

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>Financing strategy for Transit Oriented Development (TOD) - Addis Ababa Light Rail Transit (LRT)</i>
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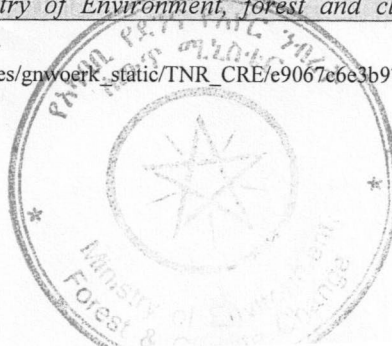
<b>Contact information:</b>		
	<b>National Designated Entity</b>	<b>Request Applicant</b>
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**Technology Needs Assessment (TNA):**

- The requesting country has conducted a TNA in 2007<sup>1</sup>*  
 *The requesting country is currently conducting a TNA*  
 *The requesting country has never conducted a TNA*

*The Government of Ethiopia (GoE) carried out a Technology Need Assessment (TNA) in 2007 inclusive of an assessment of the needs of the transport sector. Transport was selected as one of the focus areas as emissions from urban transport are significant and have been increasing steeply as a result of rapid population growth and welfare. The TNA identified the **Promotion of Use of Mass Transportation** as well as the **Use of Non-Motorized Transport** as key measures to reduce emissions in the transport sector. Furthermore, the ministry of Environment, forest and climate change is now conducting*

<sup>1</sup>[http://unfccc.int/tclear/misc/\\_StaticFiles/gnwoerk\\_static/TNR\\_CRE/e9067e6e3b97459989b2196f12155ad5/5059e1af89384cf18ca0402f71a73ea1.pdf](http://unfccc.int/tclear/misc/_StaticFiles/gnwoerk_static/TNR_CRE/e9067e6e3b97459989b2196f12155ad5/5059e1af89384cf18ca0402f71a73ea1.pdf)



*technology need assessment*

*As a result, the GoE has adopted the view that in order to achieve low carbon urban mobility, an inclusive urban planning approach that encourages non-motorized mobility as well as access to mass rapid transit systems is needed. Implementation of Transit Oriented Development (TOD) – an urban development strategy that combined high-density housing and commercial real estate with facilitated access to mass rapid transit systems – has been selected as a priority by the Government.*

*This application seeks to support the Government in devising suitable financing instruments to a) fund the incremental cost of urban infrastructure; and b) leverage sources of private capital required for the realisation of this ambitious low carbon transportation project.*

**CTCN Request Incubator Programme:**

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

Yes

No

**Geographical focus:**

Community-based

Sub-national

National

Multi-country

*In close collaboration with the Ethiopian Railway Corporation (ERC) – a publicly owned company mandated to operate the Addis Ababa Light Railway Transit project – and the Addis Ababa City Administration, TOD will be piloted in Ethiopia's capital Addis Ababa.*

**Theme:**

Adaptation to climate change

Mitigation to climate change

Combination of adaptation and mitigation to climate change

**Sectors:**

*The TOD is a cross-sectorial measure that integrates transport and infrastructure/human settlement for the implementation of TOD.*

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

*In Ethiopia, strong economic growth, combined with rapid population growth and urbanisation, are putting increased pressure on urban and inter-urban transport systems. Urbanisation has been concentrated in Addis Ababa, which is currently the fastest growing city on the African continent.*

*In the same time Addis Ababa doesn't have proper public transport to even cope with the existing demand. It was estimated that 70% of urban journeys were made by foot and 30% by motorised vehicles. This is contributing to both an increase in private vehicle ownership and use and suppression of the mobility of relatively low-income social groups that not have access to individual, motorized*



transport.

The associated rise in emissions is already apparent and will become more critical as the number of vehicles using the road network in Addis Ababa and other emerging urban areas increase. In 2010, total emissions from the transport sector in Ethiopia (excluding aviation) were estimated at 3.8 MtCO<sub>2e</sub>, accounting for 3% of domestic GHG emissions. In a business-as-usual scenario, increasing urbanisation and economic growth in Ethiopia will lead to a rapid rise in transport-related GHG emissions. The Climate Resilient Green Economy strategy – the government's action plan to achieve middle-income status by 2025 – assumes a growth rate of tonne-km of freight transport of up to 13.7% per year in addition to an increase in passenger-kilometres travelled of 8.3-9.1% per year over the next 15 years. At the same time, the capital's population is experiencing a lack of public infrastructure leading to limited access to public amenities and infrastructure services.

The GoE therefore plans to implement Transit Oriented Development (TOD) to facilitate sustainable urban development through low carbon transportation. TOD areas are designed in a pedestrian oriented manner and bring together housing, transportation and jobs within a limited radius around the stations of the AA LRT.

Initial concepts for 4 TOD nodes have been developed. The absence of a suitable financing strategy that enables public and private investment however hampers the further development and implementation.

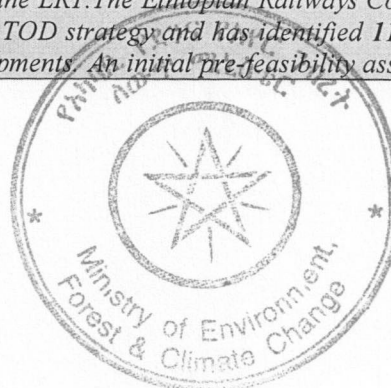
TOD development requires up-scaled public investment in urban infrastructure compared to standard urban development. The government lacks this capital, and its restricted financial ability have failed to keep pace with population growth and urbanisation. Moreover, public infrastructure required for TOD – a prerequisite to attracting the private sector – rarely provides direct revenues. Considering the shortfall in required public investment and unique funding characteristics, suitable financing instruments to fund the incremental cost of urban infrastructure required for TOD development needs to be explored.

Ethiopia envisions developing TOD areas jointly with the private sector where the GoE provides suitable public infrastructure while the private sector invests in the revenue-generating TOD facilities. Investors in Ethiopia are not yet familiar with the concept of TOD and the associated unique investment characteristics. An assessment of potential barriers for private investment, for instance through provision for social housing in TOD areas in Ethiopia, as well as the formulation of mechanisms/measures that can unlock private investment, is required.

Considering unique real estate market conditions as well as the fact that TOD is a first-of-its-kind for the Government of Ethiopia as well as private real estate investors, the technical capacity to design a suitable financing strategy is limited and requires assistance.

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

In order to tackle the lack of public transport as well as adequate urban infrastructure, the GoE is taking various measures. The first of these is a 35km long Light Rail Transit (LRT) service, which has become operational in September 2015. Given the low fare rates achievable in Ethiopia, the LRT is dependent on additional sources of revenue. TOD has been identified as the key strategy to support the long-term financial sustainability of the LRT. The Ethiopian Railways Corporation has been the driving force in the conceptualisation of the TOD strategy and has identified 11 areas along the AA LRT that are deemed suitable for TOD developments. An initial pre-feasibility assessment targeting the initial 4



priority TOD areas has been undertaken by ARUP, a multinational engineering consultancy firm. The studies were concluded early 2015 but did not advise on public-private partnership funding strategies.<sup>2</sup>

The Ethiopian Railways Corporation, in collaboration with various governmental partners, plans to carry out detailed implementation plans for these selected TOD areas up to a point where private sector funding can be raised through a public-private partnership arrangement. The Corporation, through international donor support channelled through the Strategic Climate Institutions Programme (SCIP) fund, has started exploring opportunities to access climate finance and plans to make a funding submission to the Green Climate Fund once the Government of Ethiopia receives accreditation. The absence of a robust financing strategy however remains a bottleneck for a successful application.

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

This pilot TOD area – known as Leghar as regarded as the most viable starting point for TOD development given its central location and connection to planned LRT and BRT routes – is to be implemented as a Public Private Partnership (PPP) where benefits resulting from TOD implementation support the long-term financial sustainability of the LRT.

The Government of Ethiopia is seeking CTCN support to develop an effective financing strategy that will unlock private and public investment for a pilot TOD. Technical capacity to develop such funding strategy is limited within the GoE and relevant private sector investors in Ethiopia. An effective financing strategy is a prerequisite to unlocking private investment in TOD.

The financing strategy is expected to devise suitable financing instruments to a) fund the incremental cost of urban infrastructure; and b) leverage sources of private capital required for the realisation of this ambitious low carbon transportation project, as follows:

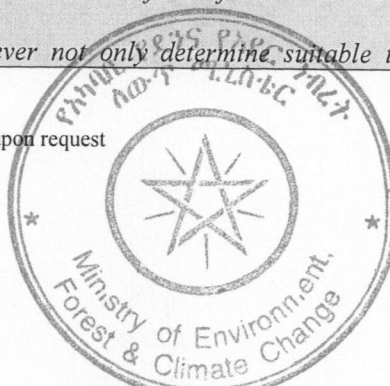
- **Detailed assessment of public infrastructure needs:** Public infrastructure investment requirements are high for the development of TOD areas compared to normal development. This includes accommodating pedestrian walkways and bicycle lanes, realizing park-and-ride facilities, establishing links to the LRT and BRT network, installing utilities, and providing green spaces.

In order to properly assess the public urban infrastructure investment requirements, it is requested that such a financing strategy will carry out an assessment of the required urban infrastructure inclusive of a detailed costing and phasing plan as currently only generic cost assumptions are available.

- **Assessment of barriers to private investment:** Based on a detailed understanding of public infrastructure needs, costs and timing, an assessment of the barriers to private investment in the pilot TOD will need to be carried out. This may include a review of existing funding modalities for private real estate investment in Addis Ababa as well as review of relevant regulations and their impact and suitability for private investment in TODs.
- **Formulation of financing structure and instruments:** The combined understanding of public infrastructure needs as well as barriers to private investment in TOD estates is expected to inform the assessment of suitable PPP models, formulation of a suitable financing structure for the TOD Leghar that is to be implemented as a form of Public Private Partnership.

The funding strategy shall however not only determine suitable terms for the public and

<sup>2</sup> All completed studies are available to the CTCN upon request



privatesector contributions but shall also include the formulation of innovative financing instruments for public urban infrastructure investments, considering the incremental TOD infrastructure needs, capabilities of the Ethiopian Government as well as associated GHG abatement potential of the Leghar TOD. The development of a detailed GHG MRV methodology may be required to support the application of such instruments.

Similarly, it is requested that the CTCN support will, based on the gained understanding of private investment conditions as well as the TOD design, develop an appropriate funding structure for private investment as well as formulate relevant financing/incentive mechanisms that unlock private investment in the Leghar TOD.

Technical capacity in to develop such a financing strategy is limited within the GoE and relevant private sector investors in Ethiopia as the TOD Leghar is a first-of-its kind investment due to which the CTCN is requested to provide support that will unlock private and public investment in TOD.

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

The requested CTCN support will lead to the technical capability to devise an effective funding strategy for the realisation of the pilot TOD investment in Ethiopia. Lessons learned from this engagement will be replicated at future TOD developments, thereby contributing to the transformational change of sustainable urban development through low-carbon mass rapid transport in Ethiopia.

Successful TOD investments will result in considerable direct and indirect emission reductions. These will result from reducing average trip length, maintaining sustainable transport behaviours and shifting demand to relatively environmentally sustainable modes of transport such as walking/biking as well as LRT. Investment in TOD will furthermore lead to enhanced revenue from a) ticketing for the LRT due to increased ridership in TOD areas and b) real estate investments within the TOD. Both will assure the financial viability of the Addis Ababa LRT thereby contributing towards sustaining other low carbon transport interventions, which would otherwise not be financially viable considering low ticketing tariffs relative to high up-front investment and debt servicing requirements.

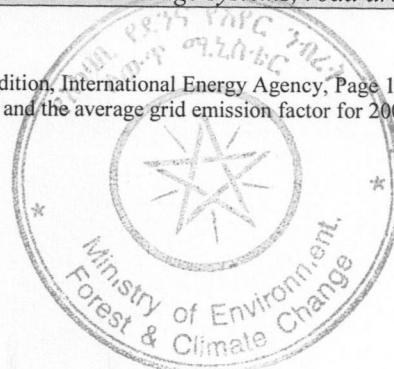
Under a business-as-usual scenario the use of inefficient and a continually aging motorised vehicle fleet (both public and private), will increase both in real terms and relative to more environmentally sustainable modes of transport. In the TOD scenario it is assumed that modal shift to relatively carbon intensive modes of transport and trip distance is reduced. It is also assumed that new public transport services such as the LRT will be powered by electricity generated from renewable energy. Electricity in Ethiopia is almost entirely renewable, generated from hydropower, geothermal and wind power.<sup>3</sup>

Total emission reductions have been estimated for the pilot TOD area that is seeking support through this CTCN application. Reduced trip distance and shift to non-motorized modes of transport within the Leghar TOD are forecasted to result in savings of over 5,000tCO<sub>2</sub>e per year (210,000tCO<sub>2</sub>e over 40 years) while increased ridership to the LRT as a result of TOD is expected to lead to further emission reductions of over 6,000tCO<sub>2</sub>e per year (250,000tCO<sub>2</sub>e over 40 years). Similar emission reduction potential is expected to result from the implementation of the other TODs.

Indirectly, the successful operation of TODs will support the LRT infrastructure in Addis Ababa over the longer term, which is expected to result in annual emission reductions of 400,000t CO<sub>2</sub>e.

Finally, investments in TOD public infrastructure such as sewerage systems, road drainage and similar

<sup>3</sup> CO<sub>2</sub> Emissions from fuel combustion - Highlights, 2012 Edition, International Energy Agency, Page 112 states the grid emission factor for Ethiopia was 0.007 tCO<sub>2</sub>/MWh for 2010 and the average grid emission factor for 2008-10 was 0.082 tCO<sub>2</sub>/MWh



*will increase the climate resilience of urban areas compared to a business as usual scenario. Knowledge of how climate change will affect future urban transport infrastructure developments and the capacity to effectively and efficiently respond in Ethiopia is currently limited.*

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

*Technical assistance provided by CTCN for developing an effective funding strategy for the pilot TOD Leghar will enable the Ethiopian Railways Corporation and its partners to engage with suitable financiers, including the private sector. The result of CTCN's intervention will be directly used to facilitate the establishment of a Public-Private Partnership arrangement that will set the stage for the realization of the first pilot TOD.*

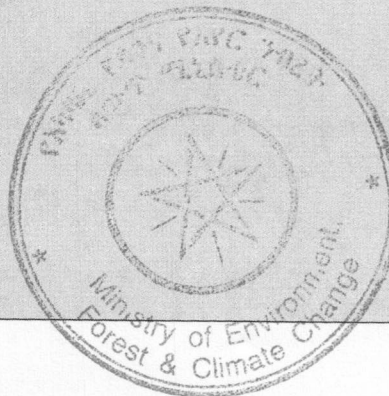
*Activities subsequent to the development of detailed financing strategy will include:*

- *Identify master developer and negotiate terms of engagement*
- *Detailed design and engineering*
- *Secure public sector approvals and title deeds*
- *Complete final design, engineering and EIA studies, inclusive of public infrastructure*
- *Secure leasing commitments*
- *Prepare development schedule*
- *Prepare and evaluate bidding packages*
- *Finalize financing structure and prepare relevant financing / loan documentation, inclusive of PPP arrangements*
- *Execute building contracts*

*Based on experiences gained with this first pilot TOD, the GoE intends to replicate TOD developments to other areas along the LRT, as well as additional planned mass rapid transit systems such as the Addis Ababa BRT system or the National Railway Network.*

**Key stakeholders:**

<b>Stakeholder</b>	<b>Role to support the implementation of the assistance</b>
<i>Ministry of Environment, Forest and Climate Change (NDE)</i>	<i>The ministry is the CTCN NDE as well as NDA to the UNFCCC and will therefore lead the communication with CTCN while also being in charge of any relevant monitoring, reporting and verification.</i>
<i>Ethiopian Railway Corporation (ERC) (main counterpart)</i>	<p><i>ERC is a fully state owned public enterprise mandated by the Government of Ethiopia to implement and operate the country's National Railway Network and rail-based mass rapid transport (MRT), including the Addis Ababa LRT.</i></p> <p><i>ERC identified the TOD concept in 2012 with the main target to increase revenues of its rail-based MRT projects that would otherwise not be able to operate in a financially sustainable manner. Since then, ERC in collaboration with the Addis Ababa City Administration has identified various potential TOD areas along its planned transport projects. ERC and its</i></p>

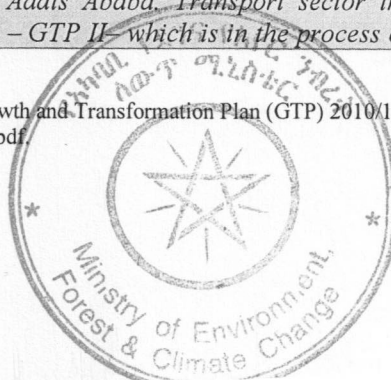


	<i>partners currently prioritize the development of TODs in Addis Ababa as the city's LRT has been commissioned in 2015</i>
<i>Addis Ababa City Administration</i>	<i>In collaboration with the transit agency (ERC), Addis Ababa City Administration plays a significant role as an owner of certain parcels of land, a regulator of urban development in Addis Ababa as well as the responsible entity to construct and maintain certain type of public infrastructure. The City Administrations will therefore play a vital role in the planning process and implementation of TOD.</i>  <i>The City's Road and Transport Bureau is furthermore currently preparing to implement BRT projects where TOD concepts may be replicated to.</i>
<i>Ministry of Transport</i>	<i>The Ministry of Transport (MoTr) is responsible for the country's transport policies as well as to oversee public transport enterprises and their activities, such as ERC. Considering the TODs nature of integrating transport and urban planning, the ministry will provide strategic policy guidance on TOD design while also acting as the formally responsible ministry overseeing ERC's activities in regard to TOD.</i>
<i>Ministry of Urban Development, Housing and Construction</i>	<i>It is the responsible Ministry for urban development, planning and housing in Ethiopia. It has the responsibility of addressing city-level planning and management issues, but also integrating Ethiopia's urban areas with the country's spatial strategy. The Ministry has the mandate to create resilient and livable cities and develop an internationally competitive construction industry by 2020. The ministry will therefore contribute to the strategic design decisions for TOD development</i>
<i>Ministry of Finance and Economic Development</i>	<i>MoFED as the Ethiopian ministry with budget control will be responsible for budget allocation approvals to relevant ministries, ERC and City Administrations.</i>
<i>Private sector real estate developer</i>	<i>Private sector real estate developers are scheduled to be integrated in the TOD implementation due to a PPP structure.</i>

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

*In recent years, the Government of Ethiopia has adopted a number of strategies, policies and regulations that seek to support and provide a framework for low carbon transport and enhanced urban planning and land management. At the highest level these are outlined in Ethiopia's first Growth and Transformation Plan (GTP I), which details the country's strategy to reach middle-income status by 2025.<sup>4</sup> Its investment programme encompasses road and rail infrastructure improvements including the construction of Light Rail Transit (LRT) in Addis Ababa. Transport sector initiatives remain prominent in Ethiopia's updated development plan – GTP II – which is in the process of being formally*

<sup>4</sup> Ministry of Finance and Economic Development (2010) Growth and Transformation Plan (GTP) 2010/11 – 2014/15. Available at [http://www.ethiopians.com/Ethiopia\\_GTP\\_2015.pdf](http://www.ethiopians.com/Ethiopia_GTP_2015.pdf).



*adopted and reflects the recognition that a sustainable transport system is fundamental to the country's ability to attain middle-income status and become carbon-neutral.*

*The Government's Climate Resilient Green Economy (CRGE) strategy has been integrated into the GTP II. The CRGE is Ethiopia's strategy for addressing both climate change mitigation and adaptation while realising a sustainable development model. It outlines 60 priority initiatives to achieve the country's vision to develop a carbon neutral green economy by 2025. Transport sector interventions are prominent in the CRGE strategy and two related interventions have been allocated national priority. These include specifically construction of Mass Rapid Transit (MRT) systems such as LRT and BRT and a modal shift of freight transport from road to an electric rail network powered by renewable energy. Electricity in Ethiopia is almost entirely renewable, generated by hydropower, geothermal and wind power.*

*Furthermore, Ethiopia's recently prepared Nationally Determined Contribution (NDC)<sup>5</sup> reiterates the role of the transport sector in achieving a carbon-neutral green economy. The NDC's climate change mitigation strategy is built on the same four pillars as the CRGE, the fourth of which targets 'leapfrogging to modern and energy efficient technologies in transport', to be complemented by 'urban planning transition towards mixed use, compact, and polycentric cities' which equals the concept of TOD. Following the Paris Agreement realisation of Ethiopia's ambitious NDC will be the Government's priority.*

*These cross-sectoral strategies are in turn consistent with the Ministry of Transport's sector policy and urban level transport plans and policy. The Addis Ababa Transport Policy<sup>6</sup> refers to the need to prioritise addressing: poor accessibility, increasing transport fares, congested roads, lack of walking and cycling infrastructure, poor road safety, and increasing air and noise pollution. It proposes that these challenges be tackled through a combination of better planning, transport infrastructure, service supply, and related management.*

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

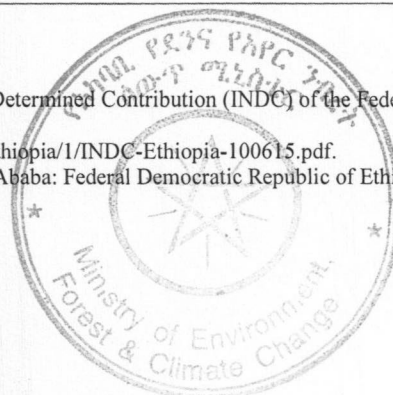
*The Ethiopian Railway Corporation and the NDE, the Ministry of Environment, Forests and Climate Change have been in continuous consultations since the TOD concept was adopted by the GoE for development in Ethiopia. The Ministry assisted in the preparation and submission of TOD funding proposals to the NAMA Facility as well as the Green Climate Fund. The Ministry furthermore led the submission of Ethiopia Railway's Addis Ababa Light Rail Transit (LRT) Transit Oriented Development (TOD) NAMA for preparation to the UNFCCC NAMA registry. Based on this submission as a NAMA for preparation, the Ministry advised the Ethiopian Railways Corporation to put forward a request for technical assistance to the CTCN. The Ministry reviewed the submission made by CTCN in order to assure alignment with national priorities as well as CTCN eligibility criteria.*

**Expected timeframe:**

*It is expected that that requested CTCN support can commence in mid-2016 and conclude in mid-2017. Based on the assistance provided by CTCN, further development and implementation of pilot TODs is envisioned to take place between 2017 and 2020.*

<sup>5</sup> Federal Democratic Republic of Ethiopia (2015) Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia. Available at <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Ethiopia/1/INDC-Ethiopia-100615.pdf>.

<sup>6</sup> Ministry of Transport (2011) Transport Policy of Addis Ababa. Addis Ababa: Federal Democratic Republic of Ethiopia.



**Background documents:**

- Climate Change Technology Needs Assessment Report of Ethiopia (TNA):  
[http://unfccc.int/ttclear/misc/\\_StaticFiles/gnwoerk\\_static/TNR\\_CRE/e9067c6e3b97459989b2196f12155ad5/5059e1af89384cf18ca0402f71a73ea1.pdf](http://unfccc.int/ttclear/misc/_StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/5059e1af89384cf18ca0402f71a73ea1.pdf)
- Ethiopia's Growth and Transformation Plan (GTP):  
[http://www.ethiopians.com/Ethiopia\\_GTP\\_2015.pdf](http://www.ethiopians.com/Ethiopia_GTP_2015.pdf)
- Climate Resilient Green Economy Strategy (CRGE):  
<http://www.undp.org/content/dam/ethiopia/docs/Ethiopia%20CRGE.pdf>
- Addis Ababa Transport Policy:  
<http://www.motr.gov.et/documents/93212/133044/Transport+Policy+of++Addis+Ababa/238460cb-6d91-406a-bebc-afe77f5039d0?version=1.3>
- Ethiopia's Intended Nationally Determined Contributions to the UNFCCC:  
<http://www4.unfccc.int/submissions/INDC/Published%20Documents/Ethiopia/1/INDC-Ethiopia-100615.pdf>
- Transit Oriented Development concepts for four initial nodes prepared by ARUP for the ERC – Can be made available upon request.

**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:**

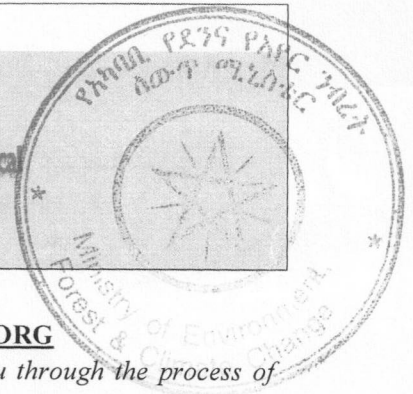
NDE name: Yamelakesira Tamene Bekele

Date: February 10, 2016

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)**

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