

1. Country Assessment Report

Country/Region name:

Ethiopia/Eastern Africa

Ethiopia is the second most populous country in Africa, with a population of 115 million. Despite recent rapid economic growth, the country remains one of the poorest in the region—with an adjusted net national per capita income of \$807 in 2020 ([Adjusted net national income per capita \(current US\\$\) - Ethiopia | Data \(worldbank.org\)](#)). Ethiopia has often served as an anchor state in the region and is host to the African Union. Yet its modern history has also included several ethno-political conflicts, with the most recent war in the Tigray region, which began in late 2020, hindering the country's economic and social development.

The power sector has thus been slow to develop, with one of the lowest per capita annual energy consumption rates at 95 kWh of electricity in 2020 ([Ethiopia Energy Information | Enerdata](#)). According to the Government of Ethiopia's recently launched National Electrification Program (NEP), 44% of the country has access to electricity (33% on-grid, 11% off-grid) while more than 90% of households are reliant on biomass fuels for cooking (World Bank, 2018).

Generation and demand: (type, MW, TWh)

Despite low connectivity rates, Ethiopia's power system is considered to be relatively large compared to regional neighbors, mostly thanks to the abundance of hydropower sources for electricity production. The country currently has approximately 4,500 MW of installed generation capacity and under recent government policy, the state utility Ethiopian Electric Power (EEP), estimates total installed generation capacity to increase to 10,358 MW by 2022 ([Ethiopia - Energy \(trade.gov\)](#)) mostly through the increasing operationalization of the Grand Ethiopian Renaissance Dam (GERD) that will add 5,150 MW of energy to the country's energy capacity when fully operational. In addition to this, EEP currently maintains 14 hydropower and three wind power plants throughout the country.

Hydropower makes up 95% of Ethiopia's current installed generation capacity—with the remaining 8% and 2% from wind and thermal sources, respectively ([Hailu and Kumsa, 2020](#)). However, the hydro systems have been severely affected by drought, and the government is planning to diversify the generation mix with other renewable sources.

Despite Ethiopia's energy potential, the country is experiencing energy shortages and load shedding as it struggles to serve its population and meet growing electricity demand that is forecast to grow by approximately 30% per year.

RE Market Potential:

95% of electricity generation in Ethiopia comes from hydropower. By the year 2030, the Government aims to increase generating capacity by 25 GW, of which 22 GW will be from hydropower, 1 GW of geothermal, 2 GW of wind. ([Ethiopia Energy Outlook – Analysis - IEA](#))

Energy resources are estimated to be underexploited, and the country has ample renewable energy sources to meet government ambitions of nationwide electrification. The International Trade Administration estimates that Ethiopia has the potential to generate over 60 GW of electric power from renewable sources. The estimated potential for exploitation of hydropower is 45 GW, wind is 10 GW, geothermal is 5 GW, and solar irradiation ranges from 4.5 kWh/m²/day to 7.5 kWh/m²/day ([Hailu and Kumsa, 2020](#)).

There are several renewable projects currently under construction by the Ethiopian government, under its initiative to add 10 GW of hydro and 3 GW of other renewables by 2020. Although delayed, the Grand Ethiopia Renaissance Dam (GERD) is nearing completion (as of May 2022) and will produce 5.15 GW once filled to capacity, though its construction and filling has raised concerns among Nile Basin countries, particularly Egypt. Additionally, the government is working with the private sector to implement geothermal projects in Corbetti and Tulu Moye, each generating 150 MW, with total investment at approximately \$1.2 billion. ([ITA](#))

In 2016, Ethiopia launched the first tender to build and operate a 100 MW solar PV project. It did this again in 2019, when the tender for the first two 125 MW Scaling Solar projects were awarded to private investors. However, in May 2022, the bidder withdrew from the negotiations, signaling the difficulties of independent power producers to operate in the country ([DICHE TO and GAD Solar Projects Terminated - Business Info Ethiopia](#))

In the off-grid space, the Government of Ethiopia and the Ministry of Water and Energy are increasingly opening up the market to private mini-grid developers and solar kits distributors. For instance, in early 2021, the Petroleum and Energy Authority (PEA) of Ethiopia issued Directive No. 268/2020, also known as “the mini-grid directive” with the aim to regulate and facilitate the market entry of mini-grid developers in Ethiopia (www.eea.gov.et/media/attachments/Licensing and Economic regulation/Mini Grid Directive.pdf). The sector, however, remains constrained by the scarcity of FOREX on the market, which constrains import of components.

Electrical interconnection and import/export:

Ethiopia is a net importer of energy, mostly fossil fuels. The country, however, aims to increase its electricity exports in neighboring countries as a result of large infrastructural hydropower investments—which would make it a net energy exporter in the next decade. Currently Ethiopia has electricity export interconnections with Djibouti, Kenya and Sudan and plans to also include South Sudan, all of which are currently being strengthened as a result of increasing available capacity. Electricity exports to Djibouti and Sudan are up to 100 MW each, and there is a plan to increase exports to Djibouti and Kenya up to 400 MW. ([ITA](#))

According to the IEA, as of 2017, the government of Ethiopia has a target to reinforce 63 existing substations, build 114 new transmission substations, and add 13,540km of new transmission lines. The ITA has more recently estimated that by the end of 2022, the total transmission line length in Ethiopia will reach 21,448 km. ([ITA](#))

Historical support or development of renewables in the country/region:

Since the National Energy Policy of 2013, the power sector has been undergoing a slow, yet steady liberalization process built around the promotion of renewable energy solutions, both on- and off-grid. All ongoing PPA discussions are for renewable energy-based plants, and mini-grid projects need to guarantee a high renewable energy fraction to be licensed.

So far, most investment from the Ethiopian government has been into the reinforcement of hydro-electric projects. Diversifying the renewable sector has been a relatively recent objective, as higher frequencies of drought in the region will prevent maximizing hydro potential. The government has recently signed PPAs with private developers for the construction of solar and geothermal plants respectively.

Electricity market structure:

The energy sector in Ethiopia is governed by the Energy Proclamation No. 810-2013 (Energy Proclamation) (as amended) and the Energy Regulation No. 447/2019 (Energy Regulation). The Energy Proclamation and Energy Regulation provide the regulatory framework for the generation, transmission, and distribution of energy for both on-grid and off-grid energy including hydropower, solar, wind, geothermal and biomass.

As a matter of policy, the transmission and distribution of energy through the integrated national grid is an activity reserved for the government of Ethiopia. Whereas generation of electricity is open for the private sector. The government handles transmission and distribution network through the two public enterprises i.e., the Ethiopian Electric Power (EEP) which is responsible for generation and transmission of power through the national grid and the Ethiopian Electric Utility (EEU) which handles distribution and retail to end customers.

The Petroleum and Energy Authority (PEA) of Ethiopia acts as regulator, mostly focused on IPPs, both on- and off-grid, and mini-grid developers, as well as the import and distribution of petroleum products in the country.

The government acknowledges a lack of privately funded energy projects (IPPs), and recognizes that partnership with the private sector is critical for sustainable development. Going forward, the EEP will step back from investing in new projects, and instead prioritize existing infrastructure. The aim is to create room for private investment, but engagement is hindered by a fairly fragile business environment.

Description of renewables support mechanism:

The Government of Ethiopia has a strong set of policies in support of renewable energy, especially in the off-grid space, which is also reflected in conducive fiscal environments. The Investment Proclamation and Investment Regulation offers several tax initiatives for private investors:

- Income tax exemption for mini-grid developers: under the Investment Regulation, income tax exemptions ranging from 1 to 10 years are available for investors, depending on the type of project and the location of investment. The exemption can apply for new enterprises or to enterprises expanding or upgrading their investment. Additional exemption applies for investors exporting at least 60% of

their products or services. The generation, transmission and distribution of electricity is eligible for a four-year income tax holiday for projects located in Addis Ababa or surrounding cities. If the investment is outside of Addis Ababa, a five-year income tax exemption applies.

- VAT exemption for retail of electricity for mini-grid developers: retail of off-grid electricity is exempted from VAT
- Loss carry forward: an investor who has incurred loss within the income tax exemption period will be allowed to carry forward such losses for half of the income tax exemption period after the expiry of such period.
- Exemptions from customs duty on capital goods: the Investment Regulation provides that investors are entitled to import capital goods and construction materials relevant for the establishment and/or expansion of their enterprise free of customs duty.
- Exemptions from customs duty on solar equipment: Solar equipment is exempted from duty, excise and surcharge tax. However, solar panels are not exempted from value added tax. (VAT). VAT is applicable at a rate of 15%.

Responsible government department: (include key contacts)

The Ethiopian Electric Power Corporation (EEP) is responsible for generation and transmission, currently owning most of the existing power plants and transmission structures in Ethiopia. The EEP also holds the power to lease transmission lines and sell bulk electric power.

However, the Ethiopian Electric Utility (EEU) is responsible for distribution infrastructure in the country, by purchasing electricity from the EEP to distribute to consumers for sale.

The Ethiopian Petroleum and Energy Authority (PEA) is responsible for regulation in the power and petroleum sector. The agency is currently under restructuring.

All three agencies report to the Ministry of Water and Electricity (MoWE), which is responsible for developing water and electricity resources in the country. The Ministry also manages the Rural Electrification Fund.

Existing/Planned energy legislation: (is there a CPO)

Passed in 2018, the Public-Private Partnership Proclamation No. 1076 aims to facilitate private investment into major infrastructure works, especially in the power sector. This policy aims to expand participation in the areas formerly monopolized by the EEU and EEP.

Adopted in 2010, the Growth and Transformation Plan (GTP) was a five-year development plan to improve the country's economic well-being. The government revised this plan in 2015 and adopted the GTP 2.0 to objectives for increasing energy generation from 2015-2020, setting renewable targets to promote development of sustainable energy generation and achieve universal electricity access, turning Ethiopia into an electricity export hub for the Eastern African Power Pool (GTP II). Under Phase II

of the GTP, the government is expected to cover 2021-2025, and plans to increase installed generation capacity by an additional 5.15 GW by 2022. ([UN](#))

Additionally, in 2015, the World Bank's Energy Sector Management Assistance Program funded a four-year engagement to assist the government with identifying key sector reforms, with a focus on electricity access. The National Electrification Strategy (NES) was adopted through this partnership, creating the National Electrification Program (NEP) in 2017 to rapidly increase connectivity with on-the-ground tactics and actions. In the first iteration, the NEP included a grid connection program to increase connectivity nearly five-fold to 65%. To implement the objectives outlined in the NES, the NEP was relaunched as NEP 2.0 in 2019—establishing an off-grid access program targeted at the remaining 35% of the population with long-term solutions. NEP 2.0 aims to establish 8.2 million new grid connections by 2025, with an additional 6 million Ethiopians gaining access to off-grid solutions. The program is expected to cost nearly 6 billion USD, through financing in direct investments and technical assistance. ([World Bank](#)) The framework also includes specific provisions for the involvement of IPPs and cooperatives in electricity transmission through public funding (NEP 2.0).

At the time this report was written, the Government of Ethiopia was designing a new development strategy which should also affect the energy sector.

Environmental legislation for RE:

Regulation of the electricity sector is a recent phenomenon, as private investment has only recently been authorized in the country. There have been a number of proclamations and financial incentives regarding the development of renewable energy since 2013, as it has been named a 'priority sector' for the Growth and Transformation Plan 2.0 (GTP).

Within the GTP, a main objective is to increase generation capacity mainly through hydro power projects. GTP 2.0 also seeks to increase investment into solar generation through the promotion of solar lanterns, household, and institutional solar PVs. (GTP II)

In the National Energy Policy (2nd Draft) of 2013, the Ministry of Water, Irrigation, and Electricity outlined a plan to diversify the energy sector by pursuing all exploitable renewable energy sources. As referenced above, the key objective of this policy is to ensure sustainable energy access for all, and the policy heavily emphasizes renewable energy as critical to the energy development of the country. More specifically, the policy recommends the promotion of decentralized energy sources in rural areas, based on renewable sources, and additionally encourages the participation of the private sector in renewable development ([Hailu and Kumsa](#)).

More broadly, the Climate Resilient Green Economy Strategy outlines the direction for the other policy documents, describing a modern Ethiopia that will be carbon neutral by 2030. The estimated cost is 150 billion USD, and sets climate adaptation and mitigation objectives for environmental regulation and investing in clean, renewable power ([UNFCCC](#)).

The National Electrification Program 2.0 (2019) references plans to increase electricity supply through new hydropower, geothermal, solar, and wind power plants; but does not include specific action plans for investment (NEP 2.0).

More specifically, the Geothermal Development Proclamation No. 981/2016 outlines a framework for how geothermal resources are developed. After obtaining a geothermal license from the EEA, the project is allowed to import into Ethiopia duty and tax free.

Finally, Environmental and Social Impact Assessments are required for any infrastructural investment, including those that are renewable energy-based.

Existing/Planned energy certificate systems: (purpose, extent)

Currently, there are no existing energy certificate systems in Ethiopia. Energy Peace Partners is proposing to issue Peace Renewable Energy Credits (P- RECs), which are designed to stimulate renewable energy market development in fragile and energy poor regions. P-RECs would monetize renewable energy generated from qualified projects in Ethiopia, where renewable energy investment is limited, to help renewable energy developers implement new projects or extend existing projects. This would support market development and expand renewable energy purchase options in a country and region with limited infrastructure, while extending the benefits of renewable energy to some of the most vulnerable communities.

Extent of engagement with government:

The Government plays a key role in the promotion and control of any private sector-initiative, including renewable energy infrastructures. Mercy Corps and its local subsidiary Humanitarian Energy (HumEn), are partners of EPP on this initiative, is actively engaged with the Ministry of Energy and the regulator for the deployment of its projects. A letter of support for the introduction of renewable energy credits in Ethiopia has recently been granted.

Response from Government in relation to attribute tracking systems:

Ethiopia has identified a carbon trading scheme under the Ethiopian Climate Resilient Green Economy Strategy (“CRGE”), where a carbon market is one of the prioritized green economic initiatives and a recognized climate finance mechanism. Further, the FDRE Updated Nationally Determined Contribution (2021) demonstrates Ethiopia’s strong desire to participate in carbon market opportunities offered through the Paris Agreement. It lists activities that will be undertaken as part of developing Ethiopia’s carbon market opportunities, including cooperating with interested parties and working towards bilateral agreements, as well as engaging in a new multilateral mechanism. While the policy framework exists, there is a gap in the legal and institutional framework for implementation of the Paris Agreement. Currently there is no legal framework or guideline regarding carbon trading or renewable energy credits in Ethiopia. Ethiopia had been engaged in the CDM as per the Kyoto Protocol for several years, but as the Kyoto Protocol expired in 2020, the Authority is currently preparing a legal framework and a guideline to support the implementation and enforcement of the Paris Agreement. The issue of Carbon Trading or other forms of credits such as renewable energy credits is expected to be dealt with when the legal framework is introduced. Except for the

international agreement concluded and ratified by Ethiopia and the policy framework outlined above, there is no domestic legal framework specifically addressing carbon trading. Consequently, there are no licensing or permit requirements to engage in carbon trading from Ethiopian based projects.

Demand-side market potential or strategic nature of market development:

As Ethiopia is increasingly improving the electricity market environment for both i) private sector involvement and ii) increased penetration of renewable energy, various initiatives and players are exploring market entrance, with some successful results. This also includes donor-based initiatives aimed at de-risking the sector for first entrants.

Analysis of political disruptions or market risks:

The business environment is moderately conducive for new initiatives, but with a steady and positive outlook as new pieces of legislation are implemented. Notably, difficult access to FOREX and competition with low national tariffs are among the main challenges.

The broader current political situation remains unstable and fragile, albeit improving compared to 2021 when the Tigray conflict was more active.

Analysis of regulatory risks including linkages with carbon markets and support systems:

At present, export of environmental attributes is subjected to a retention of 80% of revenues which is immediately converted in local currency by the national bank of Ethiopia, and this hinders private sector interest in their issuance. It is however expected that the new legal framework currently under preparation might address this and other issues related to the sector in general.

Current environmental reporting in energy:

As there is no current mechanism in place for attribute tracking systems, the environmental reporting will be directly from the Ministry of Water and Energy (MoWE).

Mechanisms in place to support the reliable verification and issuance of I-RECs:

Not available

Local organizations of importance and their opinion on local I-REC market development:

Seeking to provide sustainable energy services to the developing world, the private limited company Humanitarian Energy PLC is seeking to partner with the Energy Peace Partners to have Ethiopia become an I-REC issuing country and introduce Peace Renewable Energy Credits to Ethiopia to support solutions serving refugee and host communities in border areas of Ethiopia, as well as humanitarian agencies and operations - such as UN compounds and water distribution systems respectively, through mini-grids and systems for captive use.

Any other relevant information:

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