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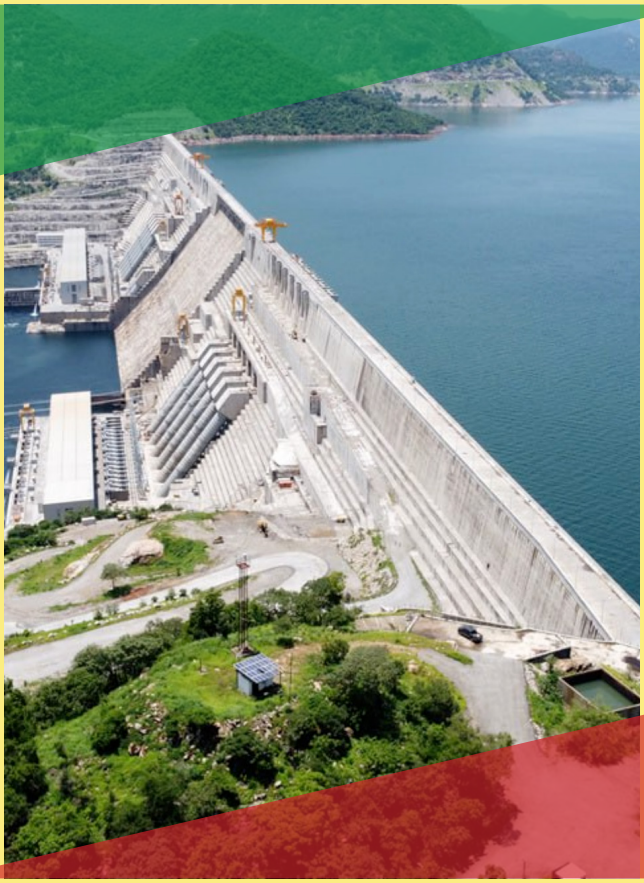
Ethiopian Electric Power



FACTS IN BRIEF
2024/25

Clean Energy For Better Life!!

Ethiopian Electric Power

Mission

"To provide reliable and sustainable electric power through innovation, technology, continuous learning, fairness and commitment"

Vision

"To be the power hub of Africa"

Core Values

✓ Customer-centric
✓ Sustainability
✓ Reliability
✓ Empowerment
✓ Continuous improvement
✓ Integrity
✓ Occupational Health and Safety
✓ Synergy

1. Overview of the country

Location: Horn of Africa
Area: 1.1 million km2
Land: 1.0 million km2---(90.56%)
Water: 104,300 km2--- (9.44%)
Population: 136,121,102
Climate: Tropical monsoon with wide topographic – induced variation Natural resource: Gold, platinum, copper, potash, natural gas, hydro power,
Geothermal power, wind power and solar energy.
Electric Energy Potential: -
Hydro power: -More than 45,000 MW
Wind power: - More than 1,350,000 MW Geothermal **power**: -More than 10,000 MW

2. Ethiopian Electric Power Establishment

The history of electricity in Ethiopia goes back to the late 1890s. The service was started by Emperor Minilik–II through one diesel generator powering up the national palace.

The diesel generator was a gift from the government of Germany. The company was established by charter in 1956 as the Ethiopian Electric Light & Power Authority (EELPA), which bundled all electricity activities in a single organization. In 1996, EELPA was split into the Ethiopia Electric Authority (EEA), taking over all regulating activities and a company, Ethiopian Electric Power Corporation (EEPCo), bundling all activities from power generation to household distribution.

In 2013, EEPCo was again split up into two companies, Ethiopian Electric Utility (EEU) and Ethiopian Electric Power (EEP).

Ethiopian Electric Power is a state-owned enterprise established under the Council of minister's regulation No.302/2013 and its amendment regulation No.381/2016 which mandated to undertake the following activities: -

✓ To undertake feasibility studies, design and survey of electricity generation in integrated national grid, construction of transmission lines and substation over 66 kV; to contract out such activities to consultants, as required;

✓ To undertake construction and upgrading of electricity generation and upgrading transmission and substation of over 66 kV; to contract out such works to contractors as required;

✓ To administer, operate and maintain electricity generation in the integrated national grid, and transmission lines and substations of over 66 kV;

✓ To sell and purchase bulk electric power on transmission lines above 66 kV;

✓ To lease transmission lines above 66kV;

✓ To submit electricity tariff proposals with respect to power its sales and implement same upon approval;

✓ In line with directives and policy guidelines issued by the Ministry of Finance and Economic Development, to sell and pledge bonds and to negotiate and sign loan agreements with local and international financial sources;

✓ To undertake any other related activities necessary for the attainment of its purposes.

3.Ethiopian Electric Power Facts in 2017 EFY (2024/25) Budget Year

Ethiopian Electric Power generates electricity from 20 power plants and supplies energy through 201 substations. It delivers high-voltage power to industries, export neighboring countries, data mining, railways and the Ethiopian Electric Utility (EEU) for nationwide distribution.

The company manages a transmission network spanning around 21,334 km of circuit lines and employs around 7,778 staff members.

4. ICS per Capita

Electric power consumption per capita (kWh) is the production of power plants and combined heat and power plants with less transmission, distribution, and transformation losses and their own use by heat and power plants, divided by the mid-year population.

EEP believes that supporting the country´s economic growth by anticipating future energy needs & decarbonizing the economy is a tremendous opportunity to create wealth, generate employment, and improve both the condition of the country and people's health.

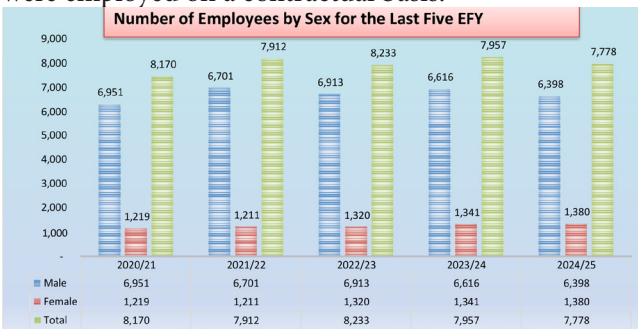
Ethiopia can be completely self-sufficient with domestically produced energy. In the previous fiscal year, the total production of all-electric energy-producing facilities is 29,467,903,240.43 kWh (29,467,903 GWh), with per capita electric energy production of 188 kWh as compared to previous years, which increased by around 14 percent. The increase of electrification in rural areas and the growth of demand in the country brought an average increment in the generation capability and showed the growth trend of the ICS per capita generation.

Per Capita Electric Energy Production (KWH)

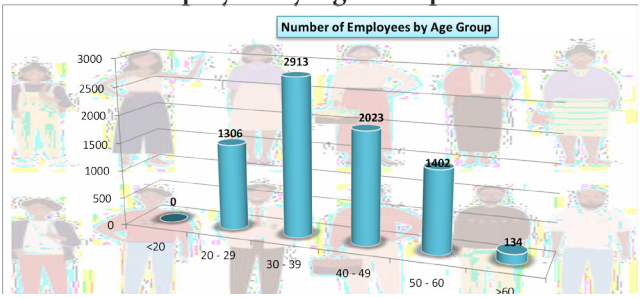
Note: All data contained herein are based on the 2017 EFY (Ethiopian Fiscal Year) - the period from July 8, 2024 to July 7, 2025.

5. Man Power

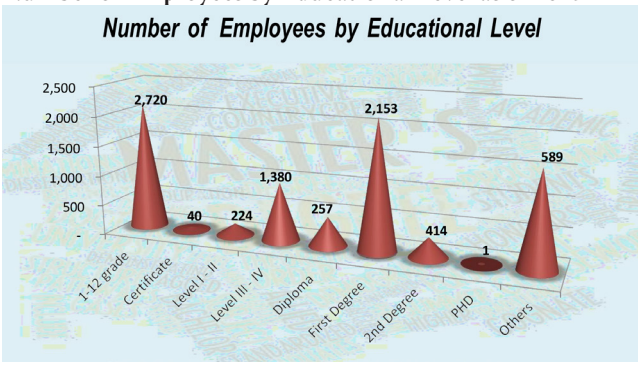
At the end of the 2017 EFY, the total number of employees of Ethiopian Electric Power was 7,778. Among these 7,237 were permanently and the remaining 541 were employed on a contractual basis.

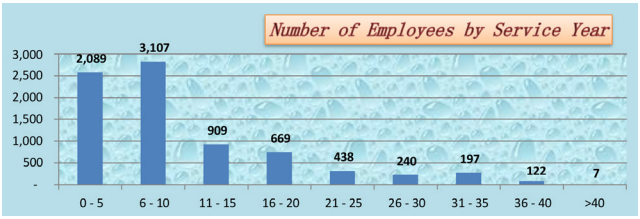


Number of Employees by Age Group as of 2017 EFY



Number of Employees by Educational Level as of 2017 EFY





Number of Employees by Service Year as of 2017 EFY

6. Generation operation

Generation is the production process center of the power industry. Ethiopian Electric Power has a total generation capacity of 8,115.84 MW from hydro, wind, geothermal and biomass (Waste), with installed capacities of 7,613.70 MW, 469.84 MW, 7.3 MW, and 25 MW respectively.

Based on installed capacity, the maximum energy source for installed EEP is a hydropower plant, where around 93.8 percent and the other source of energy is wind 5.8 percent and remains with geothermal and biomass. There are six diesel power plants with an installed capacity of around 99.7 MW that are not included due to decommissioning.

The total energy production from all sources of energy was 29,480 GWh, of which hydro 97.42 percent, wind 2.58 percent, and biomass has not produced energy. The production of energy as compared with previous years has increased by 43.1 percent and the peak load has increased by around 32.4 percent. In this budget year, electricity generated at GERD represented 33.28 percent of the generation sent out, followed by Gibe III with 24.19 percent and the remaining will be from other power plants.

Installed capacity (MW) of ICS as of 2017 EFY (2024/25 G.C.)

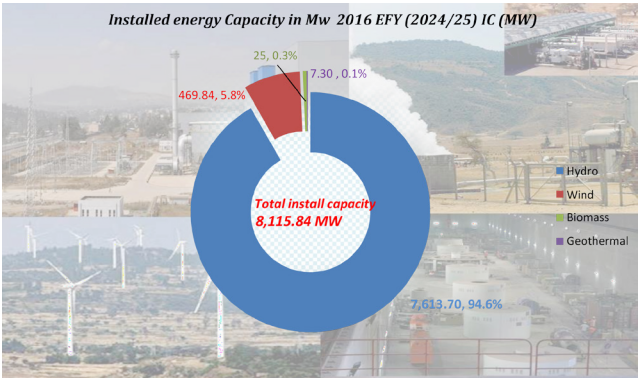
The installed generation capacity specifies the maximum possible electricity generation that can be produced by the installation and is usually given in megawatts. The sum of all installations gives the total installed generation capacity in Ethiopia.

An overview of this can be seen in the table below:

Installed capacity (MW) of ICS as of 2017 EFY (2024/25 G.C.)

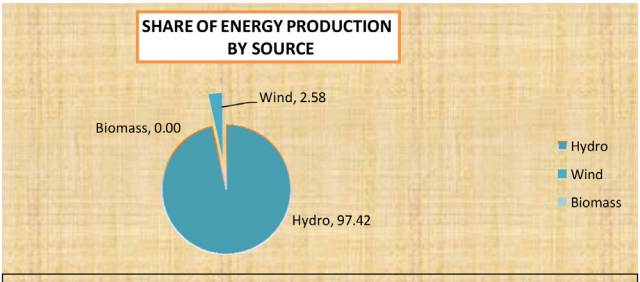
No.	Power Plant	Hydro	Geo thermal	Wind	Biomass	Total	In-service date (G.C)
1	Koka	43.2				43.2	1960
2	Tis Abay I	11.4				11.4	1964
3	Awash II	32				32	1966
4	Awash III	32				32	1971
5	Finchaa	134				134	1973/2003
6	Meleka Wakena	153				153	1988
7	Aluto Langano		7.3			7.3	1999
8	Tis Abay II	73				73	2001
9	Gilgel Gibe I	184				184	2004
10	Tekeze	300				300	2009
11	Gilgel Gibe II	420				420	2010
12	Beles	460				460	2010
13	Amerti Neshi	97				97	2011
14	Ashegoda			120		120	2012
15	Adama I			51		51	2012
16	Adama II			153		153	2014
17	Gilgel Gibe III	1,870				1,870	2015
18	Rappie Waste				25.00	25	2019
19	Genale Dawa	254				254	2020
20	GRED	3,550				3,550	2022 & 2024
21	Ayisha II Wind			80		80	2022
22	Asela Wind	-	-	65.84			
	ICS Total	**7,613.70**	**7.3**	**469.84**	**25**	**8,115.84**	
	Share (%)	**93.8**	**0.09**	**5.79**	**0.3**	**100**	

Installed energy Capacity in Mw 2016 EFY (2024/25) IC (MW)



Note: Ethiopian Electric power is installed capacity through 22 power plants which oversee 15 hydro, 1 geo-thermal, 5 winds and 1 biomass.

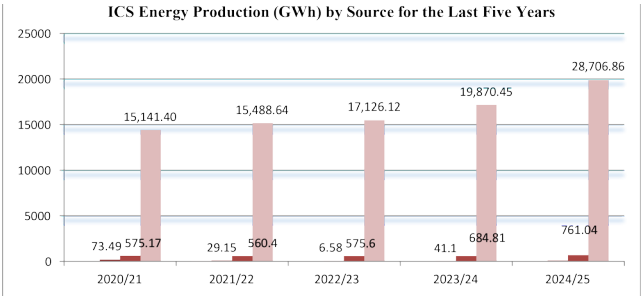
Energy Production in MWh 2017 EFY (2024/25)						
Rank	**Name of Power Plant**	**Hydro**	**Wind**	**Biomass**	**Total**	**Share of Energy by the Power Plant (%)**
1.	GERD	9,805,581,987.9			9,805,581,987.93	***33.28***
2.	Gibe III	7,129,496,000.0	0	0	7,129,496,000.00	***24.19***
3.	Tana Beles	3,184,671,200.0	0	0	3,184,671,200.00	***10.81***
4.	Genal-Dawa III	2,152,555,375.5	0	0	2,152,555,375.50	***7.30***
5.	Gelgel Gibe II	2,083,073,900.0	0	0	2,083,073,900.00	***7.07***
6.	Tekeze	1,046,044,108.0	0	0	1,046,044,108.00	***3.55***
7.	Gelgel Gibe I	989,825,203.0	0	0	989,825,203.00	***3.36***
8.	Finchaa	812,962,000.0	0	0	812,962,000.00	***2.76***
9.	Melka Wakena	525,869,200.0	0	0	525,869,200.0	***1.78***
10.	Adama II	0	387,655,267.0	0	387,655,267.0	***1.92***
11	Amerti Neshe	331,958,468.0	0	0	331,958,468.0	1.33
12.	Ayisha II		229,784,189.0		229,784,189.0	***0.78***
13.	Tis Abay II	227,629,836.0	0	0	227,629,836.0	***0.77***
14.	Awash III	164,365,900.0	0	0	164,365,900.0	***0.56***
15.	Koka	141,518,736.0	0	0	141,518,736.0	***0.48***
16.	Adama I	0	133,989,430.0	0	133,989,430.0	***0.45***
17.	Awash II	74,323,800.0		-	74,323,800.0	***0.25***
18.	Ashegoda		36,983,750.0	0	36,983,750.0	***0.13***
19.	Asela Wind	-	9,614,890.0		9,614,890.0	***0.03***
20.	Reppi	-	-	-	-	-
	Total (MWh)	28,706,859,464.43	761,043,776.00	0.00	29,467,903,240.43	*100.00*
	Share by source (%)	97.42	2.58	0.00	100.00	



Last five years ICS Energy Production in (GWh)

Source of Energy	2020/21	2021/22	2022/23	2023/24	2024/25
Hydro	15,141.40	15,488.64	17,126.12	19,870.45	28,706.86
Diesel	0.03	-	-	-	-
Biomass	73.49	29.15	6.58	41.12	-
Total	15,790.09	16,078.19	17,708.31	20,596.38	29,467.9
Wind	575.17	560.4	575.62	684.81	761.04

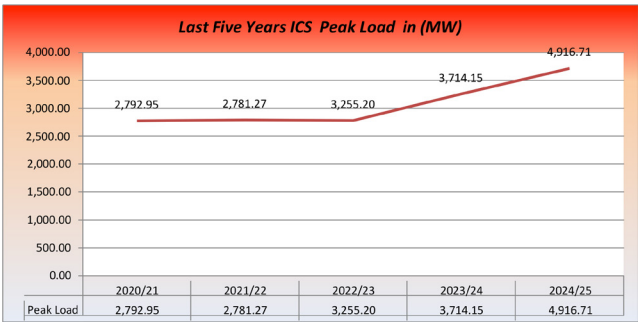
ICS Energy Production (GWh) by Source for the Last Five Years



Note: In 2017 EFY generation production is increased by 43.1 percent from the previous year, however the annual growth rate for the last five years of generation production increased 17.2 percent. In this budget year 15 hydropower plants, 5 wind power plants are fully and partially operational, producing a total of 29,467.9 GWh of energy. This includes 28,706.86 GWh from hydro and 761.04 GWh from wind energy. Compared to previous years, hydro generation increased by 44.5 percent, and wind energy increased by 11.1 percent. Additionally, GERD power plants nine units are operating fully or partially, and the Asela wind power plant has begun generating energy this year.

6. ICS Peak Load

Peak demand is the time when consumer demand for electricity is at its highest. The annual growth rate of peak demand was around 15.8 percent for the last five years. This year's peak load increased by 32.4 percent from previous years.



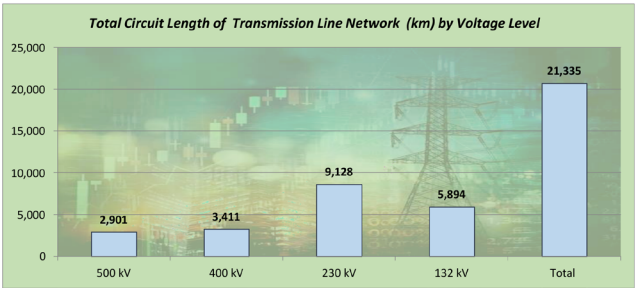
	2020/21	2021/22	2022/23	2023/24	2024/25
Peak Load	2,792.95	2,781.27	3,255.20	3,714.15	4,916.71

7. Transmission Substation Operation

Transmission is used to transmit electric power over relatively long distances, usually from a central generating station to main substations. The grid infrastructure is an electric highway that links and carries electric power from power generation plants to the load centers through a transmission system with various voltage levels at HVDC, 500kV, 400kV, 230kV and 132kV that extends 16,305 km route length and 21,335 km circuit length, and with sub-transmission lines at 66 and 45 kV that are managed by Ethiopian Electric Utility (EEU).

EEP is currently regionally interconnected with Djibouti, Sudan and Kenya. Djibouti interconnectors around 296 km 230 kV single circuit line from Hurso substation to Djibouti. Sudan´s interconnection comprises around 194 km 230 kV double circuit line from Metema substation in the north-west of Ethiopia to Gedaref in Sudan.

Service Year G.C	500 kV	400 kV	230 kV	132 kV	Total
2020/21	2,476	3,255	8,383	5,856	19,969
2021/22	2,901	3,269	8,609	5,856	20,634
2022/23	2,901	3,269	8,609	5,856	20,634
2023/24	2,901	3,269	8,609	5,894	20,673
2024/25	2,901	3,411	9,128	5,894	21,335



Kenya HVDC interconnection between Wolaita Sodo substation (Ethiopia) and Suswa (Kenya), comprising of a 435 km, +/- 500 kV HVDC bipolar overhead line.

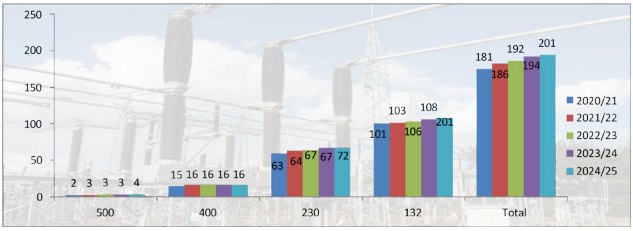
Service Year G.C

Total Circuit Length of Transmission Line Network (km) by Voltage Level

Substation: it is a part of an electrical transmission system that transforms voltage from high to low or the reverse. The power stations connected to the transmission grid had a total number of substations is 201 with various voltage levels at 500kV, 400kV, 230kV and 132kV, which is mobile, industry, generation switchyard, traction and transmission substation across the existing system.

Year (G.C)
Number of substations by voltage level (kV)

Year (G.C)	Number of substations by voltage level (kV)				
	500	400	230	132	Total
2020/21	2	15	63	101	181
2021/22	3	16	64	103	186
2022/23	3	16	67	106	192
2023/24	3	16	67	108	194
2024/25	4	16	72	109	201



8. Energy Sales

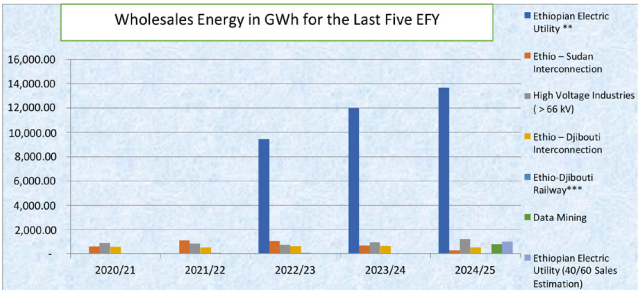
Ethiopia's electricity supply system is managed by the Ethiopian Electric Power (EEP) and the Ethiopian Electric Utility (EEU) which are wholly owned by the Ethiopian Government. EEP is mandated for the generation, transmission and bulk sale of electricity while EEU is mandated for the distribution and retail of electricity to customers nationwide. EEP is sale bulk electricity for local demand (EEU, High voltage industry greater than 66 kV (HV) and Ethio- Djibouti railway (EDR) for export (Djibouti, Sudan and Kenya).

At the end of the 2017 Ethiopian fiscal year, total energy consumption is 26,193.87 GWh. From those energy around 93.08 percent local and remaining for export customers. EEU is EEP´s primary customer that represented 60.57 percent and High voltage customers connected at 132 kV 5.66 percent and Data mining 26.67 percent and Railways at 0.17 percent of total energy consumption. The export customer has Sudan, Kenya and Djibouti with energy consumption of 0.07, 5.06 and 1.8 percent respectively.

Ethiopian Electric Utility (40/60 Sales Estimation) #

Notes: (**) refer to from Hamle up to Tekemt /2014 EFY are not included for EEU others Energy sales (out of Addis Abeba region). (***) refer to for 2019/20 G.C. Ethio-Djibouti Railway data is only for 6 months. (*) refer to starting from November 2022 G.C for Ethio-Kenya. Data mining customer starting from December 2023 G.c and also (#) refer to Ethiopian Electric Utility included 40/60 Sales Estimation and metering problem.

No.	Description	Energy Wholesales (GWh) by G.C.				
		2020/21	2021/22	2022/23	2023/24	2024/25
1	Ethiopian Electric Utility **	-	9,440.61	11,978.62	13,685.01	*15,866.02*
3	High Voltage Industries (> 66 kV)	826.77	741.61	958.94	1,227.22	1,482.28
5	Ethio-Djibouti Railway***	71.78	67.54	42.85	46.26	45.16
4	Ethion – Djibouti Interconnection	527.45	612.47	649.47	527.80	471.41
2	Ethio – Sudan Interconnection	1,109.77	1,052.70	690.17	271.64	17.49
6	Ethio-Kenya*			373.51	980.10	1,324.64
7	Data Mining	-	-	-	796.29	6,986.87
8	Ethiopian Electric Utility (40/60 Sales Estimation) #	-	-	-	1,002.77	
	Total	***2,535.77***	***11,914.93***	***14,693.55***	***18,537.09***	***26,193.87***



GRAND ETHIOPIAN RENAISSANCE DAM (GERD)

GIBE-3 230KV SUBSTATION

KOKA 230KV SUBSTATION

KOYISHA HYDRO-POWER PROJECT

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