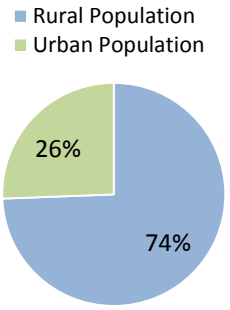
Country: Kenya

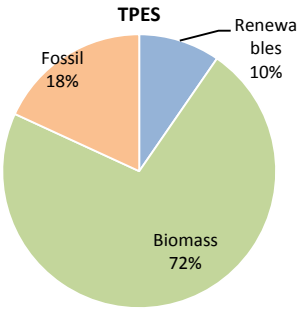
Socio- economic framework

	Year	Unit	Value
Population	2014	million	44.86[1]
Demographic growth	2014	%	2.7%[1]
Surface	2014	km2	580 370[1]
GDP	2014	M US$	60 940[1]
GDP per capita	2014	US$ per cap	1 358[1]
GDP growth	2014	% /year	5.3%[1]
Fragile country status	2014	Index	No [2]
Governance	2014	Index	58.8[3]
Governance variation over 5 years	2014	Index	5.3[3]
Human development	2013	Index	0.535[4]

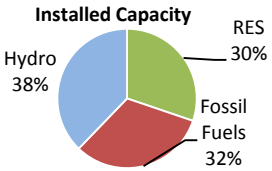


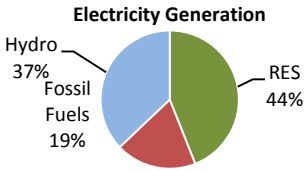
Consumed Energy (million toe=11.65 MWh)

	Year	Unit	Value
Total Primary energy Supply (TPES)	2013	Million toe	21.49[5]
Primary energy Supply - Biomass	2013	Million toe	15.52[5]
Primary energy Supply - Fossil	2013	Million toe	3.90[5]
Fraction of Non-Renewable Biomass	2009	%	64%[6]
Primary energy Supply - Renewable (incl.hydro)	2013	Million toe	2.07[5]
Primary energy - Net Import electricity	2013	Million toe	0.004[5]
Primary energy - Net import hydrocarbon	2013	Million toe	4.84[5]
Total Final Energy Consumption	2013	Million toe	13.99[5]
Final energy - Modern BLEN(*)	2013	Million toe	0.73[5]
Final Energy - Electricity	2013	TWh	7.28[5]



Electricity





	Year	Unit	Value
Peak demand	2014	MW	1512[8]
Installed connected capacity	2014	MW	2173[8]
Thermal installed capacity (fossil fuels)	2014	MW	695[8]
Hydro installed capacity	2014	MW	821[8]
Renewable installed capacity (ex.hydro)	2014	MW	657[8]
IPP/installed capacity	2015	%	30%[10]
Total Electricity production	2014	GWh	9424[8]
Electricity generation from fossil fuels	2014	GWh	1767[8]
Electricity generation from hydro	2014	GWh	3466[8]
Electricity generation from renewable	2014	GWh	4111[8]
Electricity consumption including self-consumption and losses	2013	GWh	8924[9]
Average consumption per capita	2013	kWh per cap	170[9]
Total losses (technical and non-technical) as a production % (**)	2013	%	18%[9]
Total losses (technical and non-technical)(**)	2013	GWh	1596[9]
Imports (+) exports (-)	2014	GWh	45.3[8]
Global electrification rate	2012	%	23%[1]
Urban electrification rate	2012	%	58%[1]
Rural electrification rate	2012	%	7%[1]
HV lines(+)	2014	km	3947[8]
MV lines(+)	2014	km	52850[10]
LV lines(+)	2014	km	To be confirmed
Renewable energy/global electricity production (incl. hydro)	2014	%	80.4%[8]
Connections to the LV network	2014	Thousands	2766[8]
Average tariff/social	2015	US$c/KWh	17.55[11]
Ratio cost/tariff	2014		To be confirmed

The EU's Technical Assistance Facility for the Sustainable Energy for All initiative–Eastern and Southern Africa
Project financed by the European Union and implemented by a consortium led by Atkins

ATKINS

Version dated 18/12/15

Legal, regulatory and institutional framework

Energy policy	- Draft National Energy and Petroleum Policy August 2015, Ministry of Energy and Petroleum (MoEP). - Feed-in-Tariffs Policy (MoPE) 2nd Revision 2012
Energy laws	Geothermal Resources Act (No. 12 of 1982) The Energy Act (No. 12 of 2006). The Energy Bill 2015 (not passed through parliament yet). The Petroleum Bill 2015 (not passed through parliament yet).
Enforcement texts	Legal Notice No. 43/2012 "Solar Water Heating Regulations"; Legal Notice No. 44/2012 "Electricity Licensing Regulations"; Legal Notice No. 102/2012 "Energy Management Regulations"; Legal Notice No. 103/2012 "Solar Photovoltaic Systems Regulations"; The Petroleum products strategic Stock Regulations (2008), The LPG Regulations (2009), The Minimum Operation Stock Regulations (2010), the Petroleum pricing regulations (2010), the Petroleum Regulation Levy regulations amendment (2008); Legal Notice No. 69/2010 The gasoline-alcohol blending regulations (2010); Legal Notice No. 31/2002 the petroleum amendment rules (2002).
Electricity/energy regulator	Energy Regulatory Commission (ERC) mandated by the Energy Act 2006 to regulate the electricity sector, monitor fair competition in the energy sector (including downstream petroleum sector) protect consumer rights, maintain a list of accredited energy auditors, maintain energy data and prepare an indicative national energy plan.
Electricity operators	Eleven licensed power producers in 2015, one of which is Kenya Electricity Generating Company KenGen (the largest power producer with 68% of the installed capacity); Kenya Electricity Transmission Company (KETRACO) the state owned transmission network operator; Kenya Power and Lighting Company (KPLC) (50.1% owned by the state) which owns and operates most of the electricity distribution system.
Rural electrification body	Rural Electrification Authority (REA), established under the Energy Act (2006) for enhancing the rural electrification in the country.
Renewable energy body	The Renewable Energy Department in ERC is responsible for leading the planning, development, implementation and promotion of RES. The Geothermal Development Company is responsible for the exploitation of the geothermal resources.
Energy conservation body	The ERC is responsible for leading the planning, development, implementation and promotion of energy efficiency through planning, development of standards and regulations, compliance and enforcement.
Energy objectives	The objectives in the Draft National Energy and Petroleum Policy (2015) include: increase access to affordable energy, promote indigenous sources, promote energy efficiency and conservation, encourage electricity generation from renewables, develop a natural gas master plan; achieve 1.9GW geothermal power plants by 2017 and 5.5GW by 2030; exploit the estimated 1449MW of large hydro, and the potential of small hydro, wind and PV; develop the transmission network and the interconnection capacities with Uganda and Tanzania. The nuclear development programme foresees the first unit of 1GW to operate by 2024. SE4All Action Agenda targets include: 19GW of installed capacity by 2030, of which 26% will be geothermal, 9% will be wind and 9% hydro; connection to the electricity grid for 65% of urban population by 2022 and 40% rural by 2020 with 100% electrification by 2030; 18% cooking with LPG by 2020 and 100% cooking with "modern energy" by 2030; reduce distribution losses below 15% by 2020 and to 9.3% by 2030.
Feed-in tariff policy	Yes; Feed-in-Tariffs Policy (MoEP) 2nd Revision 2012.
Metering policy for billing	Yes.
Public procurement (auctions)	No.
Unbundling	Yes. There are eleven licensed generators; KETRACO is the transmission system operator and Kenya Power the distribution company.

Private sector environment

Sector private bodies	IPPs. Kenya Renewable Energy Association (KEREA) an independent non-profit association for the development of renewable energy.
Public incentives	The feed-in tariff policy offers incentives for RES; feed-in tariffs are in USD eliminating the risk of exchange rates. There are exemptions for custom duties and VAT on equipment for power plants.
Financial grants	No.
IPPs	In 2015 there were ten licensed IPPs: Tsavo, Iberafrica, Thika Power, OrPower4, Mumias Sugar, Rabai. Imenti Tea, Gikira hydro (PTS), Triumph diesel, Gulf power and KenGen (state owned) as well as a number of isolated grids (25.8MW total).
PPPs	Kenya Power is owned 50.1% by the state and remaining is owned by the private sector (there was a two year management contract in 2005). The state owned Geothermal Development Company (GDC) exploits steam and provides it to power plant developers. The Kenya Petroleum Refineries Lid is owned 50% by the state and 50% by Essar Energy Overseas Limited.
Business index	Listed 108 out of 189 countries by the WB "Ease of doing Business Index" in 2015[12].

International Cooperation in the energy sector

Joint Declaration EU-country	No.
Energy as a focal sector for 11th EDF	Yes. The sustainable infrastructure focal sector includes the objective of developing more efficient and environmentally friendly energy services that are accessible to all.
Donors active in the country	EU, AfD, KfW, GIZ, USAID, IDA, ADB, UNEP, UNDP, EIB, SIDA, DANIDA, CIDA, the Governments of Switzerland, Finland, Belgium, Italy, Spain, Saudi Arabia, Abu Dhabi, Japan, India, China, UK.
Coordination among donors	The "Aid Effectiveness Kenya" is part of the External Resources Dept. of the National Treasury, aiming at coordinating development partner's activities and leverage their support to larger scales.

Main issues and opportunities[13]

- Low access to electricity and modern energy sources.
- Need for high investments in new electricity generation capacity to cover the increasing demand
- Need to invest in the transmission and distribution infrastructure.
- Inadequate capacity for integration of intermittent power generation in the national grid.
- Unsustainable use of biomass.

- Inadequate LPG infrastructure for cylinder filling, storage and distribution.
- High renewable energy potential including geothermal and hydro.

(*) BLEN includes **B**iogas, **L**PG, **E**lectricity and **N**atural Gas.

(**) The losses reported are only technical losses.

(+) For the interconnected system only where HV is 220kV and 132kV, MV is 66kV and 33kVand 11kV, LV is 220-240V or 415V.

Sources:

1 World Bank; Available: http://data.worldbank.org/country/kenya, [Accessed on 11/11/2015]. The source of the share of rural and urban population is the CIA World Factbook available at: https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ke.html [Accessed on 11/11/2015].

2 Kenya is not included in the list of fragile countries of the World Bank Country Policy and Institutional Assessment (CPIA) Score; Available: http://www.worldbank.org/content/dam/Worldbank/document/Fragilityandconflict/FY14FragileSituationList.pdf, [Accessed on 11/11/2015].

3 Ibrahim Index of African Governance (IIAG), Available: www.moibrahimfoundation.org/interact, [Accessed on 11/11/2015].

4 UNDP - Human Development Reports, Available: http://hdr.undp.org/en/countries/profiles, [Accessed on 11/11/2015].

5 International Energy Agency (IEA), Available: http://www.iea.org/statistics/statisticssearch/report/?year=2013&country=KENYA&product=Balances, [Accessed on 11/11/2015].

6 Bailis,R., Drigo, R., Ghilardi, A. & Masera,O. "The carbon footprint of traditional woodfuels", Nature Climate Change 5: 266-272, 2015.

8 Draft National Energy and Petroleum Policy, MoEP, June 2015.

9 International Energy Agency (IEA), Available at: http://www.iea.org/statistics/statisticssearch/report/?year=2012&country=KENYA&product=ElectricityandHeat, [Accessed on 11/11/2015].

10 Kenya Power, Annual report and financial statements, Financial year ended 30 June 2015, Available at: http://kplc.co.ke/img/full/jSsYVq47rObE_KENYA%20POWER%20ANNUAL%20REPORT%202015%20-%20FOR%20WEB.pdf , [Accessed on 02/12/15]

11 Data for January 2015 according to the Energy Regulatory Commission available at: http://www.erc.go.ke/index.php?option=com_content&view=article&id=122&Itemid=550, [Accessed on 04/12/15] with an exchange rate of 1USD=102.06KShs.

12 World Bank, Available: http://data.worldbank.org/indicator/IC.BUS.EASE.XQ, [Accessed on 11/11/2015].

13 The main issues and opportunities were taken from the Kenya SE4All Action Agenda (March 2015 draft).

Country: Kenya

ANNEX 1 – PRIMARY DATA STATISTICS AND ACCESS TO MODERN ENERGY SOURCES

SE4ALL Objectives	Indicators	Unit	Statistics						Target
			Total				Rural	Urban	Total
			1990	2000	2010	2012	2012	2012	2030
Universal access to modern energy	Electricity access	% of population	11	15	23	23	7	58	100%[1]
	Non-solid fuels access	% of population	19	20	17	16	3	49	100%
			1990		2010	2012	1990-2010	2010-2012	2030
Doubling energy efficiency	Improvement rate of Primary energy intensity	CAGR %					0.14	-2.54	
	Cumulated energy savings	PJ					457	149	
	Ratios primary energy/final energy		70.2		65.8	([2])			
	Primary energy intensity level	MJ/$2011 PPP	9.5		9.7	9.3			([3])
			1990	2000	2010	2012			2030
Doubling the renewable energy share	Total final consumption	PJ			529	556			
	RE share in the total consumption	%	77.7	81.8	77.1	78.5			
	RE share in the total electricity generation	%			69.5	75.2			([4])
	RE share in the total electricity production capacity	%			58.1	57.6			

Sources:

SE4ALL Progress towards Sustainable Energy 2015, Global Tracking Framework (GTF), Available: http://www.se4all.org/tracking-progress/ [Accessed on 24/8/2015].
SE4ALL Global Tracking Framework 2013, Available: http://www.se4all.org/tracking-progress/ , [Accessed on 24/08/2015].
Note: Figures used in this annex are those of the GTF which uses the same definitions for all countries. However, these definitions are not always those used in the other parts of the fiche.

[1] SE4All Action Agenda for Kenya, 2015
[2] This indicator is not available in the GTF 2015 publication.
[3] According to the SE4ALL Action Agenda the target is to reach 0.12 toe/1000USD GDP (PPP) by 2030.
[4]The Action Agenda foresees additional 450MW of small hydro, 6GW of wind, 800MW of PV, 2.2GW of CHP, 450MW of MSW and 20MW of biogas by 2030 and a total of 5.5GW geothermal plants installed.

Country: Kenya

ANNEX 2 – INSTITUTIONAL AND POLITICAL FRAMEWORK

N : not achieved **F**:foreseen **D** : drafted **AP** : Approval national process **A**: adopted **I** : implemented **S** : Success story

POLICY ASPECTS	N	F	D	AP	A	I	S	COMPLEMENTARY ASSESSMENT ELEMENTS
1 *Energy sector*								
Political objectives Energy laws					✓			The Draft National Energy and Petroleum Policy of June 2015 developed by the Ministry of Energy and Petroleum (MoEP) is the overarching policy text. The objectives include increased access to affordable energy, promotion of indigenous sources, promotion of energy efficiency and conservation, encouragement of electricity generation from renewables, development of a natural gas master plan, achievement of 1.9GW geothermal power plants by 2017 and 5.5GW by 2030; exploitation of the estimated 1449MW of large hydro, and the potential of small hydro, wind and PV; development of the nuclear programme with the first unit of 1GW operational by 2024; development of the transmission network and the interconnection capacities with Uganda and Tanzania. The energy related laws include the Geothermal Resources Act (No. 12 of 1982), The Energy Act (No. 12 of 2006), the Energy Bill 2015 (not passed through parliament yet), the Petroleum Bill 2015 (not passed through parliament yet).
Energy regulation authority					✓			Energy Regulatory Commission (ERC) mandated by the Energy Act 2006 to regulate the electricity sector, monitor fair competition in the energy sector (including downstream petroleum sector) protect consumer rights, maintain a list of accredited energy auditors, maintain energy data and prepares an indicative national energy plan.
Partnership agreement with the EU					✓			The Cotonou Partnership Agreement regulates the relations between Kenya and the EU. The 11th EDF includes energy under the sustainable infrastructure focal sector with the objective of developing more efficient and environmentally friendly energy services that are accessible to all.
Fragile country status								No. Kenya is not included in the list of fragile countries of the World Bank Country Policy and Institutional Assessment (CPIA) Score. However, Kenya is included as a fragile state in the "States of Fragility 2015" report[5] of the OECD and is listed in the "Alert" group of countries in the Fragile States Index of the Fund for Peace[6].
2 *Engagement and preparation for SE4ALL*								
Opting-in						✓		Kenya opted-in in 2012[7].
Gap analysis					✓			The Stock Taking report and Gap Analysis was completed in June 2013.
Action Agenda			✓					Kenya's Action Agenda was drafted in March 2015[1].

[5] "States of Fragility 2015, Meeting post-2015 ambitions" OECD, 2015 available at http://www.oecd-ilibrary.org/development/states-of-fragility-2015_9789264227699-en [Accessed on 11/11/2015].

[6] Fragile States Index 2015, Fund for Peace, available at http://fsi.fundforpeace.org/ [Accessed on 11/11/2015].

[7] http://www.se4allforum.org/sites/default/files/SE4All%20Country%20Action%20in%20Africa%20-%20The%20Kenyan%20Experience.pdf

NREAP	✓							There is the draft "Scaling up Renewable Energy Program" Investment plan (Draft 2011).
NEEAP	✓							
Investment Prospectus			✓					The SE4All Investment prospectus was drafted in March 2015[8].
SE4ALL Secretariat	✓							There is a SE4All focal point in the MoEP.
3	*Private sector participation*							
Investment and concession laws					✓			Kenya has a generally positive investment climate and the legal environment makes few distinctions between international and local investors. The Investment Promotion Act (2004) sets the legal framework for investments. The Private Public Partnership (PPP) Act 2013 provides the legal framework for the deployment of PPPs in the energy sector, among others. In general the energy sector remains the most publicly owned (state owned enterprises control most of the retail distribution and generation of electricity as well as refinement, distribution and sales of fuels).
Private sector activities					✓			The electricity generation sector is open to IPPs. There are ten licensed IPPs (but the majority of generation comes from the state owned KenGen). Transmission is a state monopoly run by Kenya Electricity Transmission Company (KETRACO) and the largest distributor is state owned Kenya Power and Lighting Company (KPLC). Exploration activities for oil deposits are performed by licensed private companies.
Investors protection					✓			The country is ranked 114 out of 189 countries in the "protecting investors" topic according to the World Bank "Doing Business" analysis[9] for 2015.
National financial incentives					✓			A feed-in tariff scheme is in operation for renewable electricity.
Institutional support to private sector					✓			Kenya Investment Authority assists foreign investors by offering a one stop shop. Energy is listed as one of the "opportunity sectors" for investments in the country.
4	*Energy access*							
Energy access policy and targets				✓				SE4ALL Action agenda target is 100% electricity access and 100% access to modern cooking solutions by 2030.
Agency / Rural energy fund					✓			Rural Electrification Authority (REA), established under the Energy Act (2006) for enhancing the rural electrification in the country. The funds used by REA mainly come from the state budget (about 80% in 2012[10])
Rural electrification master plan			✓					The rural electrification program of REA includes targets and priorities for electrification. REA is responsible for the updates of the program.
Increasing EA investment plan		✓						The SE4ALL Investment Prospectus[8] includes a list of projects for energy access and the respective investment needs.

[8] Kenya SE4ALL Investment prospectus, Draft March 2015.

[9] World Bank available at http://www.doingbusiness.org/data/exploreeconomies/Kenya/ [Accessed 07/12/2015]

[10] World Bank, available at: http://siteresources.worldbank.org/EXTAFRREGTOPENERGY/Resources/717305-1327690230600/8397692-1327691237767/Rural_Electrification_in_Kenya_presentation_Final_11thNov2011.pdf [Accessed on 08/12/2015].

EA decentralized initiatives					✓			REA finances off-grid electricity generation plants (usually hybrid) and mini-grids.
Traditional fuels replacement				✓				The SE4All Action Agenda and Investment Prospectus include initiatives for modern cooking fuels and appliances. There is also a target to promote LPG to cover 18% of cooking by 2020.
Independent distribution networks		✓						The SE4All Action Agenda and Investment Prospectus foresee the development of mini-grids.
Electricity distribution master plan					✓			The Kenya Distribution Master plan was developed in 2013 by the Kenya Power and Lighting Company Ltd (KPLC)[11]
Specific measures for the poor		✓						The domestic electricity tariffs have a block structure in which the cost of the first block is almost five times lower than the average rate. The last mile connectivity project foresees that low income households can pay the connection costs to the electricity network in instalments.
Microfinance instruments					✓			The Microfinance Act (2006) and the Microfinance Regulations (2008) set the regulatory framework for the microfinance industry in Kenya. There are twelve licensed micro-finance banks featured on the website of the Central Bank of Kenya[12]. Microfinance programs for expanding energy access and clean cooking technologies are in place.
Pre-electrification					✓			The REA funds isolated electrification projects and mini-grids. "Lighting Africa" had a programme in Kenya until 2013 for promoting solar lighting.
5	*Renewable energy (RE)*							
RE Policy					✓			The Draft National Energy and Petroleum Policy (2015) foresees the development of 1.9GW geothermal power plants by 2017 and 5.5GW by 2030, the exploitation of the estimated 1449MW of large hydro, and the potential of small hydro, wind and PV.
Agency / RE Fund		✓						The Renewable Energy Department in the ERC is responsible for "leading the planning, development, implementation, promotion and execution of structures for the development and regulation of the renewable energy and energy efficiency through research and planning, development of standards and regulations, compliance and enforcement". There is no RE fund but REA funds applications of mini-grids based on RES.
RE master plan					✓			The "Scaling up Renewable Energy Program" Investment plan (Draft 2011)[13] includes a detailed list of projects to be funded for RE electricity generation.
Biofuels regulatory frameworks			✓					Only drafts exist of the Strategy for developing the bio-diesel industry in Kenya (2008-2012), Bioethanol strategy (2009-2012) and Proposed National biofuel policy (2010). The Kenya Bureau of Standards (KEBS) drafted biodiesel standards and bioethanol standards. The Draft Biodiesel Licensing Regulations (2009) set the mandate of 5% biodiesel blending, but it is still not enforced.
Wood energy regulations				✓				The Kenya Forests Act (2005) sets the legal framework for wood uses. The Forest Conservation and Management bill (2014) is still in draft form.
Solar/wind regulations					✓			Published: Solar Photovoltaic Systems Regulations (2012), Solar Water Heating Regulations (2012).

[11] Kenya Distribution Masterplan, KPLC, Final Report, April 2013, available at: http://www.renewableenergy.go.ke/asset_upIds/files/KPLC%20Distribution%20Master%20Plan%20Study%20-%20Final%20Report%20Rev%20%201%20%285%29.pdf [Accessed on 08/12/2015].

[12] Central Bank of Kenya, https://www.centralbank.go.ke/index.php/bank-supervision/microfinance-institutions/14-bank-supervision/83-list-of-licensed-deposit-taking

[13] SREP Investment Plan, available at http://www.renewableenergy.go.ke/downloads/policy-docs/Updated_SREP_Draft_Investment_Plan_May_2011.pdf, [Accessed on 08/12/2015].

RE resources mapping					✓			The ERC hosts the Renewable Energy Portal (http://www.renewableenergy.go.ke) which presents the mapping of geothermal resources and the "Wind Sector Prospectus" (2013)[14] which includes wind maps and identifies wind projects. The Least cost power development plan has identified a number of sites for small hydro power plants.
RE Promotion					✓			RE is promoted for electricity generation (geothermal power plants, hydro, PVs for on-grid and off-grid applications, solar heating systems).
RE long-term funding					✓			The renewable energy feed in tariffs offer technology based fixed prices in US$ for 20 years.
Green Energy Fund		✓						A Green Energy Fund was announced in 2012 but is not implemented.
Network connection studies	✓							There are guidelines for the connection of small scale renewables in the electricity network[15].
6	*Energy Efficiency (EE)*							
EE Policy			✓					EE is included in the National Energy and Petroleum Policy draft (2015). The main policies included are the development of awareness raising programs, guidelines for audits, minimum energy performance standards for equipment, incentives for the uptake of energy saving technologies, enforce building codes. The development of a national energy efficiency and conservation plan is also foreseen.
EE national action plan	✓							
EE Standards and labels					✓			Kenya Bureau of Standards approved ten minimum energy performance standards for appliances including lamps, refrigerators, air conditioners and motors. The Appliances' Energy Performance and Labelling Regulations were published in 2013.
EE Promotion					✓			Kenya Power (KPLC) has developed nationwide awareness campaigns.
Electricity losses reduction programme			✓					KPLC implements a programme for the reduction of distribution losses.
Improved stoves programs		✓						There are targets in the SE4All Action agenda for improved cook stoves (ICS) aiming at 100% usage of improved charcoal stoves by 2020 in urban areas and 60% in rural areas. Many NGOs have programs for promotion of ICS, the MoE and Min. of Agriculture have been active in ICS promotion, donors have been involved in distributing ICS.
Ban on non-efficient appliances	✓							
Incentives for efficient appliances	✓							
Demand-side management		✓						KPLC provides energy audits and energy advisory services to customers, has implemented CFL roll out programmes and plans to implement a smart metering programme in the future.

[14] Wind Sector Prospectus - Kenya, Wind energy data analysis and development programme 2013 available at http://www.renewableenergy.go.ke/asset_uplds/files/Wind%20Sector%20Prospectus%20Kenya.pdf [Accessed on 08/12/2015].

[15] Connection Guidelines for Small-scale renewable generating plants, MoE, 2012, available at http://www.energy.go.ke/downloads/Guidelines%20for%20Grid%20Connection.pdf , [Accessed 08/12/2015].

7	*Electricity sector*							
Legal definition of the institutional players						✓		The Energy Act (No. 12 of 2006) set the framework for the establishment of the Energy Regulatory Commission (ERC) and the opening of the electricity market. Licensing procedures are foreseen for IPPs and distribution companies. Transmission is a monopoly of Kenya Transmission Company (KETRACO).
Tariff policy						✓		A tariff structure is in place for consumers that includes all the costs. The tariff system has been approved by the ERC and prices are reviewed monthly to account for fuel costs adjustments, foreign exchange fluctuation, inflation adjustments etc.
Interconnection rules					✓			Currently Kenya is interconnected to Uganda and there are cross-border connections with Ethiopia. The planned interconnections foresee a 500kV DC line to Ethiopia, a 400kV line to Tanzania and a new Kenya-Uganda link to increase the interconnection capacity to 350MW.
Isolated networks rules		✓						To be confirmed.
Feed-in tariff policy						✓		The revised feed in tariffs policy of 2012 foresees fixed prices for electricity generated from wind, biomass, small-hydro, geothermal, biogas and solar systems. The tariffs are reviewed every three years, are given in US$/kWh and are valid for a period of 20 years. The tariffs vary with the installed capacity of the plant until 10MW and are fixed for plants above 10MWs[16].
RE minimum % imposed to producers	✓							None.
RE certificates trade	✓							No.
Free access to the domestic network						✓		All electricity producers have access to the transmission network. Transmission tariffs are defined by ERC.
Net metering	✓							No.
Unbundling						✓		The electricity sector is fully unbundled. Generation and distribution is privatised and the transmission system operation is a monopoly of KETRACO.
Decentralized transport networks	✓							
Least cost development plan					✓			Updated Least Cost Power Development Plan 2013-2033 (March 2013)[17] by ERC, updated every two years.
Electricity master plan					✓			Updated Least Cost Power Development Plan 2013-2033 (March 2013), Kenya Distribution Master Plan KPLC (April 2013).
Privatization / commercialisation					✓			The electricity generation is fully privatised with ten licensed IPPs, and the distribution is open to licensed companies. However, in 2014 the majority of electricity generation came from KENGEN and the main distributor was KPLC. KETRACO has the monopoly for the transmission system operation.
Utility management contract	✓							
Utility financing plan				✓				KPLC is publishing its accounts and performs financing plans annually.

[16] Feed-in tariffs policy on wind, biomass, small hydro, geothermal, biomass and solar resource generated electricity, MoEP, 2nd Revision 2012, available at http://www.energy.go.ke/downloads/FiT%20Policy,%202012.pdf [Accessed on 08/12/2015].

[17] Available at http://erc.go.ke/images/docs/Least_Cost_Power_Development_Plan_2013-2033.pdf [Accessed on 08/12/2015].

ANNEX 3 – ELECTRICITY SECTOR ASSESSMENT

CRITERION	INFORMATION
Electricity sector policy	
Electricity sector laws	The Energy Act (No. 12 of 2006); Geothermal Resources Act (No. 12 of 1982); Legal Notice No. 44/2012 "Electricity Licensing Regulations"; Legal Notice No. 103/2012 "Solar Photovoltaic Systems Regulations".
Unbundling	The electricity sector is fully unbundled. Generation and distribution is privatised and the transmission system operation is a monopoly of KETRACO.
Regulation of the sector	Energy Regulatory Commission (ERC) mandated by the Energy Act 2006 to regulate the electricity sector, monitor fair competition in the energy sector (including downstream petroleum sector) protect consumer rights, maintain a list of accredited energy auditors, maintain energy data and prepare an indicative national energy plan.
Master Plans / Least cost development plans/ Capacities expansion plan	Updated Least Cost Power Development Plan 2013-2033 (March 2013), Kenya Distribution Master Plan KPLC (April 2013). "Scaling up Renewable Energy Program" Investment plan (Draft 2011)[18] which includes a detailed list of projects to be funded for RE electricity generation.
Networks and access development	Kenya Electricity Grid Code, ERC, 2008[19]. "Connection Guidelines for small scale renewable generating plant" (2012), MOEP[20].
IPPs	In 2015 there were ten licensed IPPs: Tsavo, Iberafrica, Thika Power, OrPower4, Mumias Sugar, Rabai. Imenti Tea, Gikira hydro (PTS), Triumph diesel, Gulf power as well as a number of isolated grids (isolated grids have 25.8MW in total).
RE based electricity production objectives	The objectives in the Draft National Energy and Petroleum Policy (2015) encourage electricity generation from renewables. The target is to achieve 1.9GW geothermal power plants by 2017 and 5.5GW by 2030; exploit the estimated 1449MW of large hydro, and the potential of small hydro, wind and PV. SE4All Action Agenda targets include: 19GW of installed capacity by 2030, of which 26% will be geothermal, 9% will be wind and 9% hydro.
Power purchase agreements, feed-in tariffs	Standardised PPAs are available by ERC[21]. The revised feed in tariffs policy of 2012 foresees fixed prices for electricity generated from wind, biomass, small-hydro, geothermal, biogas and solar systems. The tariffs are reviewed every three years, are given in US$/kWh and are valid for a period of 20 years. The tariffs vary with the installed capacity of the plant until 10MW and are fixed for plants above 10MWs[22].
Access to transport networks regulations	Kenya Electricity Grid Code, ERC, 2008.

[18] SREP Investment Plan, available at http://www.renewableenergy.go.ke/downloads/policy-docs/Updated_SREP_Draft_Investment_Plan_May_2011.pdf, [Accessed on 08/12/2015].

[19] Available at http://www.erc.go.ke/images/docs/Kenya%20Grid%20Code.pdf [Accessed on 08/12/2015].

[20] Available at http://www.energy.go.ke/downloads/Guidelines%20for%20Grid%20Connection.pdf

[21] Available at: http://erc.go.ke/index.php?option=com_content&view=article&id=148&Itemid=573 [Accessed on 08/12/2015].

[22] Feed-in tariffs policy on wind, biomass, small hydro, geothermal, biomass and solar resource generated electricity, MoEP, 2nd Revision 2012, available at http://www.energy.go.ke/downloads/FiT%20Policy,%202012.pdf [Accessed on 08/12/2015].

Country: Kenya

CRITERION	INFORMATION
Sector reforms	The last major sector reform was done following the Electric Power Act (put in place in 1997), which set the basis for the unbundling and the liberalisation of the sector.
Enterprises and services	
PRODUCTION	
Main companies and shareholders	Kenya Electricity Generating Company (KenGen managing the public power generation facilities) and a number of IPPs: Tsavo, Iberafrica, Thika Power, OrPower4, Mumias Sugar, Rabai. Imenti Tea, Gikira hydro (PTS), Triumph diesel, Gulf power as well as a number of isolated grids. Aggreko has a license as an Emergency Power Producer.
Production (GWH)	9424 GWh in 2014[23].
Installed capacity (MW)	In 2014 the total installed capacity was 2173MW of which 821MW hydro, 695MW oil fired power plants, 593MW geothermal power plants, 38MW of biomass fired cogeneration and 25MW of wind[23].
Production mix (GWh)	In 2014 1767GWh (19%) were generated from fossil fuels, 3466GWh (37%) from hydro and 4111GWh (44%) from other renewable sources (geothermal, biomass and wind)[23].
Peak demand (MW)	In 2014 1512MW[23].
TRANSPORT	
Enterprises	Kenya Electricity Transmission Company Ltd (KETRACO) is the transmission system owner and operator.
HV lines length and capacity	In 2014 there were 1434km of 220kV lines, 2513km of 132kV[23].
Exports/Imports	In 2014 total imports were 84.3GWh and total exports 39GWh[23].
DISTRIBUTION	
Enterprises (s)	Kenya Power and Lighting Company (KPLC) is the largest distribution company. There are a number of isolated mini-grids.
MV and LV lines length and capacity	Medium Voltage: 1212km of 66kV lines, 20778km of 33kV lines and 30860km for 11kV. Low voltage: to be comfirmed.
Clients	In 2014 the total number of clients in the distribution was 2,766,000[23]. According to the annual report of KPLC (2014-2015) the total number of customers by the end of June 2015 were 3,611,904[24]

[23] Draft National Energy and Petroleum Policy, MoEP, June 2015.

[24] KPLC, Annual Report and Financial Statements, Financial year ended 30th June 2015, available at http://kplc.co.ke/img/full/jSsYVq47rObE_KENYA%20POWER%20ANNUAL%20REPORT%202015%20-%20FOR%20WEB.pdf [Accessed on 08/12/2015].

Country: Kenya

CRITERION	INFORMATION
Total sales and tariff categories	Total sales in 2014 were 7244GWh. The following tariffs exist approved by the ERC: (a) **domestic consumers** connected to low voltage with a consumption below 15MWh per billing period, (b) **non-domestic commercial consumers** with a consumption below 15MWh per billing period, (c) **commercial and industrial** consumers (3phase connections) with a consumption above 15MWh per billing period, (d) **commercial and industrial** consumers connected at 11kV, (e) **commercial and industrial** consumers connected at 33kV, (f) **commercial and industrial** consumers connected at 66kV, (g) **commercial and industrial** consumers connected at 132kV, (h) **interruptible off-peak supply** for consumers with a consumption below 15MWh per billing period.
Demand forecast on the interconnected network (MW)	According to the updated Least Cost Development plan 2013-2033[17], in the reference scenario the expected peak load would reach 3910MW in 2020, 7480MW in 2025 and 14446MW in 2030.
Tariff / cost recovery / subventions	
Electricity tariffs	The ERC approved the "Schedule of Tariffs for the supply of electricity" in 2013. This defines the different tariff categories described above and for each tariff category there is a fixed charge per billing period, an energy charge which has a block structure for domestic consumers only, and a demand charge for large commercial and industrial users. The last change for these charges was in July 2015. On top of these charges, for every kWh consumed the following charges will be added which are revised monthly: fuel cost charge, foreign exchange rate fluctuation adjustment, inflation adjustment, security support facility, water levy, VAT, Rural electrification programme levy, ERC levy (details for the tariffs are available at http://kplc.co.ke/img/full/zcaJOzy5QmNN_Schedule%20of%20Tariffs%202013.pdf).
Social tariff	The domestic tariff is a "block tariff". The first block corresponds to 50kWh per billing period and costs 2.50KSh/kWh (about five times less than the middle consumption block).
Cost coverage through tariffs Planned tariffs adjustments	The tariff setting methodology approved by ERC is based on cost recovery principles. Tariffs are adjusted using a clearly prescribed mechanism and incorporating generation costs, exchange rate fluctuations and inflation on a monthly basis.
Level and subsidies sources	Currently the state subsidies are only for the rural electrification programme and are related to the grid expansion and connection fees and not to the electricity tariffs.
Financial situation of the main enterprises	KPLC has implemented a high capital consuming investment program since 2011 in order to increase connectivity and improve the distribution network. This was covered almost entirely by KPLC resources which had an effect on its financial position[25].
Performance: losses / efficiency/ service quality	
Production performance	The largest share of electricity generation in Kenya comes from hydro (37% of generation) and geothermal and other RES plants (44% of generation) with high efficiency. Isolated mini-grids based on diesel engines have relatively low generation efficiency.
Transport losses, evolution and objectives Distribution losses (technical and non-	Total system losses were at the level of 18% in 2014, 18.6% in 2013 and 17.3% in 2012 according to KPLC. KPLC has a loss reduction programme including more efficient transformers and line rehabilitation. SE4All action agenda foresees a reduction of distribution losses to 15% by 2020 and 9.3% by 2030.

[25] World Bank, Project Appraisal Document for a proposed guarantee for an electricity modernization project, available at http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2015/04/03/000477144_20150403090122/Rendered/PDF/PAD7300REPLACE0C0disclosed030310150.pdf, [Accessed on 08/12/2015].

CRITERION	INFORMATION
technical)	
Revenues	Revenue losses for the KPLC due to total system losses reached a level of 23.10billion KShs in 2014 (around 260million USD).
Shutdowns and improvement objectives	According to the Draft National Energy Plan, KPLC maintains data on the number of high and low voltage interruptions, transformer failures, number of low voltage breakdowns but does not use internationally accepted indicators (SAIDI, SAIFI etc.). Quality statistics are not available on the websites of KPLC or ERC.
Off-grid electrification and electricity access	
Electrification rate (urban/rural)	According to the World Bank data in 2012 the global electrification rate was 23%, the urban electrification rate was 58% and the rural electrification rate was 7%[26]. According to the Draft National Energy and Petroleum Policy (2015) in June 2014 35% of the population was connected to electricity networks[23].
Electrification objectives	The SE4All Action Agenda targets 65% of urban population with electricity access by 2022 and 40% of rural by 2020, reaching global access (100%) by 2030.
Rural electrification agency	The Rural Electrification Authority (REA), established under the Energy Act (2006) for enhancing the rural electrification in the country. The funds used by REA mainly come from the state budget.
Off-grid electrification situation and programmes	Stand-alone PV systems are the most widely used off-grid solutions, with an estimation of 200,000 systems installed and sales estimated at 20,000 systems per year[27]. Pico-solar systems for lighting and mobile phone charging are also in the market. The MoEP and REA are installing PV systems in primary and secondary schools, health centres and other public institutions in a continuing programme.
Off-grid operators	Information to be obtained.
Isolated networks regulations	Mini-grids are developed and managed by KPLC. “Connection Guidelines for small scale renewable generating plant” (2012), MOEP[28].
BoP Policy (Bottom of the Pyramid)	Information to be obtained.
Energy Efficiency (EE)	
Demand-side management	Interruptible tariff is in place for water heating to manage the demand during peak hours. KPLC offers energy audits and energy advisory services to customers and plans to install smart metering.
EE activities	KPLC has performed a number of CFL roll out programmes since 2009/10, is the prime sponsor of the energy management awards and is participating in the development of minimum energy performance standards for appliances. KPLC also has awareness campaigns on EE using fliers and adverts.

[26] World Bank; Available: http://data.worldbank.org/country/kenya, [Accessed on 08/12/2015].
[27] Kenya SE4All Action Agenda Draft March 2015.
[28] Available at http://www.energy.go.ke/downloads/Guidelines%20for%20Grid%20Connection.pdf

Country: Kenya

CRITERION	INFORMATION
Other aspects	
Regional electricity market	The power system of Kenya is interconnected to Uganda through a 132kV double circuit transmission line and there are cross-border agreements with Tanzania and Ethiopia. Within the East African Power Pool initiative there are plans for a new 400kV line to Uganda, a 500kV HVDC line to Ethiopia as a part of the Eastern Africa Electricity Highway and a 400kV line to Tanzania.

ANNEX 4 - NATIONAL TARGETS FOR ENERGY ACCESS, RENEWABLE ENERGY AND ENERGY EFFICIENCY

Country	*Sector*	*Policies and objectives*	*Source*
East African Community EAC[29]	Access	Provide access to modern cooking practices for 50% of the population that currently uses traditional cooking fuels provide access to reliable electricity for all urban and peri-urban poor provide access to modern energy services such as lighting, refrigeration, information and communication technology, and water treatment and supply for all schools, clinics, hospitals, and community centres.	Strategy on scaling up access to modern energy services, EAC Secretariat.
	Renewable Energy	No specific targets set yet for EAC.	
	Energy efficiency	No specific targets set yet for EAC.	
Kenya	Oil and gas	Promote LPG to cover 18% of cooking by 2020. Development of a natural gas master plan and exploitation of locally available hydrocarbon resources.	Kenya SE4All Action Agenda (2015). Draft national Energy and Petroleum Policy MoEP (2015).
	RE	Development of 1.9GW geothermal power plants by 2017 and 5.5GW by 2030, exploitation of the estimated 1449MW potential of large hydro, and the exploitation of the potential of small hydro, wind and PV. SE4All Action Agenda targets include: 19GW of installed electricity capacity by 2030, of which 26% will be geothermal, 9% will be wind and 9% hydro.	Draft national Energy and Petroleum Policy MoEP (2015). Kenya SE4All Action Agenda (2015)
	Access	SE4ALL Action agenda target is 100% electricity access and 100% access to modern cooking solutions by 2030. 100% usage of improved charcoal cooks stoves by 2020 in urban areas and 60% in rural areas.	Kenya SE4All Action Agenda (2015)
	Energy efficiency	Reduce the primary energy intensity by half in order to reach 0.12toe/US$1000 GDP(PPP) by 2030. Reduce electricity distribution losses to 15% by 2020 and 9.3% by 2030.	Kenya SE4All Action Agenda (2015)

[29] Kenya is a member state of the East African Community, one of the Regional Economic Communities in Africa. The reference is given to show the objectives of the regional community compared to the objectives of the country under consideration.