



Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 28-Mar-2017 | Report No: PIDISDSA19504



BASIC INFORMATION

A. Basic Project Data

Country Kenya	Project ID P160009	Project Name Kenya: Off-grid Solar Access Project for Underserved Counties	Parent Project ID (if any)
Region AFRICA	Estimated Appraisal Date 13-Mar-2017	Estimated Board Date 19-May-2017	Practice Area (Lead) Energy & Extractives
Lending Instrument Investment Project Financing	Borrower(s) The National Treasury	Implementing Agency Kenya Power and Lighting Company (KPLC), Rural Electrification Authority, Ministry of Energy and Petroleum	

Proposed Development Objective(s)

The Project Development Objective is to increase access to modern energy services in underserved counties of Kenya

Components

- Component 1: Mini-grids for Community Facilities, Enterprises, and Households
- Component 2: Standalone Solar Systems and Clean Cooking Solutions for Households
- Component 3: Standalone Solar Systems and Solar Water Pumps for Community Facilities
- Component 4: Implementation Support and Capacity Building

Financing (in USD Million)

Financing Source	Amount
International Development Association (IDA)	150.00
Total Project Cost	150.00

Environmental Assessment Category

B - Partial Assessment

Decision

The review did authorize the preparation to continue



Note to Task Teams: End of system generated content, document is editable from here.

Other Decision (as needed)

B. Introduction and Context

Country Context

1. With a population of 45 million people and a GDP of US\$61 billion, Kenya is one of the largest economies in Sub-Saharan Africa (SSA), achieving, in 2015, middle income country status. In the past several years, the GDP growth rate, hovering above 5 percent in Kenya, has outperformed the average for Sub-Saharan Africa – and is projected to rise to 5.9 percent of GDP in 2016 and 6 percent through to 2017, underpinned by a strong growth of trade and services.
2. The effects of sustained macroeconomic growth are translating into improved quality of life. The national poverty rate fell from 47 percent in 2005 to 39 percent in 2012. Even so, Gross National Income (GNI) per capita at US\$1,340 in 2015 is still converging towards the regional average of US\$1,638. Inequality remains high, with a Gini coefficient of 47.4, and opportunities are substantially different for those living in the arid and semi-arid regions of Kenya which are underserved, as well as between women and men. The 2010 Constitution of Kenya, enshrining devolution, marked a momentous point in the country's history. Kenya's decentralization is among the most rapid and ambitious processes globally, with new governance challenges and opportunities as the country builds a new set of county governments.
3. The Government of Kenya (GoK)'s Vision 2030 aims to transform "Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens." Promoting equal opportunities across the entire Kenyan territory is key to realizing this vision. Energy is identified as one of the key sectors that form the foundation for socio-political and economic growth. Access to competitively-priced, reliable, quality, safe, and sustainable energy is essential for achievement of the vision.
4. In June, 2016, the World Bank committed to supporting a multi-sectoral initiative, called North and North Eastern Development Initiative (NEDI) focusing on counties where geo-graphic inequalities in poverty and service delivery are particularly exacerbated. NEDI brings together a suite of transformative coordinated infrastructure investments in energy, transport, livestock and water that are needed to connect these counties to national and global markets. The proposed project is the energy sector investment of NEDI.

Sectoral and Institutional Context

5. Kenya has experienced a dynamic energy sector policy environment since the mid-1990s when the Electric Power Act was enacted to establish an enabling framework for power sector development. The Act included the creation of a sector regulator, the Electricity Regulatory Board (ERB) and the functional unbundling of Kenya Power and Lighting Company Limited (partially state-owned vertical integrated utility), mandating Kenya Electricity Generating Company Limited (KenGen), to be in charge of generation, and the Kenya Power and Lighting Company (KPLC), to be in charge of transmission, distribution, and retail functions. A second generation of reforms was introduced with the enactment



of the Energy Act 2006. ERB was transformed into a single energy regulatory body – the Energy Regulatory Commission (ERC); the Kenya Electricity Transmission Company Limited (KETRACO), a state owned company, was set up to facilitate creation of new transmission assets; the Geothermal Development Company Limited (GDC) was incorporated to de-risk geothermal development by undertaking upfront steamfield development works and, the Rural Electrification Authority (REA) was created with the mandate of accelerating rural electrification, specifically connecting community facilities.

6. These two generations of reforms in the 1990s and 2000s have achieved considerable progress in terms of market development. The sector operates on commercial principles supported by transparent financial relationships between the sector utilities. Electricity retail tariffs are cost reflective and key public sector power utilities, KenGen and KPLC, are both listed on the Nairobi Securities Exchange. The generation sector is complemented by several Independent Power Producers (IPPs) that sell electricity through long-term Power Purchase Agreements (PPAs) signed with KPLC.
7. Kenya has recently embarked on a third generation of reforms through the new Energy Policy and Energy Bill to align the policy and regulatory framework of the sector with the 2010 Constitution and its devolution framework. Some of the key provisions are (i) the 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 and county governments; and (iii) enhancing competition in the power sector. The bill also envisages creation of new institutions or expanded mandates for existing entities, particularly an Energy Regulatory Authority, a Rural Electrification and Renewable Energy Corporation (REA's new mandate), and Energy and Petroleum Tribunal. The Energy Bill is expected to be approved by the Senate by 2017.
8. Kenya's generation capacity currently stands at a comfortable 2,300 MW while peak demand reached 1,636 MW¹. Installed capacity grew by about 800 MW between 2010 and 2015, and the recent commissioning of 280 MW of new geothermal power in Olkaria fields (supported by the World Bank) expanded the contribution of renewable energy to 49 percent of total electricity generation, displacing conventional thermal generation and propelling Kenya as a global leader in renewable based generation. Several high voltage and medium voltage transmission projects were recently completed or are ongoing to ensure proper evacuation of new generation projects as well as to extend power service to unconnected areas of the country. However, transmission capacity needs to be scaled-up substantially to ensure quality of service delivery to the rapidly growing consumer base and to support income generation and productive growth.
9. The GoK has embraced electrification as a flagship endeavor with a focus on the distribution sector reaching all Kenyans with energy services by 2020. Kenya has emerged as a star in achieving progress on electrification, growing from 23 percent in 2009 to about 50 percent in 2016, underpinned by huge investments across the sector value chain. Today, there are about five million KPLC consumers, as more than one million consumers have been added annually in the past two years. The GoK has adopted the Last Mile Connectivity Program (LMCP) as the primary grid densification vehicle - to connect all consumers within 600 meters of a transformer - and assembled close to US\$700 million in donor resources (including the World Bank financed Kenya Electricity Modernization Project) to speed-up access in grid connected areas. Since Kenya's grid is almost exclusively concentrated in the central

¹ This wide margin is justified by the hydrological seasonality uncertainties that make the overall power system more vulnerable, hence the need for a comfortable level of generation capacity well beyond peak demand.



corridor where there is the highest population density, this approach is considered the least cost way of harnessing economies of scale in network design with a potential of reaching about 70-80 percent of consumers.

Kenya has a long history of off-grid electrification in both mini-grids and standalone systems

10. *Standalone solar home systems*: Kenya is unique in the world in terms of the depth and dynamism of its solar off-grid market. The market for standalone Solar Photovoltaic (PV) systems started to be developed in Kenya in the mid-1980s, but was catalyzed in 2008 when Kenya was selected as one of the two pilot countries for Lighting Africa program². The off-grid solar PV market in Kenya has been growing exponentially: 2.7 million quality-certified lanterns and small solar kits have been sold since 2009, out of which 700,000 in fiscal year 2015. The share of quality products improved rapidly – more than 40 percent of the off-grid lighting market now consists of products that have met Lighting Global standards³, up from just three percent in 2009. Kenyan private sector players have developed innovative business models to reach more customers over the past years, including developing efficient supply channels for cash sales of portable lanterns and solar home systems (SHS)⁴; pioneering the roll out of technological approaches such as pay-as-you-go systems, which enables customers to pay for their solar products in affordable, monthly installments, often via mobile money; and attracting private equity and debt capital to fund their fast growing businesses.
11. *Mini-grids*: The mini-grid program to electrify remote centers has also been running since the 1980's. Currently, there are 19 government-developed (public) mini-grid stations owned by REA and managed by KPLC. The total installed capacity for these mini-grids is roughly 19 MW, overwhelmingly dominated by diesel fueled plants, serving larger towns in the remote areas. There are also mini-grid IPPs (sometimes injecting power into the national grid), as well as privately owned and operated mini-grids developed by Non-Governmental Organizations (NGOs), communities and private companies located throughout the country. It is currently estimated⁵ that the capacity of mini-grid IPPs and other privately developed mini-grids is roughly 65MW and 500kW, respectively. Again, however, the expansion of mini-grids in the underserved counties has been limited. REA and KPLC have focused on electrification of urban centers, while private sector mini-grids have in general been deployed in the more populated “core” market. Smaller rural towns in underserved counties remain in general without power.

² Lighting Africa, a joint International Finance Corporation (IFC) and World Bank program launched in 2007, was the first private-sector-oriented effort to leverage new light-emitting diode (LED) lighting technologies to build sustainable markets that provide safe, affordable, and modern off-grid lighting to communities in Africa that lack access to electricity. The program developed standards and a testing methodology to support quality products (and began to test solar lanterns available on the Kenya market); it provided the private sector information about the market and consumers and business development services; and it carried out a comprehensive consumer awareness program focused on promoting high quality products.

³ Lighting Global supports the growing global market for modern off-grid lighting with a widely applicable, rigorous Quality Assurance (QA) framework. The key QA activities include measuring, benchmarking, and communicating information about product quality and performance.

⁴ Solar home systems feature a PV panel or panels, a charge controller, a large rechargeable battery, multiple light fixtures, and an interface for connecting devices such as mobile phones and DC-powered appliances such as radios, televisions, fans, and other small appliances.

⁵ “Kenya: Preparation of a program for the promotion of investments in Green Mini-Grids” executed by AFD with support from Economic Consulting Associates and EED Advisory a part of DFID’s Green Mini-Grids Kenya program, April/July 2015; and “Kenya Market Assessment for Off-Grid Electrification”, Final Report, October 2015, executed by IFC with support from Carbon Africa Limited, Trama TecnoAmbiental S.L., Research Solutions Africa Limited, and Energy research Centre of the Netherlands.



12. **The GoK would like to expand electricity services to underserved areas through mini grids and standalone systems as grid penetration remains limited, poverty is rampant, and social exclusion is prevalent.** These underserved areas, which cover the geographical scope of the proposed project, are identified as 14 counties, deemed ‘marginalized’ by the Commission of Revenue Allocation (CRA). Due to the remoteness and sometimes dispersed nature of the target populations and considering the socio-economic profile and lifestyles of those residing in these counties, the proposed project is designed to address high costs of provision of infrastructure services, low affordability of the potential users, and sustainability of service provision using an abundantly available renewable resource.
13. **The proposed project is part of the implementation roadmap of the National Electrification Strategy⁶ (NES), underpinned by a geospatial plan** that lays out the technical, financial, and institutional roadmap to universal electrification in Kenya by 2020. The draft NES, expected to be finalized in April 2017, proposes mechanisms to balance KPLC’s consumer intensification with service provision beyond the grid. The population inhabiting the underserved areas are largely cash poor, nomadic, and pastoralist – a different profile in contrast with those living in grid connected areas – also known as the core market. Roughly 80% of households currently with solar home systems are located within five to ten kilometers of the national grid, with the footprint in off-grid areas negligible. Therefore, the challenge is to create mechanisms to incentivize the private sector to deliver services in these areas in a sustainable manner; dovetail with anchor loads such as community facilities to reach remote households; and ensure affordability for consumers and adequacy of revenue for service providers.
14. **The proposed project is designed around three core principles: diversification, private sector participation and flexibility.** The first principle is ensuring that the project reaches diverse beneficiaries with varied needs including households, community facilities such as health centers, secondary schools, county offices etc. Even then, the economies of scale is such that reaching all of these consumption points together allows a more attractive opportunity for the private sector as well as benefits for the consumers in the form of longer-term reliable and affordable energy services. The second principle centers on maximizing private sector participation in the delivery of off-grid energy services. Leveraging private sector investment will help reach a larger number of beneficiaries, maximize project impact, and support sustainability of service. Kenya is the leading African market when it comes to innovation around off-grid solutions and the project leverages the private sector dynamics to provide reliable and sustainable services to the population of underserved counties. Third, the project recognizes that achieving these outcomes requires flexibility with respect to market approaches. This spectrum ranges from fully market-delivered approaches to more regulated ones where the government maintains a leading role in service provision. Most often, this necessitates a hybrid approach that leverages the comparative advantages of both public and private sectors. Such flexibility recognizes the complexities associated with delivering energy services in off-grid areas, and seeks to maximize the likelihood of success through tailored approaches to sustainable market development.

C. Proposed Development Objective(s)

Note to Task Teams: The PDO has been pre-populated from the datasheet for the first time for your convenience. Please keep it up to date whenever it is changed in the datasheet.

⁶ Supported by Kenya Electricity Modernization Project



Development Objective(s) (From PAD)

The Project Development Objective is to increase access to modern energy services in underserved counties of Kenya

Key Results

Indicator Name	Core	Unit of Measure	Baseline	End
People provided with access to electricity by household connections	✓	Number (Household)	0.	2778
Households provided with new or improved electricity service - 270750	X	Number	0.	2707
Households provided with new or improved electricity service, of which headed by women - 54150	X	Number	0.	5415
Community facilities provided with new or improved electricity service - 1097	X	Number	0.	1097
Enterprises provided with new or improved electricity service - 6050	X	Number	0.	6050
Enterprises provided with new or improved electricity service, of which headed by women - 1210	X	Number	0.	1210

D. Project Description

15. The project will be implemented in 14 counties in the North and Northeastern parts of Kenya. They are: Garissa, Isiolo, Kilifi, Kwale, Lamu, Mandera, Marsabit, Narok, Samburu, Taita Taveta, Tana River, Turkana, Wajir, and West Pokot. These counties have been defined as “marginalized areas” by the CRA. CRA defines these as “communities that have been excluded from social and economic life of Kenya for different reasons” and “geographic location (county or sub-county) where significant populations of underserved communities live” (CRA, 2013). Four of these counties are not part of NEDI.
16. The proposed project aims to support GoK’s announced objective of reaching all Kenyan consumers with energy services. The project proposes a comprehensive suite of investments to provide electricity services to households, enterprises, community facilities, and boreholes, with pragmatic business models to attract private sector investment, sustainable services, know-how and efficiencies.
17. The project area is divided into six lots or service territories based on county allocations derived from scale of challenge (un-electrified population and community facilities), poverty index, and population density to 1) to achieve greatest impact with limited IDA resources, (2) to deliver services where the need is the largest, (3) to consider additional costs due to low population density, and (4) to considering principles of equity such that all the counties should benefit in a similar manner. Such a division into service territories allow economies of scale in procurement and elicits private sector contractors to be present in these underserved counties over a long-term. All the procurements in the proposed project will be carried out according to these service territories.
18. The proposed project is expected to provide electricity to approximately 270,000 households, 1100 community facilities, and 400 boreholes, and 150,000 cookstoves.

Component 1: Mini-grids for Community Facilities, Enterprises, and Households [US\$40 million IDA]



19. This component will support the electrification of areas where electricity supply through mini-grids represents the least cost option from a country perspective, as underpinned by the geospatial plan. Depending on the number of users to be supplied, and the service level defined for each type of user (households, enterprises, community facilities, etc.), the generation system of each specific mini-grid will combine solar PV, battery storage and thermal units running on diesel. Mini-grids will be developed under a Public-Private-Partnership (PPP) whereby private investment and public funds co-finance construction of generation facilities, and public funding is used to construct the distribution network. A single private service provider (PSP) will be responsible for construction (and partial financing) of the generation system and for construction of the distribution network of each mini-grid. The same PSP will sign two long-term contracts with KPLC: (i) a 7-10 year power purchase agreement (PPA) for the operation and maintenance of the generation system, and recovery of the privately financed part of the investment; and (ii) a 7-10 year service contract for operation and maintenance (O&M) of the distribution network, including revenue cycle services (as required). Ultimately, after the recovery of the private investments, all assets (both generation and distribution) will be in GoK ownership. All electricity consumers supplied through mini-grids will be KPLC customers, and pay the same tariff for each category charged to users connected to the national grid, ensuring effective implementation of a national uniform tariff policy.
20. The component will be implemented in approximately 120 locations throughout the 14 target counties, typically in mini-grids supplying 100-700 prospective users, with approximate total demand of 20-300kW. These potential sites, capturing approximately 27,000 consumers in total, have preliminarily been identified as part of the geospatial plan. Each service territory will comprise 20 or more mini-grids located in geographically contiguous areas, with 2,000 or more serviceable customers. There will be a mix of more densely populated sites and less densely populated sites in each lot, where possible, to enhance their overall commercial attractiveness. PSPs can bid separately for each lot, with multiple lots potentially awarded to the same PSP.
21. REA and KPLC will jointly implement the component, with the procurement of lots divided among them. This component will be complemented by technical assistance, under sub-component 4.2, to (i) confirm the sites through further feasibility studies and techno-economic analysis (ii) promote productive and efficient use of energy by users (iii) technical, legal, and procurement support to effectively design the bidding documents and supervise the construction of the mini-grid assets.

Component 2: Standalone Solar Systems and Clean Cooking Solutions for Households [US\$48 million IDA]

22. **Component 2A: Standalone Solar Systems for Households (\$42 million IDA):** This component will support off-grid electrification of households in the 14 target counties where a standalone solar system is the most appropriate technology to deliver energy services, leveraging Kenya's unique off-grid solar market dynamics and innovations. The component will provide incentives for solar off-grid companies currently operating in the more densely populated areas of Kenya to expand to underserved counties and provide services to the off-grid households in these counties. These services, provided through portable solar home systems, are well-suited to some of the population in the underserved counties, as households do not always live in permanent structures. In addition, affordability is increased by allowing households to pay for systems over time. Willingness to pay analysis, confirmed by the



preliminary results from the MTF surveys shows there to be over a half-million households that could theoretically afford a Tier 1 level solar home system⁷.

23. The component will be accomplished via two financing instruments to which eligible solar service providers (SSPs) will have access:
- i. *Grant Facility - Competitively awarded expansion grants*, to compensate SSPs for initial, ongoing incremental, and opportunity costs associated with an expansion of operations in underserved counties. A percentage cap will be set within each lot so that multiple service providers will have the opportunity to operate within the space. A competitive approach will be used, whereby service providers will bid based on a grant amount per household connection, with the lowest grant requirements winning. Results-based financing will specify installment payments based on the achievement of pre-agreed connection milestones and satisfactory after sales service support.
 - ii. *Debt Facility - Debt financing to solar service providers*, to support upfront costs associated with getting hardware inventory into the market, and medium-term consumer financing to enable households to pay off the systems over time. Two typologies of business models underpin the majority of solar service providers that operate in the Kenyan market. First are service providers that sell solar products on an over-the-counter (cash sale) basis. These service providers require shorter term debt in USD or other major foreign currency to finance costs associated with hardware manufacture and transit to Kenya (typically from China) until a sale is made. This cycle typically lasts anywhere from 6 to 9 months. A second prevailing business model is pay-as-you-go, whereby customers pay for the systems in monthly installments (typically between 12-36 months), and SSPs carry the default risk during the payback period. These businesses typically require debt financing that is commensurate with the lending terms that they extend to their customers. Given that service providers' revenues are in local currency, the debt instrument will also offer loans in Kenyan Shillings in addition to USD.
24. The implementation of this component will be under a direct oversight of MoEP. MoEP will competitively select the expansion debt-grant facility manager, which will be a consortium with demonstrated experience with managing similar instruments in Kenya and similar geographies. An OP 10.00 assessment of financial intermediary financing will be carried out for on the debt facility manager.
25. **Component 2B: Clean Cooking Solutions for Households (\$6 million IDA):** This sub-component will support a transition from low-efficiency baseline stoves to cleaner, higher efficiency improved stoves. To accomplish this objective, cleaner household cooking appliances and fuels will be promoted. Activities will begin by focusing on four underserved counties in the northwestern part of the country (West Pokot; Turkana; Samburu; and Marsabit).

⁷ Simulations using 2014 FinAccess household survey data show that in a scenario where 7 percent of household expenditures are made on stopgap lighting, over 500,000 of the 1.2 million off-grid households could afford a PAYG SHS offering (assuming a 3-light point system, offered on a monthly cost of KES 500 and paid off over 36 months).



26. During project preparation, a Stove-Market Testing Program is being undertaken in the municipal, town, and densely settled parts of Turkana County. The stoves to be included will be determined following a call for Expressions of Interest for stove manufacturers wanting their products to be exposed to these new markets. To be eligible, a woodstove will have to prove that its efficiency tests it as a Tier 2 stove (roughly 30 percent efficient) and a charcoal stove will have to prove that its efficiency tests as a Tier 3 stove (roughly 40 percent efficient) to be eligible for inclusion in the market tests. These tests will involve exposing both consumers and suppliers (retailers, wholesalers, and distributors) in the urban areas of Turkana County to these improved stoves. The results will be shared with the communities and interested parties. Field testing for additional stoves models may be considered during the project implementation.
27. This sub-component will operate a window in the grant facility established for Component 2A to support sales of eligible stoves in targeted counties. The grant facility will provide the selected distributors with financial support on a matching grant and results-based scheme to enable them to market their stoves locally within the target counties; to increase their inventories of the selected higher quality stoves; to purchase and transport them to the target communities in number; and to sell them to willing buyers in the communities.

Component 3: Standalone Solar Systems and Solar Water Pumps for Community Facilities [US\$40 million IDA]

28. The community facilities considered in this component are the existing and upcoming: (i) Health facilities (Levels 2 and 3) (ii) Educational facilities (Secondary schools and Technical training institutes); (iii) Administrative offices (for example, assistant County Commissioner offices).
29. **Component 3A: Standalone Solar Systems for Community Facilities (\$25 million IDA).** This component will support the provision of electricity services to community facilities in remote areas in underserved counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities. A total of about 1100 facilities could be reached via this component.
30. KPLC, the implementing agency, would sign two (2) contracts with the contractor in each service territory – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration. The contract would specify the minimum requirements in terms of quality standards in electricity supply for the community facilities, developed by Ministry of Health, Ministry of Education, and Ministry of Interior. Contracts would stipulate the minimum package acceptable as “basic service”, but allow room for provision of additional services to community facilities. The proposed project will cover the supply and installation costs and KPLC will pay the contractor for fees under the maintenance contract with allocation or revenues from beneficiary facilities. The costs of maintenance contracts are expected to be passed through into tariff revenues recognized by ERC.
31. KPLC will take the retail risk of serving these new consumers, for which their payment record for such an arrangement is still unknown. Therefore, a payment risk mechanism would be available to KPLC, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that



KPLC can draw upon in case of inadequate revenues to pay the contractor.

32. **Component 3B: Solar Water Pumps for Community Facilities (\$15 million IDA):** This component will support financing solar powered pumping systems to increase sustainable access to water supply by equipping new boreholes and retrofitting existing diesel-powered boreholes associated with community facilities within the target counties. A private sector contractor will be competitively selected for each service territory to supply, install, and maintain standalone solar systems in community facilities.

33. REA, the implementing agency, would sign (2) contracts with the contractor in each service territory to – one for the supply and installation of the standalone solar systems and the second for the provision of maintenance services for 7-10 year duration - similar to the design in Component 3A. The payment for these maintenance services will be recouped on a monthly basis by the community facilities hosting these boreholes.

34. A payment risk mechanism would be available to REA, to which the proposed project will set aside funds equivalent to 6-12 months of maintenance fees that REA can draw upon in case of inadequate allocation from the beneficiary facilities to pay the contractor.

Component 4: Implementation Support and Capacity Building [US\$22 million IDA]

Component 4.1: Consumer Education and Citizen Engagement (US\$2 million)

35. This sub-component will support the consumer education and citizen engagement activities for the program's key delivery areas (households, community facilities, water facilities in the underserved counties). Consumers in these areas are unlikely to be aware of the new technologies being presented and have a right to expect clear, thorough information about the advantages of the services and how to access them. The activities supported under this sub-component will provide recurring opportunities for consumers to interact with service providers in order to share their feedback and concerns. For those who have some knowledge of the products, these outreach activities will provide them with the necessary guidance on how to get the best out of the products in the way they use and maintain them. Finally, in these target areas, acceptance and sustained demand is generated when the buy-in of key opinion leaders is obtained. The consumer education and citizen engagement program will employ both Above the Line (mass media tools) and Below the Line (one on one) channels in reaching out to different target audiences while ensuring opportunities for two-way dialogue.

Component 4.2: Implementation Support and Capacity Building (US\$20 million)

36. This sub-component will support all technical studies, implementation support, and capacity building of sector and counties. More specifically, the following are included. First, build capacity and address the skill set requirements in KOSAP Project Coordination Unit in MoEP and KPLC PIU and REA PIU. Second, capacity building activities in the sector and counties, for instance related to solar technology, project management, procurement, environmental and social safeguards for the sector entities, and monitoring and evaluation. As such, funding will be used to cover the investment costs (equipment,



software, training, etc.) incurred by ERC to establish a monitoring unit. Third, relevant studies and contracts for the investment components of the proposed projects. Fourth, support MoEP in the development of a Strategic Planning and Program Management (SPPM) unit with the objective of providing effective coordination and oversight in terms of policy development, strategic planning, and project design and implementation.

E. Implementation

Institutional and Implementation Arrangements

37. The MoEP will provide overall coordination of the Project and implement Components 2 and 4. KPLC and REA will be responsible for the implementation of Components 1 and 3. MoEP will competitive procure a consortium of Debt and Grant Facility Managers for Component 2.
38. The KOSAP PCU hosted in MoEP, will be responsible for not only implementing Components 2 and 4 of the proposed project but also the overall coordination of the project implementation and oversight including the following: (i) defining, jointly with the respective county governments, the project areas based on technical and policy development priorities; (ii) resolving in consultation with the county governments challenges requiring high level intervention facing the project; (iii) monitoring the implementation of the project; and (iv) consolidating information from implementing agencies on progress of implementation and evaluating the project. KPLC, REA will establish their PIUs to manage their specific components.
39. The proposed project has been designed under the overall guidance of a Technical Working Group (TWG) constituted for this project. The TWG, co-led by Director of Renewable Energy of MoEP and Chief Energy Executive of Taita Taveta County, comprises of representatives of the implementing agencies and chief executives responsible for energy in all the fourteen beneficiary counties. During implementation, there is expected to be a three-tier structure to sort out unique county-level issues to providing high-level guidance. At the highest level, is the steering group led by Cabinet Secretary of MoEP and Chair of Energy Committee of Council of Governors. At the mid-level, is the TWG that will sort out common challenges arising during project implementation. At the third-level, is the county working group that will resolve issues arising at each county level.

Note to Task Teams: The following sections are system generated and can only be edited online in the Portal.

F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The proposed project will target the 14 counties that are defined as ‘marginalized areas’ (underserved) in Kenya, they include Turkana, West Pokot, Narok, Taita Taveta, Kwale, Kilifi, Tana River, Lamu, Garissa, Wajir, Mandera, Isiolo, Samburu and Marsabit. The counties collectively represent 72% of the country’s total land area and 20% of the country’s population. Population densities are low and the lifestyle is predominantly pastoral and low level sedentary farming on the arid and semi-arid lands. These counties are deficient in terms of access to good roads, electricity, portable water and social services due to their remoteness from national infrastructural networks. Electricity supply is predominantly from unimproved sources (such as



kerosene, candles, batteries) which do not meet the ever-increasing demand in these underserved areas.

G. Environmental and Social Safeguards Specialists on the Team

Edward Felix Dwumfour, Ben Okindo Ayako Miranga

SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	<p>The project is assigned as a Category B Partial Assessment, - assigned to projects that are likely to have limited and reversible environmental impacts, that can readily be mitigated. There are no significant and /or irreversible adverse environmental issues anticipated from the subprojects to be financed under the Project. The main potential environmental impacts anticipated for the project are (i) civil works that would be limited to construction and installation of the mini-grids (Component 1), installation of the standalone solar systems for households (Component 2), installation of solar water pumps for community facilities (Component 3B) and construction of distribution lines to connect new customers (ii) environmental, health and safety concerns are likely to be associated with recycle and disposal of spent batteries at the end of their useful lives, which is usually 3-5 years after deployment. Rechargeable batteries for storing solar energy may run on nickel-cadmium (Ni-Cad), nickel metal hydride (NiMH), lithium-ion (Li-ion), lead-acid (Pb-A) or lead-gel (Pb-gel). These batteries should not be disposed in standard landfills because they can create long lasting environmental and human health impacts (e.g., headaches, abdominal discomfort, seizures and comas, cancers, irritation of skin and respiratory system, burns and damage to skin and eyes, corrosion, etc.) due largely to the heavy metals such as mercury, lead, cadmium and nickel, and acids. The entire management processes including de-</p>



manufacturing, collection, storage, recycling, transport and disposal may present a challenge to this Project, given the scope of this operation. Kenya is in the early stage of developing a national legislation or regulations on the disposal of e-waste. The zero draft does not include aspects of spent rechargeable batteries from solar PV systems. The Project will work closely with the National Environmental Management Authority to complete the drafting of the national legislation and regulations on waste management. The draft will incorporate aspects related to solid waste from solar PV systems and/or develop a project-specific environmental code of practice (ECOP) as a guidance on approach for the collection, transport, storage and disposal of spent batteries, with the aim of ensuring that risks to the environment and human health are prevented or mitigated. Apart from providing approaches to the management of spent PV batteries, such an ECOP will also seek to inform discussion and build awareness of all stakeholders, including rural community members, vendors/suppliers of products and service providers, around safe management of used batteries. Since the specific locations/ sites of the subprojects are unknown at this stage of project preparation, the Client has prepared an Environmental and Social Management Framework (ESMF) in participatory manner and consulted upon. The ESMF contains an environmental and social screening process, and environmental and social checklist to ensure that potential negative impacts are mitigated, and that subprojects are not located in critical natural habitats. If determined through screening that a subproject would require a full environmental assessment, the National Environmental Management Authority (NEMA) approval and license will be sought before commencing any civil works. The ESMF report has been prepared, consulted upon and disclosed.

Natural Habitats OP/BP 4.04

Yes

Predicated on the assumption that natural habitats may be affected by erection of poles and construction of mini-grid stations, the ESMF has provided detailed procedures to screen subprojects for potential adverse environmental and social impacts, and to take measures to avoid, minimize



and mitigate impact on natural habitats. Project funds will not finance any activities that could result in adverse risk to ecologically sensitive ecosystems and natural habitats.

Forests OP/BP 4.36 No

Pest Management OP 4.09 No

Physical Cultural Resources OP/BP 4.11 No

Indigenous Peoples OP/BP 4.10 Yes

This policy is triggered due to the known presence of IPs in all 14 counties that are targeted by the project. The project counties can be divided into two categories in terms of the IP communities found in them. The first category, represented by eight (8) of the project counties – Garissa, Mandera, Isiolo, Marsabit, Wajir, Turkana, Samburu and Narok counties– are overwhelmingly IP counties in so far as they are inhabited mainly by nomadic pastoralist communities, with some of them being hosts to a few minority ethnic/tribal groups. The second category, represented by Tana River, Lamu, Kilifi, Kwale, Taita Taveta and West Pokot counties, have minority IPs living among the more dominant communities in each of the counties. Communities and groups that are in the minority in these counties and which meet the OP 4.10 criteria are the Sengwer in West Pokot County, Wailwana of Tana River, Watha of Tana River, Taita Taveta and Kilifi Counties, Wakifundi/Wachwaka of Kwale County, Wasanye and Aweer of Lamu County and Munyoyaya of Tana River County. In addition to meeting the OP 4.10 criteria, the Government of Kenya, through the Commission for Revenue Allocation (CRA), has categorized the 14 counties as marginalised and underserved in the due to their geographic remoteness which has meant that they have not been adequately reached with social and economic development compared to other parts of the country. At this stage of project preparation, subprojects sites/location have not yet been identified, and the criteria for participation in the project are yet to be clearly defined. For these reasons, a framework approach has been adopted for this project and on the basis of this, the Client has prepared a Vulnerable and Marginalised Groups frameworks (VMGF), in consultation with the



potential project beneficiaries including VMGs, using the free, prior and informed consultations approach. The Client VMGF provides the procedures and processes to be used in the preparation of subproject specific Social Assessments and Vulnerable and Marginalised Groups Plans, should these be found to be necessary during the subprojects screening. In addition the Client has carried out Social Assessment in all the 14 counties targeted by the project which will help in the preparation of VMGPs

Overall, it is anticipated that the project will have minimal adverse impacts and no major physical or economic displacements are foreseen. Nevertheless, since the subprojects locations/sites have not been identified, at this stage of project preparation, it is assumed that the proposed Component 1 of the mini grids may require land take and may result in the displacement (both physical and economic) of people. Therefore, the Client has prepared, consulted upon and disclosed the Resettlement Policy Framework (RPF) to address any issues that might arise from physical and economic displacement and/ or restrictions of access to communal land/natural resources. Based on RPF guidance each subproject will be screened, and if RAP/ARAP are found to be necessary, these will be prepared, cleared by the Bank, disclosed in country and implemented prior to commencement of civil works, in accordance with the requirements of this policy.

Involuntary Resettlement OP/BP 4.12 Yes

Safety of Dams OP/BP 4.37 No

Projects on International Waterways
OP/BP 7.50 No

Projects in Disputed Areas OP/BP 7.60 No

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

The project will deliver positive environmental and social impacts since off-grid solar systems would replace lighting



systems that are either fossil fuel-based such as diesel generators and kerosene lamps or woody biomass, which are detrimental to the biophysical environment. The Project will install solar PV panels on rooftops/ mount them on poles. Lamps and other ancillary equipment will be used/deployed directly in homes without any construction. There are practically no risks to landscapes and ecology during the operation. On the social side, the project will result in improved/increased access to electricity via solar PV systems that will provide positive social impacts for currently underserved rural communities in Kenya. This will ensure people and public facilities are located in off-grid areas often seen as economically not feasible or too dispersed and isolated benefit from electricity power.

The main potential environmental impacts anticipated from the project are (i) civil works that would be limited to construction of the mini-grids in remote areas (Component 1), installation of solar PV for water pumping (Component 3), installation of standalone solar systems for households (Component 2) (ii) environmental, health and safety concerns are likely to be associated with recycle and disposal of spent batteries at the end of their useful lives, which is usually 3-5 years after deployment. Rechargeable batteries for storing solar energy may run on nickel-cadmium (Ni-Cad), nickel metal hydride (NiMH), lithium-ion (Li-ion), lead-acid (Pb-A) or lead-gel (Pb-gel). These batteries should not be disposed in standard landfills because they can create long lasting environmental and human health impacts (eg, headaches, abdominal discomfort, seizures and comas, cancers, irritation of skin and respiratory system, burns and damage to skin and eyes, corrosion, etc) due largely to the heavy metals such as mercury, lead, cadmium and nickel, and acids. The entire management processes including de-manufacturing, collection, storage, recycling, transport and disposal may present a challenge to this Project, given the scope of this Bank financed operation.

The mini grids may require land take and result in the displacement (both economic and physical) of people. However the proposed mini grids will have minimal footprint and can be located in places that avoid the need for resettlement.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

The project targets the marginalized counties in the country, whose majority population are cash poor and practice pastoralism as a livelihood base, while others practice a mixture of livelihood strategies which include livestock keeping, fishing, farming and to a small extent, hunting and gathering. The project's long term positive impacts include reduced use of fossil fuel based energy generation facilities, kerosene lamps and use of woody biomass by households. Also, the project will lead to improved education and health standards for the residents of these underserved counties, and with potential for increased socio-economic activities.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

N/A

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

The Client has prepared in a participatory and consultative manner, an Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), Social Assessment (SA) and Vulnerable and Marginalized Groups Framework (VMGF).

The ESMF establishes a process of environmental and social screening and permits the agency in charge of the implementation of the projects to identify and, assess and mitigate the environmental and social impacts of subproject investments. The RPF clarifies the principles, legal and institutional framework for resettlement and design criteria to be applied to investments. The RPF provides overall guidelines and procedures on how the subprojects will avoid, minimize, manage, mitigate or compensate for any adverse project related displacement risks.

The Client has carried out SA and prepared a VGMF because the overwhelming majority of the project beneficiaries in the fourteen counties targeted by the project are considered vulnerable and marginalized, and, eight of the 14 counties are overwhelmingly indigenous peoples (IPs) while the other six have IPs in the minority.

The MoEP will provide overall coordination of the Project and lead in the implementation of Component 2, which will



include overall responsibility for safeguards due diligence, and compliance monitoring. MoEP will ensure that terms of reference for hiring the Facility Manager (FM) contain clauses that relate to safeguards and Occupational Health and Safety competencies and specific tasks related to safeguard monitoring and enforcement. The selected FM will be responsible for coordinating and supporting the implementation of safeguards under the supervision of KOSAP PCU; will prepare Facilities Implementation Manual to further operationalize ESMF and RPF that will include checklist for subprojects, their potential threats, and mitigation measures as well as capacity building for safeguards implementation and compliance monitoring and that will be cleared by the Bank. The generation of safeguard reports will start from the solar companies and through the FM to MoEP.

KPLC and REA will jointly be responsible for the implementation of Components 1 and 3 and will have overall responsibility for safeguards due diligence and compliance monitoring and the private contractors will be responsible for preparing a checklist for subprojects, their potential threats, and mitigation measures as well for safeguards implementation.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The preparation of the safeguard instruments has involved extensive and indepth consultations through free, prior and informed consultations with both categories of IPs in each of the counties in line with the requirements of the World Bank Safeguard Policies, among the stakeholders consulted include: the national level participants, private sector, county governments, businesses, local communities and Non-Governmental Organizations and minutes of stakeholder meetings have been included as annexes in the safeguard instruments.

B. Disclosure Requirements

Environmental Assessment/Audit/Management Plan/Other

Date of receipt by the Bank	Date of submission to InfoShop	For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors
21-Mar-2017	23-Mar-2017	

"In country" Disclosure

Kenya
23-Mar-2017

Comments

REA - http://www.rea.co.ke/index.php?option=com_content&view=article&id=167&Itemid=629

KPLC - <http://www.kplc.co.ke/content/item/1943>

Resettlement Action Plan/Framework/Policy Process

Date of receipt by the Bank	Date of submission to InfoShop
21-Mar-2017	23-Mar-2017



"In country" Disclosure

Kenya

24-Feb-2017

Comments

REA - http://www.rea.co.ke/index.php?option=com_content&view=article&id=167&Itemid=629

KPLC - <http://www.kplc.co.ke/content/item/1943>

Indigenous Peoples Development Plan/Framework

Date of receipt by the Bank

Date of submission to InfoShop

21-Mar-2017

23-Mar-2017

"In country" Disclosure

Kenya

28-Feb-2017

Comments

REA - http://www.rea.co.ke/index.php?option=com_content&view=article&id=167&Itemid=629

KPLC - <http://www.kplc.co.ke/content/item/1943>

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?

No

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?

No

If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?

NA



OP/BP 4.10 - Indigenous Peoples

Has a separate Indigenous Peoples Plan/Planning Framework (as appropriate) been prepared in consultation with affected Indigenous Peoples?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

If the whole project is designed to benefit IP, has the design been reviewed and approved by the Regional Social Development Unit or Practice Manager?

NA

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

The World Bank Policy on Disclosure of Information

Have relevant safeguard policies documents been sent to the World Bank's Infoshop?

Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes



CONTACT POINT

World Bank

Sudeshna Ghosh Banerjee
Lead Energy Specialist

Patrick Thaddayos Balla
Energy Specialist

Borrower/Client/Recipient

The National Treasury
Kamau Thugge
Dr
ps@treasury.go.ke

Implementing Agencies

Kenya Power and Lighting Company (KPLC)
Ken Tarus
CEO
ktarus@kplc.co.ke

Rural Electrification Authority
Ng'ang'a Munyu
Mr.
nMunyu@rea.co.ke

Ministry of Energy and Petroleum
Joseph Njoroge
Principal Secretary
ps@energy.go.ke

Isaac Kiva
Director of Renewable Energy
isaac_kiva@yahoo.com



FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: <http://www.worldbank.org/projects>

APPROVAL

Task Team Leader(s):	Sudeshna Ghosh Banerjee Patrick Thaddayos Balla
----------------------	--

Approved By

Safeguards Advisor:	Nathalie S. Munzberg	28-Mar-2017
Practice Manager/Manager:	Lucio Monari	28-Mar-2017
Country Director:	Thomas O'Brien	28-Mar-2017

Note to Task Teams: End of system generated content, document is editable from here.