

*Please fill in the form in the grey spaces, by following the instructions in italic.*

<b>Requesting country:</b>	<i>ETHIOPIA</i>
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<b>Request title:</b>	<i>DEVELOPMENT OF PRODUCT STANDARD &amp; COMPARATIVE LABELING OF "ELECTRIC INJERA MITAD"</i>
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<b>Contact information:</b>		
<i>{Please fill in the table below with the requested information. The request proponent is the organization that the request originates from, if different from the National Designated Entity (NDE).}</i>		
	<b>National Designated Entity</b>	<b>Request Applicant</b>
Contact person:	Ms. Yamelakesira Tamene Bekele,	Contact person: MR. GETAHUN MOGES KIFLE
Position:	<b>Director</b> , Technology Transfer and Technical Support	<i>DIRECTOR GENERAL</i>
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<b>Technology Needs Assessment (TNA):</b>
<i>{Select one of the three boxes below:}</i>
<input type="checkbox"/> <i>The requesting country has conducted a TNA in .... (please insert date of TNA completion)</i>
<input checked="" type="checkbox"/> <i>The requesting country is currently conducting a TNA</i>
<input type="checkbox"/> <i>The requesting country has never conducted a TNA</i>
<i>{If the requesting country has completed a TNA, please indicate what climate technology priority this request directly relates to. Please indicate reference in TNA/TAP/Project Ideas.}</i>



**CTCN Request Incubator Programme:**

*{Please indicate if this request was developed with support from the Request Incubator Programme:}*

- Yes  
 No

**Geographical focus:**

*{Select below the most relevant geographical level for this request:}*

- Community-based  
 Sub-national  
 National  
 Multi-country

*{If the request is related to the sub-national or multi-country level, please indicate here the areas concerned (provinces, states, countries, regions, etc.)}*

**Theme:**

*{Select below the most relevant theme(s) for this request:}*

- Adaptation to climate change  
 Mitigation to climate change  
 Combination of adaptation and mitigation to climate change

**Sectors: ENERGY**

*{Please indicate here the main sectors related to the request. e.g. energy, industry, transport, waste, agriculture/fisheries, forestry, water, ecosystem/biodiversity, coastal zones, health, education, infrastructure/human settlement, tourism, businesses, early warning/disaster reduction, institutional design and mandates, cross-sectorial}*

**Problem statement (up to one page):**

*{Please describe here the difficulties and specific gaps of the country in relation to climate change, for which the country is seeking support from the CTCN. Please only provide information directly relevant to this request, and that justifies the need for CTCN technical assistance.}*

*Injera is a thin pancake – like, leavened bread which can be made either of Teff, Corn, Sorghum and Millet or a mixture of two or three of these and is used as the staple food by most Ethiopians. Injera baked in urban areas weigh about 300 to 450 grams. Most Ethiopians eat Injera more than once a day. Injera is baked using clay plate of diameter 40-60 cm called Mitad using either of biomass, fire wood, cow dung, leaves, saw dust and electrical power as source of Energy.*





Figure 1. Injera , Fire wood Injera Baking and electric Injera Mitad from left to right

Electric Injera Mitads are the most prevalent and energy-intensive appliances used in Ethiopia and contribute to the bulk of the electrical energy consumption and power demand of the Domestic Tariff group. The product is believed to be in the market for over 40 years. The efficiency of Injera Mitad is low. The low efficiency of Injera Mitads affected the electric power supply infrastructure by overloading and effecting frequent power interruptions, outages and voltage drops. Its excessive energy consumption has forced the consumer and the power provider to pay for the wasted energy. The causes of the low energy efficiency of this product are: the excessive heat loss from the set during operation, high heat loads, lack of standard on the product and the traditional methods of production, and the limited research and innovation made on the improvement of the product for decades.

Based on the assessment made there are estimated 530,000 Electric Injera Mitads in Ethiopia in the year 2007 EFY, and the corresponding peak power demand and energy consumption including losses are about 801MW and 627GWh respectively in the same year. The power demand of 801MW requires more than the generating capacity of the biggest power plants of the country. The projected peak power demand and energy consumption of Injera Mitads, including losses, in the year 2017EFY is estimated to be 1,685 MW and 1,316GWh respectively. The projected peak power demand reduction and energy savings obtained in 2017 EFY as a result of the implementation of Energy Efficiency (EE) standard and labeling program is estimated to be 623MW and 487GWh respectively.

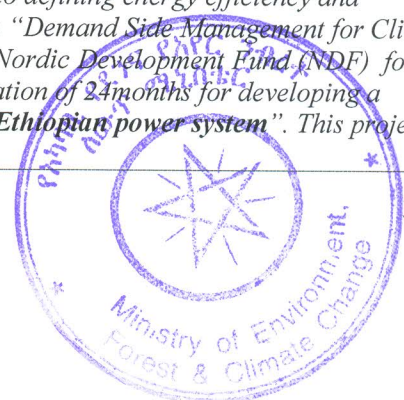
The power demand reduction saves the cost of erecting and running power plant of same size whereas the energy saving has the equivalence of 644,040 tons of cumulative carbon saving. This proves the EE program on Electric Injera Mitad to be an environmental project and contributes a lot in reducing GHG emissions as per the Ethiopia's Climate-Resilient Green Economy strategy (CRGE).

**Past and ongoing efforts (up to half a page):**

{Please describe here past and on-going processes, projects and initiatives implemented in the country to tackle the difficulties and gaps explained above. Explain why CTCN technical assistance is needed to complement these efforts, and how the assistance can link or build on this previous work.}

The Ethiopian Energy Authority has rich experiences of executing energy efficiency projects. The Demand Side Management Project funded by Nordic Development Fund (NDF) and The Strategic Climate Institutions Program funded by DfID have been successfully completed.

The Ethiopian Energy Authority has been supported with a view to defining energy efficiency and conservation measures in the power sector, by a project known as "Demand Side Management for Climate Change Adaption for the Ethiopian Power Sector" Supported by Nordic Development Fund (NDF) for a total amount of €455,000.00. The project started in 2010 for duration of 24 months for developing a comprehensive "**Demand Side Management action plan for the Ethiopian power system**". This project is successfully completed.



*The Strategic Climate Institutions Program (SCIP) funded by DfID for a total of 438,000 GBP started in September 2013 and completed on 30<sup>th</sup> May 2015. This project focused on “Energy Efficiency Regulatory Framework Development and Implementation”. With this project budget institutional capacity building activities such as development of EE Strategy Document, Guidelines and Procedures, Procurement of Energy Audit Equipment, Training of Energy Auditors have been done. In addition to this huge promotion activities such as development of Tv and Radio spots, preparation of Documentary, short drama, distribution of printed materials and establishment of regional EE demonstration centres have been done.*

*The CTCN intervention on this area primarily would assist the particular effort of establishing efficient testing standards (protocol) and product standard for different type of Injera Baking Mitad currently available in the Market. It is also expected that this process would provide specific recommendation on certain specific features of the product; such as heat reflection or preservation, waste heat harvesting for other parallel application, change of other appropriate materials etc, for best performance and efficiency reason. Such insights coming from the exercise would be used to produce alternative design and production to prototypes, where industrial scale production process of this technology may be adopted by the private sector. It is also expected that the prototype development effort could lead to a technology for Industrial scale production of Injera itself, given the current market need of Injera in urban areas and for certain institutions such as universities and hospitals, retail production of Injera for a vast market is an obvious energy wastage. It is estimated that in Addis Ababa alone the retail market in residential and hotels demand is over two Million pieces per day. Certainly the current market in urban areas requires mass production of Injera in different technological settings to be made available to buyers.*

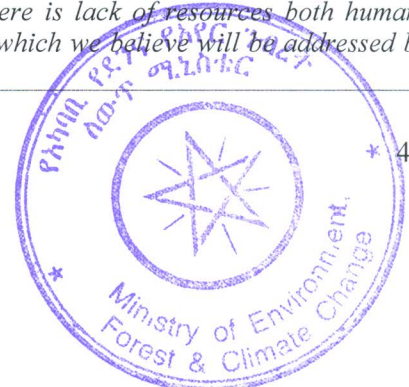
*Since the introduction of this technology, now over forty years, there has been different attempts to measure the energy performance efficiency and technical standards however as yet nothing has been adopted as a national standard.*

*Experts in the energy sector have tried to solve the problem of Injera Mitad energy consumption for decades, but none of them has brought tangible solution. The main problem of those researchers and energy experts was lack of attention and support from the government and the absence of legal mandate to provide the necessary finance and technical support*

*Now as soon as EEA got legal mandate of regulating the energy efficiency by proclamation No 810/2013, it has started studying main problem areas and causes of energy wastage. The Authority has hired The Energy and Resources Institute (TERI) and developed Framework Strategy Document in 2014/15. According to this document, solving the problem of Injera Mitad was set as priority task of EEA.*

*As mentioned above EEA has hired a consultant and assessed the huge problem posed by this product on the power sector and Climate. EEA has observed also the financial support allocated from the government and the current technical and equipment capacity of EEA and the National Testing Laboratory is not sufficient to successfully complete this project. Therefore, the CTCN technical assistance is needed to support the efforts of EEA in providing assistance for the capacity building tasks at EEA and Ethiopian Conformity Assessment Enterprise. This assistance is needed for training of project staff and procurement of equipment required for testing Energy efficiency of Injera Mitad. In addition to that this assistance can be used for hiring short term local/international project consultant.*

*Since recently the Authority has started the process of establishing technical standards with the collaboration of the National Standard Agency and other stakeholders. The Authority is also developing Standards and Labelling program for this product. On these there is lack of resources both human and Instruments to set these standards or develop proto type design, which we believe will be addressed by the CTCN intervention.*



**Assistance requested** (up to one page):

*{Please describe here the scope and nature of the technical assistance requested from the CTCN and how this could help address the problem stated above and add value vis-à-vis the past and on-going efforts. Please note that the CTCN facilitates technical assistance and is not a project financing mechanism.}*

*The comparative labeling program helps to identify energy efficient products among those products sold on the market. Once products energy efficiency ranking has been assigned based on their efficiencies, production, promotion and marketing of best products can be further supported by the government or with participation of development partners working in the sector. As those products have no product national or international standard, the test results and measurement parameters obtained from the comparative labeling program will be used as inputs for the development of product standards, which will be done by the Ethiopian Standard Agency with participations of stakeholders such as Injera Mitad manufacturers, researchers working in the area and others.*

*On the other side training of electric Injera Mitad manufacturers and promotion activities will be done side by side with comparative labeling and standardization activities, so that inefficient products can gradually disappear from the market.*

*As per the project document developed by DANAS ELECTRICAL ENGINEERING the financial and time schedule for all those activities mentioned above have been indicated. They need huge amount of money and about four years time.*

*Therefore, the CTCN assistance is required to support mainly the technical part of the project activities, which takes 12 to 18 months. The technical assistance may focuses on:*

- ✓ Identification of appropriate testing facilities, procurement and setup*
- ✓ Availing similar products standards and testing protocol*
- ✓ Project staff capacity building and experience sharing*
- ✓ Development of Energy Efficient electric Injera Mitad Prototype product*

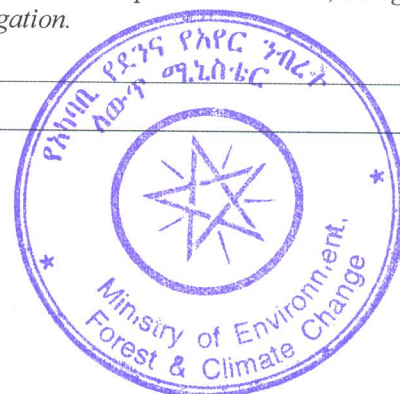
*The Ethiopian Energy Authority and local testing laboratories like Ethiopian Conformity Assessment Enterprise, which are potential partners of the Authority in the implementation of the project, have no or limited experiences in the area. Therefore, assessing the capacity building needs of this laboratory in terms of human capacity building, equipment and testing protocols is vital.*

*As this project has strategic importance for the country and huge amount of energy saving can be achieved by fully implementing of the project. Therefore, technical and financial support is required in the areas mentioned above to successfully conduct the comparative labeling of the product. All other activities proposed by the consultant in the project document can be done by the Authority's own capacity.*

**Expected benefits**(up to half a page):

*{Please outline here the medium and long-term impacts that will result from the CTCN technical assistance, including how the assistance will contribute to mitigate and/or adapt to climate change.}*

*This project focuses on standardization and comparative labeling of this indigenous product, which had been used for centuries and highly tight to the cultures of many Ethiopian societies. Therefore, standardizing this product brings technological upgrading of the product without affecting traditional values of the societies. The comparative labeling program combats the energy efficiency problems associated with this product. Therefore, implementation of this project has big impact both on product standard, energy efficiency, GHG emission reduction and Climate Change mitigation.*



**Post-technical assistance plans** (up to half a page):

*{Please describe here how the results of the CTCN technical assistance will be concretely used by the applicant and national stakeholders, to pursue their efforts of resolving the problems stated above after the completion of the CTCN intervention (list specific follow-up actions that will be undertaken).}*

*The inputs for the technical standards would be used to develop the national Technical standard where appropriate for the different types of the technology. The testing procedure would be used in developing the Standards and labeling program. Innovative ideas that may come for the exercise would be used to develop different design for better performing products to be made available for the private sector for purposes of commercial scale production.*

*Therefore, the Authority will use the existing (and that will be built) technical capacity of its staff to manage and ensure the continuity of the project. The built internal human capacity will be utilized also for the follow-up activities of this strategic project. In addition to that external/local consultant that supports the implementation of the project will be hired and assure the continuity and proper completion of the project.*

**Key stakeholders:**

*{Please list in the table below the main stakeholders who will be involved in the implementation of the requested CTCN technical assistance, and what their role will be in supporting the assistance (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.). Please indicate what organization(s) will be the main/lead counterpart(s) of CTCN experts at national level, in addition to the NDE.}*

Stakeholder	Role to support the implementation of the assistance
<i>Ministry of Environment, Forest and Climate Change</i>	<i>Provides technical assistance and serves as a bridge between CTC-N and EEA</i>
<i>Mitad producers (Body builders, Clay producers and distributors and assemblers)</i>	<i>Partners in the standardization, comparative labeling</i>
<i>Consumers (represented by women)</i>	<i>Partners in the standardization, comparative labeling and force manufacturers to produce energy efficient products through informative buying</i>
<i>Injera bakers, suppliers and exporters (represented by women)</i>	<i>Partners in the standardization, comparative labeling and force manufacturers to produce energy efficient products through informative buying</i>
<i>Heating element (Resistor) importers</i>	<i>Partners in the standardization, comparative labeling</i>
<i>Ethiopian Energy Authority</i>	<i>Partner in the standardization, comparative labeling</i>
<i>Ethiopian Electric Utility</i>	<i>Partner in the standardization, comparative labeling</i>
<i>Ethiopian Electric Power</i>	<i>Partner in the standardization, comparative labeling</i>
<i>Researchers/innovators</i>	<i>-Partner in the standardization, comparative labeling -on further improvements of Injera Mitad efficiency</i>



<i>Regional states Energy bureaus</i>	<i>Coordinate project and report the achievements</i>
<i>Parliament</i>	<i>Follow up the overall activity of the project</i>
<i>Ministry of Water Irrigation and Energy</i>	<i>Follow up the overall activity of the project</i>
<i>Ethiopian Standard Agency</i>	<i>Develop Ethiopian Mitad Standard and enforcement of standard</i>
<i>Ethiopian Conformity Assessment Enterprise</i>	<i>Avail testing facility as per agreement with EEA, test samples and provide test report</i>
<i>Ministry Science and Technology</i>	<i>Follow up research developments and award best achievements</i>
<i>Intellectual Property Office</i>	<i>Provide intellectual property certificates for best achievements</i>
<i>Donors</i>	<i>Supports the project financially</i>

**Alignment with national priorities (up to half a page):**

*{Please demonstrate here that the technical assistance requested is consistent with documented national priorities (examples of relevant national priorities include: national development plans, poverty reduction plans, technology needs assessments (TNAs), LEDS, NAMAs, TAPs, NAPs, sectorial strategies and plans, etc.). For each document mentioned, please indicate where the priorities specifically relevant to this request can be found (chapter, page number, etc.).}*

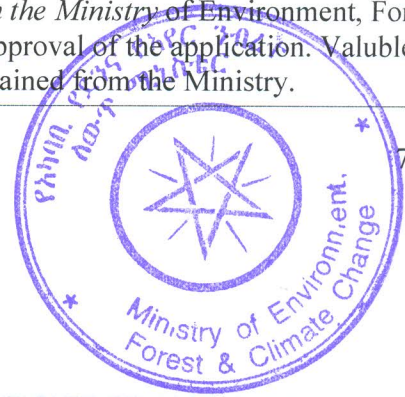
*The electricity sector energy lose in Ethiopia exceeds 20% according to IEA. As the country's annual economic growth exceeds 10% the energy demand is also growing. Growing demand causes also growing energy loses unless serious measures are taken to reduce growing energy loses. The government has recognized the problem and establishes the Ethiopian Energy Authority by proclamation no. 810/2013 with mandates to regulate Energy Efficiency and Conservation activities. In addition to that the government has set also in Ethiopian Climate Resilient Green Economy Strategy (CRGE, 2011), which considers the energy efficiency issue as one of its four pillars (Pillars 3 and 4). This shows that how the energy issue has been given attention and prioritized by the government.*

**Development of the request (up to half a page):**

*{Please explain here how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles, and describe any consultations or other meetings that took place to develop and select this request, etc.).}*

*The request was developed by EEA using information obtained on CTCN supports. Other stake holders involved in the support of request development were Mr. Pals Donald and Mr. Leon Simons who are involved in the Mitad research and development. Their roles were delivering detail information and guideline on the available supports from the CTCN and availing request format. They have sent also comments on the first draft of the application to EEA. In addition to that they have supported EEA in advising on some technical issues of the application.*

*There were continuous communications and discussions with the Ministry of Environment, Forest and Climate Change, Technical Support Directorate on the approval of the application. Valuble comments on the application form and content have been obtained from the Ministry.*



**Expected timeframe:**

*{Please propose here a duration period for the assistance requested.}*

*{Indicate the duration of the proposed request.}*

*The whole project life will extend over four years starting from January 1<sup>st</sup> 2016. Most activities of this project can be done by government financial support and the Authority's internal capacity. But the technical part to, which the Authority requested assistance will elapse from January 2016 – July 2017.*

**Background documents:**

*{Please list here relevant documents that will help the CTCN understand the context of the request and national priorities. For each document, provide weblinks if available, to attach to the submission form while submitting the request. Please note that all documents listed/provided should be mentioned in this request in the relevant question(s), and that their linkages with the request should be clearly indicated.}*

- Energy Proclamation 810/2013
- Ethiopia's Climate-Resilient Green Economy strategy
- Framework for Strategy Development on Energy Efficiency in Industries, Buildings and Appliances
- Growth and Transformation Plan II
- Project document on Electric Injera Mitad Energy Efficiency Standards and Labeling (www.energy.authority.gov.et)
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**Monitoring and impact of the assistance:**

*{Read carefully and tick the boxes below.}*

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the assistance provided by the CTCN. I understand that these processes will be explicitly identified in the Response Plan in collaboration with the CTC, and that they will be used in the country to monitor the implementation of the CTCN assistance.

I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

**Signature:**

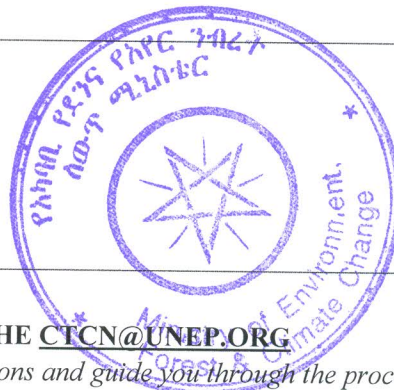
NDE name: Yamelakesira Tamene Bekele

Date: November 24, 2015

Signature:



**Yamelakesira Tamene Bekele**  
**Technology Transfer and Technical**  
**Support Directorate Director**



**THE COMPLETED FORM SHALL BE SENT TO THE [CTCN@UNEP.ORG](mailto:CTCN@UNEP.ORG)**

*Need help? The CTCN team is available to answer questions and guide you through the process of submitting a request. The CTCN team welcomes suggestions to improve this form.*

*>>> Contact the CTCN team at [ctcn@unep.org](mailto:ctcn@unep.org)*