

# ETHIO-SPOTLIGHT<sup>1</sup>

## ISSUE 3: REFORMING THE POWER SECTOR

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### 1. Background to the Power Sector Reform

Ethiopia's debt infrastructure deficit remains one of the largest in the world, despite the fact that it has in the last 15 years or so achieved substantial progress in promoting economic, social, and human development. Growth has averaged nearly 10 percent per year since 2004, making Ethiopia one of the fastest-growing economies in the region. Notably, this robust growth was driven by large-scale public investment in the key sectors, including infrastructure and energy, and was made possible by favourable commodity prices and international debt-relief efforts in the mid-2000s.

#### a) Electricity sector context

The Government of Ethiopia, under its development manifesto i.e. the Growth and Transformation Plan (GTP), envisions transitioning from a developing country to a lower-middle-income country by 2025. However, its ability to achieve this ambitious goal in key sectors, such as agriculture and industry, is significantly constrained by the current challenges in the power sector. As is, the current installed generation capacity of 4,200 MW, sourced almost entirely from hydro sources, is drought-prone and inadequate to serve the population which is approximated at over 110 million people.<sup>4</sup> The targets for progressively increasing generation capacity to 35,000 MW by 2037 (with the forecasted total installed generation capacity by 2022 being 10358 MW) would help sustain

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<sup>1</sup>Ethio-Spotlight is a free 6-part (initially) series on topics that we as authors and in-country Fellows observe are of interest to the regional and international community. These articles are published with a view to collate and transmit information that may spark further engagement with our host-country and with the Oxford Policy Fellowship

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<sup>4</sup> 'Ethiopia - The World Factbook' (*Cia.gov*, 2021) <<https://www.cia.gov/the-world-factbook/countries/ethiopia/>> accessed 6 April 2021

Ethiopia's continued economic growth, and establish it as a regional renewable energy hub in East Africa.<sup>5</sup> To meet this objective, the government has determined that private sector investment is critical to achieve these aggressive power generation targets, and simultaneously acknowledges that it faces significant challenges. These challenges include- a) Providing quality service to its current and projected future customers; b) Maintaining meaningful improvement in the energy mix in order to prevent over-reliance on hydro sources which are particularly vulnerable to climate change constraints; c) Maintaining strong credit-worthy utilities that can finance investment; d) Establishing a strong, fully-fledged and independent regulatory body; capacity building both at the human and institutional level towards meaningful engagement with Independent Power Projects (IPPs); e) the need to rehabilitate, expand and subsequently maintain the country's aged transmission and distribution system; f) the need to ensure more efficiency in service delivery and in the operation of the system; g) improving the financial well-being of the sector in order that it may become a creditworthy purchaser of electricity from IPPs; h) facilitate the entry and competitive operation of IPPs within the market; i) address foreign exchange constraints, and j) addressing reform tariffs to allow for full-cost recovery all of which when appropriately mitigated contribute towards the delivery of power to the majority of the Ethiopian population living off-grid.<sup>6</sup>

Although Ethiopia's power sector faces these and other challenges, its electrification rate is at odds with its considerable renewable energy resources. With this reality in mind, the government of Ethiopia launched the Universal Electricity Access Program (UEAP) in 2005, the First National Electrification Program (NEP) in 2017 and the updated National Electrification Program (NEP 2) in 2019. Under these three ambitious programs, led by the line ministry – MOWIE<sup>7</sup> - huge milestones in the energy sector have been delivered thus far. These include: - bringing the national electricity access rate up from less than 10% in 2005 to the current 44% by utilizing both on-grid and off-grid solutions, the ongoing work with respect to mega projects like the Grand Ethiopian Renaissance Dam and Koysa Hydro Power Plant which will increase the installed power generation capacity, undertaking the integration of the grid and off-grid electricity access, and providing an implementation framework for the achievement of 35% of off-grid access<sup>8</sup> by 2025. There has also been substantial progress which has been made in terms of engagement of the private sector through the establishment of Public-Private Partnerships (PPPs) for the

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<sup>5</sup> 'Ethiopia - Energy' (*International Trade Administration | Trade.gov*, 2020) <<https://www.trade.gov/knowledge-product/ethiopia-energy>> accessed 6 April 2021

<sup>6</sup> 'Power Africa In Ethiopia' (*Usaid.gov*, 2016) <[https://www.usaid.gov/sites/default/files/documents/1860/Ethiopia%20Country%20Fact%20Sheet\\_0.pdf](https://www.usaid.gov/sites/default/files/documents/1860/Ethiopia%20Country%20Fact%20Sheet_0.pdf)> accessed 6 April 2021

<sup>7</sup>The Ministry of Water Irrigation and Energy - MOWIE – is a federal organization established to undertake the management of water resources, water supply and sanitation, large and medium scale irrigation and energy resources. Its responsibilities fall into 3 main categories including: --

- a) Resource assessment and development - R & D;
- b) preparation and implementation of guidelines, strategies, policies, programs, and sectoral laws and regulations; and
- c) supervising its utilities including the Ethiopian Energy Authority (Regulator), the Ethiopian Electric Power company which is responsible for generation, transmission, and substation construction and operation, and the Ethiopian Electric Utility company which is responsible for distribution network construction and operation and energy retail

source - 'About Us - Ministry of Water, Irrigation And Electricity' (*Mowie.gov.et*) <<http://mowie.gov.et/about-the-ministry>> accessed 6 April 2021

<sup>8</sup>Through stand-alone solar solutions and mini-grids technologies

transformation of energy project financing and implementation with the result that future power generation projects will be developed by private Independent Power Producers (IPPs) while the public sector will focus on regulatory and off-taker roles.

### **b) Economic justification for undertaking the power sector reform**

Continued reliance on publicly-financed investments has pushed the state-owned power utilities to their financial limits. Electricity infrastructure development has up until now, with the enactment and adoption of the PPP Proclamation 2018<sup>9</sup>, been centrally planned and publicly financed. This further exacerbated financial difficulties as a result of two interrelated financial challenges: - (i) an eroding revenue base due to low consumer tariffs; and (ii) overreliance on short-term debt to finance long-term infrastructure, much of which was only partially commercial in nature (e.g., investments in electrification, or hydropower dams of strategic national interest).

The traditional model of public financing new investments in the power sector combined with exceptionally low tariffs has had a significant and adverse impact on the financial soundness of the power sector. Public borrowing by the utilities over the past decade has created a growing debt service obligation. Simultaneously, demand for electricity is growing at 30% per year in Ethiopia and power sector reform needs to deliver expansion because electricity is a key factor of production – the economy cannot grow without it. In almost all instances there are significant advantages to bringing private investment into the power sector. Such advantages include importing foreign know-how and technology, driving down costs as private owner-operators respond to incentives in supply contracts, and to remove investment risk from the government balance.

There are further macroeconomic reasons why it will not be possible for the government of Ethiopia to continue to finance all the necessary investment, making an alternative solution vital. As has already been mentioned, the last 15 years of growth in Ethiopia have been fuelled by heavy public investment financed by foreign and domestic borrowing – the government had reached the limit of this strategy in 2019, even before the COVID 19 pandemic added additional strain on government resources. Whilst the economy should recover pre-COVID growth rates in 2021/22, the crisis has pushed Ethiopia close to debt distress and increases the urgency of bringing down foreign financed public investment in infrastructure. In the power sector, these costs are enormous. Each gigawatt of capacity costs over a billion dollars to install, more-so for renewables - for example, the cost of construction of the Grand Ethiopian Renaissance Dam (GERD) – which will be the largest hydropower facility in Africa with a capacity of about 6,000 MW, nearly triple the country's current electricity generation capacity and represent a potential economic windfall for the government - is estimated at approximately US\$5 billion.<sup>10</sup> With respect to dedicated funding for off-grid renewable energy, the World Bank Electricity Network Rehabilitation and Enhancement Project (ENREP) in collaboration with the Development Bank of Ethiopia, the World Bank Electricity Network Rehabilitation and Enhancement Project (ENREP) established the financing facility in 2013 with US\$20 million and has since doubled the credit line to US\$40 million. The financing facility complements electricity grid connection programs, providing retailers credit to import and assemble renewable energy products and microfinance institutions

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<sup>9</sup> Discussed more in Ethio-Spotlight Issue 1

<sup>10</sup> 'Downstream Costs of The Grand Ethiopian Renaissance Dam - ISS Africa' (*ISS Africa*) <<https://issafrica.org/amp/iss-today/downstream-costs-of-the-grand-ethiopian-renaissance-dam>> accessed 6 April 2021

with funding to disperse loans to families to purchase and install these products.<sup>11</sup> With respect to the development of renewable energy options outside of hydropower, the US\$200 million Renewable Energy Guarantees Program (REGREP) will see the World Bank support the Government's ongoing power sector reforms and leverage private sector financing for the development of over 1,000 MW of solar and wind energy.<sup>12</sup> Demand might require over US\$60 billion of capacity in the next ten years – which is close to Ethiopia's total stock of public debt in 2020.

The ambition of Ethiopia's power sector reform runs ahead of the basic micro and macro-objectives because the longer-term goal is to create a competitive market for power generation alongside a state-owned transmission and distribution system. This could generate great value for both industry and households. It is far-sighted to be working towards this goal when generation is still largely dominated by the state sector, but it is wise because if generation continues to expand at 30% per year for a decade, then within a decade, it is expected that IPPs will dominate generation while leveraging the diverse energy mix. For example, ACWA Power, a leading international developer and operator of power generation and water desalination projects, signed two long-term power purchase agreements (PPA) with Ethiopia's state-owned electricity producer Ethiopian Electric Power (EEP) for two 125 MWac solar photovoltaic (PV) projects at USD 2.526 cents/kWh over 20 years. Located in Dicheto in the Afar region and Gad in the Somali region, the projects are characterized as one of the lowest-tariff projects in Africa and a combined capacity of 250 MWac. With an investment valued together at approximately USD\$300<sup>13</sup>, the PV projects are estimated to eventually power 750,000 homes in Ethiopia and offset 320,000 tonnes of carbon dioxide per year.<sup>14</sup> ACWA Power won the bid for the two PV plants during the first round of Ethiopia's solar programme organised by the PPP-DG under the new PPP law, and signed a Letter of Intent with the Ministry of Finance and EEP in October 2019.<sup>15</sup>

## 2. Overview of the Power Sector Reform Plan

In order to address the various challenges that the power sector is riddled with, the government in partnership with the World Bank launched the Ethiopian Power Sector Reform program to be implemented within the five-year period between 2020 and 2025. This power sector reform encompasses - (1) Increasing the Financial stability of the power sector in Ethiopia i.e. tariff reforms aiming at achieving cost recovery in the medium term as well as restructuring of the power

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<sup>11</sup> 'ESMAP IMPACT - ETHIOPIA'S ENERGY SECTOR TRANSFORMATION' (*Documents1.worldbank.org*, 2019) <<http://documents1.worldbank.org/curated/en/249971573762529445/pdf/Ethiopias-Energy-Sector-Transformation.pdf>> accessed 6 April 2021

<sup>12</sup>'ESMAP IMPACT - ETHIOPIA'S ENERGY SECTOR TRANSFORMATION' (*Documents1.worldbank.org*, 2019) <<http://documents1.worldbank.org/curated/en/249971573762529445/pdf/Ethiopias-Energy-Sector-Transformation.pdf>> accessed 6 April 2021

<sup>13</sup> 'ETHIOPIA: ACWA Power Secures Gad and Dicheto Solar Power Plants Contract | Afrik 21' (*afrik21.africa*, 2019) <<https://www.afrik21.africa/en/ethiopia-acwa-power-secures-gad-and-dicheto-solar-power-plants-contract/>> accessed 7 April 2021

<sup>14</sup> 'Ethiopia - Energy' (*International Trade Administration | Trade.gov*, 2020) <<https://www.trade.gov/knowledge-product/ethiopia-energy>> accessed 6 April 2021

<sup>15</sup> 'ACWA Power to Drive Solar Energy Development in Ethiopia' (*acwapower.com*, 2019) <<https://www.acwapower.com/news/acwa-power-to-drive-solar-energy-development-in-ethiopia/>> accessed 6 April 2021

sector utilities' existing debt obligations; (2) Sector Restructuring toward the unbundling of sector institutions and privatization of selected generation assets (3) Legal and Regulatory Framework and Governance Strengthening and (4) Introducing measures to improve the operational efficiency, service delivery, and customer service of the utilities.

In the sections that follow, we examine the current power sector legal framework and policies, key institutions in the power sector and lastly this issue will focus, in particular, on the principles informing regulatory framework strengthening as well as the regulations that should be promulgated to address the current challenges in the power sector.

### **3. The Power sector Legal Framework and Relevant Policies**

The Ethiopian power sector legal framework is comprised of various energy sector laws<sup>16</sup>, and to that extent the Energy proclamations are the standard legal framework governing the power sector in Ethiopia. In particular, the Energy Proclamation (2013)<sup>17</sup> unbundled the vertically integrated Ethiopian Power Corporation (EEP Co) into the Ethiopian Electric Power (EEU) and the Ethiopian Electric Utility. Regulatory improvements that covered tariff reforms to improve cost recovery and reconstituted the Ethiopian Energy Authority (EEA) with an expanded mandate to set tariffs and efficiency standards, as well as monitoring compliance with sector regulations, were also introduced into the legal framework in 2013.<sup>18</sup> The Energy Proclamation (as amended in 2018) contains provisions regulating the energy generation and distribution sector, including licensing requirements, energy efficiency and conservation activities, electricity supply activities, land use for electrical supply activities and criminal penalties for energy efficiency and licensing related offences.<sup>19</sup>

Other laws that are relevant to the power sector include the Public Private Partnership (PPP) Proclamation<sup>20</sup>, passed by the Government of Ethiopia in 2018, which is a key legislation to allow greater private participation in power and other sectors through competitive bidding, and a new Investment proclamation<sup>21</sup>, passed in 2020, to encourage foreign direct investment in key sectors of the economy including the energy sector. The Government of Ethiopia<sup>22</sup>, has also issued policies, strategies and strategic plans that inform the development of the power sector.<sup>23</sup> The regulatory framework includes the Licensing regime, technical codes, performance standards and tariff regulations.<sup>24</sup>

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<sup>16</sup> Including the Energy Proclamation No. 810/2013, Energy Proclamation amendment 2018, Geothermal Proclamation No. 981/2016 and geothermal amendment Proclamation No. 1204/2020,

<sup>17</sup> No. 810/2013

<sup>18</sup> Established in 2013

<sup>19</sup> The council of ministers is empowered in the Proclamation to issue directives to implement the proclamation which include the National Grid Electricity Supply Licensing Directive 007/2012, Directive for Electricity tariff setting Methodology and Guideline No. 008/2012, Quality of services for Grid Supply Directive (2019), Energy Service Providers Licensing Directive No. 006/2020, and the Mini Grid Directive No.268/2020.

<sup>20</sup> No. 1076/2018

<sup>21</sup> No. 1180/2020

<sup>22</sup> Through Ministry of Water Irrigation and Energy

<sup>23</sup> The issued policies include the Energy Policy (1994), and the Revised National Energy Policy (2019); the policies establish the goals and general arrangement of the sector and details are left to the regulations.

<sup>24</sup> The Energy Regulation No. 447/2019, supplements the Energy Proclamation. It regulates the consent and permit procedures for generation, transmission and distribution licenses, and provides guiding principles on tariffs. It is worth highlighting here that the Ethiopian power sector has an operational framework consisting of least cost expansion planning, transmission, system operation and market operation. The sector contractual framework includes power

The power sector reform plan proposes a legal framework that enhances and advances further power sector reform towards effective competition, reliable quality services and sustainability of the sector.<sup>25</sup>

#### **4. Key Institutions in the Ethiopian Power Sector**

The key institutions in the power sector include the Council of Ministers that makes legislative decisions on legislative and regulatory matters and MOWIE that manages most strategic and investment aspects of the sector. The legal framework re-established the Ethiopian Energy Authority (EEA)<sup>26</sup> as the regulatory entity that would oversee the energy sector. Under the oversight of EEA, there are two entities namely Ethiopian Electric Power<sup>27</sup> (EEP) and the Ethiopian Electric Utility<sup>28</sup> (EEU). EEP is responsible for the upstream functions of generation and transmission and is also responsible for the universal electricity access program. EEP is also simultaneously mandated to increase grid connectivity, and to promote private sector participation in electrification. EEU, on the other hand, is responsible for power distribution, sales and customer service. It is worth mentioning here that a key requirement for power sector reform success with private sector participation is the commercialization or privatization of the state owned EEP and EEU. This is because privatization would separate the Government of Ethiopia's role as both political representative and owner of the power entities.

The power sector reform plan proposes institutional reforms that include clarifying the roles of agencies across the sector to address overlaps in mandate, and strengthening the role of EEA, as the sector regulator, which will require more delegation of powers and responsibilities to the EEA through legislation, as well as providing the EEA with financial and operational independence.

#### **5. Principles informing regulatory framework strengthening**

A strong regulatory framework is important because it establishes mechanisms, procedures, standards and processes for each power sector institution, and will facilitate institutional functioning within the legal framework, as well as introduce energy policies to ensure that activities within the power sector deliver the required results and services. The main principles<sup>29</sup> informing the power sector regulatory framework strengthening are; (i) Ensuring that each instrument in the regulatory framework is consistent and harmonized to make certain that sector goals (including sector sustainability, improved efficiency or service and increase in private sector participation) are harmonized; (ii) the framework should establish standard procedures and methodologies to ensure a consistent approach; (iii) The framework should avoid gaps or language that allows conflicting and arbitrary interpretation to ensure there is clarity, feasibility and completeness. In this regard, it should include clear rationale, reasonable procedures and processes for non-discriminatory services and decisions. (iv) once approved, the regulation must be consistently applied without delays in enforcing standards or commitments or application of

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purchase agreements, transmission service agreements and other sector contractual arrangements. Other sector relevant regulations are the geothermal regulations.

<sup>25</sup> Ministry of Water Irrigation and Energy, Ethiopia Power Sector reform –Proposed roadmap, January 2020.

<sup>26</sup> See Proclamation No. 308/2013 establishing the EEA

<sup>27</sup> See Ethiopian Electric Power Establishment Regulation No. 308/2014 and the Ethiopian Electric Power Establishment Amendment 381/2016.

<sup>28</sup> See Ethiopian Electric Utility establishment Regulation No.303/2013.

<sup>29</sup> Ministry of Water Irrigation and Energy, Ethiopia Power Sector reform –Proposed roadmap, January 2020.

periodic reviews; and lastly (v) the regulation drafting process should include credible consultation and a participatory approach.

## **6. What regulations should be promulgated to address the current power sector challenges?**

The following critical regulations should be promulgated to address the current concerns and challenges in the power sector<sup>30</sup>;

- (i) Tariff regulations and guidelines should be introduced to address challenges in cost recovery and efficient tariff setting.
- (ii) Properly articulated, specific and market related regulations should be introduced to address challenges of accessibility of the wholesale market to all participants, access of different generation technologies, and integration of renewable energy sources and mini grids.
- (iii) The grid code should be harmonized with the regional grid code to foster transparency, efficiency and non-discrimination in operational planning, generation scheduling and dispatch in real time operation and reliability of the electricity system.
- (iv) A distribution code should be established to enable enhanced performance of distribution companies to tackle amongst other challenges the efficiency and quality of services and loss reduction plans.
- (v) Regulations, guidelines and procedures for power procurement (including new power procurement models such as competitive procurement) should be introduced to meet the challenge of meeting consumer demands in the most cost-effective manner.

## **Conclusion**

The challenges faced by the Ethiopian power sector, exacerbated by the COVID 19 pandemic-which has placed additional strain on government resources, have necessitated considerable sector reform. That notwithstanding, huge milestones have been met in the energy sector including bringing the national electricity access rate up by utilizing both on-grid and off-grid solutions, as well as the ongoing work with respect to mega projects which will increase the installed power generation capacity. The establishment of the Public-Private Partnerships framework, which has facilitated the transformation of energy project financing and implementation, has also contributed significantly towards creating a competitive market for power generation. In the long-term, future power generation projects developed by the private sector would, if the sector reform proceeds according to plan, operate alongside a state-owned transmission and distribution system. Furthermore, if promulgated and properly implemented, the identified critical sector regulations will address the existing challenges in the power sector addressing cost recovery and efficient tariff setting, accessibility of the wholesale market to all, efficiency and quality of services, and meeting consumer demands in a cost-effective manner.

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<sup>30</sup> Ibid.