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Investment Prospectus

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Sustainable Energy for All

Investment Prospectus for Kenya

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Development of Investment Prospectus for Sustainable Energy for All in Africa – Support to Kenya to develop its SE4ALL Action Agenda

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Abbreviations and Acronyms

AFD	African Development Fund
AFD	Agence Française de Développement (French Agency for Development
AfDB	African Development Bank
AG	Advisory Group
AUC	African Union Commission
BizClim	The ACP Business Climate Facility
COMESA	Common Market for Eastern and Southern Africa
DBSA	Development Bank of Southern Africa
DPs	Development Partners
DTA	Double Taxation Agreement
EA	Energy Access
EAC	East African Community
EE	Energy Efficiency
EACC	Ethics and Anti-Corruption Commission
EIA	Environmental Impact Assessment
Eng.	Engineer
EPC	Engineering, Procurement and Construction
EOI	Expression of Interest
ERC	Energy Regulatory Commission
ESCO	Energy Service Company
ESIA	Environmental , social Impact Assessment
EU	European Union
FIPA	Foreign Investment Protection Act
FIT	Feed in Tariff
FWG	Finance Working Group
GDC	Geothermal Development Company
GDP	Gross Domestic Product
GFG	Global Facilitation Group
GoK	Government of Kenya
GW	Gigawatt
GWh	Gigawatt-hour
KAM	Kenya Association of Manufacturers
KENGEN	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company
KPLC	Kenya Power and Lighting Company
Ksh	Kenyan shillings
KV	kilovolt

kWh	Kilowatt-hour
IFC	International Finance Corporation
IP	Investment Prospectus
IPP	Independent Power Producers
IRENA	International Renewable Energy Agency
LPG	Liquefied Petroleum Gas
MIGA	Multilateral Investment Guarantee Agency
MoEP	Ministry of Energy and Petroleum
M&E	Monitoring and Evaluation
MW	Megawatt
NC	National Coordinator
NCIA	Nairobi Centre for International Arbitration
NEPAD	New Partnership for Africa's Development
NPCA	NEPAD Planning and Coordination Agency
OECD	Organisation for Economic Co-operation and Development
PMS	Project Management System
PPA	Power Purchasing Agreement
PPP	Purchasing Power Parity/Public private Partnership
PRG	Partial Risk Guarantee
Prof	Professor
PV	photovoltaic
RE	Renewable Energy
REA	Rural Electrification Authority
SADC	Southern African Development Community
SE4ALL	Sustainable Energy for All
SEFA	Sustainable Energy Fund for Africa
SME	Small and Medium Enterprises
SSA	Sub Saharan Africa
TERI	The Energy Research Institute of India
toe	tonne oil equivalent
UK	United Kingdom
UNDP	United National Development Programme
UNEP	United National Environment Programme
US$	United States dollars

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Executive Summary

This Investment Prospectus (IP) is a Government of Kenya's (GoK) document to attract investments into the country's energy sector particularly to address the country's SE4ALL goals of achieving *universal access to sustainable energy to all*, *doubling the global rate of energy efficiency* and *doubling the global share of RE in the energy mix* by 2030.

The implementation of the IP will be led by a National Coordinator in the Ministry of Energy and Petroleum supported by a technical Advisory body and a Finance Working Group equipped to mobilize resources. The backing from the national experts will support informed decisions. The GoK has access to the support of the SE4ALL Africa Hub and Global Facilitation Group for both mobilization of resources and technical assistance.

The implementation of the IP will contribute to the expected energy supply to meet Kenya's Vision 2030 of being a prosperous Middle Income country and to increase the currently low access to electricity and modern energy services for cooking and heating. Renewable energy resources are abundant in Kenya in the form of geothermal, wind, solar, hydro, municipal waste, and cogeneration. However significant investment is required to exploit these resources to meet the fast growing demand for electricity expected to increase nearly ten-fold by 2030 from current utilisation.

The IP presents the investment environment, investment opportunities in Kenya and associated risks that will need to be managed.

With regard to the investment environment, the IP presents the priorities investors require in terms of support and incentives. At national level, Kenya has attractive taxation arrangements including easy repatriation of profits. The country has strong protection systems for investors and dispute resolution and assists investors with opportunities for insurance cover, letters of support and risk guarantees. The newly created Public Private Partnership Act also facilitates cooperation in mobilization of resources in conjunction with the GoK.

At the Energy sector level, Kenya has a strong sector institutional framework supported by experienced government agencies and a strong private sector. GoK has introduced special RE tariffs and Power Purchase Agreements to ensure returns on investment and also facilitate borrowing by private sector investors. The government is providing Partial Risk Guarantees (PRG) for investors and de-risking investment e.g. for RE generation projects by undertaking resource development and feasibility studies. In addition it provides the necessary grid infrastructure to distribute power and reach consumers, even subsidizing consumer connections to enhance demand.

For investment opportunities, the IP describes the priority project areas which were identified in Kenya's SE4ALL Action Agenda. This document provides a project pipeline and the investment readiness for those projects, in addition to their funding requirements. The project pipeline is divided into projects that are to be implemented through government agencies, those that private sector in Kenya are seeking funding for and other investment opportunities to diversify energy sources in the economy and 'soft' projects to support decision making. A Project Management System has also been developed to keep an updated pipeline from which investors can view projects publicised for investment in Kenya.

There are 19 projects falling under the responsibility of government agencies that are awaiting investment. These consist largely of geothermal (850MW), hydropower (1120MW), wind (500MW), municipal waste (30MW) power plants, transmission lines of various sizes[1] and an LPG (2,250 million

[1] There are 15 Transmission projects since 2012/2013 and 20 projects in 2013/2014 with feasibility studies and bid documents complete. Together with estimate for the Lamu- Kitui Nairobi 400KV seeking – total financing sought for transmission is about US$1.36 billion.

tonne storage) project. These projects have complete feasibility studies and investment is being sought from Independent Power Producers (IPP), other Public-Private Partnerships (PPP) including Build Own, Operate and Transfer arrangements. The estimated investment requirements for these government projects are of the order of US$8.7 billion in the short term (3-5 years). This IP presents detailed templates for some of the projects under government agencies that are investment ready, namely:

- Geothermal generation plants at Menengai
- A large hydropower plant at Grand Falls
- Lamu-Kitui-Nairobi transmission line and Four Power Evacuation Transmission projects under 5000+MW (Menengai-Rongai Transmission line: Silalii-Rongai Transmission line: Isinya-Nairobi East Transmission line: Dongo Kundu- Mariakani Transmission line)
- A LPG Storage and Bottling facility in Nairobi

The Private sector pipeline consists of those projects under FIT that are seeking for financing and are undertaking feasibility studies and/or seeking PPAs. There are 26 such projects under consideration (all hydro types), 4 of which have PPAs and are proceeding to financial close stage and 8 are under PPA negotiations. The rest (14) are still undertaking feasibility studies. To have been issued with or applying for PPAs means that the projects have proof of land acquisition, access or usage rights, a grid connection plan, a full technical and economic feasibility study, and approved EIA. The project pipeline is with the Ministry of Energy and Petroleum and details of owners, projects' status and budget estimates can only be found through the SE4ALL National coordinator due to confidentiality conditions. There are also 88 EE/RE projects that have been supported through a credit line that are now ready for investment through the Kenya Association of Manufacturers. These KAM projects are seeking combined debt funding of US$332 million as AFD is providing equity. The projects that can receive immediate investment are provided in template form, namely:

- A large solar PV- Witu (40MW)
- KAM EE/RE Project Pipeline

Other investment opportunities that can offer opportunities to private investors are schemes for developing mini-grids, connection to the national electricity grid, other decentralized electricity systems (pico and solar home systems) and cooking solutions (Improved cooking systems). For the proposed mini-grids, there are 23 hybrid sites (diesel, solar, wind) mapped in the SREP that are under the Ministry and REA and require about US$84million in investment for the RE (solar –US$77 million and wind- US$ 8 million) component. There is room for commercial operations in the country to supply pico and solar home systems, clean cooking fuels and appliances and supplying equipment for extension of the electricity distribution network but require structuring into specific projects.

Kenya faces some risks to investment around market predictability and development, surrounding pricing, subsidies, incentives, sustainability, infrastructure development plans; financing and related high costs of capital and ameliorating delays in investment enquiries. GoK will aim to manage risks associated with tariff and pricing regimes to ensure good returns to investment and provide the necessary incentives e.g. in form of PPAs, tax exemptions allowing for some smart subsidies e.g. as pro-poor policies to meet basic energy service requirements for all.

The grid development plans will be made transparent to allow investor planning notably with respect to distribution of power and investment in mini-grids. The GoK will also aim to create Seed and Investment funding to support project development and contribute to affordable cost of capital. The National Coordinator will strive to avoid unnecessary delays in reaching investment stages for the energy projects. The GoK will continue improvements to the country and agency creditworthiness to create an even better investment climate.

1. Introduction

1.1. Background

1.1.1. About the IP

This Investment Prospectus (IP) for Kenya is prepared by the Ministry of Energy and Petroleum to attract investments into the country's energy sector particularly to address the country's SE4ALL agenda related to energy access, energy efficiency and renewable energy. These activities are designed to meet the Global goals of achieving *universal access to sustainable energy to all*, *doubling the global rate of energy efficiency* and *doubling the global share of RE in the energy mix* by 2030.

The IP covers, the investment environment, investment opportunities in Kenya and associated risk and their mitigation measures.

For investment opportunities, the IP details the priority project areas identified in Kenya's SE4ALL Action Agenda and provides a project pipeline and describes the investment readiness of the projects in that pipeline.

In all cases, there are certain elements of country preparedness for investments that may impinge on the performance of investments and Kenya has provided mitigation measures that could be applied to manage potential investment risks.

The IP is building on Kenya's 5000+MW Prospectus that is under implementation (2013-2016) with regard to elements of energy access, energy efficiency and renewable energy associated with the electricity and petroleum subsectors. This IP has been developed with the recognition that the Government of Kenya through its budget and development partner support is also implementing a number of other projects/programmes to augment supply and demand efficiency in the energy sector. This SE4ALL IP has taken these initiatives into consideration and some projects listed in the 5000+MW and the other initiatives have been included as candidates that could benefit from investment mobilized through SE4ALL.

The Government of Kenya invites the private sector to invest in the energy sector of Kenya individually, jointly and in partnerships complementing public (local and international) and civil society investments in the sector.

1.1.2. Who is leading the IP?

There are institutions driving the SE4All initiative that are important in the context of implementing this IP, namely the National SE4ALL Coordinator in Kenya, the SE4ALL Africa Hub and the global SE4All institutional framework.

SE4ALL National Coordinator

Investment through this prospectus is being coordinated by the Directorate of Renewable Energy in the MoEP that is the national focal point and coordinator for SE4ALL in Kenya. The National Coordinator (NC) will answer to all requirements related to SE4ALL IP implementation and also undertake Monitoring and Evaluation to track the implementation process. The NC will be the one to link investors with relevant country institutions that support project registration, development and implementation in Kenya.

The NC will be supported by an Advisory Group (AG) [2]spanning all key categories of the stakeholders from public, civil, private sectors and research institutes. The AG members will have expertise that will be useful in providing technical advice relevant to potential investors in relation to aspects of Kenya's energy planning and policies, business models, technology and innovation and capacity building and knowledge sharing. It is the responsibility of the NC with support from the AG to manage the project pipelines and provide the necessary information on the status of the IP project-pipeline to investors.

The NC will work with a national Finance Working Group (FWG)[3]. The FWG will be responsible for establishing budget requirements to support energy sector project investments in Kenya and will have the responsibility of mobilizing the local financial sector and other local and international sources of financing to support IP implementation. The FWG will guide allocation of such financial resources to priority project areas through a fund matching system.

Both the AG and the FWG will be supported by ad-hoc specialized working groups or Centres of Excellence that will undertake any follow-up work that may be needed to guide decision making by the NC, AG and FWG.

SE4ALL Africa Hub

Additional support for the implementation of the IP is available through the SE4ALL Africa Hub that is coordinating implementation of the SE4ALL initiative in Africa. The oversight of the Hub providing strategic guidance is headed by a committee comprising of NEPAD-NPCA, AUC, AfDB, UNDP and the Regional Economic Communities (selected on a rotating basis). The Secretariat, responsible for carrying out the activities of the Hub and its work program is housed at the AfDB.

The Hub has been leading the earlier stages of SE4ALL initiatives in African countries and has the mobilizing power to source resources from development partners and other financing windows/instruments available for investment and technical assistance. It has led development of the guidelines and principles for development of national action agendas and IPs respectively and has supported the development of this IP for Kenya.

The Hub is well positioned to mobilize resources for African countries for technical assistance and investments for a variety of projects, inclusive of centralized and decentralized/bottom-up solutions. Their institutional arrangement presents opportunity to mobilize AfDB resources in support of SE4ALL and realize synergies in particular with the Bank's Sustainable Energy Fund for Africa (SEFA).The Hub is also supporting private sector participation in the preparation of the national action plans and in mobilizing financing investment and is thus a relevant player in the implementation of this IP.

[2] Currently the SE4ALL Task Group

[3] To be formed but initial enquiries can be handled by the NC with support from the relevant ministries

Global Facilitation Group

The Hub is linked to the Global Facilitation Group (GFG) which operates under the guidance of the SE4ALL Executive Committee and the Advisory Board.

The Advisory Board has constituted four committees, one each on Access, Renewables, Energy Efficiency, and Finance. The Finance Committee's focus is on:

i. defining the market opportunity i.e. countries, sub-sectors of energy, typology of projects and the size of financing-gap to be addressed;

ii. sources of capital and financing instruments: to prepare a review of investors, transaction structures, financing instruments, and optimization of risk;

iii. preparation and implementation of bankable projects: to identify typical project sponsors in the energy sector.

The Committee is also exploring the possibilities of creating a Multilateral Development Banks (MDB) sponsored fund-of-funds and institutional mechanisms to deploy it and determine who will deploy the capital and monitor the projects, particularly the bottom of the pyramid investments. The GFG is thus a resource that can be tapped into in mobilizing resources and technical assistance in the implementation of the IP.

The SE4ALL framework also has Global Thematic Centres e.g. UNEP at Denmark Technical University for energy efficiency, UNDP for energy access, IRENA for renewable energy, TERI for capacity building, World Bank for knowledge sharing and the Global Finance Group for potential sources of funding. These centres and resources will provide guidance on best practice in relation to implementation of the IP.

1.2. Driving force behind the development of the IP

1.2.1. Country Vision, Related energy demand and SE4ALL Targets)

This SE4ALL IP is intended to mobilize significant investment resources to meet energy demand for Kenya's Vision 2030 which foresees Kenya becoming a prosperous Upper Middle Income country by 2030. To achieve that Vision, Kenya's economy will have to grow at over 10% per annum. Kenya continues to experience a steady increase in electricity consumption and, there has been an increase in the peak demand of 8.4%[4] from 2012/2013 to 2013/2014. This trend is expected to be sustained due to accelerated customer connectivity by the Company, increased economic activities in the counties, and implementation. The electricity peak demand in the country is projected to reach 15 GW in 2030 from the current demand of 1.512GW. The current installed capacity as of November 2014 is 2294.82MW, 1569.5MW being generated by KenGen and the rest by Independent Power producers (698.89MW) and isolated grids (25.8MW). Eighty percent (80%) of the IPPs generation is from diesel making cost of supplying electricity high.

Kenya's average annual per capita energy consumption between 1971 and 2011 was 450koe[5] ranging from 430koe in 1971 to 482koe in 2010 compared to an average of 2000koe for Upper Middle

[4] Annual growth rate in peak demand from 2008/09 to 2013/14 is 6.5%

[5] http://www.theglobaleconomy.com/Kenya/Energy_use_per_capita/

Incomes. In the case of electricity, per capita consumption was 155kWh[6] in 2010 and 2011. This is in comparison to over 1500 kWh/capita[7] per year for African Upper Middle Incomes countries.

For such economic growth to occur there will be a leap in industrialization, which is the key driver for wealth in many countries and hence a large energy demand in that sector.

Apart from energizing economic growth, the IP aims to meet Kenya's targets for universal access to modern energy services for electricity, cooking, heating, lighting and transport for households and communities.

1.2.2. Status of and targets for Energy Access, Renewable Energy and Energy Efficiency

Required investments for meeting SE4ALL goals for Kenya are to raise current levels of energy access to the global SE4ALL objective of universal access to modern energy services, doubling the share of renewable energy in the country's energy mix and doubling the rate of energy efficiency by 2030 or earlier. Current performance in relation to these SE4ALL goals for Kenya and the set targets are presented in this section.

Energy Access

Kenya has a goal to achieve universal access to a combination of clean modern energy services in the form of electricity and modern cooking and heating energy for households, community services and productive uses. The current situation is still far from reaching that goal.

In 2013, the percentage (%) of population with access to electricity on the grid was 32% divided into 51% for urban and 5%[8]for rural[9].Only 0.6% of the population uses electricity for cooking and heating (1.8% in urban and 0.2% in rural areas). Those using LPG for cooking are 5% nationally, 21% for the urban and 1% for the rural population[10].This is in contrast to 95% and 31.9% of the population using lower grade fuels for these applications in rural and urban Kenya respectively[11]. Of solid fuels, 68.7% of the population use wood and 13.3% use charcoal for cooking[12].

The percentage using modern energy services for cooking nationally is however estimated to reach 56% by 2015[13]. The percentage of the population already using improved charcoal cook stoves is considerable (47% in urban and 40% rural) but only1% of the national population is using efficient fuelwood cook stoves[14].

Kerosene remains the predominant source of fuel for lighting (79.8%)[15] and cooking (13.2%)[16], but Kenya is proactively planning fora kerosene free economy.

Kenya had targeted electrification of main public institutions consisting of secondary schools, health centres and trading centres to have been completed by 2013. Collectively 89% of these institutions

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[6] http://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC

[7] Botswana 1600kWh/cap; South Africa 4604kWh/Cap

[8] This fugure is estimated to have reached 26% by mid-2013 but a baseline study is necessary to be conclusive on the estimate..

[9] Rural Energy Master Plan

[10] GLPGP - Kenya Market Assessment, 2013

[11] Global Alliance for Clean Cookstoves

[12] ibid

[13] East Africa Community Strategy on Scaling Up Access to Modern energy Services,

[14] GLPGP - Kenya Market Assessment 2013

[15] Solar Aid factsheet

[16] Global Alliance for Clean Cookstoves

were electrified by June 2013. In the case of other institutions that include primary schools, administration offices, police posts, coffee and tea factories, water projects/boreholes, social halls, nursery schools, churches and mosques, the achievement was 72% electrified[17]. This is a success story that has been achieved through the Rural Electrification Authority but still requires additional investment to complete the rest of the un-electrified institutions.

The overall target with respect to energy access by 2030 is that all Kenyans (households, community and productive facilities) will be connected to electricity- grid/off-grid/mini-grid, and using one or more of the modern cooking, heating and lighting energy services

Renewable Energy

The SE4All RE global goal and targets relate to doubling of the RE in the energy mix in the context of electricity, heating and transportation. For Kenya, the target is to succeed in implementing all the planned RE projects in the short term, medium and long term to 2030.

By November 2014 64.61% (1483.52MW out of 2294.82MW) of Kenya's electricity mix was renewable in form of hydropower, geothermal, cogeneration and wind. This share will become55.6% in 2016 (3760MW out of 6762MW) after implementation of the 5000+MW Investment Prospectus projects[18]. The share will be 40 %(geothermal, hydropower and wind) through 2030 according to the Least Cost Power Development Plan (2011-2031). The targets computed from the Draft National Energy Policy (2014) are more ambitious with the RE share in the electricity mix translating to 62% by 2020, 72% by 2025 and over 80% by 2030. The RE share will be even greater if decentralized systems, planned to complement grid electricity, are taken into consideration.

Regardless of the share of RE in the electricity mix, the investment required for RE future generation capacity will be more than 3 times for geothermal in 2030 compared to the current capacity.

Ninety-five (95) wind masts have been installed and an additional 5 wind masts have been installed at higher heights of 100m to collect data for detailed feasibility studies in high potential areas. Once completed, the data will be analyzed and offered to investors on a competitive basis to develop the sites. A number of IPPs and KenGen have also undertaken studies in designated areas to establish potential for power generation. A significant investment in wind (and solar) is also expected.

One of the major drivers for increasing heating energy services in Kenya is the Solar Water Heating (SWH, 201219) regulation mandating installation of SWH on all facilities consuming more than 100 litres of hot water per day. The target installation of SWHs is 800,000 by 2020.The Government of Kenya is aiming to facilitate the construction of at least 5000 in 2017, another 6500 in 2022 and 10000 in 2030 additional bio-digesters20.The Africa Biogas Partnership Programme (ABPP) alone has already installed 10,000 biogas digesters in Kenya21.

Kenya has a geothermal potential of 10,000 MW found in fields situated in the Country's Great Rift Valley, of which 593 MW have been developed to generate electricity by November 201422. Whilst geothermal steam use in industry is planned for, targets are not yet set and the potential demand is

[17] 5000+MW Investment Prospectus 2013-2016

[18] Computed from data in 5000+MW Investment Prospectus

[19] www.erc.go.ke/index

[20] Draft National Energy Policy; 24th February, 2014. Ministry of Energy and Petroleum; Republic of Kenya.

[21] http://www.dutchwatersector.com/news-events/news/8190-africa-biogas-partnership-programme-announces-construction-10-000th-biogas-digester-in-kenya.html

[22] Source: ERC website (erc.go.ke/Home/Electricity)

not yet established. However prefeasibility done suggest potential in dairy, aquaculture, crop drying and greenhouse but feasibility on a case by case is required to establish the size of demand[23].

In transportation, Kenya has set targets to achieve E10 (a blend of 10% ethanol and 90% petrol) and B5 (a blend of 5% biodiesel and 95% fossil diesel) for all government vehicles by 2025, then E30 (a blend of 30% ethanol and 70% petrol) and B5 for all national vehicles by 2030[24].

The projects in this IP pipeline will contribute towards achieving the stipulated goals and targets for the country.

Energy Efficiency

Under the Global Tracking Framework, energy intensity of GDP is taken as a proxy for energy efficiency within economies.

Basing on energy intensity of GDP (Purchasing Power Parity-PPP), Kenya was in 2012 at 0.25toe (primary energy)/ US$1000GDP (PPP)[25]. In accordance with SE4ALL Goal of doubling the rate of energy efficiency, this figure will be halved to 0.12toe/US$1000[26]GDP (PPP) by 2030. Similarly the energy intensity of GDP will improve from the current 0.11toe/US$1000 GDP (PPP) for industry to 0.05toe/US$1000 GDP (PPP) by 2030; from 0.21toe/US$1000 GDP (PPP) for Transport to 0.10toe/US$1000 GDP (PPP) by 2030. For commercial sector and agriculture/forestry[27] the energy intensity of GDP is already low at 0.003 toe/US$1000 GDP (PPP) and 0.001toe/US$1000 GDP (PPP) respectively but can also be halved by 2030.

The government has committed to improve the efficiency of electricity transmission and distribution losses from the current 18.1%[28] to 15% by 2020.The target in accordance with SE4ALL EE goal would be to reach below 10% losses by 2030.

Kenya is also moving towards adoption of 100% efficient lighting and efficient transformers by 2020 and 2030 respectively

There are a number of opportunities related to improved steam use in industry, power factor correction and efficient refrigeration/appliances that are being considered but with no specific targets mentioned.

The targets for Kenya to reduce both the energy intensity of its GDP and other energy system losses provide investment opportunities to investors.

[23] THE GEOTHERMAL DIRECT-USE GUIDEBOOK AN ASSESSMENT OF POTENTIAL GEOTHERMAL DIRECT-USE AND SMALL-POWER APPLICATIONS Submitted to: US Agency for International Development – Washington, DC US Agency for International Development – Kenya Geothermal Development Company of Kenya Submitted by: The Volunteers for Economic Growth Alliance (VEGA) Powering African Agriculture (VEGA/PAA) project Through a: Leaders With Associates (LWA) Cooperative Agreement with Land O'Lakes Inc., International Development & Winrock International Final Draft – October 2013

[24] ibid

[25] http://www.iea.org/statistics/statisticssearch/report/?year=2012&country=KENYA&product=Indicators

[26] 2005 constant prices

[27] Low energy intensity in agriculture is attributed to use of human, animal and direct solar energy that is not captured in the energy balance.

[28] KPLC Annual report for 2013/14

2. Why Invest in Kenya?

2.1. National Support and Incentives[29]

The Government of Kenya has taken steps to establish itself as investment-friendly destination. The legal framework for foreign investment exists and can be found within the Companies Ordinance, the Partnership Act (1981-revised 2012), the Foreign Investment Protection Act (1990 revised 2012), and the Investment Promotion Act of 2004.

Rule of Law and Doing Business in Kenya

Kenya maintains the stability and enforceability of laws and contracts in the country, with respect to the rights of investors and a judicial and regulatory process free of arbitrary government interference.

Although on the rule of law index report of 2014, Kenya was ranked 86 out of 99 countries globally and 12 out of 18 Sub-Saharan African (SSA) countries that were surveyed in 2012, the country has experienced an improvement and provides protection against the expropriation of private property except under due process.[30] The doing business indicators will however need a continued improvement to satisfy international investors coming to Kenya. Kenya's worst ranking in 2014 on Doing Business was on Absence of Corruption where it ranked 93 barely beating Ukraine, Bangladesh, Kyrgyzstan, Nigeria, Cameroon and Afghanistan. The country has, however, introduced Anti-Corruption regulations within government for several decades, with the latest reform coming alongside the new Constitution of Kenya in 2011 to establish the Ethics and Anti-Corruption Commission (EACC).

Taxation

Kenya offers a number of tax incentives to foreign firms that manufacture goods locally for export, including a 10-year corporate income tax holiday and a 10-year withholding tax holiday on repatriated dividends and other remittances. Foreign investors are also exempted from paying value added tax (VAT), import duty on inputs, and payment of stamp duty on legal instruments. They qualify for 100 per cent tax deduction on new capital investments. The incentive is in operation but may change in future as the incentives are costing the country hundreds of billions in revenue.

The tax on profit of 28.2% is significantly higher than the average for SSA and OECD averages of 18.4% and 16.1% respectively but the Labour tax and contributions are low and significantly below the SSA and OECD averages[31].

The Government of Kenya has concluded Double Taxation Agreements (DTA's) with a number of countries and is currently expanding this list[32] Kenya has in place DTAs with some European economies (UK, Germany, Sweden, Denmark, Norway), Canada and Zambia in Africa and is working to include Italy and the EAC counterparts of Tanzania and Uganda, some SADC (South Africa, Mauritius and Seychelles) countries and other foreign (France, Thailand, Russia, Finland, Iran) and African (Nigeria) countries

[29] What International Investors Look For When Investing In Developing Countries (World Bank 2003)

[30] Several of the above derived from the *US Department of State 2012 Investment Climate Statement for Kenya.*

[31] World Bank, International Finance Corporation (IFC), PricewaterhouseCoopers (PwC), Paying Taxes 2009

[32] http://www.revenue.go.ke/lto/ltodta.html

DTA's are important since they help in alleviating double taxation where business is conducted in different tax jurisdictions and also assist tax administrations in preventing fiscal evasion. The countries with DTA agreement with Kenya can thus do business in Kenya without facing the local high tax on profit.

Repatriation of profits

Kenya has no restrictions on converting or transferring investment funds. Capital repatriation and remittance of dividends and interest to foreign investors are guaranteed in the Foreign Investment Protection Act (FIPA). Investors are free to convert and repatriate profits including un-capitalized retained profits after payment of the relevant taxes, the principal and interest associated with any loan. Repatriation of amounts above Ksh 500,000 (about $5,600) should however be declared as a formal check against money laundering.

Bilateral trade agreements with some countries

Kenya has huge market opportunities through the bilateral trade agreements with over 20 countries spanning Africa, East European, Latin America and EU countries and presents a huge market through COMESA EAC and Africa Free Trade Zone countries[33]:

MIGA- insurance cover for investment

MIGA provides political risk insurance (guarantees) for projects in a broad range of sectors in developing member countries. Kenya is already benefiting from ongoing MIGA support to its energy sector which is a strong demonstration of trust by the agencies of the World Bank Group to assist the economy mobilize private sector investment for the sector.

MIGA Insurance is of critical importance to addressing the political risks that may accompany an investment in such emerging markets[34] e.g. Currency, Expropriation, War, Breach of contract and Non-honouring of financial obligations

Dispute resolution facility

Kenya has a facility for dispute resolution in its Nairobi Centre for International Arbitration (NCIA)[35]. The NCIA has won the confidence of foreign investors who for years have been hesitant to do business in the country due to drawn out and costly court litigation on commercial matters.

NCIA is a business dispute resolution mechanism that handles efficient arbitration offering timely, impartial and legally-binding resolutions compared to the courts. This offers immediate recourse to investors in the event of a dispute surrounding investment in Kenya.

Letter of Support and Risk Guarantees

GoK issues letters of support that give comfort to both project companies and their lenders in cases where certain risks would result in, for example, delayed completion of projects. The Letters also facilitate financing of projects using World Bank support in form of Partial Risk Guarantees issued by the International Development Association and MIGA cover. The Government however issues no guarantees. To give payment security comfort to IPPs for this perceived inability by the off-taker to

[33] http://focusafrica.gov.in/Kenya_Trade_Agreement.html

[34] http://www.miga.org/investmentguarantees/index.cfm

[35] http://sabahionline.com/en_GB/articles/hoa/articles/features/2013/12/19/feature-01

meet monthly obligations, GoK has in the recent past obtained Partial Risk Guarantees (PRG) from the World Bank for four IPPs.

Public Private Partnership Act.

A Public Private Partnership Unit was established in 2013 to facilitate development of PPPs[36].The GoK has adopted the Public-Private Partnership policy and some projects are implemented by combining public and private financing. As part of its PPP implementation, Government agencies such as KenGen can go into joint ventures with private sector in power generation projects to attract private sector participation but maintaining a small shareholding.

2.2. Energy sector Support and Incentives

Energy supply in Kenya, particularly electricity, has been falling below current demand[37] and the growing demand requires corresponding capital outlay for investment in incremental generation capacity. It is envisaged that private sector on its own or through PPP will play a key role in Kenya to provide for that required capital.

GoK is cognisant of this fact and is positioned to support private sector investments in the sector in terms of institutional and policy frameworks.

2.2.1. Institutional frameworks

Institutionally, Kenya has a strong framework in form of the Ministry of Energy and Petroleum setting the enabling environment and providing budget support to projects development and investments.

Implementation is taken care of by competent government agencies responsible for geothermal resource development, power generation, transmission network and distribution network, rural electrification and an active energy regulator. The key institutions ready to support implementation of the IP and their roles are summarized in Table 2.1. Other sector players (public, private, development partners and NGOs) are ready to support investments in the country.

Table 2-1 Key institutions providing support to the SE4ALL Agenda

Institution	Responsibility
Ministry of Energy and Petroleum	Setting of energy sector Vision, strategic direction and policies. Provides budget support for project development and implementation. The MoEP coordinates all energy sector activities and provides partial risk guarantees, letters of support and signs financing agreements with funders on behalf of investors. The Ministry is the key contact for enquiries on SE4ALL energy investment.
Geothermal Development Company (GDC)	GDC is mandated to do geothermal projects and undertakes geothermal steam resource assessment, development and management and can participate in joint venture for plant development.
Kenya Power and Lignting Company	Off-taker of all electricity produced by power generators on negotiated Power Purchase Agreements for onward transmission and distribution to consumers. On

[36] Several of the above derived from the US Department of State 2012 Investment Climate Statement for Kenya.

[37] The situation has improved based on November 2014 installed capacity figures. Source: ERC website (erc.go.ke/Home/Electricity)

Institution	Responsibility
	Transmission it is in charge of 220kV, 132kV and 66kV. Kenya Power has government shareholding of 50%. The other top shareholders are private sector financing institutions (46%) and the National Social Security Fund (4%)[38] . KPLC is listed on Nairobi Stock Exchange.
Kenya Electricity Generating Company (KENGEN)	KenGen has government and private sector shareholding and is listed on Nairobi Stock Exchange and is in charge of the largest share of power generation in the country
Kenya Electricity Transmission company (KETRACO)	Plan, design, construct and own new national and regional interconnector Transmission network above132kV. Currently, KPLC maintains and operates all lines including KETRACO
Rural Electrification Authority (REA)	In charge of rural electrification programme using grid, minigrids and other forms of decentralized electricity systems
The Energy Regulatory Commission (ERC)	ERC is in charge of tariff setting and oversight, coordinating development of energy plan, monitoring and enforcement of energy sector regulations. ERC is forming a one-stop shop to support investors in the sector and maintains a RE portal that gives potential investors information on how to develop RE projects in Kenya.
The Energy Tribunal	Established by the Energy Act No 12 of 2006 to hear appeals brought against the decisions of the Energy Regulatory Commission within 30 days of an ERC decision. Arbitration of such disputes in the sector ensure recourse for investors
Kenya Bureau of Statistics	Ciollection and source of energy statistyics
The Task Force on Accelerated Green Energy Development at the Prime Minister's (PM) office	A committee that was founded to fast track development of green energy for achievement of national development goals, particularly realization of Kenya Vision 2030. This is mainly through assisting with mobilization of technical and financial resources for the implementation of green energy programs and projects, including public private partnerships and favorable carbon finance projects
Kenya Manufacturers Association (KAM)	Championing energy efficiency initiatives and related EE/RE project development and implementation in Kenya
National Environmental Management Authority (NEMA)	Environmental Management and Coordination. In charge of approving Enviornmental and Social Impact Assessments and recommend issuance of licensing of projects.
Kenya Bureau of Standards (KBS)	Set and implement standards that can also apply to energy services and equipment/technologies.
Kenya Renewable Energy Assocdiation (KEREA)	This is a membership association founded to lobby and advocate for issues relevant to the renewable energy sector in Kenya
Kenya Solar Techncians Association (KESTA)	A membership association founded in 2006 to galvanise the activities of freelance solar technicians and advocate for effective solar business especially at grass root level (rural areas).

[38] KPLC Annual Report 2013-2014.

The power sector is deregulated, opening up opportunities for IPPs to participate in power generation. IPPs are private investors in the power sector involved in power generation and are also supported by the Feed-in-Tariff Policy. Currently 12 IPPs[39] are supplying 28.7%[40] of the country's installed capacity from thermal, geothermal and bagasse.

The Energy Act also allows private distribution companies to operate, buying bulk power from power generators and supplying directly to customers in competition with Kenya Power. Transmission network is being opened for such power trading through KETRACO.

There are many other private sector entities active in RE/EE and energy access projects that that can be accessed through recommendations from the National Coordinator.

There are also NGOs that are active in providing energy solutions to the majority of population without access to clean energy sources and/or grid electricity. Among them is Practical Action that is active in both broad based participation in energy sector policy/planning and also on developing and deploying renewable energy/energy access solutions.

2.2.2. Policy frameworks

Kenya has gone through comprehensive sector reforms and has been taking risks and making substantial efforts to enable the engagement of private investment, notably putting in place favourable conditions to make IPP and PPP power projects work.

The GoK is incentivising private investment in the energy sector through favourable tariffs, power purchase Agreements, partial risk guarantees among other incentives.

Tariff Incentives

Kenya introduced a Feed in Tariff policy to promote generation of electricity from r renewable energy sources in 2008 which was revised in 2010 and later in 2012. The purpose of the Feed-in-Tariffs policy is to:

- Safeguard the investments in time and resources made by prospective developers.
- Boost the development of electricity generation from Renewable Energy Sources i.e. (RES-E).
- Reduce transaction costs
- provide investment security and market stability

The Fit Policy (2012) has set tariffs for small renewable projects up to 10 MW of installed capacity separately from those above 10 MW of installed capacity (Table 2.2). The FiT for the category <=10MW is for projects connected to the distribution voltage as embedded power and for non-dispatchable generators. RE generators above 10 MW[41], have to meet load flow, be dispatchable

[39] Tsavo, Iberafrica,Orpower4,Mumiassugar,Raai, Imenti Tea,James Finlay, Unilever, Gulf Power, Triumph, Thika Power, Isolated grids, Aggreko (emergency).

[40] IPPs, 26.1%

Temporary IPP, 1.4%

Off-grid, 1.2%

[41] 10.1 to 40MW for other RE and 35-70MW for geothermal;

and meet system stability requirements[42].

The FiT Policy obliges KPLC to enter into a (PPA) with firms producing electricity under the policy with guaranteed priority purchase and standardized PPA templates are used as basis of negotiations.

Table 2.2 FIT tariffs by technology and capacity sizes.

	Up to 10MW			Above 10MW			
technology	capacity (MW)	Tariff US$	escalable portion of tariff %	capacity (MW)	cumulative max (MW)	tariff US$	Escalable portion of tariff %
wind	0.5-10	0.11	12	10.1-50	500	0.11	12
hydro	0.5	0.105	8	10.1-20	200	0.0825	8
	10	0.0825	8				
Biomass	0.5-10	0.1	15	10.1-40	200	0.1	15
Biogas	0.2-10	0.1	15				
solar Grid	0.5-10	0.12	8	10.1-40	200	0.12	12
solar -of grid	0.5-10	0.2	8				
Geothermal				35-70	500	0.088	20% for 1st 12 years and 15% after

Source. FiT 2012 Ministry Of Energy Feed-In-Tariffs Policy on Wind, Biomass, Small-Hydro, Geothermal, Biogas and Solar Resource Generated Electricity Initial Issue: March 2008; 1st Revision: January 2010; 2nd Revision: December 2012

Power Purchase Agreements

The Power Purchase Agreements (PPAs) are issued to facilitate mobilization of project financing by private investors thus the PPA approach is an important tool to support private sector investments in the country. Through a PPA power producers are guaranteed of revenue from investment (and hence also give confidence to lenders on repayment of debt) but bear the risks of supplying the power, while the utility in the case of Kenya being Kenya Power will be assured of a supply of a certain amount of power. The Utility however has to ensure timely payment for the delivered power. A PPA is an instrument that defines relationships of the power producer and purchaser from delivery of plant, operation stage and transfer of assets at end of the PPA period (if applicable e.g. under BOT).

In the case of Kenya, PPAs are signed with Kenya Power and are approved and regulated by the ERC prior to their execution, as per the provisions of the Energy Act[43]. The ERC ensures, among other things, the reasonableness of the rates and tariffs prescribed under the PPA and the satisfaction of the minimum criteria as set out in the Energy Act, as well as to consider any other issues which may

[42] Ministry of Energy Feed-In-Tariffs Policy ;On Wind, Biomass, Small-Hydro, Geothermal, Biogas And Solar Resource Generated Electricity 2nd Revision: December 2012

[43] http://www.nortonrosefulbright.com/knowledge/publications/100605/investing-in-the-african-electricity-sector

have a bearing on the operations of the undertakings. Other aspects that ERC considers to approve the PPA include proof of land acquisition, access or usage rights, grid connection plan, a full technical and economic feasibility study, and approved EIA, after which investor/project company can apply for a generation licence to be issued in accordance with the Energy Act and the Energy (Electricity Licensing) Regulations 2012.

Partial Risk Guarantees

The African Development Fund (ADF) Partial Risk Guarantee (PRG) program[44] is a risk mitigation instrument that covers private lenders and investors against the risk of a possible government failure to meet contractual obligations to a project. For example PRG will support the Kenyan Government's on-time delivery of a transmission line and will reduce the risk of it being unable to meet payment obligations.

Investor Information Portal (http://www.renewableenergy.go.ke/)

Kenya has established a renewable energy portal under the ERC that provides relevant information about administrative entry requirements and procedures for operating a power plant based on renewable energy, the legal and regulatory framework for such investments (e.g., tariff regulation) and relevant market information in the country.

Other support

GoK have other de-risking initiatives that include financing prefeasibility and feasibility studies for energy projects; energy resources mapping for geothermal power generation, and increasing power accessibility through construction of transmission and distribution lines.

The Government is also subsidizing connections to the electricity grid by consumers to create the necessary demand to match all the planned huge power investments and also to meet Kenya's target of universal access to electricity by 2030.

The Energy Regulation Commission (ERC) has embarked on creating a one-stop shop to facilitate attendance to investors and for provision of information and licensing of projects.

There is a legal basis for ESCO establishment and Kenya Association of Manufacturers is propagating this concept for EE and RE in industry.

Regulations for non-grid electricity systems:

GoK has introduced LPG Regulations (2009), improved biomass cook stoves regulations (draft), Energy Management Regulations (2012) and Energy Solar PV Regulations (2012) to facilitate delivery of quality modern energy services from these sources

[44] http://www.afdb.org/en/news-and-events/article/first-adf-partial-risk-guarantee-approved-in-kenya-for-largest-african-wind-power-project-12324/

3. Investment Opportunities in Energy Sector of Kenya

3.1. SE4ALL Priority Project Areas for Kenya

The Government of Kenya has identified the priority projects in this IP as part of implementation towards meeting the SE4ALL goals and national targets.

The prospective investment and project opportunities have been derived from the list of seventeen (17) priority action areas that are presented in the Action Agenda (Table 3.1[45]).

Table 3-1 Identified SE4ALL Sectoral Priority Project Areas

Priority area	Sectoral Action Area	SE4ALL Goals that priority project addresses
Promotion of innovative pico solar and solar home systems for lighting and productive use	Distributed electricity solutions [off-grid/ decentralised electricity solutions]	**EA/RE**
Improved cooking appliances	Modern cooking appliances and fuels	**EA/EE**
Geothermal	Renewable power generation	**RE**
Promotion of solar water heating	Modern cooking appliances and fuels	**RE/EE/EA**
Lower the cost of connections from existing transformers	Grid infrastructure & supply efficiency	**EA**
Small / medium solar PV	Renewable power generation	**RE/EA**
Promote energy efficiency and RE power for industry	Industrial & agricultural processes	**EE/RE/EA**
Grid extension to evacuate new power from geothermal, wind, small hydro sites	Grid infrastructure & supply efficiency	**RE/EA/EE**
Promotion of mini-grids with focus on enabling productive use of energy.	Distributed electricity solutions [off-grid/decentralised electricity solutions]	**RE/EA**
Large-scale wind	Renewable power generation	**RE/EA**
Small hydro	Renewable power generation	**RE/EA**
Strengthening of distribution network	Grid infrastructure & supply efficiency	**EA/EE/RE**
Large-scale PV	Renewable power generation	**RE/EA**
Promotion of energy management and conservation in industry	Industrial & agricultural processes	**EE**
Development of LPG sector	Modern cooking appliances and fuels	**EA/EE**
Improved alternative fuel supply or sustainable fuel use	Modern cooking appliances and fuels	**EA/RE**
Programme to build value chains for biofuel use in transport	Transport	**RE/EA**

[45]Presented in the accompanying Action Agenda

The full list of projects formulated from these priority areas during this project are of various categories in terms of ownership and status of development and are presented in Annex 7.2. A Project Management System has also been developed to keep an updated pipeline from which investors can select projects for investments.

The criteria for selection of projects for the IP were as follows:

- Considerable project information for profile definition
- Have been mentioned as important during engagement with stakeholders
- Have secured government recognition e.g. in form of PPAs and FIT approval
- Can attract investment- particularly private sector,
- Have clear ownership that has a track record of competence,
- Has a demonstrated technology and can be scaled up
- Can be implemented in the short-medium term (3-5 years)

These are largely RE power generation (including for IPP) projects, and transmission projects and have more representative financial requirements derived from feasibility studies.

Other projects/programmes that are considered important for meeting energy access in particular have been included among them schemes for accessing the grid electricity, decentralized electricity systems (mini-grids, pico/solar home systems) and cooking solutions. Whilst these projects may not attract significant conventional commercial investment, they provide opportunities for cooperation between Kenya SMEs/local and international private sector and also involvement of development partners and civil society. Annex 7.2 provides details of such projects as well and potential investors can make follow ups on these projects with MoEP.

3.2. Projects Pipeline

The most promising projects for immediate investment in this SE4ALL IP pipeline fall into three categories- those projects under Government agencies that are seeking private sector investment and IPPs, private sector owned projects that are seeking equity/debt financing and have received government approval. The third category is other investment opportunities that can meet SE4ALL goals but are not well developed for immediate investments

3.2.1. Projects under Government Agencies

The RE projects that are being promoted through Government agencies are seeking investors- through IPP and under the PPP framework, which also includes Build Own, Operate and Transfer (BOOT) and/ or BOT arrangements.

These projects have completed feasibility studies and are awaiting investment and consist of geothermal (850MW), hydropower (1120MW), wind (500MW), municipal waste (30MW)power projects, Transmission lines of various sizes and LPG projects (Table 3.2). These are the projects in the majority with 19 projects in the pipeline.

For the specific geothermal project, GDC has already developed the steam resource and will ensure that steam supply is maintained thus de-risking investments by IPPs. KenGen and GDC can take some shareholding as necessary to facilitate the attraction of funding in a PPP arrangement. Some hydropower, LPG and other RE generation projects are being promoted for PPP investment arrangements.

For Transmission projects, KETRACO is mobilizing funding from a number of sources that include government budgets blended with grants, commercial loans from local banks and concessionary

loans from multilateral and bilateral sources. On-going transmission projects seeking funding are presented in Annex 7.3 showing their sizes/lengths and estimated costs. The important regular financial institutions for such transmission infrastructure are Multilateral Banks/Development Financing Institutions (e.g. World Bank, AfDB, DBSA, and IFC) and investment Banks (e.g. European Investment Banks, Exim Banks of China and India; Export-Import Bank of the United States and the Overseas Private Investment Corporation, among others, in some instances blending with GoK budget input.

The Government of Kenya is also planning to develop the LPG industry through a PPP. In other countries (e.g. Botswana, South Africa) the industry has been developed by private oil companies and or their subsidiaries with government putting the regulatory framework.

Table 3-2 Project Pipeline under Government Agencies

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
Large RE Generation	Geothermal (Overall Target 810 MW by 2016 (*See Annexed Project Information*))	1	Menengai Generation plant	GDC	Site has full potential of 1,600 MW with 460 MW capacity additions aimed for 2016 1: 100MW is scheduled for commissioning in June 2016. 2 : 360 MW capacity additions at estimated costs of US$1598million as follows: 60MW Dec 2015 100 MW June 2016 200 MW Dec 2016	1:Feasibility study completed. 25 production wells drilled. Drilling of additional in progress. using 5 GDC owned rigs. GDC owns a total of 7 drilling rigs Available steam is about 130 MW	1:Project Implementation Steam Supply Agreement (PISSA) between GDC and Independent Power Producers (IPP's) and between GDC and IPP's signed in Nov. 2014 ▪ Power Purchase Agreement (PPA) has been signed ▪ Steam gathering system construction to be completed in March 2015. ▪ Power plant construction to commence in June 2015 ▪ Steam gathering system to be funded by GDC/GOK, power plant by IPP, Transmission line by GOK/KETRACO 2: Short listing of Independent Power Producers (IPP's) who will generate total of 60MW has been done Procurement for the other

[46] Published data indicate that installation costs ranges between 2.5 to 6.5 million US$ per MWe. Kenya average installation cost is about 3.6 million US$ per MWe.
Paul K. Ngugi Geothermal Development Company Ltd Nairobi KENYA pngugi@gdc.co.ke

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
							capacity plants are to be procured as drilling progresses as scheduled Estimated costs for steam gathering system is 190 Million USD, Drilling programme at 330 Million USD for drilling 94 wells Seeking Investors for 100MW & 200MW
		2	Baringo-Silali	GDC	Site Potential is 3,000 MW Phased development approach of 800 MW 200MW from Phase 1 to be commissioned by December 2016 Estimated costs of USD 900 million	Surface studies completed and the Environmental license obtained. Community engagement framework has been established and Land – Approval by Baringo County Government has been obtained. Infrastructure development is in progress Procurement for the drilling Services contractor has been completed and the contract expected to be signed by February 2015	Government to finance drilling. Financing acquired from GRMF for drilling of 2 wells and associated Infrastructural development Loan signed on July 10, 2014 with KfW for 100MUSD to finance infrastructure and drilling Procurements underway for drilling services, water transmission line and consultancies Funding: Expressed interest to US Exim bank, GCF, AFD, Italian Devt Co-operation Investors: Procurement of IPPs through competitive bidding as scheduled ▪ Procurement for

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
							construction of water transmission system in progress ▪ Drilling expected to commence in June 2015 using five rigs
		3	Olkario	KENGEN	140 MW		JICA has also expressed interest to extend a loan to KENGEN for development of a further 140 MW of geothermal at Olkaria.
		4	Suswa I	GDC	Site Potential is 750 MW Phase 1: 150 MW generation capacity to be added by 2016 Estimated costs of USD 800 million	Detailed Surface studies were completed in 2013 and the project ESIA in progress. Community engagement framework was established in 2013	Funding ▪ Project financing to the tune of USD 200 Million to come from the India Exim Bank for drilling materials & infrastructure works. Discussions at advanced stage. ▪ USD 50 million from AFD ▪ Drilling expected to commence in 2015 with the deployment of four rigs ▪ Funding requirements: Steam gathering system 80 Million USD, Drilling

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
							programme 190 Million USD, Power Plant construction (IPP) 450 Million USD Seeking investors for the construction of power plants: 18 firms shortlisted for power plant development.
	Large hydropower	1	High Grand Falls Hydropower project- Tana River	KENGEN	Capacity 700 MW	Feasibility study completed	
		2	Karura HPP- Tana River	KENGEN	Capacity 100 MW	Feasibility study completed	
		3	Ewaso Ngiro South River	KENGEN	Capacity 200 MW	Feasibility study completed	
		4	Arror HPP	KENGEN47	Construction of a Dam, generation of 80MW hydro power, irrigation of 5,000 Acres	Feasibility study completed	
		5	Munyu Multipurpose dam	KENGEN48	INVESTMENT. Tana and Athi water rivers development authority. 40MW plus 13,000Ha irrigation and water supply		Seeking PPP.

[47] Dam development under Kerio Valley Development Authority

[48] Dam development under Tana & Athi Water Rivers Development

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
		6	Enhancing the capacity of Masinga Dam	KENGEN	Wall raising to 1.5m. 100GWh	Feasibility Studies Completed,	seeking PPP
		7	Magwagwa Multipurpose dam	KENGEN49	INVESTMENT. Lake basin development authority. 120MW plus 15,000 ha irrigation.		Seeking PPP.
	Wind	1	Meru County Wind project	KENGEN/Private developer	Capacity 400 MW to be developed in Phases of 100MW, 150MW and 150MW	Feasibility complete 50 100MW by 2016;	Implementation funds to be raised through BOOT arrangement. Two wind farms in Ngong with a total capacity of 20.4 MW financed by the Belgium and Spanish Governments completed
		2	Wind farm at Isiolo	MoEP/Private developer	Potential exists. 100 MW	Feasibility complete.	IPP required. FIT in place.
	Municipal waste	1	Dandora dumpsite	KENGEN	Capacity 30MW	Feasibility study done	Approved under FIT Independent Power Producers identified
Grid infrastructure & supply	Transmission projects	1	On-going Transmission Development	KETRACO	To evacuate power from committed generation power plants 300km 400kV lines at a total cost of US$199 million	EPC model proposed from Government and Development	Seeking financing

[49] Dam development under Lake Basin Development Authority

[50] The project developer (listed as Stanbic, Standard Bank and Blue Sea Energy) with support of Kengenconducted technical feasibility of the project in 2011-2012: https://cdm.unfccc.int/filestorage/2/8/V/28VW4I1DTHASEPF6G93ZJQKO5YXNB7/CAP%20DD.pdf?t=N2d8bmkwb21pfDAI4lBoZa_aO8unvj5z3ffk

Sectoral Action Area		No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status46
efficiency			projects (refer to section 3.2 in main report)			partners/Contractors	
		2	Proposed transmission Line projects (Annex 7.3)	KETRACO	35Transmission projects[51] for 1623km of 132kV and 1847km of 220kV 478km of 400kV at various locations costing US$1.190 billion		Seeking financing
		3	Lamu to Kitui to Nairobi trans mission (refer to Section 3.2)	KETRACO	400kV transmission line to connect to new coal power station and also provide flexibility in network sustainability US$170 million		Seeking financing
Modern Cooking fuels and appliances	LPG	1	Development of LPG storage and bottling facilities	MoEP/National Oil corporation/Private Sector	Development of LPG storage (2225MT) and bottling facilities in Nairobi. At a cost of US$30milion	Feasibility study for Nairobi completed June 2013	Equity/debit under PPP model.

[51]Source- 5000+MW Investment Prospectus

The estimated investment requirements for the government projects are of the order of US$8.7 billion in the short term (3-5 years)-Table 3.3.These estimates are a guide to mobilization of financial resources to implement these projects but due diligence will be required for more reliable investment requirements.

Table 3.3 shows the funding requirements by type of projects for those projects under government agencies for short term and long term.

Table 3-3 Estimated financing gap basing on unit costs and provided costs

Sectoral Action areas	Technology	Capacity/Size- potential in brackets	Estimated amount for the presented projects- investment Projects (US$ Million) for immediate capacity
Large RE Generation Plants	**Geothermal- Menengai , and Baringo Silali, Olkaria, Suswa**	360+200+150+140[52]MW	4048
	Large hydro	1,120 MW	2240
	Wind	500 MW	750
	Municipal waste	30 MW	64.5
Grid Infrastructure and Supply Efficiency	**Transmission lines[53]**		1,569
Modern Cooking appliances and Fuels	**LPG**	2225 million tonnes storage	30
TOTAL			**8691.5**

From these projects, the GoK has presented some of projects from the pipeline in template form for easy of reference by potential financiers as presented below.

[52] Estimated Olkaria from Suswa rate. Other estimates indicated in table 3.3 above

[53]There are 15 Transmission projects with feasibility studies and bid documents complete since 2012/2013 financial year seeking US$ 420 million; and 20 projects with feasibility studies and bid documents complete in the 2013/2014 financial year seeking US$770 million (Annex 7.3). There is also the Lamu- Kitui Nairobi 400KV seeking US$170 million and Power evacuation lines (400kV) with total amount of US$199million.

1. *Geothermal generation plant at Menengai (360MW)*

Project Title	**Geothermal Power generation in Kenya**
SE4ALL GOAL and Sectoral Action Area	RE- Large RE Power Generation
Project owner / developer:	*GDC*
Location:	Menengai
Project Type:	Geothermal Electricity Generation Power Plants
Technology type	Geothermal
Capacity:	460MWp total capacity to be realized by 2016 (100MW of it has IPP and 360MW still seeking financing).
Project Description	The project is to develop geothermal power plants as part of the 5000+MW agenda. There are also further opportunities at these sites for development of additional capacity that can be implemented in the medium –long term and can be explored with the project developers. Feasibility studies and steam development have been done and the site is ready for drilling and plant investment.
Project Status	▪ Feasibility study has been done but drilling for steam holes is still to be done. Government will finance drilling of steam holes in 2014/15. ▪ ESIA for drilling approved and licence granted: ▪ A Power purchase agreement has been granted ▪ IPPs are invited to invest in the geothermal plant ▪ Permits, authorisations & licensing will be granted ▪ Land permits GDC signed MoU with Kenya Forest Service for access and development rights
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing structure ▪ Financing Gap	▪ US$1,598 million for Menengai ▪ Can be financed through GoK budget/soft loan DP/IPP ▪ US$1,598 million for Menengai for the 360MW still seeking financing
Procurement Model	*Joint venture of GDC/KenGen and IPP*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	Evacuation of power needs to be synchronized with plant development to avoid delays in operating the plant and the GoK is taking care of that.

2. *High Grand Falls hydropower project*

Project Title	**High Grand Falls hydropower project**
SE4ALL GOAL and Sectoral Action Area	RE- Large RE Power Generation
Project owner / developer:	*KenGen*
Location	*High Grand Falls on the Tana river*
Project Type:	Electricity Generation Power Plant
Technology:	Large hydropower
Capacity:	700MW
Project Description	*The project is to raise the dam wall to increase water holding capacity and then install additional 700MW capacity.*
Project Status	▪ Feasibility study has been completed ▪ ESIA has been approved: ▪ Permits, authorisations & licensing is in place since site is operating ▪ Land permits exists
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US$1,400 Million[54] ▪ 0million ▪ US$1,400 Million ▪ GoK budget/ soft loan DP/ private loan
Procurement Model	
Time Frame	*Commissioning of power plant after 2016*
Risks & Mitigation	Primary risks to investment in hydropower surround the relative (as compared with other resources) uncertainty regarding the future reliability of the resource. Climatic and hydrological conditions are changing, which makes further dependence on hydropower a potential risk. This is being mitigated by simultaneous development of a diverse range of other RE resources for firm power, including LNG, coal and geothermal.

[54] Estimated from unit costs

4. *Lamu- Kitui- Nairobi Transmission line*

Project Title	**Lamu- Kitui- Nairobi Transmission line**[55]
SE4ALL GOAL and Sectoral Action Area	EA, EE -Grid Infrastructure and Supply efficiency
Project owner / developer:	*KETRACO* *Contact Details*
Location:	*Lamu-Kitui-Nairobi*
Project Type:	Transmission Line
Technology:	Double circuit 400KV
Capacity:	400KV
Project Description	*The project is to extend transmission line from Lamu to Kitui to reach Nairobi. The line will evacuate power from a planned coal power station but will also allow sustainability of the network from the coast to Nairobi.*
Project Status	▪ Feasibility study is complete ▪ ESIA has been approved: ▪ Power purchase agreement- granted ▪ IPPs are invited to invest ▪ Permits, authorisations & licensing will be granted ▪ Land permits still to be secured in certain portions of the line
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US$170 Million ▪ 0.0 million ▪ US$ 170 Million ▪ GoK budget/ soft loan DP
Procurement Model	*Engineering design, procurement and construction (EPC)*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	Risks associated with transmission projects are largely with regard to land rights considerations. Land issues are a problem to most electricity projects and GoK is dealing with the situation on a case by case basis and looking forward to a more holistic approach.

[55] Part of Line already under construction but Kitui-Nairobi is the portion needing support.

5 .Four Power Evacuation projects under 5000+MW programme

Project Title	**Menengai-Rongai Transmission line**
SE4ALL GOAL and Sectoral Action Area	EA, EE -Grid Infrastructure and Supply efficiency
Project owner / developer:	*KETRACO*
Location:	*Nakuru*
Project Type:	Transmission Line
Technology:	Double circuit 400KV
Capacity:	To be determined
Project Description	*The project is to construct transmission line from Menengai to Rongai. The line will evacuate power from a planned geothermal power station at Menengai geothermal field to the national grid.*
Project Status	▪ ESIA has been completed: ▪ Permits, authorisations & licensing will be granted. ▪ Land permits still to be secured.
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US$36 Million ▪ 0.0 million ▪ US$36 Million ▪ GoK budget/ EPC+Financing
Procurement Model	*Engineering design, procurement and construction (EPC) + Financing*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	As above

Project Title	**Silalii-Rongai Transmission line**
SE4ALL GOAL and Sectoral Action Area	EA, EE -Grid Infrastructure and Supply efficiency
Project owner / developer:	*KETRACO*
Location:	*Nakuru, Baringo*
Project Type:	Transmission Line
Technology:	Double circuit 400KV
Capacity:	To be determined
Project Description	*The project is to construct transmission line from Silali to Rongai. The line will evacuate power from a planned geothermal power station at Silali geothermal field to the national grid.*
Project Status	▪ ESIA has been completed: ▪ Permits, authorisations & licensing will be granted. ▪ Land permits still to be secured.
Financial analysis ▪ Total project cost	 ▪ US$66 Million

▪ Secured financing ▪ Financing gap ▪ Financing structure	▪ 0.0 million ▪ US$66 Million ▪ GoK budget/ EPC+Financing
Procurement Model	*Engineering design, procurement and construction (EPC) + Financing*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	As above

Project Title	**Isinya-Nairobi East Transmission line**
SE4ALL GOAL and Sectoral Action Area	EA, EE -Grid Infrastructure and Supply efficiency
Project owner / developer:	*KETRACO*
Location:	*Nairobi*
Project Type:	Transmission Line
Technology:	Double circuit 400KV
Capacity:	To be determined
Project Description	*The project is to construct transmission line from Isinya to Nairobi East substation. The line will serve as an alternative supply path to the grid*
Project Status	▪ ESIA has been completed: ▪ Permits, authorisations & licensing will be granted. ▪ Land permits still to be secured.
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US51 Million ▪ 0.0 million ▪ US$51 Million ▪ GoK budget/ EPC+Financing
Procurement Model	*Engineering design, procurement and construction (EPC) + Financing*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	As above

Project Title	Dongo Kundu- Mariakani Transmission line
SE4ALL GOAL and Sectoral Action Area	EA, EE -Grid Infrastructure and Supply efficiency
Project owner / developer:	*KETRACO* *Contact Details*
Location:	*Mombasa*
Project Type:	Transmission Line
Technology:	Double circuit 400KV
Capacity:	To be determined
Project Description	*The project is to construct transmission line from Dongo Kundu to Mariakanii. The line will evacuate power from a planned LNGl plant at Dongo Kundu terminal to the national grid.*
Project Status	▪ ESIA has been completed: ▪ Permits, authorisations & licensing will be granted. ▪ Land permits still to be secured.
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US$46 Million ▪ 0.0 million ▪ US$46 Million ▪ GoK budget/ EPC+Financing
Procurement Model	*Engineering design, procurement and construction (EPC) + Financing*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	As above

6. LPG Storage and Bottling facilities in Nairobi

Project Title	**LPG Storage and Bottling Facilities**
SE4ALL GOAL and Sectoral Action Area	EA-Modern Cooking Appliances and Fuels
Project owner / developer:	*MoEP/Petroleum Institute* *Contact Details*
Location:	*Nairobi*
Project Type:	LPG supply infrastructure
Technology:	Storage tanks and cylinder bottling systems
Capacity:	2225 million tonnes of LPG storage capacity
Project Description	*The project is to develop a depot with LPG storage tanks and bottling machines and stock cylinders of various sizes. Similar projects are planned for 4 more towns throughout Kenya but these constitute a separate project.*
Project Status	▪ Feasibility study is complete ▪ ESIA has been approved: ▪ IPPs are required to invest in infrastructure also under a PPP arrangement ▪ Permits, authorisations & licensing will be granted ▪ Land permits can be secured
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	▪ ▪ US$30 Million ▪ 0million ▪ US$ 30 Million ▪ Equity/debt model
Procurement Model	
Time Frame	*Commissioning by 2016*
Risks & Mitigation	Pricing, cost and availability of appliances and cultural shift from biomass all will determine the shift to LPG. As a fossil fuel LPG may not easily get funding from clean energy funds e.g. some climate change streams. However, the potential reduction in deforestation and improvement in indoor air quality can be marketed persuasively. The potential participation of SMEs of various sizes and in widespread locations means that the industry can easily be scalable.

3.2.2. Private sector Project Pipeline

The private sector pipeline presented here consists of projects that have already obtained or are negotiating for PPAs with Government and thereafter seek funding in form of debt and/or equity and debt (Table 3.5).The pipeline derived from this study has 2 geothermal projects (Longonot and Akiira- 210MW) that will be seeking funding, and 5 suites of projects (solar 40MW, cogeneration 64MW, biogas, Hydro (135.77) and KAM RE/EE(200MW), 3 (Solar, some in hydro and KAM projects) of which have complete feasibility studies and are ready for investment.

Table 3-4 Private sector Projects seeking investment

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[56]
RE Generation	Geothermal		Longonot	Geothermal International Limited (AGIL)	140MW under licence to AGIL Commissioning expected 2018. The project has an estimated investment volume of around US$600 million.	Surface exploration and environmental studies for steam development done.	$10 million in equity for the exploration phase, with additional $8.4 million to be secured through an agreement between Agil and the African Union Commission, likely through the Geothermal Risk Mitigation Fund.
			Akiira	Marine Power Generation (MPG)	70ME additional capacity commissioning by Dec 2018 Estimated capital US$300million		Obtained KS86 million from OPIC for the technical and legal work needed before drilling 30% capital from MPG and 70% loan from local bank Awaiting PPA signing
	Solar	1	Solar FiT PV projects to supply Grid under PPA (additional profile from Kenya Power)	Contact KPLC/Witu developer	40 private developers with PPA allocated. Largest plant is 40 MW (Witu Project)		PPAs allocated to some developers already-who may be requiring financing

[56] Published data indicate that installation costs ranges between 2.5 to 6.5 million US$ per MWe. Kenya average installation cost is about 3.6 million US$ per MWe. Paul K. Ngugi Geothermal Development Company Ltd Nairobi KENYA pngugi@gdc.co.ke

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[56]
	Co-generation	1	Bagasse based cogeneration Project in the sugar industry	Contact MoEP	Investment in additional 64MW; 144MW potential by expanding cane fields &cane crushing capacity.	2007 MoEP pre-feasibility study. Need feasibility.	Full financing required
	Biogas	1	Agricultural waste based cogeneration Project in Naivasha	Contact MoEP	Investment in generation of electricity from vegetable, sisal and flower waste at industries in Naivasha, Mt. Kenya,	MoEP completed pilot at 2 flower farms. Feasibility needed at other sites.	FIT in place.
	Hydro	1	RE projects under FIT	Contact MoEP	26 projects under FIT (4 with approved PPA proceeding to financial closure, 8 under PPA negotiations and 14 to do feasibility studies and PPA applications combined capacity of 135.77[57]	12 projects with PPA approved or under negotiations have capacity of 49.55MW	
Industry and Agricultural processes	Promotion of energy efficiency in Industry (project pipeline with KAM)	1	Implementation of project pipeline of EE and RE projects	Contact Kenya Association of manufacturers	88 sites with >200MW RE generation and/or EE savings potential applying improved efficiency appliances / machinery; - demand side management and embedded & grid-tied power generation.	Feasibility completed for many of the projects; further study needed for others.	Need $332million debt. AFD provided credit line for equity

[57] Excel database provided by MoEP Feb 2015. "DATABASE NAIVASHA JAN 2015 Final"

The hydro suite has 26 projects under FIT, of which 14 are still to undertake feasibility studies and procure PPAs (86.22MW in total), 8 are under PPA negotiations (38.85MW) and 4 have signed PPAs and are proceeding to financial closure stage. The project pipeline is with the Ministry of Energy and Petroleum and details of owners and projects status are included in Annex 7.4.

The KAM suite of projects consists of 88 EE/RE projects that have been supported through a credit line and are now ready for investment under Kenya Association of Manufacturers. These KAM projects are seeking combined debt funding of US$332 million as AFD is providing equity.

In the short term, the private sector projects put forward for investment consideration are presented in the templates below.

Witu Solar PV plant

Project Title	**Witu Solar PV plant**
SE4ALL GOAL and Sectoral Action Area	RE- Large RE Power Generation
Project owner / developer:	*KENYA SOLAR ENERGY LTD*
Location:	WITU in Lamu County.
Project Type:	Electricity Generation Power Plant
Technology:	Solar PV power plant
Capacity:	40MW
Project Description	*the Grid connected project considered under FIT.*
Project Status	▪ Feasibility study is complete but under review under FIT ▪ ESIA has been approved: ▪ A Power purchase agreement still to be granted ▪ A private sector project developer exists ▪ Permits, authorisations & licensing in place ▪ Land permits approved
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	 ▪ US$160 Million[58] ▪ 0 million ▪ US$160 Million ▪ Equity/debt
Procurement Model	*Independent investor requires services for an EPC contract that will be secured through a bidding process.*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	For the project to advance owner may need to have equity and considering a 30% equity share, this becomes exorbitant for a local single investor. The PPA enables the investor to seek for both equity and debt as the market for the electricity is assured.

[58]Estimated from unit costs

KAM RE/EE Pipeline projects

Project Title	Implementation of EE/RE project pipeline
SE4ALL GOAL and Sectoral Action Area	EE-Industrial and agricultural processes
Project owner / developer: GDC	*Kenya Association of Manufacturers*
Location:	*Various locations in the country*
Project Type:	Energy efficiency and RE in industry
Technology:	Improved appliances, machinery, demand side management and embedded and grid-tied power generation
Capacity:	>200MW RE generation + energy savings
Project Description	*KAM has supported project developers to prepare their EE/RE projects through a credit line and the projects are now ready for investments. Project developers have equity from AfD and require debt (8 times the equity).*
Project Status	▪ Feasibility studies of project pipeline has been completed ▪ ESIA has been approved: ▪ Permits, authorisations & licensing have been granted at the sites
Financial analysis ▪ Total project cost ▪ Secured financing ▪ Financing gap ▪ Financing structure	▪ US$332 Million ▪ Equity share has been provided through AfD ▪ US$332 Million debt component ▪ Equity/debt
Procurement Model	*Independent investors*
Time Frame	*Commissioning by 2016*
Risks & Mitigation	Embedded EE and RE projects may not deliver the extent or longevity of savings indicated in a feasibility study due to technology, human management, grid power pricing and other factors. This may be mitigated by technical assistance to ensure project deliver on assessed technical feasibility.

3.2.3. Other Investment opportunities

There are also investment opportunities that are important to meeting Kenya's SE4ALL goals. Other projects/programmes that are considered important for meeting energy access in particular include schemes for developing mini-grids, connecting to the national grid electricity, other decentralized electricity systems (pico and solar home systems) and cooking solutions (Improved cooking systems).

REA that is in charge of rural electrification in Kenya is the contact for investments in mini-grids, solar systems for public institutions and rural distribution systems expansion systems. Both REA and MoEP are looking for investments for 23 greenfield hybrid (diesel, solar or/and wind) mini-grids to the tune of US$85 million for only the RE plant component (solar- US$77 million and wind US$8 million-Annex 7.5a). Annex 7.5b show other related costs). The mini-grids sites and locations were defined as part of the Scaling-Up Renewable Energy Program (SREP- and provided in the Investment Plan for Kenya; July 2011.

Scaling-Up Renewable Energy Program (SREP)-Investment Plan for Kenya

Development of Kenya's Investment Plan (IP) benefited from the Climate Investments Fund under the trusteeship of the World Bank.

Kenya is one of the six pilot countries selected to benefit from SREP to achieve a transformation towards low greenhouse gas (GHG) emission development pathway by harnessing the abundant renewable energy resources of the countries.

SREP was to demonstrate, through pilot operations in selected countries, the economic, social and environmental viability of low-carbon development pathways to increasing energy access using renewable energy and creating new economic opportunities. SREP also focused on addressing risks and key barriers to renewable energy development, catalyzing additional financial resources, focusing on co-benefits that will be felt by the current generation in local communities, and providing opportunities to learn lessons from its operations.

Kenya's Investment Plan (IP), is a country-level and outcome-focused programmatic approach to scaling up renewable energy developed in line with national renewable energy development strategy and various power sector, renewable energy and climate change policies, programs and initiatives.

REA is also driving rural expansion of the distribution requiring over 100,000 poles, 4000 transformers and over 200,000km of conductor wire annually. The supply of these distribution network items is also an opportunity for private sector investment.

Apart from the systems being supported through MoEP, solar home systems and Pico systems are commercially driven and investors can participate in the market, although some initiatives are also driven by development partners and civil society. The estimated market for solar home systems is 100,000 systems in the short term in addition to the existing 200,000 already operating in the country. An additional target set by GoK in its Draft National Energy Policy (2014) would see more than 600,000 additional systems up to 2030. There is an estimated 700,000 pico systems in operation and that market is moving at faster pace than solar home systems.

Similarly opportunities for investment exist in improved cooking solutions-both fuel and appliances, largely in form of biogas digesters and improved cooking stoves. Development partners and civil society support is largely driving the market for both biogas and improved cooking stoves but a business model is required to ensure sustainability in the created market, which is an opportunity for private investment as well.

Annex 7.6 presents' soft projects that are considered important to inform investments, policy and planning in Kenya. These projects present opportunities for investment, albeit more inclined to local and international public and civil society financing. The projects relate to:

- Grid capacity assessment for connections of the planned RE projects
- Establishing one-stop shop for coordination of investment enquiries
- Establishing schemes for financing mini-grids, connection to the national grid and payment of upfront costs for RE/EE technologies
- Conducting feasibility studies for local manufacture of RE/EE technologies and hence lowering the costs of these technologies
- Establishing quality standards for RE/EE supplied technologies and appliances
- Studies to inform business cases for cook stoves (wood, charcoal) building on local and global initiatives
- Feasibility studies for establishing biofuels production and use in the country
- Study to inform sustainable production and supply systems for charcoal.

Investors looking for such investment opportunities can contact the National coordinator for additional information.

4. Managing Risks

Like most developing countries, Kenya faces some risks to investment around market predictability and development, surrounding tariffs, pricing, subsidies, incentives, sustainability, infrastructure development plans; financing and related high costs of capital and delays affecting investment.

There are a number of initiatives that GoK will do to manage some of these potential risks are included in table 4.1:

Table 4.1 Government Initiatives to manage potential risks to investments.

Market predictability	GoK is committed to implement and review policies to satisfy potential investors when viewed necessary. The GoK will also address any necessary elements of its credit worthiness as a country and its state owned enterprises, ensuring that Kenya is effective in processing investments. Streamlining of PPP, PPA, licensing, way-leave and other processes
Market development	Identification and promotion of productive uses of electricity to anchor mini-grid and off-grid investments and ensure sustainability of enterprises and energy markets. Advancing the option of consumers signing power purchase agreements (PPAs) directly with independent producers on a willing buyer-willing seller basis to open a wider market for potential investors and create a competitive energy market;
Tariffs changes/pricing	To ensure attractive return to investments, the GoK will continually review set tariffs[59] that ensure viability of the sector. In accordance with ERC Tariff Review Policy- retail tariffs are reviewed every 3 years This effort will also target the mobilization of domestic resources around a sound tariff plan. A sound pricing regime will be adopted not only for electricity but for other fuels such as LPG, charcoal, biogas, to ensure sustainable business models, particularly for the other modern energy solutions apart from electricity. Review of uniform tariffs to allow differential tariff setting for energy services depending on system

[59]Taking on board changes in technology, cost of equipment and cost of capital and ERC ensuring that tariffs are reasonable to consumers and can sustain the industry.

	sizes, markets and location. The GoK will investigate modifications to the national uniform pricing policy to permit some mini-grids to use geographic specific price levels.
subsidies	GoK will allocate subsidies without creating a market failure but to facilitate access to clean and renewable energy. Working example is the Basic Electricity Service tariff being applied in South Africa.
Incentives	Evaluation of potential incentives to private project developers such as removal of duty, VAT and other taxes including, where it is warranted, tax holidays and high asset depreciation rates.
Sustainability	The GoK will allocate budget resources to accommodate PPAs and REFiTs, and continue to support feasibility studies for critical projects as a way to reduce risk to potential investors. The ESCO model that is already operating for EE in industry will also be expanded for effective implementation of some EE projects.
Infrastructure plans	Clarify grid extension plans and establish processes (financial, technical, and operational) by which off-grid mini-grids could be connected to the national grid if the latter extends to a once remote area
Financing	GoK will investigate the option of creating both Seed and Investment Funds. The Seed fund will be used to move project concepts through to investment opportunities and bankable propositions. Seed Funds can be a combination of Government budget and contributions from development partners. Kenya is already benefiting from some seed funding, for example, the Energy and Environment Programme that is funding pre-feasibility, feasibility, pilot and demonstration projects in East and Southern Africa[6061]. Kenya will promote continued use of similar such operating seed funds[62]. The Investment fund will be used to bring-down costs of capital, as part allocation to partial risk guarantees, and provide for equity and debt borrowing. This fund will benefit from contributions from blended resources including from national budgets, development partners and surcharges on electricity consumption. For that purpose the GoK will establish an institutional structure to hold and manage the Funds.
Delays	The NC will also provide coordination and effect exchange of information between private investors and public entities; and be an established effective liaison with the relevant Ministries and State-owned companies to ensure speedy support to investors

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[60] www.eapafrica.org

[61] EAC Renewable Energy Value Chain Study • November 2013 • Page 30

[62] EAC Renewable Energy Value Chain Study • November 2013 • Page 30

5. M&E frameworks

GoK will adopt a monitoring and evaluation framework that will track investments of the IP projects. Indicators are to be measured to provide key information for decision making by both investors and government. The M&E framework presented in Table 5.2 show what is to be measured, the related indicators, possible source of information, who is to measure the indicators and the frequency of measurements. The MoEP will measure contribution of the IP implementation to the SE4ALL, the projects being implemented and the financial resources mobilized for project implementation.

For ease of delivering the required information for M&E, the NC within the MoEP will establish M&E units at the MoEP, regionally and at County level. The M&E Unit at MoEP under the management of the NC will coordinate all information providers to measure and provide timely results and to ensure establishment of data collecting, analysis and reporting systems for the M&E system. The NC and its groups will determine the reporting frequency to the GoK, SE4ALL Africa Hub and to the Global Tracking Framework and Global Finance Group as necessary and will update the PMS and M&E framework

Table 5-1 Monitoring and Evaluation framework for the IP

ITEM	Level	What to measure	Indicator	Source of information	Who to Measure	Frequency of measurements
SE4ALL Goal	Energy access	Access to electricity by households Electrification of institutions Access to modern cooking by households Electrified productive/commercial SMEs	% of households % of various types of institutions % of households No of SMEs	Baseline survey	MoEP	Every 3 years
	RE	Share of RE in electricity mix Share of RE in total energy mix (including renewable biomass) Additional Capacity added Additional Generation added	% of RE in grid/off-grid % of RE in energy balance MW GWh	Electricity annual reports Energy balance Electricity annual reports and data sheets	MoEP/KENGEN MoEP KENGEN/Kenya Power, MoEP	Annually
	Energy efficiency	Energy intensity of GDP Transmission and Distribution losses Energy saved in energy sector Electricity saved	Toe/US$1000 (PPP) % of loss Toe/GJ GWh	National and economic/energy statistics by sector Kenya	MoEP Power/Ketraco MoEP Kenya Power/MoEP	Biennially

ITEM	Level	What to measure	Indicator	Source of information	Who to Measure	Frequency of measurements
PROJECTS	PROJECTS BY SE4ALL SECTORAL ACTION AREAS	PROJECTS IN THE Project management system (PMS)	No by sectoral area	PMS database	MoEP	Database updated continually- hence can be generated as required but for reporting Annually
		Projects seeking Finance	No by sectoral area	PMS database		
		Projects that reached financial closure	No by sectoral area	PMS database		
		Projects under implementation	No by sectoral area	PMS database		
		Projects commissioned	No by sectoral area	PMS database		
RESOURCES	Financial	Total Financial requirements for projects seeking funding	US$	PMS database	MoEP	As required and reported Annually
		Mobilized resources	US$	PMS database		
		Financial gap	US$	PMS database		

6. IP Document References

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7. Annex

Annex 7.1 Contact Details of National coordinator in Kenya

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Annex 7.2 Investment Projects for SE4ALL goals

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
Large RE Generation	Geothermal	1	Menengai Generation plant	GDC	Site has full potential of 1,600 MW but 460 MW capacity addition is aimed for 2016 at estimated costs of US$1598million. The rest of the potential is anticipated to be developed after into the medium to long term.	Feasibility study completed but drilling is on-going	100MW under negotiation with IPP Looking for more IPPs to develop power plant	Short term-medium term
		2	Suswa generation plant	GDC	Site full potential is 750MW aiming to develop 150MW by 2016 at a cost of US$681million and the rest to be developed beyond 2016	Surface exploration studies done; Feasibility study not started	Looking for an IPP to develop power plant	Short term-medium term
		3a	Baringo Silali	GDC	Full potential 3,000 MW but 200MW to be developed by 2016 at a cost of US$720million	Surface exploration studies done; Feasibility study not done	Some funding available from KfW. GDC and IPP joint investment	Short term-medium term
		3b	Bogoria-Silali	GDC	Potential capacity of 800 MW	Steam development is complete- drilling rigs required- Government to finance drilling	Procurement of IPPs through competitive bidding	

[63] Published data indicate that installation costs ranges between 2.5 to 6.5 million US$ per MWe. Kenya average installation cost is about 3.6 million US$ per MWe. Paul K. Ngugi Geothermal Development Company Ltd Nairobi KENYA pngugi@gdc.co.ke

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
	Large hydropower	1	High Grand Falls Hydropower project- Tana River	KENGEN	Capacity 700 MW	Feasibility study completed		Short term-medium term
		2	Karura HPP-Tana River	KENGEN	Capacity 100 MW	Feasibility study completed		Short term-medium term
		3	Ewaso Ngiro South River	KENGEN	Capacity 200 MW	Feasibility study completed		Short term-medium term
		4	Arror HPP	KENGEN	Capacity 70 MW	Feasibility study completed		Short term-medium term
		5	Munyu Multipurpose dam	Kengen	INVESTMENT. Tana and Athi water rivers development authority. 40MW plus 13,000Ha irrigation and water supply	Seeking PPP.		Med
		6	Enhancing the capacity of Masinga Dam	KenGen	Wall raising to 1.5m. 100GWh	Feasibility Studies Completed, seeking PPP		
		7	Magwagwa Multipurpose dam	Kengen	INVESTMENT. Lake basin development authority. 120MW plus 15,000 ha irrigation.	Seeking PPP.		Med
	Small hydropower	1	Tea growing areas sites (List of projects to be annexed)	MoEP	Capacity 33MW largely along Tana River	260 sites identified by end of 2013		Short term-medium term
		2	FiT RE projects (List of projects	MoEP	82 applications of capacity1990MW;	28 applications		Short term-

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
			annexed)		28 of small hydro project of 160MW			medium term
	Wind	1	236 FiT projects applications (List of projects to be annexed)	Private developers-through MoEP	Capacity 1,118 MW	20 applications approved by government for 1,008 MW		Short term-medium term
		2	Meru County Wind project	KenGen/Private developer	Capacity 400 MW to be developed in Phases of 100MW, 150MW and 150MW Wind farm to be developed in two phases of 50MW & 100MW. Estimated cost of the first phase is US$ 130 million	Feasibility complete 100MW by 2016	Developed through PPP model, but funds to be raised through BOOT	Short term-medium term
		3	Wind farm at Isiolo	MoEP/Private developer	Potential exists.	Feasibility complete.	IPP required needed. FIT in place.	Short term
	Solar	1	Solar FiT PV projects to supply Grid under PPA (additional profile information to be added from Kenya Power)	KPLC/Witu developer	40 private developers with PPA allocated. Largest plant is 40 MW (Witu Project)		PPAs allocated to developers already-who may be requiring financing	Short term-medium term
	Co-generation		Bagasse based cogeneration Project in the sugar industry	MoEP	Investment in additional 64MW potential with little investment; 144MW potential with minor investment in expanding cane fields & cane crushing capacity.	2007 MoEP pre-feasibility study. Need feasibility.	Full financing required	Short term-medium term

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
	Municipal waste	1	Dandora dumpsite (additional profile information to be added)	KENGEN	Capacity 30MW	Feasibility study done	Full investment and IPP required.	Short term-medium term
	Biogas		Agricultural waste based cogeneration Project in Naivasha	MoEP	Investment in generation of electricity from vegetable, sisal and flower waste at industries in Naivasha, Mt. Kenya, others.	MoEP completed pilot at 2 flower farms. Feasibility needed at other sites.	FIT in place.	Short term-medium term
	General	1	RE projects under FIT	MoEP	49 applications with combined capacity of 1,521 MW	42 projects approved for capacity 1,311 MW		Short term-medium term
Grid infrastructure & supply efficiency	Transmission projects	1	On-going Transmission Development projects (refer to section 3.2 in main report)	KETRACO	To evacuate power from committed generation power plants 300km 400kV lines at a total cost of US$199 million		EPC model proposed from Government and Development partners/Contractors	Short term-medium term
		2	Proposed transmission Line projects (Annex 7.3)	KETRACO	35Transmission projects[64] for 1623km of 132kV and 1847km of 220kV 478km of 400kV at various locations costing US$1.190 billion			
		3	Lamu to Kitui to Nairobi transm	KETRACO	400kV transmission line to connect to new coal power station and also provide flexibility in network	Certain portions are complete and additional support for Kitui-Nairobi		Short Term

[64]Source- 5000+MW Investment Prospectus

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
			ission (refer to Section 3.2)		sustainability	portion		
	Distribution	1	Electrification of public primary schools, other public facilities and households (details of specifications from REA)	REA	Require supply of 100000 poles, 4000 transformers and 20000km of conductors annually			Short term
Distributed electricity solutions	minigrids	1	Off-grid hybrids (Annex 7.5a & 7.5b)	MoEP/REA	47 hybrid systems of combination of solar/wind ranging from 100kW to 1100kW at total estimated costs of US$130million			
	Pico and SHS	2	Propagation of pico and solar home systems	MoEP	Reaching a target of additional 100000 systems by 2020, 200000 systems by 2025 and 300000 systems by 2030 as per Draft National Energy Policy 2014 targets	This is an established market with over 200000 systems already sold through private sector. What is required is a business case to attract more investment to supply and also credit line for consumers to acquire systems		
Modern Cooking fuels and appliances	LPG	1	Development of LPG storage and bottling facilities	MoEP/National Oil corporation/Private Sector	Development of LPG storage (2225MT) and bottling facilities in Nairobi. At a cost of US$30milion Other Storage facilities planned in	Feasibility study for Nairobi completed June 2013	Equity/debit under PPP model.	Short term

Sectoral Action Area	Priority area/project type and technology	No	Project title	Contact Organization/ developer	Description capacity, estimated total cost	Development Status	Financing Status[63]	Time frame
					Eldoret, Nakuru, Kisumu, and Sagana.			
	Improved cooking and lighting appliances	2	Domestic & community biogas for cooking & lighting	MoEP/REA	Infrastructure for biogas storage and packaging in arid and semi-arid areas (2014-19) programme to develop 4,000 digesters at a cost of $285k			Med
Industry and Agricultural processes	Promotion of energy efficiency in Industry (project pipeline with KAM and confidential)	1	Implementation of project pipeline of EE and RE projects	Kenya Association of manufacturers	88 sites with >200MW RE generation and/or EE savings potential applying improved efficiency appliances / machinery; - demand side management and embedded & grid-tied power generation.	Feasibility completed for many of the projects; further study needed for others.	Need $332million debt. AFD provided credit line for equity	Short

Annex 7.3 Transmission Lines Projects Seeking Financing

Projects With Feasibilty Studies Completed 2012/2013 (K Sh 38.2 billioon= USD0.42 billion)

S/N	PROJECT NAME	DESCRIPTION/SCOPE	COST Billion Ksh.	STATUS	CHALLENGES
1	Meru -Maua Line	50km 132kV Line and 1 Substation at Maua Counties Covered: Meru	1.3	Feasibility study & bid documents complete.	Lack of Financing
2	Nyahururu (Rumuruti) - Maralal Line	148km 132kV Line and Sub-station at Maralal Counties Covered: Laikipia, Samburu	2.6	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
3	Rabai-Bamburi-Shanzu-Kilifi line	60km, 132kV double circuit line with associated substations Counties Covered: Kilifi, Mombasa	1.7	Feasibility study & bid documents complete. Seeking Financing	Financing agreement on going
4	Voi - Taveta Line	107km, 132KV single circuit transmission line, with substation at Taveta. Counties Covered: Taita Taveta, Voi	2	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
6	Garsen -Hola - Garissa Line	240km 220kV single circuit Line and Sub-station at Hola and Bura Counties Covered: Tana River, Garissa	9.3	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
7	Kisumu - Kakamega – Musaga*	73 km, 220kV line with 220/132/33kV 2x150MVA substation at Kakamega and bay extensions at Kisumu and Musaga.		Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
	Webuye - Kimilili – Kitale*	73km, 132kV d/c Line, s/c strung with establishment of 132/33kV substations; 2X23MVA at Webuye, 2x23MVA at Kimilili and bay extension at Kitale.		Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
8	Sotik – Kilgoris*	48km, 132kV d/c Line, s/c strung with a new 2x23MVA 132/33kV substation at Kilgoris		Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
9	Garissa -Wajir Line	330km 220kV single circuit Line and 1 No. 23MVA Sub-station at Wajir Counties Covered: Garissa, Wajir	9.5	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing

S/N	PROJECT NAME	DESCRIPTION/SCOPE	COST Billion Ksh.	STATUS	CHALLENGES
10	Awendo - Isebania Line	50km 132kV single circuit Line and Sub-stations at Isebania Counties Covered: Migori	1.8	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
11	Galu - Lunga Lunga Line	60km 132kV single circuit Line and 23MVA Sub-stations at Lunga Lunga Counties Covered: Kwale	1.4	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
12	Ishiara - Chogoria Line	40km 132kV single circuit Line and 1x23 MVA Sub-station at Chogoria Counties Covered: Embu, Tharaka Nithi	1.3	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
13	Narok- Bomet Line	88km 132kV double circuit Line Counties Covered: Narok, Bomet	2.3	Feasibility study & bid documents complete. Seeking Financing.	Lack of Financing
14	Sultan Hamud-Loitoktok	88km 132kV double circuit Line	2.3	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
15	Kabarnet - Nyahururu Line	111km 132kV double circuit Line Counties Covered: Laikipia, Baringo	2.7	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing

Transmission Lines' Projects 2013/14 Feasibilty Studies (Ksh 70.206489 billion= USD 0.77 billion)

S/no	PROJECT NAME	PROJECT DESCRIPTION	ESTIMATED COST (Billion Kes)		CHALLENGES
1	Kamburu - Embu - Thika	196km, 220kV d/c line with bay extension at Kamburu and establishment of 1x150MVA 220/132kV substation at Embu, Kiganjo & Thika	9.33498	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
2	Isinya – Konza (Techno City)	38km 400kV d/c line, with 3x350MVA 400/132kV & 5x45 MVA 132/33kV substations at Konza and bay extensions at Isinya	6.22332	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
3	Longonot - Thika - Kangundo - Konza	205km, 400kV d/c line with 1x350MVA 400/220kV & 2x90MVA 220/33kV at Thika, 1x350MVA 400/132kV &2x45MVA 132/33kV at Kangundo and bay extensions at Longonot and Konza.	13.21137	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing

S/no	PROJECT NAME	PROJECT DESCRIPTION	ESTIMATED COST (Billion Kes)		CHALLENGES
4	Kitui - Mutomo - Kibwezi	144 km, 132kV d/c line with bay extensions at Kitui and establishment of 2x45MVA 132/33kV substations at Mutomo & Kibwezi.	1.5822	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
5	Ngong - Magadi	84km, 220kV Line and new substation at Magadi	2.93586	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
6	Lessos-Juja Tee - Uplands	Establishment of 2x60 MVA substations at Uplands off the existing Lessos-Juja 132kV line.	1.62615	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
7	Menengai-Nyahururu (Ol Kalau) - Rumuruti	Approximately 70km of 132kV and establishment of 132/33kV substation at Ol Kalau and bay extensions at Menengai and Rumuruti	1.5822	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
8	Rabai - Galu T-off - Likoni	15km 132kV double circuit line substation at Likoni	1.54704	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
9	Kisumu - Kakamega – Musaga*	73 km, 220kV line with 220/132/33kV 2x150MVA substation at Kakamega and bay extensions at Kisumu and Musaga.	2.03928	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
10	Webuye - Kimilili – Kitale*	73km, 132kV d/c Line, s/c strung with establishment of 132/33kV substations; 2X23MVA at Webuye, 2x23MVA at Kimilili and bay extension at Kitale.	1.5822	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
11	Sotik – Kilgoris*	48km, 132kV d/c Line, s/c strung with a new 2x23MVA 132/33kV substation at Kilgoris	1.0548	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
12	Rongai - Kilgoris - Lake Victoria Ring	235 km, 400kV d/c Line with possible interconnection to Tanzania to complete the Lake Victoria Ring with 400/132kV	4.395	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing

S/no	PROJECT NAME	PROJECT DESCRIPTION	ESTIMATED COST (Billion Kes)		CHALLENGES
13	Lessos/Tororo Tee off at Myanga - Busia	41km 132kV d/c Line, s/c strung with new 132/33kV x23MVA substations at Myanga and Busia.	0.75594	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
14	Rangala - Bondo - Ndigwa	72km, 132kV d/c Line, s/c strung, bay extensions at Rangala & establishment of 1x23MVA 132/33kV substations at Bondo and Ndigwa.	0.90537	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
15	Homa Bay – Sindo/Karungo	72km, 132kV d/c line, s/c strung from Homa Bay to Sindo through Karungo, bay extensions at Homabay and establishment of 1x23MVA 132/33kV substation at Sindo.	1.125999	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
16	Kiambere - Maua - Isiolo	145 km, 220kV d/c line with bay extensions at Kiambere and establishment of 2x90MVA 220/132kV substations at Maua and Isiolo.	4.2192	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
17	Isiolo - Maralal	165 km, 132kV d/c line with bay extension at Isiolo and Maralal.	1.9338	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
18	Isiolo - Marsabit	240 km, 220kV d/c line with bay extension at Isiolo and establishment of 2x90MVA 220/33kV substation at Marsabit	3.6039	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
19	Turkwel - Lodwar - Lokichogio	330 km 220 d/c line with establishment of 2x45MVA substations at Lodwar and Lokichogio, bay extension of substations at Turkwel.	5.8014	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing
20	Loiyangalani - Marsabit	136 km, 220kV d/c line with establishment/extension of substations at Loiyangalani and 1x25 MVAR bus reactor at Marsabit .	4.7466	Feasibility study & bid documents complete. Seeking Financing	Lack of Financing

(*) As Expected under the 10 Year Plan for the period between 2014-2024 (May 2014).

Annex 7.4 Hydro Projects under Feed-In Tariffs

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
39.	A.M. Ventures LTD	Angaluki Muaka	P.O BOX 67006	0722 977872	2.2	Hydro	Kapkateny falls	Bungoma	28-09-2010	08/11/2011			NO	NO	SUBMITED THE FEASIBILITY STUDY. IT NEEDS TO BE UPDATED	TO PROCEED	JULY 2018 Estimated
48.	Lucid Power Generation Company	Hon Norman M.G.K Nyagah	po.box 66244-00800 nairobi, kenya	-202713697	10	Hydro	Sagana River	Mukurweni	08/08/2011	08/11/2011			NO	NO	SUBMITED THE PROGRESS REPORTS	PROCEDD	DECEMBER 2019 ESTIMATED
52.	Global Sustainable Ltd	Mr. Humphrey Mulindi	P.O BOX 100310-00100 nairobi		5	Hydro	Nzoia (Sidhikho)	bungoma (Buchangu)		08/11/2011			NO	NO	FEASIBILITY STUDY UNDER REVIEW.	TO PROCEED	JULY 2018 ESTIMATED
64.	Kirengete Hydro Power Company/ Kirinyaga west hydro power company ltd	James Nganga Gakunga	p.o box 162 sagana	2.54725E+11	4	Hydro	Sagan River	Sagana	11/07/2012	29-01-2013			NO	NO	ON APPLICATION THEY HAD SUBMITTED A FEASIBILITY. THEY HAVE REGISTERED A NEW COMPANY FOR INVESTMENTS	PROCEED	JULY 2019 ESTIMATED
82.	Greenlight Holdings	Mr. Stephen Ndiga Nyaga	P.O. Box 157 kianyaga		6.9	Small Hydro	River Nyamindi	Kutus		04/02/2013			NO	NO	SUBMITED PROGRESS REPORTS	PROCEDD	JULY 2018 ESTIMATED

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
85.	Cube Energy Limited	tirulpathinanda gopal	p.o box 464-10200, murang'a		9	Small Hydro	Mweru on River North Mathioya, (2 x 1.5MW), Iyego on River South Matioya (2 x1.5MW) and Muranga on river Mathioya (2 x1.5MW)	Muranga	23/05/2013	06/07/2013			NO	NO	SUBMITED PROGRESS REPORTS	PROCEED	JULY 2019 ESTIMATED
96.	Global Sustainable Limited				4	Small Hydro	Chepkumia	Nandi Hills	18/09/2013	18/10/2013			NO	NO	PROGRESS REPORTS SUBMITED	PROCEED	JUNE 2019 ESTIMATED
106.	Craftskill EA Ltd	Mr. Simon Guyo	P.O BOX 57357-00200 nairobi		12.4	Small Hydro	Elegeyo Marakwet and Kajiado/ Narok	Embubut and Kajiado		10/12/2013			NO	NO	RESPONDED TO THE LETTER	PROCEED	OCTOBER 2019
121.	Civicon Ltd				3.17	Small Hydro	Nithi River	Chogoria		19-06-2014			NO	NO	NO PROGRESS REPORTS SUBMITTED	PROCEED	APRIL 2020 (ESTIMATED ACCORDING TO FIT POLICY)
91.	Frontier Investment Management	Bernard Osawa	P.O. BOX 20802-00202 Nairobi,Kenya	bos@frontier.dk +254204214000 0723273615	5.6	Small Hydro	River Nithi	Tharaka Nithi	12/07/2013	01/08/2013			NO	NO	PROGRESS REPORTS SUBMITED	PROCEED	Jan-17

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
108.	Kibis Kinetic Energy Ltd	Mr. Allan Simiyu Kundu	P.O BOX 1602 - 30100 eldoret		4.8	Small Hydro	Kibisi falls on river Nzoia	Kibis		14—2-2014			NO	NO		PROCEED	JANUARY 2017
128	Askip Energy Limited,	Dr. Jeremiah K. Kiplagat, Director	P.O. BOX 7696-00100 Nairobi		5.6	Small Hydro	Chepngesu River Kmware	ElegeyoMarakwet		12/8/2014			NO	NO	NO RESPONSE	PROCEED	AUGUST 2020 (ESTIMATED ACCORDING TO FIT POLICY)
129	Hydro Project Service Peters	Mr. Andrej Peters Director	P.O. BOX 102436-00100 Nairobi		0.55	Small Hydro	KIRIMA KIANTHI ON KAZITA RIVER	Meru county		12/8/2014			NO	NO	RESPNDED WITH THE GANT CHART	PROCEED	NOVEMBER 2017
130	Responsibility Africa	Mr. Joseph Ng'ang'a Agent	Fedha Plaza P.O. BOX 293-00623		5.2	hydro	IGOJI ON MUTONGA RIVER	meru/tharaka nithi		12/8/2014			NO	NO	RESPONDED WITH GANTT CHART	PROCEED	JULY 2019
34.	Que Energy/ western hydro	mr. daniel theuri	p.o. box 47054-00100	020 2248468, 020 2027929	10	Hydro	Webuye Falls	Webuye	25/06/2008	03/03/2011	14-08-2014	ppa negotiations ongoing	YES	NO, ONNOING		TO PROCEED AND FINALIZE PPA NEGOTIATIONS AND CONSTRUCTION	Jan-18

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
46.	Global Sustainable	humphrey mulindi	P.O BOX 100310-00100	020 2641972	11	Hydro	Yala /KaptisKaimosi	Kaimosi	12/07/2011	08/11/2011	11/12/2014	PPA negotiations on-going capacity upgraded to 11MW	YES	NO, ONNOING		TO PROCEED	JAN 2018 ESTIMATED
62.	Unilever Tea Kenya Ltd	Mr Eric De-Foresta	P.O. BOX 20-20200 kericho		2.85	Hydro	Kerenge, Tagabi, Jamji,	Kericho		10/04/2012	10/04/2012	PPA negotiations on-going. This is already completed project	YES	NO, ONNOING	THE PROJECT IS COMPLETE AND RUNNING. WAITING PPA NEGOTIATIONS	PROCEED	JULY 2015 ESTIMATED TIME FOR PPA NEGOTIATIONS. PLANT COMMISSIONED
27.	Hydel	Hon Norman M.G.K Nyagah	Rose Avenue, 2nd Flr, Kiganjo Hse P.O. Box 66244-00800 NAIROBI	020-2713951, info@hydelkenya.com	15	Small Hydro	Kagumoine, Kairo, Njega	Embu & Kirinyaga		03/08/2010	03/08/2010	PPA negotiations ongoing	YES	NO, ONNOING	ASKED TO BE GIVEN MORE TIME TO SORT SOME INTERNAL CHALLENGES	TO PROCEED AND FINALIZE PPA NEGOTIATIONS AND CONSTRUCTION	JUNE 2018 (ESTIMATED)
107.	KTDA	L.G maina	p.o box 30213-00100 Nairobi		3.6	Small Hydro	Gucha	Gucha		10/12/2013	14—2-2014	PPA negotiations on-going	YES	NO, ONNOING	DEVELOPER IS NTENDERING FOR EPC CONTRACTOR	PROCEED	NOVEMBER 2017

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
44.	Mt Kenya Community Based Organisation	George kirigia	P.O. BOX 944-60200	728721180	0.6	Hydro	Kathita River	Meru	19/10/2011	08/11/2011	17-02-2014	PPA SIGNED	YES	YES	PPA APPROVED AND SIGNED	TO PROCEED TO FINACIAL CLOSURE AND PROJECT IMPLEMENTATION	december 2017
	kleen energy ltd				5.6	hydro	river rupingazi	embu		07/06/2013	6/7/2013	PPA NEGOTIATONS ONGOING	YES	YES	PPA INITIALED	PROCEED	
75.	Tindinyo Falls Resort	H.E. Dr. Kipyego cheluget	p.o box 53897-00200 nairobi		1.5	Hydro	River yala	Tindinyo	22/02/2012	02/04/2013	04/02/2013	PPA SIGNED	YES	YES	PPA HAS BEEN SIGNED	PROCEED	Jan-16
26.	KTDA Metumi	Mr. Lucas Maina	KTDA P.O. Box 30213,-00100 NBI	254 020 3227000-2, 221441/2/3/4 FAX +254 020 211240 infr@ktdateas.com	5.6	Small Hdro	North Mathioya	North Muranga	19-2-2010	03/08/2010		PPA approved by ERC	YES	YES	PPA approved	TO CONTINUE WITH CONSTRUCTION	JUNE 2018
1	Imenti Tea Factory, Shp	Mr. Lucas Maina	P.O. BOX 30213-00100 NAIROBI	020 3227000 info@ktdateas.com	0.3	Small Hydro	South Imenti	Meru	18-12-2008	26-01-2009	26-01-2009	Construction Completed and generating power	YES	YES	PLANT RUNNING		

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
2	GenPro, Shp	joseph simuyu	P.O. BOX 2314-00606 nairobi	254 202 067 974 email: info@gppowersystem.co.ke	3	Small Hydro	Teremi Falls	Mt. Elgon	08/08/2008	16-10-2009	16-10-2009	PPA Signed	YES	YES	PPA REOPENED , RENEGOTIATED AND APPROVED ON NOVEMBER 2013	EXPEDITE CONSTRUCTION TO FINISH CONSTRUCTION BY 2016 AS PER LETTER	JUNE 2016 (ESTIMATED)
117.	KTDA Ltd,	L.G maina	p.o box 30213-00100 Nairobi		2	small hydro	Mara River	South Mara		20—3-2014	20—3-2014	PPA SIGNED	YES	YES	CONSTRUCTION IN PROGRESS		2018
118.	KTDA Ltd,	L.G maina	p.o box 30213-00100 Nairobi		1.8	small hydro	Nyamindi River	Lower Nyamindi		20—3-2014	20—3-2014	PPA SIGNED	YES	YES	CONSTRUCTION IN PROGRESS	PROCEED	2018
120.	KTDA power	L.G maina	p.o box 30213-00100 Nairobi		1	small hydro	Chania River	Mataara		02/05/2014	20—3-2014	PPA SIGNED	YES	YES	ADVANCED STAGE OF CONSTRUCTION	PROCEED	JUNE 2015
107.	KTDA	L.G maina	p.o box 30213-00100 Nairobi		3.6	Small Hydro	Kipsono	Kipsonoi		10/12/2013	14—2-2014	PPA negotiations on-going	YES	YES	DEVELOPER IS NTENDERING FOR EPC CONTRACTOR	PROCEED	NOVEMBER 2017
116.	KTDA Ltd,	L.G maina	p.o box 30213-00100 Nairobi		1.5	small hydro	Iraru River	Iraru		20—3-2014	20—3-2014	PPA SIGNED	YES	YES	CONSTRUCTION IN PROGRESS		2018

	NAME OF FIRM	CONTACT PERSON	ADDRESS	TEL/ EMAIL	CAPACITY (MW)	RESOURCE	SITE	NEAREST URBAN CENTRE	DATE OF SUBMISSION	DATE OF APPROVAL	DATE OF FEASIBILITY STUDY APPROVAL	STATUS	FEASIBILITY STUDY SUBMITTED	PPA ESTABLISHED	REMARKS	RECOMMENDATIONS	EXPECTED DATE OF COMMISSIONING
9.	Gura shp	lucas maina	KTDA P.O. Box 30213,-00100 NBI	254 020 3227000-2, 221441/2/3/4 FAX +254 020 211240 infr@ktdateas.com	5.8	Small Hydro Power	Gura River	Nyeri	14/05/2009	21-05-2009	21-05-2009	UNDER CONSTRUCTION	YES	YES	THE POWER PLANT UNDER CONSTRUCTION	TO CONTINUE WITH THE PROCESS	JUNE 2016
60.	KTDA	Mr.LG. Maina	p.o box 30213-00100 Nairobi	info@ktdateas.com +2540203227000	3.3	Hydro	Chemosit and Kiptiget	Kericho	19/07/2012	08/10/2012	08/10/2012	PPA negotiations on-going					
109.	KTDA Ltd	L.G maina	p.o box 30213-00100 Nairobi		1.3	small hydro	Chemosit plant on Itare river	Kabianga		14—2-2014	14—2-2014	PPA negotiations on-going					
110.	KTDA Ltd,	L.G maina	p.o box 30213-00100 Nairobi		0.9	small hydro	Yurith/Chemosit River	Cheptuyet		14—2-2014	14—2-2014	PPA negotiations on-going					
111.	KTDA Ltd,	L.G maina	p.o box 30213-00100 Nairobi		3.6	small hydro	Yurith River	Kamas		14—2-2014	14—2-2014	PPA negotiations on-going					
			NAIROBI														
		Mr. Stanley Mwiraria	MERU	ntotaini@gmail.com													
			Nairobi		162.27												

Annex 7.5a List of the RE hybrid off-grid programme- capacity of RE and diesel sources and related estimated costs and status of development.

NO.	STATION	GROUP	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
1	Lodwar	A	250	0	2,039,895	0	2,039,895
2	Hola	A	100	0	815,958	0	815,958
Sub-total							**2,855,853**
3	Mandera	A	200	0	1,631,916	0	1,631,916
4	Wajir	A	800	300	8,397,761	2,117,082	10,514,843
5	Merti	A	100	100	2,344,429	705,694	3,050,123
6	Habswein	A	100	0	815,958	0	815,958
7	Elwak	A	100	0	815,958	0	815,958
8	Baragoi	A	100	100	2,344,429	705,694	3,050,123
9	Mfangano	A	100	0	2,293,867	0	2,293,867
10	Rhamu	B	100	0	1,223,937	0	1,223,937
11	Eldas	B	100	0	1,223,937	0	1,223,937
12	Takaba	B	100	0	1,223,937	0	1,223,937
13	Lokichoggio	B	150	0	1,223,937	0	1,223,937
14	Lokori	B	150	0	1,223,937	0	1,223,937
15	Faza	B	100	100	1,223,937	705,694	1,929,631
16	Kiunga	B	150	0	1,223,937	0	1,223,937
17	Hulugho	B	150	0	1,223,937	0	1,223,937
18	Laisamis	B	150	0	1,223,937	0	1,223,937
19	North Horr	B	100	100	1,223,937	705,694	1,929,631
20	Lokitaung	B	150	0	1,223,937	0	1,223,937
21	Dadaab	B	100	100	1,223,937	705,694	1,929,631
22	Maikona	B	100	100	1,223,937	705,694	1,929,631
23	Lokiriama	B	150	0	1,223,937	0	1,223,937
24	Banisa	B	100	100	1,223,937	705,694	1,929,631
Sub-total							**44,060,313**
25	Nachokui	C	100	100	3,215,016	776,294	3,991,310
26	Turkwel	C	150		3,470,148		3,470,148

NO.	STATION	GROUP	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
27	Kaeris	C	100	100	3,215,016	776,294	3,991,310
28	Liboi	C	150		3,470,148		3,470,148
29	Gari	C	150		3,470,148		3,470,148
30	Dukana	C	100	100	3,215,016	776,294	3,991,310
31	Bubisa	C	100	100	3,215,016	776,294	3,991,310
Sub-total							**26,375,684**
32	Illeret	C	150		3,470,148		3,470,148
33	Darade	C	100	100	3,215,016	776,294	3,991,310
34	Furole	C	100	100	3,215,016	776,294	3,991,310
35	Kibish	C	150		3,470,148		3,470,148
36	Lokamarinyang	C	100		3,215,016		3,215,016
37	Kokuro	C	150		3,470,148		3,470,148
38	Nadapal	C	100		3,215,016		3,215,016
Sub-total							**24,823,096**
39	Napeitom	C	150		3,470,148		3,470,148
40	Kerio	C	150		3,470,148		3,470,148
41	Oropoi	C	150		3,470,148		3,470,148
42	Todonyang	C	150		3,470,148		3,470,148
43	Loyangalani	C	100	100	3,215,016	776,294	3,991,310
44	Lowarangak	C	100		3,215,016		3,215,016
45	Kakuma	C	100	100	3,215,016	776,294	3,991,310
46	Haut	C	100	100	3,215,016	776,294	3,991,310
47	Kalokol	C	100	100	3,215,016	776,294	3,991,310
Sub-Total							**33,060,848**

Notes:

Group A are existing mini grid stations, Group B are mini-grid stations under construction while Group C are proposed green field mini grid stations. Focus for investment should therefore be on proposed green field minigrids

Annex 7.5b Diesel/solar Pv and wind hybrid mini-grids capacity (kW) and estimated investment costs (USD)-(SREP Climate Investment Fund. (2013). SREP Investment Plan.

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
1.	Nachoku i	4° 3′ 57.60″N 35° 52′ 56.9″E	374	100	100	2,411,765.00	250, 000	815,958.00	705,694.00	4,183,417.12
2.	Turkwel	2° 54′ 57.6″N 35° 24′ 14.4″E	216	150	0	2,411,765.00	250, 000	1,223,937.00	-	3,885,702.00
3.	Kaeris	3° 57′ 32.6″N 35° 28′ 52.76″E	390	100	100	2,411,765.00	250, 000	815,958.00	705,694.00	4,183,417.12
4.	Liboi	0° 21′ 07.2″N 40° 52′ 19.2″E	577	200	0	2,588,235.00	250, 000	1,631,916.00	-	4,470,151.24
5.	Gari	3° 26′ 26.37″N 40° 57′ 53.21″E	295	150	0	2,411,765.00	250, 000	1,223,937.00	-	3,885,702.00
6.	Dukana	3° 59′ 47.43″N 37° 16′ 25.42″E	330	100	100	2,411,765.00	250, 000	815,958.00	705,694.00	4,183,417.12

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
7.	Bubisa	2° 41′ 50.6″N 38° 05′ 47.47″E	699	150	100	2,588,235.00	250, 000	1,223,937.00	705,694.00	4,767,866.00
8.	Illeret	4° 18′ 43.14″N 36° 13′ 38.15″E	166	150	0	2,235,295.00	250, 000	1,223,937.00	-	3,709,232.00
9.	Darade	Long: Lat:	185	100	100	2,235,295.00	250, 000	815,958.00	705,694.00	4,006,947.12
10.	Furole	3° 42′ 52.18″N 37° 57′56.56″E	271	100	100	2,411,765.00	250, 000	815,958.00	705,694.00	4,183,417.12
11.	Kibish	5° 16′ 39.54″N 35° 48′ 48.28″E	102	150	0	2,235,295.00	250, 000	815,958.00	-	3,301,253.12
12.	Lokamarinyang	5° 1′ 8.25″N 35° 35′ 31.45″E	184	100	0	2,235,296.00	250, 000	815,958.00	-	3,301,253.12
13.	Kokuro	4° 40′ 14.26″N	218	150	0	2,411,765.00	250, 000	1,223,937.00	-	3,885,702.00

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
		35° 42′ 46.15″E								
14.	Nadapal	3° 04′ 34.16″N 35° 30′ 31.1″E	934	300	0	3,000,000.00	250, 000	2,447,874.00	-	5,697,874.35
15.	Napeitom	1° 43′ 52.27″N 36° 02′ 31.53″E	108	100	0	815,958.12	250, 000	815,958.00	-	3,301,253.12
16.	Kerio	2° 59′ 59.6″N 36° 03′ 13.51″E	108	100	0	815,958.12	250, 000	815,958.00		3,301,253.12
17.	Oropoi	3° 48′ 46.95″N 34° 21′ 37.12″E	288	150	0	2,411,765.00	250, 000	1,223,937.00	-	3,885,702.00
18.	Todonyang	4° 27′ 03.30″N 35° 55′ 43.77″E	79	100	0	2,235,295.00	250, 000	815,958.00	-	3,301,253.12
19.	Loyangalani	2° 46′ 15.6″N 36° 43′ 30″E	71	100	100	2,235,295.00	250, 000	815,958.00	705,694.00	4,006,947.12

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
20.	Lowarangak	4° 16′ 49.47″N 35° 53′ 29.98″E	81	100	0	2,235,295.00	250, 000	815,958.00	-	3,301,253.12
21.	Kakuma	4° 16′ 49.47″N 34° 51′ 59.60″E	200	100	100	2,411,765.00	250, 000	815,958.00	705,694.00	4,183,417.12
22.	Illaut	1° 51′ 56.77″N 37° 14′ 48.43″E	100	100	100	2,235,295.00	250, 000	815,958.00	705,694.00	4,006,947.12
23.	Kalokol	3° 32′ 43.21″N 35° 50′ 17.83″E	561	200	100	2,588,235.00	250, 000	1,631,916.00	705,694.00	5,175,845.24
24.	Bangale	0° 43′ 24.89 39° 60′ 57.73″E	184	150	100	2,411,765.00	250,000.00	1,223,937.00	705,694.00	4,591,396.00
25.	Ndau	2° 00′ 39.58″S 41° 12′ 31.44″E	184	100	100	2,411,765.00	250,000.00	815,958.12	705,694.00	3,933,417.12
26.	Shimoni	4° 39′ 52.09″S	184	150	0	2,411,765.00	250,000.00	1,223,937.00	-	3,885,702.00

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
	Island	39° 21′ 08.17″E								
27.	Ukasi	0° 48′ 50.37″S 38° 32′ 05.68″E	184	150	0	2,411,765.00	250,000.00	1,223,937.00		3,885,702.00
28.	Ngodhe	0° 21′ 18.80″S 34° 11′ 24.14″E	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
29.	Takawiri	0° 28′ 51.53″S 34° 05′ 05.79″E	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
30.	Kiwa	0° 45′ 04.99″S 34° 01′ 53.67″E	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
31.	Magata	0° 08′ 01.05″S 34° 00′ 40.41″E	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
32.	Kibuogi	0° 31′ 45.01″S 34° 05′ 31.34″E	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
33.	Ringiti	Long: Lat:	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
34.	Kadaina	Long: Lat:	184	100	0	2,411,765.00	250,000.00	815,958.12		3,477,723.12
35.	Kiwayuu	2° 00’ 39.94”S 41° 16’ 10.43”E	184	100	100	2,411,765.00	250,000.00	815,958.12	705,694.00	4,183,417.12
36.	Gold(makutano)	3° 32’ 27.71”N 35° 14’ 49.13”E	184	100		2,411,765.00	250,000.00	815,958.12		3,477,723.12
37.	Charutende	Long: Lat:	184	100		2,411,765.00	250,000.00	815,958.12		3,477,723.12
38.	Dujis	0° 14’ 53.52”N 39° 23’ 36.12”E	184	150	100	2,411,765.00	250,000.00	1,223,937.00	705,694.00	4,591,396.00
39.	Ijara	0° 02’ 28.42”S	184	150		2,411,765.00	250,000.00	1,223,937.00		3,885,702.00

	STATION	LOCATION (GPS Location)	PROPOSED DIESEL GENERATION (KW)	PROPOSED SOLAR PV (KW)	PROPOSED WIND (KW)	ESTIMATED DIESEL GENERATION COST (USD)	ESTIMATED COST FOR DISTRIBUTION NETWORK(USD)	ESTIMATED SOLAR CAPITAL COST (USD)	ESTIMATED WIND CAPITAL COST (USD)	ESTIMATED TOTAL CAPITAL COST (USD)
		40° 01′ 34.31″E								
40.	Korr	2° 00′ 33.03″N 37° 30′ 29.31″E	184	150	100	2,411,765.00	250,000.00	1,223,937.00	705,694.00	4,591,396.00
41.	Sereolipi	1° 07′ 43.7″N 37° 36′ 0.809″E	184	150		2,411,765.00	250,000.00	1,223,937.00	-	3,885,702.00
42.	South Horr	2° 05′ 48.86″N 36° 54′ 54.85″E	184	100	100	2,411,765.00	250,000.00	815,958.12	705,694.00	4,183,417.12
43.	Barsaroi	1° 20′ 21.20″N 36° 51′ 36.03″E	184	100	100	2,411,765.00	250,000.00	815,958.12	705,694.00	4,183,417.12
44.	Marti	1° 28′ 22.67″N 36° 43′ 3.951″E	184	150	100	2,411,765.00	250,000.00	1,223,937.00	705,694.00	4,591,396.00

Annex 7.6 Soft Projects proposed for SE4ALL Kenya

Sectoral Action Area	Priority area/project type and technology	No	Project title	Lead organization	Description of soft project	Purpose	Status	Time frame
Large RE generation	**Grid**	1	Grid capacity assessment[65]	MoEP/KETRA CO/KPLC/ERC	Guidance to capacity for the grid network to connect RE power from various sources and locations basing on a study done by GIZ/ERC/KAM	Determine grid stability and level of base load and RE share	Comprehensive assessment not yet done but evacuation transmission lines already planned	Short term
		2	One stop Shop	MoEP/ERC	Creation of a coordination institutional unit to provide all the necessary information to investors and also facilitate registration of companies and licensing of projects building on ERC's efforts.	Shorten and speed project licensing and hence investment	Currently investor goes to several institutions for information and before project licensing.	Short term
Distributed Solutions	**Minigrids**	1	Financing of mini-grids	MoEP/REA	Creation of a credit line with local banks for equity/loan to invest in mini-grids/hybrids	Avail financing for mini-grids by SME private sector entities. Support on-going initiatives	AfD credit line on-going for some RE and EE projects through KAM The credit line has been extended for another two years but will need sustainable support beyond the two years.	

[65] Can also be under Grid Infrastructure and Supply Efficiency.

Sectoral Action Area	Priority area/project type and technology	No	Project title	Lead organization	Description of soft project	Purpose	Status	Time frame
	Pico and solar home systems	2	Public institutions solar PV systems programme	MoEP	Grant financing for completion of public institutions connections (100% secondary schools and health facilities) by 2015	Enhance and sustain an on-going government programme	Some public institutions are already covered under government budgets	On-going
		3	Market assessment for manufacturing of technologies	MoEP and	A feasibility study for local manufacture of various pico, solar home systems in Kenya	Attract investors to start manufacturing of solar systems in the country	Systems are imported and landed costs are high for bottom of pyramid consumers	Short-medium term
		4	Quality system standards	MoEP/Kenya Bureau of Standards	Installation of a testing centre for clean technology systems	This will enable supply of credible clean technology systems-	There is varied quality of systems being supplied in the country and some fail because they are of poor quality	Short-medium term
		5	Upfront costs	MoEP and Ministry of Finance	Creation of a micro-financing scheme or credit line scheme for purchase of clean energy systems	Facilitate uptake of clean energy systems by providing upfront financing	Upfront costs are high for bottom of pyramid	Short term
Grid Infrastructure and Supply Efficiency	**Grid connections**	1	Lowering costs of grid connections to new consumers Single wire earth return for customer	REA/MoEP	Grant financing to REA as government subsidy towards connection. An additional US$288/connection is required to facilitate connections especially for the low income. Indicate the full amount here	Reduce upfront costs of connection for low income groups	Stima loan already in place but not adequate WB/AfDB funds already committed but still require US$160million	

Sectoral Action Area	Priority area/project type and technology	No	Project title	Lead organization	Description of soft project	Purpose	Status	Time frame
			connectivity					
Modern cooking appliance and fuel	**Charcoal**	1	Programme to promote sustainable charcoal production and supply chain efficiency	MoEP	Study on market failures in high-value charcoal supply chain through tree-planting incentives, improved charcoal production, monitoring and regulating transport to reduce time and cost to market, national and sub-national institutional structures for effective regulation, effective trans-border trade regulations and processes, etc.	Ensure sustainable charcoal production, supply and utilization	Charcoal is not openly traded and seems to prejudice producers	Med / Long
	LPG	2	Programme of LPG use in institutions	MoEP/Kenya Petroleum Institute	Undertake demand and ability to pay assessment and resource requirements by government	Apart from introducing clean cooking fuel in public institutions, the programme will provide lessons that can also inform propagation of LPG countrywide.	Public institutions are using woodfuel for cooking to a large extent[66]	Short term-on-going

[66] https://energypedia.info/wiki/Kenya_Energy_Situation

Sectoral Action Area	Priority area/project type and technology	No	Project title	Lead organization	Description of soft project	Purpose	Status	Time frame
	Kerosene	3	Kerosene free initiative	MoEP	Development of institutional arrangement and mobilization of financial resources. Continuation of lighting Africa model for lighting appliances	Promotion of alternative fuels/sources to substitute kerosene	80% of population using kerosene for lighting and 13% for cooking	Short-medium term
		4	Improved wood/charcoal cook stoves	MoEP/Practical Action	Adoption and enhancement of the GACC programme through mobilization of grant seed money.	Promote a business case for uptake of improved cook stoves	Improved cook stoves are on-going but set targets require additional funding	On-going
Industry and agricultural processes	**Energy efficiency**	1	Energy auditing in households, public and productive facilities	KAM/ MoEP/ESCOs	Identification of opportunities for EE in the other sectors other than industry, particularly households and commerce/services, financing, capacity building	Expose other EE saving opportunities in the whole economy	Currently work is being done in industry	Short term-on-going.
		2	Solar water heaters	ERC	Capacity building through training of ERC personnel for implementation of SWH regulations	Ensure ERC are able to monitor implementation of the SWH regulations		Short term
Transport		1	Biofuels study	MoEP	Feasibility of biofuels production and use in Kenya assessing feedstock availability and production potential and the market demand and necessary investments for supply and use of both ethanol and biodiesel in transport, cooking and power generation.	Have a comprehensive assessment and understanding of the potential of biofuels in Kenya and how best to plan for it	Some ethanol production going on and some potential known. With set targets of E30 and B5 by 2030 for all vehicles, potential and resource requirements need to be known	Study in the short term

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