



# Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 14-Aug-2023 | Report No: PIDC32655



**BASIC INFORMATION**

**A. Basic Project Data**

Project Beneficiary(ies) Ethiopia, Ethiopia, Ethiopia	Operation ID P176731	Operation Name Power Sector Reform, Investment and Modernization in Ethiopia (PRIME-1)	
Region EASTERN AND SOUTHERN AFRICA	Estimated Appraisal Date 08-Jan-2024	Estimated Approval Date 06-May-2024	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing (IPF)	Borrower(s) Federal Democratic Republic of Ethiopia	Implementing Agency Ethiopia Electric Power, Ethiopia Electric Utility	

**Proposed Development Objective(s)**

To strengthen and extend the electricity network and enable renewable energy generation.

**PROJECT FINANCING DATA (US\$, Millions)**

**Maximizing Finance for Development**

Is this an MFD-Enabling Project (MFD-EP)? Yes

Is this project Private Capital Enabling (PCE)? Yes

**SUMMARY**

<b>Total Operation Cost</b>	<b>537.00</b>
<b>Total Financing</b>	<b>537.00</b>
<b>of which IBRD/IDA</b>	<b>500.00</b>
<b>Financing Gap</b>	<b>0.00</b>

**DETAILS**

**World Bank Group Financing**

International Development Association (IDA)	500.00
IDA Credit	500.00

**Non-World Bank Group Financing**

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Trust Funds	37.00
Green Climate Fund	37.00

Environmental and Social Risk Classification

Concept Review Decision

High

The review did authorize the preparation to continue

Other Decision (as needed)

### B. Introduction and Context

- The Power Sector Reform, Investment and Modernization in Ethiopia (PRIME) MPA program will support a medium-term transition of the electricity sector towards universal access, reliable supply, utility financial sustainability, increased private investments, and a climate resilient diversified generation mix.** This transition will be underpinned by *structural reforms* that will encompass a gradual segregation of the competitive segments of the sector from the monopolistic segments to enable increased private participation under a competitive market regime. In parallel, the program will pursue *operational reforms* that will enhance utility financial sustainability through timely adjustment of tariffs, greater energy accountability, efficient investment planning, improved collections, reduced losses, and modernization of systems. This medium-term reform transition will be achieved through upfront adoption of a reform mandate by the Government, time-bound reform actions intertwined with investment support, and institutional capacity building to support the preparation and implementation of specific reform actions.
- Using a multi-phase approach, the PRIME program will support investments in expansion and strengthening of the electricity network to facilitate accelerated expansion of electricity access with improved reliability of supply. The program will also enable private sector investments in non-hydro renewable energy generation.** The network strengthening investments under the PRIME will complement investments in last-mile electricity access under the ongoing ‘Ethiopia Electrification Program (ELEAP)’ and ‘Access to Distributed Electricity and Lighting in Ethiopia (ADELE)’ projects, as well as the Ethiopia phase of the upcoming ‘Accelerating Sustainable & Clean Energy Access Transformation in AFE Region MPA’ (ASCENT Ethiopia). Risk mitigation measures to enable private sector investments in non-hydro renewable energy generation will be co-supported by the ongoing Renewable Energy Guarantees Program (REGREP MPA). Together, these interventions will help Ethiopia achieve the triple goals of delivering universal electricity access, energizing faster economic growth, and establishing itself as a regional energy hub.
- The first phase of the PRIME program will improve the reliability and capacity of the electricity network in select towns and mitigate risks for private investments in non-hydro renewable energy through upstream preparation activities, while also establishing the medium-term sector reform trajectory.** PRIME-1 project will improve the reliability and capacity of the electricity network in 72 select towns and augment transmission with 14 new substations and lines, while modernizing some aspects of the electricity systems. Building on the earlier success in geothermal resource establishment through drillings at Aluto Langano, this phase will establish geothermal resources for at least two new locations for subsequent private sector-led development under competitive selection modalities. A Forex Liquidity Support Mechanism (FLSM) will be established at the Ministry of Finance (MoF) to provide an additional buffer in meeting forex obligations towards renewable energy IPPs. Finally, this phase will oversee the adoption and initial implementation of the medium-term reform roadmap through a combination of capacity building and Performance-Based Conditions (PBCs) that will intertwine network investments with specific reform actions.

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## Country Context

4. **Ethiopia remains one of the poorest countries in Africa, with a gross domestic product (GDP) per capita of US\$925<sup>1</sup> in 2021 as poverty and vulnerability are worsened by internal conflict, the COVID-19 pandemic, and natural disasters.** Though Ethiopia has made considerable progress in poverty alleviation as extreme poverty<sup>2</sup> declined from 30.8 percent in 2015 to 25.2 percent in 2020, the continuation of this trend remains uncertain.<sup>3</sup> According to the Macro Poverty Outlook 2022, the poverty trajectory is variable due to various offsetting factors. On one hand, armed conflict, persistent droughts in lowland regions, and rising inflation are expected to have driven many people into poverty. On the other hand, growth in other parts of the country is expected to have reduced poverty. Whether the poverty effect of growth can fully offset the impact of the conflict, droughts and inflation is unclear, but their intensity suggests that progress in poverty reduction will be lower than in previous periods. The magnitude of estimated household income losses in conflict affected woredas suggest the conflict could have pushed as many as three million people into poverty.<sup>4</sup> Additionally, the COVID-19 crisis has highlighted the extent of the country's vulnerability, particularly among poor and urban populations. The Government of Ethiopia (GoE) declared a state of emergency on April 8, 2020. Following that, employment rates plunged in the early days of the pandemic, particularly in urban areas where the rate dropped from 80 percent before COVID-19 to 65 percent, with changes noted more prominently in female-headed households. Estimates suggest that the rate of poverty increased by 33.2 percent in urban areas since 2018/19, compared to an increase of 9.4 percent in rural areas over the same period.<sup>5</sup>

5. **Ethiopia is emerging from one of the most devastating periods of conflict the country has seen in recent years.** According to the Damage Needs Assessment<sup>6</sup>, more than US\$22.6 billion in damages and US\$6 billion in losses had been caused across sectors and regions due to multiple conflicts from November 2020 to December 2021. On November 2, 2022, a peace agreement was reached between the Government of Ethiopia and the regional party of Tigray. Consolidating peace dividends and restoring the legitimacy of the governance system requires improvement in basic service delivery including electricity supply. Accelerated delivery of adequate, affordable, and reliable access to electricity would be vital for enabling structural transformation of Ethiopia's economy and society, which includes reduction of poverty rates, and a shift toward higher productivity and industrialization. Reliable electricity is needed for Ethiopia to develop a domestic manufacturing capacity adequate for local needs and exports, encompassing industrial parks, private sector entrepreneurship, information and communication technology, and financial centers.

6. **An overvalued exchange rate, pervasive regulations, a large state footprint with an overhang from debt-financed SOE investments, and financial repression have resulted in deep structural distortions in the economy.** These distortions have held back productivity and job creation, undermined external competitiveness, and crowded out the private sector. Alongside large, structural current account and trade imbalances, growth has visibly slowed since 2015 to about 6 percent. Amid growing FX shortages and external financing pressures, and with macroeconomic buffers depleted, Ethiopia has requested debt relief in 2021 through the G20 Common Framework. While the Ukraine conflict and high global commodity prices have contributed to sustained inflation over 30 percent over the past year, prices pressures are also increasingly policy driven, reflecting the Government's increasing reliance on the central bank to finance the deficit.<sup>7</sup>

<sup>1</sup> <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ET>

<sup>2</sup> Extreme poverty is measured at the international poverty line of US\$1.9 per day in 2011 purchasing-power-parity terms.

<sup>3</sup> 2015 and 2020 poverty rates based on the datasheet of the Macro Poverty Outlook, 2022, World Bank

<sup>4</sup> Ethiopia Resilient Recovery and Planning Framework (ERRRF. Volume B), January 2023

<sup>5</sup> Wieser et al. 2021 and Ambel et al. 2021 and World Bank estimates based on the High-Frequency Phone survey (HFPS) of households

<sup>6</sup> Damage Needs Assessment (Volume A), December 2022. The GoE, with the support of the World Bank and development partners, conducted a damage needs assessment to provide a comprehensive inventory of damage, losses, and needs resulting from the recent conflict in the North (including Tigray, Afar, and Amhara) and the spillover pockets of conflicts in parts of Benishangul-Gumuz, Oromia and Konso.

<sup>7</sup> Ethiopian Statistics Service. 2022. Monthly report for March. URL: <http://www.statsethiopia.gov.et/>



7. **Ethiopia aims to become ‘Africa’s Beacon of Prosperity’ by improving income levels, raising the standard of living, and upholding social dignity and freedom according to its 10-Year Development Plan (2021 – 2030).** The 10-Year Development Plan (2021 - 2030), based on the 2019 Homegrown Economic Reform Agenda (which will be followed by the Second Homegrown Economic Reform Agenda), aims to sustain the remarkable growth achieved under the previous Growth and Transformation plans (GTP I and II)<sup>8</sup>. The 10-Year Development Plan places strong emphasis on economic and infrastructure sectors, targeting agriculture, construction, trade, manufacturing, transport, energy, and technology innovation industries. For energy development, the main objectives presented include significantly increasing the electricity customer base by quadrupling it, expanding the coverage of grid-based electricity from around 35 percent to 96 percent, and reducing electricity losses by half. The overall focus of the energy development strategy is to expand high quality energy infrastructure and provide electricity access that is equitable, affordable, and reliable.

8. **Integrating climate resilience into development planning is imperative for Ethiopia, which remains highly vulnerable to river and urban flood, landslide, volcano, extreme heat, and wildfires.**<sup>9</sup> According to data from the International Organization of Migration from December 2022, there are 2.73 million internally displaced people (IDPs) in Ethiopia.<sup>10</sup> Climate-induced displacement has become increasingly prominent in Ethiopia. The cyclic nature of drought conditions in Ethiopia has contributed to a dearth of water resources, deepening food insecurity in the country and in the wider Horn of Africa region. Ethiopia has suffered the worst drought in 40 years which has mainly affected already poor pastoralist communities. As of September 2022, drought was the primary cause of displacement for 18.9 percent of the IDPs concentrated in Somali, Oromia and Afar regions. Floods are another major cause of climate-induced displacement, particularly in low laying areas. The ongoing Climate Change and Development Report (CCDR) will examine the likely climate-induced hydrological variations and extreme weather events, along with the consequent impacts on agriculture, electricity, water, public health, and other sectors. Steps for climate resilience that are likely to be highlighted by the study include the need to diversify electricity generation mix, strengthen grid network infrastructure to absorb higher VRE, and establish cross-border transmission links for electricity trade.

9. **Women and girls are disproportionately affected by the internal conflict in Ethiopia.** The Global Gender Gap report of 2022 ranked Ethiopia 74 out of 146 countries, with an improvement of 23 positions compared to 2021.<sup>11</sup> However, significant and deeply engrained disparities and harmful practices persist in Ethiopia, with four in ten women married before their eighteenth birthday.<sup>12</sup> The COVID-19 pandemic and the recent conflict have threatened the progress made in reducing gender disparities. Girls living in rural, poor and conflict areas or in households with lower levels of education are at a particularly high risk.<sup>13</sup> Gender-based violence (GBV) has escalated due to the conflict. The World Bank research on the gender dimensions of forced displacement shows the employment situation among IDPs is generally worse for women. A survey on IDP in Ethiopia found that 35 percent of women became unemployed due to displacement, compared with 30 percent of men.<sup>14</sup> Humanitarian assessments note the vulnerability of displaced women and children to a wide range of challenges, including food insecurity, loss in livelihoods, increased care

<sup>8</sup> Federal Democratic Republic of Ethiopia Planning and Development Commission (now the Ministry of Planning and Development). 2020. Ten Years Development Plan: A Pathway to Prosperity, 2021-2030. Addis Ababa, Ethiopia.

<sup>9</sup> World Bank. 2022. Think Hazard. Ethiopia. URL: <https://thinkhazard.org/en/report/79-ethiopia>

<sup>10</sup> International Organization of Migration. 2022. Ethiopia National Displacement Report 14 (August – September 2022), published December 2022. URL: <https://dtm.iom.int/reports/ethiopia-national-displacement-report-14-august-september-2022>. Due to operational reasons Tigray isn't included in the national total.

<sup>11</sup> World Economic Forum. 2022. Global Gender Gap Report 2022, published July 13, 2022. URL: [https://www3.weforum.org/docs/WEF\\_GGGR\\_2022.pdf](https://www3.weforum.org/docs/WEF_GGGR_2022.pdf)

<sup>12</sup> Estimates indicate that reducing basic gender inequalities in education and the labor market could increase the annual GDP growth in Ethiopia by around 1.9 percentage points—which would be an important contribution to poverty reduction given the elasticity of growth to poverty reduction. World Bank. 2009. “Ethiopia: Unleashing the Potential of Ethiopian Women – Trends and Options for Economic Empowerment.”.

<sup>13</sup> United Nations Children’s Fund, Ending Child Marriage: A profile of progress in Ethiopia, UNICEF, New York, 2018.

<sup>14</sup> Key Development Challenges Around Internal Displacement: A Gender Perspective. World Bank, January 2022.



burdens, and disruptions in access to education and basic health services.<sup>15</sup> Pregnant women have reported difficulties in accessing any form of maternal care and have been particularly affected by the lack of access to clean water and sanitation.<sup>16</sup> Lack of access to health care has been a persistent challenge for IDPs even prior to the crisis. The 2016 Ethiopia Demographic and Health Survey reported that 26 percent of all women aged 15–49 had experienced physical or sexual violence in their lifetime; with intimate partner violence higher at 34 percent. According to the Ethiopian Human Rights Commission (EHRC) and the Office of United Nations High Commissioner for Human Rights (OHCHR), GBV has become more common, and has taken more extreme forms.<sup>17</sup> The government has scaled up support to respond to the crisis, but basic services for survivors of GBV, including mental health support, remain limited.

## Sectoral and Institutional Context

10. **Ethiopia’s power sector is underpinned by a broad policy, legal, and strategic framework and structured by the National Energy Policy (2013; updated in 2019).** The Ministry of Water and Energy (MOWE) oversees planning, coordination, and monitoring of overall energy development. In 2013, through the Council of Ministers Proclamation No.302/2013, the vertically integrated utility, Ethiopian Electric Power Corporation (EEPCo) was unbundled into two public enterprises: (a) the Ethiopian Electric Power Company (EEP), responsible for generation, transmission, and system operations; and (b) the Ethiopian Electric Utility (EEU) responsible for power distribution, sales, and customer services. The Proclamation also established a regulatory agency, the Ethiopia Energy Authority (EEA) which was recently reorganized with added regulatory responsibility on petroleum and petroleum products and renamed as Petroleum and Energy Authority (PEA).

11. **Ethiopia faces the third highest electricity access deficit in Sub-Saharan Africa with an access rate of 51 percent in 2020<sup>18</sup>, even as the Government and the utilities have made some concerted efforts to expand access.** Over 56 million people in Ethiopia lack electricity access, posing a binding constraint to social development and economic growth. About 93 percent of urban houses are connected to the grid (99.9 percent in Addis Ababa), while only 40 percent of rural households have access to electricity services – mainly through standalone solutions. More than half of those connected to the grid are not formally registered as consumers with the utility. Per capita electricity consumption in Ethiopia is 69 kWh compared to world average of about 3,131 kWh. Launched in 2005 with a focus on establishing a backbone network of transmission and medium-voltage (MV) lines, the Universal Electricity Access Program (UEAP) helped the electricity grid reach within 2.5 kms of 65% of all households by 2015. The National Electrification Program (NEP) was launched in 2017 and further elaborated in 2019 (NEP2.0). It presented an investment roadmap and action plan for achieving universal electricity access by 2025 through grid and off-grid solutions, and 96% on-grid access by 2030. The NEP was designed to have a focus on fast-paced grid connections roll out, an off-grid access program with strong private sector participation, and explicit cross-sectoral linkages with the productive and social service sectors.

12. **With about 300,000 households getting electrified each year, the pace of household electrification is about one-fourth of that required under NEP2.0 to meet the goal of near-universal grid connectivity (96%) by 2030.** Despite the well-performing World Bank funded access expansion projects, the broader NEP program is delayed by nearly a decade and is constrained by limited funding, weak implementation capacity, limited contractor capacity, and the need to import key electrification materials. The Bank funded *Ethiopia Electrification Program (ELEAP, \$375 million)* has performed exceedingly well and is on course to deliver over one million new grid connections within four years of effectiveness. An additional financing of \$250 million was approved by the Bank in March 2023 resulting in

<sup>15</sup> OCHA. 2023. Ethiopia Situations Report. URL: <https://reports.unocha.org/en/country/ethiopia/>.

<sup>16</sup> There was close to an 84 percent reduction in the number of children, and pregnant and lactating women accessing healthcare services from Aug 2022 to Sep 2022. UNICEF. October 2022. UNICEF Ethiopia Humanitarian Situation Report No. 9. URL: <https://www.unicef.org/media/129671/file/UNICEF%20Ethiopia%20Humanitarian%20Situation%20Report%20No.%209%20-%20September%202022.pdf>

<sup>17</sup> EHRC and OHCHR. 2021. Report of the EHRC/OHCHR Joint Investigation into Alleged Violations of International Human Rights, Humanitarian and Refugee Law Committed by All Parties. Published 3 November 2021. URL: <https://digitallibrary.un.org/record/3947207?ln=en>

<sup>18</sup> Tracking SDG 7: The Energy Progress Report. 2022. This includes off-grid electricity access, formal grid electricity access, and illegal connections.





an addition of another one million connections. Another Bank project *Access to Distributed Electricity and Lighting in Ethiopia (ADELE, \$500 million)* will add one million off-grid connections through mini-grids and standalone solutions – mainly as an interim solution till the grid reaches these areas. However, new approaches are needed to accelerate the delivery of electricity access along with strengthening of the distribution and transmission networks.

13. **The backbone medium voltage (MV) network in many towns of Ethiopia was mostly built more than a decade ago under UEAP and now stands dilapidated, overloaded, and inadequate to accommodate further load growth or new connections.** In the past few years, urban areas in Ethiopia have seen significant expansion of new connections. With steady demand growth, higher electricity draw imposed on transformers and other infrastructure often exceeds originally designed and sanctioned load – leading to equipment damage and forced outages. As a result, electricity interruption is common. About 65 percent of the households experienced electricity interruptions twice or more per week, while over 22 percent of the households experienced four or more interruptions per week in a UHFS survey conducted in Oct-Nov 2022.<sup>19</sup> EEU also reports a very high transformer failure rate at nearly 3 percent per annum – which indicates overloading and poor maintenance. EEU has identified over 200 towns in urgent need for MV network rehabilitation for increased capacity and improved reliability.

14. **Ethiopia has invested substantial public resources in expanding its hydropower capacity, but additional generation investments will be needed by 2030 to address demand growth and meet reserve energy requirements.** With 98 percent of the generation coming from clean sources (mainly hydropower and some wind energy), Ethiopia’s near-complete reliance on green electricity is an outlier in the region. Installed generation capacity has more than quadrupled, from 1,100 MW in 2009 to 5,340 MW in 2022. If new hydropower plants under construction (GERD and Koysa) are completed as planned, then the installed generation capacity will reach about 13,000 MW by 2028. The power system is currently experiencing inadequate energy reserve margins, which will get relieved as these large hydropower projects are gradually commissioned. However, the country will need additional generation capacity by 2030 to meet demand growth and maintain adequate energy reserve margins. Efforts to plan, contract and construct such additional capacity must start in right earnest to ensure increased energy availability by 2030.

15. **Private sector led development of non-hydro renewable energy is a critical part of the Government’s strategy to diversify the generation mix from an energy security and climate-resilience perspective.** With more than 90% hydropower, electricity generation in Ethiopia is vulnerable to hydrological variations which may be exacerbated by climate change. In 2018, the country experienced a major drought that resulted in the generation shortage and widespread power outage in the country, as well as temporary suspension of power export to Sudan and Djibouti. To diversify the generation mix, and to conserve scarce public resources, Ethiopia is now transitioning towards private sector led development of solar, wind and geothermal power. EEP’s recent power sector masterplan suggested that geothermal energy has a key role to play if the sector is to remain clean and climate-resilient.<sup>20</sup> While the cost of geothermal power may not be as low as hydroelectric or solar generation, it carries important value for the stability of the grid system by providing baseload power that is not vulnerable to hydrological change or weather patterns.

16. **To mitigate the geothermal resource risk for downstream developers, the success with public-financed upstream resource exploration at Aluto-Langano can be replicated at other geothermal sites.** EEP purchased two drilling rigs under the Bank-funded *Geothermal Sector Development Project (GSDP)* which have already been used to successfully drill 10 wells at Aluto Langano and is on course to establish geothermal resource for 35 MW of capacity. EEP is also preparing a revised Geothermal Strategy building on earlier work on ‘*Long-term Geothermal Strategy*’ with support from IFC, and a ‘*Geothermal Sector Master Plan*’ with support from JICA. The strategy is to be finalized by the end of 2023 and will include a list of prioritized geothermal candidate sites, associated costing and staffing needs at EEP, and a plan to carry out the exploration drilling operations by utilizing the two drilling rigs. The past and ongoing

<sup>19</sup> Monitoring the effects of Ethiopia’s Homegrown Economic Reforms: Evidence from an Urban High-Frequency Survey (Draft Report), 2023

<sup>20</sup> In the ‘Reference Scenario’ of the EEP Masterplan, Natural Gas contributes 25% and Geothermal about 5% of the firm energy available in 2045, whereas in the ‘Minimize Fossil Fuel’ Scenario, Geothermal contributes about 25% and Natural Gas about 5% of firm energy.



geothermal strategy studies clearly distinguish high-risk upstream activities (resource exploration and site infrastructure development) from low-risk downstream activities (power plant construction accompanied by the drilling of additional wells). The studies also identify the need for a public-funded entity for investments in upstream resource establishment to de-risk private sector investments in downstream project development.

17. **GoE's path-breaking efforts during 2018-22 to establish a strong PPP regime and develop a robust pipeline of solar and wind power projects for competitive award suffered a jolt when the first set of competitively selected IPP agreements had to be terminated.** Further to the 2018 PPP Proclamation of the GoE, the World Bank put in place IDA payment guarantees to support a pipeline of IPP projects under the Renewable Energy Guarantees Program (REGREP – P162607). The overall program has a financing envelope of IDA US\$200 million and aims to mobilize over US\$1.5 billion in private investment for at least 1,000 MW of solar and wind IPPs. The first phase of REGREP covered the solar IPP project at Metehara, which preceded the 2018 PPP regime and did not emanate from a competitive selection process. The second phase was to cover Gad and Dicheto solar IPPs (125MW each) which were competitively bid in 2019 and witnessed one of the lowest solar PPA price discoveries in Africa at 2.526 USc/kWh. However, agreements with the developer for all three projects – Metehara, Gad and Dicheto – had to be terminated in May 2022, after the developers were unable to reach financial close despite repeated extensions.

18. **Lack of assured FOREX availability, convertibility, and transferability, coupled with the misalignment and distortions in the prevailing FOREX regime in the country, pose a systemic risk for IPP projects in Ethiopia.** The termination of the solar IPP agreements was primarily due to the inability of the developers to obtain debt financing in face to a lack of assured FOREX availability, convertibility, and transferability by the Government. Subsequent deterioration in the country's investment climate due to COVID, internal conflict, and now macro-economic crisis have impacted the IPP sector. A relaunch of the competitive bidding process for the IPP program needs to be preceded by a reform of the overarching FOREX regime in the country, a plan for strengthening financial performance of the off-taker utility, and steps to ensure forex availability, convertibility, and transferability specifically for IPP projects.

19. **Ethiopia is emerging as a regional energy hub with electricity exports to neighboring countries, which would provide additional revenue to the sector and generate much needed foreign exchange.** In the fiscal year ending July 2022, Ethiopia secured over US\$95 million in revenue from exports to Sudan and Djibouti. This amount comes at a critical time when foreign exchange reserves are dwindling due to an adverse balance of trade. The World Bank-funded *Eastern Electricity Highway Project (EEHP) (P126579)* connects the electricity grids of Ethiopia and Kenya with over 1,000 km of a 500 kV HVDC transmission line capable of up to 2,000 MW of bi-directional power transfer. The line became operational in December 2022. As the first publicly financed HVDC line in Sub-Saharan Africa, this transmission line is the flagship of power trade in the Eastern African Power Pool (EAPP) region. The Second Djibouti-Ethiopia Power System Interconnection Project is being funded by the World Bank on the Djibouti side (P173763) and by AfDB on the Ethiopia side. Efforts to develop transmission links to some other neighbors are faced with difficult political and security environment in those countries. Electricity exports are not only crucial to provide affordable renewable electricity to the neighboring countries, but also to maintain demand-supply balance, cross-subsidize domestic consumption, adapt to climate-induced hydrology variations, and to earn precious foreign exchange.

20. **Financial sustainability of the power sector utilities remains a concern despite adhering to a four-year tariff adjustment program (2018-2021) and transferring about US\$3.5 billion of utility debt to the newly established Liability and Asset Management Company (LAMC).** Electricity tariffs remained nominally constant since 2006 while the currency continued to depreciate against the US\$ until they reached an average of US\$0.018 per kWh in 2018 – among the lowest in Sub-Saharan Africa. A four-year tariff trajectory during 2018-2021 enabled the sector to increase average retail tariffs to US\$0.0326 per kWh in 2022. In comparison, the cost of retail electricity supply stood at about US\$0.067 per kWh in the same year. Over the last few years, the distribution company (EEU) has consistently shown a marginal profit (about US\$ 32 million in FY21). On the other hand, the generation and transmission company (EEP) has been able to cover its operating costs each year but has consistently shown overall losses which are roughly equal





to the financial costs (about US\$ 518 million in FY21). The large financial costs for EEP are due to a significant debt overhang from borrowings for the development of large hydropower projects. This debt of over US\$ 10 billion has been recently restructured by transferring a significant part (US\$ 3.5 billion) to a newly created LAMC. Also, the revenue sharing arrangement between EEU and EEP has been evolving from a fixed 37:63 sharing ratio, to a Power Purchase Agreement (PPA) based on boundary metering of energy supplied by EEP, and going forward to separate end-user charges for generation, transmission, and distribution under the new tariff directive. A new four-year tariff proposal is currently under preparation by the utilities for submission to the regulator.

21. **The mandate for most operational reforms in the power sector is already reflected in the prevailing legal, policy, and regulatory statutes but implementation is constrained by limited agency focus, delayed processing, lack of appropriate tools, and inadequate institutional capacity.** This includes a four-year tariff trajectory proposal by the utilities, and its adoption by the PEA after a thorough review. Similarly, periodic tariff adjustments to reflect extraneous factors, accounting separation of different lines of business, and regulatory review of utility least cost investment plans are mandated by the 2020 Tariff Directive but are yet to be implemented. Enhancing the energy accountability in the transmission and distribution networks requires boundary metering and periodic energy audits which do not require any further statutory mandate but need implementation support to the utilities. Another key reform area is competitive selection of IPP developers, where despite having adopted a robust legal, policy, regulatory, and procedural framework under the 2018 PPP regime, and having developed a pipeline of candidate projects for future rounds of bidding, the Government is again reverting to bilaterally negotiated deals with select private developers. Expedited implementation of all these reforms can be achieved in a time-bound manner through focused technical assistance and capacity building support to the two utilities (EEP and EEU) and the sector regulator (PEA), coupled with accountability for timely delivery on agreed implementation milestones.

22. **A clear vision for structural reforms in the sector along with an authorizing mandate for its implementation is needed to segregate natural monopoly and competitive lines of business, leverage private sector capabilities and investments, and establish performance benchmarks with improved consumer service.** This may entail a structural transition to a single-buyer model and onwards to a multi-buyer multi-seller model to establish a market-oriented regime. The segregation of accounts for generation, transmission and system operation businesses would be an important step towards possible subsequent vertical unbundling and asset privatization at EEP. Similarly, boundary metering and segregation of accounts for the Regional EEU's (administrative units within EEU) will be important steps for later horizontal unbundling and select privatization at EEU. A draft Electricity Sector Reform Roadmap was prepared by MOWE in 2019 and has since been under the consideration of the macroeconomic committee of the GoE. MOWE is now reviving a discussion among relevant government agencies to develop a medium-term vision for structural reforms in the sector that will be adopted by the Government for phased and time-bound implementation.

### Relevance to Higher Level Objectives

23. **The proposed program is consistent with Ethiopia's Country Partnership Framework (CPF) 2018-2022 and supports the World Bank's twin goals of poverty reduction and shared prosperity.** The proposed operation is directly linked to achieving Objective 1.2. '*Increased access to reliable energy supply*', under Focus Area 1 of the CPF: Promote Structural and Economic Transformation Through Increased Productivity. It is also linked directly to Focus Area 2 of the CPF: Increase Social Inclusion (including gender equality) and Resilience through integrating strategic gender equality interventions that address barriers related to limited labor force participation, access to finance, access to agricultural extension services etc. The CPF explicitly includes targets on (i) increasing electricity access rate (including both on-grid and off-grid), (ii) improving electricity reliability, and (iii) increasing the energy generation installed capacity from non-hydropower based renewable resources. The proposed operation supports the expansion and strengthening of transmission and distribution grid networks necessary for continued increase in grid access, while improving the quality and reliability of grid electricity supply. The operation also supports upstream preparation of renewable energy projects and risk mitigation for private sector investment. This is consistent with Objective 1.5 '*New*



*approaches for sustainable infrastructure financing and debt management*, which entails a target to reach 700MW of non-hydropower renewable energy capacity.

24. **The proposed program aligns well with the upcoming Ten Years Prospective Plan (2021-30) of the Government of Ethiopia.**<sup>21</sup> The focus areas for energy development identified in the plan include universal access to electricity access, providing high quality electric power services, building a reliable electricity infrastructure, ensuring healthy financial position of the electricity sector, encouraging private investment in the sector, and developing skilled and ethical manpower.

25. **The proposed program will leverage resources from Green Climate Fund (GCF) to support GoE's endeavor to scale renewable-based electricity service, consistent with the Climate Resilient Green Economy (CRGE) and the Nationally Determined Contribution (NDC) for Ethiopia.** Ethiopia currently sources all its grid electricity from renewable sources, largely from hydroelectric power. Through its CRGE Strategy and NDC to the United Nations, GoE has committed to further scale investment in renewable energy to expanding electricity access in the country and beyond. The operation will support the establishment of geothermal resources through continued upstream site preparation and resource establishment. The upcoming Climate Change and Development Report (CCDR) is also likely to indicate the need to diversify generation mix towards non-hydro renewable energy, strengthen grid network to absorb higher VRE, and establish cross-border transmission links for electricity trade (with a focus on exports).

26. **Activities under the proposed PRIME MPA program are 'universally' Paris aligned, but Geothermal activities need a further confirmation.** Activities covered by the program that are identified as being universally aligned for mitigation in the Sector Toolkit for WBG Paris Alignment Methods include: (i) electricity transmission<sup>22</sup> and distribution, (ii) electricity access expansion, (iii) technical loss reduction, and (iv) solar and wind generation projects. The only activity requiring further examination is geothermal energy, which will be examined during preparation for relatively low absolute (gross) lifecycle emissions, comparable to the metrics used for climate mitigation finance tracking (climate co-benefits). T&D activities are identified in the adaptation part of the Toolkit as being vulnerable to existing or future climate hazards. These will be examined in detail during project preparation for resilience to high temperatures, flooding, strong winds, and a combination of extreme weather events. In addition, Geothermal activities will be examined for vulnerability to climate induced water shortages. Sector reforms likely to be covered by the MPA program include reform actions which are universally Paris aligned for mitigation and adaptation. These include tariff reform, strengthening payment discipline, reducing technical & commercial losses, adoption of ICT tools for billing & payment collection, reforming the sector structure, market rules & reform, and regional trade. Least cost expansion plans will examine risk reduction measures for the hydropower dominated electrical system.

27. **The proposed program will support Ethiopia in achieving the targets of the Africa Energy Access Initiative of the World Bank.** Despite decades of efforts, 640 million people in Africa currently live without electricity. Average annual electricity consumption per capita in SSA excluding South Africa was 100kWh in 2015, barely enough to power one light bulb per person for a few hours each day, while only one in three health facilities and schools in the region have access to electricity today. The top three countries with the largest electricity access deficit in the world were Nigeria (92 million), the Democratic Republic of Congo (72 million), and Ethiopia (56 million).<sup>23</sup> Considering the huge energy deficit, the Africa Energy Access Initiative is aimed at mobilizing resources to ensure that no country will have below 50 percent electricity access by 2026 and to meet the aspirational goal of universal electricity access by 2030.

28. **The program integrates elements of Maximizing Finance for Development by addressing binding constraints and mitigating risks for unlocking private solutions in electricity generation.** These risk mitigation activities include upstream site preparation (resource establishment, site infrastructure, transmission lines and land acquisition) and credit enhancement using payment guarantees and supporting forex assurance by the Government by setting up a

<sup>21</sup> The Ten Year Prospective Plan 2021-30 has not been put in public domain yet by the Government of Ethiopia.

<sup>22</sup> No transmission lines under the program are dedicated to evacuating electricity from unablated generation plants fueled by fossil fuels.

<sup>23</sup> Tracking SDG7: The Energy Progress Report. 2022.



Forex Liquidity Support Mechanism (FLSM). PRIME-1 will include activities that can help unblock the Government's PPP program for energy generation through a combination of technical assistance for sector reforms, PBCs for achieving incremental reform progress, support for relaunch of IPP competitive bidding, and setting-up the FLSM.

29. **The proposed program is aligned to the World Bank Group Gender Strategy.** The 2016–2023 WBG Gender Strategy underlines key gender gaps and promotes gender equality; particularly it emphasizes on improving human endowments, removing constraints for more and better jobs towards increasing women's participation in the labor market including in Science, Technology, Engineering and Math (STEM) fields and enhancing women's voice and agency through strategically supporting women participation in leadership and decision-making positions in the energy sector. The program design will include research and analytic work on the existing situations of female in STEM fields as well as recommending intervention areas that strategically and systematically strengthen the participation of women in the Ethiopia energy sector.

### C. Multi-Phase Programmatic Approach

30. **Transforming the electricity sector in Ethiopia requires a sustained and medium-term approach that involves parallel implementation of a suite of solutions.** These solutions include *accelerated access investments* (including last-mile connections and network expansion), *operational reforms* to improve sector revenues and efficiency, *structural reforms* to introduce competitive efficiencies, *leveraging private sector* to meet investment needs and establish higher performance benchmarks, and *institutional capacity building* to handle an increasingly more complex sector. The proposed multi-phase approach will allow a program of engagements that will be designed to pursue different solutions in a structured manner. The MPA will deliver increased public investments in network strengthening and expansion, and utility performance improvement, while it will mitigate risks for the private investments in electricity generation.

31. **Delivering accelerated access with reliable and good quality supply requires in-tandem investments in last-mile-electrification, medium-voltage network strengthening, and transmission network expansion.** New last-mile connections in grid connected areas need to be followed up with distribution network strengthening to expand the network capacity and reliability. New transmission substations built with the aim of either expanding into hitherto unconnected areas or increasing grid capacity to serve the load growth can pave the way for setting-up distribution networks and last mile connections to expand electricity access in the adjoining areas. In both grid-connected and grid-extended areas a coordinated approach for investments in last-mile-electrification, medium-voltage network strengthening, and transmission network expansion is best served through an MPA program.

32. **The MPA program allows the opportunity to pursue a deeper 'structural reform' trajectory together with the already mandated 'operational reform'.** Structural reforms across electricity sectors in many developing countries have involved a medium-term transition towards a single-buyer structure and eventually to a multi-buyer-multi-seller structure with increasing market orientation – including privatization of some assets (or businesses) to secure private investments as well as to establish higher performance benchmarks. The medium-term structural reforms need significant preparation before implementation and must build upon shorter-term operational reforms. In case of Ethiopia, the mandate for operational reforms has already been given under the prevailing laws, policies, and regulations. The MPA is expected to allow a reform trajectory that encompasses deeper structural reforms as well as important operational reforms. It will use technical assistance and capacity building activities at the sector utilities, relevant ministries, and the regulator to support systematic implementation of the agreed reforms trajectory.

33. **Upstream resource establishment and risk mitigation for private investments in non-hydro RE generation projects require systematic steps that extend across multiple projects.** The PRIME program will replicate the success in public financed upstream geothermal establishment under the GSDP project, prepare the site infrastructure, and develop the competitive selection modalities for geothermal projects. In addition, PRIME-1 will design and establish the FLSM which can be leveraged to provide an additional forex buffer to the MOF to meet its forex obligations towards select IPPs. The MPA approach will allow these efforts at upstream risk mitigation, credit enhancement, and



support to the Government to meet its obligations to be tailored further during implementation. Based on the lessons learned during PRIME-1, corrective steps will be taken mid-course or while designing subsequent phases. Further, relaunching competitive selection process for private investments in non-hydro RE requires some key macroeconomic and sector reforms to be in place, and towards this end, the PRIME program offers the required mechanisms (such as DLIs, PBCs and disbursement conditions) to ensure that these reforms remain on track during implementation.

34. **Bank engagement under the PRIME program will help establish modalities that can be supported by other development partners to further accelerate electrification and transition to a more diversified generation mix, along with greater private sector participation.** All the major development partners are active in the Ethiopian energy sector including African Development Bank, AFD, European Union, European Investment Bank, GiZ, JICA, Netherlands, Denmark, and USAID. The Bank energy team is engaging closely with the development partners through the Energy Development Partners Group (EDPG), where the World Bank is one of the two co-chairs. The proposed MPA will provide a platform for mobilizing resources from various other development partners.

35. **The proposed MPA will be designed to synergize with the Development Policy Operations (DPOs) in the country as well as the 'Accelerating Sustainable & Clean Energy Access Transformation in AFE Region MPA' (ASCENT MPA).** Key policy decisions covered as prior actions under the DPO will be aligned with the proposed MPA program and supported through institutional capacity building support as well as hold-points to enable close follow-up on reform implementation. Such DPO prior actions may include a new four-year tariff and adoption of an electricity sector reform roadmap. The proposed MPA will also complement last-mile access investments under ELEAP (for on-grid access) and ADELE (off-grid access), as well as the upcoming ASCENT MPA. Going forward, this regional energy access program is expected to subsume all World Bank interventions in Ethiopia related to last-mile electricity access.

#### D. Proposed MPA Program Development Objective

36. **PrDO:** To increase access to electricity and improve the reliability of electricity supply in Ethiopia in a climate-resilient and financially sustainable manner.

#### E. Program Description

37. **To meet the triple goals of achieving universal electricity access<sup>24</sup>, energizing faster economic growth, and establishing Ethiopia as a regional electricity hub, the electricity utilities in Ethiopia have identified large investment needs across the power sector value-chain.** These investment needs which encompass generation, transmission, distribution, last mile connections, as well as mini-grid and standalone off-grid electrification solutions, are reflected in the National Electrification Plan (NEP 2.0), the Least Cost Generation and Transmission Expansion Plan (EEP, 2021), and the Prioritized Investment Plan for Distribution Strengthening in 200 Towns (EEU, 2020-21). Despite significant efforts by the government and the utilities, and advancements in expansion of electricity access and generation capacity over the last two decades, the sector has fallen behind the NEP 2.0 twin-targets of achieving universal access by 2025 and near-universal grid electrification (96%) by 2030. Rapid electrification and reliable electricity supply are constrained by limited financial resources, a dilapidated and overloaded MV network, large transmission expansion needs, weak sector financial sustainability, and limited implementation capacity. Efforts to leverage private sector investments to complement limited public investments in the sector have also met with challenges that need to be addressed. The proposed MPA program will make concerted efforts to accelerate public investments in electricity network strengthening and risk-mitigate private investments in non-hydro renewable energy generation by establishing models that can leverage financing from other donor partners. The program will complement ongoing projects on last-mile grid connections, off-grid electrification, IDA guarantees for IPPs, and cross-border transmission.

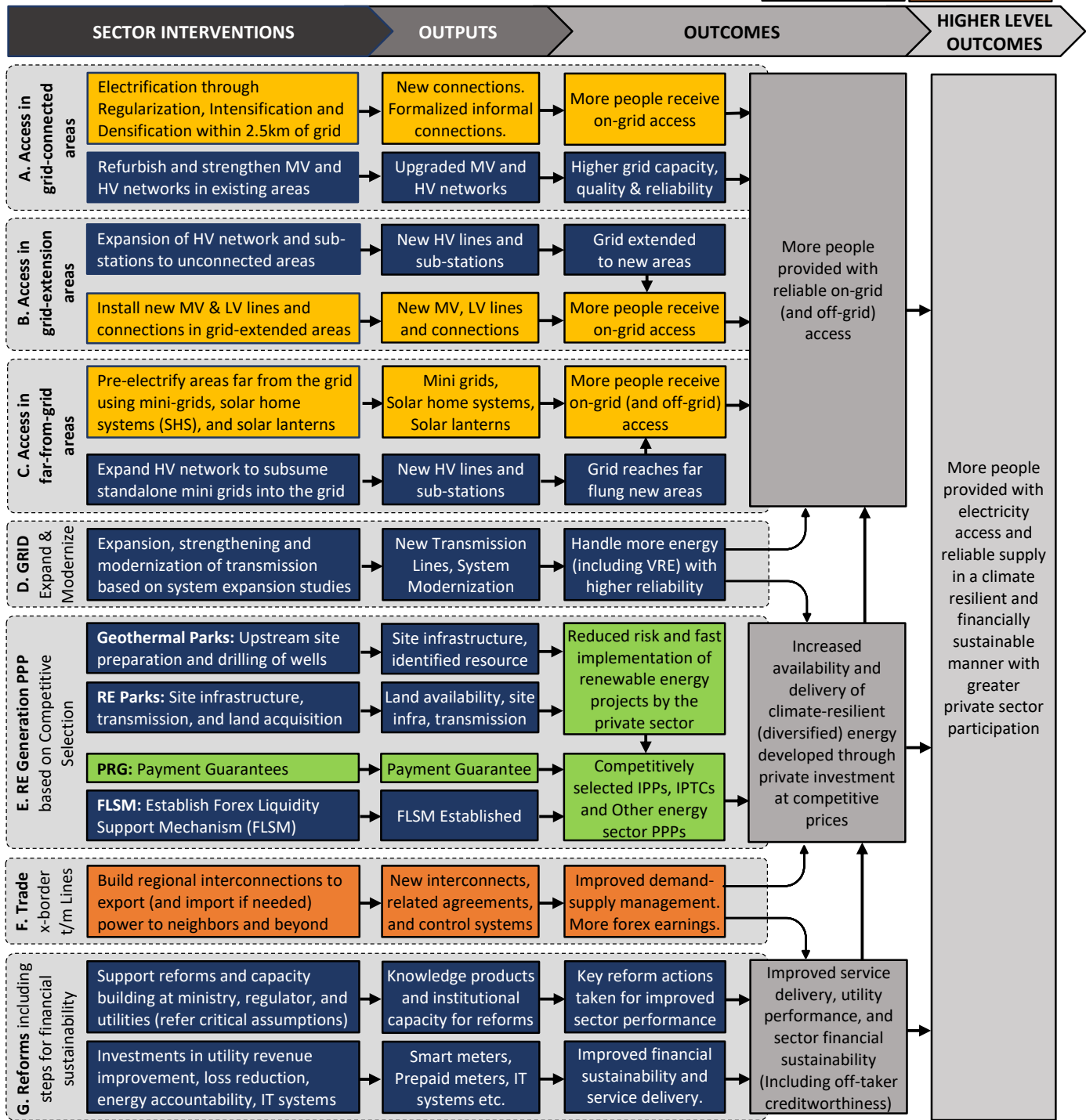
<sup>24</sup> The NEP 2017 established the goal to achieve universal electricity access by 2025. Despite significant progress during the 2017-21 period, the Government is now contemplating a push-back of the original target date in view of the COVID-19 pandemic, the internal conflict situation, and the global economic slowdown.



THEORY OF CHANGE

ASCENT Ethiopia	PRIME
REGREP	Regional Projects

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- |                             |   |                                     |   |  |   |                                 |
|-----------------------------|---|-------------------------------------|---|--|---|---------------------------------|
| <b>Critical Assumptions</b> | 1 | Sector Reform Roadmap is adopted    | 4 | Four-Year Tariff Adjustment is adopted | 7 | NEP 3.0 is prepared and adopted |
|                             | 2 | Reform Agency set-up is established | 5 | Annual Tariff Adjustments are adopted  | 8 | Geothermal strategy is adopted  |
|                             | 3 | Forex reforms are implemented       | 6 | Regular Least Cost Planning is adopted | 9 | Competitive bidding is adhered  |





38. **In parallel to investments for sector expansion and modernization, the PRIME program will support a reform trajectory encompassing structural and operational reforms.** Ahead of the program kick-off, the Government of Ethiopia will develop and adopt a medium-term trajectory for structural reforms in the sector in the form of an *'Electricity Sector Reform Roadmap'* which will provide the vision as well as the statutory mandate for structural reforms. In addition, the Government will create an *'Electricity Sector Reform Office'* with adequate empowerment for championing reform implementation. Once the medium-term mandate has been secured, the intermediate steps towards the transition will be designed and implemented through the reform office in coordination with the reform agencies. The mandate for operational reforms is already in place under the prevailing statutes, and the PRIME program will address the reform implementation constraints through a combination of reform-focused technical assistance and capacity building for the sector utilities, relevant ministries, and the regulator, while simultaneously leveraging PBCs (for IPFs) and DLIs (for P4Rs) to pursue continued progress on reform implementation. In addition, the program will also support the institutional capacity development of the two sector utilities (and other relevant agencies) to implement the reform trajectory as well as shoulder a scaled-up investment program.

39. **Structured as an MPA and implemented in synergy with other sector engagements<sup>25</sup>, the proposed PRIME program will deliver a leap-forward in the electricity sector through advancement of all elements of the value chain.** The proposed program will construct the upstream network infrastructure necessary to enable a tripling of the formal utility connections from 4.5 million (18% rate of formal grid electrification) in FY22 to 15 million (52%) in FY32 under ongoing and upcoming electrification engagements and a connection regularization scheme.<sup>26</sup> Network strengthening activities to help achieve these milestones will synergize with last-mile electrification in grid-connected and newly grid-extended areas under the ELEAP, ADELE, and Ethiopia phase of the proposed *ASCENT MPA (ASCENT Ethiopia)*. The PRIME program will also help galvanize funding from other development partners to meet the vast investment needs of this large country. These efforts will generate significant momentum for achieving universal access by 2035 and near-universal (96%) grid-based access by 2040.

40. **Acceleration in rate of electrification will be synchronized with expansion of medium voltage and high voltage networks to improve the quality and reliability of supply while creating space for continued electrification.** This improvement in quality and reliability of supply will be achieved through distribution rehabilitation in over 150 key towns.<sup>27</sup> The PRIME program will support the strengthening and expansion of the transmission network to address the problems of line overload, transformer overload, under voltage, over voltage, and overarching challenges in managing systems dynamics and short-circuits. Further, with the generation capacity set to expand from 5340MW in FY22 to 12840MW in FY30, the transmission carrying capacity and reliability (through built-in redundancies) will be strengthened by upgrading as well as constructing new lines and substations.

41. **The PRIME Program will facilitate private investments in non-hydro (solar, wind and geothermal) renewable energy by leveraging global climate finances for upstream resource establishment and set up mechanisms to mitigate critical risks faced by the private investors and their lenders.** The PRIME program will help Ethiopia in climate adaptation by diversifying the generation-mix towards non-hydro renewables, while also serving to secure energy reserve margins of at least 20% to manage climate-induced hydrological variations. Building upon the successful geothermal resource establishment at Aluto Langano under the GSDP project, the program will set-up the institutional

<sup>25</sup> Other Bank supported electricity sector programs/projects include the ELEAP project, ADELE project, REGREP MPA Program, Second Djibouti-Ethiopia Power System Interconnection Project, the upcoming ASCENT Ethiopia, and the upcoming other planned regional transmission interconnections. In addition, the ongoing ENREP and GSDP projects will be closing in December 2023 and EEHP in September 2023.

<sup>26</sup> The tripling of formal utility connections by 2032 will be achieved through: (i) intensification and densification in grid-connected areas for about 3.8 million connections, (ii) regularization of over 4 million informal connections, (iii) electrification of nearly 2 million households through grid-extension, and (iv) electrification through mini-grids for about 240,000 households. In addition, 750,000 households will receive electricity access through standalone off-grid solutions. A regularization scheme will be designed by EEU to address informal connections and establish a formal utility-consumer relationship. This will enable the utility to deliver assured services at regulated tariffs while preventing exploitative rent-seeking.

<sup>27</sup> These 150 towns will be in addition to 24 towns already covered under ongoing projects (fourteen under ENREP and ten under ADELE).





structure for public-financed upstream geothermal resource identification and enable the downstream development of at least 100 MW capacity by competitively selected IPPs. Further, the program will coordinate closely with the REGREP to unlock at least 600MW of solar IPPs by further mitigating forex availability risk through an FLSM to help the MoF in meeting its forex obligations towards select IPP developers.

### Program Phasing

42. **Structured as an IPF with PBCs, the PRIME-1 project will set the stage for structural and operational reforms through upfront adoption of an electricity sector reform roadmap.** Implementation of specific reform actions and performance improvement steps will be supported through a combination of technical assistance and Performance-Based Conditions (PBCs). Investments under prime-1 will cover distribution rehabilitation, transmission strengthening, and risk mitigation measures to support private investments in non-hydro renewable energy.

43. **PRIME-2 will be structured as an IPF with IDA Guarantees to provide continued credit enhancement for PPP projects beyond the ongoing REGREP.** Sector reforms and upstream risk mitigation measures for PPP projects under PRIME-1 will enable the relaunch of competitive bidding modalities supported by IDA guarantees under the ongoing REGREP or the follow-on PRIME-2 project. Going beyond solar and wind IPP projects, PRIME-2 will cover geothermal IPPs, transmission IPTCs, and PPPs in other segments of the electricity sector.

44. **PRIME-3 will help improve operational performance and financial sustainability of the distribution utility.** This project will support activities necessary for achieving improvements in technical and commercial loss reduction; improved billing efficiency through enhanced energy accountability; improved collection efficiency through deployment of smart-meters and pre-paid meters; strengthening utility IT systems; developing utility SCADA systems; improved customer management system, and other relevant measures. This project will be structured as a PforR with DLIs related to implementation of various performance improvement measures, as well as improved institutional practices and adherence to some minimum performance benchmarks.

45. **PRIME-4 will support the rehabilitation of old hydropower capacity, which is saddled with dilapidated equipment, while also support for upstream development of RE Parks.** Rehabilitating existing hydropower plants offers a least cost generation expansion solution. In addition, this component will support upstream resource establishment, site development, and transmission infrastructure for solar, wind, and geothermal projects, PRIME-4 will also cover the institutional building support for a new Geothermal Resource Identification Agency in Ethiopia.

### F. PRIME-1 Project Description

46. **PDO:** To strengthen and extend the electricity network and enable renewable energy generation.

47. **The first phase of the PRIME program will improve the reliability and capacity of the electricity network in select towns and mitigate risks for private investments in non-hydro renewable energy through upstream preparation activities, while also establishing the medium-term sector reform trajectory.** Component-1 of the project will rehabilitate the distribution network in existing grid-connected areas across 72 key towns. Under Component-2, fourteen new transmission lines and sub-stations will be constructed. In addition, components 1 and 2 will also support modernization of transmission and distribution networks. Component-3 will support risk-mitigation for competitively selected IPP projects, including drillings to establish geothermal resources and establishment of a Forex Liquidity Support Mechanism (FLSM). Finally, Component-4 will oversee the adoption and initial implementation of the medium-term reform roadmap through a combination of capacity building and Performance-Based Conditions (PBCs) that will intertwine network investments with specific reform actions. The detailed PBCs will be structured and the amounts that can be unlocked by fulfilling the PBCs will be defined during the preparation phase. The PBCs will be designed to ensure that the implementing agencies have adequate resources unlocked (with some buffer) ahead of each year of the project to be able to award contracts in a timely manner.

48. **Project Cost and Financing:** The total project cost is estimated at US\$597 million, which will be funded with



an IDA amount of US\$500 million and a GCF amount of US\$37 million, while the balance US\$60 million will be funded by the clients from their own resources.<sup>28</sup>

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Area OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

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49. The Environment, Health, and Safety (EHS) risk for Components 1 and 2 has the risk/impact of habitat alteration and risk to biodiversity from right-of-way (ROW) vegetation clearance that could result in habitat loss and fragmentation. Power transmission lines will require routine maintenance. Trees and other plants near the wires may have to be maintained to keep them from touching the wires, resulting in loss of vegetation. The transmission and distribution lines can pose fatal risks to birds and bats through collisions and electrocutions which may result in power outages and forest/bush fires. The ESRS provides further information about the pollution and occupational health and safety risks during the construction, operation, and maintenance of electric power.

50. Similarly, there are various environmental, health and safety risks that can result from activities to be financed under Component 3 (Geothermal Resource Establishment). One of the key risks associated with this component is water consumption and extraction as surface water extraction is necessary for a variety of geothermal power generation activities, including well drilling, injectivity testing of subsurface formations and for use in cooling systems. Geothermal development activities also can generate effluents (described under ESS3) and cause other pollution. Well blowouts and pipeline failures may occur during well drilling or facility operations which can result in the release of toxic drilling additives and fluids, heavy metals, acids, mineral deposits, and other pollutants.

51. The social risk from the project is rated as high. The transmission, distribution grid network Component involves erecting towers requiring land acquisition and access restriction on land use with implication for potential asset and livelihood losses. It shall attempt to avoid all possible socially sensitive locations, social services, places of worship, places of religious, cultural ceremonies or observances. Other details about the social risk assessment are available in the ESRS.

**CONTACT POINT**

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<sup>28</sup> GCF support to Ethiopia under the Sustainable Renewables Risk Mitigation Initiative (SRMI-2) includes: (i) Loan of US\$ 15 million for geothermal drillings, (ii) Reimbursable grant of US\$ 20 million for establishing the FLSM, and (iii) Grant of US\$ 2 million for technical assistance.



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15-Aug-2023



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