.9 percent respectively.

27. There are two reasons for the high financial return of the project. The first one is related to the very high NPV of revenue protection activities (under Component B). This is not surprising since the first impact expected from revenue protection measures is a transfer of revenue to KPLC which will in turn incentivize consumers to use energy more efficiently. The second relates to the financing of access expansion (under component C) which will be passed on as grant to KPLC. As a result, access expansion is expected to have a small positive NPV for KPLC, which will not bear the initial capital expenditure costs and collect incremental revenue from new customers slightly in excess of incremental operating costs.

28. The overall FIRR and NPV of the project activities would remain robust under all sensitivity scenarios considered. The least favorable is the scenario under which revenue protection activities manage to reduce distribution losses by only 1.0 percent instead of the 3.0 percent assumed in the base case scenario. In this case, the overall project FIRR would be 22.2% and the NPV US\$95 million.

29. Overall, in first instance, the Project is expected to have a positive financial impact on KPLC. Improved revenue collection would more than offset the costs incurred by the company to significantly expand access and improve reliability of supply. In the long term, the financial viability of KPLC, which is a distribution utility, will largely depend on its tariff regulation regime and it's the ability of the company to meet the targets assigned by the regulator and the GoK with regard to access, quality of service and efficiency. In this respect, the project will also put KPLC in an improved position.

Annex 7: Financial Analysis of KPLC
KENYA: Electricity Modernization Project

1. The following financial analysis was performed on the basis of KPLC’s audited financial statements for the fiscal years ended on June 30 of 2011, 2012, 2013 and 2014. Financial projections were prepared by PriceWaterhouseCoopers (PWC) in its capacity as financial advisor to KPLC.

Ownership and Business Activities

2. KPLC is majority owned and controlled by the GoK through a 50.1 percent direct equity interest. The balance of the Company’s shares is owned by private parties, either directly or through nominees. KPLC’s shares are listed at the Nairobi Securities Exchange. Private investors do not have representation in the Board.

3. The main business activity of KPLC is the distribution and retail sale of electricity to consumers in Kenya. For this purpose the Company purchases electricity in bulk from Kenya Electricity Generating Company Limited (KenGen) which is 70 percent directly owned by the GoK, Independent Power Producers (IPPs), Uganda Electricity Transmission Company Limited (UETCL) and Tanzania Electricity Supply Company Limited (TANESCO).

Historical Financial Performance

4. The Table below summarizes KPLC’s financial performance during the period from July1st 2010 through June 2014.

Historical Financial Highlights							
<i>KSh million</i>							
	2010/11	2011/12	YoY % var	2012/13	YoY % var	2013/14	YoY % var
Revenues							
Electricity Sales	42,486	45,008	6%	47,916	6%	62,597	31%
Fuel Cost Adjustment	25,913	41,896	62%	31,771	-24%	38,376	21%
Other	4,755	8,759		9,222		4,422	
Total Revenues	73,154	95,663	31%	88,909	-7%	105,395	19%
Operating Expenses							
Power Purchase Cost (ex-fuel)	20,214	21,080	4%	24,761	17%	30,659	24%
Fuel Costs	26,151	42,789	64%	32,297	-25%	38,973	21%
F/x cost	3,425	6,094	78%	5,120	-16%	3,008	-41%
Other	17,695	19,680		21,028		22,796	
Total Operating Expenses	67,485	89,643	33%	83,206	-7%	95,436	15%
Operating Income	5,669	6,020	6%	5,703	-5%	9,959	75%
Finance Cost	415	1,216	193%	2,495	105%	4,009	61%
Profit	4,220	4,617	9%	3,446	-25%	6,456	87%

Assets							
Current Assets	35,151	28,159	-20%	37,728	34%	50,412	34%
Fixed Assets	86,020	105,973	23%	146,485	38%	169,697	16%
Total Assets	121,171	134,132	11%	184,213	37%	220,109	19%
Current Liabilities							
Borrowings	4,764	6,250	31%	8,193	31%	16,968	107%
Bank overdraft	-	1,690	n/a	6,758	300%	3,567	-47%
Other	23,367	23,443		23,924		28,312	
Total Current Liabilities	28,131	31,383	12%	38,875	24%	48,847	26%
Long-Term Liabilities							
Borrowings	19,757	21,512	9%	42,886	99%	53,141	24%
Other	26,204	25,362		39,213		45,234	
Total LT Liabilities	45,961	46,874	2%	82,099	75%	98,375	20%
Total Liabilities	74,092	78,257	6%	120,974	55%	147,222	22%
CAPEX	24,714	25,950	5%	42,631	64%	26,651	-37%

Income Statement

5. Revenues: KPLC operates as a commercial company aiming for full cost recovery through a regulated tariff structure. The company does not receive any subsidies and their revenues are fully dependent on the retail tariff and electricity sales/market demand. Costs associated with fuel and foreign exchange are passed through and recovered from customers, therefore they are accounted for as revenues and as expenses. Historically, KPLC's revenues display significant YoY variation which is mostly attributable to annual changes in fuel mix resulting from variable hydrology. In years with poor hydrology such as 2011/12 and 2013/14 power generation relied heavily on thermal plants, consequently the fuel cost component of the revenues escalated substantially. The meaningful increase in Electricity Sales between 2012/12 and 2013/14 is the result of the combined effect of the retail tariff adjustment effective from December 2013 and a 10 percent increase in volumes sold during the calendar year. Operating Expenses have remained stable over the years. Annual variations are related to the fuel mix and to the additional power purchases needed to satisfy increased demand and sales. Operating Income has therefore remained stable reflecting the combined effect of the cost recovery nature of the tariffs and the pass through of the most variable and significant element of the operation i.e. fuel cost. Again, the sharp increase in 2013/14 reflects the combined effect of increased sales and higher tariffs.

6. In contrast, non-Operating Costs and in particular, Finance Costs (Interest on Loans) multiplied during the period, increasing from the equivalent to US\$5 million in 2010/11 to US\$45 million in 2013/14: a nearly nine-fold increase in 4 fiscal years. This change reflects the substantial increase in KPLC's debt during the same period: from the equivalent to US\$288 million in 2010/11 to US\$828 million in 2013/14. Please refer to Balance Sheet below for additional information.

7. Operating Profit remained stable during the period despite the substantial increase in Financing Cost mostly as a result of the substantial and steady increase (approximately 20

percent per year) in depreciation associated with additional assets. The substantial increase in 2013/14 is the result of improved revenues.

Balance Sheet

8. Assets: KPLC's assets grew in excess of 80 percent between 2010 and 2014. This was the result of a large Capital Investment program associated mostly with new connections and to a lesser extent with service improvement investments such as expansion and upgrading of the distribution network. These investments required expenditures equivalent to US\$291 million in 2010/11, US\$305 million in 2011/12, US\$500 million in 2012/13 and US\$300 million in 2013/14. Notably, due to their development nature, these investments do not result in immediate and proportional revenue increase and instead demand prolonged amortization periods. The investments in new connections placed a particularly heavy burden on KPLC as connection fees paid by new customers were insufficient to pay for connection costs forcing KPLC into a situation where the Company subsidized ~70 percent of connection costs equivalent to ~USD 700,000 per customer.

9. Debt: The Capital Investment program mentioned above was financed with a combination of cash from operations (~25 percent) and new debt (~75 percent). Due to the unplanned and accelerated pace of the investments related to new connections, KPLC was unable to secure long-term concessional funding and instead had to resort to medium and short term Commercial Loans and Bank Overdrafts creating a situation of Asset-to-Liability mismatch. The Company's debt profile changed with higher interest rates and shorter tenors which reflect commercial market conditions as well as the progressively weaker financial condition of the Company.

10. The quality of KPLC's assets has improved over time, with an increased share of new and well-performing assets. The company's indebtedness level, although high is still at acceptable levels with Net Leverage of 50 percent and Debt to EBITDA of 3 times. Nonetheless, due to the moderate pace of revenue growth the Company's ability to generate sufficient cash to repay their debt as due while continuing with their service improvement investments is a matter of concern. This is analyzed in the following section.

Cash and Liquidity Position

11. KPLC's cash position evolved from a positive balance equivalent to US\$114 million in 2010/11 to a low of US\$9.4 million in 2011/12, and a negative US\$23 million in 2012/13 when KPLC's cash reserves were fully depleted to pay for its accelerated investment program. As of June 2014 KPLC had returned to positive cash levels, however the Company is still facing difficulties to meet its ongoing payment obligations on a timely basis and continues supporting itself with Bank Overdrafts (US\$40 million as June 2014) to make up for the cash gaps.

12. KPLC's annual Debt Service stands at approximately US\$130 million, which constitutes more than 50 percent of the Company's Cash from Operations. Debt maturities for the next five years amount to an aggregate of US\$494 million, of which over US\$400 million relate to short and medium-term commercial debt – please see the following table.

USD million	2015	2016	2017	2018	2019
Debt Repayment	146	118	111	71	47

13. In addition, the Company requires funds to implement essential investments associated with improvement in the quality and the reliability of the service as well as critical system upgrades and expansions. In the past, these investments have exceeded the US\$200 million and approximately 25 percent was funded with cash.

Financial Ratios

14. The increase in KPLC's total debt, the use of short-term debt to finance long-term investments, the size of the investment program vis-à-vis the Company's cash generation capacity and the subsidization of connections, has resulted in a significant erosion of KPLC's liquidity position and a negative evolution of the Company's financial ratios during the past four fiscal years as illustrated in the table below.

Ratios	2010/11	2011/12	2012/13	2013/14
Debt/EBITDA (x)	1.55	1.92	3.70	3.08
EBITDA/Interest (x)	25.34	11.75	5.87	5.21
CFO/Debt	60%	45%	28%	26%
FOCF/Debt	-41%	-43%	-46%	-10%
Net Debt/Net Debt+Equity	25%	38%	52%	50%

15. KPLC is currently in compliance with the Current Ratio and in breach of the Debt Service Coverage Ratio and the Self Financing Ratios under the Project Agreement for the KEEP.

IDA Ratios	Requirement	2013/14
DSCR	>1.2x	0.55
Current Ratio	>1.0x	1.03
Self Financing Ratio	>25%	-25%

Conclusion

16. KPLC's financial structure has changed significantly in the past four years. The Company's balance sheet has grown on the back of substantial investments (approximately US\$1.4 billion), however the fast investment pace does not reconcile with KPLC's moderate revenue growth. The funding structure whereby long-term assets were financed with short- and medium-term loans and development investments were financed with commercial funds resulted in the erosion of KPLC's financial position and placed its financial integrity in jeopardy. This investment and financing strategy is not suitable for the Company and is not sustainable going forward.

17. KPLC is in urgent need of a comprehensive overhaul of its financing structure and strategy. A refinancing/restructuring of KPLC's commercial debt is essential in order to extend and reschedule maturities and to reduce interest rates to match the company's debt servicing

capacity. Going forward, KPLC's incremental investments should be subject to strict planning focused on service needs and independent from government policies, in order to ensure affordability without threatening the company's financial sustainability. Furthermore, investments associated with access to electricity (i.e., new connections) which placed a heavy burden on KPLC in the past and created the current liquidity constraints, should no longer be financed with KPLC's resources but instead with separate funds raised by the GoK, while KPLC should only be in charge of technical implementation.

Financial Projections

To be completed based on the ongoing work of the Financial Adviser PWC

Profit and Loss

To be completed based on the ongoing work of the Financial Adviser PWC

Cash Flow and Liquidity

To be completed based on the ongoing work of the Financial Adviser PWC

Balance Sheet

To be completed based on the ongoing work of the Financial Adviser PWC

Annex 8: IDA Guarantee Term Sheet
KENYA: Electricity Modernization Project

**PRELIMINARY SUMMARY OF INDICATIVE TERMS AND CONDITIONS
OF THE PROPOSED IDA GUARANTEE**

This term sheet contains a preliminary general summary of indicative terms and conditions of a potential IDA Guarantee (the Guarantee) for a private-sector financing to be contracted by KPLC. These terms would be subject to further development based on KPLC choice regarding the financing structure and the mix of financing sources to be used for their expansion plan.

This term sheet does not constitute an offer from IDA to provide a Guarantee. The provision of the Guarantee is subject, inter alia, to satisfactory appraisal by IDA of the operation, further consideration, selection, review and acceptance of the underlying financing structure and transaction documentation, and the approval of Management and the Board of Executive Directors of IDA in their sole discretion.

[Borrower]⁹ [Issuer]¹⁰: The Kenya Power and Lighting Company Limited (KPLC)

Guarantor: International Development Association (IDA)

Guaranteed

Beneficiaries: [Commercial bank lender(s) to be identified /noteholders]

Use of proceeds: Restructuring of KPLC's existing commercial debt

Financing currency: Kenya Shilling or USD

Financing amount: Up to US\$ [500] million

Maximum IDA

Liability: [A partial amount of financing, not to exceed US\$200 million]

Final maturity: [To be decided]

Guaranteed Event: Failure by the [Borrower/Issuer] to repay [TBD].

Guarantee Support: IDA would cover any outstanding scheduled payment of [TBD] up to the Maximum IDA Liability, which the [lenders][noteholders] would have otherwise received from the [Borrower/Issuer] under the guaranteed financing documents, but for the occurrence of a Guaranteed Event.

Choice of law: [To be determined]

Status of the IDA

Guarantee: The obligations of IDA under the IDA Guarantee will constitute direct, unsecured obligations of IDA ranking pari passu, without any preference among

⁹ If loan.

¹⁰ If debt security placement.

themselves, with all of its other obligations that are unsecured and unsubordinated.

IDA Guarantee Fee: The Beneficiaries will pay to IDA a Guarantee Fee of [0.75] percent on the *present value* of the Maximum IDA Liability, payable [on each fee payment date in advance of each fee period against the average balance of the present value for such a fee period][upfront]¹¹.

Other provisions related to IDA's policy and legal requirements for guarantees:

Subrogation: If IDA makes a payment under the Guarantee, IDA would be entitled to stand in the place of the [lenders][noteholders] and exercise the rights of such [lenders][noteholders] to seek reimbursement for amounts paid by IDA.

Amendments and waivers: IDA will be entitled to be kept fully informed about any proposed waiver or amendment to the terms of the transaction. Certain amendments or waivers to the provisions of the finance documentation and guarantee, insofar as they relate to the Guarantee, require the prior written consent of IDA, including but not limited to any material amendment or modification to a finance document or any amendment or waiver that materially and adversely affects the rights and obligations of IDA.

[Suspension: IDA may, during the availability period for drawdown of the guaranteed financing, inform the Agent that no further drawdown of the guaranteed financing, from the date of notification by IDA up until such notice is revoked by IDA, will be covered by the Guarantee upon the occurrence of the following types of scenarios, *inter alia*: (i) an event of default occurs under the guaranteed financing; (ii) KPLC has breached a material obligation under the Project Agreement and such breach continues after any applicable cure period; or (iii) the Agent or a beneficiary of the Guarantee engaged in certain sanctionable practices (fraud, corruption, coercion, collusion, obstruction) relating to the guaranteed financing. If the event giving rise to a suspension has been waived by IDA, or remedied to IDA's satisfaction, then IDA may revoke its suspension notice and let the Agent know which amounts are reinstated for coverage under the Guarantee]¹².

Exclusion: IDA may deny payment to a beneficiary of the Guarantee in the following types of scenarios, *inter alia*: (i) a sanctionable practice (fraud, corruption, coercion, collusion, obstruction) has been found to have been committed by the Agent or a beneficiary of the Guarantee; (ii) the Agent or a beneficiary of the Guarantee, *inter alia*, amends the guaranteed financing documents, [or transfers, or assigns the loan to a non-commercial lender]¹³

¹¹ Fee payment method (upfront or on each fee payment date) to be chosen by KPLC. For clarity, fee payment dates are expected to coincide with interest payment dates for the guaranteed financing.

¹² This clause would only be applicable if there were expected to be multiple disbursements of the financing (that is, if there were to be an availability period for drawdowns).

¹³ If the underlying financing is a loan, then, except as IDA may otherwise agree, assignments or transfers of the guaranteed loan may only be to an entity established as a bank or financial institution duly licensed to carry out banking or financial business in its country of domicile. Such assignee may be a partly or wholly government-owned institution, but cannot be an export credit agency, multilateral institution or state entity. Such assignee must not have been declared ineligible to be awarded an IDA-financed contract in accordance with World Bank Sanctions

without IDA's prior written consent; (iii) the Agent or a beneficiary under the Guarantee engages in Repackaging Arrangements in respect of the Guarantee.

Repackaging Arrangements: The [lenders][lead managers] will severally undertake for the benefit of IDA that, provided the Guarantee remains in effect, they will not enter into or permit any of their affiliates to enter into any arrangement pursuant to which any security or other similar obligation is created or issued, the economic effect of which is the separation of rights of payment from IDA under the Guarantee and of rights of payments from KPLC under the financing, which is referred to as "Repackaging Arrangements".

IDA Obligations Binding: IDA's obligations under the Guarantee shall be binding upon IDA and remain in full force and effect until payment in full of the obligations of IDA under the Guarantee or termination of the Guarantee, as the case may be, provided that the obligations of IDA under the Guarantee shall not be treated as a separate obligation of IDA independent from the principal amount guaranteed.

Termination: IDA may terminate the Guarantee in the following types of scenarios: (i) untrue statements are made by the Agent or a beneficiary of the Guarantee in connection with a demand for payment under the Guarantee; (ii) the IDA Guarantee Fee is not paid; or (iii) the Guarantee is otherwise terminated due to full repayment of guaranteed amounts.

No Discharge: Neither the obligations of IDA under the Guarantee nor the rights, powers and remedies conferred upon the Agent with respect to IDA by the Guarantee or by applicable law or regulation shall be discharged, impaired or otherwise affected by: (i) any insolvency, moratorium or reorganization of debts of or relating to KPLC; (ii) any of the obligations of KPLC under the financing agreements being or becoming illegal, invalid, unenforceable, void, voidable or ineffective in any respect; (iii) any time or other indulgence being granted to KPLC in respect of its obligations under the financing agreements; or (iv) any other act, event or omission (other than the failure of the Agent to make a timely and duly completed demand under the Guarantee) which might otherwise operate to discharge, impair or otherwise affect any of the obligations of IDA under the Guarantee or any of the rights, powers or remedies conferred on the Agent by the Guarantee or by applicable law or regulation.

Reduction of Demand: If, after the Agent has made a demand on IDA for payment under the Guarantee, but before IDA has made payment of the amount so demanded, the Agent receives payment in respect of such amount from KPLC (or the Agent recovers otherwise than from IDA) any sum which is applied to the satisfaction of the whole or any part of such amount, the Agent shall promptly notify IDA of such fact and IDA's liability under the Guarantee in respect of such demand shall be reduced by an amount equal to the portion so paid by KPLC (or so recovered by the Agent) and so applied.

Conditions Precedent: Usual and customary conditions for financing of this type including the following:

Procedures and must not be an entity included on the consolidated list of individuals and entities maintained by the United Nations Security Council Committee established pursuant to United Nations Security Council Resolution 1267.

- a) Provision of relevant legal opinions satisfactory to IDA (including a legal opinion from the Attorney General of the Republic of Kenya relating to the Indemnity Agreement and a legal opinion from a duly authorized official of KPLC);
- b) Payment in full of the [first installment of the] Guarantee Fee; and
- c) Conclusion of a Project Agreement between KPLC and IDA, an Indemnity Agreement between IDA and the Republic of Kenya (Kenya) , a [Guaranteed Loan Agreement among the Agent, Lender[s], KPLC and IDA]¹⁴ or [Fiscal Agency Agreement among the Agent, KPLC and IDA, a Warranty Agreement among the lead managers and IDA] ¹⁵, and any other applicable documentation.

Indemnity Agreement: Kenya will enter into an Indemnity Agreement with IDA in respect of the Guarantee under which it will undertake to reimburse and indemnify IDA on demand, or as IDA may otherwise direct, for all payments under the Guarantee and all losses, damages, costs, and expenses incurred by IDA relating to or arising from the Guarantee.

Any obligation by Kenya to reimburse IDA for payments made under the Guarantee will rank *pari passu* with all other external indebtedness of Kenya, including external indebtedness of Kenya to IDA.

Project Agreement: Agreement between KPLC and IDA with respect to implementation of the operation setting out the requirements¹⁶ on institutional arrangements, use of proceeds, etc.

[Warranty Agreement:]

[If debt security placement, KPLC would enter into a Purchase Agreement with the lead managers (initial purchasers) of its note. IDA would enter into a Warranty Agreement with the lead managers in order to make and receive certain representations and warranties about the information each set of parties provides to the other in that type of transaction, as well as to receive certain undertakings from the lead managers about not entering into Repackaging Arrangements (as described above), etc.]

Supplemental

LETTERS: SUPPLEMENTAL LETTERS FROM KPLC AND KENYA, AS APPLICABLE, TO IDA SUBSTANTIALLY SIMILAR TO THOSE IN IDA FINANCIAL INTERMEDIARY LENDING: (1) LETTER FROM KENYA REGARDING PROVISION OF ECONOMIC AND FINANCIAL DATA, (2) LETTER FROM KPLC CONTAINING CERTAIN REPRESENTATIONS AND (3) LETTER FROM KPLC REGARDING PERFORMANCE INDICATORS

¹⁴ If loan (the Guarantee would be included in the loan agreement with KPLC and the lenders)

¹⁵ If debt security placement, the Guarantee would be included in the fiscal agency agreement with KPLC and the fiscal agent.

¹⁶ These requirements are expected to be similar to those in previous FIL loan agreements with KPLC.

Annex 9: National Electrification Strategy
KENYA: Electricity Modernization Project

1. Key institutional design features of the National Electrification Strategy (NES) are:
 - All investments needed to actually connect new users must be included in the scope of the electrification works. In order to remove the insurmountable barrier created by unaffordable (and conceptually unsuitable) connection fees, electrification of a certain area must comprise all the supplies and construction works (investments) needed to connect all new users in the area (including individual connections). New users will pay a charge to cover only operating costs of the activities carried by the Kenya Power and Lighting (KPLC) to connect them (inspection of internal premises, installation of the meter, etc.).
 - All electricity users countrywide will pay a regular “electrification charge (EC)” together with the monthly bill for electricity consumption issued by KPLC. Revenues collected from the EC will be completely separated (“ring fenced”) from tariff revenues for service provision through full transfer of the EC by KPLC to the special-purpose “National Electrification Fund (NEF)”.
 - Planning of electrification must address the following matters: (i) prioritization: the definition of a clear, transparent and objective system to prioritize the areas to receive electricity and the projects to be selected; (ii) institutional aspects: definition of roles in the planning process of stakeholders involved in the electrification program; (iii) technical planning: definition of service quality levels to be achieved and identification of optimum technology options (from a country perspective) to extend national grid and develop mini grids and individual systems meeting the predefined service quality levels; (iv) financial planning: identification of sources of funds needed to carry out investments and ensure service sustainability.
 - Grid extension versus mini grids and off-grid: “Grid level” service is the permanent (or “steady state”) condition to be achieved in all cases. However, transitory solutions may be considered in cases where “grid level” service is not viable in the short and medium term. Off-grid electrification (through mini-grids or individual systems) could be considered as a *transitory option* suitable in remote areas, as the service they provide can represent a clear improvement in the quality of life of beneficiaries, even without reaching “grid level” service. Implementation of transitory solutions should be based on the priorities for electrification.

2. Institutional aspects to be addressed in the design of the NES are the roles of Ministry of Energy and Petroleum (MoEP), KPLC, Rural Electrification Authority (REA), Energy Regulatory Commission (ERC), communities and other stakeholders in the planning process. The electrification strategy must involve and commit all sector stakeholders and local community participation. Involving local communities from the start can help improve the design, gain local support, mobilize contributions in cash or in kind, and increase local ownership, contributing to operational sustainability.

3. **Technical aspects in planning of the NES include:**

- Definition of acceptable quality-of-service levels (may be different for urban and rural areas). Quality-of-service levels should be established through specific standards based on customers' acceptance and willingness to pay for the cost of a specific quality level. Standards should be set for both technical and commercial dimensions of the service. Required levels of service and associated penalties and rewards should be phased in over time and synchronized with tariff levels (full enforcement of the service quality regime requires tariff levels allowing recovery of total costs of efficient service provision).
- Optimization of technical design: determination of the most cost-effective options to achieve service quality levels. Incorporating low-cost technologies (single wire earth return and others) in the planning and design stage can make possible to drastically reduce investment costs while meeting predefined service quality levels. This could have an enormous impact on accelerating the pace and scope of electrification programs. Centralized procurement could also help to optimize investment costs.

4. **Main financial aspects to be addressed in the design of the NES are:**

- Review of current arrangements for financing electrification towards the creation of a National Electrification Fund (NEF). In the 1970's, the government established a rural electrification program including the creation of a dedicated fund to manage a five percent levy charged to all electricity customers nationwide to support the electrification of the country (Rural Electrification Program Levy Fund - REPLF). This approach is fully valid from the conceptual point of view. Current arrangements should be reviewed and adjusted to allow the establishment of a National Electrification Fund (NEF) that becomes the key financial support for the implementation of the national electrification strategy.
- Definition of optimized arrangements for the NEF: in consistency with the key design features of the NES, the NEF should finance all investments needed to connect all new regular users located in the area to be electrified (large industrial projects are excluded from the NES basic approach and considered on an "ad-hoc" basis). Main aspects to be addressed in the creation and management of the NEF include:
 - Sources of funds: government budget, loans/grants provided by development partners (DPs), contributions from all electricity users based on affordability (specific tariff charge), reimbursable contributions from new users, etc.
 - Operational and fiduciary management: definition of clear procedures to ensure effectiveness, transparency and accountability in the operational and fiduciary management of the NEF, and full consistency with other all components of the NES.

5. Providing additional tariff revenues to KPLC to recover efficient costs of service provision to new users meeting quality standards. Under the proposed NES, KPLC will be the implementing agency of investments in electrification funded by the NEF countrywide. Costs incurred by KPLC to provide service to all its customers meeting the predefined quality standards will be recovered through regular tariff revenues. KPLC will not be responsible for financing any electrification work not included in its tariff revenues.

6. Implementation of the NES implies reforms to address: (i) institutional aspects (in essence the roles of MoEP, KPLC, REA, ERC, communities and other stakeholders in the implementation process); (ii) technical matters (optimized arrangements for design and procurement of specific projects, construction works and supervision, commissioning and operation, systematic monitoring of service quality by ERC); and (iii) financial aspects (mainly implementing and ensuring sustainability of the NEF through the application of procedures aimed to promote effectiveness, transparency and accountability in the operational and fiduciary management of the fund, including mechanisms for supervision, oversight and audit.

7. As already indicated, preparation of the NES is the main task in Component D (technical assistance) of the KEMP. However, the GoK, KPLC and the World Bank agree that there is no reason to wait until the NES is ready to apply the main reform concepts supporting it to implement electrification projects allowing the achievement of significant results that will further strengthen the strategy. The electrification of peri-urban areas to be implemented under Component C1 will show the way towards the sustained application of the NES countrywide at the fastest pace compatible with financial resources available.

Annex 10: Scaling-Up Renewable Energy Program (SREP) in Low Income Countries

KENYA: Electricity Modernization Project

Indicator	SREP/IDA KEMP Project Component C2 (Off-grid Electrification)¹⁷	Transformational Scaled-up Phase: <i>Kenya Vision 2030</i>
Number of women and men, businesses and community services benefiting from improved access to electricity as a result of SREP interventions	13,500 – 20,250 of which half female	Universal Access
Annual electricity output from RE as a result of SREP interventions (MWh/yr)	828 - 1,242	Substantial potential for scale up if the business model succeeds
Tons of GHG emissions savings ¹⁸ <ul style="list-style-type: none"> • Tons per year (tCO₂eq/year) • Tons over 20 year lifetime (tCO₂eq) 	<ul style="list-style-type: none"> • 657 – 986 tCO₂eq/year • 13,141 – 19,711 tCO₂eq over 20 year lifetime 	Substantial potential for scale up if the business model succeeds
Financing leveraged through SREP funding (US\$ million, cumulative)	Total: US\$ 13.2 million ¹⁹ - US\$ 2.5 million (WB) - US\$ 10.7 million (Private)	Substantial potential for scale up if the business model succeeds
SREP leverage ratio	1 : 1.8	NA
Key transformational aspects of SREP intervention	Demonstrate feasibility of innovative PPP business model for hybrid mini-grid investments, which can be promptly replicated and offer an alternative to the existing diesel-based mini-grid model for rural electrification	
Co-benefits		
- Strengthen private sector role in off-grid electrification		

¹⁷ Results reported in this column represent those from the SREP-funded Component C2 (off-grid electrification) under the World Bank Kenya Electricity Modernization Project (KEMP), which will also improve service delivery and reliability of the distribution network, establish a revenue protection program for sustainable loss reduction in electricity supply, and provide financing for the connection of new households in a more cost-effective manner.

¹⁸ CO_{2eq} savings were estimated by applying a proxy-based method, which was approved by the SREP sub-committee and proposes an emission equivalent factor based on diesel-generated electricity: 793.7 tCO_{2eq} per GWh.

¹⁹ While SREP funds will leverage US\$13.2 million in support of off-grid electricity services for communities that are distant from the grid, the KEMP project will contribute significant amounts of IDA resources to enhance the distribution network and help restore KPLC's financial sustainability. Resources mobilized under KEMP include an IDA credit of US\$250 million and IDA guarantee of US\$200 million.

- Foster economic development in rural areas
- Increase energy security and employment opportunities in rural areas
- Improve quality of life in rural areas, especially of female population from positive impacts on time saving, employment, education, safety, and maternal health
- Minimize public subsidies required for increasing electricity coverage in rural areas through use of renewable energy and private sector efficiencies

A. Introduction

Country and Sector Context

1. See Sections I and II of the Project Appraisal Document.
2. **Problem Statement.** The *Kenya Vision 2030 (the “Vision”)* identifies energy and electricity as key elements of the country’s sustained economic growth and transformation. Also, *the Vision 2030* establishes the overarching objective to reach universal electricity access by 2030. Attaining the goal of universal access will require complementing efforts for extending the national grid as well as providing electricity through mini-grids and stand-alone services. The challenge is particularly significant given large variations in access to electricity coverage between urban and rural areas. Today, around 35 percent of households in Kenya have access to electricity. Of these, the vast majority are located in urban and peri-urban areas. Rural areas reveal very low access rates with only six percent having access to electricity, despite hosting about 70 percent of Kenya’s population. Noteworthy, most of these non-electrified households live nearby the national grid.
3. The provision of electricity to these areas will require a combination of grid extension and the introduction of alternative models for sustainable rural electrification, which the proposed SREP intervention intends to achieve through innovative and scalable models for hybrid mini-grid investments. Current experience in Kenya reveals that electricity uptake has been slow in diesel-powered mini-grids because, among other reasons, potential customers cannot afford the connection charges and existing customers have to deal with high fuel and operating charges. These stations are expensive and only a limited number of customers have access due to high connection charges. Reportedly, about 20 percent of the households in the service area obtain a connection. Mini-grids require high investment costs, which coupled with high fuel and operating costs, demand a large customer base to justify the investment from an economic perspective.
4. Private sector engagement in either generation, or generation and distribution offers the prospect of increasing efficiencies, lowering costs and increasing connection rates. SREP funding will support cost-efficient and scalable business models for achieving rural electrification on a sustainable manner, which is essential if the national electrification goal is to be reached by 2030. Most importantly, the deployment of hybrid mini-grids based on public-private partnerships will present an alternative for increasing electricity coverage in rural Kenya.

Kenya's SREP Investment Plan

5. The SREP Investment Plan for Kenya was endorsed by the SREP Sub-Committee in September 2011 with an initial allocation of up to US\$50 million. Investments included in the Plan will support Kenya's initiatives towards achieving a transformational change that will lead the country towards a low greenhouse gas (GHG) emissions development pathway by harnessing Kenya's abundant renewable energy resources.

6. The following investments are included in the Plan:
- 200MW of Geothermal - to accelerate the shift to geothermal based power as the main source of base load generation capacity;
 - Hybrid Mini-grids Systems – to support scale-up of ongoing program for expansion of pilot renewable energy hybrid mini-grids in rural areas to increase electricity access among households and institutions as well as to reduce local pollution and GHG emissions; and
 - Solar Water Heating (SWH) – to develop market incentives to scale up SWH systems for commercial, industrial, and residential buildings and to increase uptake of SWH and reduce peak demand.

Table I: SREP Investment Plan for Kenya (US\$ Million)

Project		GoK	SREP	AfDB / WBG	Dev. Partners / Commercial Loans	Private Investors	Total
SREP Initial Allocation	200MW of Geothermal – Phase A	126	40	234			400
	Hybrid Mini-Grid Systems	1	10 ²⁰	10	42	5	68
SREP Reserves	200 MW of Geothermal – Phase B	4	25	75	200	96	400
	Solar Water Heating	1	10	2		47	60
Total		132	85	321	242	148	928

²⁰ The US\$10 million SREP funding will be allocated in two separate World Bank and IFC projects supporting the transformation of rural electrification in Kenya. The World Bank project (US\$7.5 million) will support the deployment of hybrid mini-grid systems. The IFC project (US\$2.5 million) will establish a trade finance facility for stand-alone solar PV and micro-grids.

B. Project Description

7. The proposed SREP-funded hybrid mini-grid investments (US\$7.5 million from SREP, US\$2.5 million from IDA) will be implemented under the *World Bank Kenya Electricity Modernization Project (KEMP)*, whose objective is to increase access to electricity, improve reliability of electricity service, and strengthen KPLC's financial situation. Where connection to the national grid is economically unviable in the short and medium term, the use of SREP funding will be used for off-grid hybrid mini-grid investments based on Public-Private Partnerships (PPP) (Component C2). Typically, the schemes will be implemented in villages of approximately 400 prospective users and approximate demand of 250-500kVA to provide electricity services to residential, public, and commercial customers. Electrification of those areas will be materialized through mini-grids supplied by hybrid generation systems, combining renewable resources (solar or wind) and thermal units running on diesel. Funding from the SREP will be used to buy down the capital intensity of renewable energy generation of the hybrid mini-grid system, while SREP and World Bank resources committed to the KEMP for connection of new electricity users will finance associated distribution network infrastructure.

8. The final design of the off-grid hybrid mini-grid investments (*Component C2*) will be decided based on data collection, pre-investment studies, and institutional and regulatory framework considerations. The power supplier will be competitively selected based on lowest cost of electricity service and subject to meeting demand, service and quality standards. The business models will adopt a technology agnostic approach.

PPP Business Model

9. This sub-component will include a demonstration project of a model for electrification through isolated mini-grids based on Public-Private-Partnership (PPP). The hybrid generation system will be implemented by an Independent Power Producer (IPP) (mini-grid private sector power supplier) with a Purchase Power Agreement (PPA) with KPLC. The IPP will invest in the fuel-based generation component and SREP financing will cover supply and installation of the renewable generation facilities and IDA financing will cover the cost of the mini-grid distribution network. The construction of the distribution infrastructure will be implemented by REA and new users will become KPLC's customers. To ensure sustainability of provision of electricity services to users connected to the mini-grid, a contract between KPLC and a local company (possibly the IPP) providing operation (network and commercial) and maintenance services will be signed. Fees charged by the services contractors will be passed-through into KPLC's allowed tariff revenues set by ERC.

10. The power supplier will be selected competitively (e.g., based on offering the lowest levelized cost of electricity subject to meeting other performance requirements). REA will prepare the mini-grid Purchase Agreement and conduct the tendering process, jointly with KPLC. KPLC will review results and sign the mini-grid PPA with the IPP. The investor will receive a performance based grant (SREP funded). Subsidy options include: capital subsidy (based on the renewable generation capacity installed); generation based subsidy (based on the energy generated); and a combination of capital and generation based subsidy.

11. Pre-feasibility work will be carried out to inform technical optimization, economic and financial evaluation and subsidy design. As part of this pre-feasibility work, IFC (in coordination) with the Bank commissioned a market-sounding survey for mini-grid business models in November 2014. The draft report found there were mixed reactions on how to structure the subsidy element with some respondents preferring a capital subsidy, others preferring a generation based incentives while a few preferring a no-subsidy approach citing distortionary risks associated with subsidies. Capital subsidies and generation based incentives need not be mutually exclusive. The two can be offered as a package.

12. ERC will be responsible for approving the Mini-grid Power Purchase Agreement, issuing the licenses to the mini-grid private sector power suppliers and (if necessary) the operations and maintenance service contractors.

13. **Cost assumptions.** The table below provides the breakdown of cost assumptions for hybrid mini-grid investments based on 250kW stations and PPP business model. While these cost estimates are based on available data for four existing diesel mini-grid stations with integrated solar PV, it is expected that the combination of declining costs, expertise and efficiencies of private sector, risk reduction and competition would result in lower cost. For the four mini-grids, the solar PV installed costs ranged from \$6,000 to nearly \$9,000 per kW and around \$2,000 per kW for diesel generation. The cost for distribution network totaled \$1,200 per kW and \$300,000 per mini-grid station was estimated for civil works (land acquisition, buildings, roads, water supply, fuel tanks, and piping, etc.). The total cost for 250kW hybrid mini-grid system (solar PV, diesel) is estimated at \$1.4 million or approximately \$5,600 per kW.

Cost assumptions based on 250 kW hybrid mini-grid System		US\$
Load factor	20%	n/a
RE fraction	30%	n/a
RE cost	6,000 \$/kW	\$450,000
Diesel cost	2,000 \$/kW	\$350,000
Distribution cost	1,200 \$/kW	\$300,000
Civil works cost	\$300,000	\$300,000
Total		\$1,400,000

14. **Transformation.** The project will help test a different model for electrification with public and private participation. The demonstrational effect from the proposed SREP-funded project will enable replication and scaling-up of similar privately-led investments throughout the country, which will be essential to achieve the universal access goal by 2030. The project will contribute to the transformation of rural electrification in Kenya by exploring an alternative to the current model of unsustainable diesel-based mini-grid electricity supply. Specifically, the project will focus on removing the principal constraints to engaging the private sector to partner with public sector to deliver electricity services to households in the mini-grid service area, powered in-part by renewable energy sources. The public-private partnership models will seize on the public sector experience for setting up the conditions for attracting and catalyzing private

investment, as well as private sector experience for cost optimization. By mitigating constraints and enhancing confidence for private investments, sustained expansion of services can proceed without or with more limited government or donor support in the future.

15. **Rationale for SREP Financing.** There are still major challenges to overcome as Kenya strives for achieving universal access to electricity. Notably, the significant disparity in electricity coverage between urban and rural centers signals the necessity to introduce new, innovative, and scalable initiatives for rural electrification. The competitive allocation of SREP funding will be essential to increase the economic attractiveness of hybrid mini-grid business models through capital cost buy down for renewable energy capacity added to the system. In the absence of SREP funding, the public sector will most likely continue with the current approach of supplementing grid extension efforts with the deployment of costly diesel-powered mini-grid systems without the involvement of the private sector. SREP support will be of vital importance to demonstrate the relevant role the private sector can play in building sustainable business models for rural electrification, especially in alleviating the need for limited public resources for increasing electricity coverage in rural areas. In this context, the use of SREP financing will be fundamental to help mitigate constraints and enhance confidence to engaging the private sector to partner with the public sector for the delivery of electricity services using renewable energy resources.

C. Assessment with SREP Investment Criteria

Increased installed capacity from renewable energy sources

16. There are currently 14 mini-grid power stations in Kenya with a total installed capacity of 19.16MW, comprising of 18.1 MW thermal, 0.55 MW wind, and 0.51 MW solar. The proposed KEMP project will support the development of an additional 6-9 mini-grid investments (250-500kVA) with at least 1.5 – 2.25 MW installed capacity, including at least 0.5 – 0.7 MW of renewable energy capacity. These estimates were conservatively assumed based on implementation of 250kVA mini-grid systems, whereas it is anticipated that 500kVA mini-grid systems will also be implemented.

Increased access to energy through renewable energy sources

17. The proposed hybrid mini-grids will serve communities with households, public sector facilities, businesses and industrial loads. Since the majority of customers are likely to be households, it is estimated that the SREP-funded project will provide access to electricity to approximately 2,700 – 4,050 households or approximately 13,500 – 20,250 people (assuming 5 people per household).

Low emission development

18. Kenya's installed capacity for power generation is dominated by hydro power at about 46 percent, with thermal capacity at 38 percent and geothermal capacity at 14 percent. Nearly half of the hydro capacity is not available during periods of severe drought. In an attempt to have a generation mix that is not vulnerable to weather changes, while at the same time reducing the

contribution of the expensive thermal power, the Government has set a strategy for promoting the use of “green energy” (low carbon sources) for electricity generation. The proposed SREP-funded project will therefore support Kenya’s efforts for low carbon development by contributing to the expansion of electricity access in rural areas. The scaling-up of hybrid mini-grid systems using renewable energy will allow for “greener” expansion of electricity access in rural areas, offering a cleaner and more cost-efficient alternative to the current model of diesel-based power generation. The construction of renewable hybrid mini-grids will not only increase energy access and improve energy security in rural areas, but also enhance climate resilience and development of a green economy and will reduce the use of fossil fuels and firewood for domestic consumption.

19. The application of the proxy-based method agreed for the SREP program, which applies an emission factor based on diesel-generated power, helps estimate CO_{2eq} savings for this project. Based on the proxy 793.7 tCO_{2eq} per GWh, the proposed SREP-funded project will help avoid 657 – 986 tCO_{2eq} every year and 13,141 – 19,711 mtCO_{2eq} over the lifetime of the investments, hereby estimated at 20 years.

Affordability and competitiveness of renewable sources

20. The long-term goal of becoming a middle-income country by 2030, as envisioned under the *Vision 2030*, has encouraged the Government to develop infrastructure for cheaper and adequate electricity. The high cost for extending the national grid in rural areas, where power demand is low and settlements dispersed, remains a significant barrier for rural electrification. Since the early 1980’s, the off-grid rural electrification program has relied on diesel power mini-grid systems, which had low investment requirement, but exhibited high fuel and operating costs with a levelized cost of electricity of approximately 50 \$cent per kWh. The deployment of hybrid mini-grid systems, fueled in part by renewable energy resources, will offer lower levelized cost of electricity in rural areas.

21. Modelling studies using HOMER software for an illustrative hybrid station using solar PV as the renewable energy technology choice located in northern Kenya and with a representative load profile (peak demand of about 260kW and daily energy demand of 3.3 MWh/day) was conducted to determine whether hybrid mini-grid systems would offer the least cost solution. The analysis, which considered several configurations of solar PV, diesel, and battery, confirmed that hybrid configurations offer least levelized cost of electricity and that the system with the lowest levelized cost of electricity can deliver electricity at about 85 percent of a diesel-only system cost. In all cases, the hybrid systems also exhibited stronger economies of scale both in terms of levelized cost of electricity and capital investment required per electricity demand. The SREP-funded project will explore all avenues for cost reduction to minimize levelized cost of electricity and offer the least cost supply of electricity in rural areas. Thorough analyses will be conducted to determine the optimal technology choice and configuration to minimize capital investment and diesel fuel use, as well as optimizing staffing requirement and increasing the customer base to justify the investments on economic grounds.

Productive uses of energy

22. The project will strive to build markets and increase demand for electricity services in target communities. Customer creation and promotion of productive uses of electricity will also contribute to the sustainability of the project, as the sustainability of the proposed business models also hinges on reaching the estimated demand for power in the communities being served. The project will build on KPLC's experience to promote productive uses of electricity through pre-electrification customer education, partnerships with equipment manufacturers, financial institutions, and other stakeholders. The electricity generated from hybrid mini-grids would stimulate income generation activities through productive uses of energy and job creation. Hybrid mini-grids have the potential to enable a range of services, including residential lighting and refrigeration, operation of electrical appliances, batter charging centers, machines for the grinding of grain, etc.

Economic, Social, and Environmental Development Impact

23. The project is in line with the vision of the Government for the electricity sector. It will contribute to the expansion of electricity infrastructure for economic and social development using renewable energy (low carbon sources) and maximizing private sector investment in renewable energy generation. The engagement of the private sector in off-grid electrification will contribute to the Government's strategy for increased access to electricity using hybrid mini-grids powered in part by renewable energy sources. The project will seize on the skills and knowledge of the private sector for optimizing project design and cost minimization, which offers the prospect of increasing efficiencies, lowering costs of electricity supply and increasing energy access in remote areas.

24. The proposed project will help to: (i) increase quantity and quality of electricity services in remote areas for households, public sector facilities, businesses and industrial loads; (ii) minimize public subsidies required through use of renewable energy and private sector efficiencies; (iii) reduce dependency on costly imported diesel for power generation in remote areas, (iv) accrue educational benefits (e.g., through the provision of electricity to schools and households, lighting allows children to study at night); (v) reduce GHG emissions from using renewable energy sources (in part) for power generation; (vi) increase income or productivity from promoting productive uses of electricity in agricultural, commercial, and industrial activities; (vii) strengthen Kenya private sector involved in off-grid electrification, (viii) generate employment opportunities, mainly related to construction, operation, and maintenance of hybrid mini-grid systems, and (ix) increased public safety in service areas due to street lighting.

Economic and Financial viability

25. The financial internal rate of return was estimated at 12 percent based on a preliminary financial analysis conducted for an illustrative hybrid mini-grid investment. The financial analysis assumed cost of debt of 8 percent, loan tenor of 10 years, 70 percent debt, US\$ inflation on diesel fuel and O&M assumed as 2.5 percent per annum. Cost of diesel fuel is directly passed through and not included in the fixed feed-in tariff that KPLC would pay for electricity to the private supplier. A capital grant of \$1,000 per kW of renewable capacity was assumed in order to

create an incentive to maximum renewable share and reduce electricity supply cost. A minimum return on equity of 20 percent and a debt service coverage ratio of 1.2 was assumed. Life of supply contract was assumed as 25 years.

26. Economic and financial analyses for the KEMP Project, including detailed description of methodology and assumptions, are presented in Annex 7.

Leveraging of Additional Resources

27. The proposed SREP-funded mini-grid investments (Component C2 of KEMP Project) will crowd-in other sources of financing through innovative public-private partnership business models for hybrid mini-grids development. The use of SREP funding will be essential to leverage limited available public resources through increased private sector participation. The financing leverage ratio is estimated at 1:1.8 with most of the funding coming from the private sector. An additional \$450 million IDA resources will be mobilized under the KEMP Project toward the enhancement of the distribution network and in support of KPLC's financial sustainability, which will help KPLC offer strong and reliable off-take commitments to private investors in new power generation capacity.

Gender

28. The project will expand electricity coverage in rural areas and the positive impact of rural electrification will affect positively on the living conditions of approximately 13,500 – 20,250 people, of which half are estimated to be female. Positive impacts of rural electrification on female are well known, ranging from time saving, employment, and education, to safety and maternal health. The arrival of electricity will improve the quality of life to the whole family, and in particular to female through increasing the time they can spend on income generating activities instead of ordinary household tasks (e.g., collect firewood). Additionally, evidence suggests that household electrification raises rural employment by releasing women from home chores and enabling micro-enterprises, shifting from home to market work. Street lighting in public spaces is a valuable service for improving personal safety for women, men, and children.

Co-Benefits of Renewable Energy Scale-up

29. The proposed project is expected to have direct impact on Kenyan living conditions and economic productivity, bringing a series of co-benefits to rural communities, including:

30. *Reduced cost of and increased rates of electricity supply.* The engagement of the private sector in either generation, or generation and distribution will offer the prospect of increasing efficiencies, lowering power supply costs, and increasing connection rates. The development of innovative public-private partnership models will seize on the skills and knowledge of the private sector for optimizing project design and minimizing cost. The proposed project proposes an improvement to the current model for off-grid electrification using diesel fueled mini-grids, which exhibits high connection charges and electricity supply cost.

31. *Strengthened private sector role and participation in off-grid electrification.* The proposed SREP-funded project will remove major constraints to engaging the private sector to provide off-grid electricity services to complement the ongoing public sector efforts to expand electricity access in rural areas. The provision of adequate financing incentives and establishment of suitable implementation arrangements will enhance private sector confidence which is necessary for future expansion of sustainable energy access efforts without or with more limited government or donor support.

32. *Savings in Public funds.* Increased private sector investment and enhanced efficiency in off-grid electrification efforts will lead to savings in public funds which can be used to attend other national priorities aimed at contributing to economic and social development in the country.

33. *Increased energy security in rural areas.* Increased penetration of renewable based mini-grids will help Kenya diversify and contribute to a more sustainable energy mix in rural areas, reducing dependence on imported fossil fuels and thus enhancing the energy security in these areas.

34. *Low carbon development.* The development of hybrid mini-grids will lead to savings of CO_{2eq} emissions in the order of 657 - 986 tons per year, or an equivalent of 13,141 – 19,711 tCO_{2eq} over the lifetime of the investments. This is a conservative estimate and assumes that electricity would have been generated using diesel-powered systems. In addition, the project will lead to local pollution benefits from avoided use of kerosene for lighting.

35. *Employment opportunities.* The proposed project will lead to job creation for private developers and staff in charge of operating and maintaining the mini-grid stations. While it is not entirely clear how many additional jobs will be created, it is estimated that considerable staff will be required for operating and managing the mini-grid stations. As a reference, KPLC optimized norms for staffing mini-grid stations recommend 27 staff per mini-grid station serving more than 1,000 customers or 18 staff for stations servicing less than 1,000 customers. By adopting these norms as guidance, the deployment of 6 – 9 hybrid mini-grids proposed under the project will lead to the creation of approximately 200 jobs.

36. *Economic benefits.* The delivery of reliable electricity services will maximize economic development opportunities for rural communities. The provision of public lighting will directly benefit local shops and markets, which can now be open for business during extended nighttime hours. Economic benefits will also spur among private entrepreneurs, who would be able to add value to their businesses through the promotion of productive uses of electricity (e.g., grain milling, carpentry, tailoring). The provision of electricity will also contribute to the creation of new businesses that use electricity, including economic activities that are new to the area.

37. *Improved quality of life in rural areas.* The improvement will come from either direct electricity access or indirect access to improved services resulting from the Government's program to electricity priority loads, including clinics, schools, and trading centers. The provision of reliable electricity services in rural areas can lead to better education, health and public security, especially for women and children. The availability of electric lighting during

the evening will allow children to study for longer hours, contributing directly to better educational outcomes. Improved instruction could also result from the use of computers and other equipment in schools. Lighting services in public spaces will also increase personal safety for individuals wandering and working in previously dark public areas.

D. Monitoring and Evaluation

38. Overall monitoring and evaluation of KEMP project activities will be performed by MoEP. For the Sub-Component C2 for off-grid electrification, REA will be responsible for the implementation, monitoring and evaluation, and will report to the MoEP. The project's key performance indicators for the off-grid hybrid mini-grid component are aligned with the indicators required under the SREP program. The regular monitoring and reporting on the agreed project indicators will be conducted by a Project Implementation Unit (PIU), which will include a dedicated M&E officer. The REA will have the responsibility to collect data and report on the performance indicators (see Annex 1: Results Framework) on a semiannual basis for the PDO indicators and for the intermediate outcome indicators at the component level. An impact assessment from the proposed project activities will be undertaken at project completion as part of the implementation completion report for the KEMP project.

E. Implementation Readiness

39. *Country and Energy Sector strategies.* The Government is strongly committed to expanding electricity infrastructure through the *Vision 2030*. The guiding principle of the Government's strategy for expanding infrastructure in the electricity sector is to "*promote equitable access to quality energy services at least cost while protecting the environment*". To implement the strategy, the Government has prepared the *Electricity Access Investment Program 2009-2014* (the Program). The Program integrates the results of three separate planning studies: the Least-Cost Power Development Program (LCPDP) 2009-2029 (for generation capacity development); the Rural Electrification Master Plan; and the Kenya Electrification Investment and Policy Prospectus. The investments included in the Program, of US\$ 4,902 million cover all three elements of the Government's strategy for electricity development simultaneously (i.e., capacity expansion, enhanced security, and increased access). The Government has outlined a new strategy, namely the *Last Mile Program* for electricity access. The access strategy that was followed in the past had some serious flaws as connections were made in response to individual customer application and payment of the quotation which failed to leverage the benefits of economics of scale. The new program that is in the early stage of design will include, among other measures, proper planning and implementation of the program, definition of priorities, definition and effective application of subsidization schemes aimed at covering the gap between investment costs of connecting and the customers' ability to pay (affordability).

40. *Institutional arrangements.* The Ministry of Energy & Petroleum (MOE) will be responsible for the overall coordination of the KEMP project and REA will be responsible for implementation of Sub-component C2 for off-grid electrification. Annex 3 describes project implementation arrangements specific to the SREP-funded component (i.e., Sub-component C2), including responsibilities of KPLC, REA, ERC and the private sector.