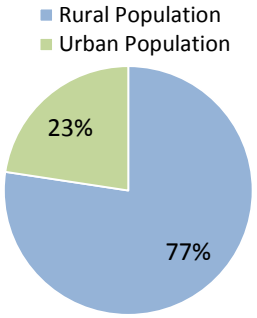
Country: Eritrea

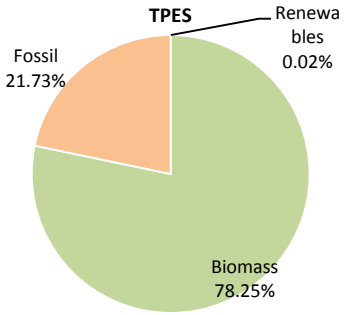
Socio- economic framework

	Year	Unit	Value
Population	2014	millions	5.11[1]
Demographic growth	2014	%	2.2%[1]
Surface	2014	km2	117 600[1]
GDP	2014	M US$	3 858[1]
GDP per capita	2014	US$ per cap	754[1]
GDP growth	2014	% /year	1.7%[1]
Fragile country status	2014	Index	Yes-2.08[2]
Governance	2014	Index	29.8[3]
Governance variation over 5 years	2014	Index	-2.8[3]
Human development	2013	Index	0.381[4]

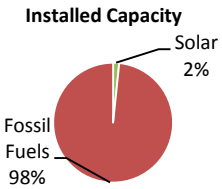


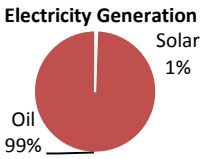
Consumed Energy (million toe=11.65 MWh)

	Year	Unit	Value
Total Primary energy Supply (TPES)	2013	Million toe	0.819[5]
Primary energy Supply - Biomass	2013	Million toe	0.641[5]
Primary energy Supply - Fossil	2013	Million toe	0.178[5]
Fraction of Non-Renewable Biomass	2009	%	68%[6]
Primary energy Supply - Renewable (incl.hydro)	2013	Million toe	0[5]
Primary energy - Net Import electricity	2013	Million toe	0[5]
Primary energy - Net import hydrocarbon	2013	Million toe	0.179[5]
Total Final Energy Consumption	2013	Million toe	0.540[5]
Final energy - Modern BLEN(*)	2013	Million toe	0.027[5]
Final Energy - Electricity	2013	TWh	0.294[5]



Electricity





	Year	Unit	Value
Peak demand	2013	MW	54.8[7]
Installed connected capacity	2012	MW	140[8]
Thermal installed capacity (fossil fuels)	2012	MW	138[8]
Hydro installed capacity	2012	MW	0[8]
Renewable installed capacity (ex.hydro)	2012	MW	2.3[9]
IPP/installed capacity	2012	%	14%[9]
Total Electricity production	2013	GWh	363[10]
Electricity generation from fossil fuels	2013	GWh	361[10]
Electricity generation from hydro	2013	GWh	0[10]
Electricity generation from renewable	2013	GWh	2[10]
Electricity consumption including self-consumption and losses	2013	GWh	363[10]
Average consumption per capita	2013	kWh per cap	50[10]
Total losses (technical and non-technical) as a production % (**)	2013	%	22%[9]
Total losses (technical and non-technical)(**)	2013	GWh	78[9]
Imports (+) exports (-)	2013	GWh	0[10]
Global electrification rate	2012	%	36%[1]
Urban electrification rate	2012	%	85%[9]
Rural electrification rate	2012	%	12%[1]
HV lines(+)	2013	km	71[9]
MV lines(+)	2013	km	320[9]
LV lines(+)	2013	km	2880[9]
Renewable energy/global electricity production	2013	%	0.55%[10]
Connections to the LV network	2013	Thousands	148[9]
Average tariff/social	2013	US$c/KWh	16[9]
Ratio cost/tariff	2013		1.68[9]

Legal, regulatory and institutional framework

Energy policy	- Renewable Energy Policy and Development Framework (2010). - National Energy Development Framework (2010). - Enhancing Energy Access and Energy Security in Eritrea (2014).
Energy laws	- Proclamation to promote the development of Mineral resources. Proclamation No. 68/1995 (including geothermal resources). - Revised proclamation to govern petroleum operations Procl. No. 108/2000 - The Electricity Proclamation No.141/2004. - Establishment of the Eritrean Electric Corporation. Procl. no.142/2004. - Establishment of the Eritrean Petroleum Corporation, Procl. 161/2008.
Enforcement texts	- Legal Notice No. 19/1995 "Regulations on Mining Operations". - Legal Notice No. 45/2000 "The revised Regulations on Petroleum Operations". - Rural Electrification Directive No.EI.001/2001.
Electricity/energy regulator	Electricity Regulatory Committee (ERC) currently not an independent regulatory body but is established under the mandate of the Department of Energy in the Ministry of Energy and Mines. The establishing law foresees that ERC will become an independent regulator.
Electricity operators	Eritrean Electricity Company (EEC).
Rural electrification body	Rural Electrification Unit under the Department of Energy of the Ministry of Energy and Mines. A Rural Electrification fund has been established to cover the costs of the rural electrification programme.
Renewable energy body	Renewable Energy Centre under the Department of Energy of the Ministry of Energy and Mines.
Energy conservation body	None.
Energy objectives	The document "Enhancing Energy Access and Energy Security in Eritrea" (2014) defines the long term objective to improve living standards through development and the principles for the development of the energy sector. The vision is to electrify all households in the long term and to reduce by half the proportion of households without access to adequate lighting and reliant on unstainable cooking methods between 2014 and 2020. Quantitative targets include: 15% of rural access to electricity by 2020 (electrifying 50 villages per year) and 100% access to electricity by 2030. By 2020, 15% of the electricity demand should be covered by renewable energy sources and by 2030 50% of the electricity demand should be covered by renewable energy sources (Renewable energy Policy and development framework MoEM (2010)). Technical and non-technical electricity losses to be less than 10% by 2020.
Feed-in tariff policy	No.
Metering policy for billing	Yes. Bimonthly meter reading and invoicing with a collection efficiency >95%[11].
Public procurement (auctions)	No.
Unbundling	No.

Private sector environment

Sector private bodies	The only private sector body active in the electricity sector is the Bisha Mining power plant operator. Erigas is a local private company which owns an LPG depot and imports LPG, Keren Shipping Line owns a gas tanker and Erisoc manufactures locally LPG cylinders and stoves. This makes the LPG market almost totally privately owned.
Public incentives	No.
Financial grants	No.
IPPs	The Electricity Proclamation foresees the existence of private sector actors in generation, transmission, distribution and sales of electricity. Currently the only IPP is Bisha Copper Mining with a 20MW oil fired power plant.
PPPs	There is no experience and practice of PPPs in the energy sector in general and the electricity sector in particular. The Revised proclamation to govern petroleum operations Proc. No. 108/2000 foresees "Petroleum Agreements" with private companies for the exploration and exploitation of oil and gas and prescribes the terms to be included.
Business index	Listed 189 out of 189 countries by the WB for the period 2013-2014[12].

International Cooperation in the energy sector

Joint Declaration EU-country	No.
Energy as a focal sector for 11th EDF	Yes. Energy was not a focal sector in the 10th EDF but energy sector projects were funded under the support to the agricultural sector, capacity building for the public administration and support to the community courts in Eritrea projects.
Donors active in the country	EU, UNDP-GDF, World Bank, IFAD, SIDA, NORAD, African Development Bank.
Coordination among donors	Donor briefing events are held to enhance coordination among donors but overall coordination remains weak. UN held its first Development Partner's Forum in 2014 aiming at increasing coordination.

Main issues and opportunities[13]

- Low access of the people to electricity and modern energy sources in general, relying excessively on biomass.
- Lack of power production capacity. Quality of electricity supply very low. In some areas electricity is available only for a few hours per day leading to high load shedding.
- Total dependence on imported oil products for electricity generation and commercial energy.
- Low efficiency of the power sector due to old equipment and network.
- Sales price of electricity is heavily subsidised making it hard to generate enough income for the Eritrean Electricity Company to undertake sufficient maintenance.
- Investment environment is not secure (see Business index above) for IPPs to enter the market.
- High renewable energy potential including wind, solar and geothermal. Feasibility studies are needed for a detailed assessment.
- Experience gained from the private sector participation in the mining sector could be useful for the energy sector development.

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

(**) The technical losses reported according to the IEA definitions were 15% (54GWh) in 2012[5]. According to EEC data total losses including non-technical losses reached 22% for the electricity consumed within the interconnected network in 2013[8]. Distribution losses in Asmara are estimated by EEC at 23%.

(+) For the interconnected system only where HV (132kV), MV (66kV), LV (400V). There are also five (5) isolated grids at 33kV in Assab, Adi keih, Agordat, Barentu and Alebu.

Sources:

1 World Bank; Available: http://data.worldbank.org/country/eritrea, [Accessed on 13/11/2015].There are no population census data for Eritrea. According to a population count by the Ministry of Local Government and estimates of the National Statistical Office the population in 2010 was about 3.2 million (Eritrea Population and Health Survey 2010, National Statistics Office, Asmara, Eritrea; Fafo Institute For Applied International Studies Oslo, Norway, August, 2013). 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/er.html [Accessed on 27/08/2015].

2 World Bank Country Policy and Institutional Assessment (CPIA) Score; Available: http://www.worldbank.org/content/dam/Worldbank/document/Fragilityandconflict/FY14FragileSituationList.pdf, [Accessed on 27/08/2015].

3 Ibrahim Index of African Governance (IIAG), Available: www.moibrahimfoundation.org/interact, [Accessed on 24/08/2015].

4 UNDP - Human Development Reports, Available: http://hdr.undp.org/en/countries/profiles/ERI, [Accessed on 24/08/2015].

5 International Energy Agency (IEA), Available: http://www.iea.org/statistics/statisticssearch/report/?country=ERITREA&product=balances&year=2013, [Accessed on 13/11/2015].

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

7 Only for the interconnected system covering Massawa, Asmara, Keren, Mendefera, Dekemhare and part of southern Asmara, according to the data of Eritrea Electricity Corporation (EEC) presented in the "Enhancing Energy Access and Energy Security in Eritrea", report (Department of Energy, 17/1/2014).

8 UN Stats Energy Balances and Electricity profiles 2012, available at: http://unstats.un.org/unsd/energy/balance/default.htm, [Accessed on 27/08/2015]. According to the data provided by EEC and presented in the "Mission to Eritrea in the energy sector" report EU TAF SE4ALL, October 2014, the installed capacity in 2013 is 143MW and 140.6MW correspond to fossil fuel fired power plants.

9 Enhancing Energy Access and Energy Security in Eritrea, Department of Energy, 17/1/2014. The World Bank data showed an urban electrification rate of 100%.which is not consistent with the previous report.

10 International Energy Agency (IEA), Available at: http://www.iea.org/statistics/statisticssearch/report/?year=2013&country=ERITREA&product=ElectricityandHeat, [Accessed on 13/11/2015].

11 "German Financial cooperation with Eritrea in the Power Sector" Fact finding mission report, Peter Lindlein, 2010.

12 World Bank, Available: http://data.worldbank.org/indicator/IC.BUS.EASE.XQ, [Accessed on 25/08/2015].

13 The main issues and opportunities were identified in the "EU TAF for the SE4All initiative – Eastern and Southern Africa, Mission to Eritrea in the energy sector" report, October 2014.

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Country: Eritrea

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	2010	2010	2030
Universal access to modern energy	Electricity access	% of population	23	32	33	36	12	100	100
	Non-solid fuels access	% of population	16	28	35	36	13	66	
			1990		2010	2012	1990-2010	2010-2012	2025
Doubling energy efficiency	Improvement rate of Primary energy intensity	CAGR %					n.a.	-4.08	
	Cumulated energy savings	PJ					152	36	
	Ratios primary energy/final energy		0.0		69.2	([1])			
	Primary energy intensity level	MJ/$2011 PPP	-		5	4.6			
			1990	2000	2010	2012			2030
Doubling the renewable energy share	Total final consumption	PJ			21	22			
	RE share in the total consumption	%	88.3	71.2	77.2	80.4			
	RE share in the total electricity generation	%			0.6	0.6			50%
	RE share in the total electricity production capacity	%			1.3	1.4			

Source:
SE4ALL Progress towards Sustainable Energy 2015, Global Tracking Framework (GTF), accessed from http://www.se4all.org/tracking-progress/ on 24/08/2015
SE4ALL Global Tracking Framework 2013, accessed from http://www.se4all.org/tracking-progress/ 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] 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					✓			"Proclamation to promote the development of Mineral resources" Proclamation No. 68/1995 (including geothermal resources); "Revised proclamation to govern petroleum operations" Procl. No. 108/2000. "The Electricity Proclamation" No.141/2004; "Establishment of the Eritrean Electric Corporation" Procl. no.142/2004; "Establishment of the Eritrean Petroleum Corporation", Procl. 161/2008. There is no concrete overall energy policy. Although objectives are set for improved energy access and penetration of renewable energy source there are no action plans and sectorial strategies.
Energy regulation authority					✓			The Electricity Regulatory Committee (ERC) has been established by Proclamation No. 141/2004 in order to become an independent regulator. At the moment ERC operates under the mandate of the Department of Energy in the Ministry of Energy and Mines.
Partnership agreement with the EU		✓						Energy will be a focal area in the 11th EDF. Energy sector projects were funded in the 10th EDF under the Agricultural sector support and capacity building for the public sector.
Fragile country status								Yes. Eritrea has a World Bank CPIA score of 2.08 regarding fragile situations in 2014. According to IMF[2], Eritrea remained fragile for the whole period 2011-2013 and is among the countries that have regressed in fragility since the 1990s.
2 *Engagement and preparation for SE4ALL*								
Opting-in	✓							
Gap analysis	✓							
Action Agenda	✓							
NREAP	✓							
NEEAP	✓							
Investment Prospectus	✓							
SE4ALL Secretariat	✓							
3 *Private sector participation*								

[2] "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]

Investment and concession laws					✓			Encouraging investments from the private sector is one of the Governments immediate priorities. Concessions are foreseen in the petroleum sector for the exploration/exploitation of hydrocarbons and in the power sector for IPPs. The related laws include: - Investment Proclamation No. 59/1994. - Revised proclamation to govern petroleum operations. No. 108/2000. - The Eritrean Free Zones proclamation No. 115/2001. - The Electricity Proclamation No.141/2004. - Foreign Financed Special Investment Proclamation No. 159/2007.
Private sector activities					✓			Limited private sector activities in the electricity sector. Only one IPP is in operation in the power sector (Bisha Copper Mining with 20MW oil fired power plant). The LPG sector is almost exclusively operated by the private sector. The mining sector has been a success story for private investments, which could be used as an example for the energy sector.
Investors protection	✓							Eritrea is ranked 189 out 189 countries by the "ease of doing business" index of the World Bank[3] in 2014. The ranking in the "protecting investors" topic is 164 out of 189 countries[4] in 2014.
National financial incentives					✓			According to the Investment law the incentives include: Capital goods, intermediates, industrial spare parts and raw materials attract 2% customs duty; Raw materials and intermediate inputs attract 3% sales tax; Investors can open and operate foreign exchange account in Eritrea and use it for investment and procurement; Foreign exchange allocations for business enterprises; Investors can remit net profit and dividends accrued from investment capital; Investor can remit fees or royalty in respect of any technology transfer agreements; Investor can remit proceeds received from liquidation of investments and /or expansion; Investors can remit payments received from sale or transfer of shares. There are no specific incentives for the energy sector.
Institutional support to private sector	✓							
4	*Energy access*							
Energy access policy and targets					✓			In the document "Enhancing energy access and energy security in Eritrea" (2014) the following targets are set for energy access: Increase the share of rural population electricity access to 30% by 2020 and 100% by 2030 (electrification of about 50 villages per year); Reduce by half the proportion of households without access to adequate lighting from 2014 to 2024; provide adequate, clean and efficient energy services to all educational, health and clean water supply facilities. Although the targets are set, concrete policies and roadmaps to achieve the targets are missing.
Agency / Rural energy fund					✓			The Rural Electrification Fund which is managed by the Rural electrification unit within the Department of Energy (established by proclamation No 141/2004). It is funded by a 1% levy on electricity sales and by the GoE and Development Partners.
Rural electrification master plan	✓							The document "Enhancing energy access and energy security in Eritrea" describes the target of rural electrification (50 villages per year) but there is no detailed master plan of the activity.

[3] World Bank, Available: http://data.worldbank.org/indicator/IC.BUS.EASE.XQ, [Accessed on 25/08/2015].
[4] World Bank, Available: http://www.doingbusiness.org/data/exploreeconomies/eritrea/ [Accessed on 08/09/2015].

Increasing EA investment plan	✓							The document "Enhancing energy access and energy security in Eritrea" provides an initial estimate of the required investments for the electrification target, but there is no details investment plan.
EA decentralized initiatives		✓						Rural electrification options to achieve the targets include standalone renewable electricity generation systems.
Traditional fuels replacement		✓						Reduce by half the proportion of households reliant on unsustainable cooking methods by 2015-2024 ("Enhancing energy access and energy security in Eritrea" report). The action plan foresees a replacement of 5000 stoves per year for the next five years and the installation of digesters for biogas production.
Independent distribution networks		✓						There are five "self-contained" systems that are not part of the interconnected system of Eritrea in Assab, Adikeih, Agordat, Barentu and Alebu consisting of diesel fired plants, isolated 33kV grid between the main load centres and low voltage (400V) lines within the villages.
Electricity distribution master plan	✓							It is required to develop a National Power Development Masterplan that will include the distribution masterplan.
Specific measures for the poor	✓							
Microfinance instruments	✓							There are no micro-finance instruments in the energy sector. Pilot applications were done in other sectors.
Pre-electrification		✓						Reducing by half the proportion of households without access to adequate lighting through the use of solar lights etc. is one of the objectives set in the "Enhancing energy access and energy security in Eritrea" document.
5	*Renewable energy (RE)*							
RE Policy					✓			The "Renewable energy policy and development framework" has been published in June 2010. RE plays an important role in achieving the electrification targets set by the GoE. The target is to produce 15% of the electricity by RE in 2020 and 50% by 2030. There is a mention for the creation of feed in tariffs but nothing materialized yet.
Agency / RE Fund		✓						A Renewable Energy Centre exists under the Department of Energy. A Renewable Electricity Fund is foreseen[5] to be established under the Rural Electrification fund for the promotion and support of RE through private and public sector participation.
RE master plan	✓							Only the "Renewable energy policy and development framework" has been published in June 2010. This sets the overall targets, a breakdown of the targets per technology, required actions and a first estimate of the investment requirements.
Biofuels regulatory frameworks	✓							No regulations for biofuels exist.
Wood energy regulations	✓							No regulations for wood energy exist.
Solar/wind regulations	✓							No regulations for solar/wind exist.
RE resources mapping	✓							There is no RE atlas. Measurements of monthly and annual insolation exist for five locations and wind speeds were measured in 25 locations (measurements exist for five years). Analysis of the geothermal potential should be done in detail as well as analysis of the micro/small hydro potential.

[5] Enhancing Energy Access and Energy Security in Eritrea, Department of Energy, 17/1/2014.

RE Promotion	✓							RE installations are parts of the rural electrification programme.
RE long-term funding	✓							There are no specific funding mechanisms or feed in tariffs for RE.
Green Energy Fund		✓						A Renewable Electricity Fund is foreseen to be established under the Rural Electrification Fund.
Network connection studies	✓							This should be part of the required National Power Development Masterplan.
6	*Energy Efficiency (EE)*							
EE Policy	✓							There is no specific policy for energy efficiency. The only target is the reduction of transmission/distribution losses of electricity[5], to the level of 10% by 2020.
EE national action plan	✓							There is no EE action plan.
EE Standards and labels	✓							
EE Promotion	✓							
Electricity losses reduction programme.		✓						Target to reduce losses to a level below 10% by 2020[5].
Improved stoves programs		✓						Replacement of 5000 stoves per year for the next five years[5].
Ban on non-efficient appliances	✓							
Incentives for efficient appliances	✓							
Demand-side management	✓							
7	*Electricity sector*							
Legal definition of the institutional players					✓			The Electricity Proclamation no 141/2004, established the Electricity Regulatory Committee and set the requirements and conditions of electricity operation permits (for generators, transmission and distribution system operators and suppliers).
Tariff policy		✓						The tariffs are set by the Department of Energy but do not cover the production costs. They are revised periodically by the MOEM following requests by the EEC.
Interconnection rules		✓						Eritrea is not interconnected to any of its neighbors. Bilateral discussions are foreseen to commence with Djibouti, Yemen and Ethiopia to examine the possibility for interconnections. The country plans to apply to become a member of the East African Power pool. A draft project document "Eritrea-Sudan power interconnector" is available for a 340km 220kV transmission line connecting the two countries. A study by IPA in 2007[6] created a draft network code and model interconnector agreement but this needs to be updated and applied in practice.
Isolated networks rules	✓							

[6] IPA consulting report, 2007. "Power sector reform and setting up regulatory function Asmara Power Distribution and Rural Electrification Project".

Country: Eritrea

Feed-in tariff policy	✓							Feed in tariffs are mentioned as a potential instrument in the “Renewable energy policy and development framework” of the Department of Energy, but are not implemented.
RE minimum % imposed to producers	✓							
RE certificates trade	✓							
Free access to the domestic network	✓							The Electricity Proclamation foresees access to the transmission and distribution network for licensed entities. However there is no implementation yet. Model permits and agreements were developed by a consultant in 2007[6] but need to be revised.
Net metering	✓							
Unbundling	✓							
Decentralized transport networks	✓							
Least cost development plan	✓							
Electricity master plan	✓							A National Power Development Master plan is required.
Privatization / commercialisation		✓						The only IPP is operating at the Bisha Copper Mining company.
Utility management contract	✓							
Utility financing plan	✓							An estimate of the cost for the achievement of the electrification targets is included in document “Enhancing energy access and energy security in Eritrea” (2014), but this is not a detailed financing plan.

ANNEX 3 – ELECTRICITY SECTOR ASSESSMENT

CRITERION	INFORMATION
Electricity sector policy	
Electricity sector laws	"Proclamation to promote the development of Mineral resources" Proclamation No. 68/1995 (including geothermal resources for electricity generation); "The Electricity Proclamation" No.141/2004; "Establishment of the Eritrean Electric Corporation" Procl. no.142/2004.
Unbundling	EEC is a vertically integrated company and the interconnected transmission network operator.
Regulation of the sector	The Electricity Regulatory Committee (ERC) has been established by Proclamation No. 141/2004 in order to become an independent electricity regulator. At the moment ERC operates under the mandate of the Department of Energy in the Ministry of Energy and Mines.
Master Plans / Least cost development plans/ Capacities expansion plan	The document "Enhancing energy access and energy security in Eritrea"(2014), includes a number of new power plants additions but a National Power Development Master plan does not exist and is urgently needed.
Networks and access development	A National Power Development Master plan is required in order to include the detailed network development. The document "Enhancing energy access and energy security in Eritrea" (2014), includes a number of transmission line expansions and the Djibouti interconnection, but a detailed network development study does not exist.
IPPs	Only one IPP is operating in Bisha Copper Mining with a diesel fired plant of 20MW.
RE based electricity production objectives	The "Renewable energy policy and development framework" (2010) sets the ambitious target of 15% RE electricity by 2020 and 50% by 2030. This is translated into 3% generation from biomass, 4% from wind, 3% from solar and 5% from geothermal in 2020 and 7% generation from biomass, 15% from wind, 7% from solar, 17% from geothermal and 4% from hydro power by 2030.
Power purchase agreements, feed-in tariffs	There are no feed in tariffs. Model PPAs have been developed in 2007 by IPA Consulting[6] but need to be updated.
Access to transport networks regulations	A model network code has been developed in 2007 by IPA Consulting[6] but needs to be updated.
Sector reforms	The Electricity Proclamation 141/2004 set up all the required background for the privatisation of the electricity sector.

Country: Eritrea

CRITERION	INFORMATION
Enterprises and services	
PRODUCTION	
Main companies and shareholders	State Owned: Eritrean Electricity Corporation (EEC) has been created as a state-owned company in charge of power generation, transmission and distribution, energy resources management and development of renewable electricity. Private: Bisha Copper Mining operating a 20MW diesel fired power plant covering the electricity needs of the mine.
Production (GWH)	In 2012 total electricity generation was 359GWh.
Installed capacity (MW)	Total installed capacity in 2012 was 140MWs with 2.3MW of renewable energy (1.5MW of PVs and 0.8MW of wind).
Production mix (GWh)	In 2012: 357GWh were generated by diesel fired power stations and 2GWh by renewable energy (PV and wind).
Peak demand (MW)	In 2012 the peak demand of the interconnected system only was 59MW and in 2013 54.8MW.
TRANSPORT	
Enterprises	EEC is the only transmission system operator.
HV lines length and capacity	The HV lines have a length of 71km operating at 132kV.
Exports/Imports	The electricity system of Eritrea is not interconnected to any of its neighbours, therefore electricity trade is zero.
DISTRIBUTION	
Enterprises (s)	EEC is the only distributor in the country.
MV and LV lines length and capacity	MV lines have a length of 320km and operate at 33kV and 66kV. LV lines operate at 400V and have an estimated length of 2880km.
Clients	In 2013 there were 148000 connections to the interconnected network of EEC.
Total sales and tariff categories	Total electricity sold by EEC in the interconnected system was 250GWh in 2012[7]. According to IMF "Selected issues and statistical Appendix" 2003[8] report the tariffs structure includes: domestic (households) with a consumption less that 500kWh, domestic with consumption higher than 500kWh, general tariff (including street lighting), small industry, large industry less than 100MWh, large industry above 100MWh and commercial.
Demand forecast on the interconnected network (MW)	Not available. A National Power Development Master plan is required.

[7] Data provided by EEC and presented in the "Mission to Eritrea in the energy sector" report EU TAF SE4ALL, October 2014.
[8] Eritrea: Selected issues and statistical appendix, 2003 available at https://www.imf.org/external/pubs/ft/scr/2003/cr03166.pdf, [Accessed on 01/09/2015].

Country: Eritrea

CRITERION	INFORMATION
Tariff / cost recovery / subventions	
Electricity tariffs	According to the document "Enhancing energy access and energy security in Eritrea" (2014), the average selling price is at the level of 3.27ERN/kWh which corresponds to 16US cents/kWh. According to the "German Financial Cooperation with Eritrea in the Power Sector. Fact-Finding Mission report"[9], the tariffs in 2010 were 8.3Eurocents/kWh in industry, 11.7Eurocents/kWh for households, 15 Eurocents/kWh for the general tariff.
Social tariff	There is no information for a social electricity tariff.
Cost coverage through tariffs Planned tariffs adjustments	According to the document "Enhancing energy access and energy security in Eritrea" (2014), the average generation cost is 5.22ERN/kWh (27US cents/kWh) while the average selling price is 3.27ERN/kWh (16US cents/kWh). Generating costs are not covered by the tariffs and this creates financial problems to EEC. The tariffs have been increased in 2004, 2005, 2006 and 2008 by double digit percentages in order to cover the increase in the price of imported fuel. The tariffs should be reviewed to reflect generation costs, but there are no current plans.
Level and subsidies sources	The state subsidises the difference between the tariff and the generation cost by covering the losses of EEC (about 8 million Euros -11 million USD- in 2008[9]).
Financial situation of the main enterprises	The existing tariffs do not allow EEC to recover the operational costs and as a result it has serious financial problems over the last years and is subsidised by the state. EEC reported losses of 8 million Euros (11 million USD) in 2008[9], the capital of the company is low and its liquidity is stressed.
Performance: losses / efficiency/ service quality	
Production performance	The existing power plants have been in operation for a long time period with limited maintenance and are therefore running at low efficiency. The newest diesel fired plant Hirgigo consumes 0.22l/kWh while older plants (Barentu, Teseney) consume 0.33 l/kWh[9]. Although there is a total installed capacity of 140MW only 50% is fully operational[9].
Transport losses, evolution and objectives Distribution losses (technical and non-technical)	According to EEC data[5] total transmission and distribution losses were 22% in 2013 in the interconnected system. The objective[5] is to reduce total losses to a level below 10% by 2020.
Revenues	Revenue losses for EEC come from the fact that the tariffs do not cover the production costs (11mil USD in 2008) and also because of the "non-delivered electricity" which was estimated to around 9.7USD million[6] in 2013.
Shutdowns and improvement objectives	Due to the age of the transmission/distribution networks there are severe voltage drops and the transformers and lines are overloaded. Load shedding is common practise for EEC. Although there are no published statistics of the service quality, average daily disruptions of 4 hours are common in the interconnected system of EEC[6].
Off-grid electrification and electricity access	
Electrification rate (urban/rural)	According to EEC the present level of electrification in 2013 was around 8.5% in rural areas and 85% in urban areas[5]. The average

[9] "German Financial Cooperation with Eritrea in the Power Sector. Fact-Finding Mission report", page 18, Jan 2010

Country: Eritrea

CRITERION	INFORMATION
	electrification rate in the country is 38%[5]. The values reported for 2012 by the World Bank are 12% rural electrification, and 36% urban electrification shares.
Electrification objectives	The vision of the GoE is to have rural electricity access up to 30% by 2020 and 100% by 2030 (electrification of about 50 villages per year).
Rural electrification agency	The Rural Electrification Unit is located in the Department of Energy. Originally it was envisaged to become and independent Rural Electrification Agency. The unit manages the rural electrification fund and it is responsible for planning and implementation of the extension of the grid in the rural areas, the development of isolated and mini-grid systems in rural areas and ensure the participation of the population in rural electrification.
Off-grid electrification situation and programmes	Isolated electrification systems are developed by the Rural Electrification Unit. There are about 3000PV systems (total capacity of about 1MW) and isolated private and municipal generators.
Off-grid operators	Information to be obtained.
Isolated networks regulations	Regulations do not exist.
BoP Policy (Bottom of the Pyramid)	Information to be obtained.
Energy Efficiency (EE)	
Demand-side management	There are no demand side management activities in the electricity sector.
EE activities	There are no EE activities in the electricity sector.
Other aspects	
Regional electricity market	The electricity system of Eritrea is not interconnected with any of its neighbouring countries. There are plans for interconnecting with Sudan and Djibouti in the future. The country plans to submit a membership application to the East African Power Pool.

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

Country	*Sector*	*Policies and objectives*	*Source*
Community of Sahel-Saharan States (CEN-SAD)[10]	Access	There are no published targets for CEN-SAD.	
	Renewable Energy	There are no published targets for CEN-SAD.	
	Energy efficiency	There are no published targets for CEN-SAD.	
Eritrea	Oil and gas	Promote the use of LPG for cooking facilities.	Enhancing Energy Access and Energy Security in Eritrea, Department of Energy, 17/1/2014.
	RE	Produce 15% of the electricity consumed by Renewable Energy in 2020 and 50% by 2030.	
	Access	Increase the share of rural population electricity access to 30% by 2020 and 100% by 2030	
	Energy efficiency	Reduce the transmission/distribution losses of electricity to less than 10% by 2020.	

[10] Eritrea is a member state of the Community of Sahel-Saharan States, 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.