



CLEAN TECHNOLOGY FUND

Ethiopia: Tulu Moyo Geothermal Power Project

USD 10 million

March 2020

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Cover Page			
CTF Project/Program Approval Request			
Dedicated Private Sector Programs (DPSP-III)			
1. Country/Region	Ethiopia	2. CIF Project ID#	[CIF AU will assign ID]
3. Public or Private	Public		
	Private		X
4. Project/Program Title	Tulu Moyo Geothermal Power Project		
5. Is this a private sector program composed of sub-projects?	Yes		
	No		X
6. Financial Products, Terms and Amounts			
Financial Product		USD	EUR
Grant		0.00	
Fee on grant		0.00	
MPIS (for private sector only)		0.00	
Public sector loan	Harder terms	0.00	
	Softer terms	0.00	
Senior loan		10.00	
Senior loans in local currency hedged		0.00	
Subordinated debt / mezzanine instruments with income		0.00	
Second loss guarantees		0.00	
Equity		0.00	
Subordinated debt/mezzanine instruments with convertible		0.00	
Convertible grants and contingent recovery grants		0.00	
Contingent recovery loans		0.00	
First loss guarantees		0.00	
Other (please specify)		0.00	
Total			
7. Implementing MDB(s)	AfDB		
8. National Implementing Agency	NA		
9. MDB Focal Point	Leandro Azevedo (l.azevedo@afdb.org)		
10. Brief Description of Project/Program (including objectives and expected outcomes)^[c]			
<p>[Note: This project was not part of the latest DPSP III pipeline submitted to the CTF TFC. The inclusion of the project in the pipeline follows a review exercise undertaken by MDBs and the CIF AU in early 2020. It was agreed that the CTF TFC would be informed of the pipeline update at the time of submission of this proposal.]</p> <p>The Project involves the design, construction, commissioning and operation of a 50 MW geothermal power plant under a Build, Own, Operate and Transfer (BOOT) project financing structure. The Project is the first phase of the cumulative generation capacity of 150MW being targeted by the Government of Ethiopia (GoE) which is expected to be completed by 2024. The project is located about 100 km Southeast of Addis Ababa in the Oromia Regional State covering a 588 sq. km concession area with an estimated potential of 2 GW. The Project includes a sub-station and an 11 km transmission line to connect to an existing 132KV line for transfer to Ethiopia Electricity Power (EEP). Half of the costs associated</p>			

with the connection to the grid of the power plant will be reimbursed by EEP. The total avoided greenhouse gas emission is estimated at 10,512,000 t CO₂ eq. over the project lifetime. The project will lead to the creation of 600 jobs.

11. Consistency with CTF investment criteria

(1) Potential GHG emissions savings	See page 11
(2) Cost-effectiveness	See page 11
(3) Demonstration potential at scale	See page 11
(4) Development impact	See page 11
(5) Implementation potential	See page 11
(6) Additional costs and risk premium	See page 12

Additional CTF investment criteria for private sector projects/ programs

(7) Financial sustainability	See page 12
(8) Effective utilization of concessional	See page 12
(9) Mitigation of market distortions	See page 12
(10) Risks	See Annex II.

12. For DPSP projects/programs in non-CTF countries, explain consistency with FIP, PPCR, or SREP Investment Criteria and/or national energy policy and strategy

The Ethiopia SREP Investment Plan that was endorsed by the SREP Sub-Committee on March 2012 highlighted the importance of considering renewable energy technologies other than hydro to reduce the country’s exposure to the negative impacts that severe droughts have on its hydro generation assets. Furthermore, Ethiopia’s Climate Resilient Green Economy Strategy explicitly focuses on addressing issues of energy access, quality of supply and productive energy use, particularly for rural communities.

The proposed facility will contribute to accelerate the electrification targets embedded in Ethiopia’s National Electrification Plan (NEP) 2.0 launched in March 2019.

13. Stakeholder Engagement

Tulu Moya Geothermal Company (TMGO) – the project Special Purpose Vehicle - has undertaken several Stakeholder consultation and sensitization workshops on the project targeting respective stakeholders (i.e.g Government officials, financiers, district & municipal authorities and residents of the concerned communities). In particular, the Project Company stakeholder engagement plan encompasses key elements notably with regards to stakeholder mapping, engagement strategies, awareness creation among vulnerable groups, grievance redress mechanisms for affected communities and disclosure of relevant project information.

14. Gender Considerations

Ethiopia’s National Policy on Women formulated in 1993 aimed at creating appropriate structures within government offices and institutions to establish equitable and gender-sensitive public policies. Within the Ministry of Energy, the women and Youth Affairs Directorate is responsible for monitoring, facilitating and designing ways for smooth implementation of the aforementioned policy in the energy sector.

Women are active participants in the social, political and cultural activities of their communities and therefore economic development in Ethiopia is unthinkable without the participation of women. That said, gaps between men and women are especially prevalent in infrastructure sectors such as energy, where the roles of women and girls in the household, market and community can affect their ability to access, control and use electricity services. Ethiopia has set a 2025 target of universal electricity access, as well as 100% access for primary and secondary schools, hospitals, and primary health centers.

The GoE is not only looking at electricity access rates and utility gender balance, but also at gaps between men and women in access to finance to purchase solar panels and other renewable energy technologies. These commitments are well captured in the National Electrification Program (NEP) launched in 2017 and in the new engagement areas targeted in NEP 2.0 launched in March 2019.

The proposed project will play a positive role towards improving the climate resilience of the country’s on-grid generation assets which will in turn lead to improvements in the resilience of the Ethiopian people due to an increase in access to an affordable and productive source of electricity.

15. For projects/programs with activities in countries assessed as being at moderate or high risk of debt distress, macro-economic analysis to evaluate the potential for the CTF project or program to impact the country's debt sustainability

As of end 2018, Ethiopia's Debt Sustainability Distress rating was "high". Despite sustained high economic growth over the last decade (9% between 2018-2019 positioning Ethiopia was one of the World's 10 fastest growing economies), substantial progress on reducing poverty and improving social indicators, policies appropriately targeted at containing public investment and debt that contributed to narrowing the current account deficit to 4.5% of GDP and a reduction in public and publicly-guaranteed debt to 57% GDP (of which half is held local lenders), the country has work to do in order to reduce its risk of debt distress. The Government of Ethiopia has taken proactive steps, including initiation of discussions with bilateral creditors to seek additional relief on debt servicing and tightening control over external borrowing by public enterprises. These together with other measures led to a welcoming slowdown in Ethiopia's external debt accumulation positioning Ethiopia's external debt to GDP ratio (31.4%) below the average for low-income countries (40%). The ongoing IMF program in Ethiopia aims to reduce the country's risk of debt distress rating, as defined in the World Bank-IMF Debt Sustainability Analysis, to "moderate" before the end of the program in 2023.

The CTF loan will be extended to a private entity meaning that this amount will not account to the sovereign debt of the country. However, the Government of Ethiopia will be providing a sovereign guarantee to cover the payment default by the off-taker. AfDB is still in discussions with Ethiopia to provide a partial credit guarantee to cover part of this risk.

Given the size of the project, it is unlikely that the envisaged sovereign guarantee will cause a substantial impact on the successful implementation of the IMF program.

16. For public sector projects/programs, analysis of how the project/program facilitates private sector investment

Not applicable.

17. Indicators and Targets

Project/Program Timeline

Expected start date of implementation	June 2021
Expected end date of implementation	June 2039
Expected investment lifetime in years (for estimating lifetime targets)	18

Core Indicators	Targets
GHG emissions reduced or avoided over lifetime (tons of CO ₂ -eq)	10,512,000
Annual GHG emissions reduced or avoided (tons of CO ₂ -eq/year):	420,480
Installed Capacity of Renewable Energy (MW)	50
Annual Additional Power Generation Capacity (in MWh)	413.250
Identify relevant development impact indicator(s)	Targets
Jobs Created during Construction	550
Jobs Created during Operations)	50

18. Co-financing

	Please specify as appropriate	Amount (in million USD)
AfDB	Senior Loan	82.50
Other DFIs	Senior Loan	105.49
GRMF	Grant	1.30
USTDA	Grant	10.70
Private Sector	Loan	11.97
Private Sector	Equity	27.94
Total		239.9

19. Expected Date of MDB Approval

30 November 2020

1. INTRODUCTION

1.1 With a population of over 105 million, Ethiopia is the second most populous country in Africa. Economic growth in Ethiopia has recently been among the highest in the world, with the compound annual GDP growth rate exceeding 10% between 2006 and 2016. Though slightly lower than in recent years, the country still experienced an estimated growth rate of 7.9% (2018) and 9.0% (2019)¹. Much of the recent growth has been driven by public expenditures and infrastructure investments. Private consumption and domestic demand are projected to grow at a steady pace in the next five years.

1.2 Of the Ethiopian total population, 80% live in rural areas and over 70% of the work in the agricultural sector. According to the National Bank of Ethiopia (NBE), agriculture and services contributed 33.78% and 36.64% respectively to the Gross Domestic Product (GDP) in fiscal year 2017. The following year, the agricultural sector's share of GDP moderately decreased 31.19%, while the service sector's slightly dropped by 36.52%. These economic shifts supported by strong industrialization policy, highlight ongoing and impending urbanization in the coming decades, which will necessitate significant investments into adequate infrastructure, particularly in energy.

1.3 The country has more than doubled its generation capacity from 2,000MW in 2011 to 4,284MW in 2018 consisting of: (i) hydro (3,816MW - 89%), (ii) wind (324MW - 7.5%), (iii) diesel generators (97MW - 2.2%), (iv) biomass (40MW - 0.9%), and (v) geothermal (7.3MW - 0.17%). Ethiopia enjoys high geothermal potential with an estimated capacity of 5,000 – 7,000MW with resources being scattered in the Rift Valley and in the Afar depression which are both part of the Great East African Rift System.

1.4 Under the Growth and Transformation Plan (GTP II), which aims to transform Ethiopia into an industrialized middle-income country by 2025, the national power generation capacity is expected to exceed 14,000 MW by 2025.

1.5 The Tulu Moya 50MW Geothermal project was selected for the concession area before the enactment of the Public-Private Partnership Proclamation Law established in 2017. The effectiveness of the project's Implementation Agreement (IA) will require; (i) amendment of the Geothermal Resources Development Proclamation; (ii) Ratification Effectiveness Protocol to be signed by the Council of Ministers, and (iii) issuance of a Legal Opinion on the Ratification Effectiveness Protocol by the Legal Director of the Ministry of Finance.

1.6 The Dedicated Private Sector Program (DPSP), established under the Clean Technology Fund (CTF) in 2013, was designed to finance programs or projects that can deliver scale in terms of development results and impact, support private sector and fast-track the deployment of CTF resources under more efficient processing procedures while maintaining a strong link to country priorities as well as CTF program objectives. This funding request is being submitted as part of DPSP III.

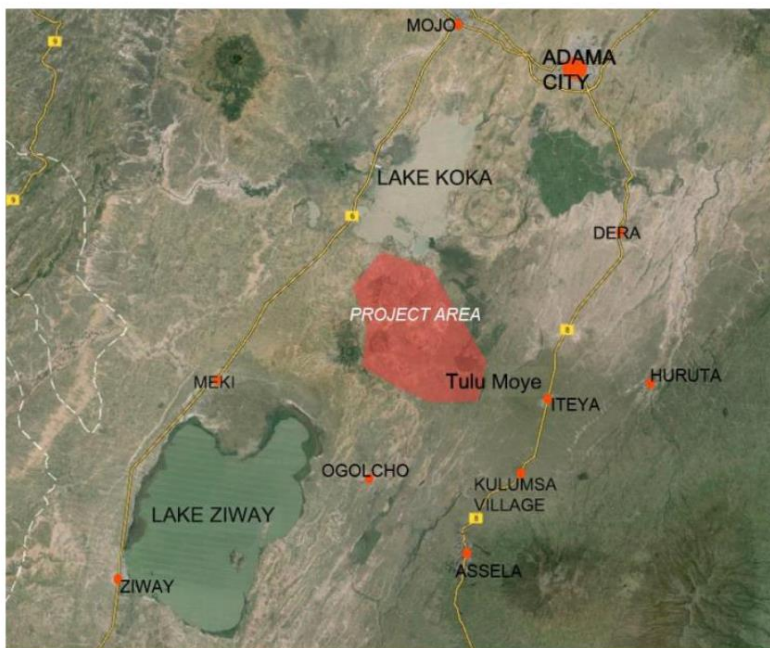
2. PROJECT DESCRIPTION

2.4 The project involves the design, construction, commissioning and operation of a 50 MW geothermal power plant under a Build, Own, Operate and Transfer (BOOT) project financing structure. The project is the first phase of the cumulative generation capacity of 150MW being targeted by the Government of Ethiopia (GoE) which is expected to be completed by 2024. The project is located about 100 km Southeast of Addis Ababa in the Oromia Regional State covering a 588 km² concession area with an estimated potential of 2 GW. The project will include a sub-station and an 11 km transmission line to connect to an existing 132KV transmission line. Half of the costs associated with the connection to the grid of the power plant will be reimbursed by the Ethiopia Electricity Power (EEP).

¹ "Global Economic Prospects, January 2020 : Slow Growth, Policy Challenges" , World Bank, Jan 2020

2.5 The project’s initial planning and preparation stages commenced in 2014 and the sponsor has made significant progress since then. In November 2015, the sponsor obtained a USD 1.3 million grant from the Geothermal Risk Mitigation Facility (GRMF) to conduct surface studies. The work was successfully completed in Q2 2016. Additional grant funding of USD 10 million has been secured from USTDA.

Figure 1: Project Area



2.6 To verify the geoscience studies conducted on the field since 2015, three wells will be drilled from two well pads aimed at confirming the geothermal resource potential. Three exploration wells will be drilled as full-size production wells. For Phase 1, eight production wells are likely to be required (including the three exploration wells) and one additional well for re-injection. Four well pads have already been identified for exploration and production wells and one for the injection well. In October 2019, the sponsor signed a drilling contract with KenGen, an experienced Kenyan power generation company with more than 530MW of geothermal power generation in its portfolio. Drilling started in February 2020 with well test results expected in May 2020.

The Sponsor

2.7 The Tulu Meye Geothermal Operations Private Limited Company (TMGO) – the special purpose vehicle for the project - was incorporated in Ethiopia. TMGO is 100% owned by Tulu Meye SAS, a company registered in France and 51% owned by Meridiam Infrastructure Africa Fund and 49% by Reykjavik Geothermal (RG). Meridiam was established in 2005 and is a global developer, investor and asset manager specializing in public and community infrastructure delivered through Public-Private Partnership (PPP) schemes with EUR 6.2 billion currently under management through 7 funds operating in the United States, Europe and Africa.

2.8 RG was founded in 2008 by a well experienced geothermal management and science teams. RG’s founders and staff have been involved with the development of numerous geothermal projects in Iceland. RG has been working in Ethiopia since 2010 and secured the rights (licenses, etc.) to develop geothermal power for sale to EEP across 3 sites: (i) Tulu Meye (500MW), (ii) Corbetti (500MW), and (iii) Abaya (300MW).

Cost Structure and Financing Plan

2.9 The project's total costs are estimated at USD 249.9 million as per Table 1 below.

Table 1: Sources and Uses of Funds (in USD million)

SOURCES OF FUNDS			USES OF FUNDS		
Description	Amount	%	Description	Amount	%
AfDB Senior Loan	82.50	33.01	Project Development	33.60	13.45
Other DFIs Loans ²	105.49	42.21	Drilling	61.40	24.57
GRMF Grant	1.30	0.52	EPC	90.60	36.25
USTDA Grant	10.70	4.28	Owner's Contingency	7.33	2.93
CTF Concessional Loan	10.00	4.00	Financing Costs	37.50	15.01
			Pre-funded Working Capital	0.47	0.19
Equity	11.97	4.79	Debt Service Reserve Account	7.04	2.82
Shareholders Loans	27.94	11.18	VAT on inputs	11.96	4.79
TOTAL	249.90	100.0	TOTAL	249.90	100.0

2.10 The Engineering, Procurement and Construction (EPC) contract and the Drilling contract are the most important cost items representing 36% and 25% of the total costs respectively. Three exploration wells, five production wells and one reinjection well are anticipated for a total USD 61.4 million. The average cost of drilling each well is expected to be USD 6.8 million. A construction contingency (Owner's Contingency) of USD 7.33 million is being included as a cost component.

2.11 The Project Development costs include up-front borne to secure rights to the project, project management fees up to financial close and a sponsors' development fee. These fees will be subject to audit during due diligence of the project. The pre-funded working capital included is a permanent cash buffer that will be required during the life of the project.

2.12 Financing Costs includes lender due diligence costs, interest during construction, and facility fees charged by the senior lenders. Value-Added Tax (VAT) will be charged at a rate of 15% over all construction expenditures but should be recoverable within 6 months from the beginning of construction.

2.13 The total investment proposed by the shareholders amounts to USD 39.9 million. AfDB in cooperation with other prospective lenders may request shareholders to increase their participation depending on the credit risk associated with the project.

AfDB's Role

2.14 AfDB is considering a senior loan of up to USD 82.5 million with a tenor of 18 years including a grace period of 38 months.

Implementation Arrangements

2.15 Project Site: The site is located in the Ethiopian Rift Valley in northern part of the East African Rift system, an area characterized by active extensional tectonics and associated volcanic activity. The site is located about 100 km southeast of Addis Ababa in the Oromia Regional State. TMGO has completed comprehensive geothermal site studies which estimate the geothermal potential at around 2GW. TMGO is responsible for acquiring and maintaining the land as well as to secure rights of way required for the successful implementation of the project. Under the IA, the GoE agreed to: (i) grant the land rights required over the land it owns at the site, and (ii) acquire rights over any additional land required by the project.

² Discussions are ongoing with FMO, DEG, Proparco, EIB and OPIC.

2.16 EPC and O&M: KenGen has been contracted to drill the steam wells. An EPC contract will be engaged to design and install the steam gathering system, the power plant and the power evacuation system. The major construction work packages expected for the Project are: (i) preparatory works (bulk earthworks, drainage), (ii) steam field development supply, piping and reinjection system, (iii) power plant, and (iv) transmission line and switchyard. TMGO will recruit an O&M company prior to financial close. Both AfDB and the Lenders' Technical Advisors will undertake detailed due diligence on the proposed companies to ensure they have the technical requirement and track record to deliver without compromising the success of the project.

2.17 Power Purchase Agreement: A 25 year take-or-pay Power Purchase Agreement (PPA) was signed between TMGO and EEP in December 2017. The tariff is USD 6.95 cents/kwh equivalent in Ethiopian Birr subject to an exchange rate reconciliation mechanism that will be detailed as a Condition Precedent to the effectiveness of the PPA. This mechanism will be further reassessed to ensure that AfDB, other senior lenders and CTF are not exposed to currency exchange risk. The annual rate of tariff escalation is 2.4% for years 1-5 dropping gradually thereafter to 2.0% at year 20 and beyond.

2.18 Government Support: In December 2017, the Project Company signed an IA with the GoE. Under the terms of this agreement, TMGO will benefit during full duration of the PPA of the following: (i) full rights to develop and operate the project, (ii) certain tax exemptions and tax incentives, (iii) a government guarantee in relation to the ongoing payment obligations of EEP under the PPA, and (iv) rights to convert local currency into USD and to repatriate the proceeds.

2.19 Grid Integration: TMGO is currently in discussion with EEP with regards to the proposed evacuation route. EEP have completed the draft grid study report which states that an evacuation voltage of 230 kV and an 11km transmission line are required. The grid study considered several connection options for each of the four phases of the project.

2.15 Environmental and Social Safeguards: The proposed project is classified as category I in line with AfDB's Integrated Safeguards System. This means TMGO will provide an Environmental and Social Impact Assessment (ESIA), an Environment and Social Management Plan (ESMP) to be reviewed prior to the approval of any financing. Summaries of these documents shall be made publicly available 60 days prior to approval by AfDB's Board of Directors. During supervision, AfDB's safeguards teams will make sure the sponsor is continuously monitoring all potential risks identified in the ESMP and that all proposed mitigation measures are being implemented.

2.20 Implementation Schedule: Construction schedule is estimated to last for a period of 36 months. The construction phase will consist of: (i) steam gathering system, and (ii) the power generation facility.

2.21 TMGO contracted KenGen, a leading electrical power generating company in Kenya, East Africa to undertake all exploration drilling activities. KenGen mobilized the drilling rig in January 2020 and started the drilling of three exploration wells on two well pads. These activities are expected to be finalized by November 2020. Securing adequate steam supply to meet the needs of the power plant is the major risk for a geothermal project. In the context of this particular project, this risk will be fully allocated to TMGO as these costs will be fully funded by their own financial contribution to the project and by proceeds of the USTDA grant. All senior lenders, including the CTF, will benefit from the Lenders Technical Advisor's confirmation that adequate steam is available to meet the envisaged 50MW capacity of the power plant.

The Market

2.22 Institutional and Regulatory Environment. In 2013/4, the GoE ratified several new regulations and proclamations which, among others, divided EEPCO into two separate entities, the Ethiopian Electric Power (EEP) and the Ethiopian Electric Utility (EEU). The EEP was established by Council of Ministers Regulation No. 302/2013 and

assumed responsibility for generation and transmission, leasing of transmission lines and sale of bulk power. EEP is responsible for the purchase of wholesale power from Independent Power Producers (IPPs) and the supply of electricity to EEU as well as several neighboring countries. The Ethiopian Energy Authority (EEA) is the state regulator and falls under the direct responsibility of the Ministry of Water Irrigation and Electricity (MoWIE). The EEA issues investment permits pursuant to the Investment Proclamation No. 769/2012. It also issues generation licenses of 25-years for hydropower and geothermal technologies and 20-years for wind, solar and biomass. Currently, no law addresses energy tariffs aside from Proclamation No.810/2012, which grants the EEA sole authority to determine tariffs.

2.23 Electricity Demand. Ethiopia continues to register high economic growth over the past decade, with annual average real GDP growth rate of 10.8% since 2004/05. Public sector investments in infrastructure has underpinned this strong economic growth. Since 2010, the demand for electricity is growing at an annual average rate of 15%. This is driven by a sustained increase in industrialization and by a renewed focus on the increase of energy access. In 2014, EEP projected electricity sales to grow from 4,925 GWh in 2012 to 97,326GWh by 2037 for a compounded annual growth rate of 12.7%. GoE has prioritized the development of industrial parks and export-processing zones and has enacted policies to encourage foreign direct investment and private investment into various sectors of the Ethiopian economy. This industrialization strategy of GoE is expected to further drive the demand for electricity.

2.24 Electricity Supply. Ethiopia has a generation capacity of 4,284MW of which 89% is hydro based. To supply the energy needs of a growing population, the GoE is focusing on the nation's abundant natural resources to meet its generation targets. The 6,000MW Grand Ethiopian Renaissance Dam (GERD) will play a large part in achieving the country's goal. However, the project is far behind schedule and IPPs will be critical for the country to achieve its target capacity. Ethiopia has high geothermal potential with an estimated capacity between 5,000–7,000MW having prioritized the development of up to four geothermal projects with a combined capacity of 1,270 MW over the next five years. Investments to exploit these resources and transition to a more diversified energy mix are in line with Ethiopia's Nationally Determined Contribution (NDC) under the Paris Agreement and the SREP Investment Plan. The GoE is aware of the important of reducing the sector's dependence on hydropower as droughts continue to severely affect the sustainability of power supply leading often to load shedding.

2.25 Since January 2018, reform of the power sector has commenced with the enactment of the PPP Proclamation Law, revision of the tariff regime, signing of PPAs for the first two IPPs (Geothermal) and decentralization of power distribution to nine regions within the country. Transmission and distribution (last mile connectivity) are targeting up to 4.5 million new household grid connections by 2025 based on an annual connection rate of 1 million households per year. The off-grid program of the country targets up to 5.7 million new household connections by 2025.

2.26 Competition. The GoE is promoting the participation of private sector in power generation. A good example, is the plan to develop up to 250MW of solar PV as part of IFC's Scaling Solar initiative. Other development partners are also supporting the diversification of the energy mix with USAID supporting the Metehara 100 MW Solar PV project, the 100 MW Mekele Solar PV project, the 100MW Humera Solar PV project and the Corbetti 500 MW geothermal project.

2.27 Opportunity. The GoE estimates demand to reach 64.2TWh in 2030, mainly driven by the commercial, industrial and agricultural users. Ethiopia's annual energy consumption per capita (around 120kWh) is still lower when compared to countries such as India (806kWh), Vietnam (1,411kWh), and China (3,927kWh). Economic growth leading to an increase in per capita energy consumption will require further investment in energy infrastructure in the medium term. Recently completed and ongoing investments in power transmission interconnections to neighboring countries will enable exports to Djibouti, Sudan, Kenya, Tanzania, Uganda, and Rwanda. While power trade in the East Africa Power Pool region is based on bilateral agreements between countries, there are plans for the development of a trading platform which could enable not only regional integration gains but also a more competitive power trade in the medium to long-term in a bid to optimize the energy systems of participating countries. Based on GoE's estimates, the country could export nearly 1,000MW of power by 2025 and thereby generate more than USD 500 million per year in revenues.

3. CTF INVESTMENT CRITERIA

Potential GHG Emission Savings

3.4 With CTF funds of USD 10 million, the project will leverage an additional USD 239.9 million in equity and debt from other investors. This provides a leverage ratio of roughly 1 to 23.99. Emission reductions for the project are expected to equal 420,480 tCO₂ eq. per year. Assuming a life of 25 years for the infrastructure, the project will contribute to a total reduction of 10,512,000 tCO₂ eq. over the life of the power plant.

Cost Effectiveness

3.5 With CTF funds of USD 10 million and estimated total emission reductions of 10,512,000 tCO₂ eq. over the life of the infrastructure, the cost effectiveness of CTF funds is roughly USD 0.95 per tCO₂ eq.. More detailed calculations can be found in Annex I.

Demonstration Potential at Scale

3.6 As one of the first IPP projects in Ethiopia, the project will have positive demonstration effects for other private sector players entering the energy market in Ethiopia. This is especially important given the need of the GoE to lower the burden on its sovereign debt levels while meeting their development plans for the sector. As a front runner IPP, the successful implementation of the project will also test the ongoing sector reform process and establish Ethiopia as a sound investment destination. The project will also contribute to the establishment of a domestic geothermal sector in Ethiopia that could in the future generate various employment opportunities and to contribute to economic growth.

Development Impact

3.7 The project will benefit the local economy through direct job creation and upskilling of the local workforce as well as generation of additional electricity for the country including diversification from hydropower which dominates power generation in Ethiopia and is subject to great seasonal variation due to droughts. Approximately 550 workers will be required during the construction phase and approximately 50 during operations. Additionally, there are possibilities to engage local small and medium enterprises in Oromia Regional State with procurement opportunities during the various phases of project implementation

3.8 Once operational, the project will generate a total of 413,250 MWh per year. Based on a per capita average electricity consumption of 83 kWh, the power generated by the proposed could potentially to feed a total of 60.000 households or 288.000 individuals of which 51% would be females.

Implementation Potential

3.9 Meridiam has currently a portfolio of over 60 infrastructure projects in various stages of development, construction and in operation across Africa representing more than EUR 50 billion of capital. RG was founded in 2008 by a well experienced geothermal management and science teams. RG has been involved in the development of over 3000 MW of geothermal projects in over 30 countries, including all phases from greenfield to power plant commissioning. They have been working in Ethiopia since 2010 and secured exploration rights and respective licenses to develop geothermal power for sale to EEP across three sites including the Tulu Moye, Corbetti (500MW) and Abaya (300MW). Exploration drilling for the Corbetti field has started and was financed by equity from African Renewable Energy Fund and InfraCo.

Minimum Concessionality and Mitigation of Market Distortions

3.10 CTF plays a vital role in the project due to a number of reasons. Being the first IPP in the country, CTF will contribute to the demonstration of the current legal and regulatory framework surrounding the deployment of IPPs. This will benefit not only geothermal but also other renewable energy technologies as valuable track record will be established and underpin future investments into the sector as first-mover risks are reduced and compliance requirements better understood to all market participants.

3.11 Being the first geothermal IPP in the country as well, CTF will not be contributing to market distortions or displace local financiers. On the contrary, it will help proving that investments in geothermal can be made at a competitive cost while generating a return commensurate with the risk borne. Over time, this could lead to the participation of local financial institutions (e.g. Commercial Bank of Ethiopia) in the financing of similar projects as the perception of risk is reduced.

3.12 In addition, lessons to be derived from this project's experiences will provide for a more robust platform of knowledge exchange and learning for the main public actors responsible for energy planning leading over time to the phasing out of concessional climate finance.

3.13 Ultimately, CTF will contribute to the transformation of the energy sector as policy makers realize that other forms of reliable and affordable renewable technologies as well as financial mechanisms that do not rely purely on public investments, can be successfully deployed in the country over long periods of time.

Financial Sustainability

3.14 The economies of scale of the proposed project are limited in nature due to the fact that TMGO spent a number of years developing the project while waiting for the GoE to establish the required legal and regulatory framework surrounding the project. This led to an increase on the development costs that must be recovered through the PPA. Once the power plant starts operations, new projects are likely to be able to move faster and with much better economies of scale and consequently with less pressure on the tariff level required to render the projects bankable.

Risks

3.15 Annex II includes a table with all anticipated risks as well as mitigation measures for each one.

4. MONITORING & EVALUATION

4.1 AfDB will undertake supervision missions throughout the life of the loans in terms of the management associated with environmental and social risks (including gender), to assess project level indicators and respective targets and to ensure the project remains operationally sound and financially viable.

4.2 The legal agreement between the CTF and the sponsor will include the obligation by the latter to submit on an annual basis a monitoring and evaluation report capturing the CTF indicators included in the CTF Results Measurement Framework. Table 4 includes the CTF expected results.

Table 2: CTF Performance Indicators

INDICATORS	TARGET
Annual GHG Emissions Reductions (t CO ₂ eq.)	420,480
Cost Effectiveness of CTF Funds (USD)	0.95
CTF Financial Leverage	1 / 23.9
Number of Jobs Created	550 construction jobs 50 full-time jobs

5. CONCLUSIONS

5.1 AfDB requests the CTF Trust Fund Committee to consider the approval of a CTF USD 10 million senior loan with an interest rate of 0.75% plus a tenor of 18 years including a grace period of 3.2 years (38 months).

Annex I: CTF Investment Criteria Calculations

SOURCE OF FUNDS	USD million
AfDB Senior Loan	82.50
Other DFIs Loans	105.49
CTF Concessional Loan	10.00
GRMF Grant	1.30
USTDA Grant	10.70
Shareholders' Loans	27.94
Equity	11.97
TOTAL	249.9

EMISSION REDUCTIONS	
Installed Capacity of the Project (MW)	50
Capacity Factor	95%
Annual Generation (MWh/year)	413,250
Project Lifetime Generation (MWh)	10,331,250
Annual Emission Reductions (t/CO2)	420,480
Project Life Emission Reductions (tCO2 / 25 years)	10,512,000

CTF COST EFFECTIVENESS	
CTF Funds (USD million)	10.0
GHG Emission Reductions for the Project (tCO2 eq.)	10,512,000
Cost Effectiveness of CTF Funds (USD per tCO2 eq.)	0.95

PROJECT COST EFFECTIVENESS	
Total Funds (USD million)	249.9
GHG Emission Reductions for the Project (tCO2)	10,512,000
Cost Effectiveness of Total Funds (USD per tCO2)	26.05

Annex II: Risks and Mitigants

Risks	Mitigants
Off-taker	EEP is the sole offtaker for the Project. Under the IA, all energy charges, deemed generation energy payments and any other payment under the PPA, as well as any termination payments payable under the IA which may become due to TMGO, are guaranteed by the GoE. AfDB is considering the provision of a Partial Risk Guarantee that could possibly provide liquidity support.
Change in tax regimes	For any change in tax regimes that increase or decrease costs incurred by TMGO by an amount exceeding USD 50,000, the PPA allows for the project company to apply for an adjustment to the tariff under the PPA to restore the same economic position.
Construction	Construction risk (other than steam risk) will be properly allocated to the EPC Contractor, including the potential payment of relevant liquidated damages. The construction risk will also be mitigated through a contingency of 7% of the gross EPC cost.
O&M	Options for the post-construction O&M of the Project include: (i) outsourcing to a reputable international firm that is well qualified, or (ii) utilizing an in-house team with support from one or more experienced international companies via a technical assistance contract. TMGO is currently developing its strategy with regards to long term operations and maintenance. AfDB will continue monitoring this risk to ensure it is fully mitigated at the time the contract comes into force.
Currency Exchange	The GoE has committed (but not guaranteed) ensure that TMGO is able to purchase foreign currency from commercial entities to exchange local currency for USD so that it can: (i) meet debt service obligation, (ii) O&M payment obligations if any, (iii) make payments under all project documents, and (iv) pay dividends, interest and principal investors, (v) make salaries payments to TMGO expatriate personnel.
Regulatory	The Project will be subject to the Geothermal Resources Proclamation. However, the IA sets out the assumptions, modifications, clarifications and conditions that will form the regulatory regime to be incorporated.
Steam	The Project Company will take 100% of the steam risk. If in the absence of planned maintenance, a force majeure event, deemed generation event or testing, the plant is not able to operate at 90% of the contracted plant capacity, the PPA requires TMGO to pay liquidated damages to EEP. Maintenance of the steam supply is therefore a critical requirement of the O&M contractor.
Grid Connection	The Project Company is required to develop, finance, build and commission the sub-station and transmission line to connect the project to the grid. The cost of the connecting works will be split 50:50 between EEP and the Project Company. EEP is required to complete all works required to its grid system to allow evacuation of power from the Project within strict completion timelines.