Monitoring & Evaluation (M&E) Plan and Impact Statement Form

Objective of the M&E Plan and Impact Statement:

- The M&E Plan and Impact Statement must be designed based on the Technical Assistance Response Plan and must enable the Implementer to complete the Closure Report at the end of the assistance.

Process for filling in the form:

- The Implementer must identify relevant quantitative and qualitative indicators as specified in the Closure Report. A sub-set of indicators to monitor and assess must be chosen among these.
- The Implementer may also identify other specific, measurable, achievable, relevant, and time-bound indicators suitable to monitor Activities, Outputs and anticipated Outcomes from the technical assistance and add to the M&E Plan and Impact Statement.
- During implementation of the TA or FTA, the Implementer must collect all relevant data as described in the Monitoring & Evaluation Plan. Aggregated data on selected indicators as well as an updated version of the Impact Statement will be presented in the Closure Report at the end of the assistance.

Basic Information	
Title of response plan	Study on the identification and evaluation of technologies and industrial processes used in cement producing industries in Congo – Brazzaville
Technical assistance reference number	2020000039
Country/ countries	Republic of Congo - Brazzaville
NDE focal point and organization	Madzou Moukili
Sector(s) addressed	Heavy Industrial Manufacturing - Cement Industry
Technologies supported	Cement Industry – Carbon footprint reduction, CO_2 emission reduction
Implementation period and total duration	From June 2021 till December 2021 (6 months)
Total budget for implementation	USD 228,425
Designer of the response plan	UNEP – The Climate Technology Centre and Network (CTCN)
Implementer of response plan	Cementis GmbH Switzerland / Cemcon AG

	Switzerland

(A) Outputs and Activities as described in the Response Plan	(B) Indicator	(C) Expected results	(D) Method and frequency for data collection	(F) Comments
Output 1: Add title from the Response Plan (e.g. CTCN planning and monitoring documents)	*Select relevant indicators from the Closure Report (at least one core indicator, section B). You may also define additional relevant indicators to be added.*	*Add the expected quantitative or qualitative target/value of the indicator (e.g. number of studies, policy recommendations, etc.).*	*Describe the expected method and frequency for data collection (e.g. survey, head count at a training workshop, application of a standard methodology etc.)*	*Describe any assumptions made or anticipated challenges for collecting quantitative and qualitative data*
Overall Indicator				
Completion of technical assistance and consolidated work product including (in the Republic of Congo context) GHG (CO_2) best available technology assessment, energy (STEC and SEEC) audit manual and GHG (CO_2) auditing manual	• Anticipated metric tons of CO_2 , equivalent emissions reduced as a result of the TA **on an annual basis.**	• XX Mt CO2 per annum (tbd at the end) with defined measures under this engagement: • Energy efficiency & optimisation – Mt CO_2 per annum reduction • Energy substitution (alternative fuel & raw material - AFR) Mt CO_2 per annum reduction • Supplementary Cementitious Materials (SCM), ie. clinker factor reduction Mt CO_2 per annum reduction • New Technologies Mt CO_2 per annum reduction	• Anticipated GHG (CO_2) emissions in the Republic of Congo for the heavy industrial manufacturing cement sector (scope 1 and 2) will be made as part of deliverable §4 under the engagement	• Accurate operational material and energy consumption data from the Republic of Congo cement producers (CIMAF, Diamond, Dangote, Forspak and SONOCC) is a key pre-requisite
	Anticipated number of direct and indirect beneficiaries as a result of the TA. Cement industry: all cement	• XX number of Cement producers, government and local established international organizations include best available	• Knowledge sharing through on-site visit inspections, stakeholder discussions and	Participation and inter-collaboration of the five cement producers (CIMAF, Dangote, Diamond,

	plants & grinders Government: All involved participants will have a better understanding of how cement and CO2 emissions are linked and the solutions Intl. organization: all involved parties will have a good vision of what can be achieved in the cement industry in the short, medium and long term	technologies to reduce CO_2 emissions in the cement industry development in the Republic of Congo • The Republic of Congo in conjunction with the heavy industrial cement sector implement comprehensive GHG (CO_2) auditing & reporting as ongoing operational SOP's	dissemination of the work product under this engagement	Forspak and SONOCC) in the Republic of Congo in the planning and implementation of GHG (CO_2) measures may pose to be a challenge.
	• Expected female presence in meetings and/or participating in the project of at least 25%	• The cement sector in the Republic of Congo promotes the integration of women in the operational and management SOP processes of each cement production facility • Stakeholders to equally include women (at least 25%) in their representation under his CTCN TA engagement at each stakeholder meeting specifically activity identifiers §2.1, §2.3, §2.4 and §5.1	• Stakeholders including Government IGES, NDE and the production plants (CIMAF, Dangote, Diamond, Forspak, SONOCC) to confirm participation of women at each of the activity identifiers stated during the CTCN TA engagement • It is expected to also invite female higher level (University) students in technical fields e.g. chemistry or mechanical engineering to the activity §2.1, §2.3, §2.4 and §5.1	• overcoming cultural, age, common practice predispositions and general perception of the integration of a gender balanced industry prove to be challenging
• Amount of	• Anticipated investment if all	• At least Public investment of xx	• Data of investment will be	• Much will depend on

funding/investment leveraged (USD) as a result of CTCN TA	technology recommendations to lower CO2 are implemented: • Public: XX USD • Private: xx USD (xx% national + yy% International)	USD will be invested to identify cementitious material in the country that would replace clinker in the country. • Public investment in waste infrastructure and waste sorting in medium term to allow cement industry to use waste.	based on average similar investment cost worldwide.	the policy regulations put in place or not.
Operational Indicator				
Output 2: Evaluation of cement plants in Congo				
Activity 2.2: Analysis and data collection of the five cement plants in the Republic of Congo	• Number of plants responding totally to the questionnaire with accuracy (Indicator - Y/N all plants) • Plants have responded in a comprehensive fashion to the TA questionnaire (Indicator - 1 to 5 rating per plant) • GHG (CO_2) evaluation report has been issued to the stakeholders (Indicator – Y/N) (target week 8 – plant data dependant)	• All plants (CIMAF, Dangote, Diamond, Forspak, SONOCC,) have responded in a comprehensive manner permitting an initial GHG assessment latest wk. 6 (mid Jul 2021). • Order of magnitude GHG (CO_2) evaluation and baseline report permitting the project stakeholders to select two priority integrated cement plants and one grinding station for further evaluation under §2.3 (in case of insufficient data availability consultant will base analysis on technology at each plant based on publicly available information)	• Regular contacts / emails exchanged between the cement producers and the consultant. • Face-face discussion between local Consultant personnel and plants as needed	• Challenge – plants are unwilling (or unable) to provide data requested and/or validate their accuracy. • Assumption - Government will provided support and enhance the collection of data
Activity 2.3: Stakeholder meeting – Priority plant identification	• Stakeholders have selected two (2) integrated cement	• Priority plants selected • One meeting has been organized	• Stakeholder meeting week 8 (end Jul 2021) In total	• Challenge – timely delivery of plant data

	plants and one (1) grinding station for further evaluation (Indicator – Y/N) • Meeting has been organized	with stakeholders	stakeholder meeting consisting of CTCN, NGES, NDE and Consultants (Consultants delegation consisting of 2-4 personnel FTE of which minimum 25% female) • Stakeholder meeting report including number of participants disaggregated by gender and institution	and evaluation of the same under §2.2 (which time stamp 21 June 2021 is delayed)

Activity 2.4: Energy (thermal) audit of the two priority cement plants and a specialist grinding plant	• Energy audit report issued:
	  • Plant 1 Integrated production (Indicator – Y/N)
	  • Plant 2 Integrated production (Indicator – Y/N)
	  • Plant 3 cement grinder (Indicator – Y/N)
		• Energy (thermal and electrical) audit report for each of the prioritized plants under §2.3
		
		(target delivery week 16 depending on timely completion of §2.2-§2.3)
			• Questionnaire & data request (base information readily available from plant DCS historical database and laboratory documentation)
			• On-site inspection and evaluation campaign (priority 2 integrated plants and 1 grinding plant defined (planned 2-4 personnel from consultant and up to 5 personnel from each plant) under §2.3)
				• Challenge – plant access / availability of suitable on-site plant personnel & measuring equipment)
				• Challenge - Plant operational status at time of site audit/inspection i.e. not running

Activity 2.5: Identification of technologies and best practices for GHG reduction	• Technology fact sheet delivered (Indicator - Y/N x 5) • Overview Technology and Best practice report delivered (Indicator – Y/N)	• Technology & best practice overview report with staged implementation approach as applicable to the Republic of Congo and the corresponding national strategies and plans	• none	• Assumption – provision of Government strategy /roadmap overview for i) Industry growth and II) GHG reduction

		• Technology facts sheets for the Republic of Congo appropriate technologies (2 page max.) (Target delivery week 16)		in the cement industry of the Republic of Congo I readily available
Output 3: Development of an Energy (specific thermal energy consumption (STEC) & specific electrical energy consumption (SEEC)) audit and reporting plan including templates				
Activity 3.1: Development of an audit manual with worksheets	• Overview summary of the STEC and SEEC of the existing facilities • Development of energy reporting/auditing worksheets & manual	• Energy (STEC & SEEC) audit manual complete with input worksheets and reporting templates (target delivery week 19)	• Subject of Stakeholder engagement and discussions over the project duration	• Assumption – Heavy industrial facilities in the Republic of Congo actively record as standard SOP, energy metrics (electrical and thermal) and processing capacities, permitting and auditing process • Assumption - Government utility data e.g., public electrical grid and/or thermal fuel dedicated to cement production (port) is available for validation
Activity 3.2: Development of a plan and reporting templates on specific energy consumption	• Energy reporting plan and worksheets completed (integrated under §3.1)	• STEC & SEEC reporting plan and standard operating procedure (SOP) input worksheets	• Subject of Stakeholder engagement and discussions over the project duration	• Challenge – implementation as an operational SOP cement business units

		(target deliver week 19)		in the Republic of Congo and consistent monitoring/reporting
Output 4: Development and implementation of a GHG emissions calculation methodology				
Activity 4.1: Development of a methodology for calculating GHG emissions from cement plants	• Tier 2 & Tier 3 mechanism GHG (CO_2) based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories - Mineral Industry emissions, developed based as SOP (worksheets) • Methodology and GHG (CO_2) emission factors (as may be the case in the Republic of Congo context) developed and clear	• GHG (CO_2) emission manual with work sheets based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories - Mineral Industry emissions (Tier 2 & Tier 3 mechanism) (target delivery week 22)	• None for development phase (deliverable)	• Challenge – implementation as an operational SOP cement business units in the Republic of Congo and consistent monitoring/reporting
Activity 4.2: Calculation of GHG emissions and emission factors from domestic cement production	• GHG (CO_2) emission of the domestic cement production in the Republic of Congo calculated (based on §4.1 deliverable and delivered plant data) • Brief summary report of GHG (CO_2) emissions for the cement production in the republic of Congo done. (Y/N)	• GHG (CO_2) emissions calculated and reported for the five cement production facilities in the Republic of Congo) (CIMAF, Dangote, Diamond, Forspak SONOCC) (target delivery week 22)	• Suitable data delivered by ALL plants under §2.2 and §2.3. above will be subject of all stakeholder discussions	• Challenge – unsuitable data delivered by the cement plants to permit an accurate GHG (CO_2) assessment • Assumption – IGES/NDE will ensure that ALL 5 plants deliver questionnaire data (under §2.2 through §2.4)

				complete and in a timely fashion
Output 5: Communication and closure				
Activity 5.1: Presentation of final results	• Stakeholder concluding meeting with for final Project Presentation executed • Consolidated work product delivered	• Consolidated package of work product and tools developed under the mandate issued to CTCN	• Work product under the §2 through §5 from part of stakeholder discussion over the mandate duration • Stakeholder meeting report including number of participants disaggregated by gender and institution	• Assumption – plant data under §2.2 through §2.4 is complete and comprehensive permitting the completion of the work product under the mandate.

Note: The Response Plan may contain information useful for the section below. The information in the table below will be used by the CTCN for public communication of the achieved and expected results of the Technical Assistance through the CTCN website www.ctc-n.org and other communication channels. See for example: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

Impact Statement	
Challenge	*Approximately 500 characters with space* *The Cement industry is one of the main GHG emitters with 5-8% of the total man-made CO_2 emissions globally. But conversely to other GHG emitters like aviation which are global, cement production is local and thus mitigation actions have to be done locally. The cement production in the Republic of Congo has increased over the last decade due to a shift to local production in order to support the urbanization policies linked to population growth.* *Potential CO_2 emissions in the cement industry can be mitigated through several measures. But most importantly before proposing mitigation measures to reduce GHG (CO_2) emissions, correct and accurate data from the industry is needed not only to understand the current situation and the exact mitigation potential, needs and progress, but also to have the most accurate data available for Congo's next NDC revision. The move from Tier 1 methodology to tier 2 and 3 methodology will enable this.*
CTCN assistance	*2 to 4 bullet points. Approximately 450 characters with space* • *Evaluation of GHG (CO_2) emission levels of the Republic of Congo Heavy Industrial Manufacturing Cement sector based on 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Tier 2 & Tier 3) mechanisms and to develop an industry technology development roadmap to mitigate such emissions* • *Provision of a potential basis for the development of The Republic of Congo 3rd National Communication report.* • *Deliverables forming part of CTCN TA* • *Energy and thermal audit of the Republic of Congo 's cement production plants* • *Development of specific energy audit manuals and monitoring plan* • *Development of GHG emissions calculation methodologies and evaluation of GHG emissions levels* *The above deliverables strengthen national capacity to permit the assessment & development of emission objectives for cement industry in the Republic of Congo.*
Anticipated impact	*2 to 4 bullet points. Approximately 250 characters with spaces. Include at least one of the core impact indicators from the Closure Report. The* *Key outcomes through the project will enable more precise calculation of the GHG (CO_2) emissions from the cement industry and thus a more accurate evaluation of the sector GHG (CO_2) emissions and possible mitigations through:* • GHG emissions reductions for the heavy industrial cement sector • People trained / impacted resulting in consistent monitoring and

	reporting across the industry • Transparency on GHG (CO_2) emissions achieved for the industry as a whole and the individual cement producers • Effective GHG (CO_2) emission management enabled • Audit manual clear and user friendly
Anticipated co-benefits from the TA	*Instruction: Please indicate expected co-benefits as described in the response plan and in the relevant deliverables* *Some co-benefits could be anticipated if technology recommendations are put in place:* • *Improved efficiency of cement plants through modernization which goes hand-in-hand with GHG reduction and economic benefits* • *Increase of Alternative Fuel replacing coal and thus a reduction of waste through the adoption of circular models for resource usage* • *Reduction of pollution leading to health benefits of local communities* • *Increase of potential "green jobs" in the country through increase of waste utilization and thus waste companies.* • *An increase of waste would reduce the quantity needed of coal to import and thus the dependency of import and foreign currency.* • *Capacity building around Tier 1, 2 and 3 as well as available technologies to reduce GHG emissions in the cement industry of the Republic of Congo*
Gender aspects of the TA	*Instruction: Please indicate if technical assistance will be supported by a gender analysis. Describe expected gender benefits as described in the response plan and in the relevant deliverables* *Cement industry is generally a male industry. Although it is expected to integrate female presence in meetings and/or participating in the project of at least 25%. Stakeholders will be asked to integrate gender quota in their delegation to work on the project. The ambition is here to show that heavy industry can be an attractive sector to work for when being a woman.*
Anticipated contribution to NDC	*2 to 4 bullet points. Approximately 350 characters with spaces.* *The NDC document which Congo submitted in xxx (tbd) to UNFCCC contains Congo's commitment to reduce GHG emissions and hence combat climate change. Congo intends to reduce overall emissions by xx% from the base year of 20xx by 20xx (tbd). (will be completed at the end)*
The narrative story	*The Cement industry is one of the main GHG emitters with 5-8% of the total man-made CO_2 emissions globally. The cement production in the Republic of Congo has increased over the last decade due to a shift to local production in order to support the urbanization policies linked to population growth.*

	Potential CO_2 emissions in the cement industry can be mitigated through several measures. But most importantly before proposing mitigation measures to reduce GHG (CO_2) emissions, correct and accurate data from the industry is needed not only to understand the current situation and the exact mitigation potential, needs and progress, but also to have the most accurate data available for Congo's next NDC revision. The move from Tier 1 methodology to "tier 2 and 3" methodology will enable this. *The CTCN assistance will enable the following:* • *Evaluation of Congo cement GHG (CO_2) emission levels according to Tier 2 & Tier 3 mechanisms and the industry roadmap to mitigate such emissions* • *Provision of a potential basis for the development of The Republic of Congo 3rd National Communication report.* • *Energy and thermal audit of the Republic of Congo 's cement production plants* • *Development of specific energy audit manuals and monitoring plan* • *Development of GHG emissions calculation methodologies and evaluation of GHG emissions levels* *Key outcomes through the project will enable more precise calculation of the GHG (CO_2) emissions from the cement industry and thus a more accurate evaluation of the sector GHG (CO_2) emissions and possible mitigations through:* • *GHG emissions reductions for the heavy industrial cement sector* • *People trained / impacted resulting in consistent monitoring and reporting across the industry* • *Transparency on GHG (CO_2) emissions achieved for the industry as a whole and the individual cement producers* • *Effective GHG (CO_2) emission management enabled* • *Audit manual clear and user friendly*
Contribution to SDGs	*To the extent possible, please describe contribution to approximately 3 SDGs, including SDG13, with a few sentences for each SDGs concerned.* *A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.* • *SDG 13: Take urgent action to combat climate change and its impacts* • *SDG 5: Achieve gender equality and empower all women and girls* • *SDG 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation* • *SDG 11: Make cities inclusive, safe, resilient and sustainable* • *SDG 12: Ensure sustainable consumption and production patterns*
Reference to knowledge products	*Please indicate if any UNFCCC Technology Executive Committee (TEC) knowledge products (publications, briefs, tools etc.) were used in the development of the TA request and/or are envisaged to be used during implementation of the technical assistance.* *Link to TEC knowledge database: https://unfccc.int/ttclear/tec/documents.html* *Which knowledge products do you envisage to use? Please list* • *Tec Brief 11 INDUSTRIAL ENERGY AND MATERIAL EFFICIENCY* • *TEC Brief 6 Enhancing Access to Climate Technology Financing*