Technical Assistance Closure Report Template

Objective of the technical assistance (TA) Closure Report:

- To communicate publicly in one document a summary of progress made, and lessons learned during the TA towards the anticipated impact (sections 1-4).
- To document qualitative and quantitative data collected during TA, for use in donor and UN reporting (Annex 1).

Steps for completing the TA closure report:

1. The lead TA implementer submits the closure report at the end of the technical assistance as a final deliverable. The TA closure report will capture outputs, outcomes and impacts of all activities conducted under the TA. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the closure report before final approval by the CTCN Deputy Director.

Important note on public and internal use of the closure report:
Once approved by the CTCN Deputy Director, the TA closure report will be a public document available on the CTCN website www.ctc-n.org. Selected content will be used for targeted communication activities. Annex 2 is for internal use only and will not be publicly available.

Closure Report for CTCN Technical Assistance

1. Basic information

Title of response plan	**Technical assistance for a study on forest biomass energy conversion**
Technical assistance reference number	**2019000036**
Countries	Central Africa: The Republic of the Congo, the Democratic Republic of the Congo, the Central African Republic, the Republic of Cameroon, the Gabonese Republic, the Republic of Equatorial Guinea, the Republic of Chad and the Republic of Burundi. West Africa: The Republic of Benin, the Republic of Senegal, the Republic of Côte d'Ivoire, the Republic of Mali, Burkina Faso and the Togolese Republic Eastern Africa: The Republic of Djibouti
NDE Organization and focal points With contact information	1. M. Aminou Raphiou, Point Focal CTCN Direction Nationale des Changements Climatiques, ministère de l'Environnement Charge de la Gestion des Changements Climatiques, du Reboisement et de la Protection des Ressources Naturelles et Forestières, **Cotonou (Benin)** 2. M. Augustin Ngenzirabona, Directeur Général, Institut Géographique du Burundi, P.O. Box 34, Gitega 331, **Bujumbura (Burundi) Focal** point: M. Astere Nindamutsa

	3. M. Ouedraogo Pamoussa, Représentant Directeur Général Conservation de la Nature 3BP 7044 **Ouagadougou 3, (Burkina Faso)** M. Forghab Patrick Mbomba Deputy Managing Director, National Observatory on Climate Change (ONACC)Boulevard du 20 Mai, **Yaoundé (Cameroun)** 5. M. Maxi**me Thierry Dongbad**a-Tambano, Coordonnateur du projet d'Evaluation des Besoins Technologiques - Focal point ministre de l'Environnement, de l'Ecologie et du Développement Durable, **Bangui, République de Centrafrique** 6. M. Mahamat Hassane Idriss Point Focal Direction des Ressources en Eau et de la Météorologie, Centre et Réseau des Technologies Climatiques pour le compte du Tchad, ministère de l'Environnement et des ressources halieutiques BP 2115, **Ndjaména, (Tchad)** 7. M. Joseph Badevokila Point Focal Ministère du Tourisme et de l'Environnement, Ministère de la Recherche Scientifique et de l'Innovation Tour Nabemba, 11e etage, Brazzaville, Congo; BP 2499 **Brazzaville, (Congo)** Point Focal : M. Andre Mfoukou Tsakala 8. M. Philippe Kouadio Kumasi Sustainable Environment and Energy Development Consulting Center **Abidjan (Côte d'Ivoire)** 9. M. Idriss Ismael Nour Directeur Adjoint de l'Environnement – Point Focal, Direction de l'Aménagement du Territoire et de l'Environnement, **Djibouti City (Djibouti)** 10. M. Santiago Francisco Engonga Osono, Directeur Général de l'Environnement - Focal point, Direction Générale de l'Environnement, Ministère de la Pêche et de l'Environnement **Malabo II, Malabo, Bioko-Norte, Equatorial Guinea** 11. M. Bernard Ndaye Nkanka, Professor and Chief, Section Electricité – Point Focal, Centre d'Études et de Recherches sur les Énergies Renouvelables kitsisa de L'institut Supérieur des Techniques Appliquées-ISTA Avenue Kabasele Joseph Proche de l'Aéroport National de NDOLO, Barumbu – **Kinshasa (RDC)** Point Focal, M. Bienvenu Mupenda Kitenge, Expert, Direction de Développement Durable 12. M. Brice BIYO'O BI MBENG

	Chef de Bureau Agence Gabonaise de Normalisation B.P: 19 134 **Libreville (Gabon) :** Point Focal, M. Nestor Mintsa, Director; Mme Ornela Chéryle Mathangoye 13. M. Birama Diarra, Directeur des Applications Météorologiques et climatologiques – Point Focal L'Agence Nationale de la Météorologie Route Aéroport Bamako Senou, Bp 237, **Bamako, (Mali)** 14. M. Issakha Youm Centre d'Etudes et de Recherches sur les Energies Renouvelables - Focal point Route du Service Géographique (HB-87) X Rue HB-478, Hann Bel-Air. B.P. 476, **Dakar, (Sénégal)** 15. Mme Mery Yaou Chef de cellule planification - Focal point Direction de l'Environnement / Ministère de l'Environnement et des Ressources Forestières, BP 4825, **Lomé, (Togo)**
NDE contact information	*Shown above*
Proponent focal point and organisation	*Shown above*
Designer of the response plan	*CTCN*
Implementer(s) of technical assistance	Climate and Energy (C&E) Advisory Limited and S2 Services
Beneficiaries	Instruction: Beneficiaries are defined as people and institutions benefitting from the TA **Burundi:** The production of wood pellets and improved cook stoves in Burundi will increase efficiency of wood biomass used for household energy, thus reducing the rate of firewood consumption per household and saving more trees. The main beneficiaries are: (i) the forestry administration; (ii) the communal administration and the Town Hall of Bujumbura; (iii) young people; (iv) women and girls and (v) the general population and households use charcoal or fuelwood as a source of energy in particular. Burundi is among the poorest countries in the world and most of the direct beneficiaries mentioned above are poor and are not able to afford affordable clean energy needs. **Cameroon:** Co-generation of electricity from wood waste will demonstrate benefits of waste-to-energy processes. Wood residues, such as sawmill dust can be converted to meet energy needs such as electricity through intensive gasification processes. Electricity from co-generation is more stable and reliable than use of raw firewood. Small businesses and households are expected to be the main beneficiaries. Specifically, the cogeneration technology will serve the communes of Feather Canton, Fang township and Zamane Township within the Djoum region. **Republic of Congo:** The project involves the manufacture of eco-charcoal from eucalyptus trees using Green Mad Retort Kiln (GMDR) technology.

	Apart from households, local artisans will be hired in the construction of GMDR kilns. **Democratic Republic of Congo:** The proposed project will consist of sale of micro-gasifier stoves and wood pellets. Local artisans who previous manufactured traditional stoves will be trained and occasionally hired in the manufacture and fixing of damages gasifier stoves. For the manufacture of wood pellets, sawmill operators will earn additional revenue from the supply of sawmill dust to the pelletizing factory. Sawmill dust residue is one of the raw materials for manufacture of pellets. Unemployed people in the villages will also benefit from the collection and supply of forest residue, examples, twigs, broken branches that will be crushed to produce pellets. Households that use microgasifier stoves and pellets will experience less indoor air pollution. **Burkina Faso:** The biggest beneficiaries from the proposed project of shea briquette manufacturing will be the shea producers' cooperatives. Apart from savings in labour costs and time spent sourcing for firewood, they shea cooperatives will also benefit from: 1) Increased energy efficiency of the briquettes compared to traditional firewood or charcoal 2) Increased profit margins from the waste-to-energy model. Since shea waste is used as fuel, this eliminates the need of cooperatives to source or purchase firewood. The cooperatives benefit from reduce running costs of time and labour. **Mali:** The shea briquettes to be manufactured in Bamako will benefit the households and small-scale businesses. The Malishi plant, located on the outskirts of Bamako will also benefit from the shea briquetting project. The manufacture and sale of briquettes is expected to increase its revenue streams. **Côte d'Ivoire**: The raw material used in manufacture of cocoa briquettes is the discarded pods in cocoa farms. Cacao farmers stand to be the biggest beneficiaries as they will be the major suppliers of the pods which are normally discarded during cocoa harvesting.
Sector(s) addressed	*Forestry, Energy Efficiency, Renewable Energy*
Technologies supported	*Wood biomass technologies (Improved cook stoves, renewable energy resource mapping, biomass briquettes or pellets, energy supply from waste; charcoal production from waste for cooking and heating)*
Implementation start date	*18/03/ 2020*
Implementation end date	*31/08/2021*
Total budget for implementation	*USD 245,900 + 68,500 in-kind from C&E Advisory & S2*
Description of delivered outputs and products as well as the activities undertaken to achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	***Output 1: Development of implementation planning and communication documents*** *Activity 1.1: A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan.* *Activity 1.2: A report on monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound*

	indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. *Activity 1.3: A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided).* *Activity 1.4: A Closure and Data Collection report completed at the end of the technical assistance.* ***Output 2: Identification of the source of forest residues in the forest supply chain*** *Activity 2.1: Mapped the forest supply chain in the selected countries.* *I. Mapped actors involved in the supply chain.* *II. Mapped flows of wood and their wastes.* *Georeferenced the links where wood waste is generated in the supply chain.* *Activity 2.2: Quantification o the waste generated in each site of the supply chain* *I. Defined calculation formulas for the quantification of wood waste in each link of the wood supply chain.* *II. Prioritized chain links where there is greater potential to generate bio-energy products by quantity, costs and current uses.* *Activity 2.3: Assessed the feasibility of a pilot project.* ***Output 3: Report on the Determined e requirements for and availability of technologies for converting the identified biomass resources*** *Activity 3.1: Identified the energy demands by sector for the selected countries and propose in which sectors the forest biomass potential can contribute, considering the current problem of traditional biomass consumption.* *Activity 3.2: Determine the most appropriate conversion technologies, including pre-treatments and treatments of biomass to produce the final energy use for each proposed sector based on output 3.1* *Activity 3.3: In each proposed sector, defined the project that best suits the country case study, the budget, the site design, the logistics and biomass suppliers.* ***Output 4: Report on the Assessment of the sustainability of the suggested bio-energy solutions*** *Activity 4.1: Carried out an environmental impact assessment (GHG emissions, consumption of natural resources, extraction forest residues).* *Activity 4.2: Defined the economic (business model, supply chain, funding sources, markets) factors and analyzing them.* *Activity 4.3: Definedthe social (policies, traditional biomass consumption social drivers, jobs) factors and analyzing them.* ***Output 5: Report on the Selection and the implementation of pilot projects (one per country)*** *Activity 5.1: The information generated in the output 2 will be used to prepare a pilot project in each country tailored to the local conditions based on replicability, engagement with local private sector and bankability noting that the possibility of merging*

	projects in some of the countries with similar conditions should be taken in due account *Activity 5.2: The pilot project is elaborated, and its expected impact evaluated.* ***Output 6: End of Project Dissemination Workshop (Validation Workshop Report)*** *Activity 6.1: Hold a one-day workshop*
Methodologies applied to produce outputs and products	*Literature review; structured interviews with key stakeholders, site surveys and site visits*
Reference to knowledge resources	*Instruction: Please indicate if any UNFCCC Technology Executive Committee (TEC) knowledge products (publications, briefs, tools etc.) were used in the implementation of the TA request, and which.* *Link to TEC knowledge database:* *https://unfccc.int/ttclear/tec/documents.html* *Innovative approaches to accelerating and scaling up implementation of mature climate technologies*
Deviations	*Instruction: Please describe any deviations from the response plan against the actual implemented activities, outputs and products:* In country travel was limited by COVID-19 and most of the information was collected by country contact persons. Almost all meetings with stakeholders and the TA were done virtually
Anticipated follow-up activities and next steps	*NDEs and focal points have expressed interest in the adoption of GCF concept reports and submission of the concepts to GCF after reviewing to ensure conformity with country prirority.*

2. Lessons learned

	Lessons learned	**Recommendations**
Lessons learned from the CTCN TA process	*Lesson1: The need to work closely with not only the NDEs but also other country experts in the field.* *Lesson 2: The need to have in-country focal points who understand the subject matter and get data.* *Lesson 3: It is possible to manage an assignment virtually but it takes longer than anticipated. technologies were therefore not developed since there was no county buy-in*	*Recommendations include:* 1. *Prior engagement and commitment by the NDEs and focal points that they will assist in availing any information and data within their reach is very crucial.* 2. *It is important for CTCN to introduce the NDEs and focal points to the implementors and also make it clear their role and responsibility and whether there will be any payment or not, as they perform the roles.* 3. *Managing assignment virtually requires that the location of execution has internet.*

Lessons learned related to climate technology transfer	The climate technology recommended for the seven countries was biased towards availability and interest of private sector/NGO ownership to drive the project, the availability and accessibility of feed-stock and the market for the improved/clean fuel in the specific area.	*Recommendations include:* 1. *Need for suitable and supporting policy environment* 2. *Financial support to pilot the technology* 3. *Critical mass of skilled labour in the location through training and capacity building* 4. *Ensuring gender neutral or positive technology*

3. Illustration of the TA and photos

Find the Illustrations of the TA and photos here - Powerpoints and illustrations;

More pictures and charts are shown below in this document as annexes

4. Impact Statement

The information in the table below will be used to communicate results and anticipated impacts of this technical assistance publicly. Please copy information from impact statement developed in the M&E Plan and update as relevant.

Challenge	Some 93 percent of rural households and 58 percent of urban households depend on wood biomass in Africa. Increasing use of traditional biomass charcoals and firewood is a direct cause of deforestation and forest degradation in many countries. Currently, the wood biomass conversion is highly inefficient and has very low recovery rates, yet there are various technologies that could be used to convert biomass to provide more convenient forms of bio-energy.
CTCN Assistance	• Assess the bio-energy potential from sustainable biomass sources across 15 African countries, such as wood waste from forest harvesting operations and industry; • Improve afforestation and forest sector residues energy conversion; • Identify market opportunities for the private sector that will bypass the exploitation of traditional biomass sources. The selected countries are : Central Africa: The Republic of the Congo, the Democratic Republic of the Congo, the Central African Republic, the Republic of Cameroon, the Gabonese Republic, the Republic of Equatorial Guinea, the Republic of Chad and the Republic of Burundi. West Africa: The Republic of Benin, the Republic of Senegal, the Republic of Côte d'Ivoire, the Republic of

	Mali, Burkina Faso and the Togolese Republic Eastern Africa: The Republic of Djibouti
Anticipated impact	• Sustainable industrial chain for forest biomass energy conversion using planted forest as raw material and forestry biomass and sawmill waste. • Reduction of pressure on native forests. • Increase the final bio-energy use options such as cogeneration plants that use pyrolysis gases and waste. • Significant reduction of greenhouse gas emissions thanks to more efficient charcoal production, waste conversion, increased forest cover, and decreased deforestation rates.
Co-benefits: Achieved or anticipated co-benefits from the TA	The key co-benefits from this TA include: Reduced greenhouse gas emissions, creation of employment through sustainable bio-energy projects; sustainable and efficient use of wood biomass, reduced discarded forest residues in wood processing value chains, contribution to the development of the COMIFAC Convergence Plan and national REDD+ processes, and facilitation and support to nationally determined contributions (NDCs). An additional anticipated co-benefit, include gender mainstreaming recommendation in the forestry sector in selected countries.
Gender aspects of the TA	The forest sector has been slow in providing equal opportunities for African women who are critical actors in forestry and natural resources utilization and management. For sustainable management of forests in Africa to succeed, it should involve all stakeholders (policy makers, farmers, women, youth, local communities and agents). This gender dimension is very important and part of the TA therefore was to mainstream gender in all aspects of the study through desk and internet research, data collection (surveys), analysis and extensive literature reviews; review of gender policies and legal framework, review of gender structures, local initiatives and responsibilities in rural forest communities and households, identification of issues related to establishment of networks for women in forestry, face-to-face interviews with key gender stakeholders, and focus discussion group.
Anticipated contribution to NDC	• Reduced GHG emissions from deforestation and forest degradation • Improved forest site conditions for regeneration and planting thereby increasing carbon sequestration. • Production of electricity from sustainable sources such as forest

	biomass energy conversion and/or cogeneration. • Creation of a system of forest eco-industrialization in the sector
The narrative story	Demand for energy wood (wood charcoal and firewood) in the countries in the COMIFAC area is and has been a direct cause of deforestation and forest degradation in the Congo basin. This growing demand is due to the combined effect of the following three underlying causes: (i) population growth, (ii) the absence of alternative energy sources appropriate for low-income populations, and (iii) inefficient production and use of wood charcoal. To address the wood biomass inefficiency challenge the Government of the Republic of the Congo, the Democratic Republic of the Congo, the Central African Republic, the Republic of Cameroon, the Gabonese Republic, the Republic of Equatorial Guinea, the Republic of Chad, the Republic of Burundi, the Republic of Senegal, the Republic of Côte d'Ivoire, the Republic of Mali, Burkina Faso, the Togolese Republic, the Republic of Benin and the Republic of Djibouti approached the CTCN for a technical assistance aimed at identifying various options for economical industrial conversion of forest waste through projects with a significant positive climatic and social impact. The CTCN technical assistance promoted projects that establish a sustainable industrial chain for forest biomass energy conversion using planted forest as raw material and forestry biomass and sawmill waste.
Contribution to SDGs A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	*SDG 7: Ensure access to affordable, reliable, sustainable, and modern energy for all* • *Industrial scale wood fuel will lower costs of production and improve its access; and* • *Industrial scale wood fuel and organization of artisanal producers will provide viable and sustainable wages for rural populations.* *SDG 13: Take urgent action to combat climate change and its impact* • *The information generated could be the base of new policies that promote the modern bio-energy sources from wood as a substitute to traditional biomass.* • *Planted forests as source of raw material will strengthen the adaptation option and land restoration; and* • *Industrial scale wood fuel will reduce the GHG emissions from current inefficient wood fuel production.*

	SDG 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 • *Industrial scale wood fuel will reduce the pressure on natural forests and thus help to forest recovery; and* • *Reduced deforestation and degradation will lower GHG emissions by each of the 15 countries supported.* *SDG 5: Gender equality - 5.1: End of all forms of discrimination against all women and girls in selected countries.*

Annex 1 Technical assistance data collection

Please add quantitative and qualitative values for the indicators selected in the M&E plan and monitored throughout the technical assistance in the tables below. Indicators which have been monitored in addition to the proposed indicators below may be added at the end of table A. Non-relevant indicators should be left blank.

A. Output and outcome indicators

Indicator Please note indicators below highlighted as **anticipated**	**Quantitative value** *Numerals only; disaggregates must sum to the total*	**Qualitative description** *List the various elements corresponding to the quantitative value as well as timelines and responsible institutions*
Total number of events organized by proponents and implementing partners	*List total number here*	*One validation workshop*
Number of participants in events organized by proponents and implementing partners		*Day 1: 29* *Day 2: 19*
a) Number of men	*List total number here*	*Total: 36* *Disaggregate by country* *Benin: 1* *Burkina Faso: 2* *Burundi: 2* *Cameroon :3* *Congo; 4* *Cote d'ivoire;1* *Equatorial Guinea ;1* *Gabon: 2* *Kenya; 1* *Mali: 1* *RCA: 1* *RDC: 2*
b) Number of women		*Total: 12* *1 Burkina Faso* *1 Cote d'Ivoire* *2 Cameroon* *1 Kenya* *1 Togo*
Number of climate technology RD&D related events		*N/A*
Number of participants in climate technology RD&D events	*List total number here*	*N/A*
a) Number of men		*N/A*
b) Number of women		*N/A*

Number of training organized by proponents and implementing partners	*List total number here*	*List the title of the training sessions and capacity strengthening activities*
Number of participants in trainings organized by proponents and implementing partners	*List total number here*	N/A
a) Number of men		N/A
b) Number of women		N/A
Total number of institutions trained	*List total number here*	*N/A*
a) Governmental (national or subnational)		*List the name of organisations trained here*
b) Private sector (bank, corporation, etc.)		*List the name of organisations trained here*
c) Nongovernmental (NGO, University, etc.)		*List the name of organisations trained here*
Percentage of participants reporting satisfaction with CTCN training (from CTCN training feedback form)		*Satisfied= 4+ on 5-pt scale*
Percentage of participants reporting increased knowledge, capacity and/or understanding as a result of CTCN training (from CTCN training feedback form)	**N/A**	*Increased knowledge, capacity and/or understanding= 4+ on 5-pt scale*
a) Percentage of men		
b) Percentage of women		
Total number of deliverables produced during the assistance (excluding mission, progress and internal reports)	*List total number here*	**22 reports**
a) Number of communication materials, including news releases, newsletters, articles, presentations, social media postings, etc.		*List the name of the documents*
b) Number of tools and technical documents strengthened, revised or developed		*D1.1 First Progress Report Work Plan in the form of CTCN response plan template* *D1.2 M&E Plan with specific, measurable, achievable, relevant, and time-bound indicators* *D1.3 CTCN Impact Description formulated in the beginning of the technical assistance and update/at the end of the TA* *D1.4 Closure and Data Collection Report completed at the end of the technical assistance (ENG)* *D2.1 A report with the collected information that explains how supply chains work and at what points the greatest amount of wood waste is generated* *D2.2: Report on geographical location of the hot spots of wood waste generation in the countries mapped supply chains.* *D2.3: A report about the projects feasibility analysis and*

		the prioritization methodology to select *D 3.1 - A report on the energy demand by sector for the selected countries* *D 3.2 - A report on the most appropriate conversion technologies, including pre-treatments and treatments of biomass to produce the final energy use for each sector identified.* *D 3.3 - A report on the identified pilot projects for each sector, including budget, site design, logistics and biomass suppliers.* *D4.1 - Report on the analysis of the environmental factor risks and benefits identified.* *D 4.2 - Report on the analysis of the economic factor risks and benefits identified* *D 4.3 - Report on the analysis of the social factor risks and benefits identified from a gender perspective* *D 5.1 - Report describing the pilot projects* *D 5.2 -- GCF Concept Notes for the 7 Pilot Projects in seven countries, shown below*
c) Number of other information materials strengthened, revised or created (For example training and workshop reports, Power Points, exercise docs etc.)		*Seven Power points on the following seven pilot concepts:* *1. ELECTRICITY GENERATION FROM WOOD WASTE IN DJOUM, SOUTHERN REGION OF CAMEROON* *2. PRODUCTION OF CHARCOAL FROM WOOD WASTE AND PLANTED FOREST IN CONGO* *3. THE PRODUCTION OF PELLETS FROM WOOD AND NON-WOOD WASTE IN THE DEMOCRATIC REPUBLIC OF CONGO* *4. TRANSFORMATION OF WOOD RESIDUES INTO PELLETS IN THE REPUBLIC OF BURUNDI* *5. PRODUCTION OF BRIQUETTE FROM SHEA WASTE IN BURKINA FASO*

		6. PRODUCTION OF BRIQUETTES FROM COCOA PODS IN IVORY COAST *7. PRODUCTION OF BRIQUETTES FROM KARITE CRAB IN MALI*
Total number of policies, strategies, plans, laws, agreements or regulations supported by the assistance	*List total number here*	*N/A*
a) Adaptation related		*List the type and name of documents supported*
b) Mitigation related		*List the type and name of documents supported*
c) Both adaptation- and mitigation related		*List the type and name of documents supported*
Anticipated number of policies, strategies, plans, laws, agreements or regulations proposed, adopted or implemented as a result of the TA	*7*	*The seven concept notes of the pilot projects will influence regulations and subnational policies in energy and forestry*
a) Adaptation related	**7**	*To implement the seven pilot concepts shown below* *1. ELECTRICITY GENERATION FROM WOOD WASTE IN DJOUM, SOUTHERN REGION OF CAMEROON* *2. PRODUCTION OF CHARCOAL FROM WOOD WASTE AND PLANTED FOREST IN CONGO* *3. THE PRODUCTION OF PELLETS FROM WOOD AND NON-WOOD WASTE IN THE DEMOCRATIC REPUBLIC OF CONGO* *4. TRANSFORMATION OF WOOD RESIDUES INTO PELLETS IN THE REPUBLIC OF BURUNDI* *5. PRODUCTION OF BRIQUETTE FROM SHEA WASTE IN BURKINA FASO* *6. PRODUCTION OF BRIQUETTES FROM COCOA PODS IN IVORY COAST* *7. PRODUCTION OF BRIQUETTES FROM SHEA BUTTER IN MALI* *countries will have to work with communities and private sector. This will in turn provide jobs locally, supply contracts for*

		biomass waste and involve local authorities who will provide guidelines for environmental integrity etc., these will go a long way towards community resilience
b) Mitigation related	**7**	*All the above documents shown above have huge mitigation potential when the pilots are implemented.*
c) Both adaptation- and mitigation related		*Shown above.*
Anticipated number of technologies transferred or deployed as a result of CTCN support	*5 technologies*	*Wood biomass technologies list as below:* *1.(Improved cook stoves,* *2. renewable energy resource mapping,* *3. biomass briquettes or pellets,* *4. energy supply from waste; 5. charcoal production from waste for cooking and heating)*
Anticipated number of collaborations facilitated or enabled as a result of technical assistance	*7*	
a) Number of South-South collaborations	**7**	1. Institut Géographique du Burundi, P.O. Box 34, Gitega 331, **Bujumbura (Burundi)** 2. Conservation de la Nature 3BP 7044 **Ouagadougou 3, Burkina Faso** **3.** National Observatory on Climate Change (ONACC)Boulevard du 20 Mai, **Yaoundé (Cameroun)** 4. Ministère du Tourisme et de l'Environnement, Ministère de la Recherche Scientifique et de l'Innovation Tour Nabemba, 11e etage, Brazzaville, Congo ; BP 2499 **Brazzaville, Congo** 5. Kumasi Sustainable Environment and Energy Development Consulting Center **Abidjan Côte d'Ivoire** 6. Section Electricité – Point Focal, Centre d'Études et de Recherches sur les Énergies Renouvelables kitsisa de L'institut Supérieur des Techniques Appliquées-ISTA Avenue Kabasele Joseph Proche de l'Aéroport National

		de NDOLO, Barumbu – **Kinshasa (RDC)** 7. Applications Météorologiques et climatologiques – L'Agence Nationale de la Météorologie Route Aéroport Bamako Senou, Bp 237, **Bamako, Mali**
b) Number of RD&D collaborations	**N/A**	*List the names of the organisations (excluding the CTCN or TA implementers)*
c) Number of private sector collaborations	**8**	1. *Centre Ecologique – Institute for Science and Applied Technologies – Burkina Faso* 2. *NITIDAE in Bobo Albert Schweitzer Ecological Centre (CEAS), Ouaga Burkina Faso* 3. *Institute for Environment and Agricultural Research* 4. *SAVONOR - 12 Chauss'ed Uvira Bujumbura Burundi* 5. *Burundi Quality Stoves* 6. *Malishi Plant, located a few kilometres from Bamako, aims to be the sole shea briquette producer* 7. The Rougier company, Cameroon 8. African Centre for Renewable Energy and Sustainable Technologies
Number of countries with strengthened National System of Innovation as a result of CTCN support		*List names of countries*
Insert any additional indicators here		

B. Core impact indicators

Please fill in the tables for anticipated impacts of the CTCN assistance. Every technical assistance should contribute to at least one of the indicators below. For guidance on how to report on core indicators see the 'M&E Guidance Document for TA Implementers'.

Core indicator 1	**Anticipated metric tons of CO_2 equivalent (CO_2e) emissions reduced or avoided as a result of CTCN TA** *Please add your calculations in word or excel format as an Annex to this Closure Report, where applicable.*

	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **on annual basis**	Anticipated metric tons of CO_2e reduced or avoided as a result of the TA **in total**
Quantitative value *(emissions reductions)*	*Total number (numerals only, no rounding or abbreviations)*	*Total number (numerals only, no rounding or abbreviations)*
Unit	tCO_2e	tCO_2e
GHG assessment boundary (project emissions) Identify expected post-TA activities, associated effects and assess boundary for quantification of GHG emission reductions	These are estimated GHG emissions, actual GHG emission will be calculated after feasibility study of the seven pilot projects that were developed as GCF concepts. The advanced kiln used in the pilots including Cameroon Congo, Republic of Congo, Burundi, Burkina Faso, Mali and Cote d'Ivoire will enable the combustion of carbonization gas. Field testing carried out in Madagascar and Namibia indicates that only 0.2% of the carbon emitted is CH_4. In this case, the use of an advanced kiln saves 1.75 tonnes of CO_2 equivalent per produced tonne of charcoal. Advanced Kiln such as the Green Mad Retort Kiln (GMDR) and CML process with Industrial Retort Kiln for example emit practically no GHGs. Thus, conversion to advanced kilns has the potential to avoid a significant number of GHGs. More generally, improvements in the conversion of biomass to charcoal in sub-Saharan Africa show a substantial potential for reductions in GHG emissions. The mitigation potential could be around 100 Mt CO_2-equivalent per year in this region alone. It consists not only in limiting emissions in the combustion process, but also in avoided consumption of non-sustainable biomass. In Africa, over 20 Mt of charcoal are consumed per year, and the growing demand for charcoal fuel is an important cause of deforestation and continued GHG emissions.	Based on the explanation, the mean estimate is 35 Mt CO_2e equivalent from the 7 pilots per year if project is fully implemented. Assumes 5 Mt CO_2e per country.

Baseline emissions Describe baseline scenario, baseline candidates, emission factors and emissions calculated	*Burundi:* Burundi's Nationally Determined Contribution (NDC) seeks to reduce greenhouse gas (GHG) emissions by 3% compared to the Business as Usual (BAU) scenario for 2030 (unconditional contribution). It also seeks to reduce GHG emissions by 20%, beginning in 2016, compared to the BAU scenario for 2030 (conditional contribution). The mitigation aim of the NDC is to reduce GHG emissions by 1,958 Gg CO_2e for the unconditional objective and 14,897 Gg CO_2e for the conditional objective by 2030. *Cameroon: Baseline scenario* - Cameroon GHG emissions were 39MtCO2 equivalent in 2010. According to a Business-as-Usual Scenario (BAU), emissions will increase to 104 MtCO2 equivalent by 2035 if mitigation actions are not implemented. *Baseline candidates* – The TA project is expected to use co-generation technology to generate electricity from wood waste. The company, Rougier, a wood processing and exporter company, will assist in provision of residues for cogeneration and in installing necessary infrastructure for the sale of electricity to the surrounding community. According to the TA, there is no other similar technology in use in the area. Emissions factor – Emission calculation – *Republic of Congo: Baseline scenario* - Excluding land use change, the Republic of Congo's emissions were 1.1 tons of CO2 equivalent as of 2015. The Republic of Congo's NDC aims to reduce GHG emissions by 48% and 55% by 2025 and 2035 respectively. This translates to a reduction of 8 MtCO2 equivalent and 19 MtC02 equivalent by 2025 and 2035 respectively. The proposed project of charcoal production using Green Mad Retort Kilns will prevent emissions of 100MtC02 equivalent per year. *Baseline candidates* - There has not been any implementation of GMDR technology in the country before. More than 80% of the Republic of Congo's population relies on traditional firewood and charcoal.	

	Emission factors – Emission calculation – *Democratic Republic of Congo: Baseline Scenario* – As of 2010, the DRC's emissions were 444 MtCO2 equivalent. As of 2018, this had increased to 681 Mt CO2 equivalent. The NDC of Congo aims to reduce 17% of its emissions, translating to 70 Mt C02 equivalent by 2030 compared to BAU scenario and using emissions of 2010 as the baseline year. The project in DRC will utilize gasification stoves and wood pellets to increase energy efficiency in households which will translate to 1) reduced deforestation, and 2) migration of households to clean cooking fuels. The project is expected to save 2.6 TCO2 equivalent annually. *Baseline candidates* – The micro gasifier stoves and wood pellets to be introduced into the country have been tested and used in villages in Rwanda. The technology, however, has not been in used before in DRC. Emission factors – Emissions calculated – *Burkina Faso: Baseline scenario* – As of 2018, Burkina Faso's emissions were 54.96 MtCO2 equivalent. According to BAU scenario, this will increase to 118.32 MtCO2 equivalent by 2030. Burkina Faso aims to reduce it GHG emissions by 36.95% according to BAU scenario. The manufacture of 2706 tonnes of shea butter using shea briquettes will offset a release of an estimated 60 ktCO2 equivalent of GHGs. *Baseline candidates* – The government and NGOs such as CIAT, 2iE and IRSAT have been conducting experiments on generating energy from shea waste. Shea waste is one of the major contributors of deforestation in the country since firewood is the main source of energy in shea cake processing. Replacing the firewood with the by-products of shea-processing to generate equal amount of heat energy required will reduce the	

	number of trees cut for manufacture of shea cake. Emission factors – Emissions calculated – Mali: *Baseline scenario* – As of 2018, the country was emitting 43.74 MtCO2 equivalent. Mali is currently a greenhouse sink and will continue to do so beyond 2030. Using a BAU scenario, GHG emissions will increase to 9269ktCO_2 equivalent by 2030. If mitigation actions are implemented, GHG emissions will be capped at 6336 ktCO2 equivalent, representing a 31% difference of GHG emissions. The use of shea briquettes will prevent the release of an estimated 4 to 5kt of CO2 equivalent. *Baseline candidates* – Most of the households in Mali rely on traditional firewood and charcoal for all their household energy needs. Emission factors – Emissions calculated – *Côte d' Ivoire: Baseline scenario* – As of 2018, Côte d' Ivoire released GHG emissions of 49.55 MtCO2 equivalent. Under a BAU scenario, this is expected to reduce to 34.25 MtCO2 equivalent and if mitigation actions are implemented, GHG emissions can be further reduced to 24.58 MtCO2 equivalent. *Baseline candidates* – There currently exists no other project in the country that similarly produces briquettes from cocoa pods. The use of traditional firewood and charcoal remain preeminent in 88% of the country's households. Emission factors – Emissions calculated -	
Methodology Explain the method or process of verifying the indicator and how data was gathered	Assumptions were made based on literature review as all the countries Covid-19 protocol did not allow field visits at the time	

Assumptions Describe assumptions made during calculation and quantification of GHG reductions	The environmental impact of carbonization gas is threefold: carbon monoxide (CO) is toxic and therefore has a direct effect on human health. Acid emissions (acetic, formic, propionic, etc.) and polycyclic aromatic hydrocarbons have effects at the environmental local scale (acid deposition, for example). Gases such as CO_2 and CH_4 are greenhouse gases, and CH_4 has a radiative forcing equivalent 25 times that of CO_2. The advanced kiln used in the pilots including Cameroon, Republic of Congo, Burundi and DRC Congo Burkina Faso, Mali and Cote d'Ivoire will enable the combustion of carbonization gas. Field testing carried out in Madagascar and Namibia indicates that only 0.2% of the carbon emitted is CH_4. In this case, the use of an advanced kiln saves 1.75 tonnes of CO_2 equivalent per produced tonne of charcoal. Advanced Kiln such as the Green Mad Retort Kiln (GMDR) and CML process with Industrial Retort Kiln for example emit practically no GHGs. Thus, conversion to advanced kilns has the potential to avoid a significant number of GHGs. More generally, improvements in the conversion of biomass to charcoal in sub-Saharan Africa show a substantial potential for reductions in GHG emissions. The mitigation potential could be around 100 Mt CO_2-equivalent per year in this region alone. It consists not only in limiting emissions in the combustion process, but also in avoided consumption of non-sustainable biomass. In Africa, over 20 Mt of charcoal are consumed per year, and the growing demand for charcoal fuel is an important cause of deforestation and continued GHG emissions.	

Core indicator 2	**Anticipated increased economic, health, well-being, infrastructure and built environment, and ecosystems resilience to climate change impacts as a result of technical assistance** *Please provide a **qualitative** description of the anticipated impacts on the categories below*

Infrastructure and built environment Anticipated increased infrastructure resilience (avoided/mitigated climate induced damages and strengthened physical assets)	**Burundi** The total economic impact to Republic of Burundi of wood pellet manufacturing facility construction and annual operation will range considerably depending upon the size of the facility. The total output impact originating from construction costs and its associated ability to offer goods and services that would otherwise benefit local economy such as provision of clean cooking fuel, jobs, spurring related industries such as local stoves manufacturing, tree planting industry and construction of associated infrastructure such as roads, houses, health facilities and schools in the long run. Such information will be crucial in pilot feasibility studies as it is useful when negotiating for state government support (e.g., tax breaks and construction support) and support from local and external economic development interested in investing in the project. *Cameroon:* Since the proposed project will employ co-generation to produce electricity, the electrical power infrastructure consisting of generation, transmission, and distribution systems that are essential to all other infrastructures and every aspect of the subnational economy will be developed. The project will increase the number of households connected to the grid in a region. The cogeneration project will also incentivize businesses and small industries to operate for longer hours. Schools and health facilities will be electrified thus offering quality education and medical facilities *Republic of Congo:* The GMDR technology to be used in manufacture of charcoal can be adopted in learning institutions. This has the potential of shifting schools and other institutions from use of raw firewood and its associated indoor air pollution effects to eco-charcoal that has more energy efficiency and pollutes less. The proposed eucalyptus plantations to serve as future sources of raw material for the eco-charcoal product will increase the 'greenery' of the area and subsequently reduce environmental degradation associated with cutting trees. *Democratic Republic of Congo:* The wood palletisation factory will necessitate the improvement of electricity lines since the pellet-making machines require electricity to run. A co-benefit of improved or upgraded power lines is that the off-grid households along the path get a chance of being connected on-grid. Other associated impact is similar to the ones in Burundi *Burkina Faso:* Shea waste will be used to manufacture shea briquettes. To undertake this process, mechanized presses will be purchased or locally designed. Since cooperatives control the shea processing chain, venturing into shea briquetting will require this cooperatives capacity build themselves with training and new equipment compared to a 'hands-only' approach when using firewood. *Mali:* The manufacturing of the proposed shea briquettes will be done by the Malishi plant. Malishi plant is the leading producer of shea butter in Mali. The factory will take up the production of shea briquettes. This will require capacity building of the workforce and

	installing briquetting machinery. The improvements will increase the technical capacity of the company to handle both production processes of shea butter and shea briquettes. *Côte d'Ivoire:* Cocoa briquettes will be manufactured from cocoa pods. Carbonization is employed to increase the carbon matter of the cocoa pods to increase its combustion properties. The use of pyrolizer reactors for carbonizations will involve establishment of small facilities, providing skills to the workforce that will be employed and installation of electricity lines to supply power to the pyrolizer reactors. This will provide employment opportunities within the cacao nuclei growing areas, the briquetting factory may attract other industrial establishments and co-benefits of on-grid installations to formerly off-grid households.
Ecosystems and biodiversity Anticipated increased ecosystem resilience (areas with increased resistance to climate-induced disturbances and with improved recovery rates)	*Burundi* • Use of ICS will improve wood energy efficiency and lead to biomass savings per year. • Reduction in deforestation due to the less consumption of non-renewable woody biomass by the ICSs. • Project will enhance ecosystem integrity as a result of reduced deforestation, thereby enabling provision of sustainable ecosystem services (e.g., water purification, soil conservation and stabilisation, cultural values) and products. • Project will enhance biodiversity impacts associated with forest protection and conservation. *Cameroon:* On average, each household in Djoum municipality uses 4 tonnes of firewood for its energy needs. The project will utilize co-generation to produce electricity from wood waste. Assuming all households in the region will be connected and subsequently purchase the electricity, annual firewood consumption per household will drop to 50%. This translates to a reduction of two tonnes of firewood per household. The population of the region of Djoum is estimated to be 27, 256. Assuming the project implementation will be successful, the project will prevent 1000 tons of wood from being felled. *The Republic of Congo:* The Congo Carbo Industries (CCI) project will be implemented in the city of Kouilou. Kouilou is a city of an estimated 147, 099 people. An estimated 86.7% of the population, or 128, 859 residents use firewood while 13.3%, or 18, 240 of the population use charcoal. With such a high population using wood fuel for their household energy needs, approximately 2.1 tonnes of firewood are consumed every day in the city. The use of charcoal from GMDR technology by CCI will save 70% of the remaining vegetation in Kouilou from further degradation.

	Democratic Republic of the Congo: The proposed project involves the use of micro gasifier stoves and wood pellets. The use of wood residues to manufacture pellets will reduce demand pressures on DRC's forests arising from the need of cheap cooking fuel. Approximately 300kg of wood are used to produce 50kg of charcoal, which is the annual household energy demand. The use of wood residues for the same purposes will, however, reduce the rate of logging to supply household fuel, increase carbon stock and preserve endangered indigenous species. *Burkina Faso:* The proposed project will use shea waste to manufacture shea briquettes. It is estimated an annual production of 2706 tonnes of shea butter will preserve an estimated 898 hectares of forest in Burkina Faso and save 60 kilotons of CO2 equivalent GHG emissions. *Mali:* Shea waste will be used to manufacture shea briquettes through mechanized press compressors. An estimated 162, 226 tons of wood is consumed by 296, 575 households in Bamako. Bamako's population consists of an estimated 1, 809, 106 inhabitants. If the entire population were to adopt the shea briquettes in place of charcoal and traditional firewood, this would preserve 3509 tonnes of forest wood from being felled and thus reduce the rate of forest degradation in Mali. *Côte d' Ivoire:* The proposed project will utilize cocoa waste pods to manufacture briquettes. Cocoa pods are abandoned on cacao farms as waste. In the region of Gagnoa where the project will be located, 86% of the 213,918 inhabitants use firewood as the primary source of their household energy. The adoption of cocoa briquettes by majority of the population will prevent the felling of approximately 3.1 million tonnes of wood from Côte d' Ivoire's forests. The collection of the cocoa pods will prevent slow methane emissions from decomposing waste cocoa pods.
Economic Anticipated increased economic resilience (e.g., less reliance on vulnerable economic sectors or diversification of livelihood)	*Burundi:* More than 90% of the population of cities and almost 100% of secondary urban centers use charcoal or firewood as a source of energy mainly for cooking food. Burundi's Vision 2025 has as a principal objective to ensure that by 2025 both the rural and urban populations have access to reliable, clean sources of energy and at competitive prices, and bioenergy offers a good opportunity to realise this objective. *Cameroon:* Households use firewood while businesses rely on generators for power during blackouts. Electricity costs from a generator range from US $ 0.5 to US $ 1 per kWh. However, the proposed cogeneration plant will supply electricity at US $ 0.2 per kWh. The latter is cheaper by 20%. *Republic of Congo:* The manufacturer of charcoal from eucalyptus plants will increase the revenue streams of traditional charcoal

	sellers. The sale of eco-charcoal is expected to bring in higher profits compared to traditional charcoal because of 1) higher energy efficiency, and 2) more sophisticated manufacture process than traditional charcoal. *Democratic Republic of Congo:* The use of micro gasifiers and wood pellets will enable household's savings of US $ 9 and improves living standards by a margin of 7%. Since the wood pellets are manufactured from wood residues (sawmill dust, fallen branches etc). the collection of the wood residues has the potential to create employment. *Burkina Faso:* It takes 7.9 kilos of firewood to produce 1 kilo of butter. The high amounts of firewood used in shea processing accounts for 31 to 6% of total butter production costs. Since shea briquettes are formed from the shea waste generated during processing, it saves the cooperatives from the need to buy firewood thus increasing profits by US $ 0.19 per kilo of shea kernels processed to butter. *Mali:* A 50kg of charcoal costs US $ 9 while each household spends US $ 80 per year on charcoal consumption. The cost of a 50kg of briquettes, when subsidised, can be at retail price of US $ 5 thus saving annual energy household costs by up to US $ 40. Since Shea processing is one of the major consumers of firewood and an equal contributor to deforestation, the use of shea briquettes which are obtained from the product processed will increase profits, completely eradicate time losses incurred when fetching firewood and conserve the Sahel vegetation. *Côte d'Ivoire:* One kilogram of charcoal costs US $ 0.4. Each household spends an average of US $ 256 annually to buy charcoal. Briquettes are cheaper in terms of their manufacturing costs and market prices compared to traditional charcoal. Cocoa briquettes are cheaper than traditional charcoal by 50% and can save 42% of the annual budget spent on purchasing cooking fuels (charcoal). Since agriculture is the second driver of deforestation in the country, more so from expansion of land for cacao growing, the use of briquettes will reduce the pressure arising from this driving force. In addition, the sale of cocoa pod waste to cocoa briquette manufacturers will earn the cacao farmers an extra income stream.
Health and wellbeing Anticipated increased health and wellbeing of target group (e.g., improved basic health, water and food security)	*Burundi:* Wood pellet processing will create jobs while use of wood pellets in ICS has positive impacts on health and safety. Gasification of wood pellets will improve indoor air quality and users' health due to less smoke/ soot from the cooking stoves. *Cameroon:* Houses that will be connected to the lines supplying electricity from the proposed co-generation plant will not experience indoor air pollution that characterizes firewood and charcoal use. *Republic of Congo:* The use of the GMDR by CCI and marketing of the eco-charcoal to the public will reduce the labour that women and

	girls undergo to make their own charcoal, or the indoor air pollution that arises from the use of traditional cooking fuels. *Democratic Republic of Congo:* The use of micro-gasifiers will shorten the cooking time and amount of wood-fuel used thus saving on costs and spent labour. Micro gasifiers emit less GHGs and smoke and are thus a safer option than traditional cooking fuels. Since wood pellets will be manufactured from wood residues, collectors of branches, leaves and sawmill dust can earn income from the sale of these residues when delivered to the pelletizing factory. *Burkina Faso:* Manufacture of shea butter uses a lot of wood and thus generates a lot of smoke. In addition, the felling of trees for firewood increases the rate of desertification which in future may render the growing of shea trees impossible. The use of shea briquettes will not only reduce outdoor and indoor air pollution in shea processing and cooking respectively but will also preserve the remaining vegetation which is a key source of food and livelihood to the community. *Mali:* The proposed project site for manufacture of shea briquettes is Malishi Plant in Bamako. The shea briquettes will improve the profit margins of businesses that rely on wood fuel, such as laundry, dyeing, bakery and catering businesses. An increased profit margin improves the nutritional status of household food consumption. *Côte d'Ivoire:* Cocoa pods when left to decompose in the field release methane, a potent GHG gas. Use of cocoa briquettes in households will reduce indoor air pollution associated with firewood. Compared to charcoal, the manufacture of cocoa briquettes has fewer respiratory health risks than the former.

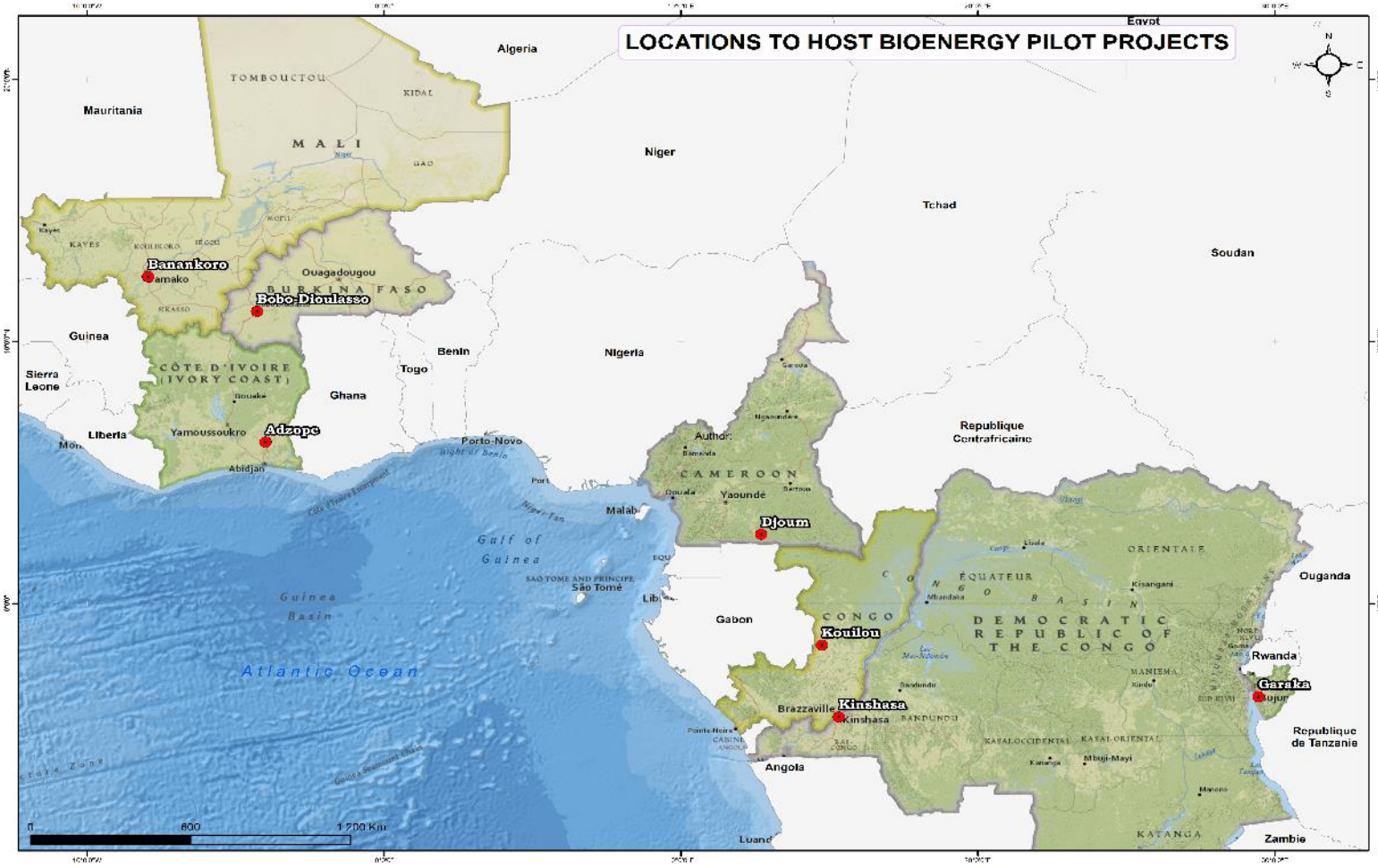
Core indicator 3	**Anticipated number of direct and indirect beneficiaries as a result of the TA**	
	Quantitative value	**Means of verification**
Total beneficiaries	*N/A*	There is not adequate data to fill in this information currently. This was beyond our TORs
Number of adaptation beneficiaries	N/A	As above
Number of mitigation beneficiaries	N/A	As above
Number of adaptation-and mitigation beneficiaries	N/A	As above

Core indicator 4	**Anticipated amount of funding/investment leveraged (USD) as a result of TA (disaggregated by public, private, national, and international sources, as well as between anticipated/confirmed funding)**			
	Quantitative value confirmed *in USD*	**Quantitative value anticipated** *in USD*	**Qualitative description** *List the institutions, timelines, and description or title of the investment*	**Methods** *Describe methods used for quantification of funds leveraged*
Total funding	*Total number in USD (numerals only, no rounding or abbreviations) Burundi – USD 9,500,000 million*	*Total number in USD (numerals only, no rounding or abbreviations) Burundi – USD 9,500,000 million* *Central Africa* *Cameroon* – USD 8,500,000 *Republic of Congo* - USD 5, 400, 000 *Democratic Republic of Congo* – USD 4, 000, 000 *West Africa* *Burkina Faso* – USD 5, 600, 000 *Côte d'Ivoire – USD 6, 250, 000* *Mali* – USD 8, 800, 000	**Burundi** Wood Pellet Production at Gakara – Gahuni Forest, Burundi Cameroon - Electricity generation from wood waste in Djoum Republic of Congo – Production of eco-charcoal from planted eucalyptus trees Democratic Republic of Congo – Production of pellets from wood and non-wood waste in the Democratic Republic of Congo Burkina Faso – Production of briquettes from shea waste Côte d'Ivoire – Production of briquettes from Cocoa pods Mali – Production of briquettes from shea waste	This is an estimate done during concept stage. Actual amount to be determined after feasibility study of the pilot during development of full GCF proposal
Anticipated amount of public funding mobilised from national/domestic sources				
Anticipated amount of public funding mobilised from international/ regional sources		*Burundi* *USD 7,850,000* *Central Africa*		

		Cameroon – USD 6,000,000 *Republic of Cameroon* – USD 5, 000, 000 *Democratic Republic of Congo* – USD 3, 700, 000 *West Africa* *Burkina Faso* – USD 4, 250, 000 *Côte d'Ivoire* – USD 4, 850, 000 *Mali* – USD 5, 750, 000		
Anticipated amount of private funding mobilised from national/domestic sources		*Burundi* USD 1,650,000 *Central Africa* *Cameroon* - USD 2,500,000 *Republic of Congo* – USD 400, 000 *Democratic Republic of Congo* – USD 300, 000 *West Africa* *Burkina Faso* – USD 1, 350, 000 *Côte d'Ivoire* – USD 1, 400, 000 *Mali* – USD 3, 050, 000		
Anticipated amount of private funds mobilised from international/regional sources				

3. Illustration of the TA and Photo

Map of the Project sites



Country	Project Location	Long	Lat	Identified project
Burkina Faso	Bobo Dioulasso	-4.305154°	11.164922°	Shea briquette manufacturing
Burundi	Gakara	29.450676°	-3.548332°	The production of wood pellets and improved cook stoves in Burundi
Cameroon	Djoum	12.673301°	2.666701°	Co-generation of electricity from wood waste
Congo	Kouilou. Kouilou	11.889172°	-4.142841°	Manufacture of eco-charcoal from eucalyptus trees using Green Mad Retort Kiln (GMDR) technology
DRC	Kinshasa	15.266293°	-4.441931°	Sale of micro-gasifier stoves and wood pellets
Ivory Coast	Gagnoa	-5.951540°	6.151442°	Production of briquettes from cocoa pods
Mali	Bamako	-8.002889°	12.639232°	shea briquette manufacturing

Figure 1: Shea briquetting technology in Burkina Faso

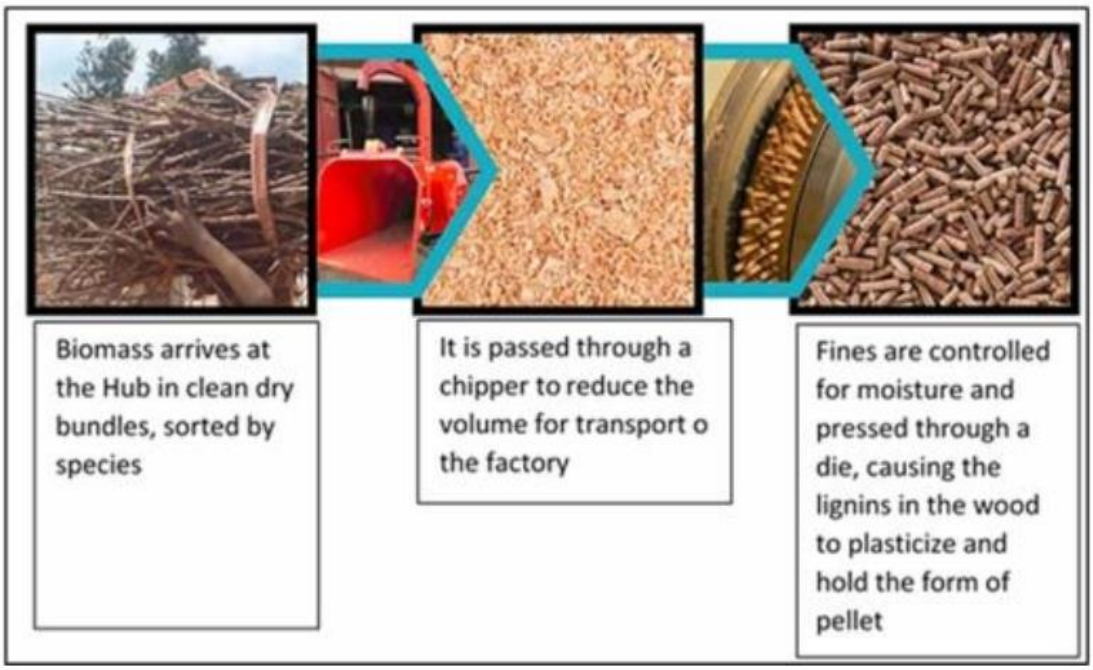


Figure 2: Wood pelleting process in Burundi

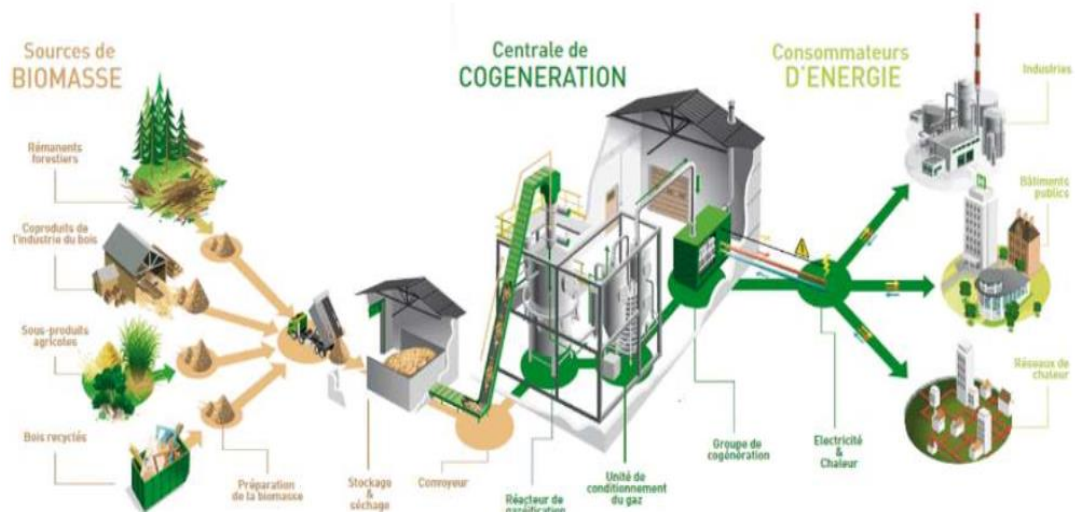


Figure 3: Proposed cogeneration technology in Cameroon

Figure 4: Use of improved eco-charcoal from eucalyptus trees in Republic of Congo

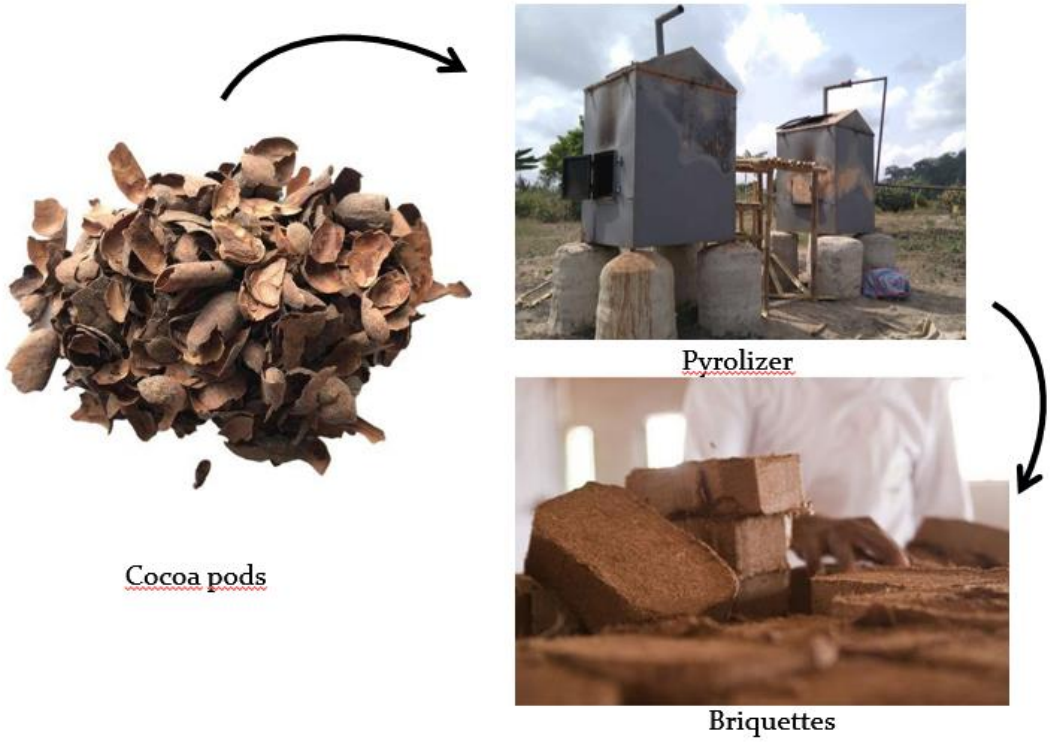


Figure 5: Manufacture of cocoa briquettes in Cote d'Ivoire

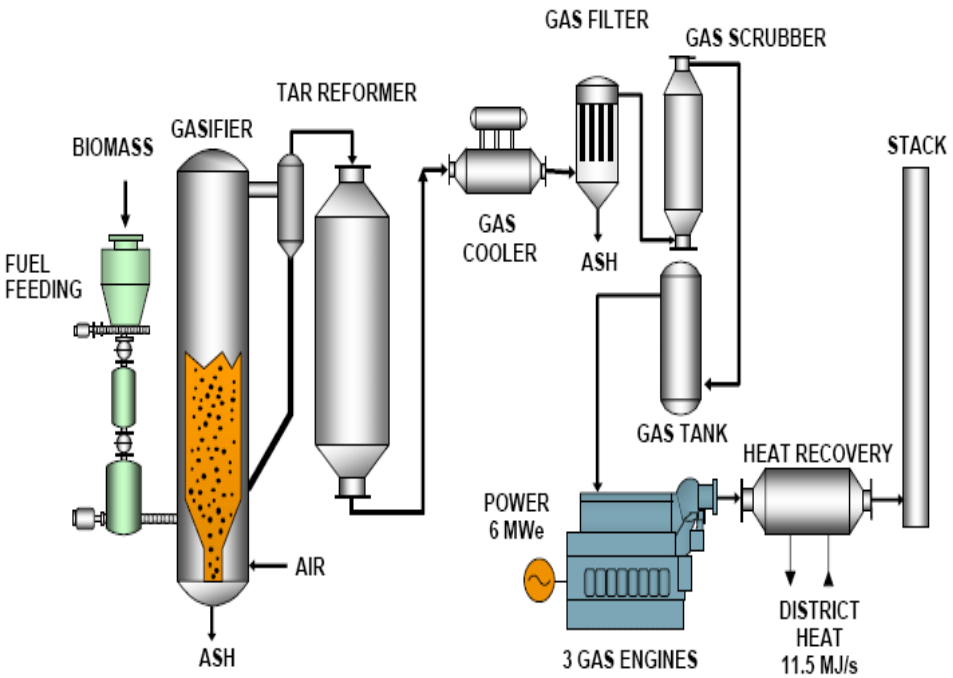


Figure 6: Use of gasification to manufacture wood pellets in the Democratic Republic of Congo

Figure 13: Press Machine to form briquettes

Figure 14: Shea briquettes

Figure 7: Manufacturing process of shea briquettes

Picture n°1. Eucalyptus plantation and tea plantation

Picture n°2. Eucalyptus in Muhuta commune

Timber for selling

Photos - Burkina Faso

Technical Assistance Photos

Figure 8: Shea waste as raw product

Figure 9: Compress machine

Figure 10: Compressed shea waste

Figure 11: Carbonized shea briquettes

Figures 15 shows the raw product, 16 to 18 show the machinery that will be purchased with CTCN assistance to manufacture the briquettes in Fig. 4.

Figure 12: Creation of work

Figure 13: Creation of temporary work opportunities

Figure 14: Creation of work opportunities for women

Fuelwood is the main source of energy used in the production of butter. This is not without consequences for the environment. The use of improved shea waste combined with appropriate stoves will save wood consumption by 59% and thus reduce greenhouse gas emissions due to the release of carbon into the atmosphere. The production unit of each group will have an improved stove. The use of these stoves will also reduce working time by 20% (according to the technical data provided by the promoter). Thus, women will be less exposed to the harmful effects of fire and smoke.

Côte d'Ivoire

Technical Assistance

Figure 15: Pyrolizer

Figure 16: Cocoa briquettes

Community Assistance

Figure 17: Provision of alternative work opportunities

Republic of Congo

Technical Assistance

Figure 18: Input of logs into the GMDR

Figure 19: The Green Mad Retort Kiln (GMDR)

Figure 20: The new chimney for eco-charcoal manufacture

Democratic Republic of Congo

Technical Assistance

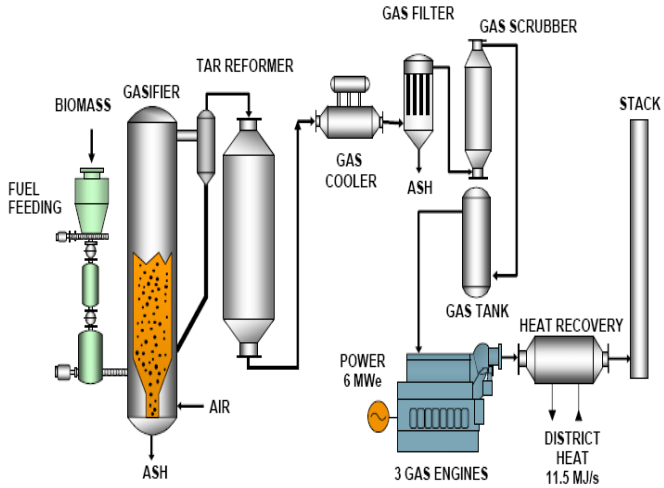


Figure 21: The pyrolizer machine to manufacture pellets

Figure 22: Microgasifier to accompany the use of pellets as fuel.

Mali

Technical Assistance

Figure 23: Binder press in use for briquetting (demonstration)

Figure 24: Machines with higher shear processing capacity

Annex 2 (for internal use – to be filled in by the CTCN)

CTCN evaluation

This section will be completed by the relevant CTCN Technology Manager.

- Evaluation of the timeliness of the TA implementation as measured against the timeline included in the response plan.
- Evaluation of TA quality as defined in the response plan.
- Overall performance of the Implementers.
- Overall engagement of the NDE and Proponent.
- Lessons learned on the CTCN process and steps taken by the CTCN to improve.