



Project WEEECAM – Sustainable e-waste recycling in Cameroon

1. Context

The United Nations University (UNU) estimates that the global flow of **electronic waste**, or WEEE (Waste of Electrical and Electronic Equipment), was 41.8 million metric tons in 2014, with an estimated growth rate of 4-5% per year. This specific type of waste poses a serious threat to human health and the environment. Indeed, many of its components and materials are regarded as **toxic and harmful**. Such is the case for lead, mercury, cadmium, chromium and bromine, as well as for gases which affect the ozone layer and powerfully contribute to the global warming.

Several international Conventions are related to WEEE issues, the main ones being the **Stockholm Convention on Persistent Organic Pollutants** and the **Basel Convention** which strictly limits the cross-border movement and disposal of hazardous wastes. Africa is one of the main destinations of illegal e-waste exportations; furthermore, it lacks sufficient financial and technical resources to dispose of that waste sustainably. At present, e-waste is partially collected by **informal workers** aiming to retrieve the metals and printed circuit boards. These practices generate little money yet create dramatic consequences on the health of those workers, often refugees or children.

In the face of this emerging threat, a few initiatives are on the rise. In Cameroon in 2012, the Ministry of Environment, Nature Protection and Sustainable Development proactively enforced a **specific legal framework** in 2012, a first in Africa, which allowed for the proper recognition of WEEE and the organization of a professional treatment sector. In the same year, the French NGOs *Guilde Européenne du Raid* and *Solidarité Technologique* implemented a **pilot e-waste recycling project** in Yaoundé, which is still in effect. The pilot phase has allowed them to build a vision based on the fact that **sustainable e-waste recycling can be viable in the context of developing countries**. The WEEECAM (WEEE in Cameroon) project has been created in order to demonstrate this vision on a broad scale.

2. Objectives and Activities

The WEEECAM project aims to **design and set up a large-scale, sustainable WEEE recycling activity, which could be replicated in most developing countries**. The project will be implemented in Cameroon's two major urban areas, Yaoundé and Douala, whose combined population is close to 5 million people. In the long run, the project is intended to foster the initiation of similar projects backed by public, private or civil society entities in several developing countries.

The project is structured into four components:

1. Setting up a large-scale **e-waste collection scheme** in Yaoundé and Douala, which will be implemented through partnerships with local authorities that will provide land assets as well as sensitization support. The collection itself will rely on the expertise of **workers from the informal sector organized through local associations**.
2. Implementing an **economically and environmentally sound e-waste treatment system** for all types of WEEE. After collection, electronic waste will be tested and **refurbished whenever possible**. The rest will be dismantled and separated into various components: plastics, metals, cables, etc., that will be recycled. In the third year, after a research and development phase aiming to devise optimized treatment processes, **a second treatment plant will be built with mechanized dismantling** in order to improve productivity and cope with increasing waste streams.
3. Reinforcing the existing **institutional framework**, as well as supporting further organization of the whole sector. This will be achieved by gathering relevant national and international stakeholders around a **reflection platform** to formulate joint proposals, which will be promoted through **targeted advocacy and lobbying**. The project has already been presented to the Minister of Environment who consented to its deployment.
4. **Capitalizing on the experience and promoting the project internationally** in order to inspire public, private or civil-society actors worldwide to support similar initiatives in developing countries. If successful, the project will be a major breakthrough for e-waste treatment in Africa, able to provide a significant contribution to the development of this new sector. As such, the valued experience gained from this project will be **communicated**.



The project's expected outcomes include: the ecological treatment of 10.000 tons of hazardous waste; the sale of thousands of tons of strategic raw materials and tens of thousands of refurbished appliances for a yearly gross revenue of over 1.5 million euros; the creation of 157 local full-time jobs as well as hundreds of contract jobs; improved income and working conditions for informal e-waste workers; and a carbon offset close to 100.000 tons.

3. Innovations

The WEEECAM project brings a number of noteworthy innovations to the international e-waste sector:

- Its sheer **scale is unprecedented** in the developing world aside from emerging countries.
- It includes a research and development component which aims to **adapt and implement modern recycling technologies in the context of developing countries**. This component will be implemented by the Bureau de Recherche Géologies et Minières, whose expertise in the field of material extraction processes is internationally recognized.
- It will implement an **innovative organizational model** inspired by both Western Industrial modes and Developing countries' Informal models, whose copy-paste application would neither be feasible nor appropriate.
- Its independently reviewed business model **allows its expenses to be covered by its activities without the support of a subsidy scheme** such as an Extended Producer Responsibility strategy. Nevertheless, the project aims to establish and enforce such a scheme nationwide in order to facilitate local small-scale replication.
- The project will bring together national and international stakeholders in an effort to **build an institutional framework** around e-waste addressing the specifications of the situation in Cameroon. This framework will aim to facilitate the viability of small-scale recycling ventures and to be adaptable to neighboring countries.
- The collection scheme will be based on a collaboration of professional and informal collectors as well as voluntary deposits, **promoting responsible waste practices on a broad scale** with a buy-back system as an incentive.
- The project will generate revenue out of its carbon offset by **producing and selling carbon credits**. The main source of credits will be the extraction and responsible disposal of Freon gases from domestic cooling devices.

4. Stakeholders

The project will be implemented by a consortium of international and local actors:

- **Gilde Européenne du Raid (GER)**, a French NGO with 50 years of experience in the development sector, will assume responsibility for the project and ensure its global supervision;
- **Solidarité Technologique (ST)**, a French NGO has extensive experience in Cameroon and runs the main e-waste activity in the country, will be the main on-field operator;
- **ERA Cameroun (ERA)**, a Cameroon based NGO specialized in environmental matters and experienced in lobbying and advocacy, will evaluate the environmental impacts of the project and lead the advocacy component;
- **Gevalor (GV)**: an expert NGO in waste management in the context of developing countries, with specific experience and expertise on the issuing and selling of carbon credits, has developed a multi-actor international platform (Re-Sources) that will be used to promote the project and exchange best practices;
- The **French Geological Survey (BRGM)**, a French public actor with strong expertise in minerals and recycling issues at the international level, will be responsible for technology transfers to Cameroon, as well as setting up new technologies and processes that will improve economic and ecological sustainability of treatment operations.

In addition to this consortium, many **local actors** are actively involved: the Ministry of the Environment, Nature Protection and Sustainable Development responsible for the national waste policies; the cities of Yaoundé and Douala which, among other forms of support, provide a significant land base for the project infrastructures; local urban associations through which the project will be able to interact with informal actors; as well as local industries, retailers of refurbished equipment and households.



5. Time frame and Cost

The WEEECAM project will be carried out over five years, from 1 October 2017 to 31 August 2022. It will be implemented in two separate phases. Phase 1 will span from 01/10/2017 to 31/03/2020 and phase 2 from 01/04/2020 to 30/09/2022.

The total cost of the project is 6 million euros, 3.6 million (60%) of which has been secured thus far. In-depth budget and funding statuses are outlined below.

6. Budget

Estimated budget				
N°	Items	Total (€)	Incl. in-kind (€)	%
I	Collection scheme in the cities of Douala and Yaoundé	484,997	39,637	8.1%
I.A	Collection	443,348	39,637	7.4%
	Investments	95,643	39,637	1.6%
	Operating costs	136,106		2.3%
	E-waste buy-back scheme	211,599		3.5%
I.B	Support for the informal sector	41,648	0	0.7%
	Support staff	25,781		0.4%
	Direct support actions	15,867		0.3%
II	Sustainable treatment system	4,092,214	1 284,694	68.2%
II.A	Infrastructure	1,917,032	1 284,694	32.0%
	Land in Douala	300,000	300,000	5.0%
	Infrastructure developments in Yaoundé	30,795		0.5%
	Preparation works	984,694	984,694	16.4%
	Construction of the Douala recycling center	601,543		10.0%
II.B	Operation of the treatment centers	1,550,973	0	25.8%
	Vehicles	230,240		3.8%
	Human resources	648,112		10.8%
	Machinery	300,000		5.0%
	Equipment	114,813		1.9%
	Various operating expenses	257,809		4.3%
II.C	Research and Development	326,500	0	5.4%
	Research and development activities	326,500		5.4%
II.D	HSE control - national and international regulation	25,781	0	0.4%
	HSE supervisor	25,781		0.4%
II.E	Sales channels	30,427	0	0.5%
	Commercial staff	30,427		0.5%
II.F	Commercial, communication and sensitization	80,000	0	1.3%
	Commercial and communication initiatives	80,000		1.3%
II.G	Enforcement of national legislation	10,000	0	0.2%
	Application fees - MINDMIDT	5,000		0.1%
	Application fees - MINEPDED	5,000		0.1%
II.H	Carbon credits initiative	68,000	0	1.1%



	Carbon certification initiative	68,000		1.1%
II.I	Evaluation of environmental impact	83,500	0	1.4%
	Environmental and social preliminary study	10,000		0.2%
	Environmental impact of the new procedures	73,500		1.2%
III	Reinforcement of the institutional framework	53,562	0	0.9%
III.A	Reflection platform	26,562	0	0.4%
	Website maintenance	781		0.0%
	Animation of the network	25,781		0.4%
III.B	Formulation of a common strategy	14,500	0	0.2%
	Expertise missions	14,500		0.2%
III.C	Advocacy and lobbying	12,500	0	0.2%
	Advocacy work	12,500		0.2%
IV	Capitalization and international promotion	85,389	0	1.4%
III.A	Capitalization process	85,389	0	1.4%
	Assistant (staff)	85,389		1.4%
V	Monitoring and control	704,515	0	11.7%
V.A	Project supervision	401,792	0	6.7%
	Head of project	401,792		6.7%
V.B	Follow-up	235,223	0	3.9%
	Steering committee annual meetings	38,510		0.6%
	Remote support and guidance (Guilde du Raid)	196,713		3.3%
V.C	External audit and evaluation	67,500	0	1.1%
	Annual financial statements	7,500		0.1%
	Audits and evaluations	60,000		1.0%
	Sub-total : direct costs	5,420,676	1,324,331	90.3%
	Various and unforeseen	150,000		2.5%
	Total direct costs	5,570,676	1,324,331	92.8%
	Administrative expenses	429,324		7.2%
	TOTAL	6,000,000	1,324,331	100.0%

7. Funding Plan

Funding plan – Phase 1			
Origin of funding	K€	%	Status
French Global Environment Facility (FFEM)	1,700	50%	Granted
Local Urban Communities (in-kind)	850	25%	Granted
Bureau de Recherches Géologiques et Minières	200	6%	Granted
Mairie de Paris	150	4%	Granted
ADEME	100	3%	Granted
Syctom	50	1%	Granted
Other funding sources	350	11%	Requested
TOTAL (k€)	3,400	100%	



Funding plan – Phase 2			
Origin of funding	K€	%	Status
Local Urban Communities (in-kind)	474	18%	Granted
Other funding sources	2,126	82%	Requested
TOTAL (k€)	2,600	100%	

8. Business Plan

Synthetic business plan						
Variables	Y1	Y2	Y3	Y4	Y5	Total
E-waste collected (t)	40	200	1,500	3,600	5,000	10,340
Incomes (K€)	39	100	519	1,173	1,600	3,431
Expenses (K€)	177	135	535	694	765	2,306
Depreciation (K€)	23	23	145	150	154	
Corporate tax (K€)	0	0	0	127	262	389
Cash flows (K€)	-138	-35	-16	352	573	736