



## Project Implementation Report

(1 July 2022 – 30 June 2023)

<b>Project Title:</b>	<i>Sustainable conversion of waste to clean energy for greenhouse gas (GHG) emission reduction</i>
<b>GEF ID:</b>	<i>5154</i>
<b>UNIDO ID:</b>	<i>120568</i>
<b>GEF Replenishment Cycle:</b>	<i>GEF-5</i>
<b>Country:</b>	<i>Kenya</i>
<b>Region:</b>	<i>AFR</i>
<b>GEF Focal Area:</b>	<i>Climate Change Mitigation (CCM)</i>
<b>Integrated Approach Pilot (IAP) Programs<sup>1</sup>:</b>	<i>N/A</i>
<b>Stand-alone / Child Project:</b>	<i>Stand-alone</i>
<b>Implementing Department/Division:</b>	<i>TCS/DSE/CTI</i>
<b>Co-Implementing Agency:</b>	<i>N/A</i>
<b>Executing Agency(ies):</b>	<i>N/A</i>
<b>Project Type:</b>	<i>MSP</i>
<b>Project Duration:</b>	<i>60</i>
<b>Extension(s):</b>	<i>4</i>
<b>GEF Project Financing:</b>	<i>USD 1,999,998</i>
<b>Agency Fee:</b>	<i>USD 190,000</i>
<b>Co-financing Amount:</b>	<i>USD 9,824,718</i>
<b>Date of CEO Endorsement/Approval:</b>	<i>9/2/2015</i>
<b>UNIDO Approval Date:</b>	<i>10/9/2015</i>
<b>Actual Implementation Start:</b>	<i>11/2/2015</i>
<b>Cumulative disbursement as of 30 June 2023:</b>	<i>USD 1,974,391.03</i>
<b>Mid-term Review (MTR) Date:</b>	<i>2/15/2021</i>
<b>Original Project Completion Date:</b>	<i>10/15/2019</i>
<b>Project Completion Date as reported in FY22:</b>	<i>10/31/2022</i>
<b>Current SAP Completion Date:</b>	<i>6/30/2023</i>
<b>Expected Project Completion Date:</b>	<i>6/30/2023</i>

<sup>1</sup> Only for GEF-6 projects, if applicable

<b>Expected Terminal Evaluation (TE) Date:</b>	6/30/2023
<b>Expected Financial Closure Date:</b>	10/31/2023
<b>UNIDO Project Manager<sup>2</sup>:</b>	<a href="#">Mr. Naoki Torii</a>

## I. Brief description of project and status overview

<b>Project Objective</b>
<i>The project aims at promoting the conversion of waste to clean energy as an alternative source of electricity generation. The main objective is to promote investments in waste-to-energy (WTE) technologies to increase the electrification rate as well as to reduce greenhouse gases (GHG) emissions in the country. The most promising waste sectors for electricity generation from the conversion of WTE are the municipal waste and agro-industrial residues. Due to the advantages of agro-industrial residue over municipal waste, the agro-industrial sector has been selected for demonstrating WTE (biogas) power plants while at the same time enhancing the processing of agro-produce to be more efficient and sustainable.</i>

<b>Baseline</b>
<i>In Kenya, agro-industrial wastes are generally underutilized and, in most cases, disposed of by burning, dumping or unplanned landfilling. Dumping and unplanned landfilling results in methane generation and its subsequent release into the atmosphere. Methane is a GHG stronger than carbon dioxide. Hence, the avoidance of its release to the atmosphere or its utilization holds great environmental benefits in terms of mitigating GHG emissions and adapting to climate change. It has been estimated that industrial-scale power/co-generation using biogas produced from agricultural residue could abate 1.6 million CO2 per year.</i>

Please refer to the explanatory note at the end of the document and select corresponding ratings for the current reporting period, i.e. FY22. Please also provide a short justification for the selected ratings for FY22.

In view of the GEF Secretariat's intent to start following the ability of projects to adopt the concept of adaptive management<sup>3</sup>, Agencies are expected to closely monitor changes that occur from year to year and demonstrate that they are not simply implementing plans but modifying them in response to developments and circumstances or understanding. In order to facilitate with this assessment, please introduce the ratings as reported in the previous reporting cycle, i.e. FY21, in the last column.

<b>Overall Ratings<sup>4</sup></b>	<b>FY23</b>	<b>FY22</b>
Global Environmental Objectives <b>(GEOs)</b> / Development Objectives <b>(DOs)</b> Rating	<i>Moderately Satisfactory (MS)</i>	<i>Satisfactory (S)</i>
<i>The rating has been downgraded to Moderately Satisfactory, since the project achieved 65% of its major relevant objectives (including global environmental objectives) and yielded some of the expected global environmental benefits.</i>		

<sup>2</sup> Person responsible for report content.

<sup>3</sup> Adaptive management in the context of an intentional approach to decision-making and adjustments in response to new available information, evidence gathered from monitoring, evaluation or research, and experience acquired from implementation, to ensure that the goals of the activity are being reached efficiently.

<sup>4</sup> Please refer to the explanatory note at the end of the document and ensure that the indicated ratings correspond to the narrative of the report

Implementation Progress <b>(IP)</b> Rating	Satisfactory (S)	Satisfactory (S)
<i>The rating was maintained at Satisfactory since progress has been made on the few remaining project activities to achieve project targets.</i>		
Overall Risk Rating	Low Risk (L)	Low Risk (L)
<i>The overall risk rating was maintained at Low Risk, since all remaining project activities are aligned with the project objectives until project closure.</i>		

## II. Targeted results and progress to-date

Please describe the progress made in achieving the outputs against key performance indicator's targets in the project's **M&E Plan/Log-Frame at the time of CEO Endorsement/Approval**. Please expand the table as needed.

Project Strategy	KPIs/Indicators	Baseline	Target level	Progress in FY23
<b>Component 1 – Capacity development and knowledge management</b>				
Outcome 1.1: Improved awareness, knowledge sharing on best practices and capacity building on WTE in the Country				
Output 1.1.1: Information and best practices platform (IBPP) for WTE technologies established at KIRDI	1. Business plan and annual work plans created. 2. Creation and operation of the centre	Lack of one-stop technical centre on biogas	1. Business plan and annual work plan creation with first 3 months of the GEF project start. 2. Creation and operation of the center within 6 months of the GEF project start.	<ul style="list-style-type: none"> <li>The fully equipped Biogas Laboratory was officially launched in January 2023.</li> <li>At the same event, the operationalization of the IBPP Website, providing relevant information and details, was also officially launched in January 2023.</li> <li>A database compiling existing biogas systems and national stakeholders in the WTE sector was finalized in November 2022.</li> <li>As part of the IBPP networking activities, 5 KIRDI Staff (4 men and 1 woman) participated in an International Conference on science and technology at Dedan Kimathi University of Technology in November 2022 and presented two scientific papers.</li> <li>A Waste to Energy (Biogas Technology) Awareness Workshop was conducted in November 2022.</li> <li>IBPP brochures, banners and leaflets were prepared and disseminated at the workshop and launching ceremony for knowledge sharing.</li> <li>A sustainability strategy was prepared for the IBPP and submitted in February 2023.</li> </ul>
Output 1.1.2: : Development of human	1. Number of trainings organized	Inadequate capacity among the key policy	1. Conduct at least 2 trainings for policy	<ul style="list-style-type: none"> <li>12 persons (7 men and 5 women) from the office of the Principal Secretary of the</li> </ul>

capacities in WTE for policy makers (at least 50 policy makers), project developers, agro-industries, and other stakeholders (at least 50 persons)	for policy makers 2. Number of trainings organized for different target groups 3. Number of key policy makers trained (% of female/male participants) 4. Number of persons (from other target groups) trained (% of female/male participants) 5. Number of female trainers	makers & project developers	makers 2. Conduct at least 2 trainings for other target groups 3. Educate and train at least 50 policy makers on WTE potential, technology and project development 4. Train at least 50 personnel from each of the target groups 5. Include at least 20% (of the total participants) women in each training	Ministry of Environment conducted knowledge sharing exercises and monitored site visits to two demonstration plants on WtE technologies in March 2023. <ul style="list-style-type: none"><li>• A national Biogas Stakeholder Meeting was conducted in April 2023.</li><li>• 5 WTE project stakeholders (3 men and 2 women) including 2 policymakers, 1 project developer and 2 UNIDO project staff participated in UNIDO's Biogas activities (WS, EGM and Biogas plant site visits) in Austria in June 2023.</li><li>• A Biogas Expert Committee meeting was held in June 2023 and culminated in draft ToRs for a Biogas Expert Taskforce.</li></ul>
Output 1.1.3: Development and strengthening of institutional capacities in the area of WTE among technical institutions and financial institutions (at least 50 persons from each group)	1. Number of trainings organized 2. Number of persons trained (% of female/ male participants) 3. Number of female trainers	Insufficient local capacity to develop, support, operate & maintain WTE plants	1. Conduct at least 2 trainings 2. Train at least 50 personnel from different target groups 3. Include at least 20%(of the total participants) women in each training	<ul style="list-style-type: none"><li>• A training team was established within the IBPP and a train-the-trainer program was conducted for KIRDI staff, implemented in two phases. Phase 1 included a 6-day online Biogas Foundation Course with lectures covering Biogas Basics (as reported in previous PIR report).</li><li>• In FY23, 3 KIRDI staff (2 men and 1 woman) were trained in an Advanced Biogas Course in Germany, which included visits to four Biogas plants in the greater area of Munich.</li></ul>
<b>Component 2 – Establishment of agro-industrial WTE plants</b>				
Outcome 2.1: Increased use of biogas for energy generation				
2.1.1 Establishment of standards for medium and large scale biogas power plants	Number of standards	Back in 2015, at the project inception phase, no standards existed for biogas power plants. KEBS & ERC were the responsible entities for the design and enforcement of the biogas standard.	Early enforcement of the proposed standard	<ul style="list-style-type: none"><li>• A launch event was held on 4 July 2022 in cooperation with KEBS and ERC for the launching of the standard and knowledge sharing.</li><li>• A 'Workshop on the Biogas Standards for Quality Energy Services and Socio-economic Development' was held at the national level on 6 October 2022.</li></ul>
Output 2.1.2: Detailed plant design prepared for WTE plants	Project progress status	Lack of plant design reports for further project development.	Detailed plant design reports for the demonstration projects	Nothing to report for FY23.
Output 2.1.3.: WTE plants established for a cumulative capacity of around 1,856 kWe and 1,397 kWth	MW of installed capacity	1. Inadequate commercial WTE plants. 2. Agro-industries depend on (fossil-fuel dominated based) electricity and fossil fuel such as fuel oil for thermal energy needs.	1,856 kWe and 1,397 kWth plants supplying electricity and thermal energy respectively	Nothing to report for FY23.
<b>Component 3 – Scaling up investment in WTE plants</b>				

Outcome 3.1: Establishment and implementation of incentive systems for WTE technologies				
Output 3.1.1: Establishment and implementation of incentive systems for WTE technologies	1. USD incentives based on incremental cost principle to WTE projects 2. Number of project developers benefitted through the incentive facility	Inadequate financing facilities to attract investments in WTE projects	1. USD 4 million incentive facility established 2. At least 15 replication project benefitted under the facility	Nothing to report for FY23.

### III. Project Risk Management

1. Please indicate the overall project-level risks and the related risk management measures: (i) as identified in the CEO Endorsement document, and (ii) progress to-date. Please expand the table as needed.

	(i) Risks at CEO stage	(i) Risk level FY 22	(i) Risk level FY 23	(i) Mitigation measures	(ii) Progress to-date	New defined risk <sup>5</sup>
1	Lack of human and institutional capacity impedes large scale penetration of WTE technology	Low Risk (L)	Low Risk (L)	The training was conducted for the experts, operators, government agencies, etc. Capacity building and transfer of technology will mitigate the technical risk. As Kenya already has the technology for domestic biogas plants, further development on commercial biogas plants can be achieved with lesser difficulty.	<ul style="list-style-type: none"> <li>40 Country staff (33 men and 7 women) were trained to prepare country-level energy planning (12 energy plans were prepared).</li> <li>56 policymakers (45 men and 11 women) were trained and exchanged knowledge on waste to energy solutions.</li> <li>28 persons (20 men and 8 women) from the office of the Principal Secretary in the Ministry of Environment conducted knowledge sharing exercises and monitored site visit of WTE technologies.</li> <li>48 personnel (37 men and 11 women) were trained for the development and strengthening of institutional capacities in WTE.</li> <li>3 WTE Project stakeholders (2 men and 1 woman) including 2 policymakers and 2 project developers participated in UNIDO's Biogas activities (WS, EGM and Biogas plant site visits) in Austria.</li> <li>14 KIRDI staff (9 men and 5 women) were trained on operation of IBPP and biogas laboratory technology in China and in Kenya.</li> <li>A Train-the-Trainer course for 13 KIRDI staff (6 men and 7 women) on basic biogas technology topics and for 3 KIRDI staff (2 men and 1 woman) on advanced biogas topics has been completed.</li> </ul>	<input type="checkbox"/>
2	General perception that WTE investments yield low returns, hence the investors are not willing to invest.	Low Risk (L)	Low Risk (L)	Detailed techno-economic feasibility studies were carried out to establish the financial viability of the demonstration projects. Moreover, financial incentives are in place to attract investments in WTE. Increased awareness, knowledge	<ul style="list-style-type: none"> <li>Pre-feasibility study reports were prepared for eight (8) project sites.</li> <li>Full feasibility study and design was done for the Dagoretti biogas plant.</li> <li>Incentive scheme based on incremental</li> </ul>	<input type="checkbox"/>

<sup>5</sup> New risk added in reporting period. Check only if applicable.

				and experiences created by the successful operation of the demonstration plants are expected to enhance the stakeholders' participation.	cost principle to the tune of USD 700,000 was finalized to incentivize project developers and investors.	
3	No off-takers for the generated electricity.	Low Risk (L)	Low Risk (L)	The demand-supply gap is very high in Kenya and hence, there is no market risk. Off-takers for each plant will be decided during the feasibility study.	<ul style="list-style-type: none"> <li>The feasibility study identified off-takers for the generated energy.</li> </ul>	<input type="checkbox"/>
4	Application of WTE technology might be in halt by the shortage of inputs	Low Risk (L)	Low Risk (L)	Installations were only done after the conducting of proper resource assessment to ensure the supply of wastes from industries.	<ul style="list-style-type: none"> <li>The assessment of the availability of the feedstock was done during the pre-feasibility study.</li> </ul>	<input type="checkbox"/>
5	Inadequate availability of trained plant operators.	Low Risk (L)	Low Risk (L)	The O&M staff will be trained at the information and best practices platform (IBPP) and will undergo on-the-job training in an existing biogas plant. Moreover, designated O&M staff at the the demonstration projects will be trained by the respective suppliers. Additionally, local engineering and O&M companies will be trained in O&M of WTE plants.	<ul style="list-style-type: none"> <li>At Olivado plant, 20 O&amp;M staff and at Tropical Power plant, 12 O&amp;M staff were trained by their respective technology suppliers.</li> <li>At Olivado plant, 1 local engineering company and 1 O&amp;M company were trained in the O&amp;M of WTE plants. It should be noted that Olivado's focus is on building in-house capacity with the aim to provide this as a service in the region.</li> <li>At Tropical Power plant, 2 local companies and at Olivado plant, 1 local company were trained in O&amp;M of WTE plants. It should be noted that Olivado's focus was on building in-house capacity with the aim to provide this as a service in the region.</li> </ul>	<input type="checkbox"/>
6	Floods	Low Risk (L)	Low Risk (L)	Biogas plant buildings and site offices will be located on elevated areas to prevent flooding. All buildings and structures will be designed and built appropriately to avoid flooding.	<ul style="list-style-type: none"> <li>Two plant operators (Olivado and Tropical power) developed their plant layouts with well-designed drainage systems to accommodate heavy rainfall and prevent flooding</li> </ul>	<input type="checkbox"/>
7	Kenya's electricity mix greatly depends on hydropower (presently 50%). Due to the changing weather patterns which significantly affect the energy sector, hydropower is highly vulnerable to weather conditions and climate changes.	Low Risk (L)	Low Risk (L)	Utilization of waste for electricity generation will reduce the dependency on hydropower.	<ul style="list-style-type: none"> <li>Olivado completed the installation of an avocado fruit/waste biogas plant with a total installed capacity of 470 kWe plus 422 kWth from the heat recovery system.</li> <li>Tropical Power plant completed the installation of a rose waste processing plant and realized the total installed capacity of 670 kWe of electricity.</li> <li>Timber Treatment International completed the installation of steam plants in Dandora, Nyahururu and Sotik KCC plants with a total cumulative capacity of 16,302 kWth.</li> <li>Total capacity generated: 1,140 kWe and 19,892 kWth.</li> </ul>	<input type="checkbox"/>

2. If the project received a [sub-optimal risk rating \(H, S\)](#) in the previous reporting period, please state the [actions taken](#) since then to mitigate the relevant risks and improve the related risk rating. Please also elaborate on reasons that may have impeded any of the sub-optimal risk ratings from improving in the current reporting cycle; please indicate actions planned for the next reporting cycle to remediate this.

N/A

3. Please indicate any implication of the **COVID-19** pandemic on the progress of the project.

*During the reporting period, Kenya experienced a minor increase of Covid-19 infections (from May 2022 to August 2022) with its peak in mid-June 2022 with over 2859 new infections registered, followed by a flattening of the curve until reaching an average of below 100 new infections per day in August 2022. <sup>6</sup>*

*As of 26 April 2023, there have been 343,035 confirmed cases of COVID-19 infections and 5,688 coronavirus-related deaths reported in the country since the pandemic began.<sup>7</sup> Kenya's vaccination campaign began in March 2021, prioritizing health workers, teachers, security personnel, and people aged over 58 years<sup>8</sup>. Accordingly, as of 26 April 2023, Kenya administered at least 23,750,431 of COVID vaccines, which corresponds to about 37% of the country's population being fully vaccinated<sup>9</sup>.*

*The main Covid-19 related challenges for the project were in relation to capacity building activities, in particular for Component 1 on Basic and Advanced Biogas training. The Covid-19 pandemic caused the rescheduling of the physical training of the Trainer-of-Trainers (TOT) in Nairobi to be conducted in an online course format, since the German trainers were unable to travel to Kenya owing to travel restrictions. Additionally, one of the trainees was infected with Covid-19 when the team was scheduled to travel to Germany for the Advanced biogas training, and hence was unable to travel and attend the same. Similarly, during the Advanced Biogas training in Germany, Covid-19 affected two of the facilitators, which led to the cancellation and re-scheduling of the training sessions, lectures, site visits and the final test to be conducted online (and only once in Kenya), taking into consideration the health and safety of staff, stakeholders, beneficiaries, and partners involved.*

4. Please clarify if the project is facing delays and is expected to request an **extension**.

*N/A.*

5. Please provide the **main findings and recommendations of completed MTR**, and elaborate on any actions taken towards the recommendations included in the report.

*In early 2021, considering the remaining project period and changing circumstances as a result of the COVID-19 pandemic, the project team initiated the mid-term monitoring and evaluation of the project by engaging a local expert and prepared a report. As per the main findings of the report, the project demonstrated good progress towards the delivery of all key outputs and tangible results were already observed. It was observed that the activities supported by the project would deliver their objectives and outcomes satisfactorily by project closure. The report further highlighted that all the major activities were already completed but identified the following items that needed attention in project execution: (i) the Information and Best Practices Platform (IBPP) for WTE technologies, which was in its final stages of being established at KIRDI, and (ii) the development of industrial biogas standards requiring a multi-stakeholder review of the draft report and the convening of a workshop to produce the final standards document. These two pending activities experienced delays due to the COVID-19 pandemic (and subsequent confinement measures) since they required in-person engagement.*

*As the main conclusions of the report in terms of relevance, it was verified that the project design and implementation were relevant and aligned with the national policies for the promotion of renewable energies, the priority areas for UNDAF and also corresponded to the national WTE related areas of training, institutional strengthening, awareness, and the regulatory environment. Concerning effectiveness, the implementation of project activities and products obtained generated positive effects that contributed to*

<sup>6</sup> WHO Health Emergency Dashboard, available at <https://covid19.who.int/region/afro/country/ke>

<sup>7</sup> WHO Health Emergency Dashboard, available at <https://covid19.who.int/region/afro/country/ke>

<sup>8</sup> Information retrieved from Reuter's Corona Virus Tracker, available at <https://graphics.reuters.com/world-coronavirus-tracker-and-maps/countries-and-territories/kenya/>

<sup>9</sup> Data retrieved from Kenya's Ministry of Health Portal, available at <https://www.health.go.ke/>

enhancing investments in WTE technologies. With regard to *efficiency*, the report concluded that the organizational structure and available resources were adequate to implement the necessary activities, however noted the experienced delays<sup>10</sup> in the technical implementation of the project. Furthermore, a gender perspective was included, and activities specifically aimed at meeting the needs and interests of women were taken into account. With respect to the sustainability of the project, the report concluded that it was highly likely for the benefits derived from the project to be maintained after the conclusion of the project.

As a recommendation, the report emphasized the relevance of the positive externalities of WTE generation, which should be made more explicit, particularly in comparison with other renewable energies. The report proposed that it could positively facilitate the diversification of energy resources which may improve access to finance for similar initiatives.

#### IV. Environmental and Social Safeguards (ESS)

1. As part of the requirements for **projects from GEF-6 onwards**, and based on the screening as per the UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), which category is the project?

- Category A project
- Category B project
- Category C project

(By selecting Category C, I confirm that the E&S risks of the project have not escalated to Category A or B).

Please expand the table as needed.

	E&S risk	Mitigation measures undertaken during the reporting period	Monitoring methods and procedures used in the reporting period
(i) Risks identified in ESMP at time of CEO Endorsement	Not Applicable as this project is under GEF-5 cycle.	-	-
(ii) New risks identified during project implementation (if not applicable, please insert 'NA' in each box)	Not Applicable as this project is under GEF-5 cycle.	-	-

#### V. Stakeholder Engagement

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes** regarding engagement of stakeholders in the project (based on the Stakeholder Engagement Plan or equivalent document submitted at CEO Endorsement/Approval).

<sup>10</sup> As detailed in the other relevant sections of this report regarding the delays due to the Covid-19 pandemic, import issues of plant materials, and political constraints of land leasing agreements.



As previously reported, the main project stakeholders and executing partners, outlined in the Stakeholder Section of the CEO document, include the Ministry of Energy (MoE), the Ministry of Environment and Forestry, the Ministry of Industry, Trade, and Cooperatives (MoITC)<sup>11</sup> and the Ministry of Agriculture, Livestock and Fishery (MoALF) as well as the Kenya Industrial Research and Development Institute (KIRDI), the Kenya Bureau of Standards (KEBS) and the Cooperative Bank of Kenya. Additionally, the Kenya Biogas Stakeholder Network (BIO-NET), the Dagoretti Environment Management Association (DEMA) and the Council of Governors are also major stakeholders in the project. All the abovementioned representatives involved in the different project components are equal members of the Project Steering Committee (PSC).

**Progress, challenges and outcomes** regarding engagement of project stakeholders during the reporting period:

1. During the reporting period, in May 2023, UNIDO's Director General Mr. Gerd Müller and the Managing Director from the Directorate of Innovation and Economic Transformation Mr. Gunther Beger visited Kenya. During this trip, the Director-General attended the UN Chief Executives Board meetings in Nairobi, where he had a fruitful discussion on UNIDO's contributions and priorities to achieve food security, access to sustainable energy and to support industrial skills and jobs for future generations. While in Kenya, MD Beger visited the Waste-to-Energy project demonstration plants of Olivado and Tropical Power which allowed for direct interaction and exchanges with the plant owners and teams as well as demonstration on site of the sustainable waste management technologies and initiatives, that were financed through the project. During the plant visits, MD Beger discussed about biogas technology and its potential and benefits in generating energy in the form of heat and electricity. The Olivado plant was praised as an excellent example of Circular Economy by processing the avocado as a fruit, to produce oil and biogas as well as the reuse of the kernels. Likewise, MD Beger encouraged the Tropical Power plant to actively share their success stories across relevant industrial sectors in Kenya.

2. During the reporting period, the PSC held two meetings (in October 2022 and March 2023 respectively) to track progress of the outstanding activities, to evaluate progress in line with the workplan and primarily, to jointly review and discuss the project's Terminal Evaluation Report. In both meetings a no-cost extension of the project period (first until March 2023 and now until end of June 2023) was agreed on, to complete the outstanding activities implemented by KIRDI and to allow sufficient time to finalize consultations on the Terminal Evaluation. Regarding the uptake and use of the newly launched Information and Best Practices Platform (IBPP) from KIRDI under Component 1, the need to calculate an incubation period of at least six to twelve months was highlighted, in order to sustain the IBPP activities. In response, it was jointly agreed to allocate some project funds for the monitoring of the IBPP activities, in particular, for the promotion and marketing of the various (new) activities and services offered by the IBPP. In the latter meeting in March, it was decided to organize a Biogas Stakeholder Workshop (that took place in April 2023) to share knowledge and experiences to pave a way forward within the industrial biogas sector after the project's closure. The outcome of the Workshop was the creation of a Biogas Expert Committee/Taskforce, to develop a roadmap for Kenya's biogas sector. In both PSC sessions, members expressed their appreciation for the project, the many lessons learned on an individual/professional and national level, and for the connections and networks established within the Waste-to-Energy ecosystem.

3. All the demonstration plant projects have sufficient feedstock on-site as a by-product of the developer's own business or an adjacent business with an equity stake. No need arose for the primary feedstock to be brought in from elsewhere, which implies a breakthrough in expanding the range of feedstock options for Kenya.

4. The ongoing global energy crisis, that began in the aftermath of the COVID-19 pandemic, has led to a depreciation of the Kenyan Shilling over foreign currencies and consequently reduced project stakeholders' purchasing power. In practical terms, it meant that originally budgeted purchases had to be reduced to accommodate the increased prices.

5. During the monitoring field visits, it was confirmed that none of the European, Chinese and Indian biogas technology providers have permanent representations in Kenya, which indicates that plant managers generally need to be self-sufficient with respect to having in-house personnel. These negative factors for plant management such as lack of local technical O&M support and poor access to spare parts, can disincentivize further uptake of biogas technologies and impede the road to self-sufficiency.

<sup>11</sup> Former Ministry of Industrialization and Enterprise Development.

6. Further research on addressing the identified challenges concerning deployment of biogas technologies and technological barriers in Kenya could be valuable. Targeted research about biogas systems could provide impetus for the promotion and growth of commercial investment in Kenya's biogas sector.

2. Please provide any feedback submitted by national counterparts, GEF OFP, co-financiers, and other partners/stakeholders of the project (e.g. private sector, CSOs, NGOs, etc.).

**Feedback from the Operational Focal Point in the Ministry of Environment and Forestry:**

During the reporting period, a team of 12 members from the OFP's monitoring team conducted a field visit to two of the demonstration plants, specifically to Olivado and Tropical Power. The monitoring team praised the work of both plants as an example of successful application of circular economy and zero waste principles. It was also highlighted that the subsidies provided under the project were important to unlock other financing that was needed by the plant companies.

3. Please provide any **relevant stakeholder consultation** documents.

5154\_7th PSC Meeting Minutes  
5154\_8th PSC Meeting Minutes  
5154\_GEF OFP Permanent Secretary Monitoring Visit  
5154\_Twitter Postings DG Müller and MD Beger

## VI. Gender Mainstreaming

1. Using the previous reporting period as a basis, please report on the **progress achieved on implementing gender-responsive measures** and **using gender-sensitive indicators**, as documented at CEO Endorsement/Approval (in the project results framework, gender action plan or equivalent),.

Although this is a GEF 5 project, and according to the UNIDO Gender Categorization Tool<sup>12</sup>, the project's intervention is categorized as having "limited gender dimensions", the project continued to emphasize women's participation and for the Biogas Week/training in Vienna, organized during the reporting period, 2 out of 4 participants were women. Moreover, gender dimensions have been applied in all project reporting and data collection activities.

## VII. Knowledge Management

1. Using the previous reporting period as a basis, please elaborate on any **knowledge management activities / products**, as documented at CEO Endorsement / Approval.

The project incorporates knowledge management under component 4. Accordingly, the following knowledge activities were conducted, and the associated products were developed:

**4.1.1 Terminal evaluation project report**

- Terminal Evaluation Project Report was prepared during the period from August 2022 until final submission on 31 May 2023.

**4.1.2 Lessons learned and information dissemination workshops**

<sup>12</sup> UNIDO Gender Categorization Tool, available at [https://www.unido.org/sites/default/files/2015-09/GENDER\\_CATEGORIZATION\\_TOOL\\_FINAL\\_0.pdf](https://www.unido.org/sites/default/files/2015-09/GENDER_CATEGORIZATION_TOOL_FINAL_0.pdf).

- A 'Standard Launching and Information Sharing' event was held on 4 July 2022 in Nairobi, Kenya in cooperation with KEBS and ERC (still within the current reporting period but was already reported in previous PIR)
- A Workshop on the Biogas Standards for Quality Energy Services and Socio-economic Development was held on 6 October 2022 in Nairobi, Kenya (Report attached).
- "Vienna Biogas Week" 12-16 June 2023, comprising an Expert Group Meeting, a Workshop and Field Visit to local biogas and compost plants, which facilitated networking and partnerships development as well as knowledge sharing amongst stakeholders and experts on advanced technologies, systems and services for biogas project development and operation, and the expansion of biogas utilization across the globe (Report attached).

#### **4.1.3 Publications and websites**

##### **FY23**

- The operationalization of the IBPP Website was officially launched on 31 January 2023.
- A sustainability strategy of the IBPP was prepared (attached).
- IBPP brochures, banners and leaflets for knowledge sharing were prepared and disseminated (attached).

##### **Previous FYs**

- National standards titled "Code of practice for farm and industrial scale biogas systems", were developed and officially endorsed.
- A news article was prepared and published on the UNIDO Website featuring the information sharing and dissemination event on the national standards for farm and industrial biogas systems.
- A video clip detailing the project activities and interviews with main project counterparts was prepared and uploaded on the UNIDO open data website, the UNIDO YouTube videos page, and shared by the UNIDO Kenya Field Office on Twitter and on the UN Kenya Flickr Homepage.
- A business plan (including a legal framework) of IBPP operationalization was developed.
- A Decentralized Energy Planning Manual was developed and shared.
- A Gender Analysis and Mainstreaming plan for future WTE projects was prepared and disseminated.
- Pre-feasibility study reports were prepared for 8 potential project sites.
- A full feasibility study and designs were prepared for the Dagoretti biogas plant.
- A biogas guidebook was developed.
- Training Materials (PPP and videos) on biogas technology were developed (11 topics including Introduction of Biogas Basics, Biogas Parameters, Biogas Feedstocks, Biogas Plant Planning & Feasibility, Construction, Operation, Maintenance, Safety of Biogas Plants, Digestate as Fertilizer, Biogas Policy, Financial Aspects, Assessment for Funding, Biogas Sustainability).
- A Mid-term project Monitoring and Evaluation report was prepared.

## **2. Please list any relevant knowledge management mechanisms / tools that the project has generated.**

5154\_ Terminal Evaluation Report

5154\_Workshop Report on Biogas Standards for Quality Energy Services and Socio-Economic Development

5154\_Report of Vienna Biogas Week

5154\_Sustainability Strategy of the Information Best Practices Platform (IBPP)

5154\_Screenshots of IBPP Website

5154\_IBPP Awareness Raising Materials

## VIII. Implementation progress

1. Using the previous reporting period as a basis, please provide information on **progress, challenges and outcomes achieved/observed** with regards to project implementation.

### **Component 1 – Capacity development and knowledge management**

*During the reporting period, significant progress was made with regards to the activities of the Information Best Practice Platform (IBPP) on Waste-to-Energy Technologies.*

*Most notable is the official inauguration of the biogas laboratory as well as the launch of the Information Best Practices Platform website that were jointly celebrated in an opening ceremony in January 2023. The Biogas laboratory was upgraded in terms of lab equipment and office appliances to support analysis of available feedstock that could be used for Waste to Energy generation. The establishment and operationalization of the IBPP website was one of the key deliverables under this component, with the aim to consolidate all stakeholders and relevant information of Kenya's biogas sector. The website is hosted within the main KIRDI website<sup>13</sup>.*

*Another objective under this component was to develop a database of existing industrial biogas systems. During the reporting period, a second field visit was conducted in October 2022 and included the inspection of the various biogas plants well as engagement with stakeholders in the WTE sector in the country.*

*Furthermore, a sustainability strategy of the IBPP was finalized, reviewing a way forward beyond the project's closure. The strategy highlights (i) the national policies that support waste-to-energy technologies, (ii) the internal institutional framework and KIRDI's internal capacities and lead partners, (iii) the sustainability criteria to promote waste-to-energy technologies vis-a-vis what is likely to be achieved, the related challenges, anticipated risks and mitigation measures, as well as (iv) an analysis of the financial resources evaluating operating costs and the projected income generated from the services of the IBPP.*

*Furthermore, within the second half of 2022 several Biogas/Waste to Energy associated networking activities were conducted. These involved a Waste to Energy (Biogas Technology) Awareness Workshop with high-level participants including policymakers, financial institutions, and NGO representatives. During the workshop, working groups were formed to discuss various challenges and come up with a way forward on policy issues and financing frameworks for biogas projects in Kenya. Accompanying communication materials, such as brochures and leaflets, were also showcased and distributed to the workshop participants to further promote the IBPP.*

*Besides this, five (5) selected KIRDI staff participated in an International Conference on Science and Technology at Dedan Kimathi University of Technology (DEKUT) and presented two scientific papers<sup>14</sup>.*

*Furthermore, during the reporting period, the train-the-trainer course continued with Phase 2, and an advanced training on biogas technology was organized for three (3) KIRDI technical staff (2 men and 1 woman) in July 2022 in Munich, Germany. The advanced biogas training consisted of a combination of lectures and biogas plants site visits. The team also had an opportunity to interact with stakeholders in the German Biogas Sector. Some of the topics covered under the advanced training included: biogas parameters (lab monitoring and analysis of biogas plants), financial aspects, assessment for funding, technology, construction, operation and maintenance, and biogas safety.*

*With regard to the components on institutional strengthening and capacity building activities, 12 persons (7 men and 5 women) of the office of the Principal Secretary in the Ministry of Environment conducted a knowledge sharing and monitoring site visit to the two demonstration plants - Olivado and Tropical Power - to share knowledge and expertise on WTE technologies.*

*In 2023, two national Biogas Stakeholder Meetings were conducted to discuss post project scenarios and a way forward, which resulted in the establishment of a Biogas Expert Task Force.*

*Lastly, in June 2023, UNIDO organized a Vienna Biogas Week, in which 5 WTE Project stakeholders (3 men and 2 women), including 2 policymakers, 1 project developer and 2 UNIDO project staff participated. The activities consisted of an Expert Group Meeting on the use of biogas, a workshop titled "Ignite the use of biogas towards the achievement of the Paris Climate Goals & SDGs: How to bridge institutional, technological, environmental and economic opportunities and challenges", and several site visits to biogas*

<sup>13</sup> Accessible at <https://energyresources.kirdi.go.ke/>

<sup>14</sup> Scientific papers entitled: "Enhancing biogas production from Biomass waste through Pretreatment" and "Optimal characterization of Market Waste for Biogas generation – A Case Study for Nyeri County".

and compost plants near Vienna. The event facilitated the building of networks and partnerships as well as knowledge sharing amongst stakeholders and experts on advanced technologies, systems and services for biogas project development and operation, and the expansion of biogas utilization across the globe.

**Component 2 – Establishment of agro-industrial WTE plants**

During the reporting period, to promote further dissemination of information on the standards, an additional Workshop on the Biogas Standards for Quality Energy Services and Socio-economic Development was organized in October 2022 by KEBS in collaboration with UNIDO. Participants included major national industry players, managers, experts, policymakers, implementers and planners. In addition to providing a basic understanding of the new standards, it was also an opportunity to share experiences and discuss current needs and challenges of the Kenyan biogas industry.

**Component 3 – Scaling up investments in WTE plants**

Since the Component has already been completed, no further progress is reported.

2. Please briefly elaborate on any **minor amendments**<sup>15</sup> to the approved project that may have been introduced during the implementation period or indicate as not applicable (NA).

Please tick each category for which a change has occurred and provide a description of the change in the related textbox. You may attach supporting documentation, as appropriate.

<input type="checkbox"/>	Results Framework	N.A.
<input type="checkbox"/>	Components and Cost	N.A.
<input type="checkbox"/>	Institutional and Implementation Arrangements	N.A.
<input type="checkbox"/>	Financial Management	N.A.
<input checked="" type="checkbox"/>	Implementation Schedule	Extension to 60 months project duration
<input type="checkbox"/>	Executing Entity	N.A.
<input type="checkbox"/>	Executing Entity Category	N.A.
<input type="checkbox"/>	Minor Project Objective Change	N.A.
<input type="checkbox"/>	Safeguards	N.A.
<input type="checkbox"/>	Risk Analysis	N.A.
<input type="checkbox"/>	Increase of GEF Project Financing Up to 5%	N.A.
<input type="checkbox"/>	Co-Financing	N.A.
<input type="checkbox"/>	Location of Project Activities	N.A.
<input type="checkbox"/>	Others	N.A.

<sup>15</sup> As described in Annex 9 of the *GEF Project and Program Cycle Policy Guidelines*, **minor amendments** are changes to the project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.

### 3. Please provide progress related to the financial implementation of the project.

UNIDO		GRANT DELIVERY REPORT		Grant:	200003217	Grant Status:	Authority to implement	Grant Validity:	02.11.2015 - 30.06.2023		
		Sponsor:	400150 - GEF - Global Environment Facility	Currency:	USD	Reporting Period:	02.11.2015 - 13.07.2023				
		Other Reference:	5154-U3-PJ-MS-GR-01	Fund:	GF	Prepared on:	13.07.2023				
Project	Project Description	Country	Region	Project Manager			Project Validity				
120568	SUSTAINABLE CONVERSION OF WASTE INTO CLEAN ENERGY TO REDUCE GHG EMISSIONS IN KENYA	Kenya	Africa	Naoki Torii			12.11.2015 - 30.06.2023				
	Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
<b>120568</b>											
<b>120568-1-02-01</b>	<b>OP 1: Capacity Building on WTE</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>
1100	Staff & Intern Consultants	0.00	0.00	0.00	0.00	48,217.80	48,217.80	48,217.80	0.00	0.00	48,217.80
1500	Local Travel	1,676.50	0.00	222.34	222.34	16,870.94	16,870.94	15,416.78	1,454.16	0.00	15,416.78
1600	Staff Travel	202.00	0.00	236.85	236.85	202.00	202.00	236.85	(34.85)	0.00	236.85
1700	Nat.Consult./Staff	0.00	0.00	0.00	0.00	97,457.07	97,457.07	97,457.07	0.00	0.00	97,457.07
2100	Contractual Services	576.83	403.05	689.21	1,092.26	40,064.14	40,064.14	40,579.57	(515.43)	0.00	40,579.57
3000	Train/Fellowship/Study	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3500	International Meetings	0.00	0.00	0.00	0.00	26,954.78	26,954.78	26,954.78	0.00	0.00	26,954.78
4500	Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5100	Other Direct Costs	0.00	0.00	0.00	0.00	10,435.25	10,435.25	10,435.25	0.00	0.00	10,435.25
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22,710.73	22,710.73
<b>120568-1-02-01</b>	<b>Total</b>	<b>2,455.33</b>	<b>403.05</b>	<b>1,148.40</b>	<b>1,551.45</b>	<b>240,201.98</b>	<b>240,201.98</b>	<b>239,298.10</b>	<b>903.88</b>	<b>22,710.73</b>	<b>262,008.83</b>
<b>120568-1-03-01</b>	<b>OP 2: Biogas for Energy Generation</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>
1100	Staff & Intern Consultants	0.00	0.00	0.00	0.00	117,097.32	117,097.32	117,097.32	0.00	0.00	117,097.32
1500	Local Travel	0.00	0.00	0.00	0.00	41,216.81	41,216.81	41,216.81	0.00	0.00	41,216.81
1700	Nat.Consult./Staff	875.07	0.00	0.00	0.00	208,545.55	208,545.55	207,670.48	875.07	0.00	207,670.48
2016	2016	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2100	Contractual Services	0.00	(1,722.14)	2,067.57	345.43	254,313.82	254,313.82	254,659.25	(345.43)	0.00	254,659.25
3000	Train/Fellowship/Study	0.00	0.00	0.00	0.00	44,057.91	44,057.91	44,057.91	0.00	0.00	44,057.91
3500	International Meetings	0.00	0.00	0.00	0.00	13,277.62	13,277.62	13,277.62	0.00	0.00	13,277.62
4300	Premises	0.00	0.00	0.00	0.00	208.38	208.38	208.38	0.00	0.00	208.38
4500	Equipment	0.00	0.00	0.00	0.00	10,229.99	10,229.99	10,229.99	0.00	0.00	10,229.99
5100	Other Direct Costs	0.00	0.00	0.00	0.00	21,967.98	21,967.98	21,967.98	0.00	0.00	21,967.98
9300	Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67,486.97	67,486.97
<b>120568-1-03-01</b>	<b>Total</b>	<b>875.07</b>	<b>(1,722.14)</b>	<b>2,067.57</b>	<b>345.43</b>	<b>710,915.38</b>	<b>710,915.38</b>	<b>710,385.74</b>	<b>529.64</b>	<b>67,486.97</b>	<b>777,872.71</b>

\* Does not include Unapproved Obligations  
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## GRANT DELIVERY REPORT

Grant:	200003217	Grant Status:	Authority to implement	Grant Validity:	02.11.2015 - 30.06.2023
Sponsor:	400150 - GEF - Global Environment Facility	Currency:	USD	Reporting Period:	02.11.2015 - 13.07.2023
Other Reference:	5154-U3-PJ-MS-GR-01	Fund:	GF	Prepared on:	13.07.2023
<b>Project</b>	<b>Project Description</b>	<b>Country</b>	<b>Region</b>	<b>Project Manager</b>	<b>Project Validity</b>
120568	SUSTAINABLE CONVERSION OF WASTE INTO CLEAN ENERGY TO REDUCE GHG EMISSIONS IN KENYA	Kenya	Africa	Naoki Torii	12.11.2015 - 30.06.2023

Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
<b>120568-1-04-01</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>
OP 3: Establishment of incentive systems										
1100 Staff & Intern Consultants	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1500 Local Travel	0.00	0.00	0.00	0.00	7,234.58	7,234.58	7,234.58	0.00	0.00	7,234.58
1600 Staff Travel	0.00	0.00	0.00	0.00	390.00	390.00	390.00	0.00	0.00	390.00
1700 Nat.Consult./Staff	0.00	0.00	0.00	0.00	69,332.57	69,332.57	69,332.57	0.00	0.00	69,332.57
2100 Contractual Services	5,887.25	(4,731.96)	5,513.49	781.53	595,494.12	595,494.12	590,388.40	5,105.72	0.00	590,388.40
3000 Train/Fellowship/Study	0.00	0.00	0.00	0.00	22,501.60	22,501.60	22,501.60	0.00	0.00	22,501.60
3500 International Meetings	0.00	0.00	0.00	0.00	765.00	765.00	765.00	0.00	0.00	765.00
4500 Equipment	0.00	0.00	0.00	0.00	1,597.03	1,597.03	1,597.03	0.00	0.00	1,597.03
5100 Other Direct Costs	0.00	0.00	0.00	0.00	7,461.77	7,461.77	7,461.77	0.00	0.00	7,461.77
9300 Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66,431.74	66,431.74
<b>120568-1-04-01 Total</b>	<b>5,887.25</b>	<b>(4,731.96)</b>	<b>5,513.49</b>	<b>781.53</b>	<b>704,776.67</b>	<b>704,776.67</b>	<b>699,670.95</b>	<b>5,105.72</b>	<b>66,431.74</b>	<b>766,102.69</b>
<b>120568-1-05-01</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>
Project Management Cost										
1100 Staff & Intern Consultants	0.00	0.00	1,007.61	1,007.61	0.00	0.00	1,007.61	(1,007.61)	0.00	1,007.61
1500 Local Travel	40,246.55	0.00	19,139.91	19,139.91	54,305.28	54,305.28	33,198.64	21,106.64	0.00	33,198.64
1600 Staff Travel	0.00	0.00	69.70	69.70	0.00	0.00	69.70	(69.70)	0.00	69.70
1700 Nat.Consult./Staff	0.00	0.00	2,248.73	2,248.73	103,445.75	103,445.75	105,694.48	(2,248.73)	0.00	105,694.48
2100 Contractual Services	10,778.24	0.00	4,118.05	4,118.05	12,711.06	12,711.06	6,050.87	6,660.19	0.00	6,050.87
3000 Train/Fellowship/Study	16,694.43	0.00	17,554.64	17,554.64	18,337.81	18,337.81	19,198.02	(860.21)	0.00	19,198.02
3500 International Meetings	0.00	52.02	16,980.25	17,032.27	4,147.64	4,147.64	21,179.91	(17,032.27)	0.00	21,179.91
4500 Equipment	0.00	0.00	0.00	0.00	1,658.40	1,658.40	1,658.40	0.00	0.00	1,658.40
5100 Other Direct Costs	767.29	0.00	2,870.68	2,870.68	2,648.92	2,648.92	4,752.31	(2,103.39)	0.00	4,752.31
9300 Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18,225.34	18,225.34
<b>120568-1-05-01 Total</b>	<b>68,486.51</b>	<b>52.02</b>	<b>63,989.57</b>	<b>64,041.59</b>	<b>197,254.86</b>	<b>197,254.86</b>	<b>192,809.94</b>	<b>4,444.92</b>	<b>18,225.34</b>	<b>211,035.28</b>

\* Does not include Unapproved Obligations

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Other Reference:	5154-U3-PJ-MS-GR-01	Fund:	GF	Prepared on:	13.07.2023
<b>Project</b>	<b>Project Description</b>	<b>Country</b>	<b>Region</b>	<b>Project Manager</b>	<b>Project Validity</b>
120568	SUSTAINABLE CONVERSION OF WASTE INTO CLEAN ENERGY TO REDUCE GHG EMISSIONS IN KENYA	Kenya	Africa	Naoki Torii	12.11.2015 - 30.06.2023

Description	Released Budget Current Year (a)	Obligations Current Year (b)	Disbursements Current Year (c)	Expenditures Current Year (d=b+c)	Total Agreement Budget (e)	Released Budget (f)	Obligations + Disbursements (g)	Funds Available* (h=f-g)	Support Cost (i)	Total Expenditures (j=g+i)
<b>120568-1-51-01</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>	<b>USD</b>
Effective Assessment of Outputs										
1100 Staff & Intern Consultants	13,725.95	0.00	0.00	0.00	31,556.48	31,556.48	17,830.53	13,725.95	0.00	17,830.53
1500 Local Travel	0.00	0.00	0.00	0.00	6,743.57	6,743.57	6,743.57	0.00	0.00	6,743.57
1700 Nat.Consult./Staff	0.00	0.00	0.00	0.00	103,737.93	103,737.93	103,737.93	0.00	0.00	103,737.93
2100 Contractual Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3000 Train/Fellowship/Study	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5100 Other Direct Costs	0.00	0.00	0.00	0.00	4,811.13	4,811.13	4,811.13	0.00	0.00	4,811.13
9300 Support Cost IDC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12,646.61	12,646.61
<b>120568-1-51-01 Total</b>	<b>13,725.95</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>146,849.11</b>	<b>146,849.11</b>	<b>133,123.16</b>	<b>13,725.95</b>	<b>12,646.61</b>	<b>145,769.77</b>
<b>120568 Total</b>	<b>91,430.11</b>	<b>(5,999.03)</b>	<b>72,719.03</b>	<b>66,720.00</b>	<b>1,999,998.00</b>	<b>1,999,998.00</b>	<b>1,975,287.89</b>	<b>24,710.11</b>	<b>187,501.39</b>	<b>2,162,789.28</b>
<b>200003217 USD Total</b>	<b>91,430.11</b>	<b>(5,999.03)</b>	<b>72,719.03</b>	<b>66,720.00</b>	<b>1,999,998.00</b>	<b>1,999,998.00</b>	<b>1,975,287.89</b>	<b>24,710.11</b>	<b>187,501.39</b>	<b>2,162,789.28</b>

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Regarding the confirmed sources of the final project's co-financing, at the concept development stage and according to the CEO doc, the total promised co-financing was close to USD 10 million<sup>16</sup>. The stakeholders that were approached during consultations were very receptive of the project and pledged co-finance and readily provided written confirmation of their commitment to provide the co-financing to the project. However, during the project implementation, specifically when the funding was received from GEF to start the project, the co-financiers were unable to commit the pledged co-financing resources/amounts and sought for GEF to finance 100% of the project. Consequently, a call for proposal was advertised in the media and only those who committed to provide the resources were selected. Notably, as per the status of the co-financing and beneficiaries in the below table, the project has been able to leverage a large contribution from within the country reaching USD 6,7 million co-financing by the end of project. Under these circumstances, the project showed a good degree of efficiency in terms of the overall achieved outcomes. Regarding the timing, the project did accrue a delay and subsequently the activities were not in line with the original plans, however the overall cost did not increase.

#### Confirmed sources of co-financing numbers

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount (USD) - MTR	Amount (USD) - TE <sup>16</sup>
Private Sector	Tropical Power	Other	Investment mobilized	285,370.00	444,067.00
Private Sector	Timber Treatment International Ltd	Other	Investment mobilized	2,800,000.00	3,737,963.00
Private Sector	Olivado EPZ Limited	Other	Investment mobilized	1,145,000.00	1,500,000.00
Recipient Country Government	Kenya Industrial Research & Development Institute (KIRDI)	Public Investment	Investment mobilized	800,000.00	1,046,205.00
<b>Total</b>				<b>5,030,370.00</b>	<b>6,728,235.00</b>

### IX. Work Plan and Budget

1. Please provide **an updated project work plan and budget** for the remaining duration of the project, as per last approved project extension. Please expand/modify the table as needed.

N/A as the project closed on 30 June 2023.

### X. Synergies

1. **Synergies** achieved:

The project involved partnering with the FACEP project, financed by the Government of France and implemented by Naskeo Environment<sup>17</sup>, an independent French engineering company and constructor of biogas plants, that installed equipment for the biogas laboratory at KIRDI. Additionally, in the area of sustainable waste, a national sustainable waste management policy (in 2020)<sup>18</sup>

<sup>16</sup> The total costs include any preliminary/start up investment, maintenance and spare parts (O&M), system commissioning and associated labour costs.

<sup>17</sup> NASKEO, available at <https://naskeo.com/en/>

<sup>18</sup> National Sustainable Waste Management Policy, available at <http://www.environment.go.ke/wp-content/uploads/2021/03/FINAL-National-Waste-Policy-March-2020.pdf>



and a sustainable waste management bill (in 2021)<sup>19</sup> were adopted, which will bring in more government support for sustainable waste management, including waste to energy, and will most certainly create synergies to further promote waste to energy technologies across the country moving forward.

### 3. Stories to be shared (Optional)

Since the project is due to close, the following challenges, outcomes and key lessons learned, covering the entirety of the project, can already be highlighted:

- This waste to energy project demonstrated new approaches to waste to energy technologies, its positive impact on GHG emissions, energy savings and sustainable waste management.
- The energy generated is used by the companies themselves, reducing their overall energy costs, but also creates new income streams by selling the surplus energy and the by-products such as bio-fertilizers.
- Training biogas practitioners can help address the skills gap in the biogas and waste to energy sector.
- The newly equipped and launched biogas laboratory at KIRDI provides a new testing facility in east and central Africa. It reduces the cost of doing analytical tests overseas, creates new job opportunities, and serves as a training and knowledge hub.
- Financial institutions, in general, are relatively less aware about waste to energy technologies and biomass energy technologies, which makes access to finance the biggest hurdle in WTE and biogas projects.
- Uptake of waste to energy technologies requires a solid and stable regulatory environment that offers security and incentives for private sector entities, (agro-processing plants in particular) to invest in responsible waste management systems.
- Lack of land lease arrangements led to delays in setting up a biogas plant.
- The initial cost of investment is high, with all private sector partners experiencing difficulties in accessing commercial loans.
- There were significant (and unexpected) delays with customs clearance processes of imported materials and parts.
- Kenya's feed-in-tariffs to feed the power to the grid are relatively low in comparison to the cost of production, which may limit investment in larger-scale biogas plants.

## XI. GEO LOCATION INFORMATION

The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. The Location & Activity Description fields are optional. Project longitude and latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate.

Web mapping applications such as [OpenStreetMap](#) or [GeoNames](#) use this format. Consider using a conversion tool as needed, such as: <https://coordinates-converter.com>

Please see the Geocoding User Guide by clicking [here](#)

Location Name	Latitude	Longitude	Geo Name ID	Location and Activity Description
Nairobi	- 1.288787	36.83295	184745	Nairobi is the main project location for the project stakeholders and related activities of KEBS, KIRDI, and Tropical Power plant.

<sup>19</sup> The Sustainable Waste Management Bill 2021, available at [http://kenyalaw.org/kl/fileadmin/pdfdownloads/bills/2021/TheSustainableWasteManagementBill\\_2021.pdf](http://kenyalaw.org/kl/fileadmin/pdfdownloads/bills/2021/TheSustainableWasteManagementBill_2021.pdf)

Murang'a	- 0.76762	37.25898		Location of the Olivado plant.
Eldoret	- 0.517763	35.26577		Location of the Timber Treatment International plant.

Please provide any further geo-referenced information and map where the project interventions is taking place as appropriate.



#### EXPLANATORY NOTE

1. **Timing & duration:** Each report covers a twelve-month period, i.e. 1 July 2022 – 30 June 2023.
2. **Responsibility:** The responsibility for preparing the report lies with the project manager in consultation with the Division Chief and Director.

3. **Evaluation:** For the report to be used effectively as a tool for annual self-evaluation, project counterparts need to be fully involved. The (main) counterpart can provide any additional information considered essential, including a simple rating of project progress.
4. **Results-based management:** The annual project/programme progress reports are required by the RBM programme component focal points to obtain information on outcomes observed.

Global Environmental Objectives (GEOs) / Development Objectives (DOs) ratings	
<b>Highly Satisfactory (HS)</b>	Project is expected to achieve or exceed <u>all</u> its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as "good practice".
<b>Satisfactory (S)</b>	Project is expected to <u>achieve most</u> of its <u>major</u> global environmental objectives, and yields satisfactory global environmental benefits, with only minor shortcomings.
<b>Moderately Satisfactory (MS)</b>	Project is expected to <u>achieve most</u> of its major <u>relevant</u> objectives but with either significant shortcomings or modes overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environmental benefits.
<b>Moderately Unsatisfactory (MU)</b>	Project is expected to achieve <u>some</u> of its major global environmental objectives with major shortcomings or is expected to <u>achieve only some</u> of its major global environmental objectives.
<b>Unsatisfactory (U)</b>	Project is expected <u>not</u> to achieve <u>most</u> of its major global environmental objectives or to yield any satisfactory global environmental benefits.
<b>Highly Unsatisfactory (HU)</b>	The project has failed to achieve, and is not expected to achieve, <u>any</u> of its major global environmental objectives with no worthwhile benefits.

Implementation Progress (IP)	
<b>Highly Satisfactory (HS)</b>	Implementation of <u>all</u> components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as "good practice".
<b>Satisfactory (S)</b>	Implementation of <u>most</u> components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.
<b>Moderately Satisfactory (MS)</b>	Implementation of <u>some</u> components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
<b>Moderately Unsatisfactory (MU)</b>	Implementation of <u>some</u> components is <u>not</u> in substantial compliance with the original/formally revised plan with most components requiring remedial action.
<b>Unsatisfactory (U)</b>	Implementation of <u>most</u> components in <u>not</u> in substantial compliance with the original/formally revised plan.
<b>Highly Unsatisfactory (HU)</b>	Implementation of <u>none</u> of the components is in substantial compliance with the original/formally revised plan.

Risk ratings	
Risk ratings will assess the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risk of projects should be rated on the following scale:	
<b>High Risk (H)</b>	There is a probability of greater than <b>75%</b> that assumptions may fail to hold or materialize, and/or the project may face high risks.
<b>Substantial Risk (S)</b>	There is a probability of between <b>51%</b> and <b>75%</b> that assumptions may fail to hold or materialize, and/or the project may face substantial risks.
<b>Moderate Risk (M)</b>	There is a probability of between <b>26%</b> and <b>50%</b> that assumptions may fail to hold or materialize, and/or the project may face only moderate risk.
<b>Low Risk (L)</b>	There is a probability of up to <b>25%</b> that assumptions may fail to hold or materialize, and/or the project may face only low risks.