



ICAT

INITIATIVE FOR
Climate Action
Transparency



Inception Report

UNEP-DTU Partnership (UDP)

Assignment: The Initiative for Climate Action Transparency (ICAT)
Conducting emission reduction impact assessment of CRGE policies and actions within the
energy sector

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Abbreviations:

ADELE	Access to Distributed Electricity and Lighting in Ethiopia
CO ₂	Carbon Dioxide
CSA	Central Statistical Agency
CDM	Clean Development Mechanism
CRGE	Climate Resilient Green Economy
CFL	Compact Fluorescent Lamp
EFCCC	Environment, Forest, and Climate Change Commission
EEP	Ethiopian Electric Power
EEU	Ethiopian Electric Utility
EEA	Ethiopian Energy Authority
ESA	Ethiopian Standard Agency
GHE	Greenhouse Gas
GTP	Growth and Transformation Plan
LED	Light Emitting Diode
MRV	Measurement, Reporting and Verification
MW	Mega Watt
MWh	Mega Watt Hour
Mt	Million ton
MEPS	Minimum Energy Performance
MOF	Ministry of Finance
MoH	Ministry of Health
MoWE	Ministry of Water and Energy
MoWIE	Ministry of Water, Irrigation and Energy
NDC	Nationally Determined Contribution
PV	Photovoltaic
t	ton
UNFC	United Nation's Framework Convention on Climate Change
CC	

1 Background

Ethiopia is a forerunner in climate policy and action in the developing world setting out the CRGE strategy in 2011 and the NDC in 2015. Ethiopia is also exemplary for setting out very ambitious targets and for allocating domestic resources to meet climate change mitigation and adaptation actions. The CRGE, and the NDC which is largely based on it, committed to reduce national GHG emissions in 2030 below 2010 levels (from 150MtCO₂e in 2010 to 145MtCO₂e in 2030 or reduction of 64% from the BAU projection for 2020).

Ethiopia's climate action was first articulated in the Climate Resilient Green Economy (CRGE) strategy (2011) and subsequently in sectoral climate resilience strategies (2015). The CRGE explicitly links action in the climate sphere with development (Figure 1): the strategy was integrated with the national development plan (GTP 1) and specific targets and projects in each sector (e.g., electric railways in transport and renewable power generation in the energy sectors).

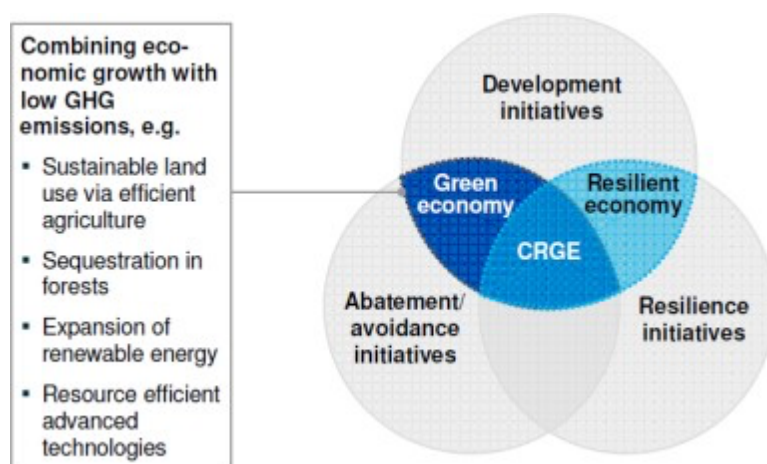


Figure 1 CRGE: integrating economic growth with emission reduction and resilience (CRGE, p. 21)

The green climate strategy under the CRGE projected GHG emissions from Ethiopia will increase to 400MtCO₂e in 2030 in the absence of mitigation actions. Agriculture and forestry will contribute 70%, while transport, power and industry will contribute nearly 30% to total emissions in 2030. The CRGE proposed sectoral mitigation actions that will reduce emission by 64% (or from 400 to 145MtCO₂e) from the BAU scenario for 2030. Emission reduction from transport (10MtCO₂e), industry (20MtCO₂e) and power (19MtCO₂e) will be through

- a) substitution of freight transport by electric rail and intercity rail,
- b) fuel economy standards,
- c) biofuel blends for diesel and gasoline fuels,
- d) clinker substitution in the cement industry to reduce CO₂,
- e) substitution of fossil fuels by biomass fuels in cement kilns,
- f) energy conservation measures in industry
- g) renewable electricity export to neighboring countries that rely on fossil fuels

Include information on updated NDC (July 2021) and how the emissions base line and targets are changed ... conditional, unconditional emission reduction targets by sector. The importance of MRV discussed and implementation strategy outlined

e.g., integrating data collection with CSA activities

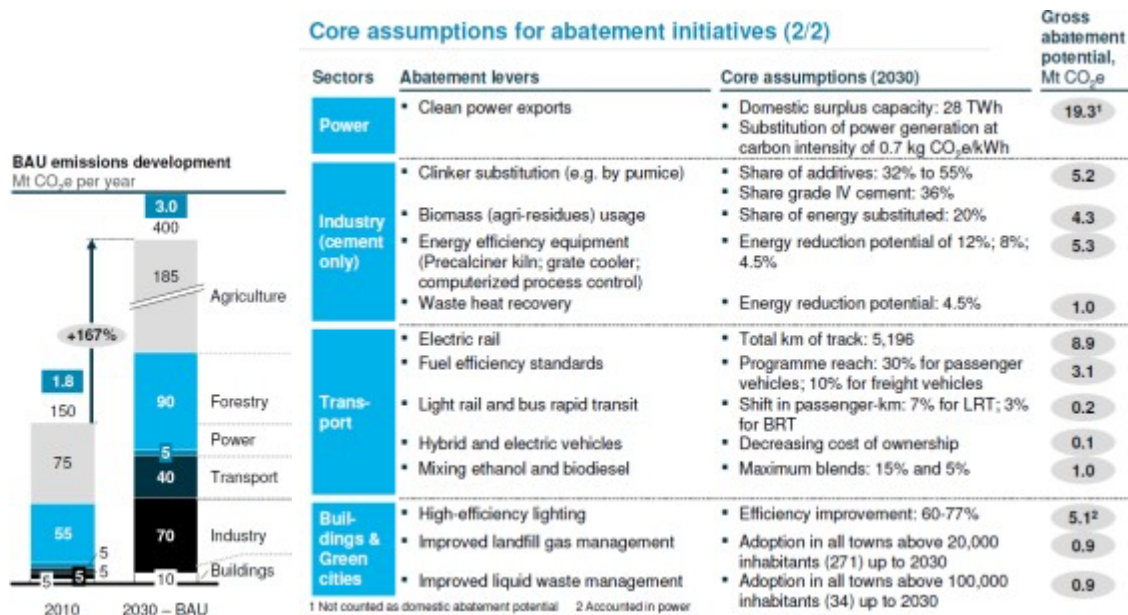


Figure 2 GHG emission by sector and abatement measures (CRGE, p. 15)

The climate resilience strategies under the CRGE were issued in 2015 for agriculture and forestry, water and energy, and transport. The climate resilience strategy for agriculture and forestry was framed around the three development and sustainability objectives -- enhancing economic growth, ensuring smallholder livelihoods and protecting biodiversity – stating that failing to act on resilience will have adverse impact on the growth potential of the economy.

- Capacity building, information and awareness
- Crop and water management (crop switching, fertilizer, farm technology, pest, irrigation)
- Livestock management (breeds, health, diversity, fodder and rangeland)
- Sustainable agriculture and land management (conservation agriculture, soil management, agro-forestry)
- Natural resources management (resilient forests, forest rehabilitation,
- Value chain development
- Disaster risk reduction and social protection for special groups

The resilience strategy for water and energy framed resilience actions aligned with economic growth and poverty reduction. With the view to safeguard economic growth, the strategy recommended diversity of energy mix and energy efficiency for the power sector. The poverty reduction component of the strategy focused strategies was to promote biomass energy efficiency and support off-grid energy access. The transport strategy focuses on building climate resilient transport infrastructure including roads, bridges and airports. The transport strategy identified possible interventions in the areas of review of design and safety standards, improved infrastructure asset management, emergency preparation.

The institutional set up for the CRGE consists of the CRGE Facility, which was created in 2013, is the central source for climate finance and for coordination of climate action in Ethiopia. The structure of the CRGE consists of a) the management committee chaired by MOF and EFCCC and membership of all sector ministries, b) an advisory board composed of development partners and the private sector, c) the CRGE secretariat which operationalizes the facility.

At sectoral level climate change implementation is carried out by climate change units (in most cases Directorates) in each ministry. This climate change units have the responsibility to coordinate, monitor and evaluate climate

change activities within their sectors (coordination inside their own ministries, horizontal coordination with other ministries).

2 The CRGE/NDC context for the energy sector in Ethiopia

In the ten years since the CRGE strategy the government has issued sectoral and cross-sectoral climate change mitigation and resilience strategies. Ethiopia has implemented mitigation and resilience activities in all sectors with varying scope and scale of investment – some sectors such as agriculture and forestry have received a large number of projects while the transport and energy sectors have received the highest level of investment from a limited number of projects.

According to Climate Action Tracker Ethiopia is making progress reducing emissions significantly. However, the current projection is that emissions in 2030 will be between 155-219 MtCO₂e with an expected mean around 185MtCO₂e. This projection is based on a revised outlook for economic growth which is expected to slow due to COVID-19. The pre-COVID-19 projection for emissions was 239MtCO₂e for 2030 – that is 22% higher than the mean for post-COVID-19.



Figure 3 Ethiopia GHG emission projections (<https://climateactiontracker.org/countries/ethiopia/>)

The climate resilience strategies were issued in 2015; the national adaptation plan (NAP) was issued in 2019. Sectoral resilience activities are underway in the agriculture and forest, and for water and energy sectors. In these sectors many of the resilience and adaptation actions are similar to ongoing risk reduction, poverty reduction and conservation measures.

3 Objectives and outputs

The overall objectives of the assignment are to: i) provide the government information on the **mitigation** effects of selected mitigation policies and actions in the country's energy sector till 2020 and 2030, which will be an important basis for future mitigation policy making, target setting, and action planning; and ii) improve the country's capacity in complying with the international rules on climate action transparency through targeted training for the country's inventory preparation and MRV team for the energy sector.

The specific objectives are to:

- a) To map the implementation status of the selected policies and actions from CRGE 2011 to date and the data availability in terms of the baseline and implementation details, including their direct and indirect energy saving and GHG emission reduction effects.
- b) To determine the temporal and spatial boundary and select the appropriate methodology for each policy/action's mitigation impact assessment.
- c) To make a quantitative assessment of the GHG emission reduction effects of the mitigation policies and actions in the energy sector, including the duration and annual and accumulated volume of their direct mitigation effects.
- d) Determine outside influencing factors on the policies and actions assessed including synergies and contradictions with other policies, making it challenging to attribute mitigation effects. (Often, the technology and emission levels of activity are subject to the direct and indirect influences of multiple policies and programs. In some cases, it may be difficult to attribute the change to a single policy).
- e) The assessment should include a quantitative estimation of both the emission reduction impacts and social-economic impacts of the selected policies and actions.

The scope of work includes the assessment of the effects of the following policies and actions:

- The policy of distribution of improved Cookstoves,
- The policy of introduction of Incandescent lamps by CFL and LED lamps, banning of Incandescent lamps promoting the use of LED lamps,
- The policy of Promotion of Power factor correctors, especially in large industries (high electricity consumers)
- The directives for labeling for Electric Injera mitad, cook stoves, and other appliances
- The policy of introduction of mini-grids in rural areas for non-electrified communities.
- The policy of upgrading of transmission and distributions, reducing loss, standard implementation
- The policy of grid-connected waste to energy in the Addis area and elsewhere
- The policy on bioethanol.
- Assess the impact of promoting solar water pumping, solar home systems, solar lanterns, solar street lightings, solar water heaters, water purification technologies replacing boiling, solar refrigerators for health posts and clinics etc.
- The new initiatives with WB support, which will start now. This includes replacing biomass energy and diesel generators. The assessment will include the establishment of a baseline, the monitoring system, etc.
- Throughout the consultancy, build capacity for emission assessment (ex-ante and ex-post) with the key experts in the line ministries, institutes, and agencies related to MRV within the energy, in order to enable an emissions assessment by the institutions in the future. This will be done through at least one training session and through on-the-job training and cooperation.

4 Approach and methodology

4.1 Approach

The objective of the assignment is to estimate the mitigation effects of stated policies (listed in the TOR) and build the capacity for GHG inventory and MRV for the energy sector. Some of the policy measures (as in the TOR) have mitigation effects at the domestic and regional level: policies such as promotion of improved or clean cookstoves, roll out of mini-grids to rural areas, promotion of liquid biofuels as transport and cooking fuel, and waste-to-energy will have domestic GHG mitigation effects; the other energy efficiency and conservation measures for the power sector increase the renewable energy capacity on the Ethiopian national grid that may be exported to countries in the region to displace fossil fuel dominated power systems there.

The following section presents the methodologies that will be adopted for assessment of the various specific policy interventions outlined in ToR.

4.2 Methodology for GHG assessment and capacity building: approach and methodology

4.2.1 Energy policy and actions

The Consultants will adopt guidelines and procedures as provided in the GHG Protocol Policy and Action Standard¹, and as far as possible, follow the recommended specific GHG assessment steps needed to be conformed to the protocol's requirements and guidance. The GHG impact assessment work covers two continuous but distinct planning and implementation periods - the first period covers 2010 to 2020, and the second period 2021 to 2030. The energy policy and actions to be assessed include: renewable energy generation and use, energy efficiency improvement measures – which are expected to have direct GHG emission reduction impacts, and capacity building for emissions inventory and MRV for the energy sector.

ex-post GHG assessment (2010 – 2020): This is the first phase of the GHG mitigation (and adaptation) policy action implementation period and is completed. The GHG impact assessment would therefore mainly focus on assessing the impact of energy sector policy and actions planned in the CRGE and first NDC documents. However, where appropriate and monitored performance data and information are available the ex-ante projections included in the CRGE/first NDC documents would be adjusted, before the net GHG impact of policy and actions are estimated and reported. A need to adjust the ex-ante GHG emission reduction estimates may be invoked due to assumed economic and other factors that have changed since then.²

Monitored policy and actions implementation performance data for CRGE/ first NDC, will be collected from MoWE and EFCCC (and other relevant institutions) for the period covering (2010 to 2020). The ex-post assessment (depending on data and information availability) will recalculate the baseline emissions to better assess the impact of policy and action within the assessment period. The Consultants will adapt and use existing GHG impact assessment models³ and/or design simple and transparent calculation models (excel spread sheet models) that supplement the

¹ The GHG Protocol Policy and Action Standard: An accounting and reporting standard for estimating the greenhouse gas effects of policies and actions. WRI, July 2014

² (for example assumed GDP growth rate which does not correspond to the real GDP growth rates registered between 2010 and 2020), or due to difference in methodology employed (largely top down approach used in the CRGE and NDC) and the mainly bottom-up approach used for GHG assessment of individual policy and actions.

³ For example, CLEER GHG Projections Calculator, and the accompanying Clean Energy Emission Reduction (CLEER) Protocol: Guidelines for Quantifying GHG Emission Reductions from Clean Energy Actions Conducted under the USAID Global Climate Change Initiative May 2019. A methodology and tool that is “Built on GHG Protocol.”

GHG protocol, consistent with CDM methodologies and tools. The Consultants would also use the guidance in the protocol to assess the non-GHG impacts: environmental, social, and economic impacts of the energy policy and actions.

ex-ante GHG assessment (2021 to 2030): In the second phase, the assessment will focus on taking lessons learned from planning and implementation of policy and actions in the first phase of the country's GHG mitigation and adaptation plan, and incorporate these lessons to provide better projections - ex-ante assessment of specific energy policy and actions for the current phase of GHG mitigation and adaptation period. Although the policy or action in the energy and other sectors included in the updated NDC are projected using top down approach (economy-wide analysis using Green Economic Modeling, (GEM)), in conducting the ex-ante assessment for specific energy sector policy and actions included in the updated NDC, the projection would be conducted using bottom-up approaches as this will allow consistency in the use of methodologies adopted for the ex-post GHG assessment described above.

4.2.2 MVR capacity building for GHG ER assessment for energy sector MRV units

In assessing the need for and recommending MRV capacity building activities, the consultants will review the current institutional capacity and institutional arrangements for MRV. The need for improving/enhancing effective exchange of data and information between the various implementing and coordinating institutions supporting the MRV processes necessary to assess GHG, as well as non-GHG impacts of mitigation policy and actions will also be reviewed.

In the updated NDC, the GoE has shown its commitment to conform to the mandatory reporting requirements (a more stringent requirement set for annex-one countries) and also intends to fully integrate its monitoring and reporting with the 10YDP targets and indicators (and it also emphasizes the need for **international support in developing the national MRV capacity**). The MRV capacity development need assessment and recommendations to be made will be informed by lessons learned and good practices documented in the Handbook on Measurement, Reporting and Verification for developing country Parties⁴, and Toolkit for non-Annex I Parties⁵

Under this assignment the main focus or target institutions for MRV training and capacity enhancement will be the MoWE and EFCC, and will be undertaken using the following approaches:

- **Identify training needs: the Consultants will identify trainings** that will help build enhance the capacity of experts of MoWE and EFCC responsible for conducting MRV of energy sector GHG emission reduction interventions (programs and projects).
 - Review of past MRV capacity enhancement trainings undertaken and the impacts of these trainings, and
 - Identifying additional training needs by conducting interviews mainly with key staff of EFCC and MoWE MRV Units.
- **Conduct trainings** – in the following areas:
 - After the approval of the Inception Report, MoWE and EFCC staff will be engaged in the detailed methodology development process for each of the policy/ action that will be assessed.
 - MoWE and EFCC staff will be engaged in the design and development of survey questionnaires, data collection, and in method of data analysis of energy consumption and quantification of related GHG emissions.
 - Identify and propose additional training needs and/or refresher trainings necessary to continuously improve MRV capacity of MoWE and EFCC in the coming policy and action implementation periods.

⁴ Handbook on Measurement, Reporting and Verification for developing country Parties, 2014 United Nations Climate Change Secretariat,

⁵ Toolkit for non-Annex I Parties on establishing and maintaining institutional arrangements for preparing national communications and biennial update reports, UNFCCC 2013.

Based on the results of the training needs assessment, effectiveness of training that will be provided, and training gaps identified:

- the Consultants will propose capacity building activities that could be undertaken within the boundaries of this consultancy services (ex-ante, ex-post GHG assessment), and with the assistance of national/international institutions (experts from UNEP- DTU partnership and ISPRA), and
- In consultation with EFCC, MoWE and UNEP DTU, the Consultants will identify and propose type of data and the frequency of data collection to be integrated with CSA national level data collection and reporting plans.

IMPROVED BIOMASSES COOK STOVES (BAKING AND COOKING)

Required information	Explanation
The title of the policy or action	National Programme for Improved Household Biomass Cook Stoves Development & Promotion
Type of policy or action	Alternative Energy Development and Promotion Program
Description of specific interventions	Support over 7,000 new cook stoves entrepreneurs Produce and disseminate different types of improved biomass stoves (3,5 million Mirt; 1.3 million Gonziye; 3 million Closed stove, 1 million Opesi, and 60 thousand Daily cooker)
The status of the policy or action	Partly implemented
Date of implementation	January 2013
Date of completion (if applicable)	January 2018
Implementing entity or entities	Ministry of Water and Energy
Objective(s) of the policy or action	Support the dissemination of 9 million improved cookstoves in Ethiopia up to January 2018 through building a sustainable and vibrant market for improved cookstoves and institutional capacity
Geographic coverage	Urban and rural areas in the 11 regions of Ethiopia
Primary sectors, subsectors, and emission source/sink categories targeted	Residential energy use, households using improved biomass cookstoves and displacing traditional biomass cookstoves
Greenhouse gases targeted (if applicable)	CO ₂ , CH ₄ , N ₂ O
Other related policies or actions	
Optional information	
Intended level of mitigation to be achieved and/or target level of other indicators (if applicable).	A carbon savings amounting to 2.1 t/year per household A total abatement potential of 14 Mt of CO₂e due to the effect of reduced degradation
Title of establishing legislation, regulations, or other founding documents	N/A
Monitoring, reporting, and verification procedures	Alternative Energy Technology Promotion and Dissemination Directorate of MOWE will be responsible for MRV; procedures for the MRV process are outlined in the program document.
Enforcement mechanisms	It will be a voluntary action

Reference to relevant guidance documents	CRGE, NAMA of Ethiopia
The broader context/ significance of the policy or action	The program is expected to contribute to realization of the CRGE vision of reducing emissions from deforestation and forest degradation and ensuring access to clean energy
Outline of non-GHG effects or co-benefits of the policy or action	Creating 5,000 private sector jobs largely in rural areas Reduce indoor air pollution and improve health.
Other info / data	
Approach for estimation of Policy/ Action impact: GHG emission reduction	Emission reduction estimate with the TPDDTEC: Emission reduction = <i>Emission reduction by the project device – Leakage emission</i> Emission reduction by the project device = <i>Fuel savings * technology days (no .of installed devices * no. operational days) * usage rate * fNRB</i> <i>* Emission factor * NCV</i> TPDDTEC: Technologies and practices to displace decentralized thermal energy consumption (TPDDTEC), Gold Standard.

ELECTRIC ENJERA STOVE

Required information	Explanation
The title of the policy or action	Energy efficiency program
Type of policy or action	Appliance energy efficiency improvement
Description of specific interventions	Set Minimum Energy Performance Standard (MEPS) and labeling for electric injera baking stove (inera mitad)
The status of the policy or action	Implemented minimum efficiency standard set by Ethiopian Standards Agency (ESA), MEPS directive issued on Dec 2019, Directive 005/2012, Energy efficiency labeling directive on electric injera mitad. Actual S&L actions not started until Nov 2021
Date of implementation	Planned for Dec 2020
Date of completion (if applicable)	Continuous, and expected to go beyond 2030
Implementing entity or entities	Ethiopian Energy Authority (EEA), and ESA
Objective(s) of the policy or action	Reduce energy demand on grid electricity supply, and reduce peak power demand.
Geographic coverage	National, countrywide, the initial stage of implementation is expected to concentrate in Addis Ababa
Primary sectors, subsectors, and emission source/sink categories targeted	Residential energy use, grid-connected households, (IPCC category 1A4b, residential- check) households switching from biomass use to efficient electric baking mitad for injera baking
Greenhouse gases targeted (if applicable)	CO ₂ , CH ₄ , N ₂ O,
Other related policies or actions	Awareness campaign for educating households on selection and use of efficient electric injera baking stove s
Optional information	Explanation
Intended level of mitigation to be achieved and/or target level of other indicators (if applicable).	To be estimated – ex-ante assessment 2020 to 2030, under this consultancy service.

Title of establishing legislation, regulations, or other founding documents	Directive 005/2012, Energy efficiency labeling directive EIM Dec 2019, EEA.
Monitoring, reporting, and verification procedures	The document “Energy efficiency program and activity plan, directive 2006/2011, EEA (issued/singed 23 May 2019). Provides some information on data collection, monitoring and verification needs and processes to be implemented.
Enforcement mechanisms	Penalties for non-compliance are indicated in the Directive 005/2012, Energy efficiency labeling directive EIM Dec 2019, EEA.
Reference to relevant guidance documents	“Energy Efficiency Standards and Labeling Project Document for Electric Injera Mitad (EIM), May 2015”. This document assesses current electric injera mitad production and marketing, efficiency levels, and provides guidance on establishing MEPS (available at EEA website). ES 6084: 2017 Technical and performance requirements for household single plate resistor based Electric Injera mitad MEPS: efficiency 60%, power 3.5 kW
The broader context/ significance of the policy or action	Cumulative energy savings by 2030: 2,017 GWh Demand reduction in 2030: 363 MW Reduced load demand on the national power grid – increased power supply reliability, reduced power shading.
Outline of non-GHG effects or co-benefits of the policy or action	Private cost-saving (reduced monthly electric bill) Clean baking (as compared using biomass enjera baking stoves),
Other info/data	
Approach for estimation of Policy/ Action impact:	Total net change in GHG emissions for policy and action = Total net policy scenario emissions - Total net baseline scenario emissions. [t CO ₂ e]
GHG emission reduction	GHG emissions = f(N _{appliances} , P _{av} , T _{av} , EF _{grid}) N _{Appliances} : Number of electric mitad P _a : Average power rating of electric mitad T _{av} : Average hours of baking in a year EF _{grid} : (National) Grid Emission Factor “Net” refers to the aggregation of emissions and removal, “Total” refers to the aggregation of emissions and removal across all sources and sinks included in the GHG assessment boundary

EFFICIENT ELECTRIC LIGHTS

Required information	Explanation
The title of the policy or action	Energy Efficiency Improvement (check)
Type of policy or action	Lighting energy efficiency improvement
Description of specific interventions	Replacement of inefficient lighting bulbs (incandescent, halogen lamps.) with CFL and LED lamps
The status of the policy or action	Implemented as projects (continuous)
Date of implementation	Effective 2021 ⁶
Date of completion (if applicable)	No final date is set
Implementing entity or entities	EEU, EEA, MoWE
Objective(s) of the policy or action	Reduce grid electricity energy demand used for lighting, as well as peak power demand.

⁶Effective from January 6, 2011 Inefficient lamps (conventional incandescent bulbs and conventional halogen lamps) are banned. EEA web site.

Geographic coverage	National
Primary sectors, subsectors, and emission source/sink categories targeted	Residential and commercial sectors renewable electricity generation off-grid displacing fuel based lighting
Greenhouse gases targeted (if applicable)	CO2, CH4, N2O
Other related policies or actions insulation	Import tax reduction on efficient lighting appliances and, solar PV electricity generating units
Optional information	Explanation
Intended level of mitigation to be achieved and/or target level of other indicators (if applicable).	Cumulative energy savings by 2030: 5,867 GWh Demand reduction in 2030:309 MW (specified in document EEA, issued/singed 23 May 2019, below) 98% of new lighting with LEDs by 2030.
Title of establishing legislation, regulations, or other founding documents	“Energy efficiency program and activity plan, directive 2006/2011, EEA (issued/singed 23 May 2019).
Monitoring, reporting, and verification procedures	The document “Energy efficiency program and activity plan, directive 2006/2011, EEA (issued/singed 23 May 2019). Provides some information on data collection, monitoring and verification needs and processes to be implemented.
Enforcement mechanisms	Importation of incandescent and halogen lamps is banned, 2011.
Reference to relevant guidance documents	The document “Energy efficiency program and activity plan, directive 2006/2011, EEA (issued/singed 23 May 2019)., EEA website
The broader context/ significance of the policy or action	Reduced load demand on the national power grid – increased power supply reliability, reduced power shading
Outline of non-GHG effects or co-benefits of the policy or action	Private cost saving (reduced monthly electric bill)
Other info / data	
Approach for estimation of Policy/ Action impact: GHG emission reduction	AM0113, Large-scale Methodology, Distribution of compact fluorescent lamps (CFL) and light-emitting diode (LED) lamps to households, and b) Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities (Annex 4).

4.2.3 Data collection methodology

Three types of data collection methods will be implemented:

1. Household survey in selected urban and rural settlements

Structured questionnaires will be prepared and household interviews will be conducted in primary and secondary cities (Addis Ababa, and Debrezeit), and one rural village. Due to limitations of budget and time, the sample survey that will be conducted under this project will not be representative to project national level estimations. However, the tools that will be developed for the household survey can be used to conduct national level representative surveys.

2. Industry level surveys for industrial energy efficiency improvement measures specifically for Power Factor Correction.

Industry surveys will be conducted to identify those industries that implemented the Power Correction Factor and the impact obtained in terms of electricity demand capacity and consumption reduction. Ethiopian Energy Authority will be the lead organization to provide support to access the industries.

3. Interviews with relevant organizations for collection of national level data such as project reports, evaluation reports, national level electricity generation and sales, electricity generation in isolated grids, and other relevant documents

Several project level documents which have important source of information about projects performances will be reviewed to identify policy actions that are implemented and whose impacts are measured. For instance, the Ethiopian Electric Power (EEP) and Ethiopian Electric Utility (EEU) have data on Transmission and Distribution system upgrades and the improvement on line losses in the national electricity grid. Similarly, several documents will be reviewed from MoWIE, MoH, and other organizations.

5 Activities and work plan

Schedule of activities

The assessment will start in November and will be completed in mid March.

	N O V	D E C	J A N	F E B	M A R
Task					
1 Inception					
a Review methods and tools					
b Consult Client, MOWIE, EFCCC					
c Write the Inception Report (IR)					
d Revise IR after comments from client					
2 Data collection and gap analysis					
a Initiate data requests from relevant agencies					
b Collect data (visits, communications)					
c Review and document data					
d Evaluate data gaps, how to correct for them					
3 Analysis and Synthesis					
a Review assumptions for policies/actions					
b Review bases/projections for policies/actions					
c Estimate ER for policies/actions					
d Compare actual ER with estimated ER					
4 Training, Reporting and Validation Workshop					
a Prepare training materials					
b Train experts from MOWE, EFCC & others					
c Write final report					
d Submit Draft Final Report					
e Incorporate Comments from the project team					
f Run validation workshop					
g Incorporate comments from wider stakeholders					
h Submit Final Report					

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CDM methodology, ACM0017, for emissions reduction estimation resulting from use of ethanol as a transport
- 2 fuel in vehicles: Large-scale Consolidated Methodology
- 3 CDM methodology, ACM0022: Alternative waste treatment processes
CDM Methodology, AM0113, Large-scale Methodology, Distribution of compact fluorescent lamps (CFL)
- 4 and light-emitting diode (LED) lamps to households,
CDM Methodology, AMS II A of the CDM methodology, Supply side energy efficiency improvements –
- 5 transmission & distribution, Version 10.
- 6 CDM methodology, AMS II.C. II.C “Demand-side energy efficiency activities for specific technologies.”
CDM methodology, AMS II-C. AMS II-C, Demand Side Energy Efficiency Activities for Specific
- 7 Technologies (Version 15), for Small Scale Methodology for Energy for Households and Building
- 8 CDM methodology, AMS0103, “Renewable energy power generation in isolated grids”.
- 9 CDM Methodology, AMS-I.A. Electricity generation by the user [e.g. SHS, SL, solar refrigerators]
- 10 CDM Methodology, AMS-I.B. Mechanical energy for the user with or without electrical energy
- 11 CDM Methodology, AMS-I.C. Thermal energy production with or without electricity
- 12 CDM Methodology, AMS-I.E. Switch from non-renewable biomass for thermal applications by the user
- 13 CDM Methodology, AMS-I.E: Switch from non-renewable biomass for thermal application by the user
- 14 EEA, Energy Efficiency Program and Activity Plan, 2018
- 15 [Ethiopia GHG emission projections \(https://climateactiontracker.org/countries/ethiopia/\)](https://climateactiontracker.org/countries/ethiopia/)
- 16 Ethiopian Climate Resilient Green Economy, 2010
- 17 Ethiopian Standard Agency, ES ISO 04090:2016, 2016
- 18 Ethiopian Standard Agency, Minimum Energy Performance Standard (MEPS) and Labeling for Clay plate resistor based electric Injera Mitad,
Forest, Environment, Climate Change Commission, The updated Ethiopian Nationally Determined
- 19 Contribution, July 2021
- 20 Gold Standard, 2016. Gold Standard Improved Cookstove Methodologies Guidebook
- 21 <https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS?locations=ET>
- 22 <https://data.worldbank.org/indicator/EG.ELC.PETR.ZS?locations=ET>
- 23 <https://unfccc.int/sites/default/files/resource>
- 24 Ministry of Water, Irrigation and Energy, National Electrification Program – 2, Integrated Planning for
Universal Access, 2019
- 25 National Energy Policy, Draft, March 2021
- 26 World Resource Institute (WRI), Policy and Action Standard, GHG Protocol.

Appendix 1 - TERMS OF REFERENCE (TOR)

ICAT ETHIOPIA

I. General Information

Services/Work Description: Conducting emission reduction impact assessment of CRGE policies and actions within the energy sector (for measures referring to reduced electricity demand through uses of efficient renewable energy & energy efficiency technologies), including:

- collect data on baseline and policy implementation,
- conduct assessment according to the adapted methodologies,
- build capacity with MRV staff in national institutions, in close cooperation with UNEP DTU Partnership (UDP) and the Ethiopia Environment, Forest, and Climate Change Commission (EFCCC), and Ministry of Water, Irrigation and Energy (MoWIE).

Project/Program Title: The Initiative for Climate Action Transparency (ICAT)

Duty Station: Addis Ababa

Consultant: Ethio Resource Group (ERG)

Duration: October 2021 – March 2022

II. Background / Rationale

The Government of Ethiopia had conducted an assessment of the Climate Resilient Green Economy (CRGE) implementation. The assessment focused on mitigation and adaptation actions and policies, as well as climate finance tracking and institutional arrangements. It revealed that numerous activities related to CRGE had taken place, and both flagship projects and smaller projects had been implemented. But the assessment did not assess the actual mitigation or adaptation impact, e.g., CO₂ emissions reductions, from these implementation activities. Consistent tracking of climate finance is likewise absent, though the assessment tried to assess the finance spent and resulting gap, compared to the needs expressed at the onset of CRGE. The assessment found that the CRGE warrants an update due to the past ten years of developments in Ethiopia. It suggested that a new national and sectoral GHG inventory should be conducted (baseline) and projections be established. The same goes for climate change risks and vulnerability. It also suggested that future investments and interventions should be

explicitly conceptualized and aligned to the climate change ambitions and that a finance tracking system with coding should be established.

In preparation for the assignment, UNEP DTU Partnership, the EFCCC, and MoWIE jointly made a public call for proposals on the UNEP DTU Partnership's website (www.unepdtu.org) during the 2-week period ending on 2 July. Three proposals were received, and among them, the proposal submitted by Ethio Resource Group (ERG) was selected in August 2021 based on the expertise level of its experts/team, its methodology, as well as its financial proposal. From August to mid of October 2021, ERG, CFCCC, MoWIE, and the UNEP DTU Partnership had several meetings and calls to discuss further details of the assignment, including capacity building from the MRV officials, primary data collection, the facilitation from the EFCCC and MoWIE to the Consultant during the assignment implementation. They have agreed on the overall budget, timeframe (until March 2022), the methodology (a combination of primary data and secondary data collection), as well as keeping the original list of 11 policies to be covered in the evaluation. They also agree to proceed with contract signing based on the above framework agreement, while further details requesting ERG to further elaborate the methodology and approach and work plan to assess the mitigation effects of each policy in the Inception Report.

III. Objectives of the assignment

ICAT support will lead to improved MRV capacity of government experts involved in MRV, especially in the institutions with responsibility for the CRGE policies and actions. Energy is a sector of ICAT focus. Thus, the MRV experts of the Commission and the Ministry will be capacitated on the Enhanced Transparency Framework of the Paris Agreement and the procedures and methodologies required to regularly produce reporting that meets basic quality principles of the UNFCCC reporting guideline, which are: Completeness, Accuracy, Transparency, Consistency, and Comparability. ICAT support will furthermore contribute to inform the government of Ethiopia about the GHG mitigation impacts of the selected CRGE policies/action, and thereby inform the government on how to improve the overall quality of the mitigation actions, e.g., in relation to the updated NDC. The overall objectives of the assignment are:

- Providing the government information on the mitigation effects of selected mitigation policies and actions in the country's energy sector till 2020 and 2030, which will be an important basis for future mitigation policy making, target setting, and action planning.
- To improve the country's capacity in complying with the international rules on climate action transparency through targeted training for the country's inventory preparation and MRV team for the energy sector.

Specific objectives:

- 1) To map the implementation status of the selected policies and actions from CRGE 2011 to date and the data availability in terms of the baseline and implementation details, including their direct and indirect energy saving and GHG emission reduction effects.
- 2) To determine the temporal and spatial boundary and select the appropriate methodology for each policy/action's mitigation impact assessment.
- 3) To make a quantitative assessment of the GHG emission reduction effects of the mitigation policies and actions in the energy sector, including the duration and annual and accumulated volume of their direct mitigation effects.
- 4) Determine outside influencing factors on the policies and actions assessed, incl. synergies and contradictions with other policies, making it challenging to attribute mitigation effects. (Often, the technology and emission levels of activity are subject to the direct and indirect influences of multiple policies and programs. In some cases, it may be difficult to attribute the change to a single policy).
- 5) The assessment should include a quantitative estimation of both the emission reduction impacts and social-economic impacts of the selected policies and actions.

For the energy efficiency policies and measures, one option is to base the mitigation effect estimation on the work of U4E (<https://united4efficiency.org/>).

IV. Scope of the Service (Work)

The Consultant firm will work closely with the Ministry of Water, Irrigation and Energy (MoWIE), EFCCC, and other key stakeholders: Alternative Energy Development and Promotion Center, Ethiopian Energy Authority (EEA), Ethiopian Electric Utility (EEU), Ministry of Trade and Industry Ministry - (Energy Efficiency and regulatory, related Department) and Ethiopian Electric power, as well as with the technical experts of UNEP DTU Partnership (UDP) and ISPRA. To deliver all the steps listed in the specific objectives above, the Consulting Firm will identify and adapt the contemporary methodology to assess the effects of the selected policies and actions, including collecting and conducting analysis of the selected policies.

Data collection aims to solve the issue of lack of existing data or improve the quality of existing data through verification and update. The data collection involves an appropriate combination of primary and secondary data e.g., in the form of sample survey, data from the source e.g., enterprises etc. The combination of data is determined on a case-by-case basis by MoWIE and the Consultant. Relevant sampling techniques should be applied

to limit the survey workload while guarantying the representativeness of the survey results. Moreover, the data collection must encompass not only the national level but regional offices as well. Moreover, NGO working on energy sector data has also to be captured.

- The policy of distribution of improved Cookstoves,
- The policy of introduction of Incandescent lamps by CFL and LED lamps, banning of Incandescent lamps promoting the use of LED lamps,
- The policy of Promotion of Power factor correctors, especially in large industries (high electricity consumers)
- The directives for labelling for Electric Enjeramitad, cook stoves, and other appliances
- The policy of introduction of mini-grids in rural areas for non-electrified communities.
- The policy of upgrading of transmission and distributions, reducing loss, standard implementation
- The policy of grid-connected waste to energy in the Addis area and elsewhere
- The policy on bioethanol.
- Assess the impact of promoting solar water pumping, solar home systems, solar lanterns, solar street lightings, solar water heaters, water purification technologies replacing boiling, solar refrigerators for health posts and clinics etc.
- The new initiatives with WB support, which will start now. This includes replacing biomass energy and diesel generators. The assessment will include the establishment of a baseline, the monitoring system, etc.

Throughout the consultancy, the Consultant will build capacity for emission assessment (ex-ante and ex-post) with the key experts in the line ministries, institutes, and agencies related to MRV within the energy, in order to enable an emissions assessment by the institutions in the future. This will be done through at least one training session and through on-the-job training and cooperation regarding the data collection and analysis of every policy, as well as development of institutionalized assessment methodologies.

The Consultant will produce an inception report, draft reports for comments, and final reports and submit them in hard copy and softcopy (word, Excel, PowerPoint presentation) to MoWIE and UNEP DTU Partnership (UDP).

V. Responsibilities of Parties

The UDP is the contracting institution, while the Ministry of Water, Irrigation and Energy (MoWIE) will be the daily counterpart, reference point, and authority for the Consultant. The consulting firm/consultant

agrees to provide the consultancy services for this particular assignment. Accordingly, the responsibilities of both parties are detailed as follows.

A. Responsibilities of MoWIE& EFCCC

The daily oversight and high-level coordination will be the responsibility of the MoWIE& EFCCC (Greenhouse Gas Measuring Reporting and Verification Directorate) with a day-to-day follow-up of the assignment. MoWIE shall facilitate communications, meetings, and high-level briefings across sector ministries relevant for this particular assignment. It will also facilitate the process of data collection, stakeholders meeting to enrich the draft and final products and facilitate the final quality assurance. MoWIE will inform UDP on the services and progress of the consultant/consulting firm, enable a clearance ahead of payments by UDP.

Access to the key stakeholders and arrangement of validation workshop and associated costs will be facilitated and managed by EFCCC.

B. Responsibilities of the Consulting Firm

The Consulting Firm will deliver on the ToR, including the objectives and scope of work. It will work in close cooperation with MoWIE and the Commission and the technical experts of UDP and ISPRA. The Consultant will consult UNEP DTU Partnership on all matters related to the formal contract. The Consultant will interact and obtain feedback and direction from the technical experts and participate in the co-creation of some elements e.g., the assessment methodology used, the training/capacity-building material, etc.

VI. Methodology / Technical Approach of the Service

The detailed assessment will be compiled by conducting primary and secondary data collection (and possibly field visits if necessary). Through a desk review (and interaction with technical experts in UNEP

DTU Partnership and ISPRA) of existing available emission assessment international and national practice, a methodology will be defined and applied. The capacity building will be in the form of training sessions/on-job training and focus on the methodology applied and lessons learned from the application.

Quality assurance

The Consulting Firm has been chosen based on the strong expertise of its team documented in the CVs and list of reference projects it has delivered in the past. It is understood that the services under the contract will be delivered by those expert staff whose CVs are included in the proposal, and no sub-contracting by the Consultant is expected unless otherwise approved by the UDP, the MoWIE, and EFCCC.

VII. Expected Outputs / Deliverables

The major deliverable expected will be two-folds: The assessment of the Greenhouse Gas (GHG) emissions reduced as a result of promotion of renewable energy and energy efficiency technologies, and the capacity building and training of MRV relevant institutions. In general, the following outputs will be expected to be prepared and submitted to MoWIE and UDP by the consulting firm

Output 1: Inception Report, describing methodology/approach to the task and detailed work plan, including a time schedule.

Output 2: first draft assessment report for comments, including data and data source, methodology, and results, as well as recommendations on how to conduct similar tasks in the future. Each policy assessment should include a detailed description of the contents of the policy intervention and specify when and where the policy interventions have been made and the geographic and temporal scope of energy-saving or GHG mitigation impact assessment. The main content needs to include the baseline scenario/ the current status and mitigation actions implemented, the methodologies used and GHG reductions achieved, challenges, and the way forward as a recommendation.

Output 3: final assessment report, the content requirements are the same as those for the draft assessment report.

Output 4: Materials for capacity-building training and a report on the capacity-building activities and their effects.

All deliverables should be handed in hard copy and soft copy (Word format, excel format, and PDF format).

VIII. Timeframe and Detailed Workplan

Timeframe: the duration of the assignment is from 15 October 2021 to 15 March 2022.

Milestones:

- 1) Inception report to be submitted by 15 November 2021
- 2) Output 2 to be submitted by 31 January 2022.
- 3) Final versions of Output 3 and Output shall be submitted by 15 March 2022, with comments and suggestions from CFCCC, MoWIE, and UNEP DTU Partnership integrated and addressed.

Appendix 2: Datasheet for policies and actions

List of energy sector CRGE strategy related policies and actions that the Impact of which would be evaluated

Policies and actions (+mitigation effects)	Methods and sources
<p>1. Distribution of improved cookstoves</p> <ul style="list-style-type: none"> Improved (clean) cookstoves reduce emission from deforestation and forest degradation Both efficient improvement for woodfuel stoves as well as switch from woodfuel to other clean cooking will be considered (includes electric stoves) 	<ul style="list-style-type: none"> Review ICS/CCS distribution data from MOWIE/AETDPD, its devt partners Review CSA & World Bank MTF data MOWIE/AETDPD, Directorate for promotion of clean cooking
<p>2. Substitution of incandescent lamps with CFL and LED lamps</p> <ul style="list-style-type: none"> Reduces demand on the grid; reduces diesel back up on the grid; increases energy available for distribution to un-served areas Reduces the evening peak on the system (due to lighting by residential customers) Reduces risk of power blackout to customers (and also their use of diesel back up systems) 	<ul style="list-style-type: none"> Review of data and reports on CFL/LED distribution from EEU, EEA, World Bank EEU energy efficiency office EEA energy efficiency directorate
<p>3. Promotion of power factor (PF) correctors</p> <ul style="list-style-type: none"> PF correctors reduce power drawn from the grid; increase energy availability on the grid They reduce energy losses to industry 	<ul style="list-style-type: none"> Review of data and reports from EEU and EEA on PF corrector adoption by industry EEU energy efficiency office EEA energy efficiency directorate
<p>4. Directives for labeling of electric Injera mitad</p> <ul style="list-style-type: none"> Promotes EE improvement for electric mitads 	<ul style="list-style-type: none"> Review data on Review CSA data on electric injera users EEA energy efficiency directorate
<p>5. Introduction of mini grids in off-grid rural areas</p> <ul style="list-style-type: none"> ER through substitution of diesel used for grain milling and other agro-industrial appliances; reduces kerosene used for lighting 	<ul style="list-style-type: none"> Baseline surveys for recently electrified villages through mini grids by the EEU EEU mini grid development office EEU CRGE office (if it exists)
<p>6. Upgrading transmission and distribution (T&D) systems to reduce losses</p> <ul style="list-style-type: none"> T&D losses are reduced on the grid; increases energy available for distribution to un-served areas 	<ul style="list-style-type: none"> Review of T&D upgrade and loss reduction data EEP transmission and sub-station construction and operation offices EEP CRGE office (if it exists)
<p>7. Grid connected waste to energy projects in Addis Ababa and other cities</p> <ul style="list-style-type: none"> Increases energy available for distribution ER by burning methane (a more potent GHG than CO₂) 	<ul style="list-style-type: none"> Data on energy generation from WTE (Addis Ababa) WTE project status for other cities EEP generation construction/operation offices EEP CRGE office (if it exists)
<p>8. Bioethanol as fuel</p> <ul style="list-style-type: none"> Displaces gasoline in automobiles Displaces charcoal and kerosene for cooking 	<ul style="list-style-type: none"> Review ethanol distribution data from sugar factories Review ethanol fuel consumption as gasoline blend and ethanol consumption for cooking MOWIE/AETDPD Biofuels directorate
<p>9. Promotion of standalone PV systems (water pumping, home systems, street lighting, water heating, refrigeration water purification)</p> <ul style="list-style-type: none"> These displace diesel engine powered appliances and kerosene used for lighting in rural homes 	<ul style="list-style-type: none"> Review of data on distribution of standalone PV systems AETDPD Rural Electrification directorate MOWIE Policy directorate GOGLA PV distribution database
<p>10. Replacing biomass energy and diesel generators (new World Bank supported initiative)?</p> <ul style="list-style-type: none"> Grid extension and mini-grids displace biomass used for cooking, and diesel used for agro-processing and irrigation 	<ul style="list-style-type: none"> Is this the ADELE project? Review the relevant documentation World Bank project document
<p>11. Build capacity for GHG ER assessment (ex-ante, ex-post) to MRV units in relevant agencies; at least <u>1 training session</u> and on the job training</p>	<ul style="list-style-type: none"> Consultation with MOWIE environment and climate directorate for areas where training is required Consultation with selected CRGE units in relevant ministries (transport, industry)

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| | <ul style="list-style-type: none">▪ Resources from the MRVAFRICA program (www.mrvafrika.com) will be used for training.▪ The Good Practice Database from the Partnership for Transparency for in the Paris Agreement (www.transparency-partnership.net/good-practice-database) may also be used. |
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