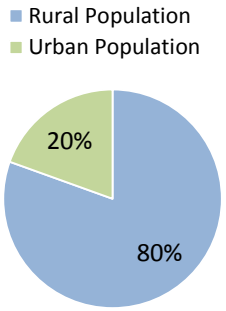
Country: Ethiopia

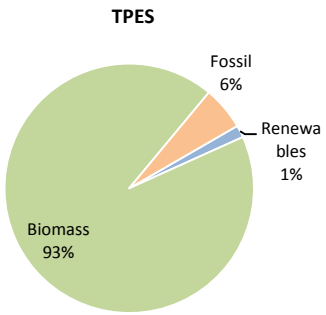
Socio- economic framework

	Year	Unit	Value
Population	2014	million	96.96[1]
Demographic growth	2014	%	2.5%[1]
Surface	2014	km2	1104300[1]
GDP	2014	M US$	54800[1]
GDP per capita	2014	US$ per cap	565[1]
GDP growth	2014	% /year	9.93%[1]
Fragile country status	2014	Index	No [2]
Governance	2014	Index	48.6[3]
Governance variation over 5 years	2014	Index	4.4[3]
Human development	2013	Index	0.435[4]

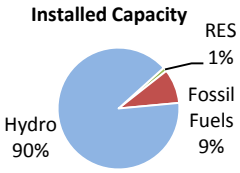


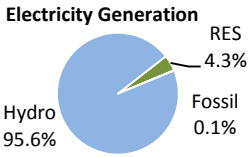
Consumed Energy (million toe=11.65 MWh)

	Year	Unit	Value
Total Primary energy Supply (TPES)	2013	Million toe	47.94[5]
Primary energy Supply - Biomass	2013	Million toe	44.55[5]
Primary energy Supply - Fossil	2013	Million toe	2.70[5]
Fraction of Non-Renewable Biomass	2009	%	62%[6]
Primary energy Supply - Renewable (incl.hydro)	2013	Million toe	0.76[5]
Primary energy - Net Import electricity	2013	Million toe	-0.08[5]
Primary energy - Net import hydrocarbon	2013	Million toe	3.10[5]
Total Final Energy Consumption	2013	Million toe	38.68[5]
Final energy - Modern BLEN(*)	2013	Million toe	0.53[5]
Final Energy - Electricity	2013	TWh	6.09[5]



Electricity





	Year	Unit	Value
Peak demand	2012	MW	1237[7]
Installed connected capacity	2012	MW	2059[8]
Thermal installed capacity (fossil fuels)	2012	MW	188[8]
Hydro installed capacity	2012	MW	1849[8]
Renewable installed capacity (ex.hydro)	2012	MW	22[8]
IPP/installed capacity	2012	%	0%[14]
Total Electricity production	2013	GWh	8719[9]
Electricity generation from fossil fuels	2013	GWh	8[9]
Electricity generation from hydro	2013	GWh	8338[9]
Electricity generation from renewable	2013	GWh	373[9]
Electricity consumption including self-consumption and losses	2013	GWh	7765[9]
Average consumption per capita	2013	kWh per cap	64.9[9]
Total losses (technical and non-technical) as a production % (**)	2013	%	19%[9]
Total losses (technical and non-technical)(**)	2013	GWh	1655[9]
Imports (+) exports (-)	2013	GWh	-954[9]
Global electrification rate	2012	%	26%[1]
Urban electrification rate	2012	%	100%[1]
Rural electrification rate	2012	%	8%[1]
HV lines(+)	2012	km	10308[10]
MV lines(+)	2012	km	2154[10]
LV lines(+)	2012	km	154687[10]
Renewable energy/global electricity production (incl. hydro)	2013	%	99.96%[9]
Connections to the LV network	2013	Thousands	2030[11]
Average tariff/social	2013	US$c/KWh	2.8[12]
Ratio cost/tariff	2013		To be confirmed

Legal, regulatory and institutional framework

Energy policy	- Five year Strategic plan of the Ministry of Water, Irrigation and Energy MoWIE (2011) part of the Growth and Transformation Plan (GTP). - Climate Resilient Green Economy Strategy (2011) - The Biofuel Development and Utilisation Strategy (2007) - National Domestic Biogas Programme (2007) - Biomass Energy Strategy (2013)
Energy laws	- Energy Proclamation No. 810/2013. - Proclamation to regulate petroleum operations No. 295/1986, Petroleum Operations Income Tax amendment Proclamation No. 226_2000.
Enforcement texts	- Ethiopian Energy Authority establishment, Council of Ministers regulation No 308/2014. - Ethiopian Electric Power establishment, Council of Ministers regulation No 302/2013. - Ethiopian Electric Utility establishment, Council of Ministers regulation No 303/2013. - Pricing Procedure for Inter-Connected System (ICS) and Large Isolated System, No1/2005. - Current Electricity Service Quality Standards Directive No. 2/2006.
Electricity/energy regulator	Ethiopian Energy Authority (EEA) established in 2014 as an energy sector regulator under the oversight of the MoWIE.
Electricity operators	Ethiopian Electric Power (EEP) established in 2013 responsible for generation, transmission and system operation, and Ethiopian Electric Utility (EEU) established in 2013 responsible for power distribution after the unbundling of the Ethiopia Electric Power Corporation (EEPC).
Rural electrification body	Rural Electrification Executive Secretariat (REES) in the MoWIE which manages the Rural Energy Fund (REF).
Renewable energy body	None. REES promotes renewable energy for rural electrification.
Energy conservation body	The Ethiopian Energy Authority is mandated to improve energy efficiency and carry out energy conservation measures. A dedicated energy agency does not exist.
Energy objectives	The five year Strategic plan of the Ministry of Water, Irrigation and Energy MoWIE (2011) is part of the Growth and Transformation Plan (GTP) and set the following targets for 2015: 8GW of on-grid installed capacity, doubling of the distribution lines length, distribution of 3 million solar lanterns and 16 million clean cook stoves and increase of the production of liquid biofuels. Targets according to the SE4All Ethiopian National Action Plan: ensuring direct access to electricity by 95% of the population; ensuring universal access to cleaner and more efficient cooking solutions by 2025. SE4ALL National Action Plan includes the focus area for diversification of RE through the installation of geothermal power plants, wind farms and solar systems.
Feed-in tariff policy	No. A draft Feed-in proclamation was developed in 2012 but was never endorsed.
Metering policy for billing	Yes. Households connect either having direct meters or through shared meters with neighbours[13].
Public procurement (auctions)	No.
Unbundling	Currently in transition phase. EEPC was unbundled to EEP and EEU in 2013.

Private sector environment

Sector private bodies	There are no IPPs in the interconnected electricity system. Smaller municipal, cooperative and private power suppliers operate in micro-grids.
Public incentives	No.
Financial grants	The REF finances projects in decentralised electricity generation.
IPPs	The Energy Proclamation foresees the existence of private sector actors but there are no IPPs yet[14].
PPPs	There is no experience for large scale PPPs in the energy sector. However, most of the energy access projects and programs implemented are PPPs in the sense that the state, donors or NGOs cover part of the cost[13].
Business index	Listed 132 out of 189 countries by the WB in 2014[15].

International Cooperation in the energy sector

Joint Declaration EU-country	No.
Energy as a focal sector for 11th EDF	Yes. In the 2014-2020 NIP energy is phasing in as a focal sector with priority areas: tariff adjustments, tapping external sources for investments in electricity generation, improving access to energy, diversification of the energy mix, electricity sector reform, energy efficiency and sustainable forest management.
Donors active in the country	EU, UNDP, World Bank, African Development Bank, KfW, Norway, AfD, SNV Netherlands, GiZ.
Coordination among donors	There is lack of strong government coordination and between the different donors in the country[12]. The Development Assistance Group (DAG http://dagethiopia.org/new/about) was established to coordinate and harmonise development partners' support.

Main issues and opportunities[12,13,14]

- Low access to grid electricity and to modern energy services for the rural population.
- Overexploitation of solid biomass resources.
- Power sector installed capacity unable to cover the continuously growing demand for electricity.
- High technical and non-technical electricity losses and low quality of service (interruptions, load shedding).
- High dependency on volatile to drought hydro power for electricity generation.
- Low participation of private sector investments in the energy sector.
- No funding mechanisms for RES (no feed in tariffs, tax exemptions or other financial incentives).
- High potential of geothermal energy for electricity generation and high wind energy potential. Substantial reserves of natural gas have been found.

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

(**) The IEA data include only technical losses. Non technical losses according to the Director of Energy Efficiency and Conservation Directorate of EEA ranges between 5% and 7%

Version dated 18/01/16

(+) For the interconnected system only, where HV is 400kV, 230kV and 132kV, MV 66kV and 45kV, LV 400V.

Sources:

1 World Bank; Available: http://data.worldbank.org/country/ethiopia, [Accessed on 12/11/2015]. The source of the share of rural and urban population is the CIA World Factbook available at: https://www.cia.gov/library/publications/the-world-factbook/geos/et.html [Accessed on 12/11/2015].
2 Ethiopia 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=ETHIOPIA&product=Balances, [Accessed on 11/11/2015].
6 Bailis,R., Drigo, R., Ghilardi, A. & Masera,O. "The carbon footprint of traditional wood fuels", Nature Climate Change 5: 266-272, 2015.
7 Ethiopian Power System Expansion Master Plan study Vol. 2 Load Forecast report. (2014).
8 UN Stats 2012 Energy Statistics Yearbook, available at: http://unstats.un.org/unsd/energy/yearbook/default.htm, [Accessed on 11/11/2015].
9 International Energy Agency (IEA), Available at: http://www.iea.org/statistics/statisticssearch/report/?year=2012&country=ETHIOPIA&product=ElectricityandHeat, [Accessed on 11/11/2015].
10 Ethiopian Power System Expansion Master Plan study Vol. 4 Transmission Planning report (2014).
11 Facts in Brief 2011/12 Ethiopian Electric Power Corporation, Strategic Management and Programming Office, Addis Ababa, 2012, available at http://www.eepco.gov.et/flyersandmagazines.php.
12 Updated rapid assessment and gap analysis on sustainable energy for all (SE4All), Federal Democratic Republic of Ethiopia, Ministry of Water Irrigation and Energy. 2013
13 Mainstreaming sustainable energy access into national development planning: the case of Ethiopia, SEI, 2013.
14 Inception report: Technical Assistance to the Ethiopian Energy Authority, EU TAF SE4ALL-Eastern and Southern Africa, August 2014
15 World Bank, Available: http://data.worldbank.org/indicator/IC.BUS.EASE.XQ, [Accessed on 11/11/2015].

Country: Ethiopia

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

SE4ALL Objectives	*Indicators*	*Unit*	*Statistics*						*Target*[1]
			Total				Rural	Urban	Total
			1990	2000	2010	2012	2010	2010	2030
Universal access to modern energy	Electricity access	% of population	10	13	23	27	5	85	95%
	Non-solid fuels access	% of population	7	6	3	2	<5	27	100%
			1990		2010	2012	1990-2010	2010-2012	2030
Doubling energy efficiency	Improvement rate of Primary energy intensity	CAGR %					0.46	-4.34	(a)
	Cumulated energy savings	PJ					-3776	-460	
	Ratios primary energy/final energy		95.1		94.3	([2])			
	Primary energy intensity level	MJ/$2011 PPP	28.6		18.6	17.0			
			1990	2000	2010	2012			2030
Doubling the renewable energy share	Total final consumption	PJ			1310	1547			
	RE share in the total consumption	%	95.6	94.3	94.5	93.5			
	RE share in the total electricity generation	%			99.4	99.4			(b)
	RE share in the total electricity production capacity	%			90.1	91.7			(b)

Source:
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.

(a) Improve EE by 30% until 2030. (b) Diversification of RE sources introducing geothermal, wind and solar.

[1] The targets are defined in the SE4All National Action Plan (2014).
[2] This indicator is not available in the GTF 2015 publication.

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 Ethiopian National Energy Policy of 2013 is the main policy document. The five year Strategic plan of the Ministry of Water, Irrigation and Energy MoWIE (2011) is part of the Growth and Transformation Plan (GTP) and sets the following targets for 2015: 8GW of on-grid installed capacity, doubling of the distribution lines length, distribution of 3 million solar lanterns and 16 million clean cook stoves and increase of the production of liquid biofuels. Important policy documents are the Climate Resilient Green Economy Strategy (2011), The Biofuel Development and Utilisation Strategy (2007) and the National Domestic Biogas Programme (2007). The newest energy law is the Energy Proclamation No. 810/2013. There is also the proclamation to regulate petroleum operations No. 295/1986.
Energy regulation authority					✓			The Ethiopian Energy Authority (EEA) established in 2014 as an energy sector regulator under the oversight of the Ministry of Water Irrigation and Energy. Its mandate is to regulate the electricity sector and energy efficiency and conservation. The newly formed authority needs support to implement its objectives.
Partnership agreement with the EU					✓			The Cotonou Partnership Agreement regulates the relations between Ethiopia and the EU. The 11th EDF has energy phasing in as a focal sector.
Fragile country status								No. Ethiopia is not included in the World Bank list for Country Policy and Institutional Assessment as a fragile state. According to a report by IMF Ethiopia became "resilient" in the 1990s[3]. However, Ethiopia is included as a fragile state in the "States of Fragility 2015" report[4] of the OECD and is listed in the "High Alert" group of countries in the Fragile States Index of the Fund for Peace[5].
2 *Engagement and preparation for SE4ALL*								
Opting-in						✓		Ethiopia is one of the 42 African countries that opted-in until 2015[6].
Gap analysis					✓			Completed in 2013.
Action Agenda					✓			National Action Plan completed in June 2014[6]
NREAP	✓							

[3] "Building Resilience in Sub-Saharan Africa's Fragile States", IMF 2015, available at https://www.imf.org/external/pubs/ft/dp/2015/afr1505.pdf [Accessed on 25/08/2015].

[4] "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].

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

[6] SE4ALL Africa Hub, Annual Report 2014-2015

NEEAP	✓							
Investment Prospectus	✓							
SE4ALL Secretariat	✓							
3	*Private sector participation*							
Investment and concession laws					✓			Investment Proclamation No. 769/2012 and amendment no. 849/2014, Proclamation to Regulate Petroleum Operations 295/1986, Proclamation to promote sustainable development of mineral resources no. 678/2010 (which applies to geothermal resources). Private investors can participate in the power generation but transmission and distribution through the integrated national grid system is reserved for the Government or Joint investments with the government.
Private sector activities					✓			Although the existing legislation foresees private sector actors, there are no IPPs in the electricity sector in the interconnected electricity system. Smaller municipal, cooperative and private power suppliers operate in micro-grids. Low level of private sector involvement in the energy sector is recognised as one of the main issues[7] in the sector. Hydropower is identified as one of the most promising areas for investors[8].
Investors protection	✓							The country is ranked 165 out of 189 countries in the "protecting investors" topic according to the World Bank "Doing Business" analysis[9] for 2015.
National financial incentives		✓						A draft Feed-in proclamation was developed in 2012 but was never endorsed. The Rural Energy Fund (REF) finances projects in decentralised electricity generation and decentralised RES in particular. A customs duty exemption is provided to domestic or foreign investors in electricity services for machinery and equipment according to the Investment Guide from the Ethiopian Investment Agency.
Institutional support to private sector		✓						The Ethiopian Investment Agency provides licensing and registration services for private investors.
4	*Energy access*							
Energy access policy and targets					✓			According to the SE4All Ethiopian National Action Plan: ensuring direct access to electricity by 95% of the population; ensuring universal access to cleaner and more efficient cooking solutions by 2025.
Agency / Rural energy fund					✓			Rural Electrification Executive Secretariat (REES) in the Ministry of Water and Energy (MWE) which manages the Rural Energy Fund (REF).
Rural electrification master plan	✓							There is no rural electrification Masterplan. The electrification targets are set in the Growth and Transformation Plan (GTP).
Increasing EA investment plan		✓						The Universal Electricity Access Program will be strengthened as part of the SE4ALL National Action Plan[10]. An estimate of the required investment is done but no detailed investment plan is in place. The SE4All National

[7] Mainstreaming Sustainable Energy Access into national development planning : the case of Ehtiopia, SEI working paper 2013-9 (2013)
[8] An investment guide to Ethiopia, Ethiopian Investment Commission, 2014
[9] World Bank available at http://www.doingbusiness.org/data/exploreeconomies/ethiopia/ [Accessed 11/11/2015]

								Action Plan also foresees the creation of a revolving fund to finance the up-front investment for the customer's service drop.
EA decentralized initiatives					✓			REF finances off-grid electricity generation plants (mainly PVs). The National Action Plan also includes a financing plan for mini-grids development.
Traditional fuels replacement					✓			National improved cook stoves program run by the Alternative Energy Technology Promotion & Dissemination Directorate of the MoWIE. National Biogas Programme of MoWIE.
Independent distribution networks			✓					There are a number of areas that are covered by isolated distribution networks supplied by small-scale diesel or hydro plants. These are called "Self-Contained System" and have a total generation capacity of 34 MW of which 6.2MW is small hydro plants[11].
Electricity distribution master plan		✓						The Ethiopian Power System Expansion Masterplan Study, Volume 4, Transmission Planning Report (2014) includes part of the distribution system. A detailed separate distribution masterplan does not exist.
Specific measures for the poor			✓					The electricity tariff has a block structure and the first block corresponds to 50% of the average tariff.
Microfinance instruments					✓			There are a number operating microfinancing institutions and the Association of Ethiopian Microfinance Institutions (AEMFI). Projects funded by donors promote the concept of microfinance in the clean energy sector. Microfinance works mostly with the agricultural sector and existing companies provide financing products for biogas solutions and solar lamps.
Pre-electrification		✓						The SE4ALL National Action Plan foresees a program to provide solar lanterns and solar home systems to 20-25% of the population. REF finances off-grid electricity generation plants (mainly PVs).
5	*Renewable energy (RE)*							
RE Policy				✓				About 95% of the electricity generation in Ethiopia comes from hydro power plants. Diversification of RES is necessary to avoid the risk of the effects of droughts to electricity generation. SE4ALL National Action Plan includes the focus area for diversification through the installation of geothermal power plants, wind farms and solar systems. The GTP sets a target of 10GW for hydro by 2014/15, and the expansion plan sets a target of 5GW for geothermal, 1.5GW for wind, 0.3GW for solar and 12.4GW for hydro by 2037[12].
Agency / RE Fund	✓							There is no independent RE Agency or RE fund. The Rural Electrification Executive Secretariat (REES) in the Ministry of Water and Energy (MWE) manages the Rural Energy Fund (REF) which finances RE off grid applications.
RE master plan			✓					A Renewable energy master plan does not exist. A Wind and Solar energy master plan[13] was developed by Hydrochina Corporation in 2012. Renewable energy plays an important role in the Power System Expansion Master Plan Study (2014)[14] and the GTP includes actions regarding renewables.

[10] Ethiopia SE4All National Action Plan, June 2014.
[11] Ethiopian Power System Expansion Masterplan Study, Volume 4, Transmission Planning Report, 2014
[12] World Bank, available at http://rise.worldbank.org/data/exploreeconomies/ethiopia/2014/renewable-energy, [Accessed 23/11/15]
[13]Masterplan report of wind and solar energy in the Federal Democratic Republic of Ethiopia, 2012, available at: http://www.mowie.gov.et/documents/714785/1953720/MP+Report+of+Wind+and+Solar+Energy/c53ac65a-a84d-448c-86d8-2e6f44aa3e39?version=1.0 [Accessed 23/11/15]
[14] Ethiopian Power System Expansion Masterplan Study, Volume 3, Generation Planning Report, 2014

Biofuels regulatory frameworks			✓					Biofuel development and utilisation strategy (2007). There is a mandate for 5% bioethanol blending but no other regulations on biofuels.
Wood energy regulations	✓							According to the Biomass Energy Strategy (2013) there is a need for regulatory review in the biomass and charcoal sectors[15].
Solar/wind regulations	✓							
RE resources mapping		✓						There are different studies estimating the hydro, geothermal and wind energy potential. The Master plan of wind and solar energy (2012)[13] includes wind maps developed using simulation software and identified specific areas for wind farm development. ESMAP is funding the Renewable Energy Resource Mapping in Ethiopia[16] in a project that is expected to end by June 2018.
RE Promotion					✓			RE is promoted as an important part of the electrification of the country (large hydro projects exist, IPP projects are under consideration, and there are plans for geothermal power plants and wind farms). REF finances off-grid renewable energy applications.
RE long-term funding		✓						A draft Feed-in proclamation was developed in 2012 but was never endorsed. Currently there is only financing from REF for small scale off grid projects.
Green Energy Fund	✓							No
Network connection studies			✓					Draft Interface code (Interconnection) Ethiopian Electricity Agency, Draft Interface code (Generation) Ethiopian Electricity Agency
6	*Energy Efficiency (EE)*							
EE Policy				✓				The National Energy Policy has among its objectives the introduction of energy conservation, raise energy efficiency and develop the necessary institutional capabilities. An Energy Efficiency Strategy (EES) was developed in the framework of the EU TAF for SE4All initiative in Eastern and Southern Africa (April 2015)[17]. The EES aims to implement a plan to sustain the overall energy intensity at least 10% below the 2015 baseline until 2025, revise building codes and support energy management programmes to improve energy efficiency by 30% until 2030, establish minimum efficiency standards for appliances, provide awareness and information services.
EE national action plan				✓				The EES aims to implement a plan to achieve the targets. The plan is described in detail in the EES.
EE Standards and labels		✓						The Ethiopian Energy authority is mandated to develop EE standards and labels for equipment. The development is foreseen as part of the Energy Efficiency Strategy.
EE Promotion		✓						The promotion of EE is rather limited. The Energy Efficiency Strategy foresees the development of awareness raising campaigns for EE and education programs in universities.
Electricity losses reduction			✓					The Growth and Transformation Plan targeted the reduction of transmission and distribution losses from a

[15] Biomass Energy Strategy Ethiopia, 2013 available at http://www.euei-pdf.org/sites/default/files/files/field_pblctn_file/Ethiopia_Biomass_Energy_Strategy_and_Action_Plan_Final_2014_02_06.pdf [Accessed 18/11/2015]
[16] Renewable Energy Resource Mapping in Ethiopia (2012), available at: http://www.esmap.org/re_mapping_ethiopia [Accessed 18/11/2015].
[17] Technical Assistance to the Ethiopian Energy Authority, Deliverable 1 : Energy Efficiency Strategy, EU TAF for SE4All initiative – Eastern and Southern Africa, April 2015.

programme								current level of about 20% to 14%.
Improved stoves programs					✓			The Growth and Transformation Plan (GTP) sets the target for 2015 to distribute 16 million clean cook stoves. The national improved cook stoves program is run by the Alternative Energy Technology Promotion & Dissemination Directorate of the MoWIE.
Ban on non-efficient appliances	✓							
Incentives for efficient appliances	✓							
Demand-side management		✓						DSM is foreseen in the Energy Efficiency Strategy. Ethiopian Electric Power Corporation requires industries to raise their power factors and distributed 10 million CFLs.
7	*Electricity sector*							
Legal definition of the institutional players					✓			The Energy Proclamation No. 810/2013 defines the institutional players in the electricity sector. Under the mandate of this proclamation, the Ethiopian Energy Authority was established by Council of Ministers regulation No 308/2014, the Ethiopian Electric Power was established by the Council of Ministers regulation No 302/2013 and the Ethiopian Electric Utility was established with Council of Ministers regulation No 303/2013.
Tariff policy		✓						The Energy Proclamation No. 810/2013 empowers the EEA to define tariffs for generation, transmission and distribution. A tariff model has been developed by the EU TAF for the SE4All initiative Eastern and Southern Africa[18] in 2015. Current tariffs have a block structure for residential uses. Tariffs are revised at the request of Ethiopia Electric Power (EEP).
Interconnection rules			✓					Technical interconnections rules are being developed by EEA. Draft Interface code (Interconnection) Ethiopian Electricity Agency[19]. The power system of Ethiopia is interconnected to Sudan and Djibouti with 230kV lines.
Isolated networks rules		✓						Article 14 of the Rural Electrification Fund Establishment Proclamation No. 317/2003 states that relevant law regarding licensing electricity services is also applied by the EEA to rural electrification projects covering off-grid areas.
Feed-in tariff policy		✓						A draft Feed-in proclamation was developed in 2012 but was never endorsed.
RE minimum % imposed to producers	✓							None
RE certificates trade	✓							No
Free access to the domestic network		✓						The operation of transmission and supply of electrical energy through the Integrated National Grid System is exclusively reserved for the Government. IPPs cat use the transmission network according to the Energy Proclamation (2013) but no IPPs exist yet. The EEA is developing tariffs for transmission and distribution.
Net metering	✓							No
Unbundling					✓			Ethiopian Electric Power (EEP) was established in 2013 responsible for generation, transmission and system operation, and Ethiopian Electric Utility (EEU) was established in 2013 responsible for power distribution after

[18] Financial and tariff models for Ethiopia's electricity sector: Generation and transmission sectors, EU TAF for SE4All initiative – Eastern and Southern Africa, May 2015.
[19] Available at http://www.ethioenergyauthority.gov.et/attachments/article/60/Draft%20Interface%20codeInterconnectionc.pdf, [Accessed 08/12/2015].

								the unbundling of the Ethiopia Electric Power Corporation (EEPCo).
Decentralized transport networks	✓							
Least cost development plan				✓				The Ethiopian Power System Expansion Master Plan Study (2014) includes a least cost capacity expansion plan.
Electricity master plan				✓				The Ethiopian Power System Expansion Master Plan Study (2014)
Privatization / commercialisation		✓						EEC is a state owned company which generates electricity and is also responsible for the operation of the transmission grid. According to regulation 84/2003 all areas apart from the Transmission and supply of electrical energy through the Integrated National Grid can be performed by private investors. There are no private players in the market yet.
Utility management contract	✓							
Utility financing plan				✓				The Ethiopian Power System Expansion Master Plan Study (2014) includes estimates of the required investments in generation capacity and transmission system development.

ANNEX 3 – ELECTRICITY SECTOR ASSESSMENT

CRITERION	INFORMATION
Electricity sector policy	
Electricity sector laws	Energy Proclamation No. 810/2013, Regulation no. 302/2013 for the establishment of the Ethiopian Electric Power, Regulation no. 303/2013 for the establishment of the Ethiopian Electric Utility, Rural Electrification Fund Establishment Proclamation No. 317/2003. Draft Regulation of Energy Operations not adopted yet.
Unbundling	The Ethiopian Electric Power (EEP) was established in 2013 responsible for generation, transmission and system operation, and Ethiopian Electric Utility (EEU) was established in 2013 responsible for power distribution after the unbundling of the Ethiopia Electric Power Corporation (EEPC).
Regulation of the sector	The Ethiopian Energy Authority (EEA) established in 2014 as an energy sector regulator under the oversight of the Ministry of Water Irrigation and Energy. Its mandate is to regulate the electricity sector and energy efficiency and conservation. The newly formed authority needs support to implement its objectives.
Master Plans / Least cost development plans/ Capacities expansion plan	The Ethiopian Power System Expansion Master Plan Study (2014) includes a least cost capacity expansion plan and a Transmission master plan.
Networks and access development	The Ethiopian Power System Expansion Master Plan Study (2014) foresees the expansion of the transmission network in order to meet the forecasted demand and the required generation expansion until 2037. The short term plan includes upgraded substations, transmission lines (a total of 13550kms of new transmission lines) and reactive compensation.
IPPs	None
RE based electricity production objectives	About 95% of the electricity generation in Ethiopia comes from hydro power plants. Diversification of RES is necessary to avoid the risk of the effects of droughts to electricity generation. The GTP sets a target of 10GW for hydro by 2014/15, and the expansion plan sets a target of 5GW for geothermal, 1.5GW for wind, 0.3GW for solar and 12.4GW for hydro by 2037[12]. SE4ALL National Action Plan includes the focus area for diversification through the installation of geothermal power plants, wind farms and solar systems.
Power purchase agreements, feed-in tariffs	The EEA has published draft PPAs on their website[20] for small PVs, bagasse fired and large hydro installations. No projects have been implemented yet. A draft Feed-in proclamation was developed in 2012 but was never endorsed.
Access to transport networks regulations	Draft Regulation of Energy Operations not adopted yet.
Sector reforms	The Energy Proclamation No. 810/2013 gave the mandate for the unbundling of the EEPCO, the establishment of the regulator EEA and the opening up of the generation market. The reform of the sector is currently under way.

[20] http://www.ethioenergyauthority.gov.et/index.php?option=com_content&view=article&id=59&Itemid=258

Country: Ethiopia

CRITERION	INFORMATION
1Enterprises and services	
PRODUCTION	
Main companies and shareholders	The only generation company is Ethiopia Electric Power (EEP) a state owned company that was created after the unbundling of EEPCo in 2013 with an installed capacity of 1994MW.
Production (GWH)	In 2013 the total electricity generation was 8719GWh[21]. In 2013/14 according to the data provided by the Director, Energy Efficiency and Conservation Directorate of the Ethiopian Energy Authority the total generation was 9515GWh..
Installed capacity (MW)	In 2012: 1849MW hydro; 188MW thermal power plants and 22MW of wind turbines[22]. In 2015 according to the data on the website of EEA the existing plants are 1811MW hydro, 102MW thermal power plants and 81MW of wind turbines.
Production mix (GWh)	In 2013[21]: 8338 GWh Hydro power (95.6%), 8 GWh Fossil fuels (0.1%), 373 GWh Wind (4.3%).
Peak demand (MW)	In 2012: 1237MW[22]. In 2014 1642MW according to an data provided by the Director, Energy Efficiency and Conservation Directorate of the Ethiopian Energy Authority.
TRANSPORT	
Enterprises	The Ethiopian Electric Services which was created from the unbundling of EEPCo is to take over the task of transmission system operator.
HV lines length and capacity	10308km of 400kV, 203kV and 132kV lines
Exports/Imports	In 2013 exports were 954GWh, to parts of Kenya near the border, Sudan and Djibouti.
DISTRIBUTION	
Enterprises (s)	The Ethiopian Electric Services which was created from the unbundling of EEPCo is operating the interconnected distribution system.
MV and LV lines length and capacity	Medium Voltage 2154km at 66kV. Low voltage: 154687km at 400V.
Clients	In 2013 the total number of EEP clients was 2030000.
Total sales and tariff categories	The total sales of electricity in 2013 were 6087GWh. The existing tariffs have a block structure for the residential consumers (0-50kWh, 51-100, then every 100kWh until 500 and above 500kWh per month). There are different tariffs for commercial, and three

[21] International Energy Agency (IEA), Available at: http://www.iea.org/statistics/statisticssearch/report/?year=2012&country=ETHIOPIA&product=ElectricityandHeat, [Accessed on 11/11/2015].
[22] UN Stats 2012 Energy Statistics Yearbook, available at: http://unstats.un.org/unsd/energy/yearbook/default.htm, [Accessed on 11/11/2015].

Country: Ethiopia

CRITERION	INFORMATION
	tariffs for industrial (low voltage, 15kV and 132kV connections).
Demand forecast on the interconnected network (MW)	The Ethiopian Power System Expansion Master Plan Study (2014) forecasts 6219MW peak demand for 2020 and 9881MW peak demand for 2025.
Tariff / cost recovery / subventions	
Electricity tariffs	The tariff calculation methodology is still provisional. Current tariffs are published on EEP's website. For the residential consumers there is a block tariff structure with 0-50kWh at 1.28 $cents/kWh, 51-100kWh at 1.68 $cents/kWh, 101-200kWh at 2.35 $cents/kWh 201-300kWh at 2.59 $cents/kWh, 301-400kWh at 2.66 $cents/kWh, 401-500kWh at 2.76 $cents/kWh and >501kWh at 3.26 $cents/kWh and a fixed service charge. The commercial tariff has two blocks 0-50kWh at 2.86$cents/kWh and >51kWh at 3.26 $cents/kWh. The street lighting tariff is 2.28 $cents/kWh. For industrial consumers there are three tariffs: LV customers at 2.72 $cents/kWh, 15kV customers at 1.92 $cents/kWh, and 123 kV customers at 1.79 $cents/kWh[23].
Social tariff	There is no social tariff. The first block in the residential tariff for consumption below 50kWh/month is rather low.
Cost coverage through tariffs Planned tariffs adjustments	Generation costs were estimated at 1.9 $cents/kWh in 2012 due to the large share of hydropower[24]. The last tariff adjustment was done in 2006 and as the local currency depreciated, the average electricity tariff is low. Although there are discussions for tariffs adjustments there are no concrete plans and adopted methodology yet.
Level and subsidies sources	The average generation cost of electricity was calculated at the level of 1.9$cents/kWh in 2012[24], while the tariffs ranged from 1.28$cents/kWh until 3.26 $cents/kWh depending on the type of customer. There are no official studies on this topic.
Financial situation of the main enterprises	To be confirmed
Performance: losses / efficiency/ service quality	
Production performance	Almost all the electricity generation in Ethiopia is based on relatively new hydro power plants and new wind farms, so the overall performance is good.
Transport losses, evolution and objectives Distribution losses (technical and non-technical)	The technical losses reported in 2013 were 19%. The Growth and Transformation Plan targets the reduction of transmission and distribution losses 14% by 2030. A study is foreseen within the EES to identify inefficiencies and losses in the generation transmission and distribution of electricity.
Revenues	According to the statistical data the total technical and non-technical losses for 2013 were 1655GWh, which corresponds to a loss of revenues of the order of 33million USD per year (assuming the average selling price of 2 $cents/kWh).
Shutdowns and improvement objectives	To be confirmed.
Off-grid electrification and electricity access	

[23] The exchange rate used was 1 Bir= 0.047 USD http://www.xe.com/currencyconverter/convert/?Amount=1&From=USD&To=ETB [Accessed on 23/11/15].
[24] World Bank Document for credit for the development of a geothermal sector project, available at https://www-cif.climateinvestmentfunds.org/sites/default/files/meeting-documents/ethiopia_gsdp_pad_4102014__0.pdf, [Accessed on 23/11/15].

Country: Ethiopia

CRITERION	INFORMATION
Electrification rate (urban/rural)	According to the World Bank data in 2012 26% of the population had access to electricity (the share in 2010 was 23%). The access to electricity in rural areas was 8% in 2012, while the access rates in urban areas was 100% in 2012.
Electrification objectives	According to the SE4All Ethiopian National Action Plan the target is to ensure direct access to electricity by 95% of the population by 2025
Rural electrification agency	Rural Electrification Executive Secretariat (REES) in the Ministry of Water and Energy (MWE) which manages the Rural Energy Fund (REF).
Off-grid electrification situation and programmes	Between 2005 and 2010 about 14000 rural households and more than 1000 rural health installations and schools were electrified with PV systems. Installed PV systems are estimated to be 6.5MW. The off-grid electrification activities are funded by the REF.
Off-grid operators	Information to be obtained.
Isolated networks regulations	Information to be obtained.
BoP Policy (Bottom of the Pyramid)	Information to be obtained.
Energy Efficiency (EE)	
Demand-side management	EEP distributed CFLs to domestic consumers, reducing the peak demand. DSM measures are included in the EES developed in 2015[17].
EE activities	EEP distributed CFLs to domestic consumers, reducing the peak demand.
Other aspects	
Regional electricity market	Ethiopia currently exports electricity to parts of Kenya, Sudan and Djibouti. Ethiopia is a member of the Eastern Africa Power Pool and is currently expanding the cross border export capabilities (500kV HVDC interconnector with Kenya etc.).

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

Country	*Sector*	*Policies and objectives*	*Source*
COMESA - Common Market for Eastern and Southern Africa[25]	Access	There are no published objectives of COMESA	
	Renewable Energy	There are no published objectives of COMESA	
	Energy efficiency	There are no published objectives of COMESA	
Ethiopia	Oil and gas		
	RE	SE4ALL National Action Plan includes the focus area for diversification through the installation of geothermal power plants, wind farms and solar systems. The GTP sets a target of 10GW for hydro by 2014/15, and the expansion plan sets a target of 5GW for geothermal, 1.5GW for wind, 0.3GW for solar and 12.4GW for hydro by 2037.	SE4ALL National Action Plan (2014), Growth and Transformation Plan (2010)
	Access	According to the SE4All Ethiopian National Action Plan: ensuring direct access to electricity by 95% of the population; ensuring universal access to cleaner and more efficient cooking solutions by 2025.	SE4All National Action Plan (2014)
	Energy efficiency	The Energy Efficiency Strategy aims to implement a plan to sustain the overall energy intensity at least 10% below the 2015 baseline until 2025, revise building codes and support energy management programmes to improve energy efficiency by 30% until 2030, establish minimum efficiency standards for appliances, provide awareness and information services. Reduction of transmission and distribution losses from a current level of about 20% to 14% by 2030.	Energy Efficiency Strategy (2015)[17]

[25] Ethiopia is a member state of the Common Market for Eastern and Southern Africa (COMESA). The COMESA objectives are presented for comparison with the objectives of Ethiopia.