

Country	Ethiopia
Request ID#	2024000009
Title	Development of a Deep Decarbonization Roadmap for the Cement and Concrete Industry in Ethiopia
NDE	Mr. Belete Gesesse Senior Expert, Climate Change Green Technology Innovation Ministry of Planning and Development Email: belete.gesesse7@gmail.com
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Summary of the CTCN technical assistance

Cement is the most widely used building material globally. Given the massive scale of production, the cement industry accounts for approximately 7 to 8% of global man-made CO₂ emissions. As of 2024, Ethiopia's cement manufacturers have an installed capacity of around 17,000,000 tonnes per year, while national demand stands at approximately 12,000,000 tonnes. The growing need for cement and concrete is driven by rapid urbanization and large-scale infrastructure projects. However, as a hard-to-abate sector, the cement and concrete industry faces significant challenges in reducing emissions.

Ethiopia's pathway to decarbonizing its cement sector is hindered by limited awareness of cost-effective decarbonization solutions, gaps in regulatory standards and incentives, governance constraints, and a lack of effective financing pathways. To accelerate emission reductions, Ethiopia will develop a national decarbonization roadmap that identifies viable technological and policy interventions that will enable investments in a sustainable development of the cement and concrete industry.

Agreement:

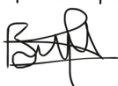
(If possible, please use electronic signatures in Microsoft Word file format)

**National Designated Entity to the UNFCCC
Technology Mechanism**

Name: Mr. Belete Gesesse

Title: Senior Expert, Climate Change Green
Technology Innovation, Ministry of Planning
and Development

Date: 07/20/2026

Signature: 

Proponent (signature of the Proponent is
optional)

Name: Dawit Alemu

Title: Senior Technical Advisor, Ministry of
Industry

Date:

Signature:

7/16/2026

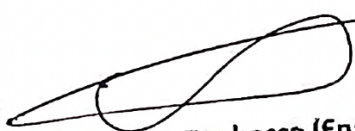

Proponent (signature of the Proponent is
optional)

Name: Gezahegn Dechasa

Title: Deputy Manager, Ethiopian Cement
Association

Date:

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Gezahegn Dechassa (Eng.)
General Manager

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Name: Simegn Degu

Title: Chief Executive Officer, Mining Industry
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Date:

Signature:


Simegn Degu

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Tomoko Furusawa

Title: Head of Partnership and Liaison Office, CTCN

CTCN, OIC

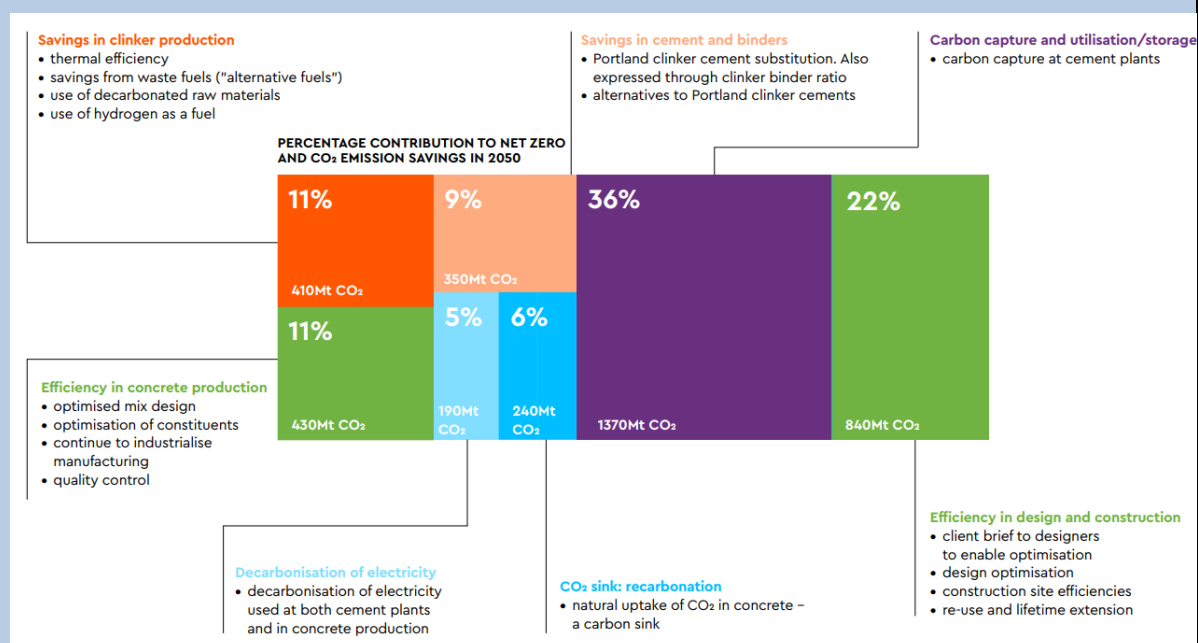
Date: 22 July 2026

Signature:



1. Background and context

Cement is the most widely consumed building material in the world. Due to its large-scale production, the cement industry is responsible for approximately 7 to 8% of global man-made CO₂ emissions. In 2020, global cement consumption reached 4.2 billion tonnes, with projections indicating continued growth in the coming decades, driven by urbanization and population increase. The Paris Agreement, adopted by 196 parties at COP 21 in December 2015 and enforced in November 2016, aims to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. In alignment with this goal, the Global Cement and Concrete Association (GCCA), representing 80% of the world's cement capacity outside China, has committed to the 1.5°C target. To achieve this, the GCCA has developed a global roadmap, the "Net Zero Accelerator Roadmap," which is to be adapted to individual countries. This roadmap follows key decarbonization levers identified by the GCCA to reduce emissions from cement production.



Aligned with the GCCA roadmap, the International Energy Agency (IEA) highlights that carbon capture and clinker reduction are among the most effective measures for reducing CO₂ emissions in cement production. One of the most promising solutions is the use of Limestone Calcined Clay Cement (LC3), which combines clinker, calcined clay, limestone, and gypsum, achieving equivalent mechanical performance to Ordinary Portland Cement (OPC) while reducing the clinker factor to 50%. This technology has the added advantage of utilizing locally available raw materials, reducing dependence on imported clinker or cement. Another crucial decarbonization strategy is the use of alternative fuels instead of coal and petroleum coke. In some European cement plants, up to 90% of energy needs are met by alternative fuels, such

as municipal, agricultural, and industrial waste, significantly reducing CO₂ emissions. Biomass-based alternative fuels, for example, are considered carbon-neutral by the Intergovernmental Panel on Climate Change (IPCC). Additionally, reducing reliance on imported fossil fuels by utilizing local waste materials can lower emissions from freight and preserve foreign currency reserves. Furthermore, depending on the age and technology of cement production units, energy efficiency measures such as waste heat recovery, improved clinker coolers, and cogeneration can lead to relevant greenhouse gas (GHG) emissions savings.

Context in Ethiopia

As of 2024, 12 cement manufacturers are operating in Ethiopia that have a combined installed production capacity of approximately 17,000,000 tonnes per year. National demand is estimated at 12,000,000 tonnes. However, fluctuations in production and demand have led to temporary supply shortages and price volatility. The growing demand for cement and concrete is largely driven by rapid urbanization and large-scale infrastructure projects. To meet this demand, new cement plant projects and modernization investments are underway to enhance production capacity. One notable development is the Lemi National Cement Factory, inaugurated in September 2024, which has added 15,000 tonnes per day to the national supply, aiming to stabilize prices and reduce shortages.

Despite these developments, industry-related greenhouse gas (GHG) emissions have been steadily increasing without effective tracking or systematic reduction strategies. Ethiopia's cement sector also faces several environmental challenges, including outdated infrastructure, insufficient environmental safeguards, and weak governance in monitoring, evaluation, and enforcement.

To address these challenges, Ethiopia has developed a Long-Term Low Emission Development Strategy (LT-LEDS) 2020 - 2050, which targets net-zero emissions by 2050. In 2021, a number of energy audits of cement plants were conducted in Ethiopia through a sector reform performance contract (SRPC) funded by the European Union. These audits have resulted in plant-specific energy conservation measure implementation frameworks. However, the implementation of these measures has been slow due to a lack of coordination between key stakeholders (public, private, finance), missing incentives and limited access to financing. The cement industry urgently requires a national decarbonization roadmap that outlines effective technological and policy measures and facilitates their implementation through strategic stakeholder engagement and resource mobilization.

Public-private collaboration will be key in developing and implementing this roadmap to ensure long-term sustainability and environmental responsibility in Ethiopia's cement and concrete industry. This includes facilitating the adoption of cleaner technologies, improving regulatory frameworks, resource mobilization and

enhancing industry efficiency while maintaining a balance between economic growth and sustainability.

This technical assistance is part of a larger programme of sectoral decarbonization in the Ethiopian cement industry supported by the United Nations Industrial Development Programme (UNIDO), African Development Bank (AfDB), United Nations Development Programme (UNDP) and CTCN.

2. Problem statement

Ethiopia's journey toward decarbonizing its cement and concrete industry faces several significant challenges:

Decarbonization Options: The Ethiopian cement sector requires clarity on economically viable decarbonization strategies. While multiple options exist and energy savings measures have already been identified through extensive energy audits in 2021, their applicability and financial viability depend on specific factors such as production volumes, technological setups, and available raw materials. A lack of transparency and tailored information hampers informed decision-making and financing.

Governance: Effective decarbonization requires a clear, actionable roadmap complemented by robust monitoring, verification, and enforcement mechanisms. In Ethiopia, challenges such as a shortage of skilled professionals, and inconsistent power supply have impeded the industry's progress. These issues highlight the need for strengthened governance and infrastructure to support emission reduction initiatives.

Stakeholder Alignment: Decarbonizing the cement and concrete industry necessitates extensive collaboration between regulators, industry stakeholders and financial institutions. Aligning on GHG emission reduction targets, technological implementation roadmaps, and the development of supportive policies and incentives is crucial for financing and implementation.

Addressing these challenges through robust governance and collaborative stakeholder engagement is essential for Ethiopia to successfully decarbonize its cement and concrete industry.

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

Objective: To develop and operationalize a comprehensive and endorsed national decarbonization roadmap for the cement and concrete industry in Ethiopia built on an effective Monitoring, Verification and Enforcement (MV&E) Framework and Digital Platform to track cement data and decarbonization actions.												
Outcome: Enhanced national capacities for the decarbonization of the national cement and concrete industry in Ethiopia through a clear roadmap, an effective MV&E framework and digital platform.												
	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
Mandatory Output: Project management <i>All implementers must undertake the following project management activities at the beginning of, during and at the end of the CTCN technical assistance.</i>												
Activity A: Beginning of implementation A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan; Based on the work plan, a monitoring and evaluation (M&E) plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan). This M&E plan also includes a CTCN Impact Description formulated in the beginning of the technical assistance which will be revised in the Closure and Data Collection report once the technical assistance is fully delivered (templates will be provided). Furthermore, a gender assessment and action plan (GAAP) will be prepared and followed throughout the technical assistance (a template will be provided). ¹												

¹ Additional information is available under Section 10 of the response plan.

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The collected data will be reviewed and complemented by additional research to establish a comprehensive sector baseline. The baseline will quantify production volumes, energy consumption, clinker-to-cement ratios, and direct and indirect emissions profiles. The baseline will include a mapping of the supply side, summarizing the manufacturer landscape, existing production facilities, installed capacity, and ongoing or planned decarbonization initiatives, as well as an analysis of the demand side, covering cement consumption types and demand patterns across key end-use segments. It will also map cross-sector dependencies and gating infrastructure relevant to decarbonization, including grid capacity and electricity supply, availability of waste streams and biomass for alternative fuels, availability of supplementary cementitious materials and calcined clay resources, and transport infrastructure. On this basis, a projection of cement production and consumption as well as sectoral GHG emissions will be established for 2030, 2040 and 2050, forming the reference pathway against which lever contributions will be assessed.										
Activity 2.2: Development of an MRV Framework This activity will establish a robust Measurement, Reporting, and Verification (MRV) framework aligned with the GCCA “Getting the Numbers Right” (GNR) platform and tailored to Ethiopia's cement sector to enable transparent, standardized, and consistent clinker and cement production, energy consumption and GHG emissions monitoring and reporting. Existing MRV procedures and activities of the Ministry of Industry, the Ministry of Mines, the Ministry of Planning and Development and the Ethiopia Cement Association will be considered to ensure alignment. Existing knowledge resources from UNIDO on industrial MRV frameworks will also be considered. The MRV framework will define: • Standardized methodologies for measuring clinker and cement production, energy consumption and GHG emissions • Key performance indicators and emission factors aligned with international standards (e.g., GHG protocol, IPCC guidelines, GCCA Cement CO2 and Energy Management Protocol) and adapted to Ethiopia's specific context • Data requirements, reporting frequency, and quality assurance/quality control procedures • Protocols and institutional responsibilities for data collection, validation, storage and reporting • Enforcement mechanisms, including compliance monitoring procedures, non-compliance response protocols, and potential penalties or incentives to ensure consistent reporting • Data confidentiality and sharing protocols to balance transparency with commercial sensitivity										

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- Facilitate dialogue between public and private sector stakeholders - Define priority areas for technology implementation, policy support, and investment for each decarbonization lever - Lay the foundation for Ethiopia's cement sector emission reduction strategy The workshop will be structured around working sessions organized by lever program: (i) demand and design efficiency; (ii) concrete production efficiency; (iii) binders/SCMs and clinker substitution; (iv) clinker production efficiency and alternative fuels; (v) CCUS readiness; (vi) electricity decarbonization and electrification; and (vii) recarbonation and circularity. Each working session will review the preliminary lever contribution and its underlying assumptions, identify priority interventions and the barriers to be addressed, and define responsible institutions, policy and finance enablers, and indicative sequencing. This workshop will be organized with the PWG in conjunction with the schedule under Activity 2.2. Meeting room costs including coffee and lunch (estimated at 1,000 USD per day), logistical support for participants (40 USD per participant per day) will be covered by the implementing partner.														
Activity 4.2: Development of the draft national decarbonization roadmap for cement and concrete Based on the outputs of previous activities and the workshop, a comprehensive national roadmap will be developed for the decarbonization of Ethiopia's cement and concrete sector. The roadmap will be structured as a suite of lever-specific action programs, providing a strategic, phased plan that individual actors and industry coalitions can adopt, sequence, and scale, and guiding investment, regulation, and capacity development efforts. As a core analytical component, the lever contributions quantified under Activity 3.1 will be refined based on workshop feedback and aggregated into a combined emission reduction pathway for 2030, 2040 and 2050. The roadmap will include: - Linkages with national climate and industrial development strategies - Strategic decarbonization objectives and emission reduction targets for 2030, 2040 and 2050, consistent with the aggregated emission reduction pathway - The quantified decarbonization pathway, setting out each lever's contribution, the underlying assumptions, and the policy enablers required - Seven lever programs, developed from the working session results of Activity 4.1 and tailored to local technical capabilities, financial conditions, and institutional arrangements. Each lever program will cover four dimensions: technology (prioritized options, mitigation potential, deployment timelines, and enabling conditions), policy (regulations, standards, fiscal incentives, and procurement measures),														

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The event will convene a maximum of 60 participants. Invitees will include representatives from cement plants, relevant government ministries and regulatory bodies, industry associations, civil society organizations (e.g. gender, youth), development partners, and members of the press. High-level Ministers will be invited to deliver opening remarks and formally endorse the roadmap. The format will consist of: - Opening remarks by senior government officials - Presentation of the roadmap's key findings, targets, and priority actions - A moderated discussion and stakeholder reflections - Media engagement and press briefing This event will be organized in Addis Ababa. Event venue costs including coffee and lunch (estimated at 2,500 USD for one day) will be covered by the implementation partner. Video production (1,000 USD) and media coverage (500 USD) will be arranged. No logistical support will be provided.												
Deliverable 4: ○ Deliverable 4.1: Roadmap Development Workshop material and report, incl. list of attendees disaggregated by gender and institution ○ Deliverable 4.2: Draft National Decarbonization Roadmap for Cement and Concrete ○ Deliverable 4.3: Roadmap Validation Workshop material and report, incl. list of attendees disaggregated by gender and institution ○ Deliverable 4.4: Final National Decarbonization Roadmap for Cement and Concrete ○ Deliverable 4.5: Agenda, Event material and report, incl. list of attendees disaggregated by gender and institution; event photos							X			X	X	

4. Resources required and itemized budget:

Please provide an indicative overview of the resources required and itemized budget required to implement the CTCN technical assistance, including for M&E-related activities, using the table below. Important to note that minimum 5% of the budget should explicitly target gender specific activities related to the technical assistance (please see section 10 for further information on gender). Once the Response Plan is completed, a Response Implementation partner(s) will be selected by the Climate Technology Centre (CTC). A detailed activity-based budget for the CTCN assistance will be finalized by the CTCN and selected Implementer.

		Input: Travel			Estimated cost
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Activities and Outputs	Input: Human Resources (Title, role, estimated number of days)	(Purpose, national vs. international, number of days)	Inputs: Meetings/events (Meeting title, number of participants, number of days)	Input: Equipment/Material (Item, purpose, buy/rent, quantity)	Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan	
					Minimum	Maximum
Mandatory Output: Project Management					3,200 USD	3,520 USD
Mandatory Activities: A: Pre-implementation B: Implementation C: Post-implementation	IE1: 4 days NE1: 4 days NE2: 1 day				3,000 USD	3,300 USD
Output 1: Coordination of a Project Working Group					52,962 USD	58,258.20 USD
Activity 1.1: Establishment of a Project Working Group	IE1: 1 day NE1: 5 days				1,750 USD	1,925 USD
Activity 1.2: Kick-off workshop and regular meetings of Project Working Group	IE1: 10 days IE2: 10 days IE3: 4 days IE4: 4 days NE1: 10 days NE2: 15 days	International travel: IE1, IE2: 3 international trips for participation in PWG meetings International travel: 1,500 USD per person per trip	4 in-person meetings of 1-2 days with the PWG are planned in months 2, 5, 7 and 10. These meetings will be combined with workshops foreseen under Activities 2.4,		51,212 USD	56,332.20 USD

		National travel: NE1, NE2 and 20 PWG members: 4 travels for participation in PWG meetings. Local DSA: 40 USD per person per day	3.2, 4.1, 4.3, 4.5 and 5.2. The locations will be defined in consultation with the national key stakeholders and may be outside of Addis Ababa (e.g. Bishoftu) Meeting room cost incl. coffee and lunch: 1,000 USD per day Media will be engaged for the kick-off workshop (250 USD in total).			
Output 2: Cement and Concrete Inventory and MRV System					104,008 USD	114,408.80 USD
Activity 2.1: Review of the Inventory of Ethiopia's Cement and Concrete Sector	IE1: 3 days IE2: 10 days IE3: 3 days NE1: 20 days				13,000 USD	14,300 USD

Activity 2.2: Development of an MRV Framework	IE1: 5 days IE2: 5 days IE3: 15 days NE1: 15 days NE2: 3 days				17,000 USD	18,700 USD
Activity 2.3: Setup of the GNR Cement Reporting Platform in Ethiopia	IE1: 5 days IE3: 10 days NE1: 15 days NE2: 3 days			GNR Platform fee: 45,000 USD	57,000 USD	62,700 USD
Activity 2.4: Capacity building on MRV and Cement Reporting Platform	IE1: 3 day IE2: 3 day IE3: 5 days NE1: 5 days NE2: 10 days	Travel and fees as per Activity 1.2	3 days MRV Capacity building workshop will be organized with 30 participants. This will be jointly organized with the PWG meeting in Month 7.		17,008 USD	18,708.80 USD
Output 3: Cement and Concrete Decarbonization Technology and Policy Review					26,000 USD	28,600 USD
Activity 3.1: Evaluation of Decarbonization Technologies and Levers	IE1: 5 days IE2: 10 days IE4: 5 days NE1: 10 days				12,750 USD	14,025 USD
Activity 3.2: Technology	IE1: 2 days IE2: 1 day	Travel and fees as per Activity 1.2	1 Technology Prioritization workshop		3,500 USD	3,850 USD

prioritization workshop	IE3: 1 day IE4: 1 day NE1: 2 days NE2: 2 days		will be organized in attendance of the 20 PWG members. This will be jointly organized with the PWG meeting in Month 5.			
Activity 3.3: Review of Ethiopia's Cement and Concrete Policy and Regulatory Framework	IE1: 5 days IE2: 5 days IE4: 3 days NE1: 10 days NE2: 3 days				9,750 USD	10,725 USD
Output 4: Development of a National Cement and Concrete Decarbonization Roadmap					59,018 USD	64,919.80 USD
Activity 4.1: Roadmap development workshop	IE1: 2 days IE2: 1 day IE3: 1 day IE4: 1 day NE1: 2 days NE2: 2 days	Travel and fees as per Activity 1.2	1 Roadmap development workshop will be organized in attendance of the 20 PWG members. This will be jointly organized with the PWG meeting in Month 7.		3,500 USD	3,850 USD

Activity 4.2: Development of the draft national decarbonization roadmap for cement and concrete	IE1: 15 days IE2: 10 days IE3: 5 days IE4: 5 day NE1: 15 days NE2: 10 days				23,750 USD	26,125 USD
Activity 4.3: Validation Workshop	IE1: 2 days IE2: 1 day IE3: 1 day IE4: 1 day NE1: 2 days NE2: 2 days	Travel and fees as per Activity 1.2	1 Validation workshop will be organized in attendance of the 20 PWG members. This will be jointly organized with the PWG meeting in Month 10.		3,500 USD	3,850 USD
Activity 4.4: Finalization of the national decarbonization roadmap for cement and concrete	IE1: 5 days IE2: 5 days IE3: 1 day IE4: 1 day NE1: 10 days NE2: 5 days			Design fees: 2,500 USD Printing fees: 1,000 USD	13,250 USD	14,575 USD
Activity 4.5: Roadmap Launch Event	IE1: 4 days IE2: 4 day NE1: 5 days NE2: 5 days	International travel: IE1, IE2: 1 roundtrip International travel: 1,500 USD per person per trip	1 Roadmap Launch Event will be organized in attendance of 60 participants. Venue cost including coffee and lunch: 2,500 USD per day	Video production: 1,000 USD Media invitation: 500 USD	15,018 USD	16,519.80 USD

Estimated range of costing for the entire Response Plan					245,188 USD	269,706.80 USD

5. Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan. A gender expert is required for each technical assistance and suitable experts can be identified from the CTCN Gender and Climate Technology Expert Roster or other relevant sources.

Experts required	Brief description of required profile
International Experts	
Project Coordinator and Policy Expert (IE1)	Education: Master’s degree or higher in Environmental Policy, Climate Policy, Industrial Decarbonization, Environmental Law, Engineering, or Project Management. Work Experience: • 10+ years of experience in managing large-scale climate or industrial transformation projects. • Extensive experience in environmental policy development and regulatory frameworks. • Experience in cement, heavy industry, or other hard-to-abate sectors is highly desirable. • Proven track record in coordinating multidisciplinary international teams. • Experience with UN agencies, multilateral climate funds, or international technical assistance projects. Skills: • Strong leadership and project management capabilities. • In-depth knowledge of industrial decarbonization policy instruments. • Experience reviewing and drafting regulatory and policy frameworks. • Familiarity with IPCC guidelines, GCCA roadmap, GHG Protocol, and NDC processes.

	• Excellent stakeholder engagement and facilitation skills. • Ability to align sectoral roadmaps with national climate strategies (NDCs, LT-LEDS).
Industrial Decarbonization Expert (IE2)	Education: Master's degree or higher in Environmental Engineering, Climate Policy, Industrial Engineering, or related field. Work Experience: • 10+ years of experience in industrial decarbonization. • Extensive experience in cement sector technologies (LC3, alternative fuels, clinker substitution, WHR, carbon capture, etc.). • Experience conducting technology mapping and prioritization studies. Skills: • Strong analytical and research capabilities. • Knowledge of international best practices (IPCC, GCCA, GHG Protocol). • Ability to conduct multi-criteria assessments. • Experience drafting sectoral roadmaps and policy recommendations.
MRV Expert (IE3)	Education: • Master's degree or higher in Environmental Science, Climate Policy, Data Science, Economics, or related field. Work Experience: • 8+ years of experience designing and implementing MRV frameworks. • Experience working with GHG inventories and IPCC-aligned reporting systems. • Experience in industrial emissions accounting. Skills: • Strong data analysis and KPI development skills. • Experience designing QA/QC procedures. • Ability to design compliance and verification mechanisms. • Strong reporting and presentation skills.
Financial Analyst (IE4)	Education: Bachelor's degree or higher in Finance, Economics, Climate Finance, or related field.

<i>This position can also be covered by a national expert.</i>	Work Experience: • 5+ years of experience in climate finance and project financing. • Experience with green finance mechanisms, blended finance, and carbon markets. • Experience working with international climate funds. Skills: • Advanced financial modeling and cost-benefit analysis. • Structuring of blended finance and de-risking instruments. • Development of investor-ready concept notes and project summaries. • Knowledge of carbon finance and results-based financing mechanisms.
National Experts	
Industrial Expert (NE1)	Education: Bachelor’s degree or higher in Industrial Engineering, Chemical Engineering, Material Science, or related field. Work Experience: • 8+ years of experience in cement or heavy industrial sector. • Familiarity with cement production processes and plant operations. Skills: • Technical understanding of kiln systems, grinding systems, and fuel use. • Ability to assess plant-level technology suitability. • Knowledge of Ethiopian industrial context. • Spoken and written fluency in Amharic
Gender and Capacity Building Expert (NE2)	Education: Bachelor’s degree or higher in Gender Studies, Social Sciences, Development Studies, Education, or related field. Work Experience: • 5+ years of experience in gender mainstreaming and institutional capacity development • Experience in climate change, industrial, or environmental projects preferred

	• Experience designing and delivering training programs Skills: • Design gender-responsive capacity-building strategies • Develop gender-disaggregated monitoring indicators • Facilitate inclusive stakeholder workshops and training sessions • Spoken and written fluency in Amharic
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6. Intended contribution to impact over time

Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (maximum 1250 characters including spaces)

If the objective is achieved, the technical assistance will catalyze a long-term transition of Ethiopia's cement sector, currently with ~17 Mt/year installed capacity, toward a low-carbon growth pathway. By enabling adoption of clinker substitution (e.g. LC3), alternative fuels, and energy efficiency measures, the roadmap could support significant emissions reductions.

The MRV framework and digital platform will institutionalize emissions tracking across all major plants, improving transparency and enabling alignment with NDC and LT-LEDS targets.

Given the sector's central role in infrastructure and urbanization, the intervention will indirectly benefit tens of millions of people through reduced air pollution, more resource-efficient construction, and enhanced climate resilience of infrastructure systems. It will also strengthen industrial competitiveness and support Ethiopia's transition toward a low-carbon, climate-resilient economy.

7. Relevance to NDCs and other national priorities

Please identify relevance and contribution from the technical assistance to the Nationally Determined Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (maximum 2500 characters including spaces)

The proposed technical assistance directly supports Ethiopia's updated Nationally Determined Contribution (NDC) (2021), which identifies the industrial sector as a growing source of greenhouse gas (GHG) emissions and prioritizes energy efficiency and low-carbon development pathways. By developing a national cement and concrete decarbonization roadmap, an MRV framework, and a digital emissions reporting system, the project strengthens sector-level mitigation planning, transparency, and emissions tracking in line with NDC implementation and reporting requirements.

The project is closely aligned with Ethiopia's Long-Term Low Emission Development Strategy (LT-LEDS) 2020–2050 (2020), which sets a pathway toward net-zero emissions by 2050. The project operationalizes LT-LEDS objectives within the cement sector by identifying and prioritizing mitigation measures such as clinker substitution (including LC3), alternative fuels, waste heat recovery, and energy efficiency improvements.

It builds on national energy saving and energy conservation measures, including sectoral energy audits conducted in 2021, by translating identified efficiency opportunities into a structured roadmap to accelerate implementation.

The technical assistance also supports the Ethiopian Manufacturing Industry Policy (2013), the Green Industrialization Development Plan (2014), and the Ten-Year Development Plan (2021–2030), all of which promote sustainable industrial transformation, modernization, and improved competitiveness. By embedding decarbonization into sector planning and investment strategies,

the project advances Ethiopia’s ambition to transition toward a low-carbon, resource-efficient industrial economy.

Overall, the technical assistance integrates climate mitigation into industrial development frameworks, enhances transparency and accountability systems, and supports Ethiopia’s national and international climate commitments in a structured and measurable manner.

8. Linkages to relevant parallel on-going activities:

Please identify relevant previous and ongoing public and private sector initiatives, projects or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (maximum 2500 characters including spaces)

The proposed CTCN technical assistance builds on and complements several ongoing national and international initiatives supporting Ethiopia’s industrial transformation and climate ambitions.

In 2025, Ethiopia joined the Breakthrough Agenda, committing to accelerate clean technology deployment in hard-to-abate sectors such as cement. The development of a national decarbonization roadmap and MRV framework provides a concrete mechanism to operationalize these commitments through clear sector targets, prioritized technologies, and transparent emissions tracking.

The CTCN technical assistance is embedded in a larger coordinated programme on cement decarbonization in Ethiopia implemented jointly with UNIDO, UNDP and the African Development Bank, with clearly delineated responsibilities (see coordination table). Within this programme, the CTCN assistance leads the setup of the MRV platform, technology identification, and the development of the national decarbonization roadmap. UNIDO, with GEF support, leads methodology development, the policy framework, and impact monitoring. The African Development Bank leads sector data collection and the development of a complementary investment framework, with the aim of supporting Ethiopia’s submission to the Climate Investment Funds (CIF). UNDP leads technology feasibility studies, drawing on the prioritization results of this assistance.

Activity	CTCN	UNIDO	AfDB	UNDP
Stakeholder coordination	Co-lead	Co-lead	Co-lead	Co-lead
Methodology Development	Co-lead	Lead	Co-lead	
Data collection	Co-lead	Co-lead	Lead	
MRV Platform	Lead	Co-lead	Co-lead	Co-lead
Technology Identification	Lead	Co-lead	Co-lead	Co-lead
Roadmap development	Lead	Co-lead	Co-lead	Co-lead
Policy Framework	Co-lead	Lead	Co-lead	Co-lead
Investment Framework	Co-lead	Co-lead	Lead	Co-lead
Technology feasibility studies	Co-lead	Co-lead	Co-lead	Lead
Capacity Building	Co-lead	Co-lead	Co-lead	Co-lead
Impact monitoring		Lead		
Communication	Co-lead	Co-lead	Co-lead	Co-lead

At the national level, the assistance supports Ethiopia’s shift toward an industry-led economy under the “Made in Ethiopia” movement. By integrating low-carbon technologies and improved efficiency into cement sector modernization, the project ensures that industrial expansion aligns with sustainability objectives.

The technical assistance also complements large infrastructure and mega projects that are increasing cement demand. By promoting low-carbon production pathways and improved emissions monitoring, the project helps reduce the climate footprint of these investments.

Finally, while the Green Legacy Initiative strengthens carbon sequestration efforts, this assistance addresses emissions from heavy industry, creating a balanced mitigation approach. The roadmap will also position Ethiopia to demonstrate progress at COP32 and attract international climate finance.

9. Anticipated follow up activities after this technical assistance is completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. Please also describe the role of the NDE and project proponent(s) in post-implementation monitoring and reporting. (maximum 2500 characters including spaces)

Policy development and adoption:

- The National Decarbonization Roadmap will serve as the official reference framework for integrating cement sector mitigation measures into national industrial and climate policies.
- The Ministry of Industry, the Ministry of Planning and Development and other relevant institutions will use the roadmap and the prioritized policy recommendations to develop regulatory updates, incentive mechanisms, and sectoral guidelines. This work will be taken forward under the policy framework workstream led by UNIDO within the coordinated cement decarbonization programme.
- Decarbonization targets and actions will be aligned with NDC updates and LT-LEDS implementation.

Resource mobilization:

- The Investment Framework, developed under the lead of the African Development Bank building on the roadmap and the GNR Government Dashboard, will provide investor-ready project summaries to engage development partners, climate funds, multilateral development banks, and private investors.
- The roadmap and Investment Framework will directly support the African Development Bank's submission to the Climate Investment Funds (CIF), as a strategic basis for international climate finance discussions and partnerships.
- Priority technologies will be developed into bankable projects, informed by technology feasibility studies led by UNDP that draw on the technology rating and prioritization of this assistance.

Technology implementation:

- Cement producers will use the lever programs of the roadmap to guide phased modernization and plant-level investments.
- Technology feasibility studies led by UNDP, drawing on the technology rating and prioritization of this assistance, will assess priority technologies at plant level and prepare their implementation.
- Identified technologies will be implemented progressively based on financial and technical feasibility.

Capacity building on clean technologies:

- Training materials and tools developed under the project will be used for continued technical training of industry and government stakeholders, coordinated jointly across the programme partners (CTCN, UNIDO, AfDB, UNDP).
- Institutional knowledge on MRV, low-carbon technologies, and climate finance will be strengthened for long-term sector transformation.

Operationalization of the MRV Framework and reporting:

- The MRV Framework and GNR Cement Reporting Platform will be institutionalized within the responsible government authority, with the platform further extended through the Decarbonisation Investment Acceleration Platform developed by UNIDO.
- Continuous emissions monitoring, compliance tracking, and reporting will support national GHG inventory preparation, NDC transparency requirements, and impact monitoring under the coordinated programme (led by UNIDO).
- The system will underpin the roadmap's review and revision mechanism, enabling evidence-based policymaking, annual performance reviews and the formal roadmap revision cycle every 3–5 years.

10. Gender and co-benefits:

Each technical assistance must integrate gender mainstreaming activities and lead to gender and other co-benefits. At least 5% of the technical assistance budget needs to be allocated to gender mainstreaming activities.

Imbedded in design of the activities:	Gender mainstreaming will be integrated across all project outputs. A National Gender and Capacity Building Expert will conduct a gender assessment at project inception and develop a Gender Assessment and Action Plan (GAAP) to guide implementation. The assessment will analyze gender disparities in Ethiopia's cement and industrial sectors, including access to employment, decision-making roles, finance, and technical training. Gender-disaggregated data will be collected during consultations, workshops, and capacity-building activities (Outputs 1–5), and participation will be monitored accordingly. Gender-responsive approaches will be incorporated into the MRV Framework (Output 2), and the Decarbonization Roadmap (Output 4), ensuring inclusive stakeholder engagement and identifying opportunities for women in clean technologies.
Gender and co-benefits intended as result of the activities:	The technical assistance is expected to improve women's participation in industrial climate governance, technical training, and decision-making processes within Ethiopia's cement sector. Through gender-responsive consultations, capacity-building activities, and inclusive policy development, the project will promote equal access to knowledge, finance opportunities, and green technology initiatives.

	The integration of gender considerations into the Decarbonization Roadmap, and MRV Framework will help create enabling conditions for women's employment in emerging low-carbon value chains. Broader co-benefits include strengthened institutional capacity for gender-responsive climate action, improved transparency and accountability in industrial emissions management, enhanced resource efficiency, reduced air pollution, and long-term environmental and public health improvements.
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11. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
National Designated Entity (NDE): Ministry of Planning and Development	National focal point; ensures alignment with NDC and LT-LEDS; coordinates with CTCN; integrates the MRV framework into national climate reporting systems; oversees post-implementation monitoring and reporting.
Ministry of Industry	Lead government institution for industrial sector policy; co-leads roadmap development; supports regulatory alignment, policy integration, and implementation of decarbonization measures; hosts Digital Reporting Platform.
Mineral Industry Development Institute	Technical focal institution for the cement sector; supports sector data collection, technology assessment, and coordination with cement producers.
Ministry of Urban and Infrastructure	Responsible for building codes, construction standards, and public infrastructure; supports demand-side policy review (performance-based standards, green public procurement) and the demand and design efficiency levers.
Ethiopia Green Building Council	Represents the sustainable construction community; provides input on material-efficient design and low-carbon construction practices, and promotes roadmap uptake among developers, architects, and builders.
Ethiopian Cement Association	Represents cement producers; facilitates industry engagement, data sharing, validation of technical outputs, and dissemination of roadmap recommendations, support of cement data collection.
Ministry of Finance	Supports climate finance mobilization, engagement with development partners.
Environmental Protection Agency	Supports environmental compliance oversight; integrates MRV framework into national environmental monitoring systems.
Petroleum and Energy Authority	Provides technical support on energy efficiency measures, fuel switching, and energy-related MRV calculations.

Waste Management Authority	Facilitates development of alternative fuels from municipal and industrial waste; supports regulatory alignment for waste-to-energy use in cement plants.
Cement producing industries	Provide plant-level operational and emissions data; implementation of prioritized decarbonization technologies.
Civil Society Organizations, e.g. - Network of Ethiopian Women's Association - Ethiopian Women in Energy Association - Talent Youth Association	Support inclusive stakeholder engagement; advocate for gender-responsive and youth-inclusive approaches in implementation; contribute to awareness-raising on cement sector decarbonization.
Global Cement and Concrete Association	Provides benchmarking, global best practices, and technical experience sharing.

12. SDG Contributions:

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here:*

<https://sustainabledevelopment.un.org/partnership/register/>.

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	
	7.1 - By 2030, ensure universal access to affordable, reliable and modern energy services	
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	
9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	The TA supports low-carbon industrial transformation by developing a decarbonization roadmap, and digital MRV system to modernize Ethiopia's cement sector.
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	<i>All TAs should indicate relevance to Goal 13 and at least one target below (13.1 to 13.b).</i>

	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
	13.2 - Integrate climate change measures into national policies, strategies and planning	The TA integrates climate mitigation measures into national industrial policy.
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	The TA supports climate finance mobilization and implementation in a least developed country context
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

13. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

<i>Please tick off the relevant boxes below</i>	<i>Primary</i>	<i>Secondary</i>
☐ 1. Decision-making tools and/or information provision	☐	X
☐ 2. Sectoral roadmaps and strategies	X	☐
☐ 3. Recommendations for law, policy and regulations	☐	X
☐ 4. Financing facilitation	☐	X
☐ 5. Private sector engagement and market creation	☐	X
☐ 6. Research and development of technologies	☐	☐
☐ 7. Feasibility of technology options	☐	☐
☐ 8. Piloting and deployment of technologies in local conditions	☐	☐
☐ 9. Technology identification and prioritisation	☐	X

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

14. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; and (ii) the Lead Implementer about the

knowledge and learning gained through delivery of technical assistance. Furthermore, the NDE together with the project proponent(s) will complete a periodic post-implementation form to track the impact of the activities beyond the technical assistance end date.

