CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Technical Assistance Response Plan - Terms of Reference

Country	**Kenya**
Request ID#	**2020000018**
Title	*Development of an action plan to improve the circularity of large household appliances in Kenya*
THE COUNTRY	Mr. Kelvin Khisa Head, Environment Division Kenya Industrial Research and Development Institute Phone: +254 20 6003842 Email: kelvinnamukhasi@gmail.com ; kelvin.khisa@kirdi.go.ke Address: Kenya Industrial Research and Development Institute, P.O.BOX 30650-00100 Nairobi, Kenya
Proponent	Ministry of Environment and Forestry NHIF BUILDING,12th FLOOR, RAGATI ROAD, UPPERHILL, P.O BOX 30126-00100 Nairobi, Kenya

Summary of Climate Technology Centre and Network (CTCN) technical assistance

The circular economy is a regenerative, restorative, economic and industrial model for design processes that seeks to use materials that have already been processed and can be recovered and reused, thus protecting the natural resources from overexploitation. This aims to maintain resources for longer periods, driving more efficient processes and technologies and reducing the loss of materials. Within a circular economy, Value-Retention Processes (VRPs), including remanufacturing, refurbishment, repair and direct reuse, are central concepts to achieve greater circularity. Beyond recycling, these processes allow the retention of the inherent value of the product. VRPs enable disruptive business models, a higher independence from material purchases and imports and the creation of new jobs, all whilst reducing the environmental impact of industrial activities.

Achieving these benefits requires engaging value-chain stakeholders in behavioural and social system transformation, and designing industrial economic and production systems to enable, accept, and support system circularity. The Climate Technology Centre and Network (CTCN) will support Kenya, collaborating with its Nationally Designated Entity (NDE) counterpart, in the analysis and enhancement of its current e-waste management infrastructure, specifically focusing on large household appliances, by conducting an infrastructure gap analysis and identifying management and infrastructure requirements to meet future e-waste capacities and enhance circularity. The resulting action plan will serve as a management tool for a future implementation phase in order to create new businesses, innovation and technological transfer, generate quality employment and combat climate change in Kenya, while complying with its nationally determined contributions (NDC) and sustainable development goals (SDGs), enabling Kenya to become a leader in the field of circular economy.

Agreement:

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

National Designated Entity to the United Nations Framework Convention on Climate Change (UNFCCC) Technology Mechanism

Name:	Dr. Kelvin Khisa

Technical Assistance Response Plan - Terms of Reference

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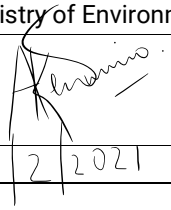
Signature:	
Date:	17/2/2021
Climate Technology Centre and Network (CTCN)	
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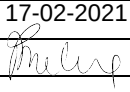
Signature:	

1. Background and context

Since the Industrial Revolution, in the nineteenth century, most countries have based their growth and development on a linear model of production and consumption which can be summed up as "take, make and discard" and an energy matrix that is based on the use of fossil fuels. Some 250 years later, our Earth has become home to 7 billion people, who use resources equivalent to 1.7 planets.[1] Not only is the linear economy inefficient, because out of the 92.8 billion tonnes of resources mined each year, only 9 per cent is reused, but it also contributes to environmental degradation and climate change, as the management of materials accounts for approximately 67 per cent of greenhouse gas (GHG) emissions.[2] Human activity is estimated to have caused the global temperature to increase by about 1°C above pre-industrial levels and, if no rapid and far-reaching action is taken, the temperature is expected to rise by 1.5°C between 2030 and 2053.[3]

The circular economy concept (Figure 1) seeks to replace the current linear economic model with a circular model, to enable the harnessing and efficient use of resources, promoting the use of non-conventional renewable energies (NCRE). Instead of extracting natural resources, the circular economy involves recovering and reusing materials that have already been processed, thus keeping them in circulation for as long as possible, reducing pressure by up to 28 per cent and GHG emissions by up to 72 per cent globally.[4] A circular system allows the decoupling of economic growth from the use of natural resources, promoting the creation of new companies, as well as changes in the production processes of existing companies, with an economic potential of up to US $4.5 trillion,[5] and generating up to 6 million new jobs by 2030 worldwide,[6] thus complying in particular with Sustainable Development Goals (SDGs) 9, 12 and 13, as well as the nationally determined contributions (NDC) agreed to by the requesting country, representing a great opportunity for sustainable development in Africa.

[1] Global Footprint Network, 2018, www.footprintnetwork.org
[2] Circularity Gap Report, Circle Economy, 2018
[3] Global Warming of 1.5°C, IPCC, 2018
[4] Resource Efficiency: Potential and Economic Implications, IRP, 2017
[5] Waste to Wealth: The Circular Economy Advantage, Peter Lacy, Jakob Rutqvist, 2015
[6] World Employment Social Outlook 2018: Greening with Jobs, ILO, 2018

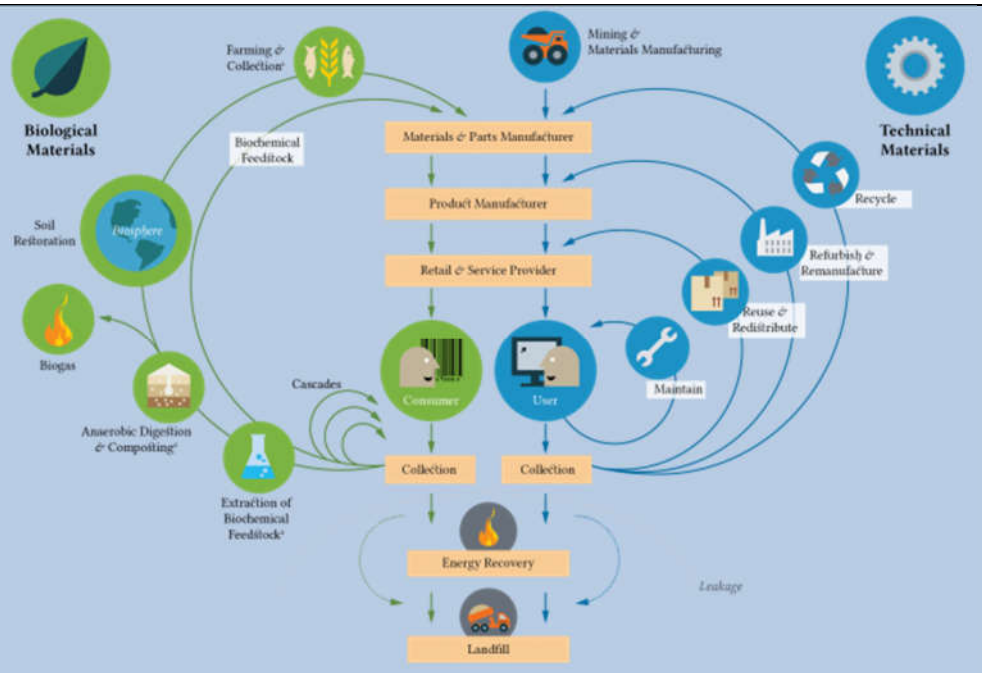


Figure 1: Circular Economy Diagram[7]

Value-Retention Processes (VRPs) (namely remanufacturing, refurbishment, repair and direct reuse) and recycling of technical materials are central concepts within a circular economy. While most manufacturing supply chain stakeholders currently focus on recycling their products, the adoption of VRPs can lead to the retention of substantially greater value in the system: VRPs allow the retention of the inherent value of the product beyond the value of the material or resource.

Based on this concept, the technical assistance distinguishes between the following processes (including recycling):

- **Reuse**: The using again of a product, objective or substance that is not waste for the same purpose for which it was conceived, possibility after repair or refurbishment
- **Direct reuse**: The using again of a product, object or substance that is not waste for the same purpose for which it was conceived without the necessity of repair or refurbishment.
- **Repair**: Fixing of a specified fault in an object that is a waste or a product and/ or replacing defective components, in order to make the waste or product a fully functional product to be used for its originally intended purpose.
- **Refurbishment**: Modification of an object that is a waste or a product to increase or restore its performance and/or functionality or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for a purpose that is at least the one that was originally intended.
- **Remanufacturing**: A process in which cores are restored to original as-new condition and performance or better. The remanufacturing process is in line with specific technical specifications, including engineering, quality, and testing standards, and typically yields fully warranted products.

[7] The Circular Economy, Ellen MacArthur Foundation, 2012

- **Recycling**: The process of recovering material from waste and turning it into new products. The original product is destroyed in this process, usually through a melting process, but is used to form new products.

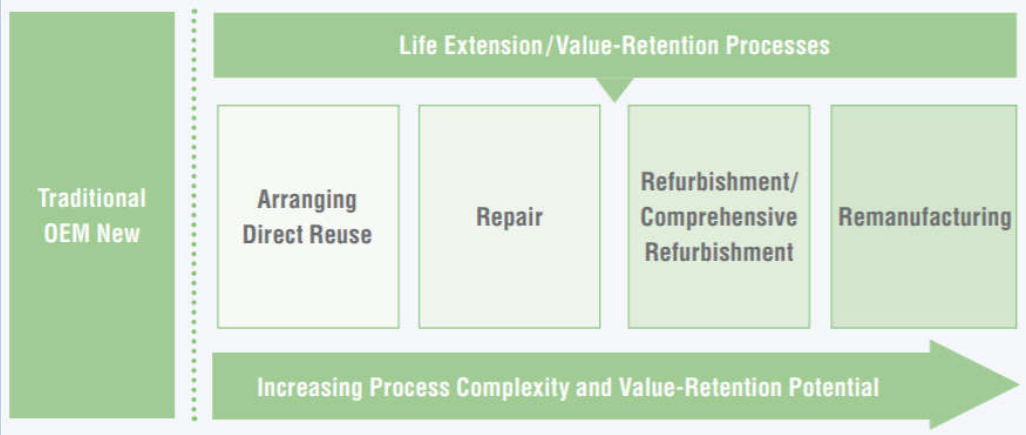


Figure 1: Value-retention processes[8]

The growing consumption of electrical and electronic equipment (EEE) in Africa is strongly linked to economic development, fuelled by trends such as urbanization, industrialization and a growing middle class. EEE has become indispensable in modern societies and is enhancing living standards but its production and usage is very resource-demanding, and an increasing amount of e-waste is generated due to short life cycles and few repair options. Africa also suffers from the import of used or obsolete EEE, finding its way to the waste streams in an even shorter time.[9] According to the latest Global E-waste Monitor, Africa generated a total of 2.9 Mt of e-waste (2.5 kg per capita) in 2019 but only 0.9% were collected and recycled.[10] In addition, the great majority of e-waste flows are currently not even documented, eventually leading to even lower numbers of collection and recycling.

Valuable materials in electronic products include precious metals (incl. Gold, Tantalum and Silver) as well as non-hazardous components (incl. plastics, metals and copper). Only considering recycling as a value retention mechanism, it is estimated that the e-waste generated in Africa holds an annual value of US$ 3.2 billion. Other VRPs hold an even greater value, as they extend the life cycle of products. VRPs and recycling are only economically beneficial but also reduce the environmentally damaging and pollutive extraction of new resources. At the current stage, the steel industry currently accounts for 7-9%[11] and the plastics industry for about 2%[12] of global CO2 emissions. Based on recent studies, steel production based on recycling would emit 87% less GHG emissions compared to the production based on extraction. In the same way, plastics production based on recycling would emit 37% less GHG emissions compared to a primary production.[13]

[8] Re-Defining Value: The Manufacturing Revolution, 2015
[9] EACO, 2017
[10] ITU, 2020
[11] WorldSteel Association, 2020
[12] CIEL, 2019
[13] Nordon: Climate Benefits of Material Recycling, 2015

Kenya is the most industrially developed country in East Africa, and with its economic development and a growing middle class, the usage of EEE has tremendously increased. The increasing consumption also results in increasing disposal – Kenya generated more than 51.000 t of e-waste (1.0 kg per capita) in 2019. As an adequate and sufficient e-waste infrastructure is largely missing, most of the e-waste is disposed in dustbins, on the streets, in gardens, dumped into a water body or kept it in the homes of citizens.[14] Most existing recycling and waste picking activities are informal, small in scale or limited to community-based organizations (CBOs) and non-governmental organizations (NGOs). One successful initiative is the Waste Electrical and Electronic Equipment Centre (WEEE Centre) in Nairobi, initiated by the NGO Computers for Schools Kenya (CFSK), and now owned and operated by local entrepreneurs with sustained support from various local and international partners. It provides e-waste collection, dismantling and automated processing services in Nairobi and in other major cities in Kenya, and has parallel systems, one for repair and refurbishment and the other for dismantling and recycling. Another initiative, the East African Compliant Recycling Company (EACR) opened by Hewlett-Packard (HP) in 2011 in partnership with the NGO "Camera Education" and now owned by private stakeholders, operates a recycling facility with decentralized collection centres across Kenya.

Despite these important initiatives, the amount of EEE re-use, remanufacturing, repair, refurbishment or recycling remains low due to limited e-waste collection, treatment and disposal capabilities. The current mode of handling e-waste is not only causing environmental degradation and increasing health threats due to toxic chemicals, but Kenya is also missing out on the economic benefits of VRPs and recycling, as they hold opportunities for new industries, allow a greater independence from EEE imports and create new jobs.

2. Problem statement

The main challenge to be addressed is the lack of adequate infrastructure for e-waste management as well as insufficient methods of e-waste logistics, treatment and disposal.

Having achieved some progress with regulating plastic waste over the past years, the management of e-waste still poses major challenges in Kenya. To date, most re-use, repair and recycling activities are informal except pioneer activities of the WEEE Centre and the EACR. Furthermore, there are currently no restrictions on the import of used EEE. A proposal on guidelines for the management of e-waste has been in discussion since 2013 without further progress. In April 2019, the Kenyan Ministry of Environment and Forestry published a draft national e-waste management strategy, yet to be adopted, with the clear goal to "achieve a sustainable E-waste management system in Kenya" by 2030. In order to realize this objective, Kenya, inter alia, aims to strengthen the regulatory framework, to raise public awareness, research and capacity building, to establish an infrastructure for e-waste management, and to mobilize additional resources.

In order to establish a future-proof e-waste management infrastructure and progress towards circularity, Kenya specifically requires a detailed e-waste infrastructure analysis which identifies current and future

[14] https://www.dw.com/en/kenya-needs-to-step-up-efforts-to-recycle-e-waste/a-43252169#:~:text=Kenya%20generates%20over%2044%2C000%20tons,no%20law%20regulating%20such%20waste.&text=One%20of%20the%20three%20plants,is%20in%20Nairobi's%20Utawala%20neighborhood.

infrastructure gaps, assesses informal and formal practices, and results in a concrete action plan for the improvement of the management infrastructure for e-waste. The action plan will provide an effective roll-out plan for the upgrade of current processes and infrastructure and lay out opportunities for circularity, including the development of a business model for a pilot project. The action plan will enable the transition towards a circular model aligned to the national strategy for climate change, creating performance indicators that facilitate monitoring compliance with the NDC, the SDGs (9, 12 and 13) and the commitments of the requesting country under the Paris Agreement adopted by the Conference of the Parties (COP) to the Framework Convention on Climate Change.

The following electrical and electronic equipment, with a focus on large household appliances, will be analysed within the technical assistance as taken from Kenya's draft E-Waste Management Strategy:

- Large cooling appliances
- Refrigerators
- Freezers
- Other large appliances used for refrigeration, conservation and storage of food
- Washing machines
- Clothes dryers
- Dish washing machines
- Electrical Cooking equipment
- Electric stoves
- Electric hot plates
- Microwaves
- Other large appliances used for cooking and other processing of food
- Electric heating appliances
- Electric radiators
- Other large appliances for heating rooms, beds, seating furniture
- Electric fans
- Air conditioner appliances
- Other fanning, exhaust ventilation and conditioning equipment

3. Logical Framework for the CTCN Technical Assistance:

	Month[16]											
	1	2	3	4	5	6	7	8	9	10	11	12
***Goal**: Development of an action plan[15] to improve the circularity of large household appliances in Kenya*												
***Outcome**: Kenya, which is aware of the economic, social and environmental benefits of the circular economy but has no specific strategies for its implementation, may develop a road map for the promotion and development of a sectoral or process-specific circular model, in which public and private players will be identified to generate national strategies required for the development of the circular economy.*												
Output 1: Development of an implementation plan and communication documents												
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* **Activity 1.1**: Drafting a detailed implementation plan for all activities, deliverables, outputs, deadlines and responsible persons/organizations, including a gender study and an itemized budget for implementing the Response Plan. The detailed implementation plan and budget must be based directly on this Response Plan. **Activity 1.2**: Based on the indicators listed in the Closure and Data Collection Report, drafting a monitoring and evaluation plan with specific, measurable, achievable, relevant and time-bound indicators that can be used to monitor and evaluate the timeliness and appropriateness of implementation. The monitoring and evaluation plan should enable the implementer to complete the CTCN Closure and Data Collection Report at the end of the technical assistance (please refer to Item 1.4 and Section 14 of the Response Plan); **Activity 1.3**: A two-page description of the expected impact of the CTCN technical assistance at the start of the assistance, updated at the end of the technical assistance (a template will be provided). **Activity 1.4**: A CTCN Closure and Data Collection report completed at the end of the technical assistance (a template will be provided).												
Deliverable 1:												

[15] Road maps will be at the national level and will be determined by the requesting country; they may have a sectoral or process-specific scope.
[16] The project timeline can be adjusted according to the level of development of the participating country.

1.1 Implementation plan	X											
1.2 Monitoring and evaluation plan	X											
1.3 Impact description document (initial and final version)	X											X
1.4 Closure and Data Collection Report												X
Output 2: Status quo analysis of the management of large household appliance waste in Kenya												
Activity 2.1: Kick-off meeting for the presentation of the technical assistance with the different stakeholders Present the technical assistance plan (Deliverable 1.1) to all relevant stakeholders. Collect information on the current waste management infrastructure for large household appliances and identify sources for the quantification of waste per appliance. Map relevant national policies, past and ongoing projects and initiatives in the area of value-retention-processes and recycling of large household appliances, including the activities of the EU and other international stakeholders in Kenya.												
Activity 2.2: Analysis of the current activities and infrastructure for the management of large household appliance waste Analyse the current activities and infrastructure for the waste management of large household appliances with regards to activities, sites, technologies and capacities. This analysis should span along the waste value chain from sorting, collection and transportation to treatment (recycling, VRPs, dumping, etc.), and should include the mapping of formal and informal activities. Analyse key initiatives, policies, strategies and stakeholders linked to the activities and infrastructure for the waste management of large household appliances. For this purpose, interviews should be conducted with key stakeholders from the public and private sector, including (1) ministries, (2) municipalities, (3) corporates, (4) NGOs and the (5) civil society. A minimum of 10 interviews should be conducted in total, including a minimum of 2 interviews per stakeholder group.												
Activity 2.3: Characterization, quantification and forecasting of large household appliance waste Classify and collect data of large household appliance waste types, sources, quantities, usage and processing, including both formal and informal activities, through primary and secondary research. This is to define the baseline scenario that will serve as a reference for the outcomes and objective of the technical assistance. 1. Validate the types of large household appliances. The following appliances have been identified in line with Kenya's E-Waste Management Strategy: (a) Large cooling appliances, (b) Refrigerators, (c) Freezers, (d) Other large appliances used for refrigeration, conservation and storage of food, (e) Washing machines, (f) Clothes dryers, (g) Dish washing machines, (h) Electrical Cooking equipment, (i) Electric stoves, (j) Electric hot plates, (k) Microwaves, (l) Other large appliances used for cooking and other processing of												

food, (m) Electric heating appliances, (n) Electric radiators, (o) Other large appliances for heating rooms, beds, seating furniture, (p) Electric fans, (q) Air conditioner appliances, (r) Other fanning, exhaust ventilation and conditioning equipment 2. Define sources of large household appliance waste. The following e-waste sources in large household appliances have been identified as relevant: (a) Individual holds, (b) private sector corporations, (c) public entities 3. Collect data on sources, quantities and treatment (VRPs, recycling, dumping or other) of large household appliances waste. Design and conduct questionnaires and sampling of waste to collect further data where needed. Include quantifications on informal activities. 4. Establish yearly forecasts on waste quantities per source per large household appliance in Kenya until the year 2030. Questionnaires and sampling of e-waste should be conducted according to the guidelines of the United Nations Statistics Division. The quality should meet requirements for the funding through GEF or GCF of eventual follow-up projects.												
Activity 2.4: Identification of current and future gaps along the waste value chain of large household appliances Based on the results of Activity 2.2 and 2.3, develop an analysis to identify current and future gaps along the waste value chain of large household appliances. This gap analysis should indicate required capacities of large household appliance waste handling at each step of the waste value chain on a yearly basis until the year 2030. Beyond quantitative gaps, it should indicate qualitative gaps of the current management infrastructure.												
Deliverable 2: 2.1 Meeting report. 2.2 Report on current activities and the infrastructure for the management of large household appliance waste in Kenya, including interview sheets. 2.3 Report on the characterization, quantification and forecasting of large household appliance waste in Kenya. 2.4 Report on the identified current and future gaps along the waste value chain of large household appliances in Kenya.		X	X X	X								
Output 3: Identification and definition of activities for an improved waste management infrastructure for large household appliances												

Activity 3.1: Identification and evaluation of international best practices in terms of processes and infrastructure for the management of large household appliance waste Based on the results of Activity 2.4, identify proven processes, infrastructure and technologies that provide solutions to the identified gaps. Evaluate them based on their appropriateness for the context in Kenya. This activity should identify solutions for the inclusion of informal activities as well.												
Activity 3.2: Development of recommendations for an improved waste management infrastructure for large household appliances Based on the analysed infrastructure gaps of Activity 2.4 and the identified appropriate best practices for processes, technologies and infrastructure in Activity 3.1, develop recommendations for an improved waste management infrastructure for large household appliances along the entire waste value chain. These recommendations should, inter alia, target: • The enhancement of existing facilities or set up of new collection and recycling facilities at country and national level • The enhancement or introduction of waste management process along the value chain • The integration / formalization of informal activities The recommendations should include a quantification of the impact on the previously identified gaps along the waste value chain.												
Deliverable 3: 3.1: Report on the identified best practices for processes and infrastructure for large household appliance waste 3.2: Report on the recommendations for an improved waste management infrastructure for large household appliances					X	X						
Output 4: Identification of opportunities for a circular waste management infrastructure for large household appliances												
Activity 4.1: Identification and analysis of best practices for circularity of large household appliances Identify international best practices for value-retention processes (reuse, repair and remanufacturing) along the waste value chain of large household appliances, including for informal practices. Analyse general requirements for the adoption as well as the economic, social, environmental and institutional impact of these best practices.												

Activity 4.2: Market analysis for the adoption of identified best practices for circularity of large household appliances Analyse the market adoption potential for these best practices in Kenya with regards to its appropriateness, available infrastructure and adopters as well as its expected benefits.												
Activity 4.3: Stakeholder meeting on identified circularity opportunities In a meeting with the project proponent, the NDE and further relevant stakeholders, the results of the circularity opportunity analysis should be presented and discussed. Together, one prioritized circularity opportunity should be selected that will be conceptualized as a pilot project / proof of concept under Output 5.												
Deliverable 4: 4.1: Report presenting best practices enhancing circularity along the waste value chain of large household appliances. 4.2: Report presenting the market analysis for the adoption of the identified best practices. 4.3: Meeting report.							X	X X				
Output 5: Development of an action plan and conceptualization of a pilot project for an improved and circular waste management infrastructure for large household appliances												
Activity 5.1: Development of an action plan for an improved waste management infrastructure for large household appliances Based on the results of outputs 2, 3 and 4, develop an action plan for the establishment of a circular waste management infrastructure for large household appliances. This action plan for the upgrade of the current management infrastructure should include inter alia: • Description and roll-out plan of identified activities to be implemented • Timeline for the action of activities • Stakeholders to be involved • Budget plan and financing mechanisms During this activity, the gender perspective must be incorporated transversally, and it must be evaluated how this diagnosis, associated with a baseline in circular economy issues within e-waste, could carry economic, social and environmental implications, disaggregated by gender. In view of the CTCN's unrestricted commitment to gender equality, throughout this process the active inclusion of women in each phase should be considered, ensuring that their participation is considered incidentally, at all												

decision-making levels and that the dignity and respect of women also be considered, in line with SDG 5 on gender equality.[17]												
Activity 5.2: Concept for a pilot project to increase circularity of large household appliances The selected pilot project will be conceptualized for a proof of concept. To that end, the following steps must be taken: a) Define economic activities and/or product process b) Identify stakeholders and existing productive and technological structures in order to create partnerships c) Identify local public and private bodies that are already developing or are interested in developing the pilot project d) Estimate costs e) Analyse of economic, environmental, social and regulatory benefits f) Estimate the contribution to the identified gaps under Activity 2.4 g) Establish performance indicators to track and measure progress and compliance of the pilot project These activities should be summarized in a business plan.												
Activity 5.3: Establishment of communication material Develop communication material on the results of the technical assistance, summarizing the action plan and benefits of recycling and VRPs in Kenya.												
Activity 5.4: Presentation of final results Present the final results of the technical assistance to the NDE, the project proponent and further participating stakeholders.												
Deliverables 5: 5.1: Action plan 5.2: Business plan for the identified pilot project. 5.3: Material for communication and the final presentation of the results to the NDE, the project proponent and other participating stakeholders. 5.4: Meeting report								X	X	X X		

[17] CTCN Gender Mainstreaming Tool for Response Plan Development: https://www.ctc-n.org/technologies/ctcn-geNDEr-mainstreaming-tool-response-plan-development

4 Resources required and itemized budget:

Provide an indicative summary of the necessary resources and detailed budget required to implement the technical assistance of the CTCN, including monitoring and evaluation activities, with the help of the following table. It is important to note that a minimum of 1 per cent of the budget must be explicitly aimed at gender-specific activities related to technical assistance (see Section 10 for more information on gender). Once the response plan is completed, the Climate Technology Centre (CTC) will select the implementers responsible for implementing the response. *The CTCN and the chosen lead implementer will need to agree on a detailed activity-based budget.*

Activities and Outputs	**Input: Human resources** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings and events** *(Meeting title, number of participants, number of days)*	**Input: Equipment and resources** *(Item, purpose, buy/rent, quantity)*	**Estimated cost (US $)** *Please indicate the cumulative cost of the activities and outputs and provide an estimated cost range for each activity and the entire Response Plan.*	
					Minimum	**Maximum**
Output 1: Development of the work plan and related communication documents	***NC1, 10 days*** ***NC2, 10 days***				***4,000***	***4,400***
Activity 1.1: Work plan	*NC1, 2 days* *NC2, 2 days*				*800*	*880*
Activity 1.2: Monitoring and evaluation plan	*NC1, 2 days* *NC2, 2 days*				*800*	*880*
Activity 1.3: Impact description document (initial and final version)	*NC1, 2 days* *NC2, 2 days*				*800*	*880*

Activity 1.4: Closure and Data Collection Report	*NC1, 4 days* *NC2, 4 days*				*1,600*	*1,760*
Output 2: Status quo analysis of the management of large household appliance waste in Kenya	**E1, 22 days** **E2, 32 days** **NC1, 42 days** **NC2, 52 days** **GE, 5 days**				***75,960***	***83,556***
Activity 2.1: Kick-off meeting for the presentation of the technical assistance with the different stakeholders	*E1, 2 days* *E2, 2 days* *NC1, 2 days* *NC2, 2 days* *GE, 2 days*	*1 international trip to Kenya for E1 and E2* *1 national trip for NC1, NC2 and GE*	*Kick-off meeting, 1 day, 25 additional participants*		*23,260*	*25,568*
Activity 2.2: Analysis of the current activities and infrastructure for the management of large household appliance waste	*E1, 10 days* *E2, 10 days* *NC1, 20 days* *NC2, 20 days* *GE, 2 days*				*18,400*	*20,240*
Activity 2.3: Characterization, quantification and forecasting of large household appliance waste	*E1, 5 days* *E2, 15 days* *NC1, 10 days* *NC2, 20 days*	*5 national trips for NC1 and NC2 for waste sampling*		*Waste sampling equipment*	*20,100*	*22,110*
Activity 2.4: Identification of current and future gaps along the waste value chain of large household appliances	*E1, 10 days* *E2, 10 days* *NC1, 10 days* *NC2, 10 days* *GE, 1 day*				*14,200*	*15,620*

Output 3: Identification and definition of activities for an improved waste management infrastructure for large household appliances	**E1, 25 days** **E2, 25 days** **NC1, 25 days** **NC2, 25 days** **GE, 5 days**				***36,000***	***39,600***
Activity 3.1: Identification and evaluation of international best practices in terms of processes and infrastructure for the management of large household appliance waste	*E1, 15 days* *E2, 15 days* *NC1, 10 days* *NC2, 10 days* *GE, 2 days*				*19,400*	*21,340*
Activity 3.2: Development of recommendations for an improved waste management infrastructure for large household appliances	*E1, 10 days* *E2, 10 days* *NC1, 15 days* *NC2, 15 days* *GE, 3 days*				*16,600*	*18,260*
Output 4: Identification of opportunities for a circular waste management infrastructure for large household appliances	**E1, 16 days** **E2, 16 days** **NC1, 21 days** **NC2, 21 days** **GE, 6 days**				***25,600***	***28,160***
Activity 4.1: Identification and	*E1, 10 days* *E2, 10 days*				*12,400*	*13,640*

analysis of best practices for circularity of large household appliances	*NC1, 5 days* *NC2, 5 days* *GE, 2 days*					
Activity 4.2: Market analysis for the adoption of identified best practices for circularity of large household appliances	*E1, 5 days* *E2, 5 days* *NC1, 15 days* *NC2, 15 days* *GE, 3 days*				*11,600*	*12,760*
Activity 4.3: Stakeholder meeting on identified circularity opportunities	*E1, 1 day* *E2, 1 day* *NC1, 1 day* *NC2, 1 day* *GE, 1 day*		*Online Meeting*		*1,600*	*1,760*
Output 5: Development of an action plan and conceptualization of a pilot project for an improved and circular waste management infrastructure for large household appliances	**E1, 34 days** **E2, 33 days** **NC1, 34 days** **NC2, 33 days** **GE, 9 days**				***69,460***	***76,406***
Activity 5.1: Development of an action plan for an improved waste management infrastructure for large household appliances	*E1, 20 days* *E2, 20 days* *NC1, 20 days* *NC2, 20 days* *GE, 5 days*				*29,000*	*31,900*

Activity 5.2: Concept for a pilot project to increase circularity of large household appliances	*E1, 10 days* *E2, 10 days* *NC1, 10 days* *NC2, 10 days* *GE, 2 days*				*14,400*	*15,840*
Activity 5.3: Establishment of communication material	*E1, 2 days* *E2, 1 day* *NC1, 2 days* *NC2, 1 day* *GE, 1 day*			*Printed communication material*	*2,800*	*3,080*
Activity 5.4: Presentation of final results	*E1, 2 days* *E2, 2 days* *NC1, 2 days* *NC2, 2 days* *GE, 2 days*	*1 international trip to Kenya for EI and E2* *1 national trip for NC1, NC2 and GE*	*Closure meeting, 1 day, 25 additional participants*		*23,260*	*25,586*
Estimated cost range for the entire Response Plan (US$)					***211,220***	***232,342***

5 Profile and experience of experts

Experts required	Brief description of required profile
Expert 1 (E1)	Economist or commercial engineer, M.Sc., with experience in the design and development of action plans, knowledge and experience in circular economy policies and development, project management, technological innovation, industry 4.0, lifecycle assessment of products and services, climate change, SDGs and NDC with a minimum of seven years of experience. Fluency in English is required.
Expert 2 (E2)	Industrial, mechanical or electrical engineer, M.Sc., with specialisation in the waste sector, knowledge and experience in circular economy policies and development, waste quantification and characterisation, technological innovation, industry 4.0, lifecycle assessment of products and services, climate change, SDGs and NDC with a minimum of seven years of experience. Fluency in English is required.
National consultant 1 (NC1)	Economist or commercial engineer, expert in evaluation and development of industrial policies (technological innovation, road maps, national programs) and environmental policies (waste management, climate change, NDC (nationally determined contributions), TNAs (technology needs assessments), TAPs (technical assistance programmes), NAPs (national action plans) or NAMAs (nationally appropriate mitigation actions), according to the experience of the country), with a minimum of seven years of experience. Experience working in Kenya. Fluency in English is required.
National consultant 2 (NC2)	Industrial, mechanical or electrical engineer, M.Sc., with specialisation in the waste sector, knowledge and experience in circular economy policies and development, waste quantification and characterisation, technological innovation, industry 4.0, lifecycle assessment of products and services, climate change, SDGs and NDC with a minimum of seven years of experience. Experience working in Kenya. Fluency in English is required.
Gender expert (GE) – National consultant	Social science professional (sociologist, anthropologist or psychologist) expert in gender studies and management of equality policies, with experience in research methodologies and data processing, with a minimum of seven years of experience. Experience working in Kenya. Fluency in English is required.

6 Intended contribution to the expected impact of the technical assistance

The deliverables developed under Activity 2 will provide the country a baseline, forecast and gap analysis of waste from large household appliances as well as the related infrastructure, which allows better planning and policy making. Through the outputs 3 and 4, Kenya will have recommendations for VRPs and recycling at hand to transition its waste management infrastructure for large household appliances towards a circular model enhancing its capacity of recycling, reusing and repairing. These outputs will also facilitate the access to other financial mechanisms that can scale up the work in the areas of recycling, reuse and repair in Kenya.

The country will obtain an analysis of its productive matrix, identifying the potential for territorial development, considering at least the following aspects:

(a) Economic (productive chains that add value to industry and competitiveness to the country)
(b) Social (increased employment rate and impact on gender equality)
(c) Environmental (saturated or latent zones and quantification of greenhouse gas emission reduction)
(d) Institutional (capacities, institutions, human capital, knowledge)

As noted by the request made by Kenya to the CTCN, this technical assistance (TA) will enable the country to enhance the potential of these aspects, facilitating the creation of new national policies and initiatives, and to quantify these results to develop performance indicators that enable the country to delineate and measure progress and compliance with its objectives, as well as the implementation of the NDC and SDGs signed by Kenya.

7 Relevance to NDCs and other national priorities

In its NDC from 2015, Kenya prioritized sustainable waste management systems as a key pillar for climate mitigation to achieve its ambition to abate its GHG emissions by 30% by 2030.

Kenya's NAMA on circular economy for solid waste management in urban areas from 2016 has presented a comprehensive mitigation action plan with the objectives to establish an infrastructure for recycling and reuse of waste as well as a framework for the privates sector to participate in the recycling and reuse of waste.

The National E-Waste Management Strategy draft from 2019 specifically targets a sustainable e-waste management system in Kenya by strengthening the regulatory framework, setting up the requisite e-waste management infrastructure and increasing capacity building, awareness creation, research and resource mobilization in this area.

More generally, the waste sector is a priority mitigation area and is equally a sector where the circular economy has one of the greatest impacts. This is of high importance, since the TA seeks to set the basis for a circular waste management infrastructure for large household appliances that generates an economic, social, institutional and environmental impact through by setting favourable conditions for the development of circular models, improving the competitiveness and efficiency of local businesses, enterprises and organizations that operate in these sectors, particularly small and medium-

sized enterprises (SMEs) that require sustainable and inclusive development due to the high impact that this type of enterprise has for Kenya as a main source of employment.

The intersection between circular economy and industry 4.0 represents a great opportunity for companies, organizations and academia to develop new circular business models through the incorporation of technologies and continuing competitivity, and to reduce the environmental impact of their productive activities.

8 Links to relevant parallel activities:

This TA is built on the basis of Kenya's identification of the circular economy as an economic model with a quadruple impact that offers economic, social, institutional and environmental benefits.

The National E-Waste Management Strategy draft published in 2019 foresees a set of interventions across the establishment of policy, legal and regulatory frameworks, strengthening the public awareness, education, research and capacity building for e-waste, and the resource mobilization for e-waste management. Within these interventions are important activities such as the establishment of an Extended Producer Responsibility (EPR) regulation and capacity building actions that may happen in parallel to the implementation of this technical assistance and therefore must be considered and coordinated with.

Furthermore, there are two private sector led operations in Kenya to be mentioned. The Waste Electrical and Electronic Equipment Centre (WEEE Centre), led by a not-for-profit organization, has been involved in the management and recycling of e-waste since 2002 and operates as a formal recycling facility since 2011. The East African Compliant Recycling Company (EACR), led by the private sector, has been opened in 2011 in Mombasa, Kenya, sourcing e-waste from eight registered collection centres located all over the Kenyan territory. The infrastructure and activities related to these initiatives will need to be taken into account in the technical assistance.

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

The TA will be the beginning of a set of activities that will lead to a circular waste management infrastructure for large household appliances. However, the future and continuity of this initiative will be underpinned by the following actions:

(a) Communication and promotion of the action plan at a government, business, academic and social organization level.
(b) Dissemination of the results and potential benefits of the quadruple impact that the implementation of the action plan could have in Kenya.
(c) Use of the action plan by government agencies for the implementation of follow-up projects and the creation of new instruments to promote the development of circular business models in specific territories and/or economic activities.
(d) Use and continuous updating of Output 2 by Kenya. This may lay the ground for the institutionalization of a continuous e-waste measurement mechanism.
(e) Implementation of the pilot project and the measurement of success involved.
(f) Creation and/or continuation of support programmes for circular economy projects by development organizations or corporations in Kenya.

(g) Update and monitor the NDC committed by Kenya and incorporation of new SDGs.
(h) Seek opportunities for South-South cooperation from lessons learned. Potential cooperation partners will be identified through the coordination with other Circular Economy projects of the CTCN in the region.

10 Benefits in terms of gender and co-benefits:

Imbedded into the design of the activities:	Consideration should be given to the active inclusion of women at each stage, ensuring that their participation is taken into account at all levels of decision making, as well as respect for women and their dignity. This is why this condition is clearly defined in the design of this TA in activities 2.1 and 2.2. The road map must transversely incorporate a gender perspective. The challenge is to evaluate how this analysis associated with a baseline in circular economy issues (and the subsequent road map) could create economic, social and environmental implications, disaggregated by gender. Once the project is established, the expected results and impact should be established in terms of gender perspective, in compliance with SDG 5 on gender equality. This considers the inclusion of appropriate gender indicators in the monitoring and evaluation process.
Gender and co-benefits of the activities:	The benefits in terms of gender will be the incorporation of women into new business models based on a circular economy that, being intensive in skilled labour and use of technology, offer new and better opportunities for their education, training and subsequent participation in economic activities with circular models, as well as in the creation of new ventures and academic research. These new opportunities have the potential to improve women's living conditions, offering economic stability, security, health and equal opportunities for access to jobs, whilst at the same time reducing the wage gap, in compliance with SDG 5 on gender equality. In general, the following benefits are envisioned through circular economy implementation: (a) A new awareness of the importance of moving towards a circular, low-carbon economy. (b) A decrease in the use of resource requirements per unit produced. (c) A reduction in e-waste generation, which increases the useful life of waste disposal sites. (d) A reduction in the amount of energy consumed and the reuse of raw materials, which reduces the energy required to produce the same product or another (if it cannot be recycled, the mineral must be extracted and refined, and the raw materials required for the manufacture of the final product must be produced, with all externalities associated with mining and industrial operations). (e) The development of new businesses and creation of new jobs. The recycling rate in Kenya is currently low, and an increase will create the need to hire more staff for the different tasks required in each link of the value chain of every product.

	(f) The promotion of innovation, because it is necessary to change the production model and update production infrastructure, its equipment and technologies in order to process what is now considered waste (a future raw material). (g) Tools for monitoring compliance with NDC and SDGs (h) Climate change mitigation and adaptation.

11 Main national stakeholders in the implementation of the technical assistance activities:

National Stakeholder	**Function in the implementation of the technical assistance**
Kenya Industrial Research and Development Institute (KIRDI)	Organization of the NDE, supporting the organizational coordination.
Ministry of Environment and Forestry	Acting as the project proponent of the technical assistance, supporting the organizational and implementation, providing access to further stakeholders and data.
WEEE Centre / Computers for Schools Kenya	Key national stakeholder

12 Contribution to the SDGs:

Goal:	**Sustainable Development Goal**	**Direct contribution from CTCN TA**
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 lifelong 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 objective of the technical assistance (TA) is to promote the development of circular models in the waste sector that incorporate innovative technologies and approaches aiming at strengthening the resilience of supply chains and the waste value chain.
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	The circular economy is directly related to SDG 12, promoting sustainable consumption and developing technologies and business models that enable this change with focus on the waste value chain.
13	Take urgent action to combat climate change and its impacts	*All technical assistance should indicate relevance to SDG 13 and at least one of the following targets (13.1 to 13.b).*
	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 circular economy, through new business models and reuse of resources, allows for the direct reduction of greenhouse gas emissions.
	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	
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 tick the relevant boxes below	Primary	Secondary
☐ 1. Decision-making tools and/or information provision		X
☐ 2. Sectoral road maps and strategies	X	
☐ 3. Recommendations for legal reforms, policies and regulations		X
☐ 4. Financing facilitation		X
☐ 5. Private sector engagement and market creation		X
☐ 6. Research and development of new technologies		
☐ 7. Feasibility of technology options		
☐ 8. Piloting and deployment of technologies in local conditions		X
☐ 9. Technology identification and prioritization		X

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

14 Monitoring and evaluation process

Upon contracting the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. This 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) THE COUNTRY on overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer on the experience and knowledge gained through the technical assistance; and (iii) the CTCN Director on the timeliness and appropriateness of the activities and outputs.